Corelight Sensor AP 200, AP 1001 AP 3000 & AP 5000 Common Criteria Guidance Document

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0.8

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Revision History

Version	Date	Description
0.1	March 30, 2020	Initial version
0.2	April 3, 2020	Addressed comments
0.3	April 3, 2020	Addressed comments
0.4	May 5, 2021	Added AP 1001, AP 3000, & AP 5000 details
0.5	January 12, 2022	Added zeroization process
0.6	February 14, 2022	Added Rekey process
0.7	April 01, 2022	Updated based on ECR comments
0.8	April 23, 2022	Updated based on ECR comments

Overview

This document is intended to be a supplement to the Corelight Sensor documentation version 22.1. This Common Criteria guidance document contains configuration information needed to correctly configure and administer the Corelight Sensor in a way that conforms to the Common Criteria Certification requirements. The Corelight Sensor, properly configured, conforms to the Common Criteria **Network Device Profile Version 2.2e** [NDcPP v2.2e]. The information contained in this document is intended for administrators responsible for the configuration and management of the Corelight Sensor.

This document is meant to provide necessary guidance to the administrators of the Corelight appliance who require a configuration which leaves the system in compliance with Corelight's Common Criteria certification. There are several steps to be followed, and while some parameters allow for a level of flexibility, most parameters must be configured exactly as documented.

It is important to outline the various constraints that Corelight chose to impose on itself in order to better align the Common Criteria certification, and the safety requirements that it outlines, with the capabilities of the Corelight sensor.

1.1 Definitions

TOE - Target of Evaluation (the Corelight appliance)

2 TOE Overview

Simple to deploy and integrate with existing analysis tools, the Corelight Sensor appliances capture and transform high-volume network traffic into high-resolution data, which unlocks new capabilities for incident response, intrusion detection, forensics and more. The Sensor parses dozens of network protocols and generates rich, actionable data streams designed for security professionals.

3 TOE Product Information

The Corelight Sensor comes in a number of models. Only AP 200, 1001, 3000 and 5000 are part of the Common Criteria certification program, and thus in scope of this document.
The Corelight Sensor, referred to as the TOE is a device which is composed of hardware and software that offers a scalable network analysis and insights solution to the end users. It satisfies all the criteria to meet the collaborative Protection Profile for Network Devices, Version 2.2e [NDcPP v2.2e]. Please refer to the User Guide, **Chapter Two - Quick Start Guides** for additional information about the available models as well as the model-specific details for initial rack and stack.

The TOE is comprised of the following models as indicated:

Figure 1 – AP 5000

Figure 2 – AP 3000

Figure 3 – AP 1001

Figure 4 – AP 200

Table 1 – Corelight Sensor AP 200, AP 1001, AP 3000 & AP 5000

Specifications	AP 200	AP 1001	AP 3000(1)	AP 3000(2)	AP 5000
Processors	Intel Xeon Silver 4110 (Skylake)	Intel Xeon Silver 4116 (Skylake)	Intel Xeon Gold 6238 (Cascade Lake)	Intel Xeon Gold 6152 (Skylake)	AMD EPYC 7742 (Zen 2)
Size and Weight	1U half-depth rackmount (19 x 14.5 x 1.75 inches), 17 lbs.	1U rackmount (19 x 25.6 x 1.75 inches), 40 lbs.	1U rackmount (19 x 25.6 x 1.75 inches), 34 lbs.	1U rackmount (19 x 25.6 x 1.75 inches), 34 lbs.	1U rackmount (19 x 27 x 1.7 inches) 48 lbs.
Monitoring Interface	Four 1G SFP interfaces in a powerful, specialized NIC. Support for copper and optical modules at 100M & 1G.	Four 1G/10G SFP/SFP+ interfaces in a powerful, specialized NIC. Support for copper and optical modules at 1G and 10G.	Four 1G/10G SFP/SFP+ interfaces OR two 10G QSF28 OR two 40G QSFP28 OR eight 10G QSFP28 interfaces in a powerful, specialized NIC. Support for copper and optical modules at 1G and 10G or 40G.	Four 1G/10G SFP/SFP+ interfaces OR two 10G QSF28 OR two 40G QSFP28 OR eight 10G QSFP28 interfaces in a powerful, specialized NIC. Support for copper and optical modules at 1G and 10G or 40G.	Two QSFP28 bays, capable of supporting eight 10G OR two 40G 8 OR two 100G interfaces in a powerful, specialized NIC.
Management Interface	One 10/100/1000 copper ethernet port.	One 10/100/1000 copper ethernet port and up to 2 10G ethernet ports	One 10/100/1000 copper ethernet port and up to 2 10G ethernet ports	One 10/100/1000 copper ethernet port and up to 2 10G ethernet ports	One 10/100/1000 copper ethernet port and up to 4 10G ethernet ports

Specifications	AP 200	AP 1001	AP 3000(1)	AP 3000(2)	AP 5000
Power	120/240 VAC 50/60 Hz single PSUs. Approximately 83W usage when idle and 141W usage at load.	120/240 VAC 50/60 Hz redundant dual PSUs. 700W at 110V or 750W at 220V. Approximately 180W usage when idle and 290W usage at load.	120/240 VAC 50/60 Hz redundant dual PSUs. Approximately 161W usage when idle and 445W usage at load.	120/240 VAC 50/60 Hz redundant dual PSUs. Approximately 161W usage when idle and 445W usage at load.	120/240 VAC 50/60 Hz redundant dual PSUs. Approximately 443W usage when idle and 852W usage at load.

4 TOE Delivery

The TOE is delivered via commercial carrier (i.e. DHL, FedEx, UPS, Expeditors etc). The shipment will contain a packing slip with the serial numbers of all shipped devices. The receiver must verify that the hardware serial numbers match the serial numbers listed in the packing slip. The Corelight appliance is shipped with all necessary software pre-installed. All software updates will be provided in the form of offline updates and will be made available by Corelight as part of the normal appliance release lifecycle.

5 TOE Evaluated Configuration

The TOE in the evaluated configuration consists of the platform as stated in the previous section. The TOE supports secure connectivity with another IT environment device as stated in Table 2 below.

Table 2 – IT Components

Component	Required	Usage
Audit server (via SFTP server)	Yes	The TOE exports audit events to an external SFTP server via SSH v2 protocol.
Management workstation with SSH client	Yes	This includes any IT Environment Management workstation with an SSH client

6 Assumptions

This section describes the assumptions made in identification of the threats and security requirements for network devices. The network device is not expected to provide assurance in any of these areas, and as a result, requirements are not included to mitigate the threats associated.

