

How to Become Cloud Backup Provider

Prepared for:









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Abstract

In this white-paper we will explain how one can install and configure cloud storage software and use it for backup purposes. Document can be used by an individual or a company who wishes to become a cloud backup provider and utilize its own hardware for cloud object-based storage. We will use Cloudian object-storage software along with CloudBerry Lab products.

Introduction

Object-based storage is considered a leading emerging technology, and many of its features are deemed ideal for cloud storage. Benefits of object storage include massive scalability, geographic independence, multi-tenant features and the ability to use off-the-shelf hardware. More companies are considering object-based storages as a part of their infrastructure, for instance for backup purposes. They choose it for its benefits and price. There is a number of public object-based cloud storages offered on the market, such as Amazon S3, Glacier, Windows Azure, Rackspace, and many others. However, there are still many companies who already have existing hardware and want to transform a part of it or transform it entirely in a cloud storage, utilizing latest technologies. It's also a huge playground for Managed Service Providers (MSP), who are willing to provide cloud storage and backup services to their final customers at the same time. New technologies, such as object-based storage require new tools, like products of CloudBerry Lab.

Purpose

This white-paper may be used by Managed Service Providers who are willing to expand their portfolio by providing cloud backup services to their customers using their own private cloud storage and CloudBerry Managed Backup. There are two ways to provide cloud storage to the final customers from MSPs' point of view. First one is to create new account on public cloud storage provider, like Amazon, for example, and resell it. However, there is a number of MSPs who run their own hardware and want to utilize its capacity to construct their own private cloud storage built on their own resources. In this white paper, we will briefly explain the second way: how this can be done by using Cloudian object-storage software. We will explain how to use CloudBerry Managed Backup to offer online backup service to the final customer. As an add-on, we will show how this cloud storage can be accessed and used by stand-alone products of CloudBerry Lab for object-based storages.





Architecture

It is recommended to install the Cloudian software in a cluster of three or more nodes. For this documentation, we deployed a single-node installation of Cloudian 2.4.3 in a virtual machine running Red Hat Enterprise Linux 6.3.

Result

We were able to install and configure Cloudian object-storage software on a stand-alone Linux server and use it together with CloudBerry Managed Backup, Backup, Explorer and Drive products. Thus, we proved a concept that any individual or company, MSP especially, may use this basic scenario to become a Managed Backup Provider to the cloud storage, built on their own hardware resources. We encourage everyone to go through the following sections to get the basic idea of the technical requirements, tips, and general steps of the installation.









Requirements

OS

Cloudian is officially supported only on these versions of Linux:

- Red Hat Enterprise Linux (RHEL) 5.x up through 6.4, 64-bit
- CentOS 5.x up through 6.4, 64-bit

For best performance and capacity, Cloudian, Inc. recommends version 6.4.

Sizing

As a sizing example, a Supermicro SuperStorage Server with:

- CPU: 2 quad-core Intel Xeon E5-2600
- 32GB RAM
- 12-2TB SAS2 HD (24TB total)

would have these approximate storage limits (presuming that HyperStore functionality is enabled):

- Assume 80% of raw disk is used for data object storage
- Replicated 2x: $(24TB * 80\%)/2 \rightarrow 9.6TB$ data per node.
- Replicated 3x: $(24TB * 80\%)/3 \rightarrow 6.4TB$ data per node.

NB!

An ext4 file system on RHEL/CentOS 6.3 has a maximum size of 16TB. However, with the latest *e2fsprogs* package (which provides file system utilities for ext2/3/4), ext4 file systems of up to 100TB are supported.

Third-party software requirements

You need to install (Cloudian v3.0 will install the following software automatically):

- Java 7 JRE 64-bit JVM
 - Cloudian v2.4.3 allows Java 6 and 7, v3.0 and above requires Java 7
- Ruby (Puppet requirement)
- Puppet
- Facter





Installation of Linux server

For this single-node installation we used Red Hat Enterprise Linux. We installed it on the VMware VM. It's better to set up a fix IP address from the beginning, as each time you shut down a node with DHCP you will have to repeat a certain procedures to start Cloudian node again.

Useful tips

Confirm that:

The machine's hostname **is not** set to *localhost*.

The machine's hostname is not mapped to the loopback address (127.0.0.1) in /etc/hosts.

The host is assigned a static IP address. Do not use DHCP.

