Pengadaan Software Sistem Virtualisasi

Technical Documentation

PT. Sugi Jaya Teknologi

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Project Information

Customer	LAPAN (Lembaga Penerbangan dan Antariksa Nasional
Title	Pengadaan Software Sistem Virtualisasi

Implementation Team

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Table of Content

Chapter 1 Summary of Implementation

Background

For this project, LAPAN has chosen PT.Sugi Jaya Teknologi as the partner to implement the vSphere & Operation Management 6

## Scope of Work

The scope of this project are :

- Design vSphere 6
- Install & Configure vSphere 6 and Operation Management
- User Acceptance Test
- Documentation

Chapter 2 Detail of Implementation

2.1. Project Management

ID	Task Name	Baseline Start	Baseline Finish	Duration	Actual Start	Actual Finish	% Complete	Predecessors
1	Instalasi VMWare - LEMBABA PENERBANGAN DAN ANTARIKSA NASIONAL	Tue 9/8/15	Tue 12/15/15	99 days	Tue 9/8/15	Tue 12/15/15	100%	
2	Proses Inisiasi	Tue 9/8/15	Wed 9/16/15	9 days	Tue 9/8/15	Wed 9/16/15	100%	
3	Penawaran Pembelian barang diterima oleh Sugi Jaya	Tue 9/8/15	Tue 9/8/15	1 day	Tue 9/8/15	Tue 9/8/15	100%	
4	PO diterima oleh Sugi Jaya	Wed 9/9/15	Wed 9/9/15	1 day	Wed 9/9/15	Wed 9/9/15	100%	3
5	Mengeluarkan SO	Thu 9/10/15	Thu 9/10/15	1 day	Thu 9/10/15	Thu 9/10/15	100%	4
6	Pembentukan tim proyek	Wed 9/16/15	Wed 9/16/15	1 day	Wed 9/16/15	Wed 9/16/15	100%	5
7	Proses Perencanaan	Tue 9/29/15	Mon 10/26/15	28 days	Tue 9/29/15	Mon 10/26/...	100%	
8	Pembahasan proyek internal	Tue 9/29/15	Tue 9/29/15	1 day	Tue 9/29/15	Tue 9/29/15	100%	6
9	Pembahasan proyek dengan pihak LAP	Mon 10/12/15	Mon 10/12/15	1 day	Mon 10/12/...	Mon 10/12/...	100%	8FS+10 days
10	Membuat PID	Mon 10/12/15	Sun 10/18/15	7 days	Mon 10/12/...	Sun 10/18/15	100%	8
11	Submit PIC	Mon 10/19/15	Wed 10/21/15	3 days	Mon 10/19/...	Wed 10/21/...	100%	10
12	Pengecekan PID	Thu 10/22/15	Mon 10/26/15	5 days	Thu 10/22/15	Mon 10/26/...	100%	11
13	Penandatanganan PID	Mon 10/26/15	Mon 10/26/15	1 day	Mon 10/26/...	Mon 10/26/...	100%	12
14	Proses Eksekusi/Implemetasi	Tue 9/29/15	Fri 12/4/15	67 days	Tue 9/29/15	Fri 12/4/15	100%	
15	Melakukan pemesanan kepada penyed	Tue 9/29/15	Tue 9/29/15	1 day	Tue 9/29/15	Tue 9/29/15	100%	4
16	Pelatihan tim IT LAPAN di hotel Grand Whizz	Mon 11/16/15	Fri 11/20/15	5 days	Mon 11/16/15	Fri 11/20/15	100%	4
17	Pelatihan Selesai	Sat 11/21/15	Sat 11/21/15	1 day	Sat 11/21/15	Sat 11/21/15	100%	16
18	Instalasi VMWare di LAPAN	Thu 11/26/15	Fri 12/4/15	9 days	Thu 11/26/15	Fri 12/4/15	100%	
19	Pre Konfigurasi VMWare	Thu 11/26/15	Fri 11/27/15	2 days	Thu 11/26/15	Fri 11/27/15	100%	17FS+5 days,1
20	Konfigurasi VMWare mengacu pada I	Sat 11/28/15	Mon 11/30/15	3 days	Sat 11/28/15	Mon 11/30/...	100%	19,13
21	Monitor hasil instalasi	Tue 12/1/15	Fri 12/4/15	4 days	Tue 12/1/15	Fri 12/4/15	100%	20
22	Instalasi selesai	Fri 12/4/15	Fri 12/4/15	1 day	Fri 12/4/15	Fri 12/4/15	100%	21
23	Monitor dan Kontrol Proyek	Wed 10/7/15	Tue 12/15/15	70 days	Wed 10/7/15	Tue 12/15/15	100%	
24	UAT	Sat 12/5/15	Tue 12/8/15	4 days	Sat 12/5/15	Tue 12/8/15	100%	21
25	Penandatanganan UAT	Tue 12/8/15	Tue 12/8/15	1 day	Tue 12/8/15	Tue 12/8/15	100%	24
26	Pengawasan Proyek	Wed 10/7/15	Tue 12/15/15	70 days	Wed 10/7/15	Tue 12/15/15	100%	8SS,31FF
27	Quality Control	Tue 12/8/15	Tue 12/8/15	1 day	Tue 12/8/15	Tue 12/8/15	100%	19SS,24FF
28	Proses Penutupan	Wed 12/9/15	Tue 12/15/15	7 days	Wed 12/9/15	Tue 12/15/15	100%	
29	Laporan Akhir hasil pekerjaan	Wed 12/9/15	Sat 12/12/15	4 days	Wed 12/9/15	Sat 12/12/15	100%	17,24
30	Berita Acara Serah Terima	Sun 12/13/15	Mon 12/14/15	2 days	Sun 12/13/15	Mon 12/14/...	100%	29
31	Pengalihan pekerjaan kepada pihak pemeliharaan	Tue 12/15/15	Tue 12/15/15	1 day	Tue 12/15/15	Tue 12/15/15	100%	30
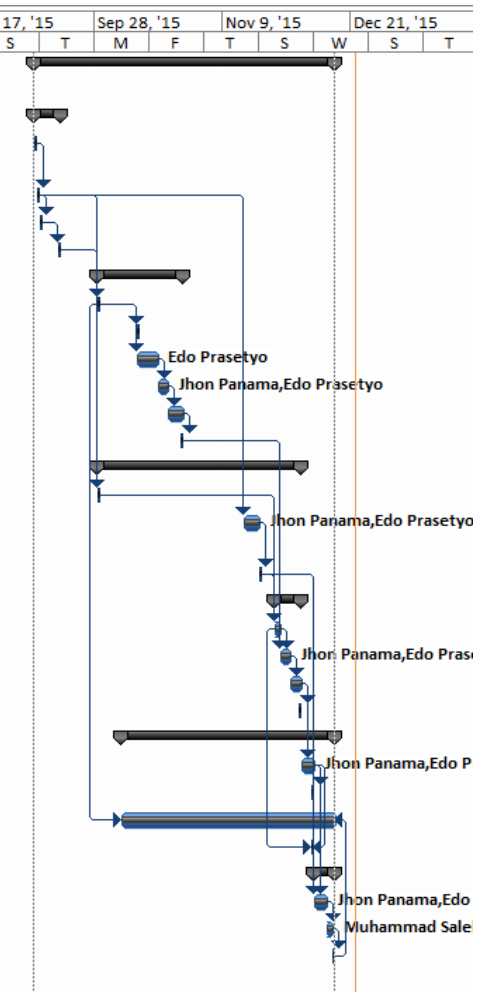
2.2. Project Technical Details

