We will begin by installing a three node Oracle Solaris 11 x86_64 VCS cluster with a failover HA zone. Based on above discussion, we need:

0)Desire to learn.

.

1)At least an i3 PC/Laptop with about 6-8Gb of RAM and Intel VT or AMD-V enabled. Power on the machine and open the BIOS Enable Intel VTd or AMD IOMMU, if the options are available. Intel VTd and AMD IOMMU are used for PCI passthrough. Select Save & Exit.

2)A virtualisation mechanism(you don't need this if you have your own physical servers), you can choose Oracle VirtualBox, however, I recommend Vmware Workstation 10 (or whatever is the latest release at this time), I have found it to use less RAM.

We will run Solaris 11 and Red Hal Enterprise Linux(RHEL) as Virtual Machines(VM's).

We will use the latest free/trialware versions of RHEL/Solaris/VCS/VMware workstation.

NOTE: Some trialware expires after 30 days, so START NOW.

3)We will need shared storage(as discussed earlier), for this we choose Openfiler(openfiler.com).

4)We need an ssh client, we will use "putty"

5)We need a good browser, we will use google chrome.

So, go ahead and download, google chrome. Download adobe reader. These are free.

All software that we need:

1)VMware workstation 10
 2)Openfiler
 3)Solairs 11
 4)VCS
 5)Putty
 6)RHEL

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Downloading and installing Vmware Workstation 10:

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Choose "Typical" install.

Click "Next" Click Next Click Next Next Click "Continue" Click "Finish"



In Chrome, go to http://www.openfiler.com

At the top right, there is a SMALL, "download" link, click that.

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We will select:

Click on the download arrow.

It says, your download will begin shortly, no need to do anything else on this page – just ads are there.

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If problems, click on "direct link"

I clicked on direct link, and gotm it, see bottom left of screen

It downloaded it twice – my mistake

Anyway, now we are ready for the most important part of the session:

Installing opnfiler on Vmware Workstation 10.

Launch Vmware workstation 10:



Do you see the Vmware workstation 10 icon?

Double click it.



Click on "Create a New Virtual Machine" in the center of the Vmware Workstation 10 window.

New Virtual Machine Wizard	
Guest Operating System Installation A virtual machine is like a physical computer; it needs an o system. How will you install the guest operating system?	perating
stall from:	
) Installer <u>d</u> isc:	
NVD RW Drive (F:) OFFICE10	
1. Dec.	
) Installer disc image file (iso):	
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◯ Installer disc i <u>m</u> age file (iso):	Browse
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 Installer disc image file (iso): I will install the operating system later. The virtual machine will be created with a blank hard disk. 	B <u>r</u> owse
Installer disc image file (iso): I will install the operating system later. The virtual machine will be created with a blank hard disk. Help	Browse

Choose "Typical"

N	ew Virtual Machine	Wizard	×
Guest Operating Sy A virtual machine system. How will y	stem Installation s like a physical computer; ou install the guest operal	it needs an op ting system?	erating
Install from:			
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	ile (iso):		
		~	Browse
Select the insta	ler disc image to continue.		
○ T			
	ating system later.		
The virtual machine	will be created with a blan	K NARD DISK,	
Help	< Back	Next >	Cancel

WE will select the option for "Installer disc image file (iso) :

Click "Browse"

New Virtual Machine Wizard	
Browse for	ISO Image
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File name: openfileresa-2.99.1-x86_	_64-disc1 ♥ CD-ROM images (*.iso) ♥
	Open Cancel
	i.

Select the openfiler iso, we downloaded earlier.

Iso file means disc image file.

Nev	v Virtual Machine	Wizard	×
Select a Guest Operat Which operating sys	t ing System tem will be installed on t	his virtual machin:	ie?
Guest operating system Microsoft Windows Image: Solution with the system Solaris VMware ESX Other			
<u>V</u> ersion Other Linux 2.6.x kernel 6	4-bit		~
Help	< <u>B</u> ack	<u>N</u> ext >	Cancel

New \	/irtual Machine Wizarc	i 🔽
Name the Virtual Machin What name would you	ie like to use for this virtual mach	ine?
<u>/</u> irtual machine name:		
openfiler		
ocation:		
C:\Users\kartik\Documents\V	'irtual Machines\openfiler	Browse
	6	
	< <u>B</u> ack <u>N</u> ex	t > Cancel

Change "Virtual Machine Name" to "openfiler"

New Virtual Machine Wizard	×			
Specify Disk Capacity How large do you want this disk to be?				
The virtual machine's hard disk is stored as one or more files on the host computer's physical disk. These file(s) start small and become larger as you add applications, files, and data to your virtual machine.				
Recommended size for Other Linux 2.6.x kernel 64-bit: 8 GB				
◯ Store virtual disk as a single file				
Split virtual disk into multiple files				
Splitting the disk makes it easier to move the virtual machine to another computer but may reduce performance with very large disks.				
\searrow				
Help < Back Next > Cancel				

Please change Maximum disk size from the default 8Gb to 18Gb.

Name:	openfiler	^	
Location:	C:\Users\kartik\Documents\Virtual Machines\openfiler		
Version:	Workstation 10.0		
Operating System:	Other Linux 2.6.x kernel 64-bit		
Hard Disk:	18 GB, Solit		
Memory:	384 MB		
Network Adapter:	NAT		
Other Devices:	CD/DVD, USB Controller, Printer, Sound Card	~	

Click "Customize Hardware"

Device	Summary	Memory Specify the amount of memory allocated to this virtual
Memory	384 MB	machine. The memory size must be a multiple of 4 MB.
Processors New CD/DVD (Network Adapter USB Controller Sound Card Printer Display	1 Using file C:\Users\kartik\Downloa NAT Present Auto detect Present Auto detect	Memory for this virtual machine: 384 MB 64 GB - 32 GB - 16 GB - 8 GB - 4 GB - 2 GB - 2 GB - 412 MB
	Ş	1 GB - 4412 MB 512 MB - ■ Recommended memory 256 MB - 384 MB 128 MB - Guest OS recommended minimu 32 MB - 32 MB 16 MB - 32 MB 4 MB - - 8 MB - - 4 MB - -
	<u>A</u> dd <u>R</u> emove	

Device	Summary	Device status
Memory	384 MB 1 Using file CVU sers/kartil/Downloa	<u>Connected</u> ✓ Connect at power on
New CD/DVD (NAT	Network connection
USB Controller Present Sound Card Auto detect Printer Present Display Auto detect	Present Auto detect Present Auto detect	 Bridged: Connected directly to the physical network Replicate physical network connection state NAT: Used to share the host's IP address Host-only: A private network shared with the host Custom: Specific virtual network
		VMnet0 v
	\searrow	LAN segment:
	<u>A</u> dd <u>R</u> emove	

Select "Network Adapter"

Go, to Right side and select "Bridged: Connected directly to the physical network"

	Hard	dware
Device Memory Processors New CD/DVD (Network Adapter USB Controller USB Controller Display	Summary 384 MB 1 Using file C:\Users\kartik\Downloa NAT Present Auto detect Present Auto detect	Device status
	Add <u>R</u> emove	
		Close Help

Select Memory
Hardware

)evice	Summary	Memory
Memory	384 MB	Specify the amount of memory allocated to this virtual machine. The memory size must be a multiple of 4 MB.
 Processors New CD/DVD (Network Adapter USB Controller Sound Card Printer Display 	1 Using file C:\Users\kartik\Downloa Bridged (Automatic) Present Auto detect Present Auto detect	Memory for this virtual machine: 384 ♥ MB 64 GB - 32 GB - 16 GB - 8 GB - 4 GB - 2 GB - 1 GB - 512 MB - 552 MB - 128 MB - 64 MB - 32 MB - 64 MB - 8 MB - 4 MB - 32 MB - 64 MB - 8 MB - 4 MB - 32 MB - 64 MB - 8 MB - 64 MB - 8 MB -
	Add Remove	

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Increase Memory to 1Gb.

Memory Device Summary Specify the amount of memory allocated to this virtual Memory 1 GB machine. The memory size must be a multiple of 4 MB. Processors 1 Using file C:\Users\kartik\Downloa... 1024 🍨 New CD/DVD (... MB Memory for this virtual machine: Network Adapter Bridged (Automatic) 🚭 USB Controller Present 64 GB -Sound Card Auto detect 32 GB Printer Present 16 GB Display Auto detect Maximum recommended memory 8 GB - \triangleleft (Memory swapping may 4 GB occur beyond this size.) 2 GB 4412 MB 1 GB 512 MB - \triangleleft Recommended memory 256 MB -384 MB 128 MB 64 MB -Guest OS recommended minimum 32 MB - \triangleleft 32 MB 16 MB 8 MB 4 MB -A.J... Remove Help Close

Hardware

Click "Close"

Name:	openfiler	~
Location:	C:\Users\kartik\Documents\Virtual Machines\onenfiler	
Version:	Workstation 10.0	
Operating System:	Other Linux 2.6.x kernel 64-bit	
Hard Disk:	18 GB, Split	
Memory:	1024 MB	
Network Adapter:	Bridged (Automatic)	
Other Devices:	CD/DVD, USB Controller, Printer, Sound Card	v

Click "Finish"





On the right side, click, "Power on this virtual machine"

Please put mouse inside the right side and press "Enter" key.

You will see a message saying "Press Ctrl-Alt" to return to your computer.



Go into right side, and press "Enter" button.

