

BlackPearl Virtual Machine Simulator Installation Instructions

Summary

The Spectra Logic BlackPearl simulator is contained within a Virtual Machine (VM) image. This allows us to simulate the underlying platform and exercise the same code used on a production level system.

Please report any issues to barryl@spectralogic.com

New Installation

Download Spectra Logic simulator zip file that contains the virtual image of the BlackPearl simulator. The file is approximately 1 GB (yes, that's big). Extract the virtual image which will be approximately 4.5 GB (yes, that's big too ⁽³⁾).

Download and install VirtualBox for your appropriate platform. VirtualBox is required to allow the simulator, which is a Virtual Machine (VM) image to run properly.

Go to https://www.virtualbox.org/wiki/Downloads

Once downloaded, double-click the executable and leave the defaults to install all options. You will get a warning about losing network connection temporarily. Proceed with installation and accept driver installations that appear in dialog windows.

Then start VirtualBox either immediately after finishing the installation or from the program menu or desktop icon. You will be prompted to create a "New" VM machine.

Type a name of the Virtual Machine such as "Spectra Logic Simulator".

Choose BSD as the "Type".

Choose FreeBSD (64bit) as the "Version".

NOTE: Make sure your laptop supports Virtual Machine 64 bit setups. New laptops should not be a problem, but older ones will require you to "Enable" VM support in the BIOS BEFORE installing Virtual Box so it will recognize FreeBSD (64bit) support.

Set the memory size to 2048 MB.

Next Dialog will be for the Hard Drive.

Choose "Use an existing virtual hard drive"

Browse to and choose the "black_pearl_sim-1.0.0-xxxxxx.vmdk" image which was extracted from the zip file.

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Hit "Create"

Your VirtualBox will appear.

Choose "Settings"

Choose "System"

Make sure Enable IO APIC is checked.

Make sure that Hardware clock in UTC time is checked.

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eneral System D	isplay Storage A	udio Network	Ports S	nared Folder	s
	Motherboard		eleration]	
	Motherboard	10003301 700	ciciation]	
Base Memor	ry:	191 19171 19181 101 1 1917		2048	MB
	4 MB		16384 M	В	
Boot Orde	er: 🗹 💾 Floppy	y 🕈			
		VD			
	Mard I	Disk			
Chipse	et: PIIX3	\$			
Pointing Devic	e: PS/2 Mouse	A T			
Extended Feature	es: 🗹 Enable I/O A	PIC			
	Enable EFI (s	pecial OSes only	()		
	🗹 Hardware Cl	ock in UTC Time	2		
				Cancel	ОК

Choose "Network" from the left-hand navigation menu.

There are a few choices here depending on whether you are connected via wireless or cable to the network.

Wireless for MAC

You must setup VirtualBox to use a virtual network on the MAC. In the right-hand content pane keep the setting for "Attached To:" to "Host Only Adapter". You will not be able to connect to the internet, setup DNS or NTP. These are not necessary to run the simulator.

Windows and Direct Connect

In the right-hand content pane change the setting for "Attached To:" to "Host Only Adapter". We have also used "Bridged Adapter". You may have to try one or the other for this setting until you get a valid IP address. **You should be connected via a hard-wired connection.** It may still work wireless, but we have seen some issues with address translation.

If you need to use Host Only Adapter, you will need to setup a Host Only Network on your machine. To do this, you may go to http://www.virtualbox.org/manual/ch06.html#network_hostonly and read the directions for your machine. This will vary depending on what OS you are using.

Once you've set up a new host only adapter network, you can set your VM Network to use that network that you just created.

NOTE: You need to enable/disable the Virtual Box Network Adapter under:

Network Sharing->Manage Adapter Settings

to get wireless internet access. Enable for running the simulator, disable when not using the simulator.



Choose "OK"

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Update Simulator image

Download and extract the VM image as before to the same folder location. In the "Storage" dialog for VirtualBox select the missing VM image and delete it. Select the "Controller: IDE" line and right-click or choose to add a Hard Disk image and then select "Choose an Exisiting Hard Drive Image". Browse the proper location and that should do it.

General	Storage			
 System Display Storage Audio Network Serial Forts USB Shared Folders 	Storage Tree Controller: IDE Strata_sim-1.1.0-667379.vmdk The provided HTML Strategy Strate Strategy Strate Strategy	Attributes <u>N</u> ame: <u>T</u> ype:	IDE PIIX4 Use host I/O cache	
	Select a settings category from the list on the item to get more information.	e left-hand sid	de and move the mouse over a settings	
			OK Cancel Help	

Starting Simulator

Then choose "Start" in upper left area. You will get a warning dialog about keyboard capture going to the VM. That's normal. You may also get a warning about mouse capture for the VM window. That's normal too. Read the info in the screen to use your mouse within the VM window or back on your main computer screen. The "RT CTRL" key will toggle the mouse control from the VM back to the main computer screen.

