Veeam

Release 1.0

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ONE

VEEAM'S OVERVIEW



- Veeam Software is a privately held, U.S. information technology company with a U.S. based leadership team.
- Founded in 2006, we focused on simplifying backups for virtual machines. We quickly became the industry leader. Veeam continues to charge forward to innovate the industry so you can own, control and protect your data anywhere in the hybrid cloud.
- In March 2020, Veeam was acquired by Insight Partners which has enable us to expand into new markets and continue our growth trajectory.
- Veeam named a Leader for the 6th time!



Figure 1: Magic Quadrant for Enterprise Backup and Recovery Software Solutions

1.1 Veeam's Vision

To be the most trusted provider of backup, recovery and data management solutions that deliver Modern Data Protection.

1.2 Veeam Product

1.2.1 Veeam Backup & Replication (aka VBR)

Initially a product for VM protection, now central management & protection place with built-in agents and platform services.

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1065						

1.2.2 Veeam One



Deliver deep, intelligent monitoring, reporting and automation through interactive tools and intelligent learning, identifying.



1.2.3 Veeam Backup for Public Cloud(include AWS, GCP, AZURE)

Cloud-native, web-based console for AWS/Azure, available via Marketplace.

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1.2.4 Veeam Disaster Recovery Orchestrator(aka VDRO)

vdro|A disaster recovery solution should be easy to configure, and easy to use.

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1.2.5 Veeam Backup for O365(aka VBO)



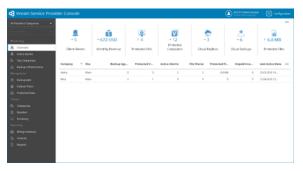
Retrieve Office 365 Exchange Online, SharePoint Online, OneDrive and Teams for Business data from a cloud-based instance of Office 365.

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1.2.6 Veeam Service Provider Console(aka VSPC)

c3

Cloud-enabled platform for Veeam Cloud & Service Providers (VCSP) partners and distributed enterprise environments to deliver expert-built and managed Backup as a Service (BaaS) and Disaster Recovery as a Service (DRaaS).



1.2.7 Kasten K10(aka K10)

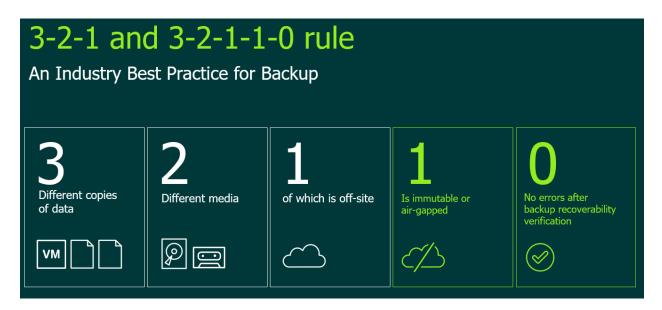
Protect Your Fleet of Kubernetes Deployments with Multi-Cluster Support and Retain Control of and Access to Your Data.

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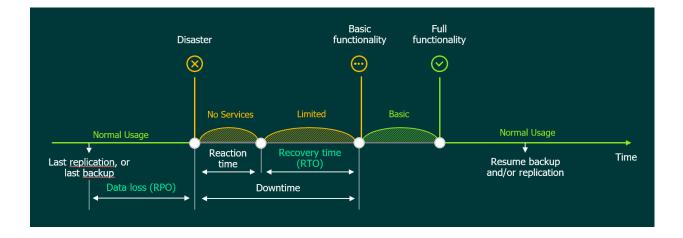
TWO

BACKUP CONCEPT

2.1 Industry Rule 3-2-1 Plus V 1-0

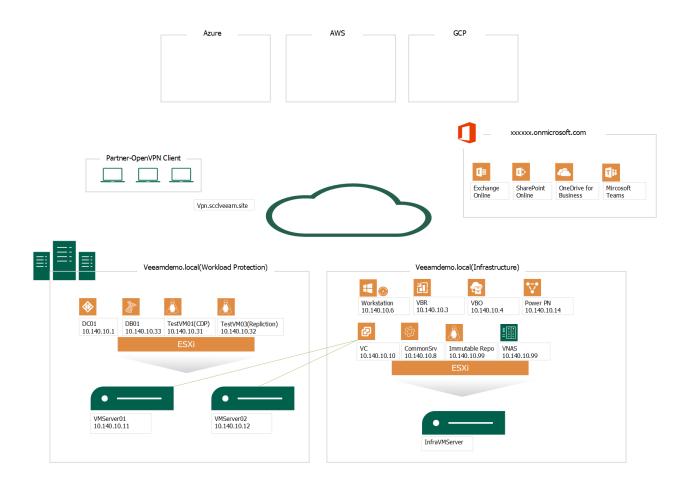


2.2 RPO and RTO



THREE

LAB DESIGN



FOUR

LAB DEMO

Channels allows you to use WebSockets and other non-HTTP protocols in your Django site. For example you might want to use WebSockets to allow a page on your site to immediately receive updates from your Django server without using HTTP long-polling or other expensive techniques.

In this tutorial we will build a simple chat server, where you can join an online room, post messages to the room, and have others in the same room see those messages immediately.

