eStreamer eNcore for Microsoft Sentinel 3.6.8

First Published: June 1, 2017
Last Updated: Aug 24 2020

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About This eStreamer eNcore Operations Guide v3.6.8

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Content ID	585637
Project ID	852716

Revision History

Revision	Date	Name or User ID	Comments
1.0	06/01/2017	Michelle Jenkins	Initial Release
3.0	08/25/2017	Sam Strachan	Updated for v3.0
3.5	08/13/2018	Richard Clendenning	Updated for v3.5
3.6.8	08/24/2020	Seyed Khadem	Updated for v3.6.8

Conventions

This document uses the following conventions.

Convention	Indication
bold font	Commands and keywords and user-entered text appear in **bold** font.
italic font	Document titles, new or emphasized terms, and arguments for which you supply values are in *italic* font.
[ ]	Elements in square brackets are optional.
{x | y | z }	Required alternative keywords are grouped in braces and separated by vertical bars.
[x | y | z]	Optional alternative keywords are grouped in brackets and separated by vertical bars.
String	A non-quoted set of characters. Do not use quotation marks around the string or the string will include the quotation marks.
`courier font`	Terminal sessions and information the system displays appear in `courier` font.
< >	Nonprinting characters such as passwords are in angle brackets.
[ ]	Default responses to system prompts are in square brackets.
!, #	An exclamation point (!) or a pound sign (#) at the beginning of a line of code indicates a comment line.

Note: Means *reader take note*. Notes contain helpful suggestions or references to material not covered in the manual.

Caution: **Means *reader be careful.* In this situation, you might perform an action that could result in equipment damage or loss of data.**

Warning: **IMPORTANT SAFETY INSTRUCTIONS**

Means danger. You are in a situation that could cause bodily injury. Before you work on any equipment, be aware of the hazards involved with electrical circuitry and be familiar with standard practices for preventing accidents. Use the statement number provided at the end of each warning to locate its translation in the translated safety warnings that accompanied this device.

SAVE THESE INSTRUCTIONS

Regulatory: Provided for additional information and to comply with regulatory and customer requirements.

1 Introduction

1.1 Document Purpose

This document seeks to outline the background and usage of the eStreamer eNcore client in order to assist users with installation and execution.

1.2 Background

The Cisco Event Streamer (i.e. eStreamer) allows users to stream system intrusion, discovery, and connection data from Firepower Management Center or managed device (i.e., the eStreamer server) to external client applications. eStreamer responds to client requests with terse, compact, binary encoded messages that facilitate high performance.

Historically, the eStreamer SDK has been wrapped with some additional code to create separate Perl applications (e.g., the Cisco eStreamer for Splunk app and the CEF agent).

eStreamer eNcore is a multi-platform, multi-process Python application that is compatible with FMC versions 6.0 and above.

1.3 Application Summary

eNcore is an all-purpose client, which requests all possible events from eStreamer, parses the binary content, and outputs events in various formats to support other SIEMs. eNcore was built from scratch in Python with a scalable and fast multi-process architecture. It supports version 6.0 of Firepower Management Center. It was built and tested on CentOS 7, but should work with any Linux distribution that supports the pre-requisites. The software will run on Windows, although, it has not been made production-ready yet.

There are three packages associated with eStreamer eNcore.

1.3.1 eStreamer-eNcore CLI for Sentinel

This is a command line interface for eStreamer eNcore. It runs standalone to request data from the FMC eStreamer server and output its data. The output data format can be:

- key-value pairs designed to maintain compatibility with previous Splunk collectors
- JSON
- CEF which maintains backwards compatibility with the previous cef-agent.

The output can be streamed to files, a TCP or UDP network port, stdout.

2 eNcore CLI Prerequisites

The CLI version of eNcore can be run on either Python 2.7 or Python 3.6+. You must also have a means of splitting the FMC's PKCS12 file. The default approach is to install pyOpenSSL and let eNcore do the work for you.

Note: The **encore.sh** script should guide you through all these points if you wish to get going immediately, but it is worth being familiar with these points prior to install.

To check whether Python2.7 is present, use following command:

which python

To test where Python2.7 is present, use the following command.

whereis python

Note: If you are installing the CLI version on a device running Splunk, then it is worth noting that Splunk has its own version of Python. The Splunk Python has been compiled differently from the normal distribution – specifically, it is built with PyUnicodeUCS2. The **encore.sh** script will detect this and warn you. If you encounter this problem, then you will need to create a new user and run eStreamer-eNcore as that user. You should consider running the Splunk add on instead.

To check for pyOpenSSL, use the following command:

pip list | grep -i pyOpenSSL

Alternatively using the python3 version will no longer require the pyUnicodeUS4 complication. To access the python3 branch perform the following

git checkout python3

2.1 Python 2.7 Installation

Use the following command to install Python on CentOS:

sudo yum install python

2.2 pyOpenSSL

Install pyOpenSSL as follows:

sudo yum install python-pip python-devel openssl-devel gcc
sudo pip install pyOpenSSL