You will notice mouse becomes "dark" - go ahead and press the "Next" button

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	*	
	Release Notes	Back
	Cick in the virtue screen Install the guest operating system as you would brie physical conducter. When you are done and the operating system boots uplicities "Finished Installing".	d Tuslaling 🛛 🛛 🗷
To direct input to this VM, click in	side or press Ctr1-G	- Co Ro Ho I I I / 2

Press "Next button"



Select "Yes"

	openfiler VMware Workstation	- 🗆 🗙
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Q Type here to search +	acasfilar	
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🚊 Shared VMs		
~	Installation requires partitioning of your hard crive. By default, a partitioning layout is chosen which is reasonable for	r most users.
4	You can either choose to use this or create your own.	
	Remove all partitions on selected drives and create default layout	0
	Select the drive(s) to use for this installation.	
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	What drive would you like to boot this installation from?	
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Please click on the "Next" button.



Please select "Yes"

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Please select "Next"



I am in Chicago, so, I will select, Chicago, Time Zone.



Please click "Next"

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Please enter a suitable, easy to remember, root password. Please, then, click, "Next".



Please click "Next"



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Please wait



Please click on "Reboot"




Please click "I finished installing"



WE get the above screen, your IP address will definitely be different than mine. Anyway, please note this down, for instance, I will note this down:

So, I have to go to HTTPS://10.0.0.10:446/ TO ADMINISTER OPENFILER. PLEASE NOTE IT IS HTTPS AND NOT HTTP.

So, open a browser tab, and let's go there:

Username and password for this is: USERNAME: openfiler NOTE: in lowercase PASSWORD: password



The site's security certificate is not trusted!

You attempted to reach **10.0.0**.10, but the server presented a certificate issued by an entity that is not include by your computer's operating system. This may mean that the server has generated to consecutly continuits, which Showns cannot rely on the density information, or an ota declines the rying to interpret your communications

You should not proceed, especially if you have never seen this warning before for this site

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Please enter "openfiler" for username and "password" for password.

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Please select Services, from top tab list

Please NOTE:

Please ENABLE it and START it.



Now, let us go back to Vmware Workstation 10 and add disks to Openfiler. To do this, we first add the disks to openfiler in Vmware Workstation 10 and then reboot openfiler

ADDING DISKS TO OPENFILER

GO TO VMWARE WORKSTATION 10 WINDOW

SELECT OPENFILER WITH ONE MOUSE CLICK(NOT DOUBLEW CLICK)



Click on VM at top

Select "Settings"

rdware Options Device Memory Processors Hard Disk (SCSI) CD/DVD (IDE) Network Adapter USB Controller Sound Card Printer Display	Summary I GB I IB GB Using file C:\Users\kartik\Downloads\o Bridged (Automatic) Present Auto detect Present Auto detect	Memory Specify the amount of memory allocated to this virtual machine. The memory size must be a multiple of 4 MB. Memory for this virtual machine: 1024 → MB 3 GB 2 GB 1 GUEST OS recommended minimution 1 GUEST OS RECOM 1 GUEST OS RECOM
	Add Remove	8 MB - 4 MB - MB - The virtual machine must be powered off to reduce the amount of memory.

click on Add

Add Hardware Wizard
Select a Disk Type What kind of disk do you want to create?
Virtual disk type
IDE (Cannot be added while the VM is powered on)
● <u>S</u> CSI (Recommended)
⊖ S <u>A</u> TA
Mode
Independent
Independent disks are not affected by snapshots.
Persistent
Changes are immediately and permanently written to the disk.
Nonpersistent
Changes to the disk are discarded when you power off or restore a snapshot.
< <u>Back</u> <u>N</u> ext > Cancel

Click "Next"

Click on "Next"

Add Hardware Wizard	×
Specify Disk Capacity How large do you want this disk to be?	
Maximum disk <u>s</u> ize (GB):	
Recommended size for Other Linux 2.6.x kernel 64-bit: 8 GB	
Allocate all disk space now.	
Allocating the full capacity can enhance performance but requires all of the physical disk space to be available right now. If you do not allocate all the space now, the virtual disk starts small and grows as you add data to it.	
O Store virtual disk as a single file	
Split virtual disk into multiple files	
Splitting the disk makes it easier to move the virtual machine to another computer but may reduce performance with very large disks.	
< <u>B</u> ack <u>N</u> ext > Cancel	

Click on Next Please change size to 18Gb Please click "Next"

Add Hardware Wizard	×
Specify Disk File Where would you like to store the disk file?	
Disk <u>f</u> ile	
This virtual disk file will store the configuration details of the p	hysical disk.
openfiler-0.vmdk	Browse
2	
and the	Consul
< <u>B</u> ack Hinis	n Cancel

Please click "Finish"

We will add another Hard Disk, so, similarly, on your own, now, add another Hard Disk.

Finally, it will look like this:

options		
Device Memory Processors Hard Disk (SCSI) New Hard Disk (S New Hard Disk (S CD/DVD (IDE) Dol/DVD (IDE) Network Adapter USB Controller Sound Card Printer	Summary 1 GB 1 GB 1 18 GB 18 GB 18 GB 18 GB Using file C:\Users\kartik\Downloads\o Bridged (Automatic) Present Auto detect Present	Disk file openfiler-1.vmdk Capacity Current size: 2.9 MB System free: 856.1 GB Maximum size: 18 GB Disk information Disk space is not preallocated for this hard disk. Hard disk contents are stored in multiple files.
	~	Utilities v Advanced

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Please click "OK"

REBOOTING OPENFILER

GO TO THE BROWSER MANAGEMENT URL

IN MY CASE IT WAS HTTPS://10.0.0.10:446/

Now to reboot openfiler? Please go to the "System" tab:

the right pane, please select Shutdown/Reboot

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Click on Shutdown

Please change to Reboot.



Please click on the "Shutdown" button.



Wait for sometime for openfiler to reboot, then, please click on "You can administer the storage device from here"

We are back to this screen:

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Please click on "Volumes" tab

In right pane, please click on block devices:

We see this:

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We see the two drives we added via Vmware Workstation 10, in my case they are: /dev/sdb abd /dev/sdc with 0 partitions.

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		Firmary.	-	2049	17.99 30			
mode	Partiti	an Type	Starting cylinder	Foding cylinde	r 512	o Creato	Arsot	
L in any		di sen	1,	Long .	le caso		24000	
Li trate a		ACT.		1		- I to con t		

NOTE: PLEASE DO NOT TOUCH THE DISK WITH THREE PARTITIONS, THAT IS THE OPENFILER BOOT DRIVE

Now, we click on /dev/sdb

Click on "create"

openfiler		נפי ה אז, ו	LOI, C.C. Log Det States	
Estatus Esystem Revice Type Ri Jacobild Late Nyear Value (rare)	Volumes section Manage Volum Volume Groups Block Devices Add Volume SiSCSI Targets Software RAID	es 5 Dolet	Valumes so Manage Stock U a Add Vol Biscel T. Support re Kepart Support re Support re	ertinn Volumes Viroups BVILBS Ionne aryels
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	© 2001 - 2011 Openfiler - All rights Horda - Sneuro diation - Support - Wate the	reserved. Isseer Log Out		

NOTE: DO NOT CLICK ON CREATE AGAIN

FROM RIGHT PLANE, CLICK ON "VOLUME GROUPS"

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				al la					Relieves system
			Volume Gi	oup Mar	agement				Manage Yolumes Yolume Groups
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		Yalaan: George Ka	nne Size	Allocated	Fna	Shandare	s – Add physica	d shurage	Delish: VG	 ➢ Bluck Devices ➡ Add Values ➡ ISESE Torgets ➡ Software BATD
				Create a r	new	volume	group			
			-							Support resources
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				Here	© 20 • <u>Fil at</u>	01 20.1	Openfiler, ell rich S <u>agaart</u> (<u>el al al</u>	ts reserved 3 * <u>100 (80</u> *	• <u></u>	

								Volumes section
Volume Group Management								= Manage Yolume @ Yolume Groups
	Yohoor Group Noor	Size	Allmated	From	Mondures	Add physical shraige	Defete VD	 ➡ Black Devices ➡ Add Values ➡ ISESE Tangels ➡ Software BATD
	500 Olev	17 16 62	C Evtes	17_0 GD	View member PVs	24 Firs are used	Delete	
	Create a new volume group							
	More existing physical locarnes were found on eventstude on receive bolivities are used. Not concrete new physical <u>existences</u>							

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	Volumes section
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	S Volume Groups
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Aleasa selectis votime Coportic create a votimi a uv	emple¥ bbA @
	iscst Tangels
cc 0 Charge	Sullware RAID
	Support resources
Block storage statistics for volume group "vol0"	Separt bug
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Total Space Used Space Free Space	🔯 Furuns
Порезер Митор (Поева Мер) – с Нуток (1 МБ) – Поререзер Митор (Поева Мер)	🖽 Admin Guide
Create a volume in "valo"	
Create a volume in "volo" Volume Name ("nn spaces", Yolid characters (a 2,4 2,0 9)):	
Create a volume in "visiO" Volume Name ("nn spaces", Volid charactors [a z,A Z,B 9]): Volume Description:	
Create a volume in "valo" Volume Name (*ini spaces*, Valid characters [a 2,4 7,0 9]): Volume Descriptions Required Space (NB):	
Create # volume in "volo" Volume Name (*nn spaces*, Volid rharacters [a z,A Z,0 9]): Volume Description: Required Space (NB): Filesystem / Volume type: SFS w	
Create a volume in "valo" Volume Name ("nn spaces". Valid charactors (a 2,4-2,0-9.)): Volume Description: Required Space (NB): Filesystem / Volume Type: Create	
Create a volume in "vol0" Volume Name ("in spaces". Volid tharactors [a 2,4 7,6 9]): Volume Description: Required Rome (ViB): Filosystem / Volume Type: Filosystem / Volume Type:	