4.1 Lab 1. Create a VeeamZIP Job

With Veeam Backup & Replication, you can quickly perform backup of one or several VMs with VeeamZIP. VeeamZIP is similar to a full VM backup.

The VeeamZIP job always produces a full backup file (VBK) that acts as an independent restore point. You can store the backup file to a backup repository, to a local folder on the backup server or to a network share.

If Veeam Backup and Replication isn't already running, then double click the Veeam Backup and Replication Console icon located on the desktop.

4.1.1 Step-By-Step

Quickly create a point in time copy of one of your virtual machines using VeeamZIP.

- 1. Open the Inventory view.
- 2. In the infrastructure tree, choose VMware vSphere, vCenter Servers, vc.veeamdemo.local, Veeam Datacetner, VeeamCluster.

∃ ▼ Home View			
Backup Replication Job + Job + Policy Primary Jobs	Tape Backup Copy SureBackup Job Copy Job Auxiliary Jobs	Restore Failover Plan * Restore	Import Export Backup Backup Actions
Inventory		(${f Q}$ Type in an object name t
 Virtual Infrastructure Image: Wirtual Wirtua Wirtual Wirtua Wi			ame 🕇
VCenter Server			DC01 Docker-CentOS8
▲ Event vc.veeamde ▲ Is Veeam D			freedos MSSQL-Win2019
▷ 🗐 Veear			tinyLinux
Veear			Webapp01-CentOS8
Microsoft Hyper-		6	Webapp02-Ubuntu20
4 📃 Standalone Ho	sts		webapp03-Ubuntu20

3. In the working area, right-click tinyLinux and select VeeamZIP...

Inventory	Q Type in an object name to search for				
G Wirtual Infrastructure	^	Name 🕇		Used S	
4 👔 VMware vSphere		🕞 DC01			
▲ Every vCenter Servers		Docker-CentOS8			
▲ Every vc.veeamdemo.local		🙀 freedos			
▲ I Veeam Datacenter		MSSQL-Win2019			
VeeamCluster		🔓 tinyLinux		VeeamZIP	
VeeamDR		🚰 Webapp01-CentOS8			
A Const Hyper-V		Webapp02-Ubuntu20		Quick backup	
Standalone Hosts		webapp03-Ubuntu20	2	Quick migration	

4. In the open window in the Destination section, review a location (*eg. VeeamRepo02-ReFS*) to which you want to store the VeeamZIP file.

Use the Delete this backup automatically list to specify retention settings for the created VeeamZIP file.

Select 'in 1 week' from the drop-down list.

By default, VeeamZIP files are not removed but are kept in the specified location for an indefinite period of time.

VeeamZIP 1 VM (17.1 GB)	×
Destination:	0
Backup repository:	
VeeamRepo02-ReFS (Created by VEEAMDEMO\veeamadmin at 5/23/20. $ \sim$	
📒 487 GB free of 599 GB	
○ Local or shared folder:	
	Browse
✓ Delete this backup automatically in 1 week ∨	
More >> OK	Cancel

5. To review additional options for the VeeamZIP file, click More.

As we did not select a password, Veeam Backup & Replication will produce an unencrypted VeeamZIP file. By default, Veeam Backup & Replication uses application-aware image processing to create a transactionally consistent backup of VMs running applications with VSS support. If you were backing up VMs that run something other than Windows OS or applications without VSS support, you could disable this option by clearing Disable guest quiescence checkbox

VeeamZIP 1 VM (17.1 GB)	×
Destination:	0
Backup repository:	
VeeamRepo02-ReFS (Created by VEEAMDEMO\veeamadmin at 5/23/20. \sim	
📒 487 GB free of 599 GB	
○ Local or shared folder:	
	Browse
✓ Delete this backup automatically in 1 week ∨	
Enable backup file encryption Password:	
~ Add	
Manage passwords	
Compression level:	
Optimal (recommended) \checkmark	
Optimal compression provides for best compression to performance ratio, and lowest backup proxy CPU usage.	
Guest processing: Disable guest quiescence (performs crash consistent backup)	
Less << OK	Cancel

6. Click OK. The VeeamZIP job will start immediately.

You can click Show Details to view the status of the VeeamZIP job. You may also click OK and continue with the labs. To monitor job progress, navigate to the Backup & Replication section, choose Last 24 hours, and then click Running

			0	1%						0 of 1	VMs
SUMMARY		DATA		STATUS							
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Processing rate: 0 KB/s Bottleneck: Detecting		Read:	0 B	Warnings:	0						
		Transferred:	0 B	Errors:	0						
HROUGHPUT (LAST	5 MIN)										
Name	Status	Action							Dur	ation	
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E tinyLinux	● 0%	 Required back VM processin VM size: 16 G Resetting CBT Getting VM in Cannot use VI Creating VM s Saving [DS01] Saving [DS01] Using backup 	cup infrastructure reso g started at 11/18/20 B "per job settings for a fo from vSphere Mware Tools quiescer mapshot tinyLinux/tinyLinux. tinyLinux/tinyLinux. proxy VMware Backu	ources have been assign 22 5:06:43 PM ctive fulls nce because VMware To vmx nvram up Proxy for disk Hard di	ols are not four	nd.			00: 00:0 00:0 00:0	16 02 00 00	

4.2 VBR - Creating and Scheduling Backup Jobs

To back up VMs, you must configure a backup job. The backup job defines how, where and when to back up VM data.

