Kraken OVA Deployment Guide

Kraken OVA 3.6

This Deployment Guide describes how to deploy Haivision's Kraken H.264/HEVC Video Encoder/ Transcoder within a virtual environment from an Open Virtual Appliance (OVA) file.

🕕 Note

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.

As of release 3.2, Kraken supports capture and encoding of SDI input using SFP SDI->IP gateway devices, specifically Embrionix SDI-SFP devices.

The minimum disk space requirement for Kraken VMs is 250 GB.



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).

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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

								root@10.66.13	31.129 - He	lp v l	Q Search	
Navigator 🗆	localhost.haivision.com - Mana	ige										
Host	System Hardware Lice	ensing	Packages S	ervices	Security & users							
Manage Monitor	PCI Devices	🚑 Т	Toggle passthrough	/ Conf	figure SR-IOV 🛛 🚯 Rel	boot host C Refresh				Q Sear	ch	
Virtual Machines	Power Management		Address ~	Descrip	otion			~	SR-IOV	~ Pa	ssthrough	~
Networking			0000:00:00.0	Intel Co	prporation Xeon E3-120	0 v5/E3-1500 v5/6th Gen (Core Processor Host Bridg	e/DRAM Regi	Not capable	No	t capable	~
			0000:00:02.0	Intel Co	propration Iris Pro Grap	hics P580			Not capable	Ac	tive	
		□	0000:00:08.0	Intel Co	prporation Xeon E3-120	0 v5/v6 / E3-1500 v5 / 6th/	7th Gen Core Processor G	aussian Mixt	Not capable	Di	sabled	
			0000:00:14.0	Intel Co	orporation Sunrise Point	t-H USB 3.0 xHCI Controlle	er		Not capable	No	t capable	
			0000:00:14.2	Intel Co	orporation Sunrise Point	t-H Thermal subsystem			Not capable	No	t capable	
			0000:00:16.0	Intel Co	orporation Sunrise Point	t-H CSME HECI #1			Not capable	No	t capable	
			0000:00:17.0	Intel Co	orporation Sunrise Point	t-H AHCI Controller			Not capable	No	t capable	
			0000:00:1c.0	Intel Co	orporation Sunrise Point	t-H PCI Express Root Port	#1		Not capable	No	t capable	
		Ц.	0000:01:00.0	Intel Co	orporation I210 Gigabit I	Network Connection			Not capable	Di	sabled	
			0000:00:1c.1	Intel Co	orporation Sunrise Point	t-H PCI Express Root Port	#2		Not capable	No	t capable	
		<u> </u>	0000:02:00.0	Blackm	agic Design DeckLink N	vicro Recorder			Not capable	Ac	tive	
			0000:00:1c.2	Intel Co	orporation Sunrise Point	t-H PCI Express Root Port	#3		Not capable	No	t capable	- 1
			0000:03:00.0	Conexa	ant Systems, Inc. CX23	885 PCI Video and Audio I	Decoder		Not capable	Ac	tive	
			0000:00:1f.0	Intel Co	orporation Sunrise Point	t-H LPC Controller			Not capable	No	t capable	
		.	0000:00:11.2	Intel Co	orporation Sunrise Point	I-H PMC			Not capable	No	t capable	~
	🗐 Recent tasks											
	Task	~ Ta	arget	~	Initiator ~	Queued ~	Started v	 Result 			 Complete 	ed 🔻
	Refresh Network System	lo	calhost.haivision.com		dcui	12/31/2008 19:25:35	12/31/2008 19:25:35	Completed :	successfully		12/31/2008	19:25:35
	Auto Start Power On	lo	calhost.haivision.com		root	12/31/2008 19:25:07	12/31/2008 19:25:07	Completed a	successfully		12/31/2008	19:25:07