If using python3 branch then run the following

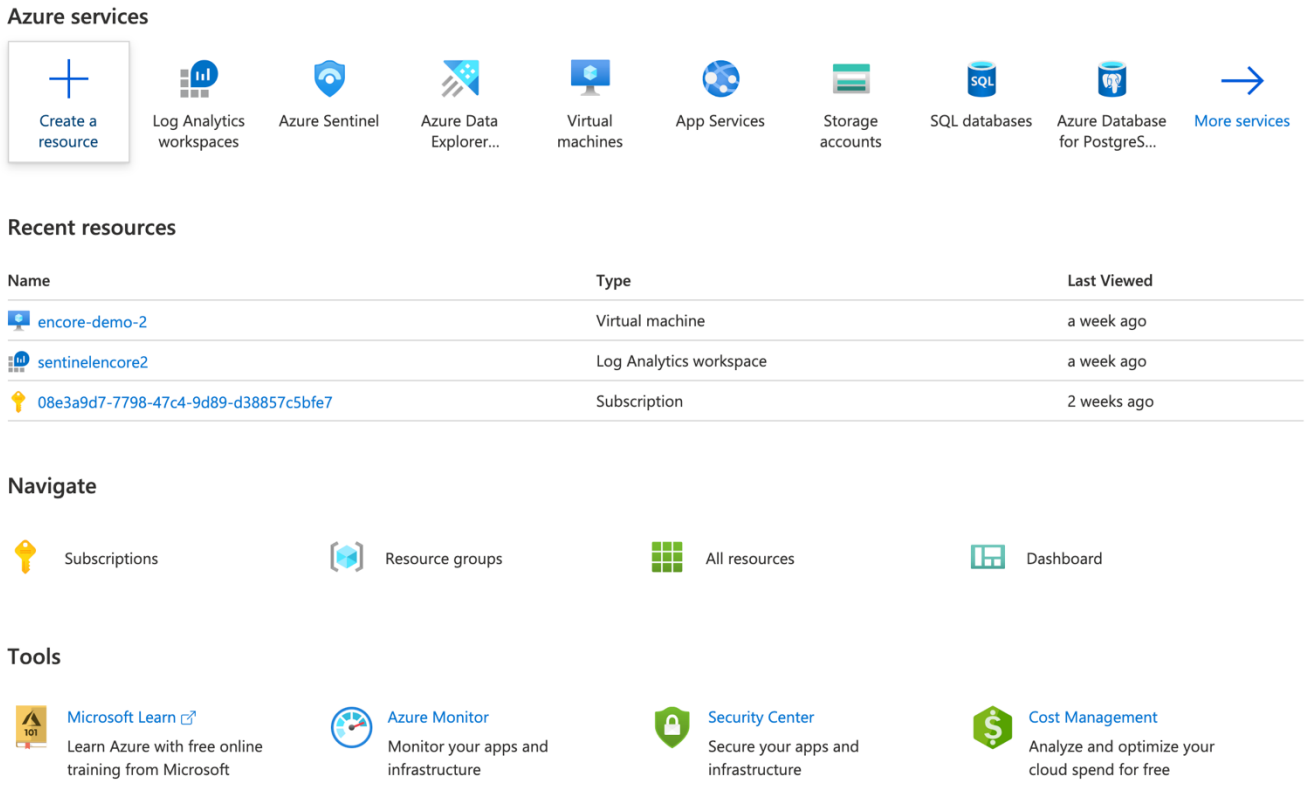
sudo pip3 install pyOpenSSL

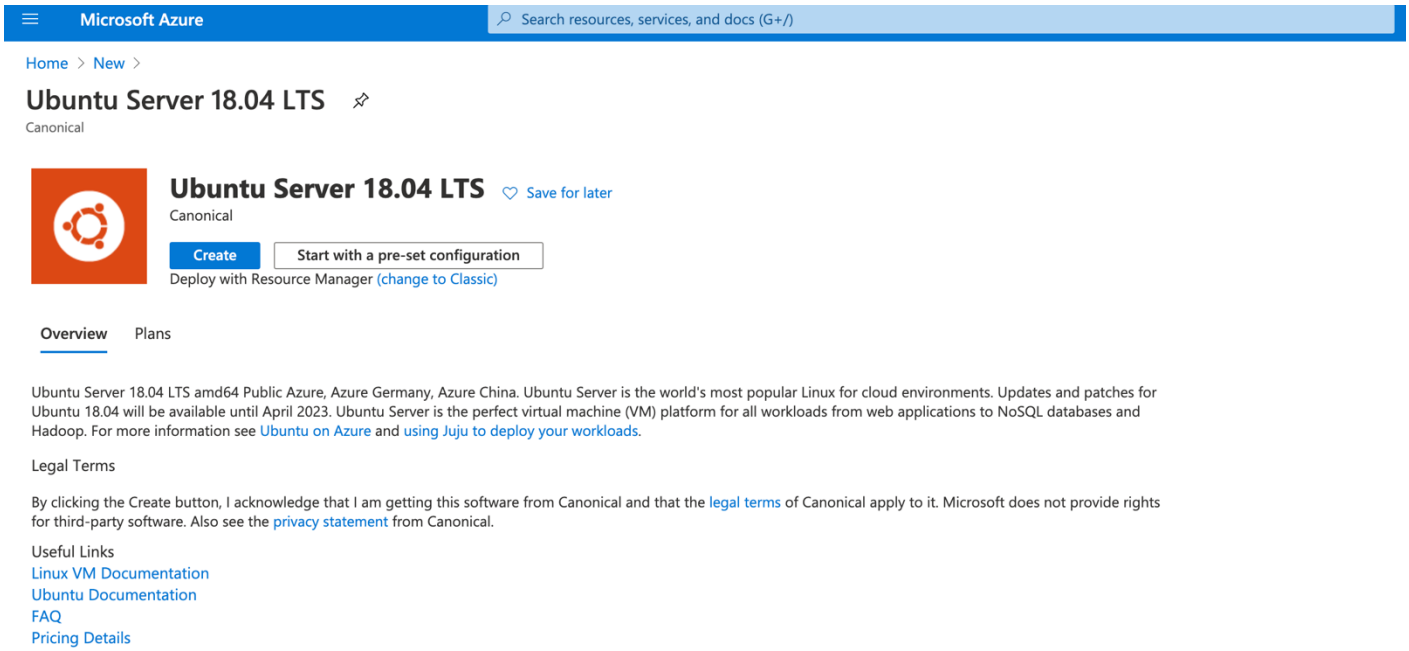
2.3 EPEL Repo Dependency for RHEL

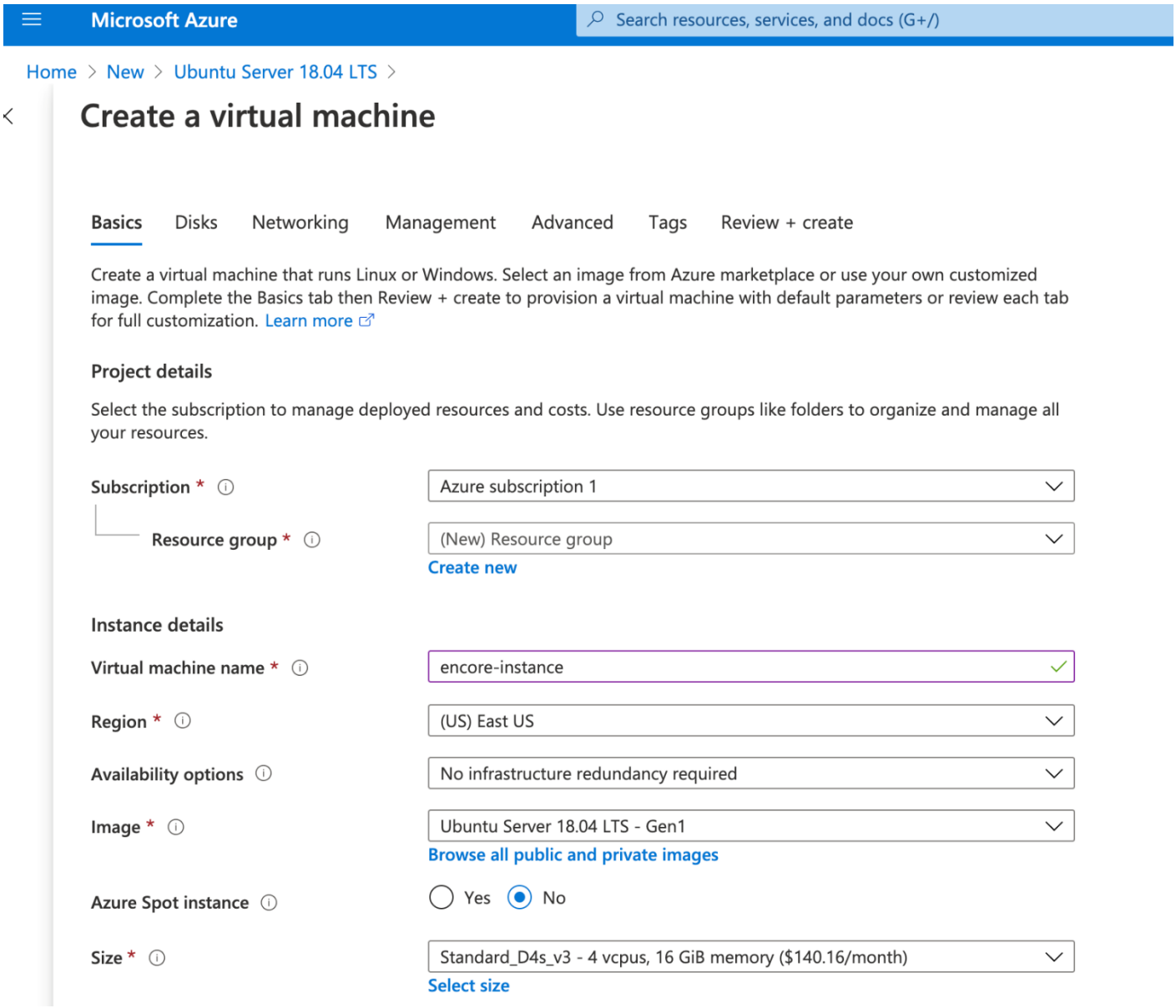
If you are having problems installing these packages, then you may need to enable the EPEL repository. Instructions for installing and enabling the EPEL repository are available on the World Wide Web.

2.4 Running eNcore CLI on Azure

Create a new Linux resource such as Ubuntu 18.04 LTS:




Microsoft Azure
Search resources, services, and docs (G+/)
Home > New >
Ubuntu Server 18.04 LTS
Canonical
Ubuntu Server 18.04 LTS
Save for later
Canonical
Create
Start with a pre-set configuration
Deploy with Resource Manager (change to Classic)
Overview
Plans
Ubuntu Server 18.04 LTS amd64 Public Azure, Azure Germany, Azure China. Ubuntu Server is the world's most popular Linux for cloud environments. Updates and patches for Ubuntu 18.04 will be available until April 2023. Ubuntu Server is the perfect virtual machine (VM) platform for all workloads from web applications to NoSQL databases and Hadoop. For more information see Ubuntu on Azure and using Juju to deploy your workloads.
Legal Terms
By clicking the Create button, I acknowledge that I am getting this software from Canonical and that the legal terms of Canonical apply to it. Microsoft does not provide rights for third-party software. Also see the privacy statement from Canonical.
Useful Links
Linux VM Documentation
Ubuntu Documentation
FAQ
Pricing Details


Microsoft Azure
Search resources, services, and docs (G+/)
Home > New > Ubuntu Server 18.04 LTS >
Create a virtual machine
Basics
Disks
Networking
Management
Advanced
Tags
Review + create
Create a virtual machine that runs Linux or Windows. Select an image from Azure marketplace or use your own customized image. Complete the Basics tab then Review + create to provision a virtual machine with default parameters or review each tab for full customization. Learn more
Project details
Select the subscription to manage deployed resources and costs. Use resource groups like folders to organize and manage all your resources.
Subscription *
Azure subscription 1
Resource group *
(New) Resource group
Create new
Instance details
Virtual machine name *
encore-instance
Region *
(US) East US
Availability options
No infrastructure redundancy required
Image *
Ubuntu Server 18.04 LTS - Gen1
Browse all public and private images
Azure Spot instance
Yes
No
Size *
Standard_D4s_v3 - 4 vcpus, 16 GiB memory ($140.16/month)
Select size

Administrator account

Authentication type ⓘ — (•) SSH public key ( ) Password

ⓘ **Azure now automatically generates an SSH key pair for you and allows you to store it for future use. It is a fast, simple, and secure way to connect to your virtual machine.**

Username * ⓘ — azureuser ✓

SSH public key source — Generate new key pair ⌄

Key pair name * — encore-instance_key ✓

Inbound port rules

Select which virtual machine network ports are accessible from the public internet. You can specify more limited or granular network access on the Networking tab.

Public inbound ports * ⓘ — ( ) None (•) Allow selected ports

Select inbound ports * — SSH (22) ⌄

⚠ **This will allow all IP addresses to access your virtual machine.** This is only recommended for testing. Use the Advanced controls in the Networking tab to create rules to limit inbound traffic to known IP addresses.

Review + create | < Previous | Next : Disks >

Home > New > Ubuntu Server 18.04 LTS > Create a virtual machine >

Select a VM size

Search by VM size... | Display cost : **Monthly** | vCPUs : **8-16** | RAM (GiB) : **16-32** | Family : **2 selected** | Add filter

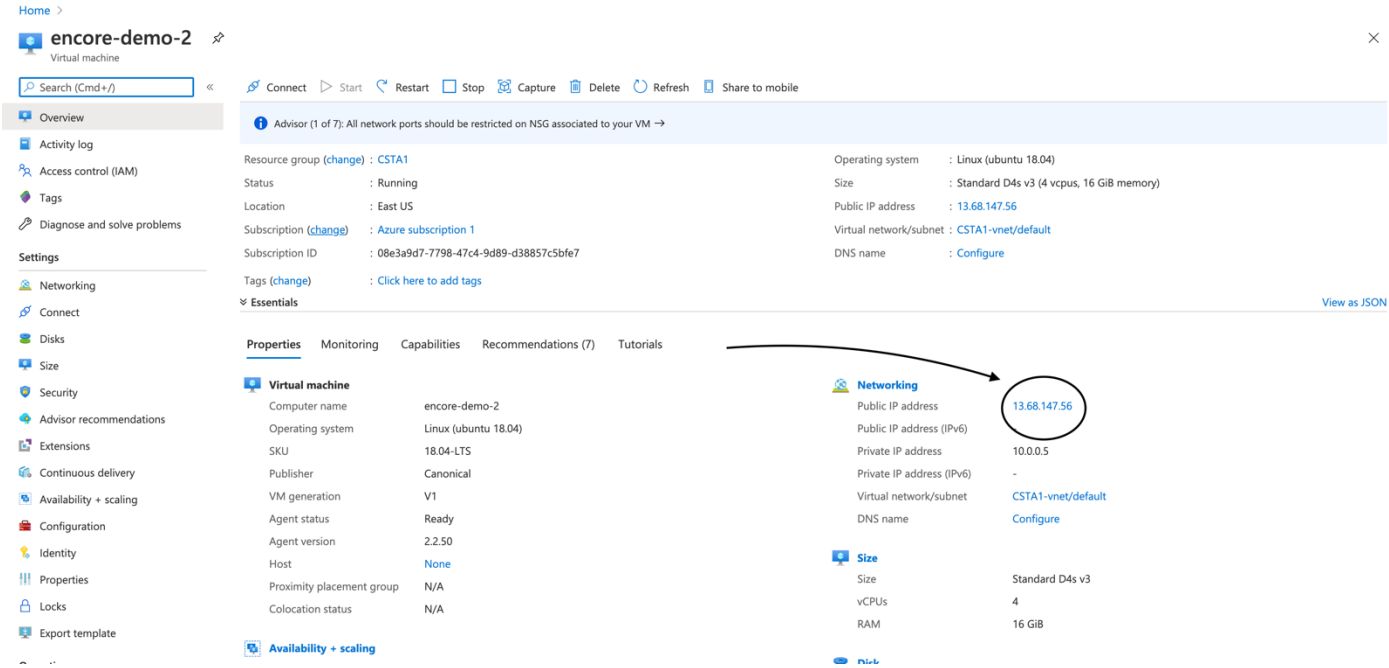
Most used sizes by Azure users

Showing 6 of 363 VM sizes. | Subscription: Azure subscription 1 | Region: East US | Current size: Standard_D4s_v3 | Image: Ubuntu Server 18.04 LTS | Learn more about VM sizes

VM Size	Family	vCPUs	RAM (GiB)	Data disks	Max IOPS	Temp storage (GiB)	Premium disk	Cost/month
F8s	Compute optimized	8	16	32	25600	32	Supported	$290.54
F16s	Compute optimized	16	32	64	51200	64	Supported	$581.08
F8	Compute optimized	8	16	32	32x500	128	Not supported	$290.54
F16	Compute optimized	16	32	64	64x500	256	Not supported	$581.08
F8s_v2	Compute optimized	8	16	16	12800	64	Supported	$246.74
F16s_v2	Compute optimized	16	32	32	25600	128	Supported	$494.21

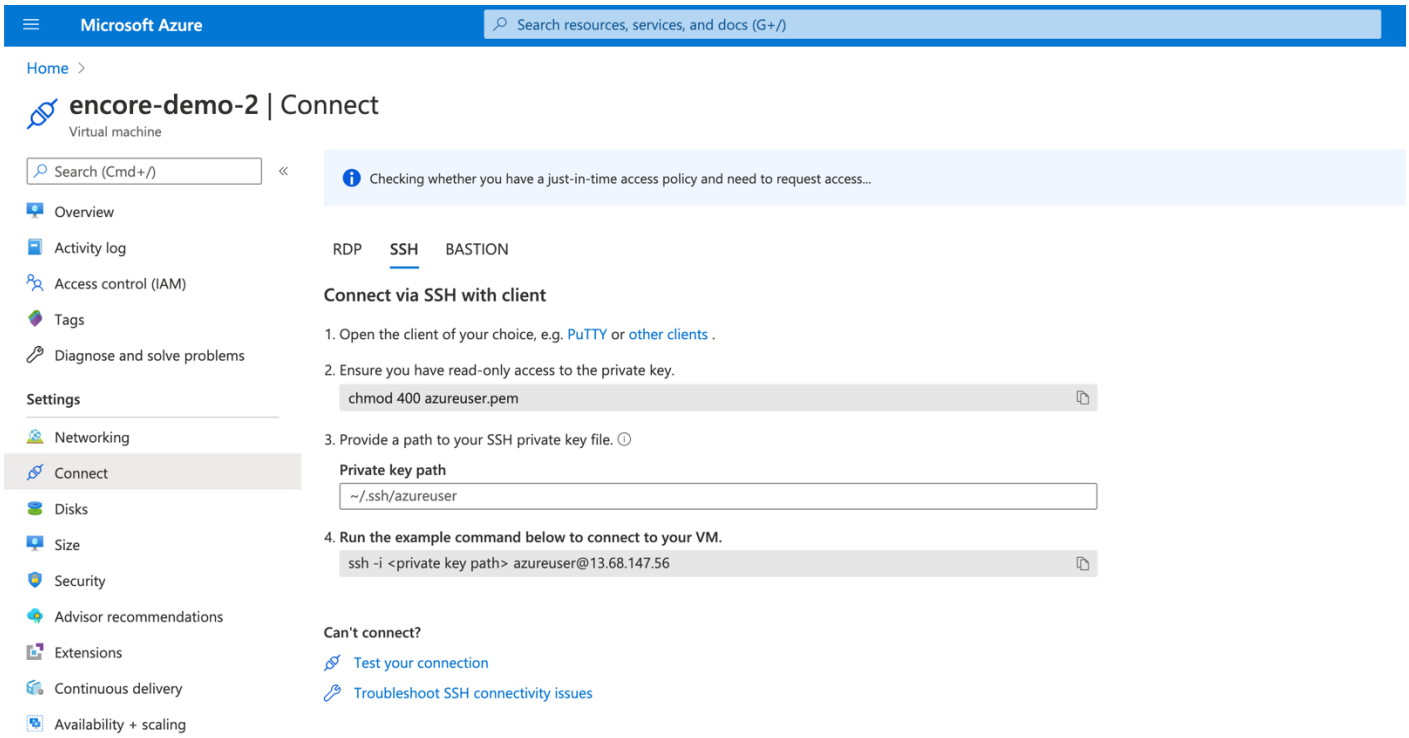
Assign CPU(s) to the Virtual Instance. eNcore CLI can support up to 12 threads, we recommend 8-16 cores compute optimized, eNcore CLI can support up to 7k events/second using 16 CPU F16s_v2 option. Scale according to expected volume of your organization, the minimum recommended number of CPUs is 4 for low volume (>500 ev/sec) operations.