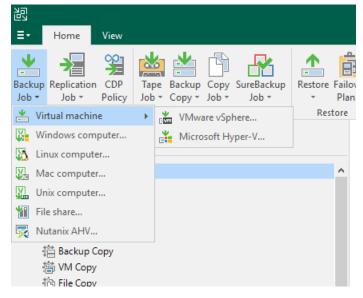
One job can be used to process one or more VMs. Jobs can be started manually or scheduled to run automatically at a specific time.

4.2.1 Step-By-Step

vm

Create a backup job to protect some of the virtual machines used in the lab environment.

1. Click on HOME workspace, on menu bar, click Backup Job, Virtual Machine, Vmware vSphere

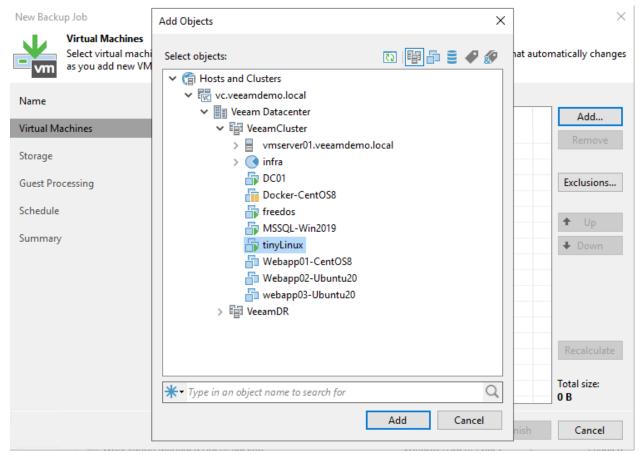


2. At the first step of the wizard, enter Backup (your initials) as the Name. Keep the default Description and click Next.

New Backu	dor di	×
	Name	
	Name Type in a name and description for this backup job.	

Name	Name:
Virtual Machines	Your Initials - Backup Description:
Storage	Created by VEEAMDEMO\veeamadmin at 11/21/2022 2:33 PM.
Guest Processing	
Schedule	
Summary	
	High priority Backup infrastructure resources are offered to high priority jobs first. Use this option for jobs sensitive to the start time, or jobs with strict RPO requirements.
	< Previous Next > Finish Cancel

3. Click Add... to browse the VI infrastructure to review the selection criteria and select Veeam-DC01 and Tiny-Veeam. Click Add and Next.



New Backup Job

vm

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Virtual Machines

Select virtual machines to process via container, or granularly. Container provides dynamic selection that automatically changes as you add new VM into container.

Name	Virtual machines to backup:			
Virtual Machines	Name	Туре	Size	Add
	TinyLinux	Virtual Machine	16.0 GB	Remove
Storage				
Guest Processing				Exclusions
Schedule				
Summary				✿ Up
Summary				↓ Down
				Recalculate
				Total size:
				16.0 GB
		< Previous Next	> Finish	Cancel
				Curreer

- 4. Leave Automatic selection for Backup proxy.
- 5. Confirm Main Backup Repository is selected as Backup repository in the drop down menu.
- 6. Change the Restore points to keep on disk to 2.

New Backup Job		×
	roxy server to be used for source data retrieval, backup repository to store the backup files p dvanced job settings if required.	roduced by this
Name	Backup proxy: Automatic selection	Choose
Virtual Machines Storage	Backup repository: VeeamRepo02-ReFS (Created by VEEAMDEMO\veeamadmin at 5/23/2022 3:31 PM. ~	
Guest Processing	496 GB free of 599 GB Map backup	
Schedule	Retention policy: 2 🔹 days 🗸 🧃	
Summary	 Keep certain full backups longer for archival purposes GFS retention policy is not configured Configure secondary destinations for this job Copy backups produced by this job to another backup repository, or tape. We recommat least one copy of your backups to a different storage device that is located off-site. Advanced job settings include backup mode, compression and deduplication, block size, notification settings, automated post-job activity and other settings. 	
	< Previous Next > Finish	Cancel

- 7. Click Advanced to specify advanced options for the backup job.
- 8. Leave Incremental selected under Backup mode and click OK and Next.
- 9. Do not enable synthetic or active full: This way the backup chain will be created in the Forever Forward incremental backup mode.

Advanced	Settings						×
Backup	Maintenance	Storage	Notifications	vSphere	Integration	Scripts	
Backup Maintenance Storage Notifications vSphere Integration Scripts Backup mode Reverse incremental (slower) Increments are injected into the full backup file, so that the latest backup file is always a full backup of the most recent VM state. Incremental (recommended) Increments are saved into new files dependent on previous files in the chain. Best for backup targets with poor random I/O performance. Create synthetic full backups periodically Days Create on: Saturday							
	O Monthly or			onday	\sim	Months	
	Weekly on Saturday	selected d	lays:			Days	
Save As	Default				OK	Cance	el

- 10. From the Guest OS Credentials dropdown box, choose the Domain Administrator (veeamlabadministrator)..
- 11. Click on the "Applications" button. Select Tiny-Veeam from the list and click Edit.
- 12. Select the Disable application processing radio button. Click OK. And then click OK again.

Tiny-Veeam is a linux VM so it does not have VSS framework on it, therefore we choose to disable applicationaware image processing for this VM.