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]

					om - Manage	.dev.haivision.co	🔋 localhost		Navigator
		inty & usors	Service	Packages	Licensing	Hardware	System		📱 Host
Networks	Matematic	Leie E BRU Basister	Lucio	0000-17-1-0	1.0				Manage
rvot capable	Not capable	Lake-E PCU Registers	Intel Cor	0000:17:1e.2		005	PCI Devi		Monitor
Not capable	Not capable	Lake-E PCU Registers	Intel Cor	0000:17:16.3		anagement	Power M	2	Virtual Machines
Not capable	Not capable	Lake-E PCU Registers	Intel Cor	0000:17:1e.4				_	• 🝈 k-187
Not capable	Not capable	Lake-E PCU Registers	Intel Cor	0000:17:1e.5					Monitor
Not capable	Not capable	Lake-E PCU Registers	Intel Cor	0000:17:1e.6					More VMs
Not capable	Not capable	Lake-E PCI Express Root Port A	Intel Cor	0000;3a:00.0					Storage
Active	Not capable	3P107GL High Definition Audio Controller	NVIDIA	0000:3b:					Networking
Active	Not capable	3P107GL [Quadro P400]	NVIDIA	0000:3b:				_	-
Not capable	Not capable	Lake-E VT-d	Intel Cor	0000;3a:05.0					
Not capable	Not capable	Lake-E RAS Configuration Registers	Intel Cor	0000:3a:05.2					
Not capable	Not capable	Lake-E IOxAPIC Configuration Registers	Intel Cor	0000:3a:05.4					
Not capable	Not capable	Lake-E Integrated Memory Controller	Intel Cor	0000:3a:08.0					
284 items 🦼		σ		uick filters	Q				
						sks	🛐 Recent ta		
 Completed • 		Queued ~ Started ~ Result .	~ Initiat		 Target 		Task		
	_	v Queued v Started v Result *	~ Initiat	uick fiters	~ Target	sks	E Recent ta Task		

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.)

 4 Deployment options 5 Ready to complete 	Network mappings Disk provisioning Power on automatically	bridged VM Network © Thin O Thick
	Disk provisioning Power on automatically	
	Power on automatically	
	-0	
vm ware [.]		

- 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 uploa	d to the appliance.

D New Virtual machine - Kraken 5.0-7	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	
6 Additional settings	
7 Ready to complete	
	Extracting OVA, this could take some time
viiivare	
	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).

To Algorithm Spring France to Ntol/218.06.131.135
CESC> to refresh

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

🕕 Note

For GPU devices that require 16GB or above of memory, the virtual machine must boot in EFI or UEFI mode for correct GPU use. A Kraken OVA that supports EFI boot is required to create an EFI-bootable Kraken VM. (If you import a Kraken OVA that supports EFI boot, the Boot Options->Firmware field is set to EFI automatically.)

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 Actions \rightarrow Edit Settings \rightarrow VM Options.

rtual Hardware VM Options	
General Options	VM Name: Kraken3.6r184
VMware Remote Console Options	Lock the guest operating system when the last remote user disconnects
VMware Tools	Expand for VMware Tools settings
Power management	Expand for power management settings
Boot Options	Expand for boot options
Advanced	
Settings	Disable acceleration Enable logging
Debugging and statistics	Run normally ~
Swap file location	 Default Use the settings of the cluster or host containing the virtual machine. Virtual machine directory Store the swap file in the same directory as the virtual machine. Datastore specified by host Store the swap files in the datastore specified by the host to be used for swap files. If not possible, store the swap files in the same directory as the virtual machine. Using a datastore that is not visible to both hosts during vMotion might affect the vMotion performance for the affected virtual machines.
Configuration Parameters	Edit Configuration
Latency Sensitivity	Normal
Fiber Channel NPIV	Expand for fiber channel NPIV

3. Expand Advanced, select Configuration Parameters and then +Add Parameter.

4. Add the following parameter: svga.vgaonly = "TRUE"

		/		
Add parameter 🗙 Delete parameter		(Q Search	
Key	~	Value		~
hypervisor.cpuid.v0		FALSE		
sched.mem.pin		TRUE		
/mware.tools.internalversion		2147483647		
mware.tools.requiredversion		10341		
nigrate.hostLogState		none		
nigrate.migrationId		0		
nigrate.hostLog		./Kraken3.6r184-7794bf4e.hlog		
svga.vgaonly		TRUE		
				53 items
			OX	Cancel

🕕 Note

Adding svga.vgaonly = "TRUE" as a configuration parameter improves stability for Kraken instances with GPU passthrough enabled.