Create a volume in "vo	010"
------------------------	------

Volume Name (*no spaces*. Valid characters [a-z,A-Z,0-9]):	LUNO
Volume Description:	LUNO
Required Space (MB):	17568
Filesystem / Volume type:	block (iSCSI,FC,etc) 👽
Create	

PLEASE MODIFY THE FIELDS AS SHOWN IN THE SCREENSHOT BELOW, REMEMBER TO CHANGE ALL FIELDS:

SO, WE HAVE MAXED OUT ON THE "REQUIRED SPACE" AND CHOSEN BLOCK(ISCSI) FOR FILESYSTEM/VOLUME TYPE

THIS IS VERY IMPORTANT, PLEASE DO NOT MESS THIS UP

PLEASE CLICK CREATE



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NOW GO TO RIGHT PLANE AND SELECT ISCSI TARGETS

Target Configuration LBK Mapping Network A	CE CHAP Authenticatio			- Manage Volume
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	Add new iscar ha	-ijei		add Volume
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PLEASE CLICK ADD

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🐔 Status 🛛 🛱 System 🛛 📾 Vulumes 🖉	Cluster 😵 Quuta 🚔 Shares 🛹 Services 🤌 Accounts	
Target Configuration LUN Happing	Retwork ACL CHAP Authonitisation	Volumes section Image Volumes Volume Groups Black Devices Abit Volumes ISEST Torgets
Map New LUN	bn LINs mapped to this target Target: "ign.2006-01.com.openfiler:tsn.327aef98-17ei	Support resources
Name HHN Path H LJSW Zdec/volu/uru	W Made 5FSI Serial No. SCST Id. Transfer Mode M interture App4 proxVIFAD20 App4IbrouvIFAD20 Slock prov I	Map IIIs Construction State
	© 2001 - 20 1 <u>promine</u> , el norte resevent Hure (Desmanann (Sacord (Malade (as es y Le Cal	

NO NEED TO DO ANYTHING IN ABOVE SCREENSHOT

PLEASE SELECT "LUN MAPPING" TAB

PLEASE CLICK "MAP"



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NOW WE HAVE TO DO THE SAME FOR THE SECOND DRIVE WE ADDED WHICH IS NAMED /DEV/SDC

HERE ARE THE SCREENSHOTS FOR THAT:

SELECT "BLOCK DEVICES"

								Volumes section
	Edit pai	titions i	n/dev/sdc(2	349 cylinders v	with "gpt"	label)		Shuk Devices
	Device	Туре Ма	nber Startiyl	End cyl Blocks	Size Түрө	Delete		- Add Values: - iSCST Tangels
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made	Portitik	ал Турс	Starting ryline	for Ending cylind	nr Slao	Genato	Arsot	
Frimary .	Physical vo	lurs v	1	2049	27.85.63	Create	Aese:	

CLICK ON /DEV/SDC

openfiler	Volumes section	1. 1, C.C3 Log Out Status Update Shutheon
Status 🗊 System 🗭 Volumes 😭 Diuster Ldit partitions in /dev	 Manage Volumes Volume Groups Block Devices Add Volume iSCSI Targets Software RAID 	Volumes sertion Manage Volumes Volume Groups Diock Devices Add Volume BiSCST Targets Support resources Kepart bug Gist support Figure Largets Construction Cons
Create a Create a Made Starting of Prinary 2202 Made Partition Type Starting	Interface Ending cylinder Size Create Re	set
Frimary W Physical Folume W 2200	2019 UT ALU MU Create 15-	25*

CLICK CREATE

CLICK ON VOLUME GROUPS IN RIGHT PANE

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					Acd	volume group				
					licme -	ko 2001 - 2011 Decumentation	<u>Openfiler</u> , All righ - Support - Oebsit	ts reserved e ruicense rui	oc Cat	

WE WILL NAME THIS VOL1 AND CHECK /DEV/SDC1 AND CLICK "CREATE VOLUME GROUP"

	<u> </u>				
U	12 13	-		6	
_	-	_		_	

		Volu	ime Gr	oup Managem	ent		- Manage Volumes
Volume Bernyi Sana:	Size	Allocated	Franc	Mendoas	Add physical shorage	Detets VG	Bluck Devices
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		Gre	alean	ew volume ge	()LIF)		Support resources
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	Volumes so time
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Please select a volume proup to create a volume in	 Add Yulame ISL51 Largets
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Block storage statistics for volume group "volu"	auppun resources
Tubal Sparse Used Sparse Free Sparse	🖾 bet support 🐺 Formus 10. Admin Cuide
La La	
11-3C &1	
Create a volume in "vol0"	

UNFORTUNATELY VOL0 – WHERE WE HAVE ALREADY CREATED A VOLUME IS SELECTED BY DEFAULT, WE NEED TO CHANGE IT TO "VOL1"

SO CHANGE IT TO VOL1

CLICK CHANGE

			 	- 12
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Select volume Group	S Valume Groups
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	Support resources
Block storage statistics for volume group "vol1"	🍓 Kepart bug
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Total Space Used Space Free Space	🔯 Furuns
17060632 homa (17668 MP) - C Extas (0.36) - 17060632 homa (17663 MP)	🖽 Admin Guide
Foreste a volume in "vol t"	
Volume Name ("nn spaces", Valid characters (a 2,4-2,6-9.)):	
Volume Description:	
Required Space (NR):	
Filesystem / Volume Type: dFR v	
There	

NAME THE VOLUME "LUN1" DESCRIPTION "LUN1" MAX OUT ON "REQUIRED SPACE" AND SELECT "BLOCK/ISCSI" AS FILESYSTEM/VOLUME TYPE, SHOWN BELOW:



CLICK CREATE

penfiler					J\$(12)J7 C57	5 min, Ulusers, Icad e	Herege: C.CJ, C.CJ, C.CJ	l og flæt Status Update Shutdeo
🐁 Stabus 🛛 🛱 S	System (💭 Valumes	🕞 Eluster 🛛	🗿 Quota 🛛 🚍 Sh	sres 🐺 Service	s 🤌 Accounts	í.	
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	THK TH	. ETIN Path Verw/se Oylind	R/W Nude	SESE Secial No. Appell: prive 6530	SCS1 Till Anc-th nuve ARAD	Transler Mode D obckio	Innap IIN	Support resources
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ON RIGHT PANE CLICK ISCSI TARGETS

AFTER CLICKING ISCSI TARGETS, YOU WILL SEE:

CLICK MAP ON LUN1, YOU WILL, THEN, SEE:

								Value of the second
Target Fn	ntiqueation	LUS Mapping	Network Af	I FHAP Authont	ration			= "tanage Volume
	LL	JNs mappe	d to tange	t: iqn.2006-01.	com.opentiler:t	sn.32 7aet98	17e8	 Volume Groups Black Devices Add Volume WYSH Learners
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			<u>A</u>	ris qui de FOSTE Al- Liaj	he Husbarg d Erve E not.			i bet support i Fucuus i Admin Guide

now that we have the shared storage(the necessity of shared storage has been explained earleir), WE ARE NOW READY TO INSTALL SOLARIS.

TO DO THIS FIRST WE NEED TO DOWNLOAD IT.

GO TO HTTP://WWW.ORACLE.COM:



PUT THE MOUSE ON "DOWNLOADS"

OR, GO TO:

http://www.oracle.com/technetwork/server-storage/solaris11/downloads/index.html





PLEASE ACCEPT THE LICENSE AGREEMENT: WE WILL DOWNLOAD THIS:

CLICK ON DOWNLOAD ARROW

PLEASE REGISTER AND DOWNLOAD THE OPERATING SYSTEM.

AFTER YOU HAVE DOWNLOADED THE SOLARIS 11 X86 TEXT INSTALL SOFTWARE, WE NOW GO BACK TO OUR VIRTUALIZATION PLATFORM, WHICH IS, VMWARE WORKSTATION 10 AND INSTALL SOLARIS 11 THERE, THIS IS AGAIN AN IMPORTANT STEP AND IT IS GOOD IF YOU FOLLOW THE DIRECTIONS:



CLICK "CREATE NEW VIRTUAL MACHINE"

Ne	w Virtual Machine	Wizard	×
Guest Operating Sysl A virtual machine is system. How will yo	em Installation like a physical computer; u install the guest operat	it needs an ope ing system?	erating
Install from:			
O Installer <u>d</u> isc:			
😽 DVD RW Drive (F) OFFICE10	~	
Installer disc image file	e (iso):		
		~	Browse
Select the installe	r disc image to continue.		
I will install the operat	ing system later.		
The virtual machine w	ill be created with a blanl	< hard disk.	
Help	< <u>B</u> ack	<u>N</u> ext >	Cancel

CHOOSE THE "TYPICAL" OPTION

CLICK NEXT

SELECT INSTALL DISC ISO IMAGE

New Virtual Machine Wizard	>
Name the Virtual Machine What name would you like to use for this virtual machine?	
<u>V</u> irtual machine name:	
Solaris 11 64-bit	
Location:	
C:\Users\kartik\Documents\Virtual Machines\Solaris 11 64-bit	Browse
The default location can be changed at Edit > Preferences.	
< <u>B</u> ack <u>N</u> ext >	Cancel

BROWSE FOR THE SOLARIS 11 X86 ISO THAT YOU DOWNLOADED

NOTE; VMWARE WORKSTATION AUTODETECTS SOLARIS 11 64 BIT, THIS IS BOTH GOOD AND BAD, IT IS BAD BECAUSE IT WILL TRY TO DO THINGS AUTOMATICALLY (WE WONT GET A CHANCE TO LEARN!!), SO, WE'LL FIX THAT SOON ENOUGH