- 13. Click Test Now and watch the test complete. Notice that Tiny-Veeam fails guest credentials. That's to be expected and is ok.
- 14. Click Close as the testing completes.
- 15. Click Next to proceed.
- 16. Schedule this job to run daily. Click APPLY to proceed. There is no option to schedule the automatic retry for jobs configured to start only manually.
- 17. Click Finish
- 18. Click Finish. Feel free to review the job by right clicking and selecting Edit. To keep the lab cleaned up for others, please delete your job when you're done.

4.3 VBR - File Level Restore

We hava a Domain Controller VM Backup Policy ("Domain Controller Backup - Agentless")

🔯 Domain Controller Backup - Agentless	VMware Backup	1	Stopped	1 day ago	Success	1

4.3.1 Step-By-Step

Using Veeam Explore to browser your deleted/modified objects for restore.

1. Click on Navigation, Backups, Disk. On the Right, choose "Domain Controller Backup - Agentless" - "DC01" Right Click - "Restore application items", "Microsoft Active Directory objects..."

记 Backup Tools		Veeam Backup and Repli
∃• Home Backup		
Instant Instant Disk Entire Virtual VM Guest Application Recovery * Recovery VM Disks Files Files * Items * Restore	Imazon Microsoft Google EC2 Azure laas CE Restore to Cloud Actions	
Home	Q Type in an object name to	search for
 参 Jobs 提 Backup 额 SureBackup 續 Replication 續 CDP 结 Backup Copy 續 VM Copy 續 File Copy 續 Endpoint Agent Backup 續 Virtual Machine Backup 續 Virtual Machine Backup 를 Snapshots 逆 Disk 唑 Disk (Copy) 	DC01-File Sha	FS Repo 10/1/2022 11 9/27/2022 2:4 8/7/2022 11:0 with log rotation - a 11/5/2022 9:0 aged Agent Backup 7/29/2022 9:0 10/22/2022 9 d 5/28/2022 10:5 8/5/2022 3:41
Disk (VeeamZIP) Disk (VeeamZIP) Disk (VeeamZIP) Ready Ready Disk Last 24 Hours Home	↓ Res ↓ Res ↓ Res ↓ Res	store entire VM store virtual disks store VM files store guest files store application items store to Amazon EC2
Backup Infrastructure	Res	store to Microsoft Azure store to Google CE
Storage Infrastructure	The second secon	oort backup lete from disk
🔚 Tape Infrastructure	🗼 Res	store entire VM to Nutanix AHV

- 2. Select your restore point, and click "Next"
- 3. Type your restore point reason, and click "Next"

images/lab03/lab02_03.png

1. Click "Browse", Veeam Explorer For Active Directory will be opened.

New Backup Job

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Virtual Machines

Select virtual machines to process via container, or granularly. Container provides dynamic selection that automatically changes as you add new VM into container.

Add
Remove
Exclusions.
► Up
Down
Recalculat
otal size:
5.0 GB
ota

New Backup Job

- vm

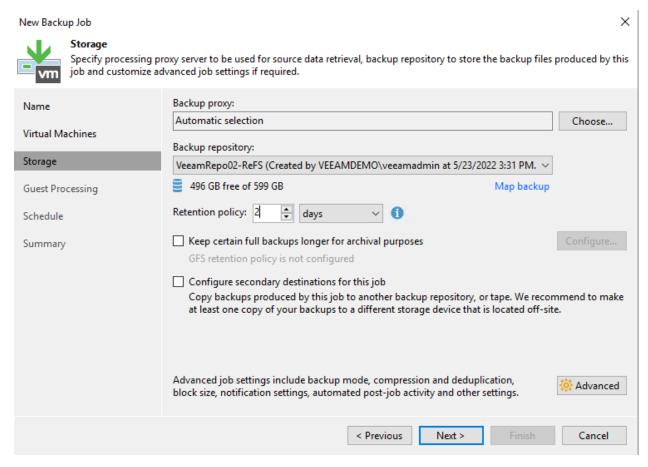
Virtual Machines

Select virtual machines to process via container, or granularly. Container provides dynamic selection that automatically changes as you add new VM into container.

Name	Virtual machines to backup:			
Virtual Machines	Name	Type Virtual Machine	Size 16.0 GB	Add Remove
Storage				
Guest Processing				Exclusions
Schedule				✿ Up
Summary				I Down
				Recalculate
				Total size:
				16.0 GB
		< Previous Next	> Finish	Cancel

- 4. Leave Automatic selection for Backup proxy.
- 5. Confirm Main Backup Repository is selected as Backup repository in the drop down menu.
- 6. Change the Restore points to keep on disk to 2.

 \times



- 7. Click Advanced to specify advanced options for the backup job.
- 8. Leave Incremental selected under Backup mode and click OK and Next.
- 9. Do not enable synthetic or active full: This way the backup chain will be created in the Forever Forward incremental backup mode.