To Set Host Name

vim /etc/sysconfig/network

To Set DNS Server IP

vi /etc/sysconfig/network-scripts/ifcfg-eth0

PEERDNS=no

To disable firewall

- # service iptables save
- # service iptables stop
- # chkconfig iptables off

To set DNS name

#cp /etc/resolv.conf /etc/resolv.dnsmasq.conf
#nano /etc/hosts

#nano /etc/resolv.conf

- Comment out all nameserver entries
- Add the line: nameserver 127.0.0.1



CloudBerry Lab cloud storage tools



Installation of third-party software

To fulfill the pre-requirements for Cloudian installation, we have to install this third-party software:

- 1. Java 7 JRE 64-bit JVM (Cloudian v2.4.3 allows Java 6 and 7, v3.0 and above requires Java7)
- 2. EPEL (Extra Packages for Enterprise Linux)
- 3. Ruby
- 4. Puppet
- 5. Facter

NB!

Please note, that it may be installed automatically during Cloudian v3.0 and above installation. Here is a quote from Cloudian official documentation:

- 1. From *ftp.cloudian.com*, download the Cloudian release package on to your Cloudian host machine and untar the package.
- As root, run the self-extracting script for installing required third party software: root# sh ./selfextract_prereq.bin

Useful tips

These tips may be used if manual installation preferred, or if the host doesn't have internet connectivity.

Link to install Java 7 JRE

http://docs.oracle.com/javase/7/docs/webnotes/install/linux/linux-jre.html#install-64

To install EPEL for RHEL/CentOS 6.x

#rpm -Uvh http://dl.fedoraproject.org/pub/epel/6/x86_64/epel-release-6-8.noarch.rpm

Install Ruby

#sudo yum install ruby ruby-libs ruby-shadow ruby-rdoc

Install Puppet

#sudo yum install puppet puppet-server facter





Cloudian installation

Here we won't show the complete procedure, just give a brief idea and some useful tips, which might help you setting up the test cloudian node. You can download the software and manuals/Installation guide from <u>here</u>.

This paper is based on Cloudian software version 2.4.3, the GA version available during the time of integration and development of this paper. The basic steps are the same and the procedure is even easier for the version 3.0.

At a high level, your single-node Cloudian installation will proceed as follows:

- 1. Download the Cloudian packages and extract them.
- 2. Review and edit a few installation settings.
- 3. Execute the installation.
- 4. Set up Dnsmasq, a domain resolution utility.

Useful tips

While editing/etc/puppet/manifests/extdata/common.csv:

Javahome - you can leave it "/usr/java/latest" Jrehome- you can leave it "/usr/java/latest"

To have Dnsmasq started automatically with node reboot, please add: "cd /opt/dnsmasq; ./dnsmasq-2.55 -C ./dnsmasq.conf" to the /etc/rc.local file.

Please check mts-ui.properties for admin.host details. It should contain your IP address: #nano /opt/tomcat/webapps/Cloudian/WEB-INF/classes/mts-ui.properties

To get logs #tail -f /var/log/cloudian/*

To verify connectivity between the CMC host and the admin host and admin port specified in the mtsui.properties file

#telnet <u>s3.cloudian.com</u> 18081 *we used default domain s3.cloudian.com, please use yours if you created it in *singlenode.csv*



CloudBerry Lab



To set up DNS on the main DNS server, you will need 3 entries (in our case 192.168.3.x, hostname Cloudian, default domain s3.cloudian.com):

Cloudian IN A 192.168.3.xxx s3.cloudian.com IN A 192.168.3.xxx *.s3.cloudian.com IN A 192.168.3.xxx

After the installation check:

/etc/init.d/cloudian-cassandra status
/etc/init.d/cloudian-redis-credentials status
/etc/init.d/cloudian-redis-qos status
/etc/init.d/cloudian-hyperstore status
/etc/init.d/cloudian-s3 status
/etc/init.d/cloudian-redismon status
/etc/init.d/cloudian-cmc status

Configuration of Cloudian software

After installation you will see the login screen (Pic 1), please log in with username *admin@cloudian.com* and password *public*. Cloudian example is the host name of our server.

https://cloudian.example/Cloudian/login.htm



Sigir III		
Group ID:	System Admin 🔄	
User ID:	admin@cloudian.com	
Password:	•••••	
Lonio		

Pic.1. Initial log in.





Now, you need to create a new group and a new user. Click on the Admin tab and do that by selecting Manage Groups \rightarrow New Group and Manage Users \rightarrow New User (Pic 2).

Cloudia	P			dmin@cloudian.com	(SystemAdmin)	
Multi-Tenant S3 Cl	oud Storage		Admin	Data Explorer	Account	Usage
Select Admin Category	Users					
> Manage Users	Group ID	test		I		-
> Manage Groups	User ID starts with					
> Rating Plan	Liser Turse	All				
> System Info	osei iype					
	User Status	All		<u> </u>		
	Search New User User QOS Default					
	User List					
	User User Name User Type		Group ID	Status	Ac	tions

Pic.2. Admin Tab.