2.2.1. License List

Product	Total Qty
VMware vSphere 6 with Operation Management Standard	**8**
1 Year Production Sns 24*7	**8**
vCenter Management for vSphere	**1**
1 Year Production Sns 24*7 for vCenter	**1**

2.2.2. Logical Topology
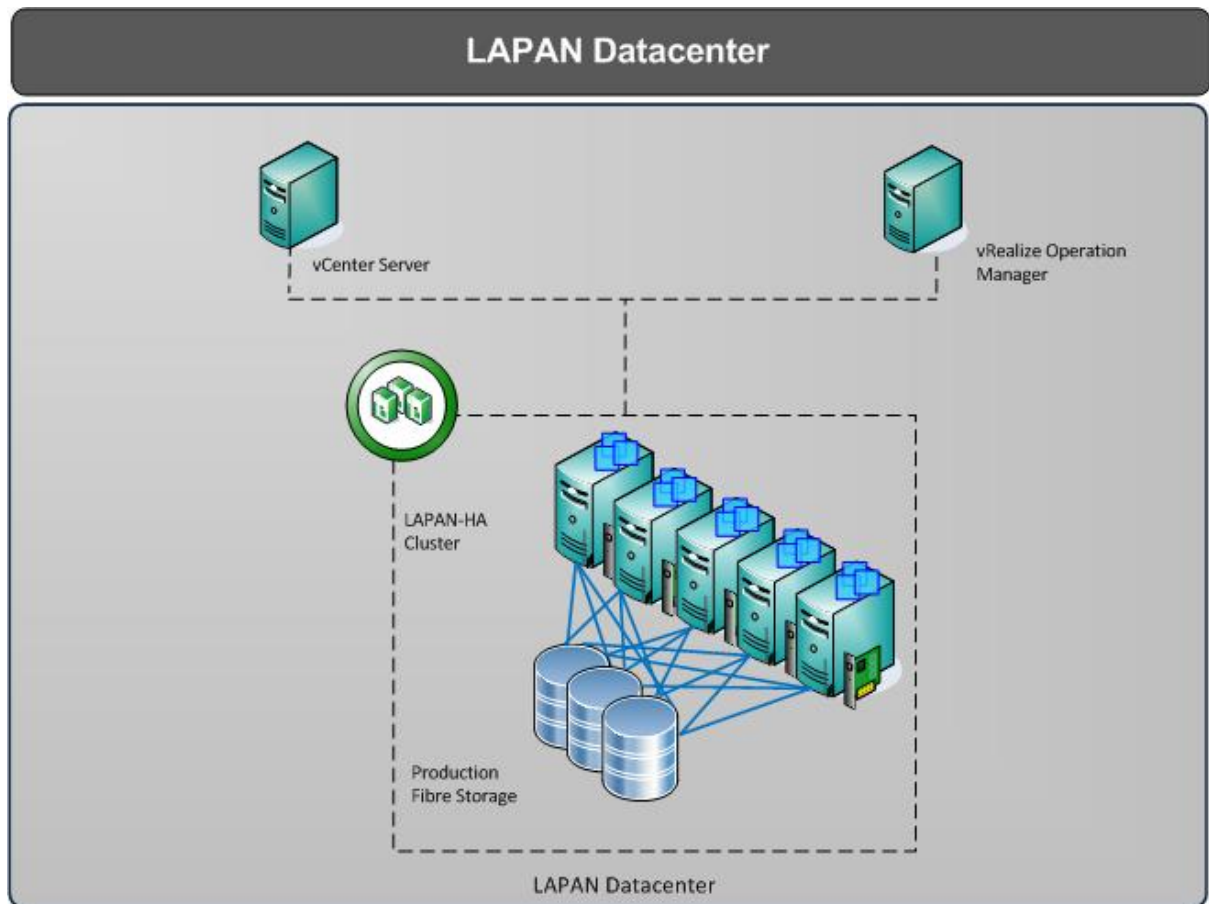
2.2.3. IP Address List

Below is IP address for Devices Management, VMware, Host and etc.

2.2.3.1. IP Address Esxi Management

IP Address Esxi Management				
No	Name	Vlan ID	IP Address	SubnetMask
1	Esx01.lapan.go.id	115	10.15.15.2	255.255.255.0
2	Esxi02.lapan.go.id	115	10.15.15.3	255.255.255.0
3	Esxi03.lapan.go.id	115	10.15.15.4	255.255.255.0
4	Esxi04.lapan.go.id	115	10.15.15.5	255.255.255.0
5	Esxi05.lapan.go.id	115	10.15.15.6	255.255.255.0

No	IP Address Esxi Management			
	Name	Vlan ID	IP Address	SubnetMask
6	Esxi06.lapan.go.id	DMZ	10.14.1.51	255.255.255.0
7	Esxi07.lapan.go.id	DMZ	10.14.1.52	255.255.255.0

2.2.3.2. IP Address Virtual Machine

No	IP Address Virtual Machine			
	Name	Vlan ID	IP Address	SubnetMask
1	Vcenter01.lapan.go.id	115	10.15.15.7	255.255.255.0
2	Vrops01.lapan.go.id	115	10.15.15.8	255.255.255.0
3	Vdp01.lapan.go.id	115	10.15.15.9	255.255.255.0

2.2.3.3. VLAN List

VLAN Name	ID	Network Address
Vlan 115	115	10.15.15.0/24
Vlan DMZ	1	10.14.1.0/24
Vlan Public	1	103.16.223.0/24

2.3.   vSphere 6 Configuration

2.3.1.   vCenter Server

vCenter Server is an application that serves as a centralized management tool for ESXi hosts and their respective VMs. vCenter Server acts as a proxy that performs tasks on the individual ESXi hosts that have been added as members of a vCenter Server installation.

vSphere 6.0 introduces a new component called the Platform ServicesController (PSC). It is used to run common components for VMware products in a central or in distributed location(s). The PSC offers multiple services;let's step through them so you can understand why the PSC is vital to your vSphere environment:

- Single Sign-On
- Licensing
- Certificate Authority
- Certificate Store
- Service Registry