Advanced	Settings						X	
	. .							
Backup	Maintenance	Storage	Notifications	vSphere	Integration	Scripts		
	p mode Reverse incre Increments are file is always a	injected i	nto the full ba			est backup		
۲	file is always a full backup of the most recent VM state. Incremental (recommended) Increments are saved into new files dependent on previous files in the chain. Best for backup targets with poor random I/O performance.							
	Create synt	hetic full	backups perio	dically		Days		
Active	Create on: full backup —	Saturday						
	Create active fo	ull backup	s periodically					
	 Monthly or 	n: First	\sim N	londay	\sim	Months		
	Weekly on	selected d	ays:			Days		
Saturday								
Save As	Default				ОК	Cancel		

- 10. From the Guest OS Credentials dropdown box, choose the Domain Administrator (veeamlabadministrator)..
- 11. Click on the "Applications" button. Select Tiny-Veeam from the list and click Edit.
- 12. Select the Disable application processing radio button. Click OK. And then click OK again.

Tiny-Veeam is a linux VM so it does not have VSS framework on it, therefore we choose to disable applicationaware image processing for this VM.

- 13. Click Test Now and watch the test complete. Notice that Tiny-Veeam fails guest credentials. That's to be expected and is ok.
- 14. Click Close as the testing completes.
- 15. Click Next to proceed.
- 16. Schedule this job to run daily. Click APPLY to proceed. There is no option to schedule the automatic retry for jobs configured to start only manually.
- 17. Click Finish
- 18. Click Finish. Feel free to review the job by right clicking and selecting Edit. To keep the lab cleaned up for others, please delete your job when you're done.

4.4 VBR - Creating and Scheduling Backup Jobs

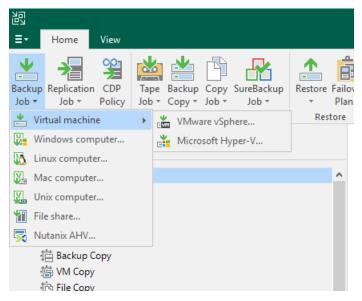
To back up VMs, you must configure a backup job. The backup job defines how, where and when to back up VM data.

One job can be used to process one or more VMs. Jobs can be started manually or scheduled to run automatically at a specific time.

4.4.1 Step-By-Step

Create a backup job to protect some of the virtual machines used in the lab environment.

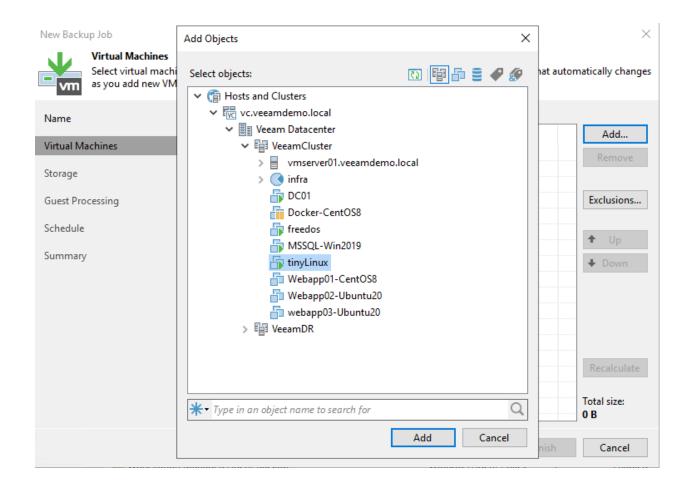
1. Click on HOME workspace, on menu bar, click Backup Job, Virtual Machine, Vmware vSphere



2. At the first step of the wizard, enter Backup (your initials) as the Name. Keep the default Description and click Next.

New Backup Job	×
Name Type in a name and d	escription for this backup job.
Name	Name:
Virtual Machines	Your Initials - Backup Description:
Storage	Created by VEEAMDEMO\veeamadmin at 11/21/2022 2:33 PM.
Guest Processing	
Schedule	
Summary	
	 High priority Backup infrastructure resources are offered to high priority jobs first. Use this option for jobs sensitive to the start time, or jobs with strict RPO requirements.
	< Previous Next > Finish Cancel

3. Click Add... to browse the VI infrastructure to review the selection criteria and select Veeam-DC01 and Tiny-Veeam. Click Add and Next.



New Backup Job

- vm

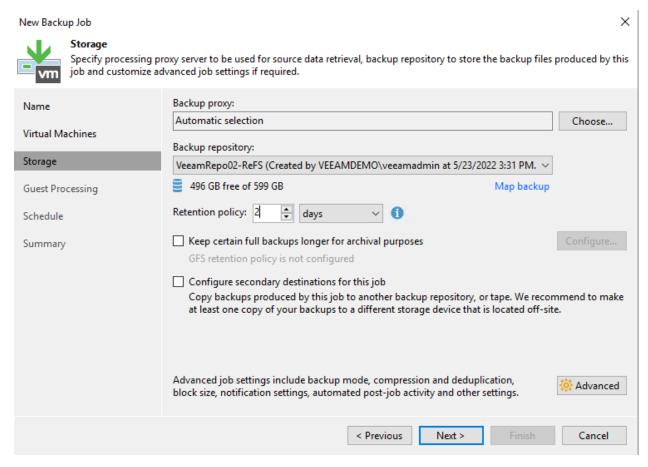
Virtual Machines

Select virtual machines to process via container, or granularly. Container provides dynamic selection that automatically changes as you add new VM into container.