Name your instance and download the pem certificates

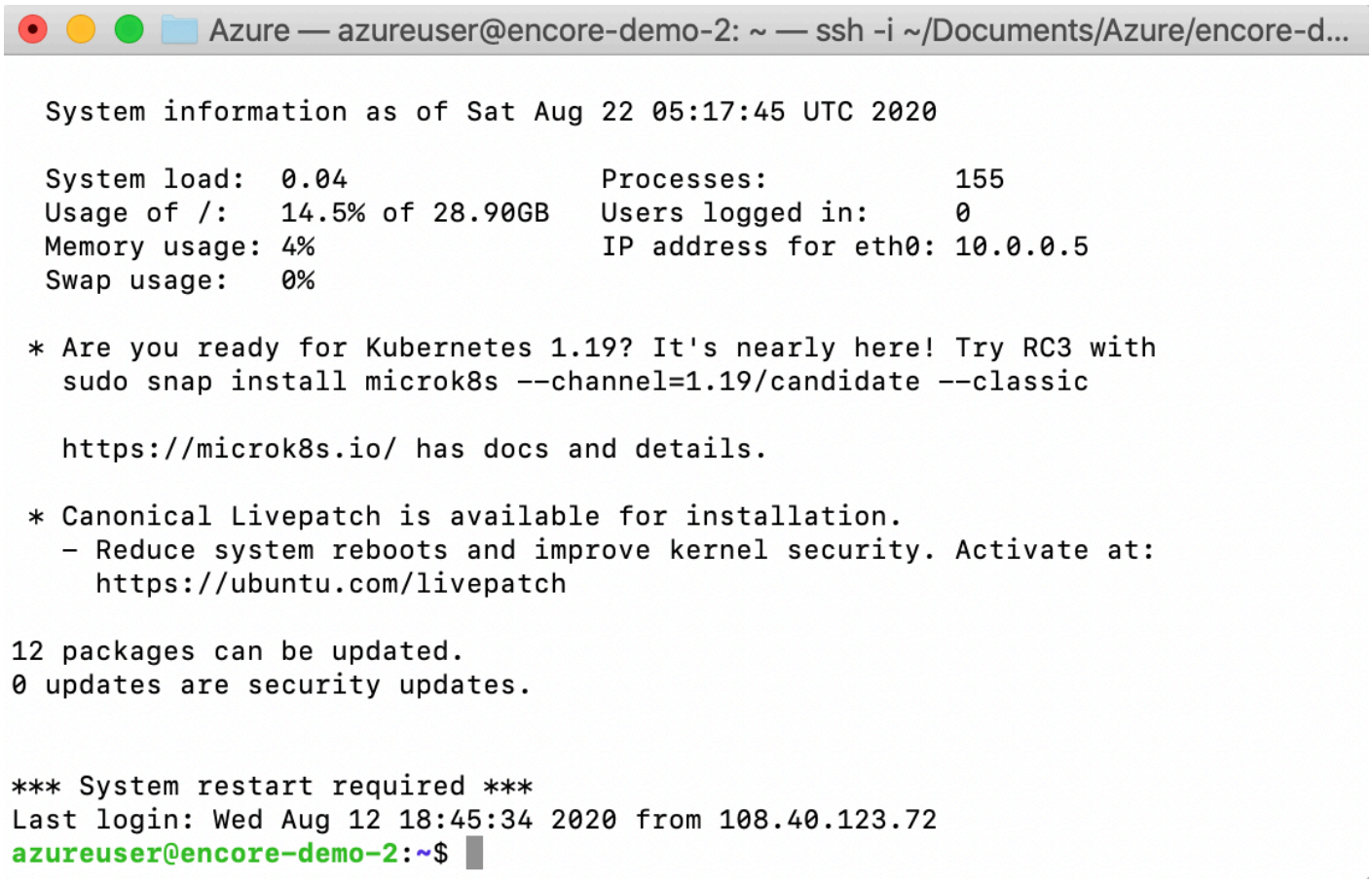


Make note of the Public IP assigned to your instance, you will use this to create a certificate in the FMC eStreamer

Connect to the Command Line version of your instance using the pem file. Now you are ready to proceed with the installation. Azure also has a shortcut to enable a quick command line connection.



ssh -I <private key path> azureuser@<public ip>



2.5 Running eNcore CLI on Windows

Warning: **Windows is not yet supported for production execution. If, however, you wish to attempt an install for the CLI version, then you will need to run the following commands.**

pip install pyOpenSSL
pip install win-inet-pton

3 Installing eStreamer eNcore CLI

3.1 Build the eNcore Client from Source

Use the following command to copy the file from your local machine to the target device:

git clone https://github.com/CiscoSecurity/fp-05-microsoft-sentinel-connector.git

The project can also be downloaded to zip or

3.3 Create (or copy existing) PKCS12 file

See Appendix A for instructions on how to create a PKCS12 file in the FMC and download it.

3.4 Install the PKCS12 File

Use the following command to securely copy the pkcs12 file to the eNcore CLI installation.

scp -i /path/to/pem/encore-demo-2_key.pem /local/path/<public ip>.pkcs12 azureuser@<Public Ip>:/tmp/

Copy the certificate from /tmp to the runtime path of the git project

cp /tmp/client.pkcs12 ~/fp-05-firepower-cef-connector-arcsight

3.6.8 Test

Change the working directory to /using the following command:

cd ~/fp-05-firepower-cef-connector-arcsight

Then, run the encore shell script – you will be guided through any additional configuration:

./encore.sh test

The script will verify that you have the pre-requisites installed, notably:

- Python 2.7, Python 3.6+ requires “python3” branch from git
- the correct build of Python
- pyOpenSSL
- a client.pkcs12 file
- a valid host
- It will prompt you to choose whether to output data for Splunk, CEF or JSON, in this guide we use the CEF outputter, however future versions may use JSON or other custom formats on depending on the Sentinel Connector being used

If there are any missing items, you will be presented with an explanation. An example explanation is in the following figure.

Figure 1. Choosing your output

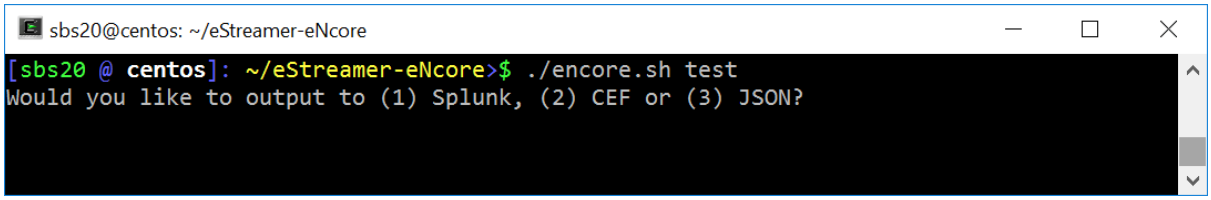
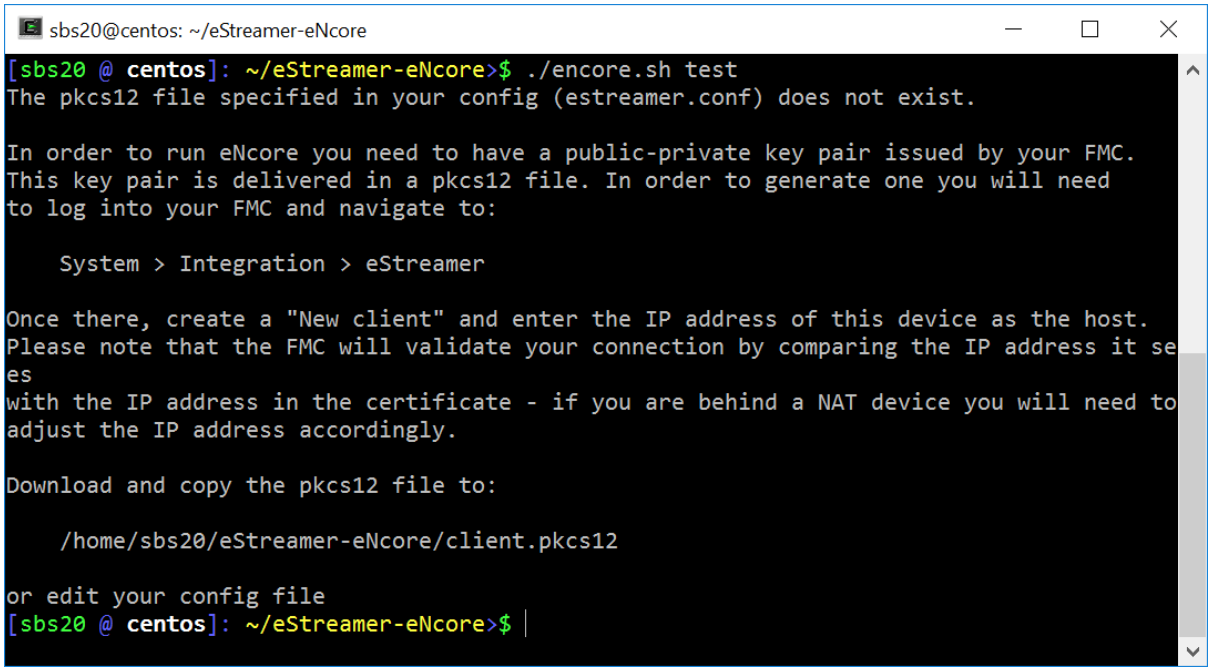


Figure 2: Missing pkcs12 File



You will then be prompted to enter the IP / FQDN of the FMC and the PKCS12 file password.