For Lapan environment, we recommended fresh embedded deployment for vCenter and Platform Services Controller. Embeded installation is recommended for standalone environment in which there is only one vcenter server.
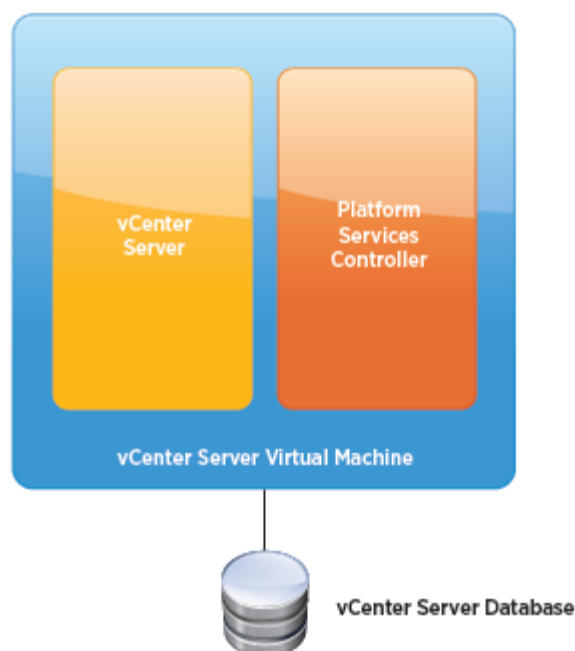

Figure 1. Embedded Architecture

Table 1 vCenter Server Spesification

Attribute	Specification
vCenter Server version	6
Physical or virtual system	Virtual
Number of vCPUs	2
vMemory	8 Gb
Number of NIC Adapter Type	1 NIC VMXNET 3
Harddisk size	120GB
Operating system and SP level	Suse Linux (vCenter Appliance)

Table 2 vCenter Server Settings

No	Attribute	Spesification
1	Database version	Postgresql Embedded
2	vCenter Statistic Level	2
3	vCenter Logging Level	Verbose
4	SMTP Server	
5	Task & Event retention	10 days

2.3.2.   vRealize Operation Manager

VMware vRealize Operations Manager builds on the revolutionary VMware approach to converging real-time performance, capacity and configuration management of your ITinfrastructure. With VMware vRealize Operations Manager, virtual infrastructure administrators and enterprise operations center teams are able to identify, diagnose and repair poor operation and high-risk situations as well as identify opportunities to improve infrastructure efficiency problems.

Deployment of VMware vRealize Operations Manager will allow LAPAN IT staff to have a single pane of glass view into the virtual machines. Access to log onto the datacentre specific web portals and VI Client portions of the application, will be via the roles based access groups.

A number of different configuration items such as time periods for display, health levels, workload level and capacity levels will be defined once the vCenter Operations virtual machine is deployed.

With vROps 6.0, there are concept of different kinds of nodes which can make up the vROps cluster. Here a brief description about each node type in a cluster:

MASTER NODE - As the name suggests is the MASTER of the cluster. This is essentially the first node of the cluster i.e. if you plan to build one. I will talk about various deployment models as we move forward in this series. This node has the Global xDB (Postgres), the xDB as well as the FSDB. In essence, this node is where all the customization of your entire vROps solution lies. Things such as user preferences, policies and the entire brain of the solution.

REPLICA NODE - Doing justice to it's name, the Replica Node also called '**Master Replica**' is the exact copy of the master node. This is to give resiliency to the solution. In vROps GUI this is identified as enabling High Availability. This node is not doing any work, but just watching the master node at all times and syncing with the node to ensure that it can take its place once the Master Fails.

DATA NODE - Every node which collects data in the vROps cluster is a Data Node. The function of this node is to ensure that it collects the data from you environment based on the adapters which are assigned to this node. This node basically allows you to keep scaling your cluster by adding new nodes.

REMOTE COLLECTOR - The remote collector is not a new concept in vROps, but this is now the only solution to get data from an environment which is not within a LAN. In other words, you have to install a REMOTE COLLECTOR if you need to fetch the data from a remote location into a centralized vROps cluster/node. Good news is that it is the same appliance which you have to install, and just chose collector during the install which makes it a simple install. Collector does not have the CONTROLLER, ANALYTICS or the PERSISTENCE layer since it is not required. It sends the data out to the centralized controller and then the data is treated using the Analytics engine.

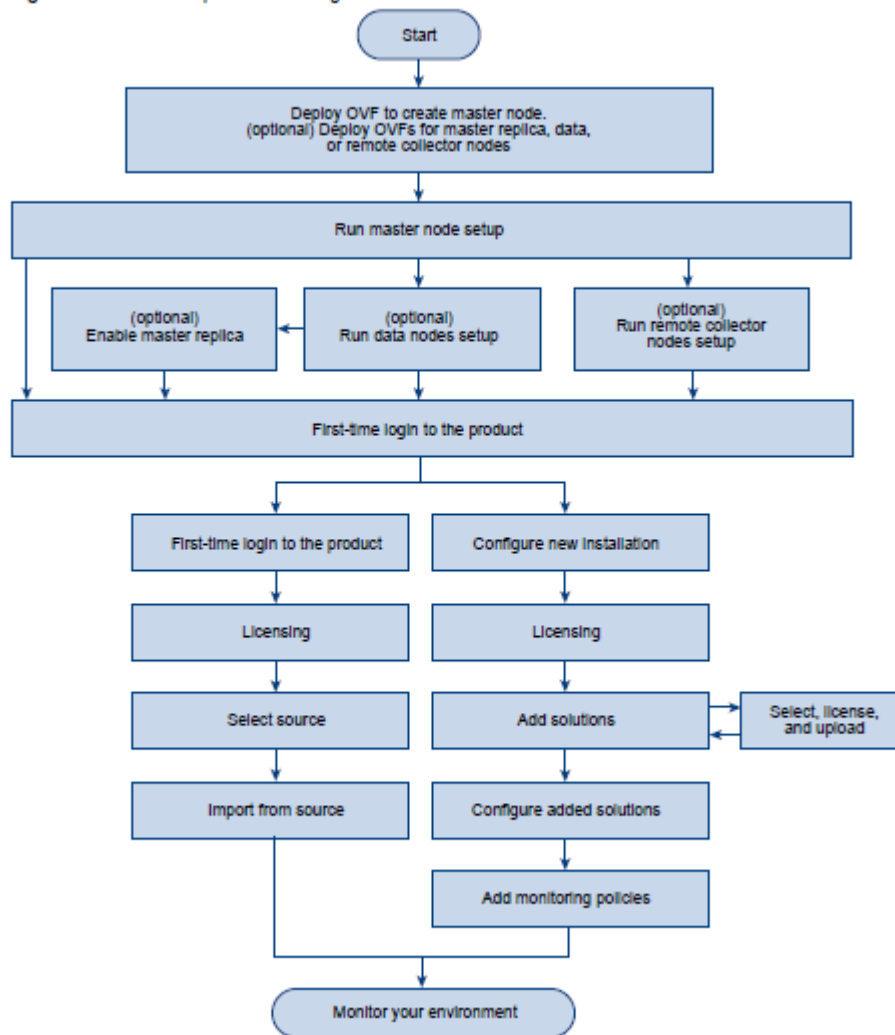Figure 1-1. vRealize Operations Manager Installation

Table 3 vRealize Operation Configuration Item

Attribute	Specification
Version	6.1
Physical or virtual system	Virtual
Number of vCPUs	2
Memory	8
Harddisk size	300 GB

2.3.3. vSphere Datacenter Configuration

2.3.3.1. Cluster HA

VMware High Availability (HA) minimizes virtual machine downtime by monitoring hosts, virtual machines, or applications within virtual machines, then, in the event a failure is detected, restarting virtual machines on alternate hosts.Each VMware vSphere ESXi host within a HA enabled cluster has an agent running that communicates to every other host in the cluster. The hosts send heartbeats to each other, and they use these heartbeats as the detection mechanism for host outages or self-isolation.