Table 3 – Assumptions

ID	Assumption
A.PHYSICAL_PROTECTION	The Network Device is assumed to be physically protected in its operational environment and not subject to physical attacks that compromise the security or interfere with the device's physical interconnections and correct operation. This protection is assumed to be sufficient to protect the device and the data it contains. As a result, the cPP does not include any requirements on physical tamper protection or other physical attack mitigations. The cPP does not expect the product to defend against physical access to the device that allows unauthorized entities to extract data, bypass other controls, or otherwise manipulate the device. For vNDs, this assumption applies to the physical platform on which the VM runs.
A.LIMITED_FUNCTIONALITY	The device is assumed to provide networking functionality as its core function and not provide functionality/services that could be deemed as general purpose computing. For example, the device should not provide a computing platform for general purpose applications (unrelated to networking functionality). .
A.NO_THRU_TRAFFIC_PROTECTION	A standard/generic Network Device does not provide any assurance regarding the protection of traffic that traverses it. The intent is for the Network Device to protect data that originates on or is destined to the device itself, to include administrative data and audit data. Traffic that is traversing the Network Device, destined for another network entity, is not covered by the ND cPP. It is assumed that this protection will be covered by cPPs and PP-Modules for particular types of Network Devices (e.g., firewall).

ID	Assumption
A.TRUSTED_ADMINISTRATOR	The Security Administrator(s) for the Network Device are assumed to be trusted and to act in the best interest of security for the organization. This includes appropriately trained, following policy, and adhering to guidance documentation. Administrators are trusted to ensure passwords/credentials have sufficient strength and entropy and to lack malicious intent when administering the device. The Network Device is not expected to be capable of defending against a malicious Administrator that actively works to bypass or compromise the security of the device. For TOEs supporting X.509v3 certificate-based authentication, the Security Administrator(s) are expected to fully validate (e.g. offline verification) any CA certificate (root CA certificate or intermediate CA certificate) loaded into the TOE's trust store (aka 'root store', ' trusted CA Key Store', or similar) as a trust anchor prior to use (e.g. offline verification).
A.REGULAR_UPDATES	The Network Device firmware and software is assumed to be updated by an Administrator on a regular basis in response to the release of product updates due to known vulnerabilities.
A.ADMIN_CREDENTIALS_SECURE	The Administrator's credentials (private key) used to access the Network Device are protected by the platform on which they reside.
A.RESIDUAL_INFORMATION	The Administrator must ensure that there is no unauthorized access possible for sensitive residual information (e.g. cryptographic keys, keying material, PINs, passwords etc.) on networking equipment when the equipment is discarded or removed from its operational environment.

7 Security Objectives for the Operational Environment

The following subsections describe objectives for the Operational Environment

Table 4 – Security Objectives for the Operational Environment

ID	Objective for the Operational Environment
OE.PHYSICAL	Physical security, commensurate with the value of the TOE and the data it contains, is provided by the environment.
OE.NO_GENERAL_PURPOSE	There are no general-purpose computing capabilities (e.g., compilers or user applications) available on the TOE, other than those services necessary for the operation, administration and support of the TOE. Note: For vNDs the TOE includes only the contents of the its own VM, and does not include other VMs or the VS.
OE.NO_THRU_TRAFFIC_PROTECTION	The TOE does not provide any protection of traffic that traverses it. It is assumed that protection of this traffic will be covered by other security and assurance measures in the operational environment.
OE.TRUSTED_ADMIN	Security Administrators are trusted to follow and apply all guidance documentation in a trusted manner. For vNDs, this includes the VS Administrator responsible for configuring the VMs that implement ND functionality. For TOEs supporting X.509v3 certificate-based authentication, the Security Administrator(s) are assumed to monitor the revocation status of all certificates in the TOE's trust store and to remove any certificate from the TOE's trust store in case such certificate can no longer be trusted.
OE.UPDATES	The TOE firmware and software is updated by an Administrator on a regular basis in response to the release of product updates due to known vulnerabilities.
OE.ADMIN_CREDENTIALS_SECURE	The Administrator's credentials (private key) used to access the TOE must be protected on any other platform on which they reside.

ID	Objective for the Operational Environment
OE.RESIDUAL_INFORMATION	The Security Administrator ensures that there is no unauthorized access possible for sensitive residual information (e.g. cryptographic keys, keying material, PINs, passwords etc.) on networking equipment when the equipment is discarded or removed from its operational environment. For vNDs, this applies when the physical platform on which the VM runs is removed from its operational environment.

8 General understanding of requirements and constraints

Only the SFTP exporter has been included in the scope of the Common Criteria evaluation and it is therefore the only supported exporter which must be selected for the system to be compliant with Corelight's Common Criteria certification. This has a number of implications, one of which having to do with auditing and audit log export.

Audit logging is a requirement to comply with Common Criteria. To this end the sensor records audit events around configuration changes and any security-related matters, such as authentication attempts, successes, failures, cryptographic failures, attempted use of disallowed algorithms, failures in the customer-accessible API, etc. Auditing on the sensor is automatically enabled and those records are stored locally, however only last 7 days worth of messages are accessible. Audit log **export** however is not automatically enabled, and needs to be enabled explicitly.

Accurate timestamps are a prerequisite for usable audit records. You must make certain that the sensor's NTP configuration is working correctly.

Compliance with certification requires that all generated audit messages be securely transported to a remote logging server, periodically without any manual effort. Audit messages are sensitive in nature, may contain confidential information, and are critical to the detection of suspicious activity on the sensor. To comply with Common Criteria requirements, these messages must be protected from modification and from exposure in transport. Thus, a protocol with on-the-wire data encryption, and authenticatication must be used. SFTP was the protocol Corelight chose to use to provide for secure delivery of audit records. With SFTP message security and integrity are assured and the export mechanism used for audit records is the same as the export for Zeek logs.

SFTP exporter operates in batches, periodically transfering a batch of messages to the configured remote SFTP server. Audit records are batched-up hourly, meaning each batch will contain roughly 60 minutes worth of audit records. As of this writing this setting is not configurable. Thus, in every batch the oldest messages will be up to 60 minutes old. Timestamps within the actual messages are recorded at the time the messages are generated and thus as long as the clock on the sensor is accurate, the timestamps will be accurate and not affected in any way by the batching mechanism.

One of the more impacting choices which must be adhered to is a single administrative user (**admin** account) requirement for management of the sensor. This means that if multiple users are entrusted with the ability to configure the sensor, all users making configuration changes must be making those changes after logging in as the **admin** user. By extension this limits the visibility into who specifically made a particular configuration change. All audit events generated while the name of the logged in user is known, are going to contain admin as the username. In some cases the name of the user is unknown, or irrelevant, such as in the instances where some system task leads to the generation of audit records. These events may not have any user associated with them, or may have the admin user referenced.