Once the VM window shows the BlackPearl Console UI screen, use the IP listed to have your computer browser, preferably Chrome, bring up the UI for BlackPearl.

Ex. 192.168.56.101

You will get this screen and choose to Proceed anyway. You will end up at the BlackPearl login screen. Login using spectra/spectra as the username/password.

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GUI and the simulator

A user can use all of the features in the GUI that are available on a live system. There are some caveats.

- 1. It doesn't do real data I/O or expose mount points.
- 2. The performance graphs are "canned" statistics.
- 3. Not all features are working yet. Anything that BlackPearl developers care about probably does work in the GUI (user accounts, bucket creation, object browser, etc).
- 4. The GUI shows fake network interfaces to match a real system. You cannot see the status of the VM's network interface nor can you configure it from the GUI.
- 5. Don't change the network settings for the management port $\ensuremath{\textcircled{\sc op}}$

Additional VM notes

- 1. A user can use all of the features of the DS3 API and also access the "system" by using ssh and the root login with no password.
- 2. There is no firewall.
- The VM image size is setup to be 20GB which means you'll have about 17GB available for uploading objects if you have 17GB additional space available in the local storage that the .vmdk image is running. The image will grow as objects are uploaded to the BlackPearl simulator.
- 4. The VM only has a single network interface. Port 80 is the GUI, port 8080 is the DS3 server. It's configured for DHCP.
- 5. The console app shows the real IP address of the network interface. It cannot be configured via the console app.

Using the BlackPearl GUI

Creating a new user:

1) Select Configuration->Users from the top menu

Dime lend	businooulu	Buckets	Support		ouch pear of cog
Hardware	1	Pools Services		Performance	
System Dlack-pearl	Serial Number 5003048000bf30	Network Mail Recipients	Size 1.5 TB	Pool Pocl BlackPearl_Tape_Buffer : Pacolution: ExtEducation	Colort elements to plat.
Pools Name BlackPearl_Tape_3uffer Network Name	Raw Size	Available Used 1.0 TB 784.7 Kt	Overhead 426.2 GB	1.010PS Read 10PS Write 10PS Read M8/sec 0.810PS 0.610PS 0.610PS	1.0 MB/s Read ICPS Write IOPS 0.8 MB/s Read M&/sec 0.6 MB/s
© Management © Aggregate Data 4	Active Active	10.1.4.10() 0.0.0.0/8	/20	0.410PS	0.4 MB/s
SMTP Server SMTP has not been config DNS Name Servers	ured.			0.210P5	0.2 MB/s
10.1.0.9 NTP Servers 0.freebsd.pool.ntp.org				0.010PS 11:39 11:40 11:41 11:42 11:43 Time zone (GMT): 1.0	0.0 MB/s
.treebsd.pool.ntp.org				0.5 0.0 11:39 11:40 11:41 11:42 11:43 0.0 Network Interface Revolution: 5s (Smin total) : 12:3 12:3 12:3 12:3 10:5 10:5 10:5 10:5 10:5 10:5 10:5 10:5	Select elements to plot: 0125 MB/s Packets In
				Input Drops PacketsOut MB Out	S MB In

2) Select New from the Action menu

SPECTRA Black Pearl	Dashboard (Configuration	Status	Support	black-pearl	G→ Logout
Dashboard > Users						
P New s Edit Show S3 Credentials Sp Delete		U: St	sername pectra			
Users						
Full Name		U	sername			
There are currently no items	to display					
🕑 Hardware						Q

3) In the "New User" panel, fill out the fields and click "Create"

New User	0
Full Name	New User
Username	newuser
Email	email@email.com
Role	User ‡
	A Create O Cancel

4) You should see your new user in the list of Users, for example:

SPECTRA Black Pearl	Dashboard	Configuration	Status	Support	black-pearl 🕞 Logout
Dashboard > Users					
Action -					
Primary Administrators					
Full Name		L	Jsername		
Spectra		S	pectra		
Users					
Full Name		I	Username	•	
New User		r	newuser		

🕑 Hardware

5) In order to view and edit the S3 credentials for a user, double click on the specific user and you will see the following:

Full Name	New User
Username	newuser
Email	email@email.com
Role	User ‡
S3 Access D	bmV3dXNlcg==
S3 Secret Key	nNGxVXwB

6) You may also just view the S3 credentials by highlighting the user and then going to "Action"->"Show S3 Credentials" which will display something like the following:

S3 Credentials	0
S3 Access ID	bmV3dXNlcg==
S3 Secret Key	nNGxVXwB
	O Cancel

7) As shown above, the S3 Access ID and S3 Secret Key are created for that new user. If you would like to put buckets and objects for that user account, please use the corresponding Access ID and Secret Key.