The VMware HA agent attempts to contact every other agent (host) every 5 seconds using a heartbeat. If a host heartbeat is not returned after 3 attempts (15 seconds), it is assumed that the host is offline. The remaining HA agents will then "elect" one or more hosts to take over the workload of the failed host, and begin powering on its virtual machines.

The configuration settings for VMware HA are shown in the following table.

Table 4 VMware HA Cluster Configuration Cluster Production

Attribute	Specification
Enable Host Monitoring	Enable
Admission control	Disable (allow VM Power on operation that violate availability constraints)
Default VM restart priority	Medium (majority of VMs)
Host isolation response	Leave powered on
VM monitoring	Disable (VM monitoring restart individual VMs if their VMware tools heartbeat are not received within a set time)
Datastore Heartbeat	Select any of the cluster datastores development. (HA user datastore to monitor host and VMs when the management network has failed)

Setting Explanations

- **Enable host monitoring**. When HA is enabled, hosts in the cluster are monitored. If there is a host failure, the virtual machines on a failed host are restarted on alternate running hosts in the cluster.

- **Admission control.** Enforces availability constraints and preserves host failover capacity. Resource average in condition hight load 60 % each Host.

- **Default VM restart priority**. The priority level specified here is relative. VMs must be assigned a relative restart priority level for HA. VMs are organized into four categories: high, medium, low, and disabled. Virtual machines are tiered in relative order of priority for restarts:
    o High (for example, Windows Active Directory domain controller virtual machines, SAP Database servers).
    o Medium (default)
    o Law (for example, server monitoring)
    o Disable (Cisco Nexus 1000v virtual switches and for non-critical virtual machines)

- **Host isolation response.** Host isolation response determines what happens when a host in a VMware HA cluster loses its service console/management network connection,but continues running.

- **VM monitoring.** checking for regular heartbeats from the VMware Tools process running in each guest OS. If no heartbeats are received, HA assumes that the guest operating system has failed, and HA reboots the VM.

- **Datastore Heartbeat.** vSphere HA cluster can not communicate with a slave host over the management network, the master host uses datastore heartbeating to determine whether the slave host has failed, is in a network partition, or is network isolated. If the slave host has stopped datastore heartbeating, it is considered to have failed and its virtual machines are restarted elsewhere**.**

Table 5 VMware Cluster Configuration

Attribute	Spesification
Datacenter	TBA
Cluster Names	TBA
Number of Hosts	4
Cluster Member	TBA
	TBA
	TBA
	TBA

2.3.3.2. Esxi Host Spesification

Table 6 Esxi Host Spesification

Atribute	Specification
Type	IBM System x3650 M4
Processor	1 X 2 Ghz E5-2620 @6Core
Memory	40GB
NIC	4 x 1 GB (intel l350)
HBA	QLogic 8Gb FC Dual-Port HBA
Hardisk	2 X 300 GB 10K

Atribute	Specification
Type	IBM System x3650 M4
Processor	1 X 2 Ghz E5-2620 @6Core
Memory	40GB
NIC	4 x 1 GB (intel l350)
HBA	QLogic 8Gb FC Dual-Port HBA
Hardisk	2 X 300 GB 10K

Atribute	Specification
Type	Dell Poweredge R720
Processor	2 X 2 Ghz E5-2620 @6Core
Memory	40GB
NIC	4 x 1 GB (Broadcom 5720)
HBA	QLogic 2562 Dual-Port 8Gb FC HBA
Hardisk	2 X 500 GB 15K

Atribute	Specification
Type	Dell Poweredge R720
Processor	1 X 2 Ghz E5-2620 @6Core
Memory	48GB
NIC	4 x 1 GB (Broadcom 5720)
HBA	QLogic 2562 Dual-Port 8Gb FC HBA
Hardisk	2 X 300 GB 15K

Atribute	Specification
Type	Dell Poweredge R720
Processor	1 X 2 Ghz E5-2620 @6Core
Memory	48GB
NIC	4 x 1 GB (Broadcom 5720)
HBA	QLogic 2562 Dual-Port 8Gb FC HBA
Hardisk	2 X 300 GB 15K

2.3.3.3. vSphere Network

Lapan vSphere ESXi vSwitch Configuration
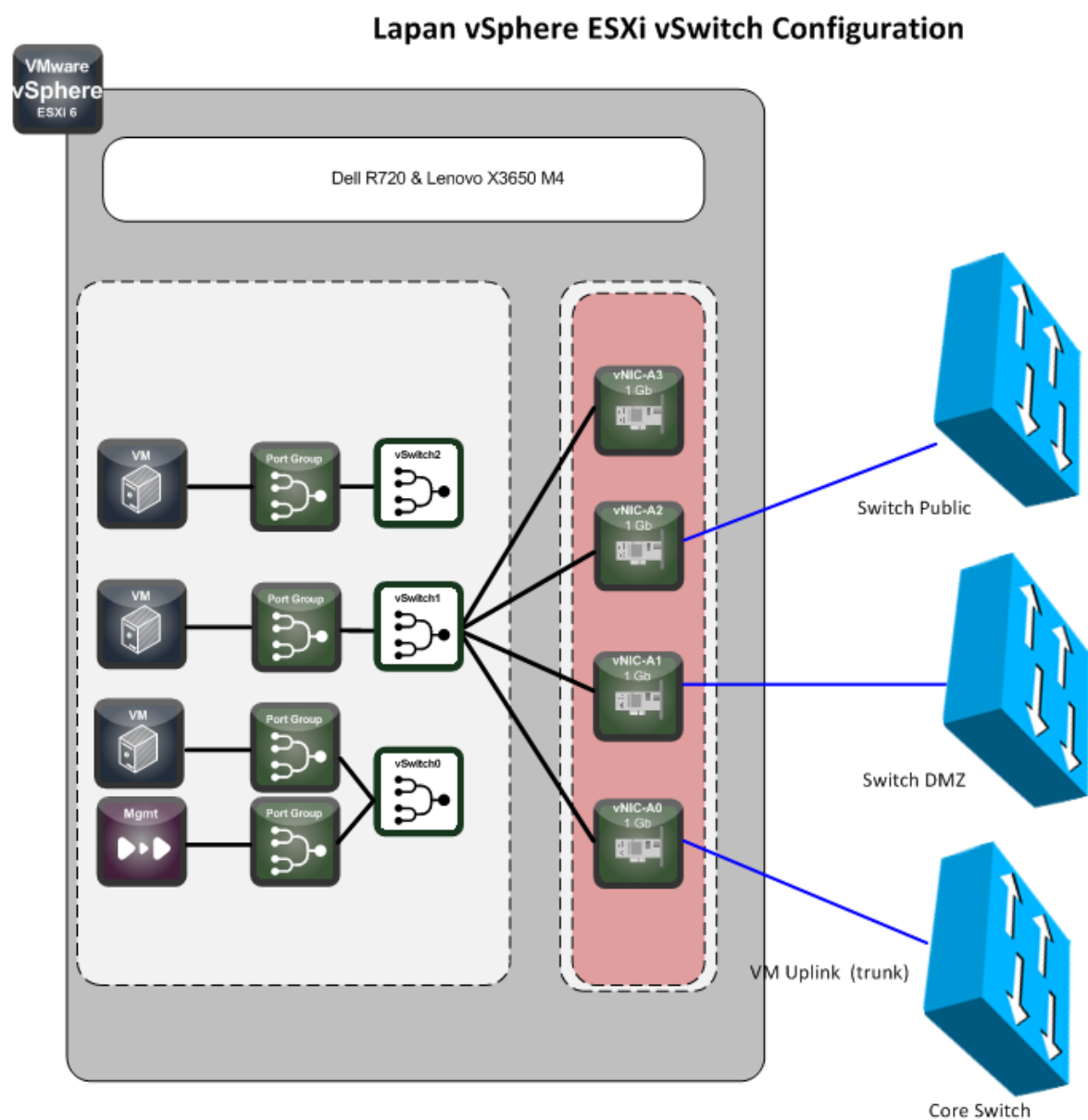
Table 7 vSwitch Configuration Settings