For this basic installation we simply created one Group with a name **test**, one user **testuser** and a test bucket **testbucket**. It's pretty easy to set everything up. After doing this please check Account->Security Credentials which we will need later (Pic.3, 4).

🔏 Cloudian VMware Remote Console 👻 Devices 👻				
🧠 Applications Places System 🔚 🥪 隆			🌞 🏟 🛃 🔿 5	52 °F Wed Oct 23, 2:16 AM root
8	Cloudian™ Storage - Mozil	lla Firefox (on Cloudian.dev.o	cbl.corp)	_ = ×
<u>File Edit View History Bookmarks Tools Help</u>				
Cloudian Single Node Install 🗶 🖳 Cloudian™ Stora	ge X ₽			~
ttps://cloudian.example/Clo	udian/account.htm		슈 🗙 🚼 Google	🔬 🐴
Cloudian Multi-Tenant S3 Cloud	Storage		testuser : test Data Explorer Account	Help Log out
Manage Account Info	Access Credentials			
> Account Profile	Your Access Keys			
> Security Credentials	Created	Access Key ID	Actions	
> Account Activity	Oct-21-2013 20:26 -0400	00890e8d114973a5d813*	View Secret Key Inactivate Delete	
	Create New Key * Active	Access Key		
> Payment information				
	Sign-In Credentials			
	User ID:	te	stuser	
	Password:			
	Confirm Password:			
	Change Password			
To direct input to this virtual machine, press Ctrl+G.				🚬 🖓 🗐 🖓 💭 🖳

Pic.3. Checking access and secret keys.





			and the second se
Your Access Keys			
Created	Access Key ID	Actions	
Oct-21-2013 20:26 -0400	00890e8d114973a5d813*	View Secret Key Inactivate Delete	

Pic.4. Checking access and secret keys. Closer view.

CloudBerry Managed Backup configuration and usage

You can go to **My Account -> Switch to my own account** and choose Amazon s3 compatible account (Pic 5, 6). Then select storage provider and provide cloud storage credentials (Pic.7) that we've copied from cloudian installation (Pic.3, 4). After finishing the wizard, you will be able to backup your clients to your own cloud storage. To make it happen, please create an arbitrary user (Pic.8), this user will receive a download link for backup client (Pic.9, 10). After installation which is very similar to installation of stand-alone CloudBerry Backup, this user becomes the first user of your managed backup service. Please check <u>Appendix A</u> to get the basic idea how to configure stand-alone products of CloudBerry Lab with this new storage.

CloudBerry MBS Getting Star	ed Wizard	2
1 Step Please specify if you want to use CloudBerry Managed Storage account or your own Cloud Storage account. CloudBerry Managed account is provided for test purposes to make your trial easier. If you want more control over your storage use your own Cloud Storage account.	 Select storage Amazon S3 account Your backup data will be stored in your personal Amazon S3 account. You have to be signed up for Amazon S3. You will pay for storage to Amazon directly according to their prices. You can have unlimited storage. Windows Azure account Your backup data will be stored in your personal Azure account. Mazon S3 compatible account (BETA) If you own an S3-compatible account such as Scality, Dunkel, Tiscali, HostEurope, GreenQloud, Cloudian, Constant, etc You will be able to select cloud storage provider from the list on the next step. CloudBerry Managed Amazon S3 account Your backup data will be stored in Amazon S3 account managed by CloudBerry Lab. You don't have to pay for storage. The only restriction is that each of your users can have up to 2 GB of storage. You can switch to your personal Amazon S3 account later if you need more storage. (or purchase more storage from CloudBerry Iab - coming later) 	
	<< Back Next >> Close	

Pic.5. Selecting a private cloud-object storage, based on Cloudian.



CloudBerry Lab cloud storage tools

		Cloudian
CloudBerry MBS Getting Sta	arted Wizard	23
2step	Select Storage Provider:	
Please select storage type	● Generic S3-compatible account [*]	rel
from the list of supported providers.	Tiscali 🛛 H 🛇 Host	Europe
	③ GreenQloud Seew	reb
	🧟 💿 Connectria 🛛 🌔 C 💿 Cons	tant
	🕖 💿 DreamObjects 🧿 💿 Arub	a
	* Based on Scality technology.	
	<< Back Next >>	Close

Pic.6. Selecting a private cloud-object storage.