Figure 3: Enter Password

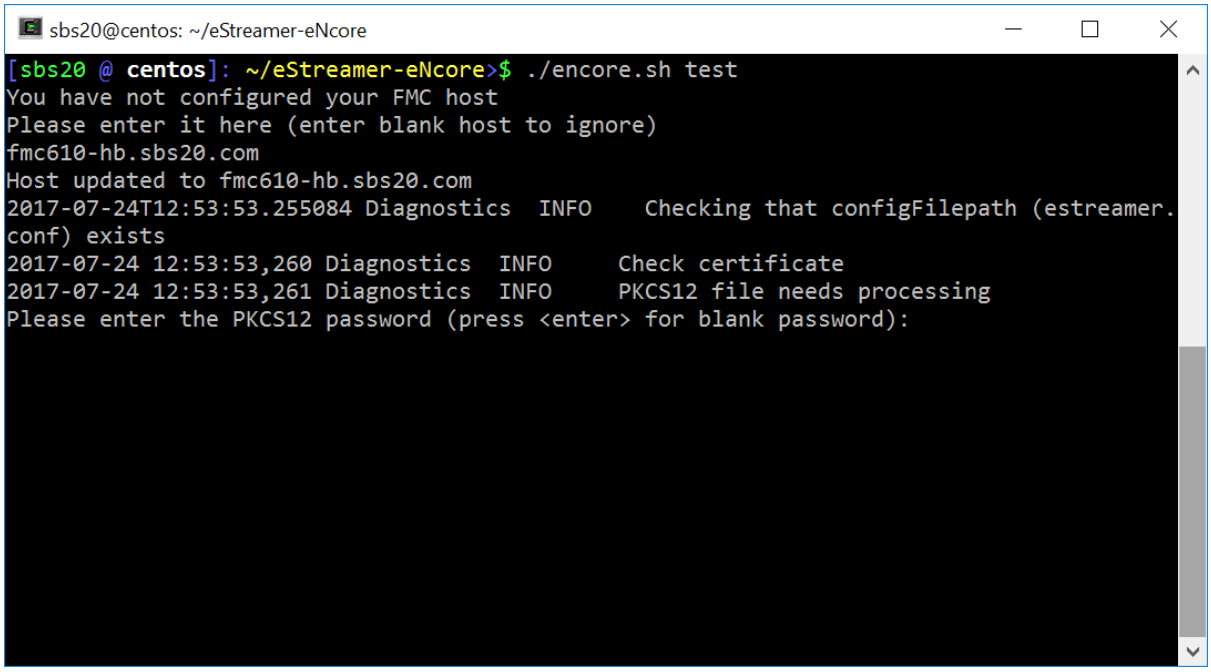
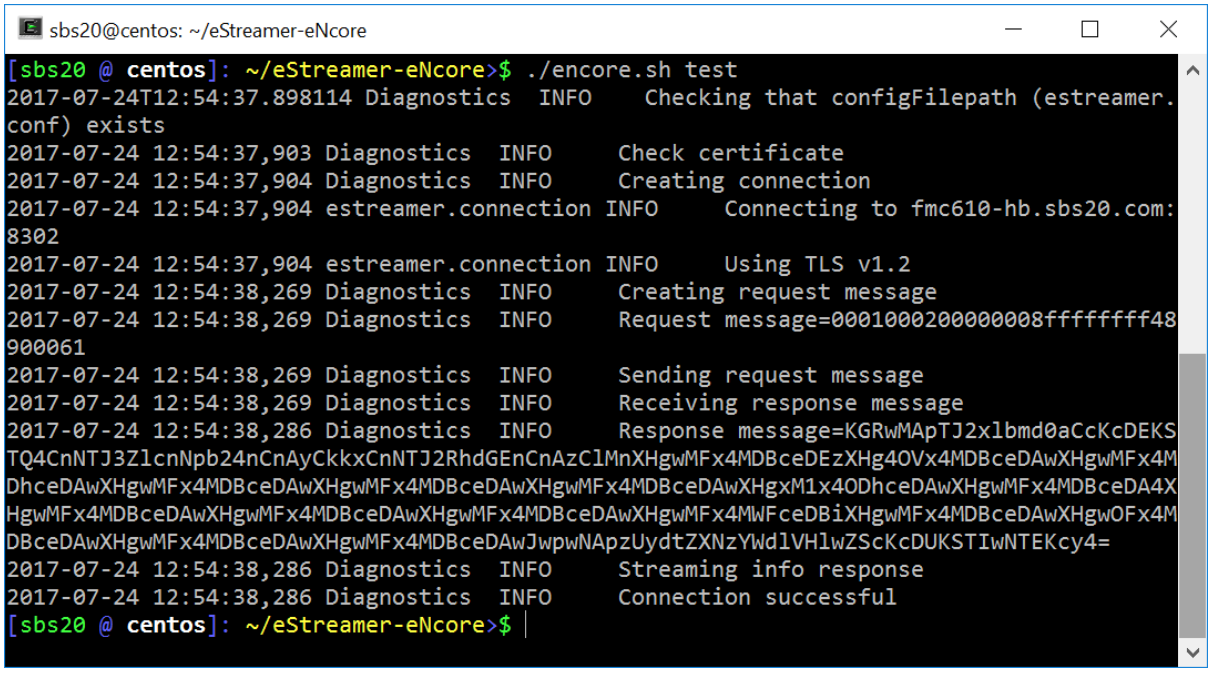


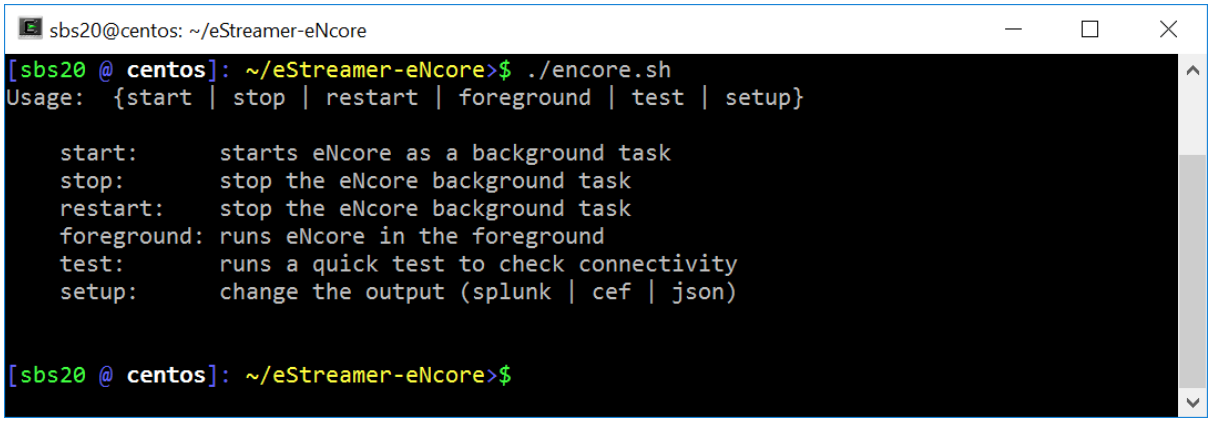
Figure 4: Successful Test



4. Running eNcore CLI

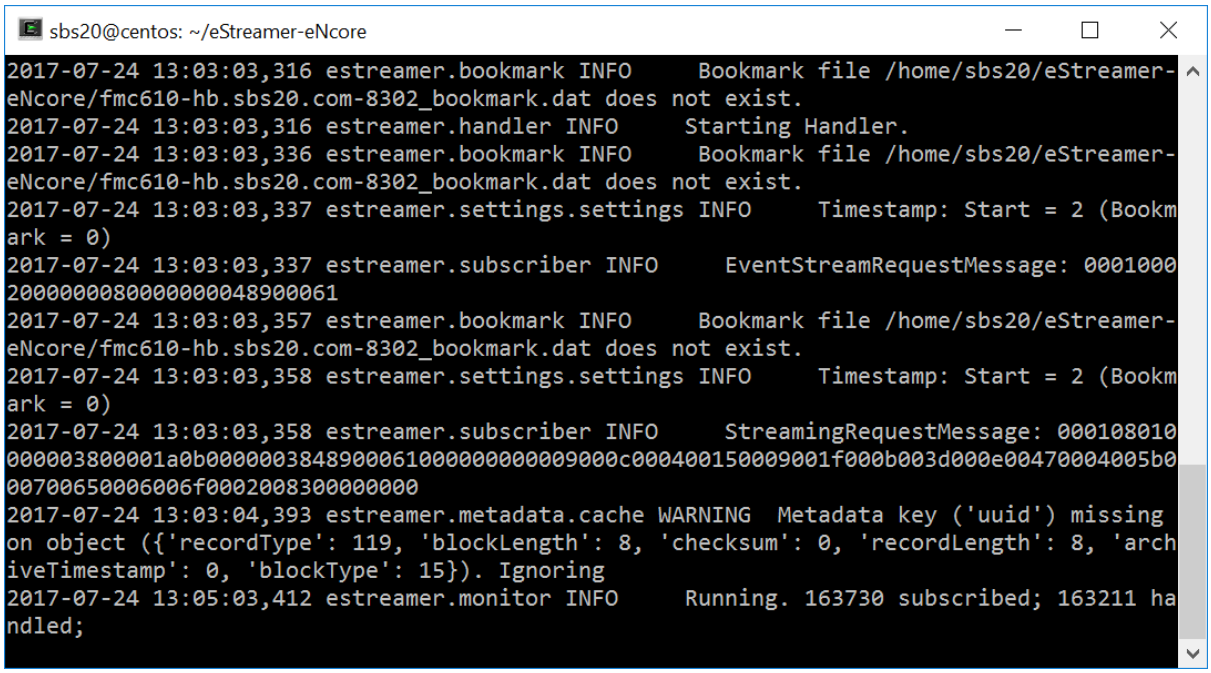
If you run **encore.sh** without any parameters, you will be presented with brief instructions.

Figure 5: Help Screen



For your first run, run it in the foreground so you can see what is happening. Every two minutes, the screen will update with a note of how many records have been processed. If you wish to change the update frequency, see the **monitor.period** configuration setting.

Figure 6: Running in the Foreground with Monitor Status



Note: To stop the foreground process, press ctrl-c.

5. Configuration Options

5.1 Essential Configuration

The default configuration file is set up to run out of the box. Following is a brief explanation of each setting in case you wish to customize.

5.1.1 Subscription Server

This is the FMC host and associated information. If you encounter TLS difficulties and are willing to downgrade, then you can change **tlsVersion** to 1.0.

Note: Note that downgrading the TLS version is useful for debugging and seeing the software work but it is not a recommended long-term strategy. It is recommended instead to fix the root cause.

Figure 8: Subscription Server Screen

```
"subscription": {
  "servers": [
    {
      "host": "1.2.3.4",
      "port": 8302,
      "pkcs12Filepath": "client.pkcs12",
      "@comment": "Valid values are 1.0 and 1.2",
      "tlsVersion": 1.2
    }
  ], ...
```

5.1.2 Monitor

The monitor is a separate thread that runs monitoring and maintenance tasks. By default, it runs every two minutes. It will report the number of events received and handled and will check the status of sub-processes. If there have been any problems, the monitor will place the client into an error state and the client will shut itself down.

Figure 9: Monitor Screen

```
"monitor": {
    "period": 120,
    "velocity": false,
    "bookmark": false,
    "subscribed": true,
    "handled": true
},
```

5.1.3 Start

The eStreamer server expects requests to state their chosen start time. There are broadly three options:

- 0: Return all data from the earliest point available on the FMC

- 1: Return all data from now onwards
- 2: Use a bookmark to pick up where we left off. First run is from 0

Figure 10: Start Screen

```
"@startComment": "0 for genesis, 1 for now, 2 for bookmark",
"start": 2,
```

5.14 Outputters (Output Data Location)

Two examples of outputters are given in the figure below. Although only one outputter is required – one that sends CEF events to the Sentinel connector, it is often useful to write CEF output to local files. The second outputter shown in the figure below writes the CEF events to local files.

Figure 11: Outputters Screen

```
"outputters": [
  {
    "name": "CEF",
    "adapter": "cef",
    "enabled": true,
    "stream": {
      "uri": "udp://10.0.1.2:514",
    }
  },

  {
    "name": "CEFfile",
    "adapter": "cef",
    "enabled": true,
    "stream": {
      "uri": "relfile:///data/data.{0}.cef",
      "options": {
        "rotate": false,
        "maxLogs": 9999
      }
    }
  }

]
```

5.2 Advanced Configuration Options

Key	Definition
alwaysAttemptToContinue	true | false. Controls whether eNcore client will persist a connection even if the CLI process has been terminated

Key	Definition
Enabled	true | false. Controls whether eNcore will run.
connectTimeout	The duration in seconds the client will wait for a connection to establish before failing.
responseTimeout	The duration in seconds the client will wait for a response before timing out.
monitor.period	The period in seconds between each execution of monitor tasks. Default is 120. Lower numbers are useful for debugging but will create more log traffic.
monitor.velocity	true | false. True will display the speed at which the client is processing records. A positive value means the client is processing events faster than eStreamer is sending them. Negative is slower. Once up to date, this should hover around zero.
monitor.bookmark	true | false. True will show the last bookmark timestamp. This is useful to see how far behind the eNcore client is.
monitor.subscribed	true | false. True will report the total number of events subscribed.
monitor.handled	true | false. True will report the total number of events written to output.
Start	0 specifies oldest data available 1 specifies data as of now 2 specifies use of bookmark
logging.level	Levels include FATAL, ERROR, WARNING, INFO, DEBUG, VERBOSE, and TRACE. Select the level of logging as per your requirement. It is strongly recommended that you do not use anything above INFO for production environments. DEBUG will generate very large log files and TRACE will significantly affect performance.
logging.format	This describes the format of the log and how they are stored. Default configuration setting for message format is “{date-time}-{name of module}-{level of logging-message}”.
logging.stdOut	true | false. This determines whether log output is also shown in Standard Output.
logging.filepath	This specifies the location of the application log.
maxQueueSize	Maximum number of messages buffered before throttling takes place. It is essentially a buffer size. The larger this number, the longer it will take to shutdown. Default configuration setting is 100. Do not change.
subscription.servers[]	While this is an array, eNcore can only currently support one server. The array is to support the future ability to connect to multiple hosts.