The sensor normally communicates with the Corelight Cloud Services infrastructure to enable remote support, share non-sensitive telemetry, enabling observability and monitoring by Corelight, and automatic updates. This remote connectivity must be disabled in order to comply with the Common Criteria certification. In this mode of operation remote access by Corelight's support personnel will not be possible and no telemetry will be sent back. Licensing and automatic upgrades are also disabled. It is still possible to correct entitlement and update the sensor via an alternate (offline) process.

Local and remote management of the sensor is assumed to be performed either via the keyboard directly at the console or via SSH if remote. To comply with the Common Criteria certification the sensor must be able to lock out users after some number of failed authentication attempts. This requirement applies only to remote management. Local authentications, those performed directly at the appliance's console are thus not in scope of this requirement. It will be necessary to enable account locking if remote management of the sensor (via SSH) will be permitted.

The account locking behaviour is only applicable to password-based authentication. It is possible to enable key-based authentication, in which case account locking is not a requirement. Key-based authentication is a mechanism where a previously generated key containing two parts, public and private, is used by the administrator to authenticate themselves to the sensor by having previously provided to the sensor the public part of the key, which the sensor "trusts". It does not make sense to lock an account when key-based authentication is used, because password authentication is at that point disabled, and the purpose behind the lockout mechanism is to defeat password-guessing brute-force attempts.

9 Initial onboarding of a brand-new appliance

If the system is brand new and thus never configured before, it will require some basic configuration before the remainder of this document could be followed. Out of the box the only usable configuration interface is the textual user interface, which is local only, requiring a keyboard and a monitor to be physically attached to the sensor being configured.

After the sensor boots there will be a login screen on the primary terminal which looks like the following screenshot.

Login as the admin user with the default password admin. Please be sure to change the password as soon as you authenticate successfully and are able to manage the device. To change the password after you have logged in, select **Access** from the left-hand side navigation and then the **right arrow key** on the keyboard to highlight the **Update Administrator password** and hit the **Enter** key. You will be prompted to enter the current password, which in this case will be the out-of-box default password and then once accepted you will be asked to enter and confirm the new password.

Repeat this process for the netconfig user. This is a default user, which ships with the system, but Corelight chose to exclude it from the Common Criteria certification. The account should have its

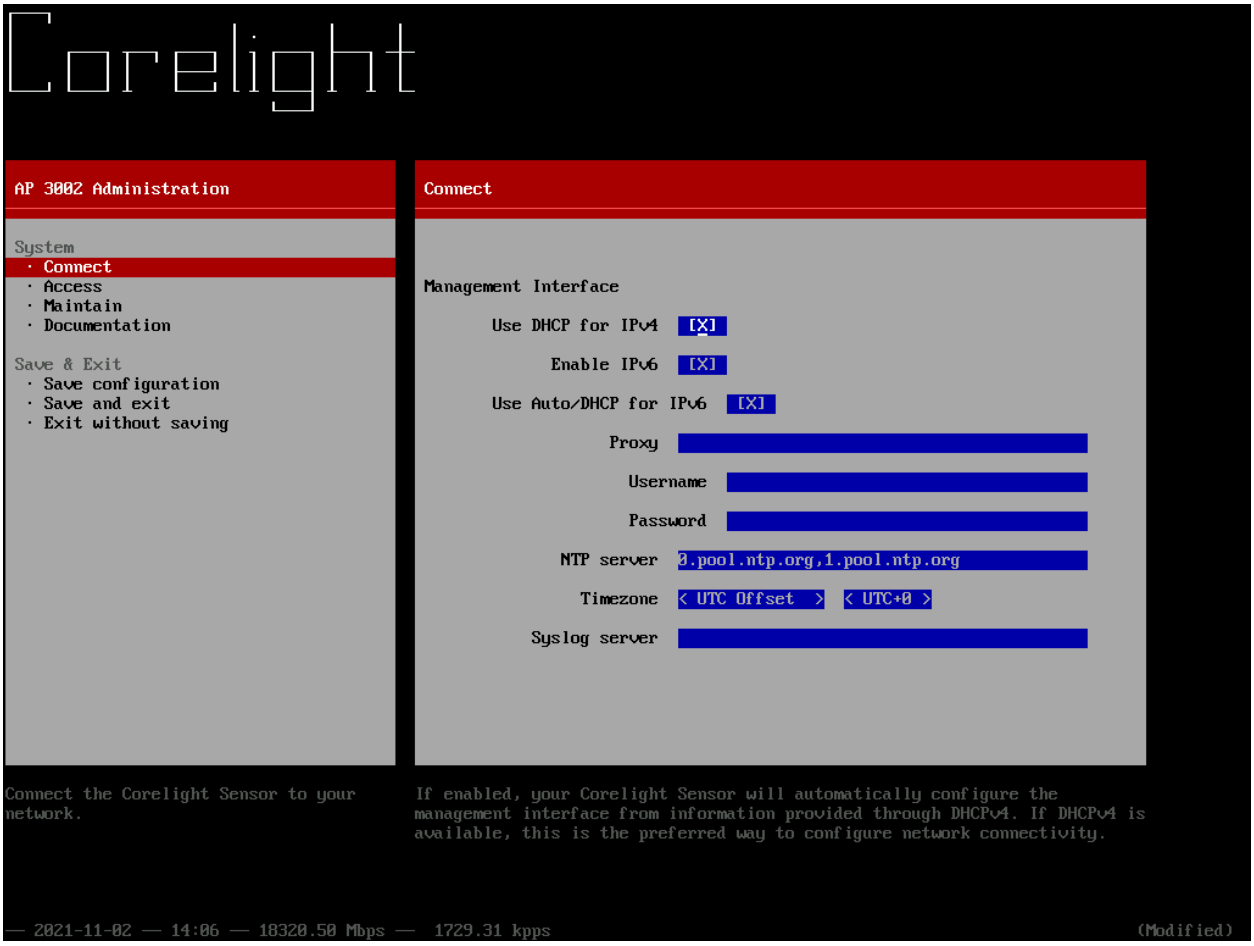
password changed so as to not leave the default password set. This account must not be used otherwise. Changing its password at this point is strictly a security concern. Highlight the **Update Network configuration password** and hit the **Enter** key. You will be prompted to enter the current password, which in this case will be the out-of-box default password and then once accepted you will be asked to enter and confirm the new password.