NOTE: At this time, if you do not use the spectra user account for putting buckets and objects, you will not be able to see them in the following display. Only (at present) will buckets and objects be displayed for the spectra user account in the Object Browser (see below).

Bucket/Object Browser

1) Select Configuration -> Buckets from the top menu

SPECTRA Black Pearl	Dashboard	Configuration	n Status	Support			black-pearl 🕞
		Buckets					
Hardware		Pools			Performance		
System	Serial Number	Network		Size	Pool		
o black-pearl	5003048000bf30	Mail Recipie	ents	1.5 тв	Pool BlackPearl_Tape_Buffer :		
Poole	2	Users			Resolution: 5s (5min total) :		Select elements to plot:
Name	Daw Size	Available	Ured	Overhead	1.010PS Read IOPS Write IOPS Read M8/sec	1.0 MB/s	Read IOPS
RlackPearl Tane Buffer	1 5 TR	1 O TR 7	784 7 Kt	426 2 GB	Write MB/sec		Write IOPS
o blackreal i_tape_builter	1.5 10	1.0 10 7	104.7 Ki	420.2 00	0.810PS	0.8 MB/s	Sead M8/sec
Network							Write NB (sec
Name	Link Status	IP .	Address		0.610PS	0.6 MB/s	S white worset
Management	Active	10.	.1.4.100/	20			
S Aggregate Data 4	Active	0.0	0.0.0/8		0.410PS	0.4 MB/s	
SMTP Server							
🔺 SMTP has not been configu	ured.				0.210PS	0.2 MB/s	
DNS Name Servers							
10.1.0.9					0.01095	0.0 MB/s	
NTP Servers					11:54 11:55 11:56 11:57	11:58	
0.freebsd.pool.ntp.org					-7 ± 1.0	Reset View	
					0.5 0.5	,	
					0.0 11:54 11:55 11:56 11:57 11:58	2	
					Network		
					Interface Management +		2012 TO 10
					Resolution: 5s (Smin total) :	0.0008 NB/s	Select elements to plot:
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					Input Drops Packets Out MB Out Output Errors Collisions	0.0007 MB/s	MB In
Hardware O Messages Mai	rch 04, 2014 03:45	РМ					

2) Initially, there will not be any buckets or objects to display

SPECTRA Black Peak	L Dashboard	Configuration	Status	Support		black-pearl 🕞 Logcut
Dashboard > Buckets Action -						
Name	Tape Location			Physical Location	Created At	
There are currently n	o items to display					
🛇 Hardware 🛛 🙆 Me	ssages March 04, 2014 03:4	5 PM				¢.

3) After using the "Spectra" user to perform some PUT commands to create buckets and upload objects into buckets, the object browser will allow visibility to those items, as follows: (please see the NOTE about using the spectra user in the prior section)

SHECTRA Duniferry	Contraction and a local distance		Jtatta	Support			black-pearl 🕩 Logou
Dashboard > Buckets Action -							
Name				Tape Location	Physical Location	Created At	
▼ 🗑 bucket10343424						March 05, 2014 12:17 PM	
🗎 client00obj000000-010101							
🖹 client00obj000001-010101							
lient00obj00002-010101							
l client00obj000003-010101							
• 🖤 bucket20686848						March 05, 2014 12:18 PM	
il client00obj00000-020202							
l client00obj00001-020202							
lient00obj00002-020202							
l client00obj00003-020202							
 						March 05, 2014 12:18 PM	
il client00obj00000-030303							
liclient00obj000001-030303							
il client00obj000002-030303							
iii client00obj000003-030303							
• 🗑 bucket41373696						March 05, 2014 12:18 PM	
i client00obj00000-040404							
l client00obj000001-040404							
l client00obj00002-040404							
client00obj000003-040404							
Double click on a bucket/folder	to navigat	e into that b	ucket/f	older			

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Viewing the simulated tape(s)

ar Code	Type	State	Available	Used	Tape Library Partition	Bucket	Last Modified
efaultsimtape	LTO-6	Unknown	, runde		defaultsimpartition		

Notes:

This tape shown is entirely virtual and is only a representation of what will be available in the full BlackPearl product. The "LTO-6" type is also just showing what will be present in an actual system.

Because this tape is virtual, it will not actually be assigned to a bucket (7th column from the left) but in an actual system, you would see the Bucket field correspond to the name of the bucket that the tape is assigned to.