Key	Definition
server.host	The IP address of the FMC (eStreamer Server). Default configuration is 1.2.3.4. If you change the host entry after having run eNcore then new cache, bookmark and metadata files will be generated.
server.port	The server port to connect to. Default 8302.
server.pkcs12Filepath	The PKCS12 filepath location. If you change this having already run eNcore, then you must also delete the cached public and private key otherwise eNcore will continue to use those. They are called {host}-{port}_pkcs.cert and {host}-{port}_pkcs.key.
server.tlsVersion	Valid options are 1.0 and 1.2.
subscription.records	Do not change these values.
handler.records.metadata	true | false. If you wish to exclude the output of metadata (since it has no timestamp information) then set this to false.
handler.records.flows	true | false. If you wish to exclude connection flow records then set this to false.
handler.outputters[]	An array of outputter controllers which define the behavior and format of what gets written by eNcore.
outputter.name	This is a human readable name for your conveience. It is unused by the code.
outputter.adapter	Data is read from eStreamer and stored in a structured internal format. The adapter transforms the data to a desired format. Recognized values are: — splunk — json
outputter.enabled	true | false. You can have more than one outputter specified at once. If you wish to disable a specific outputter, set this flag to false. If all outputters are false (or there are no outputters) then it behaves as a sink.
outputter.passthru	true | false. If true then data flowing through bypasses decoding and metadata processing. It is very fast but of limited use. Its primary purpose is for debugging.
outputter.stream.uri	Specify the location where the output will be stored. You can specify a file URI as normal (e.g., file:///absolute/path/to/file) or a relative filepath (relfile:////relative/path/to/file). Only file URLs are supported currently.
outputter.stream.options	File-based streams require additional options.

Key	Definition
option.rotate	true | false. Set if you want log rotation. Default configuration setting for this is true. Please note that eNcore will not delete any old files. If you wish to do that, you will need to script it separately and schedule it. Example: Call this from a cron job. **#!/bin/bash** **find /opt/splunk/etc/apps/eStreamer/log/* -mmin +1440 -exec rm {} \;**
option.maxLogs	Specify the size of the log (number of lines). *Default configuration for this is 10,000. You can have fewer, larger files (e.g, 50,000).*

5.3 Execution

Various shell scripts options are available.

During installation and initial setup – or perhaps for debugging purposes it is useful to run the following commands.

./encore.sh test

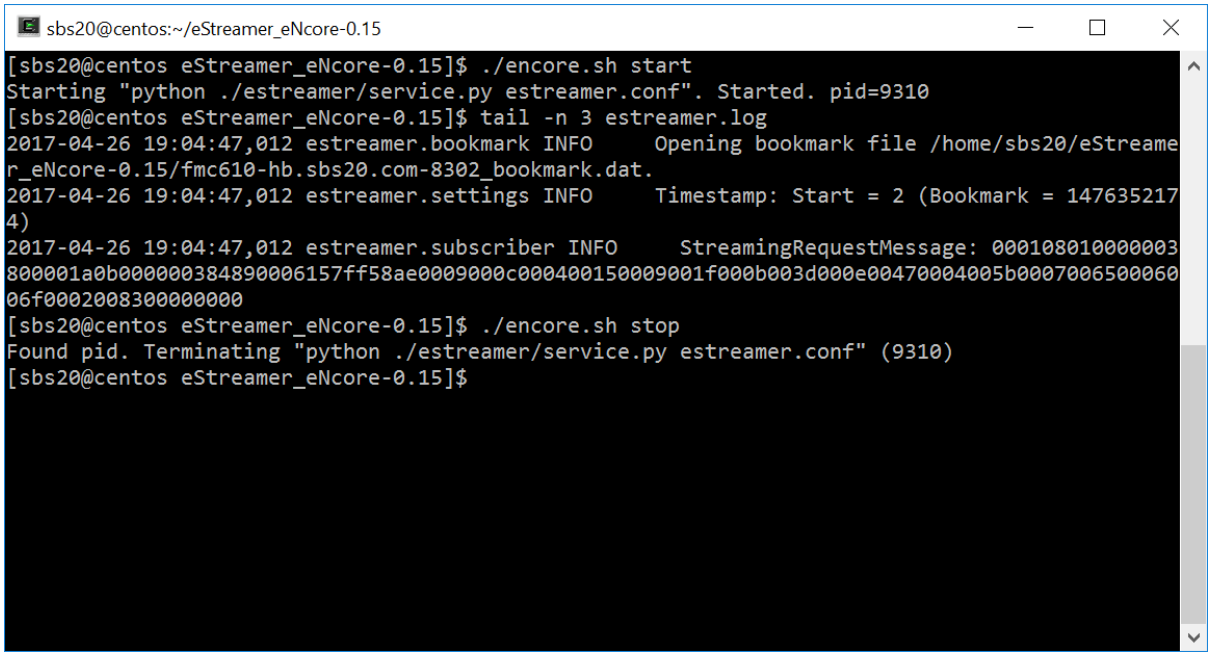
And

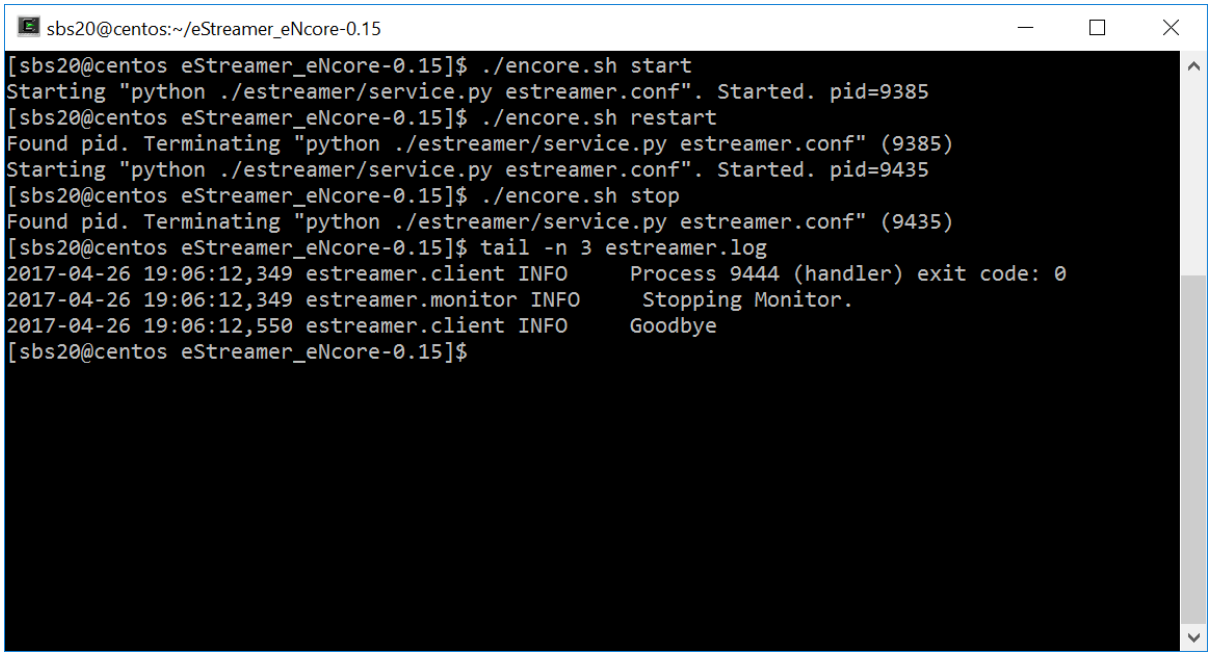
./encore.sh foreground

In all other cases, it is expected that encore will be run in the background, for which the following commands are pertinent.

./encore.sh start
./encore.sh stop
./encore.sh restart

Figure 12: Start, Tail Log, Stop





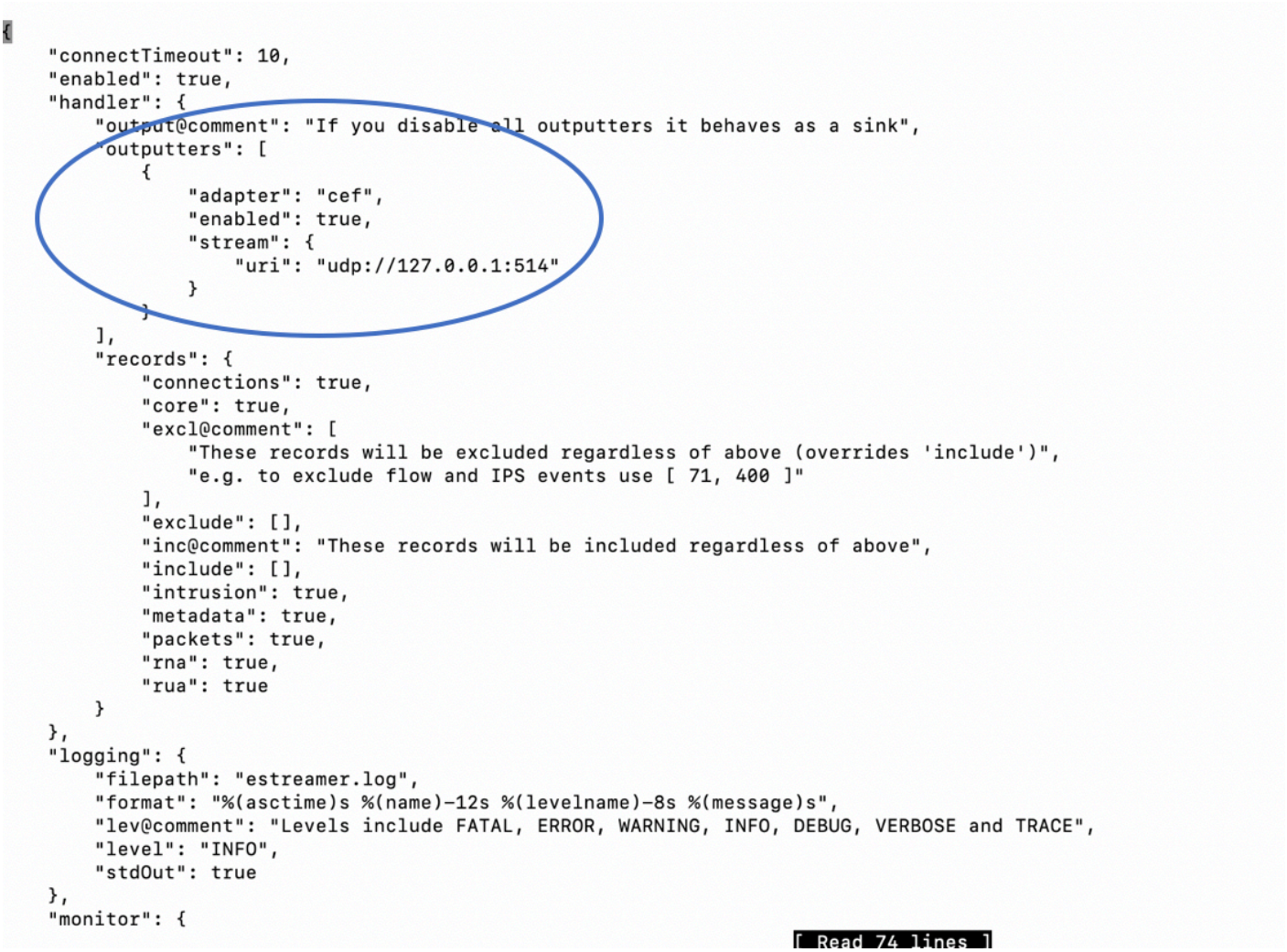
5.4 Logging

By default, eNcore will output an **estreamer.log** application log in its working directory with a log level of INFO. The format of the log file can be adjusted using the **logging.format** configuration setting. The level can also be adjusted. It is recommended that the default settings are left in place for production execution.