Attribute	Setting
Load Balancing	Route based on originating virtual port id
Failover Detection	Link State
Notify Switch	Enabled
Failback	Yes
Failover order	All active

Look for more detail configuration vSwitches by Physical nic and Function

Table 8 vSwitch Configuration Physical Nic

vSwitch	Vmnic	Function
Vswitch0	0	Vlan public
Vswitch1	1	Management and vlan 115
Vswitch2	2	Vlan dmz

2.3.3.4. vSphere Storage

Table 9 List vDisk

vDisk	Size (TB)	Logical Size (TB)	Raid
Zimbra	4X1	3	5
VMware	4X1	3	5

Table 10 List LUN

Datastores	Size (TB)	Remarks
LPN-MAIL01	2.5	For Mailbox
LPN-HP-PROD01	2.2	
LPN-HP-PROD02	2.2	

Table 11 Configuration LUN

Attribute	Specification
Vendor and Model	HP MSA 1040
Type	Activer/active
ESXi Host Multipathing	Native Multipath
Datastore Configuration	VMFS 5
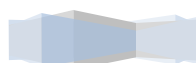
Table 12 VMFS Naming Convention

Uuu-www-xxxxyy

Parameter	Specification
uuu	Organization-LAPAN
www	Array- HP
xxxx	Usage – Prod/Mail
yy	Running number
Example	LPN-HP-PROD01,LPN-HP-MAIL01

2.3.4. vSphere Data Protection

vSphere Data Protection (VDP) is a robust, simple to deploy, disk-based backup and recovery solution that is powered by EMC. VDP is fully integrated with the VMware vCenter Server and enables centralized and efficient management of backup jobs while storing backups in deduplicated destination storage locations.

The VMware vSphere Web Client interface is used to select, schedule, configure, and manage backups and recoveries of virtual machines. During a backup, VDP creates a quiesced snapshot of the virtual machine. Deduplication is automatically performed with every backup operation.

vSphere Data Protection sizing determine the vSphere Data Protection appliance size and number of appliances required based on:

- Number of and type of VMs (do the VM contain file system or database data?)

- Amount of data

- Retention periods (daily, weekly, monthly, yearly)

- Typical change rate

The following table shows examples for vSphere Data Protection sizing recommendations:

Table 13 Sizing recommendation

Of VMs	Data Storage per Client	Retention: daily	Retention: weekly	Retention: monthly	Retention: yearly	Recomendation
25	20 Gb	30	0	0	0	1 – 0.5 TB
25	20 Gb	30	4	12	7	1 – 2 TB
25	40 Gb	30	4	12	7	2 – 2 TB
50	20 Gb	30	0	0	0	1 – 1 TB
50	20 Gb	30	4	12	7	2 – 2 TB
50	40 Gb	30	4	12	7	3 – 2 TB
100	20 Gb	30	0	0	0	1 – 2 TB

Of VMs	Data Storage per Client	Retention: daily	Retention: weekly	Retention: monthly	Retention: yearly	Recomendation
100	20 Gb	30	4	12	7	3 – 2 TB
100	40 Gb	30	4	12	7	6 – 2 TB

The recommendations above (note these are only guidelines) are based on the following assumptions:

- The VMs primarily contain file system data. If the VMs primarily contain database data, the deduplication rates will be lower.
- 70% initial deduplication rate for file system data.
- 99.7% daily deduplication rate for file system data.
- The annual growth rate is 5%.

If unsure of the size of the appliance to deploy, it is better to use a larger vSphere Data Protection datastore. Once a appliance has been deployed, the size of the datastore cannot change

System requertments The vSphere Data Protection appliance is available in three options :

- 0.5 TB
- 1 TB
- 2 TB

The system requirements for each option of vSphere Data Protection are specified in the following table.

Table 14 System requirements VDP

Attribute	0.5 TB	1 TB	2 TB
Processors dedicated to vSphere Data Protection	Minimum four 2 GHz processors available to vSphere Data Protection at all times	Minimum four 2 GHz processors available to vSphere Data Protection at all times	Minimum four 2 GHz processors available to vSphere Data Protection at all times
Physical memory dedicated to vSphere Data Protection	4 GB	4 GB	4 GB
Disk space	850 GB	1,600 GB	3,100 GB
Network connection	1 GbE connection	1 GbE connection	1 GbE connection

Table 15 Backup Job VDP

Server Name	Application	Schedule Type			
		Daily/Retention	Weekly/Retention	Monthly	Yearly
Vcenter01.lapan.go.id	vcenter	Yes/10	Yes/1		
Vrops01.lapan.go.id	vrops	Yes/10	Yes/1		
Mail.lapan.go.id	zimbra	Yes/10	Yes/1		
Hosting	Web server & DB	Yes/10	Yes/1		
Radius.lapan.go.id	Radius server	Yes/10	Yes/1		
Dns Publik	Dns	Yes/10	Yes/1		
Dns Lokal	Dns	Yes/10	Yes/1		
DB server	Sql	Yes/10	Yes/1		

2.3.5. Assesment Physical Server

Web Lapan (BIOS Firmware)

Cpu = 1 X 2Ghz @6core

Memory = 32GB

```
[root@web ~]# df -h
Filesystem      Size  Used Avail Use% Mounted on
/dev/sda1       259G   72G  175G  30% /
tmpfs            16G    0   16G   0% /dev/shm
```