New Virtual Machine Wizard	×
Specify Disk Capacity How large do you want this disk to be?	
The virtual machine's hard disk is stored as one or more files on the host computer's physical disk. These file(s) start small and become larger as you add applications, files, and data to your virtual machine.	
Maximum disk <u>s</u> ize (GB):	
Recommended size for Solaris 11 64-bit: 16 GB	
 Store virtual disk as a single file Split virtual disk into <u>m</u>ultiple files Splitting the disk makes it easier to move the virtual machine to another computer but may reduce performance with very large disks. 	
Help < <u>B</u> ack <u>N</u> ext > Cancel	

PLEASE CHANGE THE NAME OF THIS VIRTUAL MACHINE TO "SOLARIS11-1"

click next

he virtual machine v	vill be created with the following settings:	
Name:	Solaris11-1	^
Location:	C:\Users\kartik\Documents\Virtual Machines\Solaris11-1	
Version:	Workstation 10.0	
Operating System:	Solaris 11 64-bit	
Hard Disk:	16 GB, Split	
Memory:	2048 MB	
Network Adapter:	NAT	1
Other Devices:	CD/DVD, USB Controller, Printer, Sound Card	Y
Customize Hardw	are	

CLICK NEXT

NOTE: POWER ON VIRTUAL MACHINE AFTER CREATION IS CHECKED, PLEASE UNCHECK IT:
Device	Summary	Device status
Memory	1 GB	⊆onnected ✓ Connect at power on
	1 Using file CVUsers\kartik\Docume	
Network Adapter	NAT	Network connection
Sound Card	Auto detect	Bridged: Connected directly to the physical network
Display	Auto detect	Replicate physical network connection state
		O NAT: Used to share the bost's IP address
		Host-only: A private petwork shared with the bost
		Custom: Specific virtual network
		VMpet0
		×
		LAN Segments Advanced
	N	LAN Segments Auganceu
	12	
	Add Remove	

CLICK ON "CUSTOMIZE HARDWARE" CHANGE MEMORY TO 1Gb CHANGE NETWORK ADAPTER TO BRIDGED NOW, IF YOU REMEMBER WE NEED HEARTBEAT LINKS BETWEEN THE TWO NODES OF THE CLUSTER, SO, WE WILL ADD NETWORK ADAPTERS, WE NEED TWO MORE, SO, WE WILL ADD TWO NETWORK ADAPTERS, ONE AT, A, TIME:

CLICK ON "ADD" SELECT NETWORK ADAPTER

Network connection	
Bridged: Connected	directly to the physical network
Replicate physica	al network connection state
○ <u>N</u> AT: Used to share	the host's IP address
Host-only: A private	network shared with the host
<u>C</u> ustom: Specific virt	ual network
VMnet0	¥
Device status	
Connect at nower or	n

CLICK NEXT

NOTE: WE HAVE CHANGED THE NETWORK ADAPTER TO BRIDGED, CLICK FINISH.

Hardware types: CD/DVD Drive Floppy Drive VISB Controller Sound Card Parallel Port Serial Port Frinter Generic SCSI Device	Explanation Add a network adapter.
--	---------------------------------------

NOW WE HAVE TO ADD ANOTHER NETWORK ADAPTER, HERE ARE THE SCREENSHOTS:

SELECT NETWORK ADAPTER

CLICK NEXT

Add H	Hardware Wi	zard	×
Network Adapter Type What type of network adap	oter do you want	to add?	
Network connection			
Bridged: Connected directly to	the physical net	vork	
Replicate physical network	connection state		
\bigcirc <u>N</u> AT: Used to share the host's	IP address		
O Host-only: A private network s	hared with the h	ost	
O Custom: Specific virtual networ	ĸ		
VMnet0	Ŷ		
Device status			
✓ Connect at power on			
	< Back	Finish	Cancel

AGAIN NOTE DEFAULT IS "NAT", WE NEED TO CHANGE IT TO "BRIDGED" AS BEFORE:

CLICK FINISH

Device	Summary	Device status	
••• Memory 😡 🖓	1 GB 1	Connected Connect at power on	
 New CD/DVD (Network Adapt Network Adapter Network Adapt Network Adapt Sound Card Display 	Using file C:\Users\kartik\Docume Bridged (Automatic) Bridged (Automatic) Bridged (Automatic) Auto detect Auto detect	Network connection Bridged: Connected directly to the physical network Replicate physical network connection state NAT: Used to share the host's IP address Host-only: A private network shared with the host Custom: Specific virtual network	
		VMnet0 V	
		V	
		LAN <u>S</u> egments Ad <u>v</u> anced.	
	Add		

CLICK "CLOSE"



CLICK FINISH



IN RIGHT PLANE CLICK "EDIT VIRTUAL MACHINE SETTINGS"

EVERYTHING LOOKS GREAT, HIT CANCEL





THEN



PLEASE ACCEPT DEFAULT

		Selaris11 1 VMware workstation				
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	ubrary X	🖞 🔮 lizne 🕷 👔 sperfiler 🕷 🗐 Mo compute: 🚿 🖡 Solarin I - 1 🕷				
	C. Type ners to search	SunOS Release 5.11 Version 11.1 64-bit				
	- 🗐 My Computer	Copyright (c) 1983, 2012, Uracle and/or its affiliates. All rights reserved. Remounting root read/write				
	openfiler					
	🔛 Sheled VMa	Probing for device nodes				
	00000 Arrest 000 0.00	Preparing image for use				
		Done mounting image				
		USB keyboard				
		1. Anabio 15. Korean				
		2. Belgian 16. Latin-American				
		3. Brazilian 17. Norwegian				
		4. Canadian-Bilingual 18. Portuguese				
		5. Canadian-French 19. Russian				
		7. Parish 20. Sparish				
		21. Sweatsh 2 Descent				
		9 Finish 22 Switz-reach				
		10 French 24 Traditional_Chinese				
		11. Leeman 25. Turki shill				
		12. Italian 26. $UK = huglish$				
		13. Japanese-type6 27. US-Liglish				
		14. Tapanese				
		To select the keyboard layout, enter a number [default 27]:				
		1. Chinese - Simplified				
		2. Chinese - Traditional				
		3. English				
		4. French				
		o. German				
		5. Italian				
		7. Japanese				
		9 Partimere - Brazil				
		10. Spanish				
		To select the Language you wish to use, enter a number [default is 3]:				
		🔄 disk in the 4-tual screen 🛛 hasal Solaris Ei blaces vari and don a physical computer "When you are care and the operating system social 📊 policy - weather in the weather in the second screen and the operating system social in the second screen and the operating system social in the second screen and the operating system social in the second screen and the operating system social in the second screen and the operating system social in the second screen and the operating system social in the second screen and the operating system social in the second screen and the second screen and the operating system social in the second screen and the operating system social in the second screen and t				
		There is a first the state of t				
1	In direct it put to this SV, thek include	#P1201300416 二级 對 調 對 例 [辰				



ACCEPT DEFAULT



PRESS THE COMBINATION "Esc 2"

press Esc 2



PRESS Esc 2



ACCEPT THE DEFAULT OF USE WHOLE DISK - THIS IS BETTER FOR ZFS FILESYSTEMS



PRESS Esc 2

GIVE IT THE NAME solairs11-1, then, USING THE ARROW KEYS, GO DOWN TO "MANUALLY CONFIGURE THE NETWORK"



PRESS Esc 2 TO CONTINUE



PRESS Esc 2



GIVE IT AN IP ADDRESS IN YOUR SUBNET, I AM GONNA TRY 10.0.0.20, AND YOU SHOULD HAVE ROUTER INFORMATION, IN MY CASE IT IS 10.0.0.1

	9	Solaris11 1 VMwa workstation - 🔍	
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Set the Time Zone, I am in Chicago, so I will choose US Central





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after a very short while:



NOTE – YOU MIGHT HAVE TO HIT ENTER INSIDE THE BOX AND THEN PRESS Esc 8



please choose option ${\bf 5}$



CONGRATULATIONS YOU JUST INSTALLED SOLARIS 11

CLICK "I FINISHED INSTALLING"

TEST FOR NETWORK



WE NEED TO MAKE ONE CHANGE IN VMWARE WORKSTATION 10
SO GO TO YOUR VMWARE WORKSTATAION 10

SELECT EDIT – VIRTUAL NETWORK EDITOR

	VMware Workseation	- • ×
File Hait Name Wild this H	Hrn	×
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PLEASE CHANGE THE AUTOMATIC TO WHATEVER YOU HAVE FROM THE DROP DOWN(AVOID WIRELESS)



NOW WE NEED TO CREATE THE SECONDNODE OF THE CLUSTER, AND WE CAN START ALL OVER AGAIN AND DO THAT, AND I RECOMMEND YOU DO THAT.

