Note

Kraken OVA Deployment Guide

Kraken OVA Deployment, 3.1

Kraken is available as a virtual machine for VMware ESXi and vSphere environments. For hardware acceleration of video encoding and decoding, VMWare ESXi 6.5 with Update 1 must be installed on the host appliance. For Intel GPU accelerator support, processors from the SkyLake (or newer) generation with support for Intel Quick Sync Video (QSV) video are required. Iris Pro Graphics P580 or higher is recommended. As of release 3.0, Kraken supports NVIDIA GPUs which utilize NVENC. The minimum disk space requirement for Kraken VMs is 250 GB.	vmware [®]

This guide details how to enable GPU passthrough for hardware encoding and supported capture cards (when supported by the hardware, in the current release, either Iris Pro or NVIDIA Quadro). This guide assumes you are familiar with VM servers and hypervisor systems.

After completing the steps in this guide, you will have a Kraken Virtual Machine installed that will include Kraken's support for hardware-accelerated video encoding and access to the capture card.

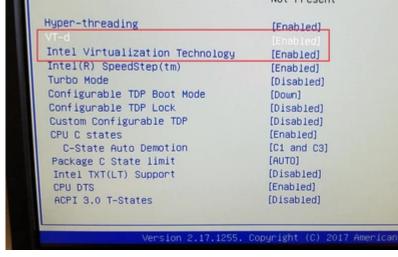
For detailed Kraken configuration and operation information, please refer to the User's Guide (available at https://doc.haivision.com). For the default credentials, refer to the *Important Notice* (postcard shipped with appliances). You may download the *Important Notice* as well as the latest software and Release Notes through the Download Center on the Haivision Support Portal (http://support.haivision.com).

Confirming the BIOS Settings

To get started, you need to enable the "Virtualization Technology" in the CPU.

To confirm and update the BIOS settings:

- 1. Reboot the server.
- 2. When the system is starting up, press F2 to enter the system setup and open the system's BIOS menu.
- 3. Open the **Processor** submenu (i.e., scroll down to "Processor Settings" and press Enter).
- 4. Enable both the **Vt-d** (Intel Virtualization Technology for Directed I/O) and **Intel Virtualization Technology** BIOS settings, as shown in the following example.



5. Select Save & Exit.

Enabling Hardware Pass-through on the Host

Assuming VMWare ESXi 6.5 is installed with Update 1 on the host system, you must now enable the passthrough of the hardware devices on the system needed by Kraken. This first step is done at the host level.

- 1. Log into the hypervisor.
- 2. In the Navigator, select $Host \rightarrow Manage \rightarrow Hardware \rightarrow PCI Devices$.
- 3. On an example host, locate the graphics card and the video capture devices to be enabled for passthrough.

Following are examples of the devices available on Kraken CR (Intel Quick Sync Video (QSV)):

- 0000:00:02.0 Intel Corporation Iris Pro Graphics P580
- 0000:02:00.0 Blackmagic Design DeckLink Micro Recorder
- 0000:03:00.0 Conexant Systems, Inc. CX23885 PCI Video and Audio Decoder

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or devices available on Kraken servers (NVIDIA Quadro)

- 0000:3b:00.1... NVIDIA Corporation GP107GL High Definition Audio Controller
- 0000:3b:00.2... NVIDIA Corporation GP107GL [Quadro P400]

Navigator 🛛	localhost.	dev.haivision.c	om - Manage								
Host	System	Hardware	Licensing	Packages	Services	Security & users					
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	Power Ma	nagement		0000:17:1e.3		tion Sky Lake-E PCU			Not capable	Not capable	
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More VMs				0000:3a:00.0	Intel Corpora	tion Sky Laka-E PCI	Express Root Port A		Not capable	Not capable	
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				0000:3a:05.0	Intel Corpora	tion Sky Lake-E VT-	d		Not capable	Not capable	
				0000:3a:05.2	Intel Corpora	ition Sky Lake-E RAS	S Configuration Register		Not capable	Not capable	
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4. **()** Note

The Graphics Controllers are identified differently depending on the CPU model. For example, on Skylake systems, it reports as: **Intel Corporation Iris Pro Graphics ####** (as shown in the above screenshot), while on Kaby Lake systems, it reports as: **Intel(R) Display controller**.

5. Reboot the host to confirm the settings if you changed anything.

🕑 Tip

You can toggle all selected devices at once, and then reboot.