Tgl	Cpu(%)			Memory(GB)			Disk(iops)		
	Min	Max	Average	Min	Max	Average	Min	Max	Average
25	0.33	6.99	0.9	26.6	31	30.5	16.39	139.26	30.44
26	0.39	7.19	1.4	30.3	31	30.5	9.85	118.39	31.75
27	0.42	7.39	1.2	30.3	31	20.5	18.03	244.69	36.55
28	0.53	6.86	1.3	30	31	30.7	13.26	129.26	38.73
29	0.44	7.06	1.3	30.1	31	30.4	19.49	92.98	35.75
30	0.52	7.5	1.2	30.3	31	30.5	17.81	90.9	34.58
31	0.45	6.97	1.5	30.4	31	30.6	14.61	111.3	37.17

Mail Lapan

Cpu = 1 X 2Ghz @6core

Memory=32GB

```
[root@mail ~]# df -h
Filesystem              Size  Used Avail Use% Mounted on
/dev/sda2               267G  2.9G  250G   2% /
tmpfs                    16G    0   16G   0% /dev/shm
/dev/sda1               500M  296K  500M   1% /boot/efi
/dev/mapper/opt_zimbra-space
                        916G  287G  582G  34% /opt
```

Tgl	Cpu(%)			Memory(GB)			Disk(iops)		
	Min	Max	Average	Min	Max	Average	Min	Max	Average
25	0.1	3.62	1.4	11.7	13.6	12.5	16.39	166.6	50.3
26	0.1	2.81	1.5	13.2	18	15.3	9.85	412.8	66.1
27	0.1	2.43	1.4	17.5	19.8	18.9	18.03	458.2	59.5
28	0.1	2.4	1.5	19.3	23.4	20.9	13.26	299.45	59.3
29	0.1	2.94	1.6	23.5	30.1	28	19.49	275.76	58.5
30	0.1	2.31	1.5	29.4	30.1	30.1	17.81	351.22	62.5
31	0.1	2	1.4	29	30.5	29.8	14.61	191.45	40.7

Jurnal LAPAN

```
admin_jurnal@jurnal:~$ lscpu
Architecture:          i686
CPU op-mode(s):        32-bit, 64-bit
CPU(s):                4
Thread(s) per core:    1
Core(s) per socket:    4
CPU socket(s):         1
Vendor ID:             GenuineIntel
CPU family:            6
Model:                 44
Stepping:              2
CPU MHz:               2260.493
Virtualization:        VT-x
L1d cache:             32K
L1i cache:             32K
L2 cache:              256K
L3 cache:              8192K


Filesystem            Size  Used Avail Use% Mounted on
/dev/sda1             212G  6.8G  194G   4% /
none                  2.0G  188K  2.0G   1% /dev
none                  2.0G     0  2.0G   0% /dev/shm
none                  2.0G   32K  2.0G   1% /var/run
none                  2.0G     0  2.0G   0% /var/lock
none                  2.0G     0  2.0G   0% /lib/init/rw
/dev/sda2             232G  6.3G  214G   3% /home


 top - 16:59:27 up 19:42,  1 user,  load average: 1.08, 1.06, 1.01
Tasks: 286 total,   1 running, 285 sleeping,   0 stopped,   0 zombie
Cpu(s): 23.5%us,  3.5%sy,  0.0%ni, 72.7%id,  0.4%wa,  0.0%hi,  0.0%si,  0.0%st
Mem:   4108712k total,  1141068k used,  2967644k free,   110580k buffers
Swap: 15582200k total,        0k used, 15582200k free,   103048k cached
```

2.3.6. System Requirement For Zimbra Collaboration 8.6 Open Source Edition

	Requirements

Servers	**Evaluation and Testing**
	• Intel/AMD 64-bit CPU 1.5 GHz
	• RAM requirements:
	   • For single server installations, a minimum of 8GB of RAM is required.
	   • For multi-server installations, contact Zimbra sales for recommendations.
	• 5 GB free disk space for software and logs
	• Temp file space for installs and upgrades*
	• Additional disk space for mail storage
	Production environments
	• Intel/AMD 2.0 GHZ+ 64-bit CPU
	• RAM requirements:
	   • For single server installations, a minimum of 8GB of RAM is required.
	   • For multi-server installations, contact Zimbra sales for recommendations.

Example VM requirement 10000 User Zimbra with VMware

FUNCTION	VCPU	MEMORY	OS DISK	NETWORK
LDAP01	2 vCPU	4GB	32GB	1 VMXNET3
LDAP02	2 vCPU	4GB	32GB	1 VMXNET3
MTA01	2 vCPU	4GB	32GB	1 VMXNET3
MTA02	2 vCPU	4GB	32GB	1 VMXNET3
PROXY01	2 vCPU	4GB	32GB	1 VMXNET3
PROXY02	2 vCPU	4GB	32GB	1 VMXNET3
ZMMBX01	4 vCPU	16GB	32GB	1 VMXNET3
ZMMBX02	4vCPU	16GB	32GB	1 VMXNET3
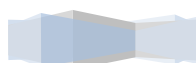
Proposed VM Spesification for Mail.lapan.go.id, Web.lapan.go.id, Jurnal.lapan.go.id

Mail lapan Development (P2V)

Attribute	Specification
Physical or virtual system	Virtual
Number of vCPUs	2
vMemory	8 Gb
Number of NIC Adapter Type	1 NIC VMXNET 3
Harddisk size	500GB
Operating system	Centos 6.6

Mailbox + Ldap

Attribute	Specification
Physical or virtual system	Virtual
Number of vCPUs	4
vMemory	20 Gb
Number of NIC Adapter Type	1 NIC VMXNET 3
Harddisk size	OS : 30 GB (vDisk VMware) Zimbra : 1 TB (vDisk Zimbra)
Operating system	Centos 6.6

MTA01

Attribute	Specification
Physical or virtual system	Virtual
Number of vCPUs	2
vMemory	4 Gb
Number of NIC Adapter Type	1 NIC VMXNET 3
Harddisk size	OS : 30 GB (vDisk VMware)
Operating system	Centos 6.6

MTA02

Attribute	Specification
Physical or virtual system	Virtual
Number of vCPUs	2
vMemory	4 Gb
Number of NIC Adapter Type	1 NIC VMXNET 3
Harddisk size	OS : 30 GB (vDisk VMware)
Operating system	Centos 6.6

Web Lapan Development (P2V)

Attribute	Specification
Physical or virtual system	Virtual
Number of vCPUs	2
vMemory	TBA
Number of NIC Adapter Type	1 NIC VMXNET 3
Harddisk size	200GB
Operating system	Centos 6.6

Keterangan

Mysql use 20 GB for Memory

mysql   2052 0.7 5.8 20161084 1924144 ?   Sl   Nov05   9:09 _ /usr/libexec/mysqld --basedir=/usr --datadir=/var/lib/mysql --user=mysql –

Web Lapan DB

Attribute	Specification
Physical or virtual system	Virtual
Number of vCPUs	2
vMemory	20
Number of NIC Adapter Type	1 NIC VMXNET 3
Harddisk size	150GB
Operating system	Centos 6.6

2.3.7. VMware vCenter Converter

VMware® vCenter Converter Standalone is a product to convert virtual and physical machines to VMware virtual machines. You can also configure existing virtual machines in your vCenter Server environment.

For Lapan, we suggest to use VMware vCenter Converter to convert physical to virtual and stopped service for consistent data.