OR

WE CAN CLONE THIS SOLARIS VM. TO DO SO WE FOLLOW THESE STEPS:



ON LEFT PANE HIGHLIGHT THE SOLARIS VM

RIGHT CLICK ON IT – SCROLL DOWN TO "MANAGE" – SELECT "CLONE"



hit cancel

SO WE'LL POWER IT DOWN GRACEFULLY ISSUE THE COMMAND FROM CONSOLE AS ROOT init 5





So NOW IT IS POWERED OFF:

SELECT SOLARIS11-1, VM - "MANAGE" - "CLONE"

Clone Virtu	al Machine	Wizard	
Clone Source Which state do you want to cre	eate a clone fro	om?	
Clone from			
The current state in the virtual m	nachine		
Creating a linked clone from the	current state v	vill create a new s	napshot.
An existing snapshot (powered of the state of the stat	off only): ing cloneable s	napshots.	~
	< Back	Nevt	Cancel
	< DOLK	Next >	Cancer

CLICK NEXT

Clone Virtual Machine Wizard	×
Clone Type How do you want to clone this virtual machine?	
Clone method	
O Create a linked clone	
A linked clone is a reference to the original virtual machine and requires less disk space to store. However, it cannot run without access to the original virtual machine.	
Create a full clone A full clone is a complete copy of the original virtual machine at its current state. This virtual machine is fully independent, but requires more disk space to store.	
z Pack Next > Canad	
	_

CLICK NEXT

•

WE DO NOT WANT A LINKED CLONE – WE WANT A FULL CLONE, SO PLEASE CHECK CREATE A FULL CLONE

Name of the New ¥ What name would	irtual Machine d you like to use for this virtual machine?	
Virtual machine name		
Solaris11-2		
Location		
C:\Users\kartik\Docu	ments\Virtual Machines\Solaris11-2	Browse

NOW THAT WE HAVE DESELECTED LINKED CLONE AND SELECTED FULL CLONE, CLICK NEXT, PLEASE

WE WILL NAME IT SOLARIS11-2

Clone Virtual Machine Wizard	
Cloning Virtual Machine	
	_
✓ Preparing clone operation	
✓ Creating full clone	
✓ Done	
, , , , , , , , , , , , , , , , , , ,	
	-
Close	

PLEASE CLICK FINISH



CLICK "CLOSE"

NOW WE HAVE TO BOOT solaris11-2 UP AND CHANGE IT'S IP ADDRESS, NAME ETC BECAUSE WHEN IT GOT CLONED, IT BECAME AN EXACT COPY OF solaris11-1.

LET'S DO THAT.

CLICK ON "POWER ON THIS VIRTUAL MACHINE IN LEFT PANE.





AS YOU CAN SEE IT IS NAMED solaris11-1, so, we have toi change it's name and IP address.



e direct input to this VM, to takinsion process Ctell, G.

Let us enable root to login directly via ssh to the system, so we can work directly ssh into the system: vi /etc/default/login

comment out the line that says CONSOLE

If CONSOLE is set, root can only login on that device.

If the specified device is /dev/console, then root can also log into

any of the currently enabled /dev/vt/# virtual terminal devices.

Comment this line out to allow remote login by root.

#

#CONSOLE=/dev/console

Next, change this file: /etc/ssh/sshd_config PermitRootLogin yes (it is set to no) Then, do this:

rolemod -K type=normal root then svcadm restart ssh

Category:		
🚍 Session	Basic options for your PuT	TY session
Logging ⊡ Terminal Keyboard	 Specify the destination you want to Host <u>Name (or IP address)</u> 10.0.0.10 	connect to <u>P</u> ort 22
Feature S	Connection type:	● <u>S</u> SH ○ Se <u>r</u> ial
Appearance Behaviour Translation Selection	Load, save or delete a stored session Sav <u>e</u> d Sessions	on
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⊞ SSH Serial	Close window on e <u>x</u> it: O Always O Never O Onl	y on clean exit
About	 pen	<u>C</u> ancel

Now root can login directly via putty.

GOING FORWARD WE WILL DO OUR WORK VIA PUTTY, PUTTY CAN BE DOWNLOADED FROM: http://www.chiark.greenend.org.uk/~sgtatham/putty/download.html

```
root@solaris11-1:~# svccfg -s system/identity:node setprop config/nodename="solaris11-2"
root@solaris11-1:~# svccfg -s system/identity:node refresh
root@solaris11-1:~# svcadm restart system/identity:node
```

so, now when we do a hostname command on the system: root@solaris11-1:~# hostname solaris11-2 root@solaris11-1:~#

Now we can boot up the original system(the system we cloned)

Let us boot up solairs11-1

go to VMWARE WORKSTATION window, select solairs11-1, right click on it, and select, power on guest.

```
login as: kartik
Using keyboard-interactive authentication.
Password:
Last login: Sat Nov 9 18:38:49 2013
Oracle Corporation
                     SunOS 5.11
                                    11.1
                                           September 2012
kartik@solaris11-1:~$ su -
Password:
Oracle Corporation
                     SunOS 5.11
                                           September 2012
                                    11.1
root@solaris11-1:~#
root@solaris11-1:~# vi /etc/default/login
root@solaris11-1:~# vi /etc/ssh/sshd config
root@solaris11-1:~# rolemod -K type=normal root
root@solaris11-1:~# svcadm restart ssh
root@solaris11-1:~#
```

Now, we'll set things up so that root from solaris11-1 can ssh to solaris11-2 without password, and, vice versa, this is a requirement for VCS installation.

root@solaris11-1:~# pwd /root root@solaris11-1:~# mkdir .ssh root@solaris11-1:~# ssh-keygen -t dsa Generating public/private dsa key pair. Enter file in which to save the key (/root/.ssh/id_dsa): Enter passphrase (empty for no passphrase): NOTE: just hit enter Enter same passphrase again: Your identification has been saved in /root/.ssh/id_dsa. Your public key has been saved in /root/.ssh/id_dsa.pub. The key fingerprint is: fc:a6:1b:29:05:e0:ae:f2:99:b7:0b:61:39:a3:a3:c3 root@solaris11-1 root@solaris11-1:~#

Do the same thing on solaris11-2

Now, copy the contents on /root/.ssh/id_dsa.pub of one system into a new file called /root/.ssh/authorized_keys of the other system, do this for both systems.

As a test from solaris11-1 launch the command: root@solaris11-1:~/.ssh# ssh solaris11-2 date The authenticity of host 'solaris11-2 (10.0.0.30)' can't be established. RSA key fingerprint is 63:c8:a8:f7:74:54:d8:2c:d7:bb:cc:97:73:d6:d3:22. Are you sure you want to continue connecting (yes/no)? yes Warning: Permanently added 'solaris11-2,10.0.0.30' (RSA) to the list of known hosts. Saturday, November 9, 2013 06:55:53 PM CST root@solaris11-1:~/.ssh#

This part works

Now from solairs11-2 root@solaris11-2:~/.ssh# ssh solaris11-1 date The authenticity of host 'solaris11-1 (10.0.0.20)' can't be established. RSA key fingerprint is 63:c8:a8:f7:74:54:d8:2c:d7:bb:cc:97:73:d6:d3:22. Are you sure you want to continue connecting (yes/no)? yes Warning: Permanently added 'solaris11-1,10.0.0.20' (RSA) to the list of known hosts. Saturday, November 9, 2013 06:56:13 PM CST root@solaris11-2:~/.ssh#

This part works too.

Going forward, it won't ask the yes/no question, wanna check: root@solaris11-1:~/.ssh# ssh solaris11-2 date Saturday, November 9, 2013 07:02:17 PM CST root@solaris11-1:~/.ssh# AND

root@solaris11-2:~/.ssh# ssh solaris11-1 date Saturday, November 9, 2013 07:02:33 PM CST root@solaris11-2:~/.ssh#

Now we are ready to install VCS on the two systems.

Download VCS software from symantec.com

close the pop up window

Click on "Trialware and Downloads"

Click on "Recently released"

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While this is being done let us configure the hearbeat links on the two solaris systems

root@solaris11-1:~/.ssh# ipadm create-ip net1 root@solaris11-1:~/.ssh# ipadm create-addr -T static -a 12.12.12.12/24 net1/v4 root@solaris11-1:~/.ssh# ipadm create-ip net2 root@solaris11-1:~/.ssh# ipadm create-addr -T static -a 12.12.12.13/24 net2/v4 root@solaris11-1:~/.ssh# So We created two interfaces with IP addresses 12.12.12.12 and 12.12.12.13 on net1 and net2 respectively.

Similarly on the second node: root@solaris11-2:~/.ssh# ipadm create-ip net1 root@solaris11-2:~/.ssh# ipadm create-addr -T static -a 12.12.12.14/24 net1/v4 root@solaris11-2:~/.ssh# ipadm create-ip net2 root@solaris11-2:~/.ssh# ipadm create-addr -T static -a 12.12.12.15/24 net2/v4

NOTE: The heartbeat interfaces should be on a private LAN, here they are on the 12.12.12.X subnet

root@solaris11-1:~/.ssh# ping 12.12.12.14 12.12.12.14 is alive root@solaris11-1:~/.ssh# ping 12.12.12.15 12.12.12.15 is alive root@solaris11-1:~/.ssh#

root@solaris11-2:~/.ssh# ping 12.12.12.12 12.12.12.12 is alive root@solaris11-2:~/.ssh# ping 12.12.12.13 12.12.12.13 is alive root@solaris11-2:~/.ssh#

As you may see from above we pinged the interfaces of the other host from one another

By now the scp is over

root@solaris11-1:~/.ssh# cd ~kartik root@solaris11-1:/home/kartik# ls -al total 1974344 drwxr-xr-x 2 kartik staff 5 Nov 9 19:43 . dr-xr-xr-x 2 root root 2 Nov 9 18:38 .. -rw-r--r-- 1 kartik staff 159 Nov 9 13:07 .bashrc -rw-r--r-- 1 kartik staff 568 Nov 9 13:07 .profile -rw-r--r-- 1 kartik staff 1010115654 Nov 8 17:30 VRTS_SF_HA_Solutions_6.0.1_Solaris_x64.tar.gz root@solaris11-1:/home/kartik#

root@solaris11-1:/home/kartik# gzip -d VRTS_SF_HA_Solutions_6.0.1_Solaris_x64.tar.gz root@solaris11-1:/home/kartik#

root@solaris11-1:/home/kartik# tar xvf VRTS_SF_HA_Solutions_6.0.1_Solaris_x64.tar

root@solaris11-1:/home/kartik# cd dvd2-sol x64/ root@solaris11-1:/home/kartik/dvd2-sol x64# ls -al total 12 drwxr-xr-x 4 root root 4 Aug 3 2012. drwxr-xr-x 3 kartik staff 6 Nov 9 19:58 ... drwxr-xr-x 17 root root 20 Aug 3 2012 sol10 x64 drwxr-xr-x 17 root 20 Aug 3 2012 sol11 x64 root root@solaris11-1:/home/kartik/dvd2-sol x64# cd sol11 x64/ root@solaris11-1:/home/kartik/dvd2-sol x64/sol11 x64# ls -al total 105 drwxr-xr-x 17 root root 20 Aug 3 2012. drwxr-xr-x 4 root 4 Aug 3 2012 .. root