5. 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 netw	ork adapter 🛛 🚊 Add other der	rice			_	^
CPU	8 🔻 🚺					
- Memory						
RAM	4096 MB					
Reservation	4096	•	MB			
	Reserve all guest me	mory (All	locked)			
Limit	Unlimited	•	MB	•		
Shares	Normal					
Memory Hot Plug	Enabled					
Hard disk 1	73.242187 08				0	~

Intual Hardware VM Options]			
Hard disk 2	9.765625 GB *			0
SCSI Controller 0	LSI Logic Parallel	•		0
New USB controller	USB 2.0	•		0
WE Network Adapter 1	VM Network	• 🗹 Con	nect	0
CD/DVD Drive 1	Host device	•		0
Wideo Card	Specify custom settings	•		
New PCI device	Iris Pro Graphics P580 - 0000:00:02.0		•	0
New PCI device	DeckLink Micro Recorder - 0000:02:00.0			0
III New PCI device	CX23885 PCI Video and Audio Decoder - 0	000-03-00.0	•	0
EIII New USB device	Blackmagic design DeckLink Micro Record			0

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 v	virtual ma	ichine)				
Virtual Hardware VM Options						
🔜 Add hard disk 🛛 🎫 Add network	adapter	Add other device				
CPU	8	CD/DVD drive				
		Floppy drive				
Memory	819	🔤 Serial port	-			
Hard disk 1	73.2	Parallel port				8
Hard disk 2		🖶 USB controller				
	9.76	📷 USB device				8
SCSI Controller 0	LSI	Sound controller	~			\otimes
Metwork Adapter 1	VM	Terrice PCI device	~	Connect		\otimes
▶ 🛄 Video Card	Spe	SCSI controller				
Image: PCI device 1					~	8
					Save	Cancel

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

F 🔲 CPU	2 🗸 🚺			
Memory	4096 MB	~		
Hard disk 1	73.242187 GB	~		0
Hard disk 2	9.765625 GB	~		0
SCSI Controller 0	LSI Logic Parallel		Y	0
Network Adapter 1	VM Network		Connect	0
GD/DVD Drive 1	Host device		Connect	\odot
Video Card	Specify custom settings		~	
New PCI device	GP107GL [Quadro P400] - 0000:3b:00.0	~	0
New PCI device	GP107GL [Quadro P400] - 0000:d8:00.0	~ ·	0

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

Add hard disk 🕅 Add neb	work adapter 🛛 🗎 Add other dev	ce			_	1
CPU	8 🔻 🚯	8 -				
- Memory						
RAM	4096 MB	•				
Reservation	4096		MB	•		
	Reserve all guest me	Reserve all guest memory (All locked)				
Limit	Unlimited	•	MB			
Shares	Normal			Ψ.		
Memory Hot Plug	Enabled	Enabled				
+ And disk 1	73.242187 08				0	`

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

💠 Add parameter 🔀 Delete parameter	Q Search	
Key	Value	~
sched.cpu.latencySensitivity	normal	ſ
pciPassthru0.id	00000:000:02.0	
pciPassthru0.deviceId	0x1912	
pciPassthru0.vendorld	0x8086	
pciPassthru0.systemId	5abd29b1-1a5f-23d4-c30e-847bebcf61b4	
tools.guest.desktop.autolock	FALSE	
pciBridge0.present	TRUE	
svga.present	TRUE	
	53 i	tems

hypervisor.cpuid.v0 = "FALSE"

Configuration Parameters	
💠 Add parameter 🛛 🗙 Delete parameter	Q Search
Key ~	Value ~
guestinfo.vmtools.buildNumber	15389592
guestinfo.appInfo	{ "version":"1", "updateCounter":"570", "publishTime":
vmware.tools.internalversion	11269
vmware.tools.requiredversion	10341
migrate.hostLogState	none
migrate.migrationId	0
migrate.hostLog	./Kraken3.6r191-7794bf6c.hlog
hypervisor.cpuid.v0	FALSE
	53 items
	OK Cancel

svga.vgaonly = "TRUE"

💠 Add parameter 🛛 🗙 Delete parameter	Q Search
Key ~	Value ~
hpet0.present	TRUE
ethernet0.pciSlotNumber	33
nvram	Kraken3.6r191.nvram
virtualhw.productcompatibility	hosted
svga.vgaonly	TRUE
numa.autosize.cookie	40001
numa.autosize.vcpu.maxPerVirtualNode	4
sched.swap.derivedName	/vmfs/volumes/5abd3449-da641d8c-3b52-847bebcf6
	53 items

🕕 Note

Adding svga.vgaonly = "TRUE" as a configuration parameter improves stability for Kraken instances with GPU passthrough enabled.

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.