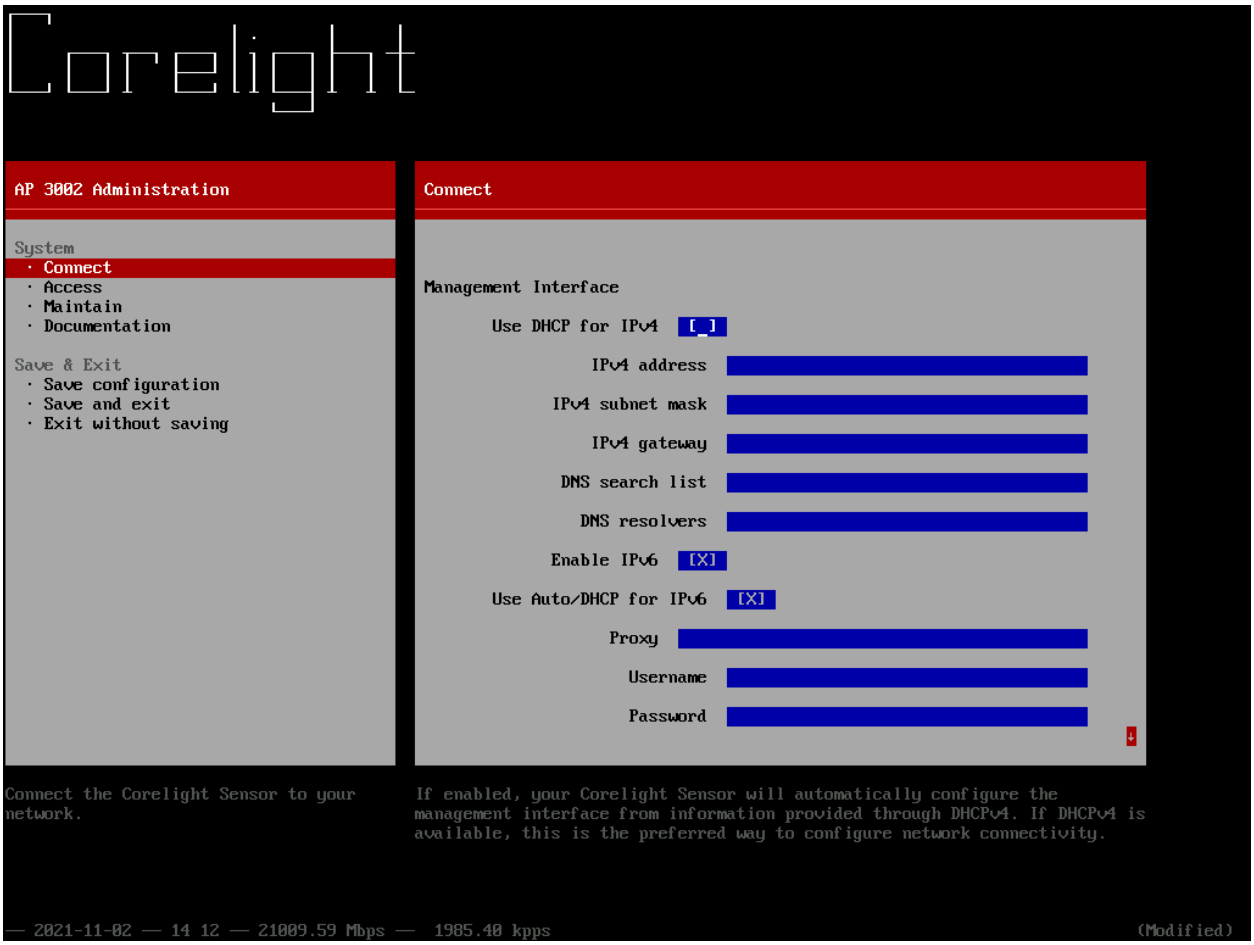
If you plan on enabling remote access to manage the appliance over SSH, now is a good time to enable this functionality. Simply hit the down arrow key a number of times, until you reach the **Enable access via SSH** checkbox. Check the box by hitting the **spacebar key** and hit the **left arrow key** to return to the primary left-hand side navigation. We will cover key-based authentication in the later part of this document. After saving these changes it will become possible to connect to the sensor remotely via SSH as soon as the management network interface is configured, and make further configuration changes from the convenience of your workstation.

Corelight chose to exclude support for Fleet and the Web UI from the Common Criteria certification, thus we do not cover their enablement in this document.

The Corelight appliance defaults to DHCP to automatically manage network settings on the management interface. By default, the management network is also the network used for export of telemetry and additionally audit log data. However, if DHCP is not enabled on the network where the sensor is connected, or it is not actually desired, it will be necessary to configure the network settings manually. To configure the management interface manually, select **Connect** from the left-hand side navigation and then hit the **right arrow key**. The screen will look similar to one in the next screenshot. This is where you can set your preferences for IPv4 and IPv6 networking, DHCP vs. static, etc.

In order to configure a static address you must first uncheck the **Use DHCP for IPv4** checkbox. Once that's unchecked additional fields will appear, allowing you to specify the desired interface IP address, subnet mask, and DNS configuration. Use the arrow keys to navigate these settings and when done return to the left-hand side navigation by hitting the **left arrow key**.





In order to have reliable timestamps, which is necessary to support audit logging, be sure to also configure the NTP server(s) and timezone. These settings are at the bottom of the same screen. Simply navigate to the bottom with the **down arrow key**. Without setting any timezone, the system will assume Universal Time Coordinated (UTC). It is recommended to configure at least two NTP servers in order to make clock synchronization more resilient to transient outages of NTP servers. Multiple servers may be specified by separating the DNS names or IP addresses with a comma. By default, two public NTP servers are already configured. They are 0.pool.ntp.org and 1.pool.ntp.org. DNS is for all intents and purposes required, and assumed to be working correctly, whether configured automatically via DHCP or manually. These names will not be resolvable otherwise and this will lead to a broken NTP configuration and by extension drifting clock.

10 Accessing product documentation

Corelight appliance documentation is not openly distributed. Each appliance will contain necessary information to access this documentation from a secure site. Username, password and the URL for the docs site will be provided. This information will be accessible from the diagnostic shell, via the following command.

corelight-client information get | grep doc-

11 Audit server requirements for audit log export

One of the core requirements of Common Criteria is ability to audit the system and broadly any configuration changes, cryptographic failures, etc. The Corelight appliance is designed to have capacity for 100,000 audit records. This capacity should be sufficient to store multiple days' worth of auditing data, even with a large number of events such as those generated during the appliance reconfigurations. Once this limit is reached, oldest records are removed in order to permit new records to be added. Administrators can access the audit events locally, however while there is room to store months of data on a typical system, API queries cannot back further than 7 days. In order to remain compliant with the certification all audit data must be exported to a secure external audit server in order to protect from loss of this information. The mechanism for export exists and its configuration is covered later in this document.