Veritas Dynamic Multi-Pathing (DMP)
 Veritas Cluster Server (VCS)
 Veritas Storage Foundation (SF)
 Veritas Storage Foundation and High Availability (SFHA)
 Veritas Storage Foundation Cluster File System HA (SFCFSHA)
 Symantec VirtualStore (SVS)
 Veritas Storage Foundation for Oracle RAC (SF Oracle RAC)
 Back to previous menu

Select a product to install: [1-7,b,q]

drwxrwxr-x 4 root root	7 Aug 3 2012 cluster_server
-rw-rr 1 root root	860 Aug 3 2012 copyright
drwxrwxr-x 10 root root	14 Aug 3 2012 docs
drwxrwxr-x 3 root root	6 Aug 3 2012 dynamic_multipathing
drwxrwxr-x 3 root root	6 Aug 3 2012 file_system
-rwxr-xr-x 1 root root	6322 Jul 24 2012 installer
drwxrwxr-x 4 root root	4 May 7 2012 perl
drwxrwxr-x 3 root root	4 Aug 3 2012 pkgs
drwxrwxr-x 7 root root	18 Aug 3 2012 scripts
drwxrwxr-x 4 root root	7 Aug 3 2012 storage foundation
drwxrwxr-x 4 root root	7 Aug 3 2012 storage foundation cluster file system ha
drwxrwxr-x 4 root root	7 Aug 3 2012 storage foundation for oracle rac
drwxrwxr-x 4 root root	7 Aug 3 2012 storage foundation high availability
drwxrwxr-x 3 root root	6 Aug 3 2012 virtualstore
drwxrwxr-x 3 root root	6 Aug 3 2012 volume manager
-rwxr-xr-x 1 root root	18331 Jul 24 2012 webinstaller
drwxrwxr-x 2 root root	3 Aug 3 2012 windows
drwxrwxr-x 4 root root	4 Jul 24 2012 xprtl
root@solaris11-1:/home/kar	tik/dvd2-sol_x64/sol11_x64#
-	

root@solaris11-1:/home/kartik/dvd2-sol_x64/sol11_x64# ./installer



Choose option 2

Please choose option 3

Select default option# 2



select "n"

hit enter

Select YES

Select YES

Press ENTER

The kollowing data is required to configure the Virtual IP of the fluster: i yubic NiC used by each system to the constar i Yurrual IF address era network bo you want to configure the Virtual IP (y,a,q,7) (b) y hittays NIC devices discovered on solarishin-1: (b,q,7) (net0) In solo to be the public NIC and by all systeme) (y,a,q,b,2) (y) Inter the NDC for Virtual IF of the Cluster to use on solarishin: (b,q,7) (net0) In solo to be the public NIC and by all systeme) (y,a,q,b,2) (y) Inter the NDC for Virtual IF of the Cluster to use on solarishin: (b,q,7) (net0) In solo to be the public NIC and by all systeme) (y,a,q,b,2) (y) Inter the Virtual IF address for the Cluster: (b,q,7) 10.0.0.050 Inter the WetBook for IP 10.0.0.50 (net,q,7) (255.255.255.0) Meritar Cluster Stavet 6.0.. Eastall Drogram colorishi = solor 2 Cluster Virtual IP verification: NCC: moch The the Virtual IP verification: NCC: moch The the constart (b,q,n) (y)

WE will name our cluster as "ourcluster"

select default option# 1

Just accept the fdefaults ansd say yes "y"

Select YES for this



Select NO for this

Select YES for this

select yes

select No



Select No

Select "q"

root@solaris11-1:/home/kartik/dvd2-sol_x64/sol11_x64# tail -f /var/VRTSvcs/log/

CmdServer-log_A.log engine_A.log hastart.log HostMonitor_A.log tmp/ uuidconfig.log root@solaris11-1:/home/kartik/dvd2-sol_x64/sol11_x64# tail -f /var/VRTSvcs/log/engine_A.log SMF_METHOD=start SMF_RESTARTER=svc:/system/svc/restarter:default SMF_ZONENAME=global TZ=localtime

2013/11/09 20:44:39 VCS INFO V-16-6-15002 (solaris11-2) hatrigger:hatrigger executed /opt/VRTSvcs/bin/internal_triggers/dump_tunables solaris11-2 1 successfully 2013/11/09 20:44:40 VCS INFO V-16-1-10304 Resource webip (Owner: Unspecified, Group: ClusterService) is offline on solaris11-2 (First probe) 2013/11/09 20:44:40 VCS NOTICE V-16-1-10438 Group ClusterService has been probed on system solaris11-2 2013/11/09 20:44:44 VCS NOTICE V-16-1-10438 Group VCShmg has been probed on system solaris11-2 2013/11/09 20:44:44 VCS NOTICE V-16-1-10435 Group VCShmg will not start automatically on System solaris11-2 as the system is not a part of AutoStartList attribute of the group.

root@solaris11-1:/home/kartik/dvd2-sol_x64/sol11_x64# export PATH=\$PATH:/opt/VRTSvcs/bin root@solaris11-1:/home/kartik/dvd2-sol_x64/sol11_x64# hastatus -sum

SYSTEM ST	ATE				
System	State	Frozer	1		
A colorial1 1		1	0		
A Solalisti-I	KUMMING	J	0		
A solaris11-2	RUNNINC	Ĵ	0		
GROUP STA Group	ATE System	Probed	AutoD	bisabled	State
B ClusterServi	ce solaris11-1	Y	Ν	Ol	NLINE
B ClusterServi	ce solaris11-2	Y	Ν	O	FFLINE
root@solaris11	-1:/home/kartik/	dvd2-sol	_x64/sol	11_x64#	

## YOUR FRIENDS ARE THESE VCS COMMANDS:

export PATH=\$PATH:/opt/VRTSvcs/bin

hastatus -sum

tail -f /var/VRTSvcs/log/engine_A.log NOTE: ALWAYS KEEP THIS COMMAND RUNNING IN A SEPERATE PUTTY SESSION ON ONE OF THE CLUSTER NODES.

NOW WE WILL INSTALL A NON GLOBAL ZONE AND MAKE IT "HIGHLY AVAILABLE" (HA) (PUIT IT UNDER VCS CONTROL).

FISRT WE HAVE TO CONFIGURE SHARED STORAGE(STORAGE THAT IS SEEN BY BOTH NODES – DRIVES THAT ARE SEEN BY BOTH NODES, HOWEVER, ARE UNDER THE CONROL OF ONLY ONE NODE AT A TIME)

WE WILL MAKE USE OF OPENFILER ISCSI TO DO TAT.

WE HAVWE TO SET UP ISCSI DISCOVERY ON OUR SOLARIS SYSTEMS, THIS IS ACCOMPLISHED IN TWO EASY COMMANDS.

REMEMBER THE IP ADDRESS OF OPENFILER IS 10.0.0.10

run the following commands on both nodes:

root@solaris11-1:/home/kartik/dvd2-sol_x64/sol11_x64# iscsiadm add discovery-address 10.0.0.10:3260 root@solaris11-1:/home/kartik/dvd2-sol_x64/sol11_x64# iscsiadm modify discovery --sendtargets enable root@solaris11-1:/home/kartik/dvd2-sol_x64/sol11_x64# devfsadm -i iscsi

and lo and behold

root@solaris11-1:/home/kartik/dvd2-sol_x64/sol11_x64# format Searching for disks...done

AVAILABLE DISK SELECTIONS:

0. c8t0d0 <VMware,-VMware Virtual S-1.0-16.00GB> /pci@0,0/pci15ad,1976@10/sd@0,0 1. c9t2d0 <OPNFILER-VIRTUAL-DISK-0 cyl 2237 alt 2 hd 255 sec 63> /iscsi/disk@0000iqn.2006-01.com.openfiler%3Atsn.327aef9847e80001,0 2. c9t3d0 <OPNFILER-VIRTUAL-DISK-0 cyl 2237 alt 2 hd 255 sec 63> /iscsi/disk@0000iqn.2006-01.com.openfiler%3Atsn.327aef9847e80001,1 Specify disk (enter its number):

we see our two SAN drives, they are: c9t2d0 and c9t3d0 Hiot Ctrl-d

and on node solaris11-2

root@solaris11-2:~/.ssh# iscsiadm add discovery-address 10.0.0.10:3260 root@solaris11-2:~/.ssh# iscsiadm modify discovery --sendtargets enable root@solaris11-2:~/.ssh# devfsadm -i iscsi root@solaris11-2:~/.ssh# format Searching for disks...done AVAILABLE DISK SELECTIONS: 0. c8t0d0 <VMware,-VMware Virtual S-1.0-16.00GB> /pci@0,0/pci15ad,1976@10/sd@0,0 1. c9t2d0 <OPNFILER-VIRTUAL-DISK-0 cyl 2237 alt 2 hd 255 sec 63> /iscsi/disk@0000iqn.2006-01.com.openfiler%3Atsn.327aef9847e80001,0 2. c9t3d0 <OPNFILER-VIRTUAL-DISK-0 cyl 2237 alt 2 hd 255 sec 63> /iscsi/disk@0000iqn.2006-01.com.openfiler%3Atsn.327aef9847e80001,1 Specify disk (enter its number): Hit Ctrl-d