2.3.7.1. Converter Standalone Components

The Converter Standalone application consists of Converter Standalone server, Converter Standalone worker, Converter Standalone client, and Converter Standalone agent.

- **Converter Standalone server**
  Enables and performs the import and export of virtual machines. The Converter Standalone server comprises two services, Converter Standalone server and Converter Standalone worker. The Converter Standalone worker service is always installed with the Converter Standalone server service.

- **Converter Standalone agent**
  The Converter Standalone server installs the agent on Windows source machines to import them as virtual machines. You can choose to remove the Converter Standalone agent from the source machine automatically or manually after the import is complete.

- **Converter Standalone client**
  The Converter Standalone server works with the Converter Standalone client. The client component consists of the Converter Standalone user interface which provides access to the Conversion and the Configuration wizards, and lets you to manage the conversion and the configuration tasks.

Table 2-1. Supported Operating Systems

Supported Operating Systems	Converter Standalone Support	Source for Powered On Machine Conversions	Source for Virtual Machine Conversions	Configuration Source
Windows Server 2003 R2 (32-bit and 64-bit) SP2	Yes	Yes	Yes	Yes
Windows Vista (32-bit and 64-bit) SP2	Yes	Yes	Yes	Yes
Windows Server 2008 (32-bit and 64-bit) SP2	Yes	Yes	Yes	Yes
Windows Server 2008 R2 (64-bit)	Yes	Yes	Yes	Yes

Windows 7 (32-bit and 64-bit)	Yes	Yes	Yes	Yes
Windows 8 (32-bit and 64-bit)	Yes	Yes	Yes	Yes
Windows 8.1 (32-bit and 64-bit)	Yes	Yes	Yes	Yes
Windows Server 2012 (64-bit)	Yes	Yes	Yes	Yes
Windows Server 2012 R2(64-bit)	Yes	Yes	Yes	Yes
CentOS 6.x (32-bit and 64-bit)	No	Yes	Yes	No
CentOS 7.0 (64-bit)	No	Yes	Yes	No
Red Hat Enterprise Linux 4.x (32-bit and 64-bit)	No	Yes	Yes	No
Red Hat Enterprise Linux 5.x (32-bit and 64-bit)	No	Yes	Yes	No
Red Hat Enterprise Linux 6.x (32-bit and 64-bit)	No	Yes	Yes	No
Red Hat Enterprise Linux 7.x (64-bit)	No	Yes	Yes	No
SUSE Linux Enterprise Server 9.x (32-bit and 64-bit)	No	Yes	Yes	No
SUSE Linux Enterprise Server 10.x (32-bit and 64-bit)	No	Yes	Yes	No
SUSE Linux Enterprise Server 11.x (32-bit and 64-bit)	No	Yes	Yes	No
Ubuntu 12.04 (32-bit and 64-bit)	No	Yes	Yes	No
Ubuntu 14.x (32-bit and 64-bit)	No	Yes	Yes	No

2.3.7.2.   Remote Hot Cloning of Powered On Source Machines Thar Are RunningWindows

The following workflow is an example of remote hot cloning in which the powered on machine being cloned experiences no downtime.

1. Converter Standalone prepares the source machine for the conversion. Converter Standalone installs the agent on the source machine and the agent takes a snapshot of the source volumes.
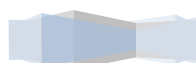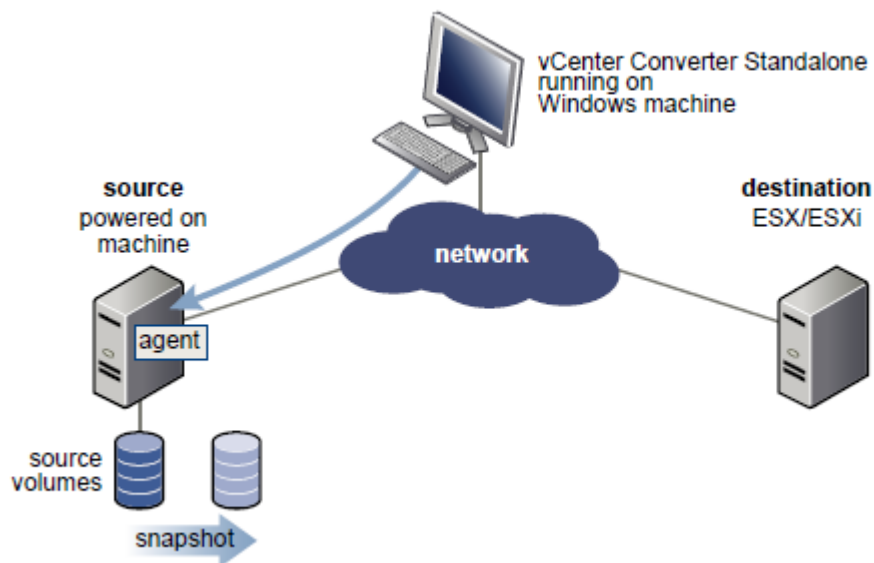
2. Converter Standalone prepares the virtual machine on the destination machine. Converter Standalone creates a virtual machine on the destination machine and the agent copies volumes from the source machine to the destination machine.
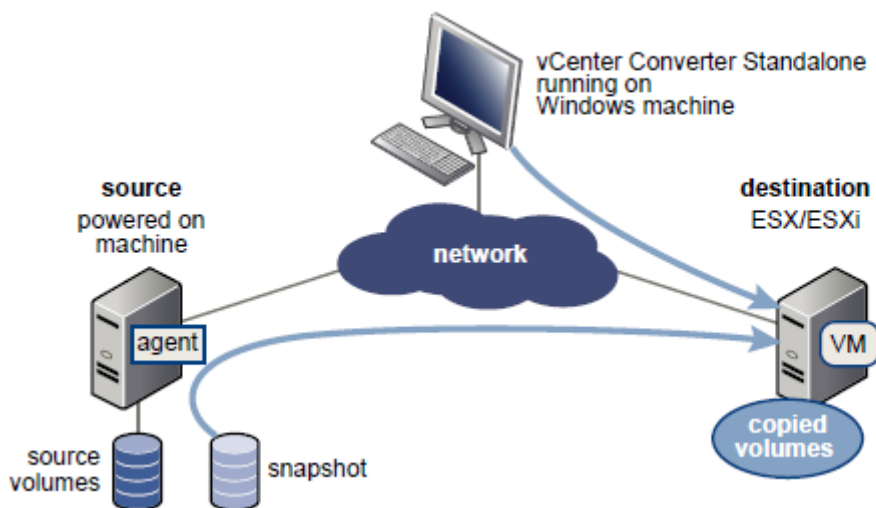

If the proxy mode feature is off, the data traffic passes from the source machine directly to the destination server. If the proxy mode feature is on, the data traffic passes from the source machine through the Converter Standalone server to the destination server. The proxy mode feature enables conversion processes when the source machine does not have direct access to the destination ESXi server. **NOTE** The proxy mode feature is available only for conversion of powered on Windows sources to managed destinations.