🕕 Note

After making this change, you may notice that the VMWare ESXi host console boot screen no longer comes up completely. This is because the GPU pass-through is enabled at the host level and is unfortunately normal. The progress bar will stop at the message

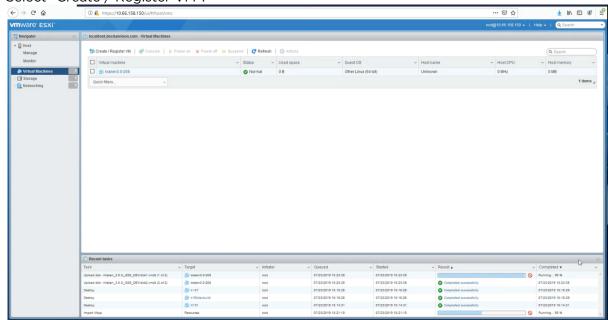
"vmkapi_v2_1_0_0_vmkernel_shim loaded successfully." There will be no further visual indication from the host console that VMWare is booting up, but it is. After a couple of minutes, you will be able to navigate to the hypervisor with a Web browser and log in.



Importing the Kraken OVA

Follow these instructions to import the Kraken OVA onto the hypervisor.

- 1. Log into the hypervisor and select "Virtual Machines".
- 2. Select "Create / Register VM".



3. Select "Deploy a virtual machine from an OVF or OVA file."

🕑 Tip

4.

Make sure you uncheck "Power on automatically". This will allow you to enable the Intel or NVIDIA cards individually, which will save time and rebooting steps. (You can only change settings in Power Off state.)

 1 Select creation type 2 Select OVF and VMDK files 3 Select storage 	Deployment options Select deployment options	
 4 Deployment options 5 Ready to complete 	Network mappings	bridged VM Network ~
	Disk provisioning	Thin O Thick
	Power on automatically	
vm ware		
		Back Next Finish Cancel

- 5. Click **Next** to choose the default datastore.
- 6. Click **Finish** to begin importing.

7.	It will take a few minutes	for the	OVA file to upload	d to the appliance.
	·			

2 New virtual machine - Kraken 3.0-2	200
 1 Select creation type 	Select storage
 2 Select OVF and VMDK files 	Select the storage type and datastore
✓ 3 Select storage	
4 License agreements	
5 Deployment options	13
6 Additional settings	
7 Ready to complete	
	Extracting OVA, this could take some time
vm ware [®]	
	Back Next Finish Cancel

Learning the Virtual Machine's IP Address

🕕 Note

The virtual machine will power on after it is imported. You will see the Kraken "Loading Please Wait" screen in the VMWare console.

- 1. After the Kraken VM loads, the device's IP address is displayed on the console. Write it down.
- 2. If static IP addressing on the virtual machine is preferred, use the console to modify it (refer to the Kraken User's Guide for details).

Copyright 2817 To Mainister the system, broase to http://18.66.131.135	
(ISC) to refresh	
Please Log In Disconner: Passaged: -	

3. When changing to a static IP address, confirm that the settings are valid before moving on to the next step.

Configuring the Kraken Virtual Machine

Now that the VM's IP address is known and configured, it is time to enable the hardware pass-through to the Virtual Machine.

- 1. Close the VM console window and "Shut Down" the Kraken VM using the hypervisor.
- 2. Select the Kraken VM and then select $\textbf{Actions} \rightarrow \textbf{Edit Settings} \rightarrow \textbf{VM Options}.$
- 3. Follow the steps below based on the capture card(s) installed.

Intel Quick Sync Video (QSV)

- 1. Make the following strategic modifications:
 - Increase CPU count from 2 to the desired number. More CPU's assigned to the Kraken device increases its ingest and video reformatting capabilities.
 - Under Memory, make the "Reservation" setting equal to the "RAM" setting. 4096 is the default and will work for both.
 - Choose "Add other device" → "USB Device". At the bottom you will see a "New USB device" called "Blackmagic design DeckLink Micro Recorder".
 - Choose "Add other device" → "PCI Device" three times. All three of them will say "Iris Pro Graphics P580 - 0000:00:02.0".
 - Leave one of them alone, and set the other two PCI Devices to be "DeckLink Micro Recorder 0000:02:00.0" and "CX23885 PCI Video and Audio Decoder 0000:03:00.0".
- 2. Click Save.

Following are screen shots of the settings after all of the modifications are done.