# NOW WE WILL CREATE A ZPOOL ON ONE OF THE SHARED DRIVES(LUN'S) AND CREATE A ZFS FILESYSTEM ON THAT ZPOOL AND USE IT AS THE ROOT FOR OUR SOLARIS NON GOBAL ZONE

ON NODE 1(solaris11-1) root@solaris11-1:/home/kartik/dvd2-sol_x64/sol11_x64# zpool create spool c9t2d0

root@solaris11-1:/home/kartik/dvd2-sol x64/sol11 x64# zpool create spool c9t2d0 root@solaris11-1:/home/kartik/dvd2-sol x64/sol11 x64# zfs create spool/mnt root@solaris11-1:/home/kartik/dvd2-sol x64/sol11 x64# zonecfg -z testzone Use 'create' to begin configuring a new zone. zonecfg:testzone> create -b zonecfg:testzone> set zonepath=/spool/mnt/testzone zonecfg:testzone> set ip-type=shared zonecfg:testzone> add net zonecfg:testzone:net> set physical=net0 zonecfg:testzone:net> set address=10.0.0.60 zonecfg:testzone:net> end zonecfg:testzone> verify zonecfg:testzone> commit zonecfg:testzone> zonecfg:testzone> exit root@solaris11-1:/home/kartik/dvd2-sol x64/sol11 x64#

root@solaris11-1:/home/kartik/dvd2-sol_x64/sol11_x64# zoneadm -z testzone install The following ZFS file system(s) have been created: spool/mnt/testzone Progress being logged to /var/log/zones/zoneadm.20131110T112051Z.testzone.install Image: Preparing at /spool/mnt/testzone/root.

PROGRESS:

root@solaris11-1:/home/kartik/dvd2-sol_x64/sol11_x64# zoneadm -z testzone install The following ZFS file system(s) have been created: spool/mnt/testzone Progress being logged to /var/log/zones/zoneadm.20131110T112051Z.testzone.install Image: Preparing at /spool/mnt/testzone/root.

AI Manifest: /tmp/manifest.xml.G6a4Bq SC Profile: /usr/share/auto_install/sc_profiles/enable_sci.xml Zonename: testzone Installation: Starting ...

Creating IPS image Startup linked: 1/1 done Installing packages from: solaris origin: http://pkg.oracle.com/solaris/release/ DOWNLOAD PKGS FILES XFER (MB) SPEED Completed 183/183 33556/33556 222.2/222.2 782k/s

PHASE	ITEMS
Installing new actions	41103/46825

## **PROGRESS**:

Updating package state database	Done
Updating image state	Done
Creating fast lookup database	Done
Installation: Succeeded	

Note: Man pages can be obtained by installing pkg:/system/manual

done.

Done: Installation completed in 624.658 seconds.

Next Steps: Boot the zone, then log into the zone console (zlogin -C)

to complete the configuration process.

Log saved in non-global zone as /spool/mnt/testzone/root/var/log/zones/zoneadm.20131110T112051Z.testzone.install root@solaris11-1:/home/kartik/dvd2-sol_x64/sol11_x64#

SO NOW OPEN ANOTHER PUTTY WINDOW OF solaris11-1

IN THE FIRST WINDOW TYPE: root@solaris11-1:/home/kartik/dvd2-sol_x64/sol11_x64# zoneadm -z testzone boot IN THE SECOND WINDOW JUST OPENED TYPE: System Configuration Tool enables you to specify the following configuration parameters for your newly-installed Oracle Solaris 11 system: [ - system hostname, time zone, user and root accounts, name services System Configuration Tool produces an SMF profile file in /system/volatile/scit_profile.xml. How to navigate through this tool: - Use the function keys listed at the bottom of each screen to move from screen to screen and to perform other operations. - Use the up/down arrow keys to change the selection or to move between input fields. - If your keyboard does not have function keys, or they do not respond, press ESC; the legend at the bottom of the screen will change to show the ESC keys for navigation and other functions.

F2 Continue F6 Help F9 Quit

Hit Esc 2



Hot Esc 2

Hit Esc 2

DNS Search List
Enter a list of domains to be searched when a DNS query is made. If no domain is entered, only the DNS domain chosen for this system will be searched.
Search domain: Search domain: Search domain: Search domain: Search domain: Search domain:
3C-2 Continue Esc-3 Back Esc-6 Help Esc-9 Quit

type in your routers IP address, mine is 10.0.0.1

Hit Esc 2

type in your domain from your ISP, mine is comcast.net, Hit Esc 2

Time Zone: Regions
Select the region that contains your time zone.
Regions
dadaaaadaaaaaaaaaaaaaaaaaaaaaaaaaaaaaa
Africa Americas
Antarctica Arctic Ocean
Asia
Australia
Europe Indian Ocean
Pacific Ocean
Fac-2 Continue Fac-3 Back Fac-6 Heln Fac-9 Quit

"None" is fine, hit Esc 2

I will select Americas – Central Time, hit Esc 2



Esc 2



## System Configuration Summary Review the settings below before continuing. Go back (F3) to make changes. q Time Zone: US/Central х x Language: *The following[can be changed when logging in. x Default language: C/POSIX x Terminal type: vt100 x Users: x Username: kartik x Network: x Computer name: testzone x Name service: DNS x DNS servers: 10.0.0.1 x DNS Domain search list: comcast.net x Support configuration: v Not generating a Support profile as OCM and ASR services are not Esc-2 Apply Esc-3 Back Esc-6 Help Esc-9 Quit

Esc 2



kartik@testzone:~\$ su -Password:

offile successfully generated. up Jyster Countygration Tool, Log is eveniatic at: m/vplatile/syscontig/syscontig.log.llUUL mis bastone

leetabbe soosole login: 🚦

Nov 10 05:46:32 testzone su: 'su root' succeeded for kartik on /dev/console Oracle Corporation SunOS 5.11 11.1 September 2012 root@testzone:~# Nov 10 05:47:01 testzone sendmail[10918]: unable to qualify my own domain name (testzone) -- using short name

## NOW ADD THE CLUSTER NODES TO THIS ZONE'S HOSTS FILE

root@testzone:~# svcadm disable sendmail root@testzone:~# echo "10.0.0.20 solaris11-1" >> /etc/hosts root@testzone:~# echo "10.0.0.30 solaris11-2" >> /etc/hosts root@testzone:~#

#### NOW WE HAVE TO ADD THIS ZONE TO VCS

GO BACK TO NODE 1 (solaris11-1)

root@solaris11-1:/home/kartik/dvd2-sol_x64/sol11_x64# hastatus -sum

SYSTEM STA	АТЕ				
System	State	Frozer	1		
A solaris11-1	RUNNING	G	0		
A solaris11-2	RUNNING	Ĵ	0		
GROUP STA	ГЕ				
Group S	System	Probed	AutoD	isabled	State
B ClusterServic	e solaris11-1	Y	Ν	O	NLINE
B ClusterServic	e solaris11-2	Y	Ν	O	FFLINE

root@solaris11-1:/home/kartik/dvd2-sol_x64/sol11_x64# hagrp -add testgrp

VCS WARNING V-16-1-11335 Configuration must be ReadWrite : Use haconf -makerw

root@solaris11-1:/home/kartik/dvd2-sol_x64/sol11_x64# haconf -makerw

root@solaris11-1:/home/kartik/dvd2-sol_x64/sol11_x64# hagrp -add testgrp

VCS NOTICE V-16-1-10136 Group added; populating SystemList and setting the Parallel attribute recommended before adding resources

root@solaris11-1:/home/kartik/dvd2-sol_x64/sol11_x64# hagrp -modify testgrp Parallel 0

root@solaris11-1:/home/kartik/dvd2-sol_x64/sol11_x64# hagrp -modify testgrp SystemList solaris11-1 0 solaris11-2 1

root@solaris11-1:/home/kartik/dvd2-sol_x64/sol11_x64# hagrp -modify testgrp AutoStartList solaris11-1

root@solaris11-1:/tmp# hares -add vcspool Zpool testgrp

VCS NOTICE V-16-1-10242 Resource added. Enabled attribute must be set before agent monitors

root@solaris11-1:/tmp# hares -modify vcspool Critical 1

root@solaris11-1:/tmp# hares -modify vcspool ChkZFSMounts 1

root@solaris11-1:/tmp# hares -modify vcspool FailMode continue

root@solaris11-1:/tmp# hares -modify vcspool ForceOpt 1

root@solaris11-1:/tmp# hares -modify vcspool ForceRecoverOpt 0

root@solaris11-1:/tmp# zpool list

NAME SIZE ALLOC FREE CAP DEDUP HEALTH ALTROOT

rpool 15.6G 7.29G 8.33G 46% 1.00x ONLINE -

spool 17.1G 448M 16.7G 2% 1.00x ONLINE -

root@solaris11-1:/tmp# hares -modify vcspool PoolName spool

root@solaris11-1:/tmp# hares -modify vcspool AltRootPath /

root@solaris11-1:/tmp# hares -modify vcspool ZoneResName vcszone

root@solaris11-1:/tmp#

root@solaris11-1:/tmp# hares -modify vcspool Enabled 1

root@solaris11-1:/tmp# hazonesetup -g testgrp -r vcszone -z testzone -p abc123 -a -s solaris11-1,solaris11-2

V-16-34-1107 Group testgrp is already present

VCS WARNING V-16-1-10563 Key solaris11-1 already in list.

VCS WARNING V-16-1-10563 Key solaris11-1 already in list.