11.1 Audit Log Export

The TOE supports secure communication with an external audit server. This communication is secured with the SSH protocol. The Corelight appliance is able to buffer a large number of records and this is meant to protect from loss of information in the instances where the external audit server is not available for some period of time. Audit records are automatically exported in batches on a regular schedule. A batch will contain zero or more JSON-encoded records, with a few examples presented in the *Sample Audit Events* below.

The Corelight appliance extended its Zeek log batch exporter infrastructure in order to support secure export of audit logs via an already established mechanism. Currently, due to constraints we imposed with Common Criteria, the only supported method is via the SFTP log exporter. The only supported exporter under Common Criteria is the SFTP exporter, thus you will be required to have an SFTP capable server to receive both audit logs and the traditional Zeek logs. We discuss configuration of audit log export later in this document.

11.2 Connection Loss Recovery

Upon connection loss, the exporter process is going to detect the failure and will immediately restart itself, which will happen in a continuous loop as long as the remote end is not available. Each time the exporter is unable to connect, it will terminate, wait for a period of time and start-up again. There are no security concerns with the strategy. Any sensitive information in flight between the appliance and the audit server was encrypted on the wire, and any information in memory is destroyed as soon as the exporter exits, which happens as quickly as a disconnected connection is detected. Upon recovery there is no possibility for any data to be observed in clear text coming from the appliance. The appliance will attempt to authenticate with the key in the same way after an outage recovery as it does normally.

11.3 Auditable Events

Table 5 – Auditable Events

Requirement	Auditable Events	Additional Audit Record Contents
FAU_GEN.1	None.	None.
FAU_GEN.2	None.	None.
FAU_STG_EXT.1	None.	None.
FCS_CKM.1	None.	None.
FCS_CKM.2	None.	None.
FCS_CKM.4	None.	None.
FCS_COP.1/DataEncryption	None.	None.
FCS_COP.1/SigGen	None.	None.
FCS_COP.1/Hash	None.	None.
FCS_COP.1/KeyedHash	None.	None.
FCS_RBG_EXT.1	None.	None.
FCS_SSHC_EXT.1	Failure to establish an SSH session	Reason for failure
FCS_SSHS_EXT.1	Failure to establish an SSH session	Reason for failure
FIA_AFL.1	Unsuccessful login attempts limit is met or exceeded.	Origin of the attempt (e.g., IP address).
FIA_PMG_EXT.1	None.	None.
FIA_UIA_EXT.1	All use of identification and authentication mechanism.	Origin of the attempt (e.g., IP address).
FIA_UAU_EXT.2	All use of identification and authentication mechanism.	Origin of the attempt (e.g., IP address).
FIA_UAU.7	None.	None.

Requirement	Auditable Events	Additional Audit Record Contents
FMT_MOF.1/ManualUpdate	Any attempt to initiate a manual update	None.
FMT_MTD.1/CoreData	None.	None.
FMT_SMF.1	All management activities of TSF data.	None.
FMT_SMR.2	None.	None.
FPT_SKP_EXT.1	None.	None.
FPT_APW_EXT.1	None.	None.
FPT_TST_EXT.1	None.	None.
FPT_TUD_EXT.1	Initiation of update; result of the update attempt (success or failure)	None.
FPT_STM_EXT.1	Discontinuous changes to time - either Administrator actuated or changed via an automated process. (Note that no continuous changes to time need to be logged. See also application note on FPT_STM_EXT.1)	For discontinuous changes to time: The old and new values for the time. Origin of the attempt to change time for success and failure (e.g., IP address).
FTA_SSL_EXT.1 (if "terminate the session" is selected)	The termination of a local session by the session locking mechanism.	None.
FTA_SSL.3	The termination of a remote session by the session locking mechanism.	None.
FTA_SSL.4	The termination of an interactive session.	None.
FTA_TAB.1	None.	None.

Requirement	Auditable Events	Additional Audit Record Contents
FTP_ITC.1	● Initiation of the trusted channel. ● Termination of the trusted channel. ● Failure of the trusted channel functions.	Identification of the initiator and target of failed trusted channels establishment attempt.
FTP_TRP.1/Admin	● Initiation of the trusted path. ● Termination of the trusted path. ● Failure of the trusted path functions.	None.

11.4 Sample Audit Events

The audit events will be written in batches, where every batch contains one hour of events. They are JSON-structured for ease of further processing and ingestion into other systems.

All events will contain a:

- Timestamp
- Source of the event
- Outcome, either *success* or *failure*
- Additional required details, and details to provide richer context

Depending upon the nature of the event and its origin, there may be more or less context available. These are examples of what the audit events will look like when the contents are examined after export.

FIA_AFL.1: Unsuccessful login attempts limit is met or exceeded.

```
{
  "audit_event": {
    "outcome": "failure",
    "port": "45712:",
    "source": "192.168.66.66",
    "user": "admin"
  },
```

```
   "brolin": "brolin-dev/1.2873",
   "ip": "192.168.66.65",
   "key": "SSHAuthFail",
   "level": "error",
   "mac": "12:56:54:d1:3d:e3",
   "msg": "Disconnected connection after reaching limit of authentication failures with invalid
account",
   "pid": "",
   "rid": "23f2448c62",
   "seeded": "20210607080458",
   "source": "sshd",
   "syslog": "1",
   "syslog-time": "1638193649",
   "time": 1638193650.670487,
   "type": "auditlog",
   "uid": "c0-1d-c0-ff-ee-ca-11-ed"
}
```


FIA_UIA_EXT.1: All use of identification and authentication mechanism.


```
{
   "audit_event": {
      "outcome": "success",
      "source": "SSH",
      "user": "admin"
   },
   "brolin": "brolin-dev/1.2873",
   "ip": "192.168.66.65",
   "key": "Login",
   "level": "info",
   "mac": "12:56:54:d1:3d:e3",
   "msg": "user admin has logged in through SSH from 192.168.66.66",
   "pid": "",
   "rid": "59dd0d6813",
   "seeded": "20210607080458",
   "source": "broala-at-login",
   "syslog": "1",
   "syslog-time": "1638194237",
   "time": 1638194238.2393825,
   "type": "auditlog",
   "uid": "c0-1d-c0-ff-ee-ca-11-ed"
}
```