CloudBerry MBS Getting Start	ed Wizard	X
3 step Please specify Credentials that will be used to access your Cloud Storage.	Specify Cloud Storage Credentials: Access Key: 00890e8d114973a5d813	
	Secret Key:	
	1ivXXeT+yS+IqSFxATBYOJ	
	HTTP endpoint: s3.cloudian.com:18080 HTTPS endpoint:	
	<< Back Next >>	Close

Pic.7. Specifying credentials of a private cloud-object storage for Managed Backup account





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CIOUGBERRY MBS Getting Started WIZ

6 step	Create User
Create a new user account. A user will enter their login (email) and a password in backup application installed on their computer and start the backup. User will not be able to access other users data. Users will not have access	First Name: Pavel Last Name: Shter Email*:
User can only back up and restore THEIR data.	Email*: pavel.sh@cloudberrylab.com Initial password *: qwerty
	<< Back Next >> Close

Pic. 8. Creating the first customer's profile.

CloudBerry MBS Getting Start	ed Wizard	23
7 step Your customized client software is ready.	Your client software Download 3.5.2.32 version for: Windows XP, Windows 2003, Windows Vista, Windows 7, Windows 2008, Windows Server 2012, Windows 8	
	<< Back Finish	Close

Pic.9. Customer's link to download Backup client.





Onlin	ne Backup login information 📃	Inbox	x	• 2
+	Cloudberry to me 💌	6:09	9 PM (5 minutes ago) 🔆	*
	Dear Pavel Shter,			
	You are receiving this email because Clou Backup account.	dberry	has created your Online	
	Please use the following information when account:	n acces	ssing your online storage	
	Login: pavel.sh@cloudberrylab.com Initial Password:qwerty You may change the initial password at a	ny time	from within the software.	
	Please contact your provider to get client	softwa	ire.	
	Please download our latest desktop/serv	<u>er</u> back	up client, version 3.5.2.32.	
	If you experience any issues using Online paul.sh@cloudberrylab.com	Backup	p please contact us at	
	If you received this email by mistake, or y please ignore this email.	ou do n	not wish to use Online Back	«up
	Thank you, Cloudberry team			

Pic.10. Customer receives an email with initial password and the link to Backup client.

About Cloudian Inc.

Cloudian is a Foster City, California-based software company specializing in object storage software. With Cloudian[®], Enterprise IT and Cloud Service Providers (CSPs) can deploy turnkey multi-tenant private and public object storage systems on commodity IA servers, scaling from two servers to exabytes across multiple datacenters with high reliability and elasticity. Cloudian has a strong record in commercial production at major cloud service providers and enterprises across the U.S., Japan, Europe, and APAC.

About CloudBerry Lab

CloudBerry Lab is established in 2008 by a group of experienced IT professionals with the mission to help organizations in adopting Cloud computing technologies by closing the gap between Cloud vendors propositions and consumer needs through development of innovative low costs solutions.





Appendix A: CloudBerry Lab stand-alone products usage

CloudBerry Lab also develops stand-alone products: Backup - robust backup product, Explorer - file manager, Drive – product, which maps cloud storage as a virtual disk with the Windows environment.

If you set everything up, you can now use your cloud storage with CloudBerry Explorer, Backup and Drive. Please go to **File -> S3 compatible -> Cloudian** (Pic.11) and enter your Service Point name, Access and Secret keys (Pic.12). As the process is very similar for other products, we want to show it.

File View Tools Sync	Folder	s Compare Folders	AWS Import/Export	Access Manager (IAM)	CloudFront	Capacity Report	Security Assessment
 Amazon S3 Amazon Glacier 	dian-test 🔝 Home 🔟						
S3 Compatible	6	S3 Compatible					
Export Settings Import Settings	0	Aruba Cloud					습 (
	С	Cloudian					
Exit Ctrl+Q	8	Connectria Constant	Size	Date Modified	Туре		
L ATI CB Docs		DreamObjects		8/15/2013 6:17:50 F 10/23/2013 6:57:50	PM Folder PM Folder		
🔄 f03c88635cab1e2fcc	V	EasyStorage		8/14/2013 12:48:17 8/15/2013 5:49:43 F	PM Folder		
PerfLogs	0	GreenQloud		7/14/2009 7:20:08	AM Folder		
Program Files	Q	Hitachi		10/21/2013 4:48:21	PM Folder		
restore		Mezeo		8/16/2013 5:25:25 F	PM Folder		
Storage		Scality		8/22/2013 12:09:18	PM Folder		
SWTOOLS	3	🔏 Seeweb		8/15/2013 6:24:32 F	PM Folder		
📜 test	t:	Tiscali		8/16/2013 5:19:44 F	PM Folder		
Users Windows		Walrus		8/21/2013 6:29:36 F 9/20/2013 5:44:53 F	PM Folder PM Folder		
msdia80 dll	-		883 5 KB	12/1/2006 11:37:14	DM File		

Pic.11. Connecting CloudBerry Explorer to new cloud-object storage.



Pic.12. Specifying credentials of a private cloud-object storage for CloudBerry Explorer.