6 Sending data to Sentinel

6.1 Configuring Encore to Stream UDP

Configure encore to stream CEF data using UDP on port 514



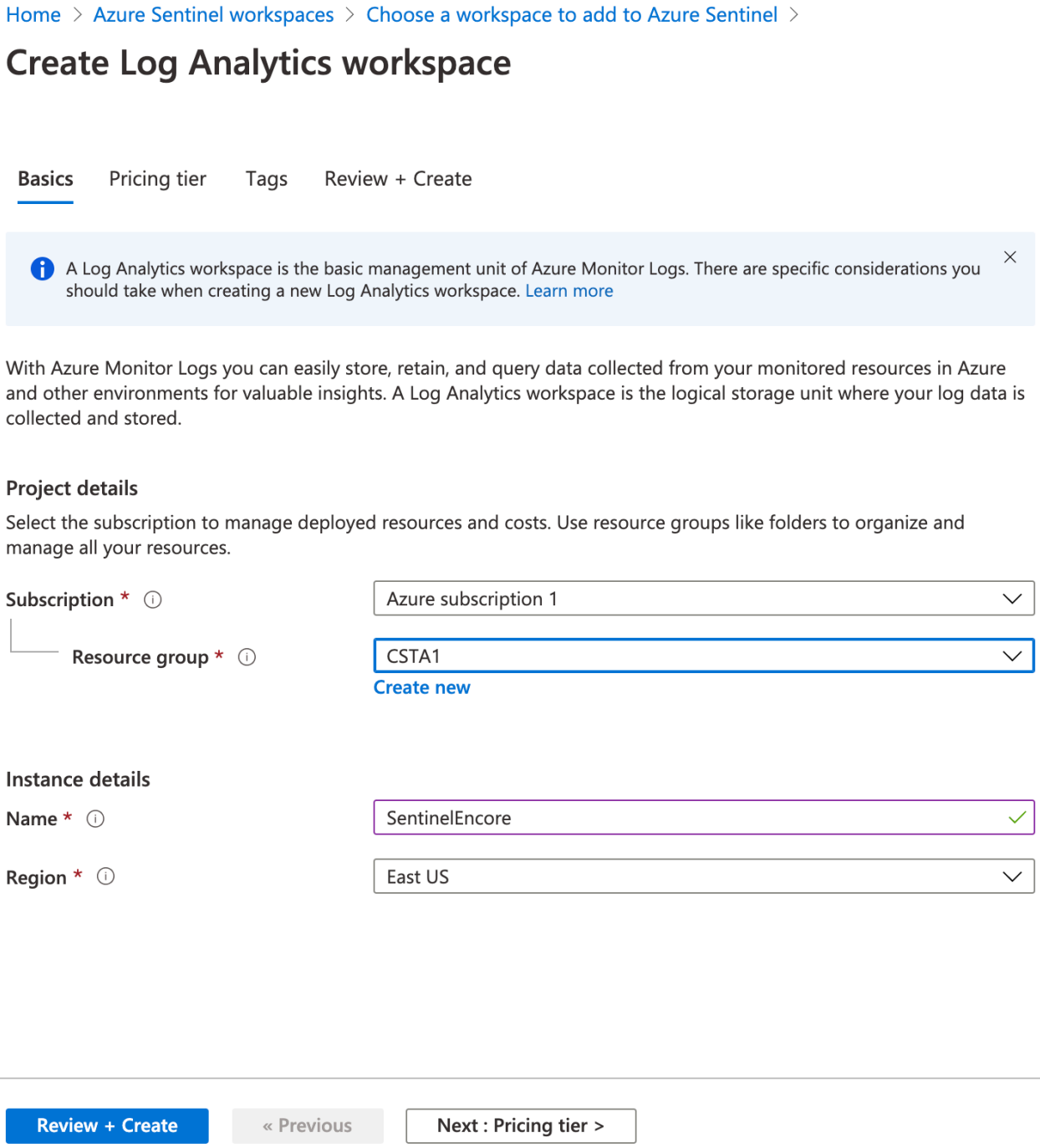
```
{
    "connectTimeout": 10,
    "enabled": true,
    "handler": {
        "output@comment": "If you disable all outputters it behaves as a sink",
        "outputters": [
            {
                "adapter": "cef",
                "enabled": true,
                "stream": {
                    "uri": "udp://127.0.0.1:514"
                }
            }
        ],
        "records": {
            "connections": true,
            "core": true,
            "excl@comment": [
                "These records will be excluded regardless of above (overrides 'include')",
                "e.g. to exclude flow and IPS events use [ 71, 400 ]"
            ],
            "exclude": [],
            "inc@comment": "These records will be included regardless of above",
            "include": [],
            "intrusion": true,
            "metadata": true,
            "packets": true,
            "rna": true,
            "rua": true
        }
    },
    "logging": {
        "filepath": "estreamer.log",
        "format": "%(asctime)s %(name)-12s %(levelname)-8s %(message)s",
        "lev@comment": "Levels include FATAL, ERROR, WARNING, INFO, DEBUG, VERBOSE and TRACE",
        "level": "INFO",
        "stdOut": true
    },
    "monitor": {
                                                                    [ Read 74 lines ]
```

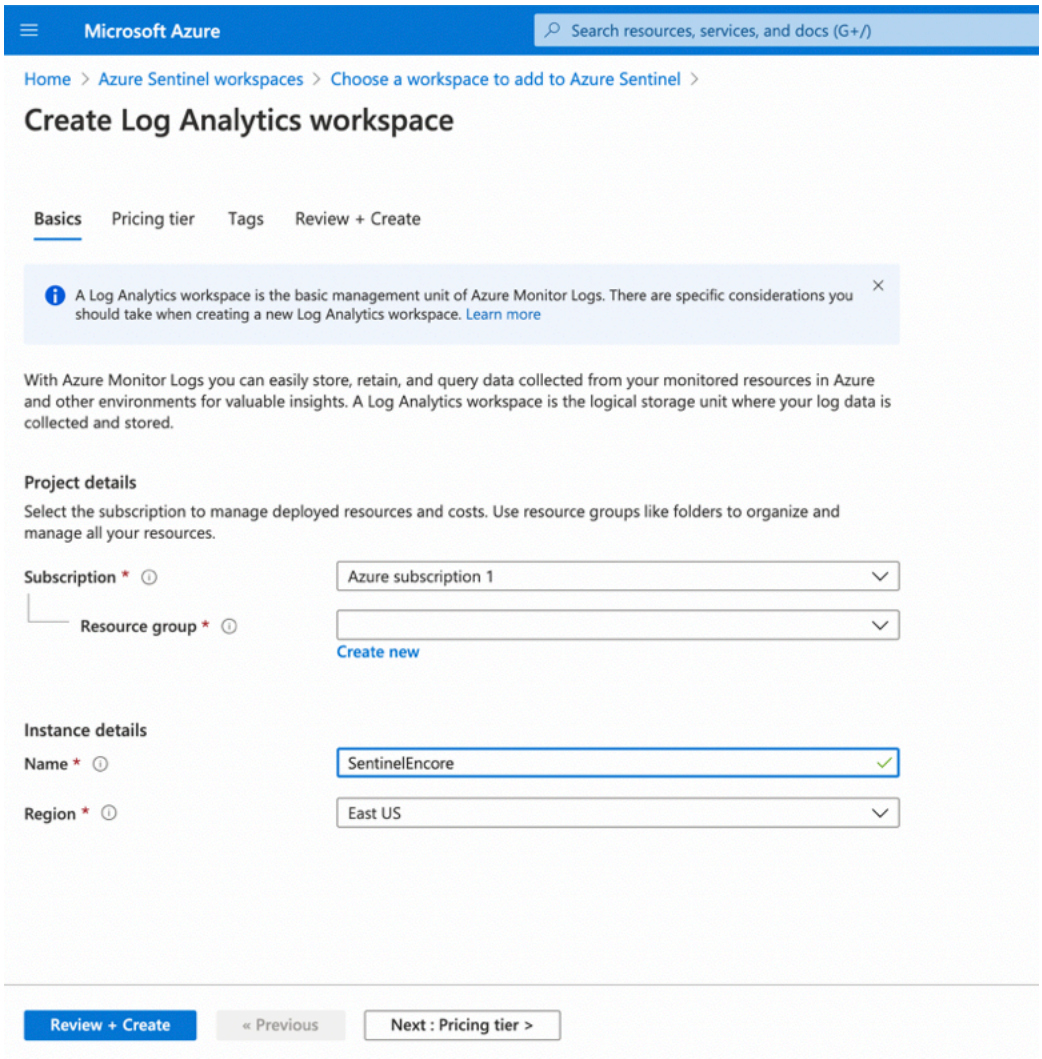
If encore is already in process use the encore.sh stop/start command to restart encore

6.2 Creating a Sentinel Workspace

Once you've established a working eNcore client between the FMC and your Azure instance you can route your data outputs to Sentinel using an agent collector

If you don't have a Sentinel Workspace proceed with the following.

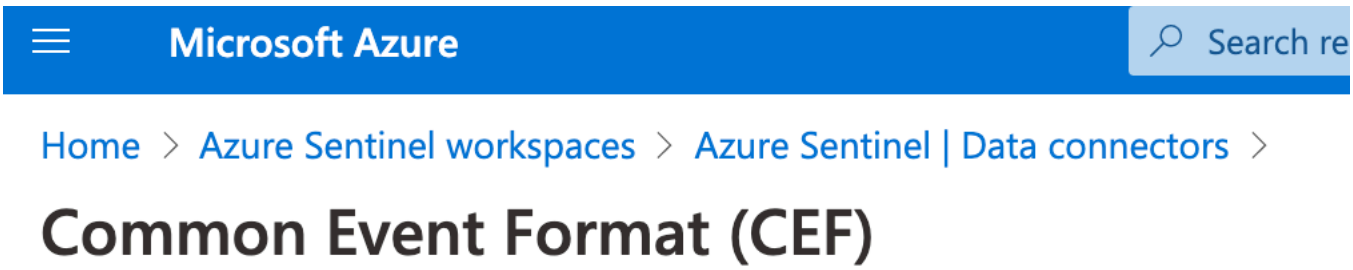

Home > Azure Sentinel workspaces > Choose a workspace to add to Azure Sentinel >
Create Log Analytics workspace
Basics
Pricing tier
Tags
Review + Create
A Log Analytics workspace is the basic management unit of Azure Monitor Logs. There are specific considerations you should take when creating a new Log Analytics workspace. Learn more
With Azure Monitor Logs you can easily store, retain, and query data collected from your monitored resources in Azure and other environments for valuable insights. A Log Analytics workspace is the logical storage unit where your log data is collected and stored.
Project details
Select the subscription to manage deployed resources and costs. Use resource groups like folders to organize and manage all your resources.
Subscription *
Azure subscription 1
Resource group *
CSTA1
Create new
Instance details
Name *
SentinelEncore
Region *
East US
Review + Create
« Previous
Next : Pricing tier >



6.2 Setting up the CEF Data Connector

Once you've established a working eNcore client between the FMC and your Azure instance you can route your data outputs to Sentinel using an agent collector

Please refer the official Microsoft guide (https://docs.microsoft.com/en-us/azure/sentinel/connect-cef-agent?tabs=rsyslog) , accessing



Accessing the connector documentation guide directly from Sentinel is preferred as the docs and prepopulated commands

will contain workspace and primary key information specific to your Azure instance. The following steps below are directly from the Azure Sentinel setup guide for reference, again it is better to use direct documentation with the Sentinel platform since it contains the exact command and workspace/primary ids that will need to be run when installing the agent collector.