Name	Virtual machines to backup:			
Virtual Machines	Name	Type Virtual Machine	Size 16.0 GB	Add Remove
Storage				
Guest Processing				Exclusions
Schedule				✿ Up
Summary				I Down
				Recalculate
				Total size:
				16.0 GB
		< Previous Next	> Finish	Cancel

- 4. Leave Automatic selection for Backup proxy.
- 5. Confirm Main Backup Repository is selected as Backup repository in the drop down menu.
- 6. Change the Restore points to keep on disk to 2.

 \times



- 7. Click Advanced to specify advanced options for the backup job.
- 8. Leave Incremental selected under Backup mode and click OK and Next.
- 9. Do not enable synthetic or active full: This way the backup chain will be created in the Forever Forward incremental backup mode.

Advanced	Settings						X	
	. .							
Backup	Maintenance	Storage	Notifications	vSphere	Integration	Scripts		
	p mode Reverse incre Increments are file is always a	injected i	nto the full ba			est backup		
۲	file is always a full backup of the most recent VM state. Incremental (recommended) Increments are saved into new files dependent on previous files in the chain. Best for backup targets with poor random I/O performance.							
	Create synt	hetic full	backups perio	dically		Days		
Active	Create on: full backup —	Saturday						
	Create active fo	ull backup	s periodically					
	 Monthly or 	n: First	\sim N	londay	\sim	Months		
	Weekly on	selected d	ays:			Days		
Saturday								
Save As	Default				ОК	Cancel		

- 10. From the Guest OS Credentials dropdown box, choose the Domain Administrator (veeamlabadministrator)..
- 11. Click on the "Applications" button. Select Tiny-Veeam from the list and click Edit.
- 12. Select the Disable application processing radio button. Click OK. And then click OK again.

Tiny-Veeam is a linux VM so it does not have VSS framework on it, therefore we choose to disable applicationaware image processing for this VM.

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- 17. Click Finish
- 18. Click Finish. Feel free to review the job by right clicking and selecting Edit. To keep the lab cleaned up for others, please delete your job when you're done.

FIVE

FEATURE

K10 DEMO

Purpose built for Kubernetes, Kasten K10 is a Cloud Native data management platform for Day 2 operations. It provides enterprise DevOps teams with an easy to use, scalable and secure system for backup/restore, disaster recovery and application mobility for Kubernetes applications. Kasten K10 integrates with relational and NoSQL databases, all major Kubernetes distributions, and runs in any cloud to maximize freedom of choice.

k10/images/k10/k10_01.png

6.1 K8S Setup

Kubernetes is an open-source platform for managing containers such as Docker. Is a management system that provides a platform for deployment automation. With Kubernetes, you can freely make use of the hybrid, on-premise, and public cloud infrastructure to run deployment tasks of your project.

And Docker lets you create containers for a pre-configured image and application. Kubernetes provides the next step, allowing you to balance loads between containers and run multiple containers across multiple systems.

This guidebook will walk you through How to Install Kubernetes on Ubuntu 20.04.

6.1.1 K8S Environment Setup

Using Vagrant to build the K8S Environment. This setup includes 1 master node and 2 worker nodes. 1

Hostname	IP Address	vCPU	vRAM	vDisk	OS
k8s-m1	10.110.10.80	2	2	120G	generic/ubuntu2004
k8s-w1	10.110.10.81	4	4	120G	generic/ubuntu2004
k8s-w2	10.110.10.82	4	4	120G	generic/ubuntu2004

Table 1: K8S_H	Iost_Settings
----------------	---------------

Setting the ENV variables Before running vagrant , please add ENV variables first.

Create .profile file and run source .profile

.profile:

```
export ESXI_HOSTNAME="host ip address"
export ESXI_USERNAME="username"
export ESXI_PASSWORD="password"
```

run following command to add ENV variables

source ~/.profile

Vagrantfile:

```
Vagrant.require_version ">= 1.6.0"
boxes = [
   {
        :name => "k8s-m1",
        :eth1 => "10.110.10.86",
        :netmask => "255.255.255.0",
        :mem => "4096",
        :cpu => "2"
   },
    {
        :name => "k8s-w1",
        :eth1 => "10.110.10.87",
        :mem => "4096",
        :netmask => "255.255.255.0",
        :cpu => "4"
   },
    {
        :name => "k8s-w2",
        :eth1 => "10.110.10.88",
        :netmask => "255.255.255.0",
        :mem => "4096",
        :cpu => "4"
   }
]
Vagrant.configure(2) do |config|
# config.vm.box = "ubuntu/jammy64"
config.vm.box = "generic/ubuntu2004" #ubuntu 20.04 generic/ubuntu1804 ubuntu/focal64_
\rightarrow bento/ubuntu-20.04
config.vm.box_download_insecure = true
boxes.each do |opts|
    config.vm.define opts[:name] do |config|
        config.vm.hostname = opts[:name]
        config.vm.provider "vmware_fusion" do |v|
        v.vmx["memsize"] = opts[:mem]
        v.vmx["numvcpus"] = opts[:cpu]
        end
```