Add hard disk 🗰 Add neb	ands adapter 🖉 Add other d	evice				~
CPU	8 7 0					
Memory						
RAM	4096 MB					
Reservation	4096	•	MB			
	Reserve all guest n	nemory (All	ocked)			1
Limit	Unlimited	•	MB	•		
Shares	Normal	•				
Memory Hot Plug	Enabled					
Hard disk 1	73.242187 08				0	~

Edit settings - Drip (ESXI 5.1 virtual machine) Virtual Hardware VM Options + And disk 2 9.765625 68 ٠ 0 SCSI Controller 0 LSI Logic Parallel ٠ 0 New USB controller USB 2.0 . 0 INE Network Adapter 1 VM Network Connect 0 + (a) CD/DVD Drive 1 Host device • Ó + 🐺 Video Card Specify custom settings ٠ New PCI device Iris Pro Graphics P580 - 0000:00:02.0 ٠ 0 • I New PCI device DeckLink Micro Recorder - 0000.02:00.0 0 ٠

CX23885 PCI Video and Audio Decoder - 0000:03:00.0

Blackmagic design DeckLink Micro Recorder

• I New PCI device

ER New USB device

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Save

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Cancel

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VM Client Configuration for NVIDIA GPUs

Edit the VM settings to add and configure the NVIDIA Quadro P400 cards:

- 1. Select Actions -> Edit Settings -> Virtual Hardware-> Add other device.
- 2. Select **New PCI device** as many times as there are cards to add.

🔁 Edit settings - K198OVA (ESXi 5.1 vi	rtual ma	achine)			
Virtual Hardware VM Options					
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		📄 Floppy drive			
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Hard disk 2		😽 USB controller			
	9.76	USB device			\otimes
SCSI Controller 0	LSI	Sound controller	~]	•
► ■ Network Adapter 1	VM	PCI device	~	Connect	8
▶ 🜉 Video Card	Spe	SCSI controller			
▶ i PCI device 1				~	\otimes
				Sa	ve Cancel

3. Set the new PCI Devices to match the Quadro P400 cards selected under Enabling Hardware Passthrough on the Host.

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Memory	4096	MB ~			
Hard disk 1	73.242187	GB v			\otimes
Hard disk 2	9.765625	GB ~			\odot
SCSI Controller 0	LSI Logic Pa	arallel	Ŷ		0
Network Adapter 1	VM Network		Ŷ	Connect	\odot
S CD/DVD Drive 1	Host device		Ŷ	Connect	\odot
Video Card	Specify cust	om settings	Ŷ		
New PCI device	GP107GL [0	Quadro P400] - 0000:3b:0	00.0	~	\otimes
New PCI device	GP107GL [0	Quadro P400] - 0000:d8:0	0.0	· · · · · · ·	0

- 4. Click Save.
- 5. Be sure to check the "Reserve all guest memory" checkbox.

1 Gliffy Macro Error

Cannot find a diagram with these parameters:

- Name: VM_Reserve_Guest_Mem_checkbox
- 6. Select **Configuration Parameters** and then **+Add Parameter**.
- 7. Add the following two parameters:
 - pciHole.start = "2048" (Note: This only applies for VMs that have more than 2GB of configured memory.)

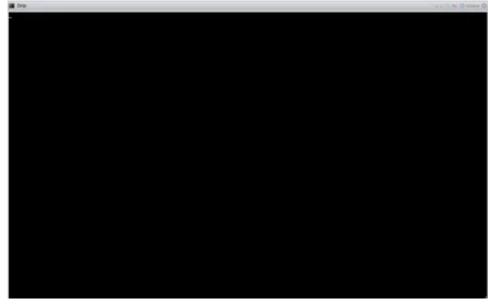
• hypervisor.cpuid.v0 = "FALSE"

Configuration Parameters	
🕂 Add parameter 🛛 🗙 Delete parameter	Q Search
Key ~	Value ~
vmci0.pciSlotNumber	32
ethernet0.generatedAddressOffset	0
monitor.phys_bits_used	40
vmotion.checkpointFBSize	67108864
softPowerOff	FALSE
hypervisor.cpuid.v0	FALSE
pciHole.start	2048
sched.mem.pin	TRUE
	56 items
	OK Cancel

8. Click **OK**, and then **Save**.

Booting the Virtual Appliance

Now that the device passthrough to the VM has been enabled in the settings, power on the VM. The VM console will function briefly and then go black. This is because the GPU device is being passed to the Virtual Machine, making it unavailable for use by the console. You may notice that the host console to the monitor (which was stuck at "vmkapi_v2_1_0_0_vmkernel_shim loaded successfully") disappears at this time as well.