'	Haivision Kraken 艬
Pa	
	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 🏤		Welcome haiadmin (Sign out)	0 🔅 0
Licensing			Save Settings
Accounts	Haivision Kraken		
Certificates	License expires on 12/0	1	
Events	Product	Kraken 3.2.0	
Licensing	MAC Address	00:30:64:18:D5:7A	
Network	Instance UUID	564D7AB8-9323-D6B3-67B5-A04797080391	
Presets	CPU ID	E3 06 05 00 FF FB AB 0F	
REST API			
Status	License Features		
Update	the second a structure of the sta		
	Upgrade Version Limit	3.2	
	HEVC video encoder		
	ST2110 Input		
	KLV option		
	HD H.264 streams allowed		
	Active stream load	0%	
	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 $\ensuremath{\text{New}}$ 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. Select the Source, as applicable for your system, for example, "DeckLink Micro Recorder 1", "Analog Capture 1" or ST2110.

Inputs	New Input		
GENERAL SETTINGS Streams	Parameters		
Inputs			
Transcoders	Name		
Outputs	Source	TS over UDP	
Metadata		TS over UDP	
	URL -	TS over SRT	e.g. udp://239.100.100.100:5000
Source Specific Multicast		RTSP RAW Motion JPEG	e.g. 192.168.1.220
	Network Interface	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.

Parameters		
Transcoder Name		
Encoder	Software	
	Software	
Format	Hardware (QSV)	
Video Bitrate		
Resolution	Auto (Detect Continuously)	
KLV Metadata		
Frame Rate	Auto (Detect Continuously)	
Framing	Auto	
GOP Size		
Intra Refresh		
	Parameters Transcoder Name - Encoder Format Video Bitrate Resolution KLV Metadata Frame Rate Framing GOP Size Intra Refresh	Parameters Transcoder Name Encoder Software Software Format Video Bitrate Resolution KLV Metadata Check this box to pars throu Frame Rate GOP Size Intra Refresh

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

Appendix A: Provisioning Embrionix SFP Gateways

This topic explains how to prepare the Embrionix SFP to ingest raw video and output IP streams. Following is a summary of the setup steps to route data from the SFP device to Kraken:

- 1. Assign an IP address to the SFP device.
- 2. Set up the video flow (see following sections):
 - Provisioning the Embrionix SFP Device EMOPT-2E-2110-E Using the Embrionix UI
 - Provisioning the Embrionix SFP Device EMOPT-2E-2110-E Using Curl
- 3. Set up the input (Kraken Web Interface, see Configuring Inputs in the Kraken User's Guide).

Provisioning the Embrionix SFP Device EMOPT-2E-2110-E Using the Embrionix UI

- Recommended to use emSET Version 4.00 Software. emSET is a server/client software that can be run on Windows or Linux platforms. The server software can be installed on one PC, and multiple instances of clients can connect to the server remotely or locally via an internet browser. The software discovers Embrionix IP products and provides full access to configure, control and monitor each device. See https://www.embrionix.com/product/emSET.
- Recommended to use Windows 7 or 10.
- Code and documentation: https://app.box.com/s/h7leewkbvcpsis21raugp0dxbqzpou3i
- EmbUI (User Interface for interacting and configuring Embrionix SFPs) is included in the package.
- The Hosting Ethernet board IP address is used as the Gateway on the Embrionix SFP.
- Flows must be configured with the Ethernet host board IP as the gateway. Port 20000 is used by default (for video) but can be configured to other valid values via the EmbUI. Audio uses port 20001 and Ancillary uses port 20002 (future use).
- The Embrionix SFP IP address and HTTP port used for the provisioning must be provided to the Kraken Web Interface. The program will retrieve the internal Embrionix routing information and flow settings and start the captures.

Following is an example of the provisioning of an Embrionix device:

Hosted by:

- Ethernet controller: Intel Corporation 82599ES 10-Gigabit SFI/SFP+ Network Connection inet 10.0.2.100 netmask 255.255.255.0 broadcast 10.0.2.255
- Embrionix settings:

At the device level:

```
curl -X GET 10.0.2.105:80/emsfp/node/v1/self/information/
"emsfp_version": "A2xx",
"type": "3 - 2110 Encapsulator","asic_slot_00": "0x000003bb","asic_slot_01":
```

At the port level:

```
"local_mac":"40:a3:6b:a0:9a:8c"
"ip_addr":"10.0.2.105"
"subnet mask":"255.255.255.0"
```