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```
config.vm.provider "virtualbox" do |v|
        v.customize ["modifyvm", :id, "--memory", opts[:mem]]
        v.customize ["modifyvm", :id, "--cpus", opts[:cpu]]
        end
        config.vm.provider "vmware_esxi" do |v|
        v.esxi_hostname = ENV['ESXI_HOSTNAME']
        v.esxi_username = ENV['ESXI_USERNAME']
        v.esxi_password = ENV['ESXI_PASSWORD']
        # v.esxi_password = 'prompt:'
        v.esxi_virtual_network = ['vagrant-private', 'swguest110']
        v.esxi_disk_store = 'ESXI02_Datastore'
        v.guest_name = opts[:name]
        v.guest_username = 'vagrant'
        v.guest_memsize = opts[:mem]
        v.guest_numvcpus = opts[:cpu]
        v.guest_disk_type = 'thin'
        v.guest_boot_disk_size = '30'
        v.guest_nic_type = 'e1000'
        v.guest_virtualhw_version = '14'
        v.debug = 'true'
        # v.customize ["modifyvm", :id, "--memory", opts[:mem]]
        # v.customize ["modifyvm", :id, "--cpus", opts[:cpu]]
        end
        # config.vm.network :private_network, type: "dhcp"
        config.vm.network :public_network, ip: opts[:eth1], netmask: opts[:netmask],_

→gateway: "10.110.10.254", dns: "10.110.10.101"

   end
end
config.vm.provision "shell", privileged: true, path: "./setup.sh"
end
```

6.1.2 K8S Setup

1. Check Version for kubeadm, kubelet, kubectl

kubeadm version
kubelet --version
kubectl version

- 2. Initizalize K8S cluster do it on master node
- -apiserver-advertise-address=master interface IP
- –pod-network-cidr=your k8s pod network

```
sudo kubeadm init --apiserver-advertise-address=10.110.10.86 --pod-network-cidr=10.244.

→0.0/16
```

1. Check joining cluster command

sudo kubeadm token create --print-join-command

4. worker node join to cluster - do it on worker node

5. Setup kubectl ENV - do it on master node

```
mkdir -p $HOME/.kube
sudo cp -i /etc/kubernetes/admin.conf $HOME/.kube/config
sudo chown $(id -u):$(id -g) $HOME/.kube/config
source <(kubectl completion bash)
echo 'source <(kubectl completion bash)' >>~/.bashrc
```

6. download flannel

7. edit kube-flannel.yml, add the line [- -iface=eth1], apply kube-flannel.yml

```
containers:
        - name: kube-flannel
        #image: flannelcni/flannel:v0.20.2 for ppc64le and mips64le (
        image: docker.io/rancher/mirrored-flannelcni-flannel:v0.20.2
        command:
        - /opt/bin/flanneld
        args:
        - -ip-masq
        - --kube-subnet-mgr
        - -iface=eth1
        resources:
```

kubectl apply -f kube-flannel.yml

8. download helm installation script file

```
curl -fsSL -o get_helm.sh https://raw.githubusercontent.com/helm/helm/main/scripts/get-

→helm-3
chmod 700 get_helm.sh
```

9. install helm

./get_helm.sh

10. helm add repo and install csi-driver-nfs

```
helm repo add csi-driver-nfs https://raw.githubusercontent.com/kubernetes-csi/csi-driver-

→nfs/master/charts

helm install csi-driver-nfs csi-driver-nfs/csi-driver-nfs --namespace kube-system --

→version v4.1.0
```

11. helm add ceph-csi repo

```
helm repo add ceph-csi https://ceph.github.io/csi-charts
kubectl create namespace "ceph-csi-rbd"
helm install --namespace "ceph-csi-rbd" "ceph-csi-rbd" ceph-csi/ceph-csi-rbd
```

12. create csi-nfs storageclass

```
cat <<'EOF'> storageclass-csi-nfs.yaml | kubectl apply -f storageclass-csi-nfs.yaml
apiVersion: storage.k8s.io/v1
kind: StorageClass
metadata:
name: csi-nfs
annotations:
   storageclass.kubernetes.io/is-default-class: "true"
provisioner: nfs.csi.k8s.io
parameters:
server: 10.110.10.83
share: /nfs/export1/
# csi.storage.k8s.io/provisioner-secret is only needed for providing mountOptions in_
→ DeleteVolume
# csi.storage.k8s.io/provisioner-secret-name: "mount-options"
# csi.storage.k8s.io/provisioner-secret-namespace: "default"
reclaimPolicy: Delete
volumeBindingMode: Immediate
mountOptions:
- nconnect=8 # only supported on linux kernel version >= 5.3
- nfsvers=4.1
EOF
```

13. create csi-nfs storageclass

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```
reclaimPolicy: Delete
volumeBindingMode: Immediate
mountOptions:
- nconnect=8 # only supported on linux kernel version >= 5.3
- nfsvers=4.1
EOF
```

15. create volumesnapshotclass, volumesnapshotcontent, volumesnapshotclass

kubectl create -f https://raw.githubusercontent.com/kubernetes-csi/external-snapshotter/ orelease-3.0/client/config/crd/snapshot.storage.k8s.io_volumesnapshotclasses.yaml kubectl create -f https://raw.githubusercontent.com/kubernetes-csi/external-snapshotter/ orelease-3.0/client/config/crd/snapshot.storage.k8s.io_volumesnapshotcontents.yaml kubectl create -f https://raw.githubusercontent.com/kubernetes-csi/external-snapshotter/ orelease-3.0/client/config/crd/snapshot.storage.k8s.io_volumesnapshotcontents.yaml kubectl create -f https://raw.githubusercontent.com/kubernetes-csi/external-snapshotter/ orelease-3.0/client/config/crd/snapshot.storage.k8s.io_volumesnapshots.yaml