3. Converter Standalone completes the conversion process. The agent installs the required drivers to allow the operating system to boot in a virtual machine and personalizes the virtual machine (changes the IP information, for example).
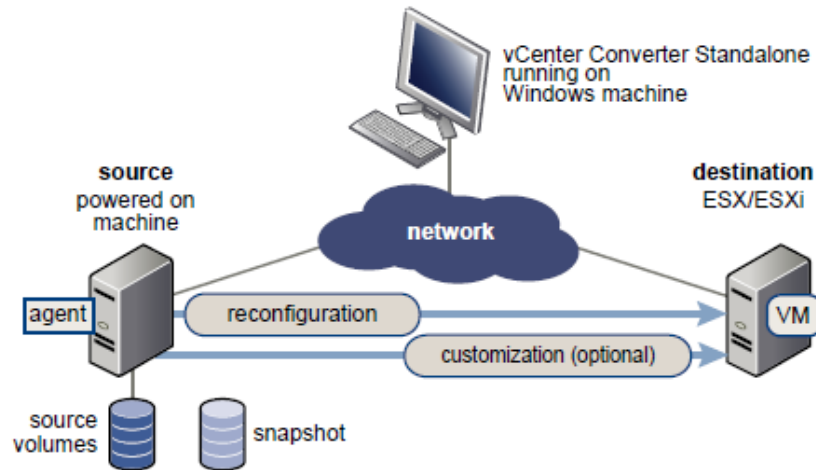

4. Optionally, Converter Standalone uninstalls the agent from the source machine. The virtual machine is ready to run on the destination server.

2.3.7.3. Remote Hot Cloning of Powered On Source Machines That Are Running Linux

The following workflow demonstrates the principles of hot cloning powered on source machines that run Linux to managed destinations.

1. Converter Standalone uses SSH to connect to the source machine and retrieves source information. Converter Standalone creates an empty helper virtual machine based on your conversion task settings. The helper virtual machine serves as a container for the new virtual machine during conversion. Converter Standalone deploys the helper virtual machine on the managed destination, an ESX/ESXi host. The helper virtual machine boots from a *.iso file that is located on the Converter Standalone server machine
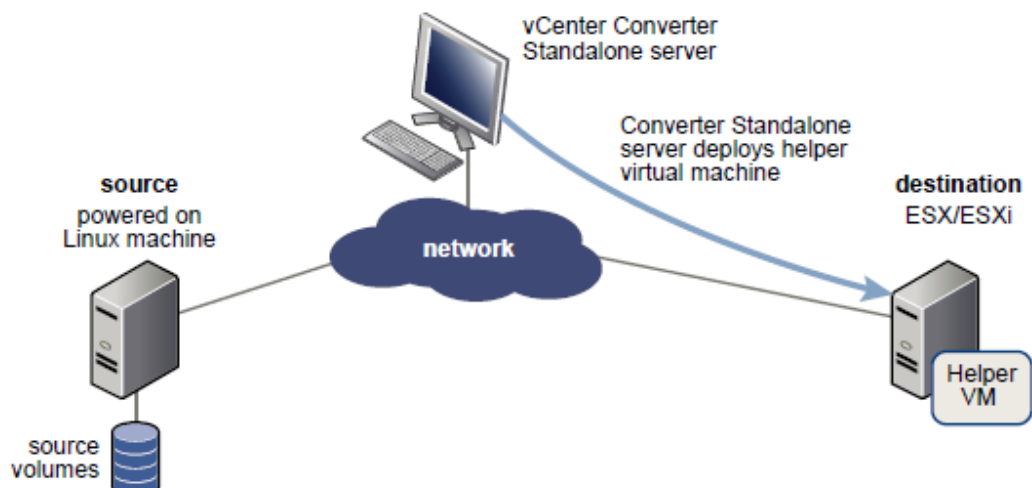
2. The helper virtual machine powers on, boots from the Linux image, connects to the source machine through SSH, and starts retrieving the selected data from the source. While you set up the conversion task, you can select which source volumes to be copied to the destination machine.
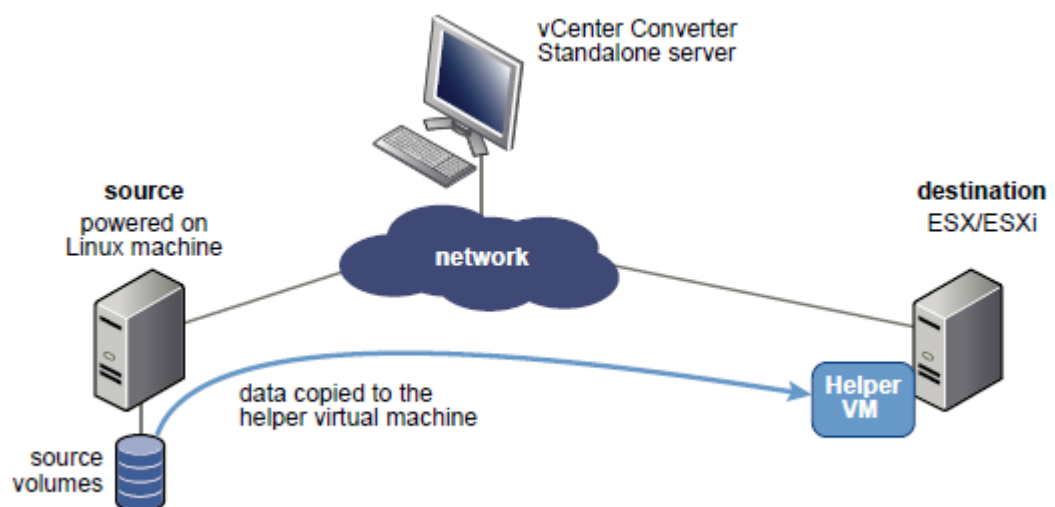
3. Optionally, after data is copied, the destination virtual machine is reconfigured to allow the operating system to boot in a virtual machine.
4. Converter Standalone shuts down the helper virtual machine. The conversion process is complete. You can configure Converter Standalone to power on the newly created virtual machine after the conversion is complete.

2.3.7.4. Physical to Virtual Strategy

1. P2V using vCenter Converter while services application stopped

2. P2V using vCenter Converter while service application running and do backup restore or rsync to synchronize GAP

3. Create freshly installed OS and do backup restore to new OS for Jurnal lapan, because Ubuntu 10.14 is not supported with vcenter converter 6

2.3.7.5. Zimbra Migration

Task on Old Server

- Rsync'ing large amounts of data. Since rsync can sync data incrementally, you can therefore rsync the majority of the data in advance of any downtime. The actual amount of downtime is then limited to a final rsync and then the final setup steps. For the second-to-last rsync run, it is a good idea to time it - this will give you a good idea of the amount of downtime required.
- Backup LDAP and MYSQL data for importing into new server.

Task on New Server

- Prepare the new server
- Restore the LDAP data
- Edit the localconfig.xml file to update the MySQL and LDAP password values to be the same as those configured on the old server
- Copy the latest backup files from the Old Server to the New Server
- Delete the MySQL data that is set up in the initial installation of ZCS
- Copy various files from the Old Server to the New Server
- Prepare and run a new backup for the New Ser