Generating and pulling Support Logs

1) Select Support -> Logs from the top menu

PECTRA BLACK COL	Dashboard	Configurat	ion Status	Support		black-pearl 🕞 Lo	
Hardware System Serial Number S			Software Activation Keys Logs Documentation	mance			
 black-pearl Pools 	5003048000bf3)bf	1	Contact Informat Tools	on BlackPearl_Tape_Buffer : tion: 5s (5min total) :	Select elements to plot:	
Name BlackPearl_Tape_Buffer Network Name Li Management Ac Data 4 Ac SMTP Server SMTP has not beea config DNS Name Servers 10.10.9 NTP Servers O.freebsd.pool.ntp.org 1.freebsd.pool.ntp.org	Raw Size 1.5 TB nk Status tive tive ured.	Available 1.0 TB IP Add 10.1.4 10.1.4	Used 784.7 Ki ress 3.100/20 20.101/20	Overhead 426.2 GB	Read IOPS Write IOPS Read MB/sec Write MB/sec Write IOPS Read MB/sec 0.810PS 13:50 13:51 13:52 0.410PS 13:50 13:51 13:52 0.510PS 0.5 0.5 0.5 0.0005 13:49 13:50 13:51 13:52 1.0 0.5 0.5 0.5 0.5 0.5	✓ Write IOPS O.8 MB/s ✓ Read MB/sec O.6 MB/s ✓ Write MB/sec O.4 MB/s O.2 MB/s O.2 MB/s O.2 MB/s Reset View	
				Ĩ	Network terface Management 2 evolution: Ss (Smin total) 1	Select elements to plot: 2.035 MB/s Packets in 2.030 MB/s MB in 2.025 MB/s Input Errors	

2) Select "New Log Set" from the Action menu

SPECTRA Black Call	Dashboard	Configuration	Status	Support			black-pearl 🕞 Logout
Dashboard > Logs							
Action -							
New Log Set							
New Statistic Log Set						Size	
Download	04, 2014 03:45 PM					126.6 KB	
Email							
Delete Statistic Log sets	}						
	Date				Size		
No log sets are avai'ab	le. Select Action -:	> New Log Set	to crea	te a log set.	,		
Kernel Logs							
	Date				Size		
No kernel logs are avai	lable.						
Log Set Schedule							
Schedule O							
No additional Schedu'ed	Log Sets. Select A	ction -> New	og Set	Schedule to create a schedule.			
🗢 Hardware 🛛 Messa	ges March 04, 2014 03:45	i PM					c

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3) Indication on the page will show that it is creating a new log set

SPECTRA	Blackfeeld Dashboard Configuration Status Support		black-pearl 🕞 Logcu
Dashboard Action -	d ≯ Logs		
Log Sets			
	Date	Siz	e
-	March 04, 2014 03:45 PM	126	5.6 KB
¢	March 05, 2014 01:57 PM - Creating		
Statistic Lo	.og Sets		
	Date	Size	
No log set	ts are available. Select Action -> New Log Set to create a log set.		
Kernel Log	igs		
	Date	Size	
No kernel	logs are available.		
Log Set Scl	chedule		
Schedule 0	0		
NO Additio	onal Schedu ed Log Sets. Select Action -> New Log Set Schedule to create a	chedule.	
Hardwar	are Missages March 04, 2014 03:45 PM		ta International de la construction de La construction de la construction d

4) When finished, highlight the log set by clicking on it, then go to Download in the Action menu

SPECTRA Black Ball	Dashboard	Configuration	Status	Support			black-pearl 🕞 Logout
Dashboard > Logs	19						
L New Log Set New Statistic Log Set						Sizo	
New Log Set Schedule Download	04, 2014 03:45 PM					126.6 КВ	
Email Delete	05, 2014 01:57 PM					375.9 КВ	
Statistic Log Sets							
	Date				Size		
No log sets are avai'ab	le. Select Action -:	> New Log Set	to crea	ate a log set.			
Kernel Logs							
	Date				Size		
No kernel logs are avai	lable.						
Log Set Schedule							
Schedule 0							
No additional Schedu'ed	Log Sets. Select A	ction -> New L	.og Set	Schedule to create a schedule.			
🙁 Hardware 🤒 Messa	ges March 04, 2014 03:45	5 PM					Ø

5) The log set zip file will begin downloading to your browser's download area. The .zip files can vary in size.

Object Storage: Interfacing with the DS3 Server

A few notes on performing I/O to the BlackPearl system.

- The BlackPearl system is running a DS3 server that allows a remote client application to perform RESTful PUT and GET commands to send and retrieve "objects". This works much the same as other cloud storage interfaces. Familiarity with other cloud storage interfaces is not a prerequisite for understanding DS3 but it does help.
- 2) The client application (including any client tool that Spectra Logic provides) that is used to perform DS3 commands to the BlackPearl should not be running on the BlackPearl itself. Client applications are meant to operate independently of the BlackPearl appliance. The BlackPearl appliance must be accessible via network connectivity to the host on which the client application is running. Any attempts to run client applications on the BlackPearl appliance itself (targeting the DS3 server the BlackPearl appliance) are not supported by Spectra Logic.
- 3) Please refer to the DS3 API and Client Development guides that are available thru the Spectra Logic DS3 Developer's Portal.