FIA_UAU_EXT.2: All use of identification and authentication mechanism.

```
{
  "audit_event": {
    "outcome": "success",
    "port": "39324",
    "source": "192.168.66.64",
    "user": "diag-shell"
  },
  "brolin": "brolin-dev/1.2873",
  "ip": "192.168.66.65",
  "key": "SSHAuthSuccess",
  "level": "info",
  "mac": "12:56:54:d1:3d:e3",
  "msg": "Established new connection between 192.168.66.64 and sensor",
  "pid": "",
  "rid": "56640bb2d7",
  "seeded": "20210607080458",
  "source": "sshd",
  "syslog": "1",
  "syslog-time": "1638194602",
  "time": 1638194603.0817604,
  "type": "auditlog",
  "uid": "c0-1d-c0-ff-ee-ca-11-ed"
}
```


FMT_MOF.1/ManualUpdate: Any attempt to initiate a manual update


```
{
  "audit_event": {
    "method": "POST",
    "outcome": "success",
    "params": {
      "dry-run": false,
      "repository": null,
      "skip-apply-config": false,
      "skip-reboot": false
    },
    "path": "/api/updates/actions/apply",
    "remote_host": "192.168.66.64",
    "status": 200,
    "timestamp": "2021-11-29T14:29:12.624325Z",
    "user": "admin"
  },
  "brolin": "brolin-dev/1.2871",
  "ip": "192.168.66.65",
```

```
  "key": "APIRequestSucceeded",
  "level": "info",
  "mac": "12:56:54:d1:3d:e3",
  "msg": "requested application of updates on sensor",
  "rid": "237d6022a6",
  "seeded": "20210607080458",
  "source": "broala-apid",
  "time": 1638196152.6288264,
  "type": "auditlog",
  "uid": "c0-1d-c0-ff-ee-ca-11-ed"
}
```


FMT_SMF.1: All management activities of TSF data.


```
{
  "audit_event": {
    "method": "PUT",
    "outcome": "success",
    "params": {
      "dry-run": false
    },
    "path": "/api/authentication/banner/pre-login",
    "remote_host": "192.168.66.64",
    "status": 200,
    "timestamp": "2021-11-29T14:37:28.890401Z",
    "user": "admin"
  },
  "brolin": "brolin-dev/1.2873",
  "ip": "192.168.66.65",
  "key": "APIRequestSucceeded",
  "level": "info",
  "mac": "12:56:54:d1:3d:e3",
  "msg": "requested to update pre-login banner on the sensor",
  "rid": "94aa586aa4",
  "seeded": "20210607080458",
  "source": "broala-apid",
  "time": 1638196648.8916342,
  "type": "auditlog",
  "uid": "c0-1d-c0-ff-ee-ca-11-ed"
}
```


FPT_TUD_EXT.1: Initiation of update; result of the update attempt (success or failure)


```
{
  "audit_event": {
```

```
      "outcome": "success",
      "timestamp": "2021-11-29T14:26:34.857839Z",
      "user": "system"
    },
    "brolin": "brolin-dev/1.2871",
    "ip": "192.168.66.65",
    "key": "UpdateActionSucceeded",
    "level": "info",
    "mac": "12:56:54:d1:3d:e3",
    "msg": "started applying configuration changes after installation of sensor updates",
    "rid": "364767744b",
    "seeded": "20210607080458",
    "source": "broala-update-repository",
    "time": 1638195994.8598695,
    "type": "auditlog",
    "uid": "c0-1d-c0-ff-ee-ca-11-ed"
}
```


FPT_STM_EXT.1: Discontinuous changes to time - either Administrator actuated or changed via an automated process.


```
{
    "audit_event": {
      "delta": -3034.590595,
      "method": "PUT",
      "new_time": "2021-11-29T06:07:17-08:00",
      "original_time": "2021-11-29T06:57:51.590595-08:00",
      "outcome": "success",
      "params": {
        "ascii": null,
        "dry-run": false,
        "unix": 1638194837
      },
      "path": "/api/system/status/clock",
      "remote_host": "192.168.66.64",
      "status": 200,
      "timestamp": "2021-11-29T14:07:17.124091Z",
      "user": "admin"
    },
    "brolin": "brolin-dev/1.2873",
    "ip": "192.168.66.65",
    "key": "APIRequestSucceeded",
    "level": "info",
    "mac": "12:56:54:d1:3d:e3",
```

```
  "msg": "requested change to current local time",
  "rid": "2c328a4b53",
  "seeded": "20210607080458",
  "source": "broala-apid",
  "time": 1638194837.125498,
  "type": "auditlog",
  "uid": "c0-1d-c0-ff-ee-ca-11-ed"
}
```


FTA_SSL_EXT.1: The termination of a local session by the session locking mechanism.


```
{
  "audit_event": {
    "outcome": "success",
    "remote_host": "192.168.66.66",
    "timestamp": "2021-11-29T17:11:48.170972Z",
    "user": "admin"
  },
  "brolin": "brolin-dev/1.2873",
  "ip": "192.168.66.65",
  "key": "UIIdleSessionTimeout",
  "level": "info",
  "mac": "12:56:54:d1:3d:e3",
  "msg": "idle session timeout",
  "rid": "426a18d977",
  "seeded": "20210607080458",
  "source": "UI",
  "time": 1638205908.2700908,
  "type": "auditlog",
  "uid": "c0-1d-c0-ff-ee-ca-11-ed"
}
```


FTA_SSL.3: The termination of a remote session by the session locking mechanism.


```
{
  "audit_event": {
    "outcome": "success",
    "port": "36240",
    "source": "192.168.66.66",
    "user": "diag-shell"
  },
  "brolin": "brolin-dev/1.2873",
  "ip": "192.168.66.65",
  "key": "SSHAuthSuccess",
  "level": "info",
```

```
  "mac": "12:56:54:d1:3d:e3",
  "msg": "Closed connection between 192.168.66.66 and sensor",
  "pid": "",
  "rid": "b4f3de94d7",
  "seeded": "20210607080458",
  "source": "sshd",
  "syslog": "1",
  "syslog-time": "1638365354",
  "time": 1638365355.416626,
  "type": "auditlog",
  "uid": "c0-1d-c0-ff-ee-ca-11-ed"
}
```