Using your Web browser, you can now navigate to the Web page of the Kraken virtual machine.

V N	
Haivision Kraken 🎇	
 Sign In	

Licensing the Virtual Appliance

The next step is to license the Kraken virtual appliance:

- 1. Sign in to the Web interface using one of the credentials provided in the Important Notice.
- 2. If you see a License Required dialog, click **Add License.** -or-

Click the Administration icon on the toolbar (the settings gear) and click Licensing from the sidebar.

Haivision Kraken 艬		Welcome haiadmin (Sign out)	0 🔅 0
Licensing			Save Settings
Status	Haivision Kraken		
Presets	License expires on 17/0	8	
Events	Product	Kraken 2.9.0-52-RELEASE	
Update	MAC Address	B0:83:FE:DE:B2:25	
Network	Instance UUID	564D7AB8-9323-D6B3-67B5-A04797080391	
Licensing	CPU ID	E3 06 05 00 FF FB AB 0F	
REST API	License Features		Í
Accounts			
	Upgrade Version Limit	2.9	
	MPEG-2 video encoder		
	HEVC video encoder	Enabled	
	KLV option	Enabled	
	HD H.264 streams allowed	12	
	Active stream load	33%	
	Load calculated based on	1x HD H.264 = 2x SD H.264 1x HD HEVC = 4x HD H.264 = 2x SD HEVC 1x HD MPEG-2 = 1x HD H.264	

The Licensing page provides three pieces of information required to generate the license:

- MAC Address
- Instance UUID
- CPU ID
- 3. Click the 🗎 icon to copy the current product details to the clipboard for use in the following step.
- 4. To request a license for your product:
 - a. Log in to the Haivision Support Portal (https://support.haivision.com).
 - b. After logging in, click License Requests.
 - c. Click the **New** button.
 - d. Select the appropriate device type and click the **Next** button.
 - e. Fill in the form with the appropriate information, and click Save.
 - Your license request is submitted and you will be contacted by a Haivision representative shortly with a license key for your product.
- 5. After you receive a license key, paste the license string in the License text box.
- 6. Click Save Settings to load the license.

The License Status is updated to show the new license information.

Testing the Installation

At this point, the installation is complete and can be tested.

- 1. Click the Streaming icon on the toolbar, and then click Inputs on the sidebar.
- 2. From the Inputs List view, click the 🕚 Add button to add an input.
- 3. For the Source, select either "DeckLink Micro Recorder 1" or "Analog Capture 1" as applicable for your system.

Inputs	New Input		
GENERAL SETTINGS			
Streams	Parameters		
Inputs			
Transcoders	Name		
Outputs	Source	TS over UDP -	
Metadata	June Co	TS over UDP	
URL •		TS over SRT	e.g. udp://239.100.100.100:5000
		RTSP	
Source Specific Multicast Network Interface		RAW Motion JPEG	e.g. 192.168.1.220
		DeckLink Micro Recorder 1	
		Analog Capture 1	

- 4. Click Apply.
- 5. Click **Transcoders** on the sidebar.
- 6. From the Transcoders List view, click the 🕚 Add button to add a transcoder.
- 7. On the "Encoder" drop-down, select either "Software" or the "Hardware (QSV)" encoder.

CENERAL SETTINGS				
	Parameters			
Inputs Transcoders	Transcoder Name			
Outputs			_	
Metadata	Encoder	Software		
	Format	Hardware (QSV)		
	Video Bitrate			
	Resolution	Auto (Detect Continuously)		
	KLV Metadata			
	Frame Rate	Auto (Detect Continuourily)	•	
	Framing	Auto		
	GOP Size			
	Intra Refresh			

8. Set up and start a transcoding session with the device of interest to test it.

Obtaining Documentation

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Getting Help

General Support	North America (Toll-Free) 1 (877) 224-5445	
	International 1 (514) 334-5445	
	and choose from the following: Sales - 1, Cloud Services - 3, Support - 4	
Managed Services	U.S. and International 1 (512) 220-3463	
Fax	1 (514) 334-0088	
Support Portal	https://support.haivision.com	
Product Information	info@haivision.com	