VCS WARNING V-16-1-10563 Key solaris11-2 already in list.

bash: /opt/VRTSvcs/bin/halogin: No such file or directory

root@solaris11-1:/tmp#

root@solaris11-1:/tmp# hares -link vcszone vcspool

root@solaris11-1:/tmp#haconf -dump

NOW WE COPY OVER THE ZONE CONFIGURATION FILES FROM NODE1 TO NODE 2, THESE ARE LOCATED ON /etc/zones on NODE1

root@solaris11-1:/etc/zones# cd /etc/zones root@solaris11-1:/etc/zones# ls -al total 28 drwxr-xr-x 2 root sys 10 Nov 10 05:31 . drwxr-xr-x 80 root sys 179 Nov 10 05:34 .. -rw-r--r-- 1 root sys 345 Nov 10 05:31 index lrwxrwxrwx 1 root root 16 Nov 9 13:03 SUNWdefault.xml -> ./SYSdefault.xml -r--r-- 1 root bin 375 Sep 19 2012 SYSblank.xml

```
bin
                       368 Sep 19 2012 SYSdefault-shared-ip.xml
-r--r-- 1 root
                       492 Sep 19 2012 SYSdefault.xml
-r--r-- 1 root
               bin
                           16 Nov 9 13:03 SYSsolaris.xml -> ./SYSdefault.xml
lrwxrwxrwx 1 root
                  root
                       494 Sep 19 2012 SYSsolaris10.xml
-r--r-- 1 root
               bin
                        405 Nov 10 05:19 testzone.xml
-rw-r--r-- 1 root
               root
root@solaris11-1:/etc/zones# cat index
# ident "%Z%%M% %I%
                       %E% SMI"
# Copyright 2005 Sun Microsystems, Inc. All rights reserved.
# Use is subject to license terms.
#
# DO NOT EDIT: this file is automatically generated by zoneadm(1M)
\# and zonecfg(1M). Any manual changes will be lost.
#
global:installed:/
testzone:installed:/spool/mnt/testzone:3c02adee-7da4-40ab-d0c6-bfe4820aacc3
root@solaris11-1:/etc/zones# cat testzone.xml
<?xml version="1.0" encoding="UTF-8"?>
<!DOCTYPE zone PUBLIC "-//Sun Microsystems Inc//DTD Zones//EN"
"file:///usr/share/lib/xml/dtd/zonecfg.dtd.1">
<!--
DO NOT EDIT THIS FILE. Use zonecfg(1M) instead.
-->
<zone name="testzone" zonepath="/spool/mnt/testzone" autoboot="false" brand="solaris" ip-
type="shared">
<network physical="net0" address="10.0.0.60" configure-allowed-address="true"/>
</zone>
root@solaris11-1:/etc/zones#
root@solaris11-1:/etc/zones# scp index solaris11-2:/etc/zones
            100%
index
***************************| 345
                                00:00
root@solaris11-1:/etc/zones# scp testzone.xml solaris11-2:/etc/zones
testzone.xml
              100%
**********************
                                00:00
root@solaris11-1:/etc/zones#
NOW GO TO NODE 2 AND EDIT THE index file
```

root@solaris11-2:/etc/zones# vi index
# ident "%Z%%M% %I% %E% SMI"
# Copyright 2005 Sun Microsystems, Inc. All rights reserved.
# Use is subject to license terms.
#
# DO NOT EDIT: this file is automatically generated by zoneadm(1M)
# and zonecfg(1M). Any manual changes will be lost.
#
global:installed:/

testzone:installed:/spool/mnt/testzone:3c02adee-7da4-40ab-d0c6-bfe4820aacc3

~

WE WILL REPLACE "installed" in testzone by "configured", AND WE WILL REMOVE THE uuid ENTRY, SO AFTER EDITS IT LOOKS LIKE THIS:

root@solaris11-2:/etc/zones# vi index root@solaris11-2:/etc/zones# cat index # ident "%Z%%M% %I% %E% SMI" # Copyright 2005 Sun Microsystems, Inc. All rights reserved. # Use is subject to license terms. # # DO NOT EDIT: this file is automatically generated by zoneadm(1M) # and zonecfg(1M). Any manual changes will be lost. # global:installed:/ testzone:configured:/spool/mnt/testzone: root@solaris11-2:/etc/zones#

### NOW GO BACK TO NODE 1 halt testzone on solaris11-1 and export spool

root@solaris11-1:/etc/zones# zoneadm -z testzone halt root@solaris11-1:/etc/zones# zpool export spool root@solaris11-1:/etc/zones#

root@solaris11-1:/etc/zones# hastatus -sum

SYSTEM ST System	TATE State	Frozer	1		
A solaris11-1 A solaris11-2	RUNNING RUNNING		0 0		
GROUP STA Group	ATE System	Probed	AutoDis	abled	State
<ul><li>B ClusterServi</li><li>B ClusterServi</li><li>B testgrp</li><li>B testgrp</li></ul>	ice solaris11-1 ice solaris11-2 solaris11-1 solaris11-2	Y Y Y Y	N N N	ON OF OFFLI PART	JLINE FLINE INE FAULTED IAL

-- RESOURCES FAILED
Group	Туре	Resource	System	
D testgrp	Zone	vcszone	solaris11-1	
RESOURO Group	CES ONLIN Type	NING Resource	System	IState
F testgrp root@solaris	Zone 11-1:/etc/zo	vcszone ones#	solaris11-2	W_ONLINE

CLEAR THE FAULTS ON NODE1 (solaris11-1)

root@solaris11-1:/etc/zones# hares -clear vcszone -sys solaris11-1 root@solaris11-1:/etc/zones#

root@solaris11-1:/etc/zones# hastatus -sum

	SYSTEM S7	TATE				
	System	State	Froze	n		
А	solaris11-1	RUNNINC	í	0		
А	solaris11-2	RUNNINC	f	0		
	GROUP STA	ATE				
	Group	System	Probed	Auto	Disabled	State
В	ClusterServi	ce solaris11-1	Y	Ν	0	NLINE
В	ClusterServi	ce solaris11-2	Y	Ν	0	FFLINE
В	testgrp	solaris11-1	Y	Ν	OFFL	LINE
В	testgrp	solaris11-2	Y	Ν	ONLI	INE
ro	ot@solaris11	-1:/etc/zones#				

Now run this command on node2:

root@solaris11-2:/etc/zones# export PATH=\$PATH:/opt/VRTSvcs/bin root@solaris11-2:/etc/zones# hazonesetup -g testgrp -r vcszone -z testzone -p abc123 -a -s solaris11-1,solaris11-2 V-16-34-1107 Group testgrp is already present VCS WARNING V-16-1-10563 Key solaris11-1 already in list. VCS WARNING V-16-1-10563 Key solaris11-1 already in list. VCS WARNING V-16-1-10563 Key solaris11-2 already in list. V-16-34-1114 Resource vcszone already present bash: /opt/VRTSvcs/bin/halogin: No such file or directory root@solaris11-2:/etc/zones#

## Now we will test switching the zone from one node to another

check which node the service Group (zone) is running:

root@solaris11-2:/etc/zones# hastatus -sum

	SYSTEM ST	ΓΑΤΕ					
	System	State	Fro	zen			
	2						
A	solaris11-1	RUNNINC	ť	0			
А	solaris11-2	RUNNING	f	0			
				-			
	GROUP STA	ATE					
	Group	System	Prohe	h	Auto	Disabled	State
	oroup	System	11000	a	1 Iuto	Dibuoita	State
В	ClusterServ	ice solaris11-1	Y	•	Ν	0	NLINE
B	ClusterServ	ice solaris11-2	Ŷ	-	N	0	FFLINE
R	testorn	solaris11-1	Y I	N	1,	OFFL	INE
D	tostgrp	colorial 1 2	v	N		ONU	
D	lesigip	solaris11-2	I	IN		UNLI	INE
ro	ot@solar1s11	-2:/etc/zones#					

it is running on node 2, to test our work, we will try to switch it to node 1

on either node run the command: hagrp -switch testgrp -to solaris11-1

```
root@solaris11-1:/etc/zones# hagrp -switch testgrp -to solaris11-1
root@solaris11-1:/etc/zones#
```

constantly keep typing this command on either node:

hastatus -sum

root@solaris11-2:/etc/zones# hastatus -sum

SYSTEM ST	ΓΑΤΕ				
System	State	Frozer	ı		
A solaris11-1	RUNNING	Ĵ	0		
A solaris11-2	RUNNING	3	0		
GROUP ST.	ATE				
Group	System	Probed	AutoD	isabled	State
<b>·</b> T	<b>J</b> ·				
B ClusterServ	rice solaris11-1	Y	Ν	O	NLINE
B ClusterServ	rice solaris11-2	Y	Ν	O	FFLINE

B testgrp	solaris11-1	Y	Ν	STAR	FING PARTIAL
B testgrp	solaris11-2	Y	Ν	OFFLI	NE
RESOUR	CES ONLINI	NG			
Group	Туре	Resource		System	IState
F testgrp	Zone	vcszone	S	olaris11-1	W_ONLINE
root@solaris	s11-2:/etc/zone	es#			
<u> </u>					

root@solaris11-2:/etc/zones# hastatus -sum

	SYSTEM ST	ΓΑΤΕ			
	System	State	Froze	n	
А	solaris11-1	RUNNINC	Ĵ	0	
А	solaris11-2	RUNNINC	í	0	
	GROUP STA	ATE			
	Group	System	Probed	Auto	Disabled State
В	ClusterServ	ice solaris11-1	Y	Ν	ONLINE
В	ClusterServ	ice solaris11-2	Y	Ν	OFFLINE
В	testgrp	solaris11-1	Y	Ν	ONLINE
В	testgrp	solaris11-2	Y	Ν	OFFLINE
	P		-	1	OII DH (D

So, we have successfully implemented zone failover/switchover.