FTA_SSL.4: The termination of an interactive session.


```
{
  "audit_event": {
    "outcome": "success",
    "remote_host": "192.168.66.66",
    "timestamp": "2021-11-29T19:26:30.564143Z",
    "user": "admin"
  },
  "brolin": "brolin-dev/1.2873",
  "ip": "192.168.66.65",
  "key": "UIExiting",
  "level": "info",
  "mac": "12:56:54:d1:3d:e3",
  "msg": "exiting UI",
  "rid": "37481cfee8",
  "seeded": "20210607080458",
  "source": "UI",
  "time": 1638213990.6545186,
  "type": "auditlog",
  "uid": "c0-1d-c0-ff-ee-ca-11-ed"
}
{
  "audit_event": {
    "outcome": "success",
    "port": "49152",
    "source": "192.168.66.66"
  },
  "brolin": "brolin-dev/1.2873",
  "ip": "192.168.66.65",
  "key": "SSHAuthSuccess",
```

```
  "level": "info",
  "mac": "12:56:54:d1:3d:e3",
  "msg": "Connection closed by remote end",
  "pid": "",
  "rid": "d63ae2b6e6",
  "seeded": "20210607080458",
  "source": "sshd",
  "syslog": "1",
  "syslog-time": "1638202155",
  "time": 1638202156.7079196,
  "type": "auditlog",
  "uid": "c0-1d-c0-ff-ee-ca-11-ed"
}
```


FTP_ITC.1:

- Initiation of the trusted channel.
- Termination of the trusted channel.
- Failure of the trusted channel functions.


```
{
  "audit_event": {
    "outcome": "success",
    "port": "22",
    "target": "192.168.66.64",
    "user": "corelight_user"
  },
  "brolin": "brolin-dev/1.2873",
  "ip": "192.168.66.65",
  "key": "SSHConnectBsftp",
  "level": "info",
  "mac": "12:56:54:d1:3d:e3",
  "msg": "Established connection as corelight_user to SSH server 192.168.66.64 port 22",
  "pid": "",
  "rid": "a367032efc",
  "seeded": "20210607080458",
  "source": "ssh_log_transfer",
  "syslog": "1",
  "syslog-time": "1638365938",
  "time": 1638365939.4915025,
  "type": "auditlog",
  "uid": "c0-1d-c0-ff-ee-ca-11-ed"
}
{
  "audit_event": {
```

```
    "outcome": "failure",
    "port": "2222",
    "target": "192.168.66.64",
    "user": "corelight_user"
  },
  "brolin": "brolin-dev/1.2873",
  "ip": "192.168.66.65",
  "key": "SSHAuthFailBsftp",
  "level": "error",
  "mac": "12:56:54:d1:3d:e3",
  "msg": "Error connecting to SSH server as corelight_user connecting to 169.254.2.2 port 2222;
Connection timed out",
  "pid": "",
  "rid": "0a881a9b7b",
  "seeded": "20210607080458",
  "source": "ssh_log_transfer",
  "syslog": "1",
  "syslog-time": "1638365348",
  "time": 1638365349.328164,
  "type": "auditlog",
  "uid": "c0-1d-c0-ff-ee-ca-11-ed"
}
{
  "audit_event": {
    "outcome": "failure",
    "port": "53774",
    "source": "192.168.66.64",
    "user": "corelight_user"
  },
  "brolin": "brolin-dev/1.2873",
  "ip": "192.168.66.65",
  "key": "SSHAuthFail",
  "level": "error",
  "mac": "12:56:54:d1:3d:e3",
  "msg": "Connection closed by remote end before authentication",
  "pid": "",
  "rid": "bf88621148",
  "seeded": "20210607080458",
  "source": "sshd",
  "syslog": "1",
  "syslog-time": "1638365908",
  "time": 1638365909.3246408,
  "type": "auditlog",
```

```
  "uid": "c0-1d-c0-ff-ee-ca-11-ed"
}
```


FTP_TRP.1/Admin:

- Initiation of the trusted path.
- Termination of the trusted path.
- Failure of the trusted path functions.


```
{
  "audit_event": {
    "outcome": "success",
    "source": "SSH",
    "user": "admin"
  },
  "brolin": "brolin-dev/1.2873",
  "ip": "192.168.66.65",
  "key": "Login",
  "level": "info",
  "mac": "12:56:54:d1:3d:e3",
  "msg": "user admin has logged in through SSH from 192.168.66.66",
  "pid": "",
  "rid": "34c05384ad",
  "seeded": "20210607080458",
  "source": "broala-at-login",
  "syslog": "1",
  "syslog-time": "1638367901",
  "time": 1638367902.9185555,
  "type": "auditlog",
  "uid": "c0-1d-c0-ff-ee-ca-11-ed"
}
{
  "audit_event": {
    "outcome": "success",
    "port": "37376",
    "source": "192.168.66.66",
    "user": "admin"
  },
  "brolin": "brolin-dev/1.2873",
  "ip": "192.168.66.65",
  "key": "SSHAuthSuccess",
  "level": "info",
  "mac": "12:56:54:d1:3d:e3",
  "msg": "Closed connection between 192.168.66.66 and sensor",
  "pid": "",
```

```
  "rid": "9eada0801f",
  "seeded": "20210607080458",
  "source": "sshd",
  "syslog": "1",
  "syslog-time": "1638367906",
  "time": 1638367907.4844341,
  "type": "auditlog",
  "uid": "c0-1d-c0-ff-ee-ca-11-ed"
}
{
  "audit_event": {
    "outcome": "failure",
    "port": "37818",
    "source": "10.1.1.167",
    "user": "admin"
  },
  "brolin": "brolin-dev/1.2873",
  "ip": "192.168.66.65",
  "key": "SSHAuthFail",
  "level": "error",
  "mac": "12:56:54:d1:3d:e3",
  "msg": "Login was attempted with incorrect password",
  "pid": "",
  "rid": "bbe5b9ab1d",
  "seeded": "20210607080458",
  "source": "sshd",
  "syslog": "1",
  "syslog-time": "1638368869",
  "time": 1638368870.6552353,
  "type": "auditlog",
  "uid": "c0-1d-c0-ff-ee-ca-11-ed"
}
```


11.5 Role Based Access Control (RBAC)

The TOE implements Role Based Access Control (RBAC). Administrative users are required to authenticate before being granted access to any administrative functions. The TOE restricts the ability to manage the TOE to Security Administrators, otherwise referred to as the Administrator role.

The TOE maintains the following roles: Administrator, Network and Monitor. Each role defined has a set of permissions that will grant them access to the TOE data. Security functions and data are restricted to the Administrator.

For the purposes of the Common Criteria certification, only the Administrator role is supported with a single admin account.