16. volumestorageclass

```
cat <<'EOF'> volumestorageclass.yaml | kubectl apply -f volumestorageclass.yaml
apiVersion: snapshot.storage.k8s.io/v1beta1
kind: VolumeSnapshotClass
metadata:
    annotations:
        k10.kasten.io/is-snapshot-class: "true"
    name: csi-nfs-snap
driver: nfs.csi.k8s.io
deletionPolicy: Delete
EOF
```

17. helm add repo and install kasten K10

```
kubectl create namespace kasten-io
helm repo add kasten https://charts.kasten.io/
helm install k10 kasten/k10 --namespace kasten-io \
    --set global.persistence.metering.size=20Gi \
    --set prometheus.server.persistentVolume.size=20Gi \
    --set global.persistence.catalog.size=20Gi \
    --set injectKanisterSidecar.enabled=true \
    --set injectKanisterSidecar.enabled=true \
    --set injectKanisterSidecar.enabled=true \
    --set-string injectKanisterSidecar.namespaceSelector.matchLabels.k10/
    --set auth.tokenAuth.enabled=true \
    --set auth.tokenAuth.enabled=true \
    --set auth.basicAuth.htpasswd='admin:$apr1$nj8m0exb$RIkh3QZ1bMUk4mXXHCTSG.'
```

18. set k10 nodeport

```
cat > k10-nodeport-svc.yaml << EOF | kubectl apply -f k10-nodeport-svc.yaml
apiVersion: v1
kind: Service
metadata:
    name: gateway-nodeport
    namespace: kasten-io</pre>
```

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```
spec:
  selector:
    service: gateway
  ports:
    name: http
    port: 8000
    nodePort: 32000
    type: NodePort
EOF
```

19. check kasten io

curl -s https://docs.kasten.io/tools/k10_primer.sh | bash

20. deploy shopping website

```
git clone https://github.com/microservices-demo/microservices-demo.git
cd microservices-demo/deploy/kubernetes
kubectl apply -f complete-demo.yaml
### run application using browser
## http://10.110.10.86:30001/
```

21. check kasten io

kubectl label namespace generic k10/injectKanisterSidecar=true

SEVEN

V12 UPDATE

Purpose built for Kubernetes, Kasten K10 is a Cloud Native data management platform for Day 2 operations. It provides enterprise DevOps teams with an easy to use, scalable and secure system for backup/restore, disaster recovery and application mobility for Kubernetes applications. Kasten K10 integrates with relational and NoSQL databases, all major Kubernetes distributions, and runs in any cloud to maximize freedom of choice.



7.1 V12 Features

New capabilities introduced with V12 include:

- Backups going direct to object storage and cloud-based agents are also available as cloud-accelerated features
- With immutability everywhere, ransomware can be recovered, and threats against cyberattacks can be stopped even faster
- · Improves efficiency at scale with additional enterprise application support and innovations
- A new Veeam Backup & Replication plug-in for Kasten by Veeam K10 V5.0 provides visibility and management for Kubernetes data protection.

7.1.1 Key Highlights

v12 Feature Release - Key Highlights

Core Architecture Improvements

- Configuration Database on PostgreSQL
- VeeaMover copy & move backups
- Multiple gateway servers
- IPv6 support all products
- BfSS NFS for Linux proxies

Security And Compliance Improvement

- MFA for console
- Auto log off

Object Storage

• Direct to object storage

Veeam Agent for AIX and Solaris

Bare metal restore

Application integrations

- Restore Multiple SQL Databases Parallel
- AAIP for Postgres incl new Explorer
- Enterprise Plug-ins
 - Hardened Repository Support
 - IPv6
 - Centralized management
 - VDI Plug-In for SQL

Primary and secondary storage integrations

- Nimble peer-persistence support
- StoreOnce catalyst immutability support
- StoreOnce CloudBank support
- Fujitsu Eternus CS800 integration
- Infinidat Infiniguard integration
- Universal Storage API 2.0

Core Architecture Improvements

More Option for VBR Database

Veeam is introducing a new database platform – PostgreSQL v14. Some of the reasons for doing so is first and foremost, like MSSQL Express, it's free. But, from a use and scalability perspective, it has no size limit or compute restrictions, and has improved performance over SQL Express. SQL Express will still be an usable option if it's your preference. PostgreSQL is only going to be in VBR and Enterprise Manager (EM) initially.

SQL Express limitations

- 10 GB maximum database size
- 4 cores maximum
- 1 MB buffer cache

SQL Standard / Enterprise Edition

• Too high costs

Postgres

- Free
- No database size or compute restrictions
- Proven in other Veeam Products
- Performance

move or copy backups with VeeaMover

VeeaMover The new VeeaMover feature allows to easily copy or move backups between different Repositories or Backup Jobs with one click.

Use cases

- Move backups to different repository
- Copy backups to different repository
- Migrate ReFS to XFS for Hardened Repository
- Migrate NTFS to ReFS
- Re-balance Scale-Out Repository
- Scale-Out Repository extent evacuation

EIGHT

V12 UPDATE

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NINE

INDICES AND TABLES

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