Run the deployment script

1. From the Azure Sentinel navigation menu, click **Data connectors**. From the list of connectors, click the **Common Event Format (CEF)** tile, and then the **Open connector page** button on the lower right.
2. Under **1.2 Install the CEF collector on the Linux machine**, copy the link provided under **Run the following script to install and apply the CEF collector**, or from the text below:

   ```
   sudo wget https://raw.githubusercontent.com/Azure/Azure-
   Sentinel/master/DataConnectors/CEF/cef_installer.py&&sudo python cef_installer.py
   [WorkspaceID] [Workspace Primary Key]
   ```

3. While the script is running, check to make sure you don't get any error or warning messages.

Note

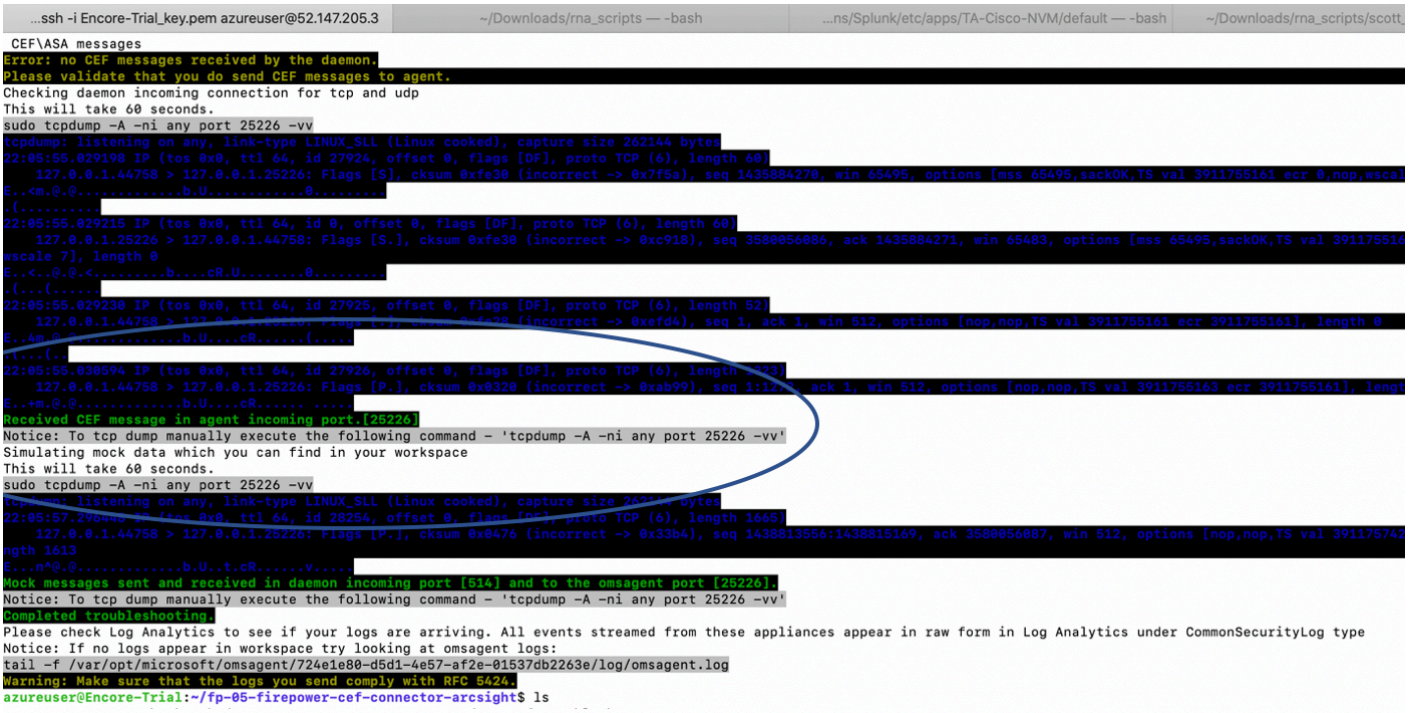
Using the same machine to forward both plain Syslog *and* CEF messages

If you plan to use this log forwarder machine to forward **Syslog messages** as well as CEF, then in order to avoid the duplication of events to the Syslog and CommonSecurityLog tables:

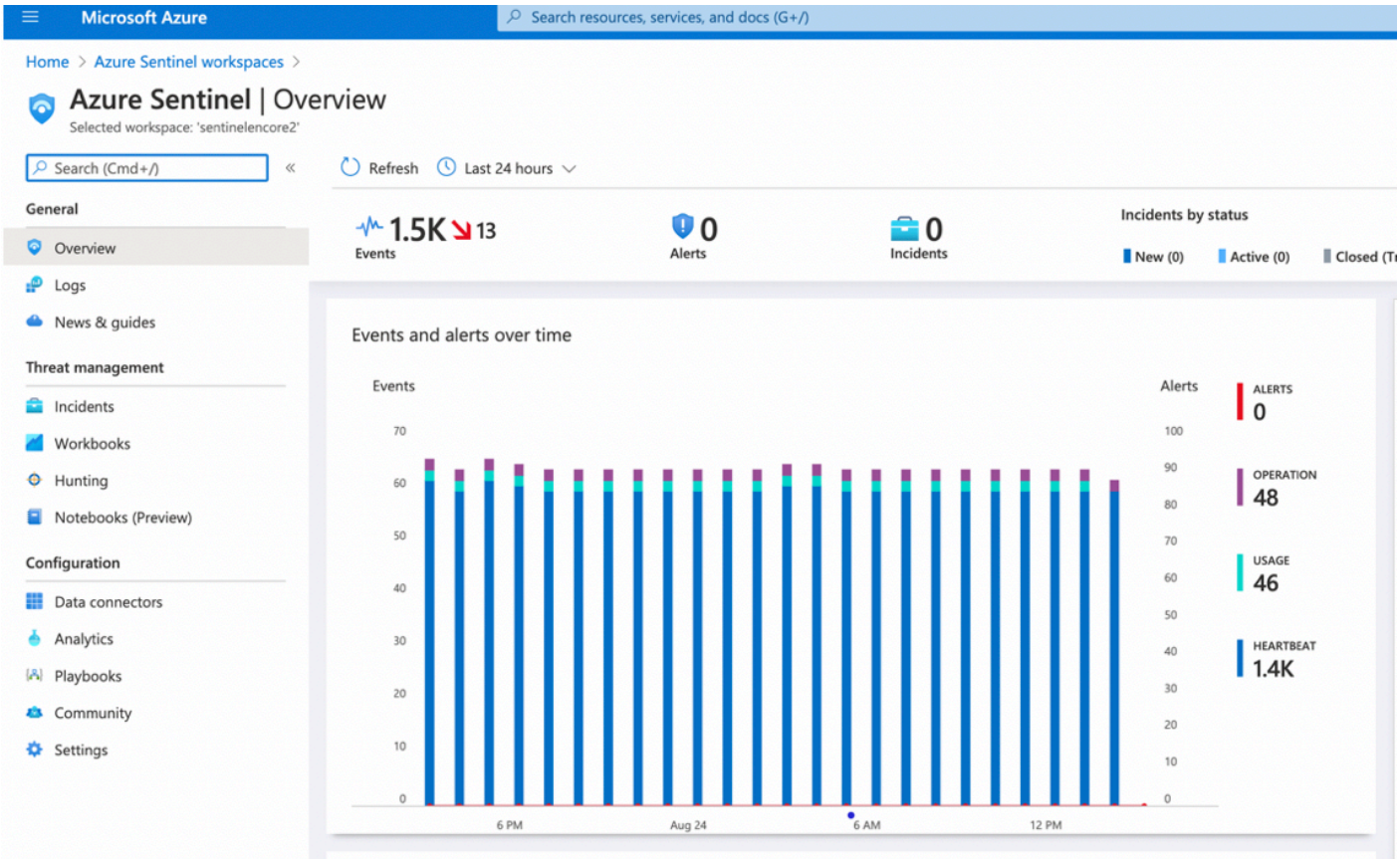
1. On each source machine that sends logs to the forwarder in CEF format, you must edit the Syslog configuration file to remove the facilities that are being used to send CEF messages. This way, the facilities that are sent in CEF won't also be sent in Syslog. See **Configure Syslog on Linux agent** for detailed instructions on how to do this.
2. You must run the following command on those machines to disable the synchronization of the agent with the Syslog configuration in Azure Sentinel. This ensures that the configuration change you made in the previous step does not get overwritten.
   ```
   sudo su omsagent -c 'python /opt/microsoft/omsconfig/Scripts/OMS_MetaConfigHelper.py --
   disable'
   ```

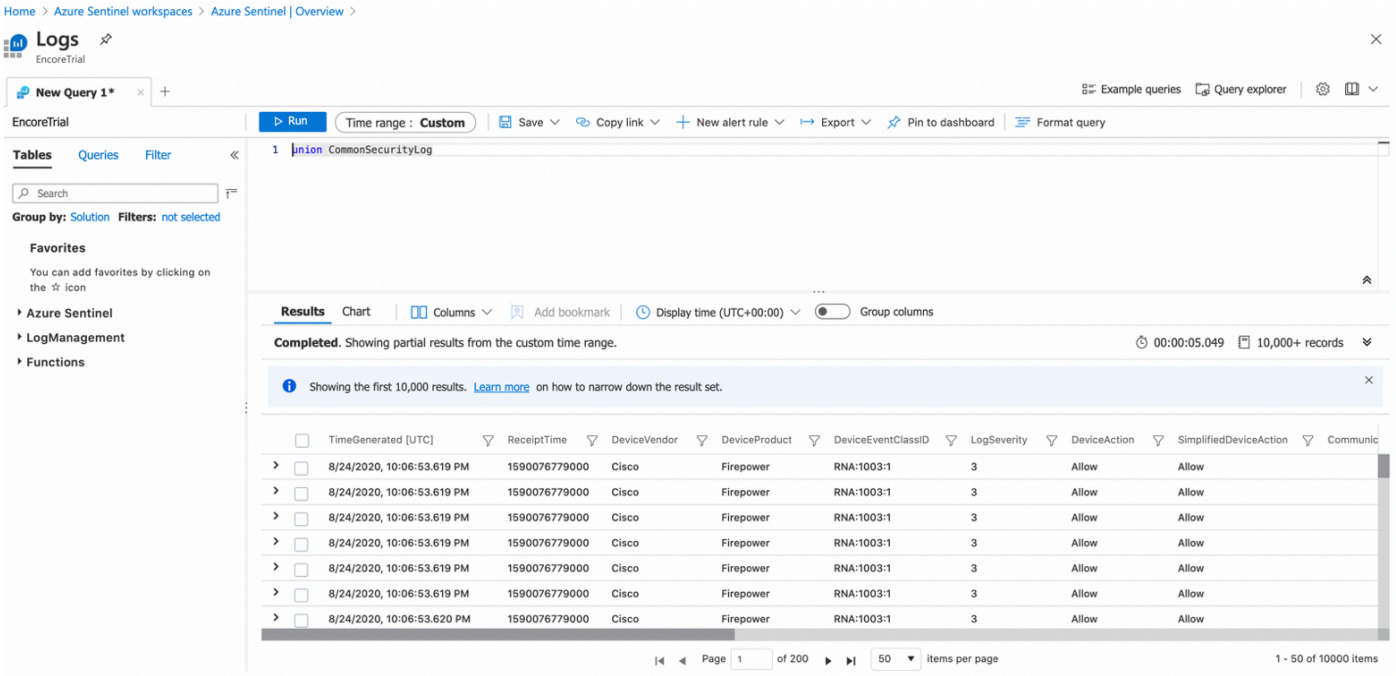
https://docs.microsoft.com/en-us/azure/sentinel/connect-cef-agent?tabs=rsyslog

After running the validation script you should be able to see data coming into the Azure Sentinel Analytics screen



Note: Seeing the messing Received CEF message in agent (incoming port 25226) is an indicator that the validation and configuration of the agent was successful


Microsoft Azure
Search resources, services, and docs (G+/)
Home > Azure Sentinel workspaces >
Azure Sentinel | Overview
Selected workspace: 'sentinelencore2'
Search (Cmd+/)
Refresh
Last 24 hours
General
Overview
Logs
News & guides
Threat management
Incidents
Workbooks
Hunting
Notebooks (Preview)
Configuration
Data connectors
Analytics
Playbooks
Community
Settings
1.5K 13
Events
0
Alerts
0
Incidents
Incidents by status
New (0)
Active (0)
Events and alerts over time
Events
Alerts
ALERTS
0
OPERATION
48
USAGE
46
HEARTBEAT
1.4K
6 PM
Aug 24
6 AM
12 PM



7 Troubleshooting and questions

7.1 Error messages

As far as possible, eNcore has been engineered to provide meaningful error messages. Below is an example error message.

Figure 13: Example Error Message

The eStreamer service has closed the connection. There are a number of possible causes which may show above in the error log.

If you see no errors then this could be that
*** the server is shutting down**
*** there has been a client authentication failure (please check that your outbound IP address matches that associated with your certificate - note that if your device is subject to NAT then the certificate IP must match the upstream NAT IP)**
*** there is a problem with the server. If you are running FMC v6.0, you may need to install "Sourcefire 3D Defense Center S3 Hotfix AZ 6.1.0.3-1")**

If you encounter errors that do not make sense or require further explanation, please contact support so that we can fix the problem and improve the error messages.

Microsoft Sentinel Agent install: If you encounter issues install the Microsoft agent on Azure then try reinstalling the OMS
https://support.microsoft.com/en-us/help/4131455/how-to-reinstall-operations-management-suite-oms-agent-for-linux

7.2 Frequently Asked Questions

Can I output my data to a different server?

Yes. Currently eNcore only writes to the filesystem, but you could mount an NFS or SMB share and specify its path as above. This may impact performance.

Can I run more than one instance?

Yes, using the CLI version. Although currently the encore.sh shell script only supports one instance. The underlying Python program prefixes temporary files (e.g., metadata, certificates, bookmarks) with the host and port. You will also need to update the outputter locations (e.g., [Splunk] ... directory = splunk) in order to avoid data collision. If you wish to run more than one instance we recommend you extract additional copies of eStreamer-eNcore and configure separately in order to avoid changing encore.sh.