"gateway":"10.0.2.100" "hostname":"emsfp-xx-xx-xx" "port":"80"

At the flow level:

```
"src_ip_addr":"10.0.2.105"
"src_udp_port":"10000"
"dst_ip_addr":"10.0.2.100"
"dst_udp_port "20000"
"dst_mac":"00:1b:21:be:ff:9c"
```

Provisioning the Embrionix SFP Device EMOPT-2E-2110-E Using Curl

First, locate the MAC address of the SFP labeled on the SFP device. For example, 40:A3:58:A0:7A:0E-0F

Configuration is done via the default IP address extracted from the last 3 digits of the MAC and fix digit 1.

To obtain this Control IP address, you need to do the following steps;

- 1. From the device MAC address visible on the emSFP i.e. 40:A3:6B:A0:39:40-41
- 2. Only use the last 3 Bytes: A0:39:40 (note the -41 is for the second port, not used for provisioning)
- 3. Convert each byte from Hexadecimal (HEX) to Decimal (DEC).
 - A0=160
 - 39=57
 - 40=64
- 4. The control IP address will then be formed the following way:.

Fix digit (10).3rd Last byte of MAC in DEC(160).2nd last byte of MAC in DEC(57).Last byte of MAC in DEC(64).

So 10.160.57.64.

See "emSET Version 4.00 Software User guide emSET-UG01-400" Chapter 3.4 for details.

Once you can ping the SFP via the hosting NIC card, you can configure it via this command:

curl -X PUT -d '{"ip_addr":"your.new.sfp.ip" "subnet_mask":"255.255.255.0"
"gateway":"your.gate.way.ip"}' 10.160.57.64.:80/emsfp/node/v1/self/ipconfig

The SFP should reboot and you will lose connection (curl: (56) Recv failure: Connection reset by peer).

When it comes back, enter this command:

curl -X GET your.new.sfp.ip:80/emsfp/node/v1/self/ipconfig

You should get back something in the form of:

{"version":"1","local_mac":"40:A3:6B:A0:39:40","ip_addr":"your.new.sfp.ip","subnet_mask
":"255.255.255.0","gateway":"your.gate.way.ip","hostname":"emsfpa0-39-40","port":"80","dhcp_enable":"1","alias_ip":"0.0.0.0","alias_ip_subnet":"0.0.0.0
","ctl_vlan_id":"0","ctl_vlan_pcp":"0","ctl_vlan_enable":"0","data_vlan_id":"0","data_v
lan_enable":"0","bootstatus1":"005","bootstatus2":"000"} (

Then configure the video flow output:

```
curl -X PUT -d '{"dst_ip_addr":"dest.host.add.ip" "dst_mac":"dest.host.mac.add"}'
your.new.sfp.ip:80/emsfp/node/v1/flows/a04f66a2-9910-11e5-8894-feff819cdc9f/
```

dest.host.add.ip in the form 10.0.0.124

dest.host.mac.add in the form 38:d5:47:e2:79:a5

Validate the flow traffic:

```
curl -X GET your.new.sfp.ip:80/emsfp/node/v1/flows/a04f66a2-9910-11e5-8894-
feff819cdc9f/
```

The response will be in the form of:

```
{"version": "2","label": "st2110 flow","id": "a04f66a2-9910-11e5-8894-
feff819cdc9f","source_id": "a0008e96-990d-11e5-8994-feff819cdc9f","type": "3","name":
"tx_flow0","network":
{"src_ip_addr":"your.new.sfp.ip","src_udp_port":"10000","dst_ip_addr":"dest.host.add.ip
","dst_udp_port":"20000","dst_mac":"dest.host.mac.add","vlan_tag":"0","ssrc":"0","pkt_c
nt":"1516032","rtp_pt":"96","ttl":"64","dscp":"0","enable":"1"},"format":
{"format_type":"video","sdp_file_url":"10.0.2.105/emsfp/node/v1/sdp/
a04f66a2-9910-11e5-8894-
feff819cdc9f","format_code_valid":"1","format_code_t_scan":"4","format_code_p_scan":"4"
,"format_code_mode":"0","format_code_format":"64","format_code_rate":"6144","format_code
e_sampling":"8192"},"jumbo_frame":"0"}
```

Validate that the pkt_cnt":"1516032" gets updated (input needs to be active).

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