Can I connect to more than one FMC?

Currently not within a single instance. However, you can configure multiple instances as above.

Can eNcore de-duplicate data to keep my SIEM costs lower?

Not today. It is on the roadmap.

Can I run two instances of eNcore in a HA pair?

Yes and no. It is technically possible to run two side-by-side, but they will be completely ignorant of each other and output double the data. It may be preferable to run them in a hot-stand-by configuration where the primary client's state and configuration data is regularly copied to the secondary client. The state and configuration data in question is **estreamer.conf; x.x.x.x-port_bookmark.dat; x.x.x.x-port_cache.dat; x.x.x.x-port_pkcs.cert; x.x.x.x-port_pkcs.key; x.x.x.x-port_status.dat**

Can I increase the logging granularity?

Yes, change **logging.level** in the conf file. Please note that while it is possible to increase this level to VERBOSE, the performance impact will be crippling. DEBUG may be useful but slow. We strongly recommend not going above INFO for standard production execution.

8 Cisco Support

Support is provided by Cisco TAC.

9 Appendix A:

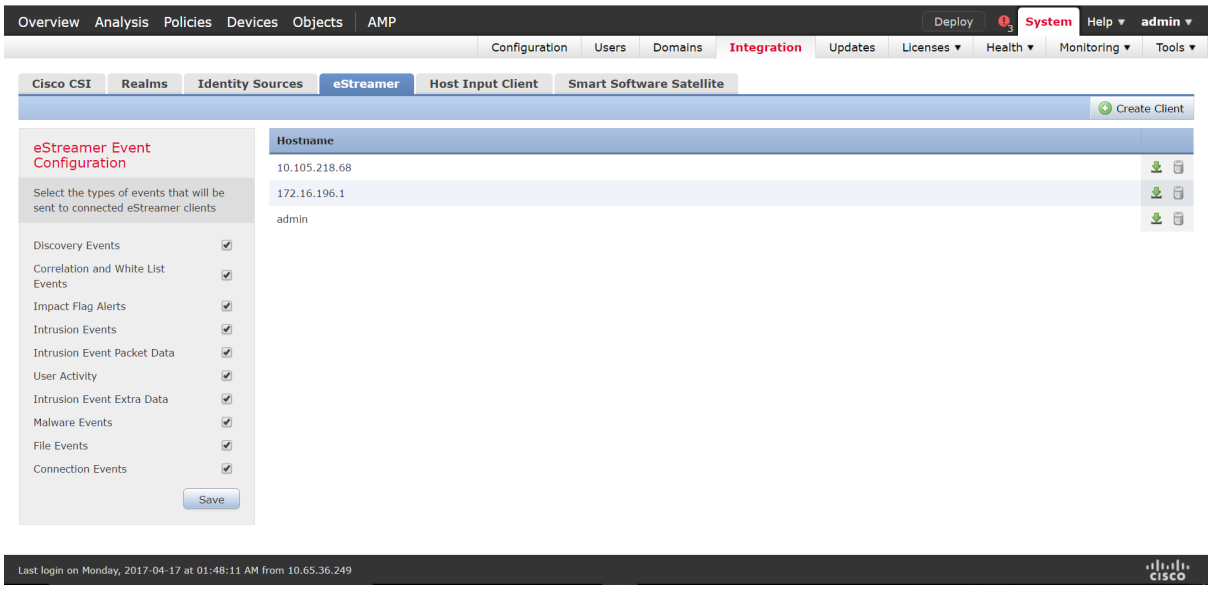
9.1 FMC eStreamer Certificate Creation

Steps to generate an eStreamer client certificate are as follows:

Navigate to the web interface of the FMC – https://fmc-ip-address and log in with your FMC credentials.

In the FMC 6.x GUI, navigate to **System > Integration > eStreamer**

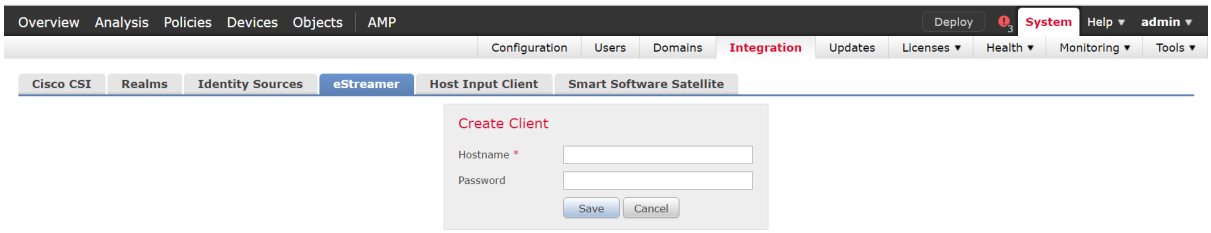
Figure 14: FMC eStreamer Certificate Creation



Click **Create Client**. Provide the Hostname and password.

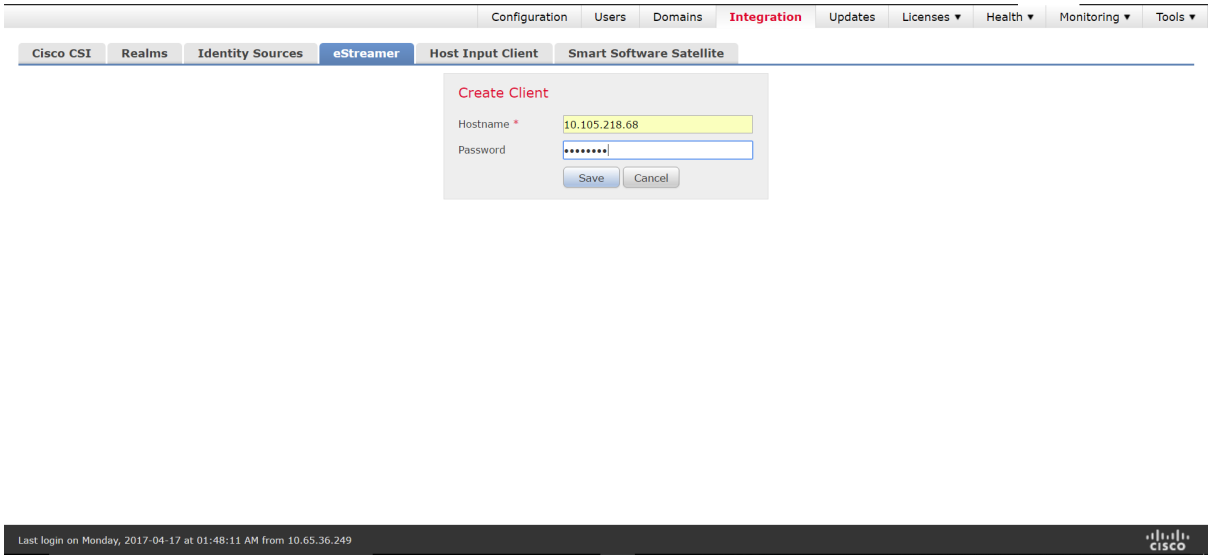
Note: This should be the IP of the client, which will be collecting the event data from the FMC. This password will be required when you first execute eStreamer eNcore.
Please note that the IP address you enter here must be the IP address of the eStreamer-eNcore client *from the perspective of the FMC*. In other words, if the client is behind a NAT device, then the IP address must be that of the upstream NAT interface.

Figure 15: Create Client Hostname and Password Screen



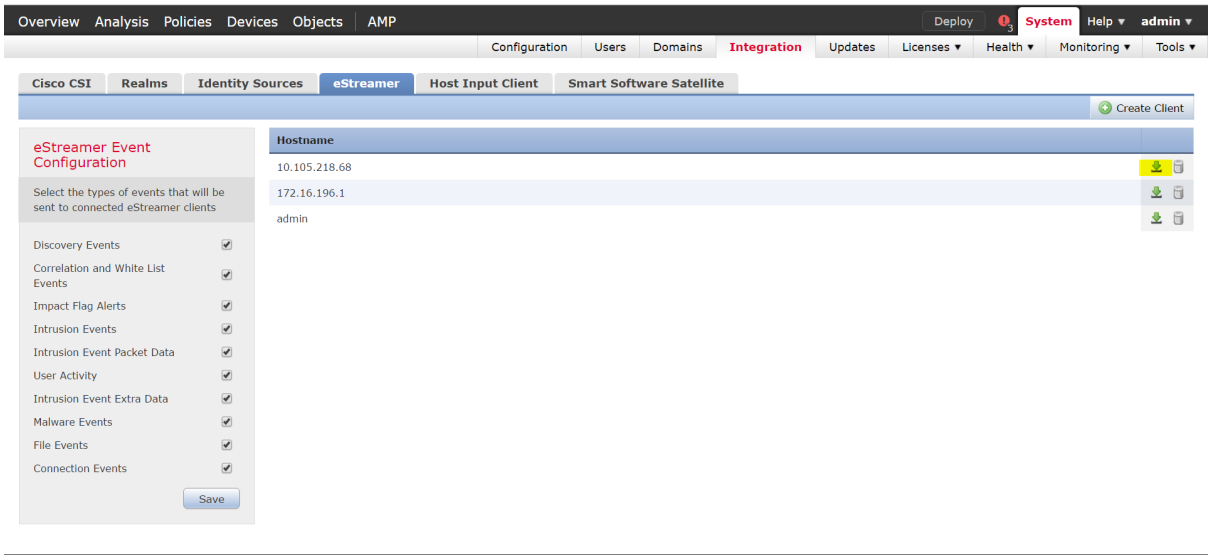
Click **Save**.

Figure 16: Create Client Save Screen



Download the pkcs12 file.

Figure 17: Download Screen



Copy the pkcs12 file to the desired location in the target device. By default, eStreamer-eNcore will look for **/path/eStreamer_eNcore/client.pkcs12**. If you wish to use a different filename, then you must edit the **estreamer.conf** file.

9.2 Example Configuration File

Figure 18: Example Configuration File

```
{
  "connectTimeout": 10,
  "responseTimeout": 10,

  "@startComment": "0 for genesis, 1 for now, 2 for bookmark",
  "start": 2,


  "monitor": {
    "period": 120,
    "velocity": false,
    "bookmark": false,
    "subscribed": true,
    "handled": true
  },


  "logging": {
    "@comment": "Levels include FATAL, ERROR, WARNING, INFO, DEBUG, VERBOSE and TRACE",
    "level": "INFO",
    "format": "%(asctime)s %(name)-12s %(levelname)-8s %(message)s",
    "stdOut": true,
    "filepath": "estreamer.log"
```

```
},

"@queueComment": [
  "Maximum number of messages buffered before throttling takes place. The more powerful",
  "your CPU and more RAM you have, the larger this number can be. It's essentially a",
  "buffer size. Beyond a certain size you won't see any performance gain and it will",
  "just take longer to stop"
],

"maxQueueSize": 100,

"subscription": {
  "servers": [
    {
      "host": "1.2.3.4",
      "port": 8302,
      "pkcs12Filepath": "client.pkcs12",
      "@comment": "Valid values are 1.0 and 1.2",
      "tlsVersion": 1.2
    }
  ],

  "records": {
    "@comment": [
      "Just because we subscribe doesn't mean the server is sending. Nor does it mean",
      "we are writing the records either. See handler.records[]"
    ],
    "packetData": true,
    "extended": true,
    "metadata": true,
    "eventExtraData": true,
    "impactEventAlerts": true,
    "intrusion": true,
    "archiveTimestamps": true
  }
},

"handler": {
  "records": {
    "core": true,
    "metadata": true,
    "flows": true,
    "packets": true,
    "intrusion": true,
    "rua": true,
    "rna": true,
```

```
      "@includeComment": "These records will be included regardless of above",
      "include": [],

      "@excludeComment": [
        "These records will be excluded regardless of above (overrides 'include')",
        "e.g. to exclude flow and IPS events use [ 71, 400 ]"
      ],
      "exclude": []
    },

    "@comment": "If you disable all outputters it behaves as a sink",
    "outputters": [

      {
        "name": "CEF",
        "adapter": "cef",
        "enabled": true,
        "stream": {
          "uri": "udp://10.0.1.2:514",
        }
      },

      {
        "name": "CEFfile",
        "adapter": "cef",
        "enabled": true,
        "stream": {
          "uri": "relfile:///data/data.{0}.cef",
          "options": {
            "rotate": false,
            "maxLogs": 9999
          }
        }
      }

    ]
  }
}
```

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