Table 2 – Roles and Permissions

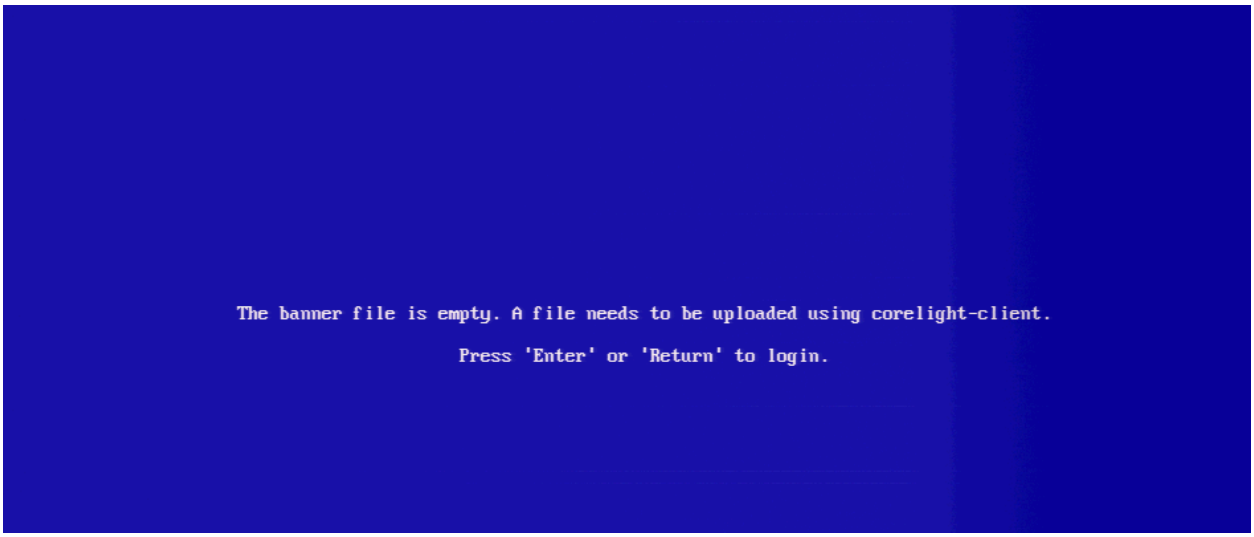
Roles	Permissions
Administrator (admin)	Can configure user accounts and manage users and their associated privileges.
	Ability to administer the TOE locally and remotely
	Ability to configure the access banner
	Ability to configure the session inactivity time before session termination or locking
	Ability to configure account lockout
	Ability to update the TOE, and to verify the updates using digital signatures capability prior to installing those updates
	Ability to configure the authentication failure parameters
	Ability to configure audit behavior
	Ability to set the time which is used for timestamps
	Ability to configure the reference identifier for the peer
Network Administrator (netconfig)	Ability to change network settings of the TOE locally and remotely
	Can change their own password, but not other users' passwords
User (monitor)	Able to carry out system monitoring and gather information about the configuration and performance of the system.
	Can change their own password, but not other users' passwords

12 Accessing the appliance to make configuration changes

All configuration changes here assume that the administrator has previously launched the diagnostic shell (diag-shell) via the textual UI on the sensor, or by establishing a connection via **ssh**.

12.1 Local Console

It is not necessary to enable the local console. It is automatically enabled out of the box. To connect to the sensor via the local console, the keyboard and monitor must be connected first. A warning banner appears for the administrator to ensure the interface is local, press **Enter** login prompt will normally be seen on the console. Login as the admin user and after successfully authenticating, select **Maintain** from the left-hand side menu, then hit the **right arrow key** on the keyboard and select **Enter Diagnostic Shell**. You are now ready to configure the sensor.



Example

12.2 Remote SSH

To connect to the sensor remotely, you will be required to use the SSH protocol, and therefore will need some SSH client on the management workstation. In order to enable SSH access to the sensor it is necessary to connect via the console in order to configure required settings. This step requires the keyboard and monitor to be connected to the sensor. After successfully authenticating, select **Maintain** from the left-hand side menu, then hit the **right arrow key** on the keyboard and select **Enter Diagnostic Shell**. You are now ready to configure the sensor. The following command is going to enable remote access via ssh.

corelight-client configuration update --security.ssh.enable=True

It is likewise possible to enable remote access via SSH directly from the textual interface without entering the diagnostic shell. After successfully authenticating, select **Access** from the left-hand side menu, then hit the **right arrow key** on the keyboard and scroll down to the checkbox labeled **Enable access via SSH**. Check the previously unchecked box by hitting the spacebar key once. Hit the **left arrow key** once to return to the main menu. Then, scroll down and select either **Save configuration** or **Save and exit**.

If the admin user's ssh public key was previously configured on the sensor, and the administrator possesses the matching private key, authentication via a key-exchange will simply work.

To establish a management connection to the sensor, use the ssh client utility such as the OpenSSH client simply named ssh or a utility with a graphical interface such as PuTTY. The following syntax is appropriate for the OpenSSH version of the ssh client. Replace the <address> placeholder with the IP address or hostname of the sensor: ssh admin@<address>. Adjust this accordingly for whatever ssh client utility you are using. After successfully authenticating, select **Maintain** from the left-hand side menu, then hit the **right arrow key** on the keyboard and select **Enter Diagnostic Shell**. You are now ready to configure the sensor.

12.3 Session Termination

To terminate a local or remote session from the diagnostic shell:

- type exit or exit diag and hit the Return/Enter key.

To terminate local or remote session from the textual user interface, select from two options in the left-hand navigation with the arrow keys, and hit the Return/Enter key:

- **Save and exit**
- **Exit without saving**

12.4 FIPS mode requirement

FIPS compliance is a prerequisite for the Common Criteria certification. The sensor must be configured to operate in FIPS mode, which among other things imposes limitations on availability of algorithms from the cryptographic module and by extension constrains those components which depend on it, imposes mandatory cryptographic module initialization health testing and enables protections which go beyond the normal security mechanisms such as keeping sensitive details protected in memory and securely wiping memory after it has been freed.

corelight-config fips enable

The system will validate that it is FIPS-capable and then enable FIPS mode and reboot.

12.5 Enabling Common Criteria mode

It is necessary to enable Common Criteria mode in order to make adjustments to allowable algorithms as well as other security parameters which put the system into a state that is compliant with the certification. When the Common Criteria mode is enabled, a limited set of algorithms will be enforced by the system. This is entirely governed by the appliance and there are no external controls. Only those algorithms claimed as part of the certification will be available.

```
corelight-client configuration update \
        --mode.common_criteria.enable=True
```

13 Configuring the system clock

The Corelight appliance allows for the system clock to be set manually. It is possible to keep the clock synchronized with NTP. If the system clock is very inaccurate, it is possible to set the clock manually, and then make sure that NTP is configured, which will continue to maintain accurate time. Note that NTP is not evaluated.

13.1 Setting the clock manually

It is possible to manually set the clock, but NTP is strongly recommended. To set the clock manually, using the following command, replacing <time now> with a UNIX epoch time value.

corelight-client clock update --help --unix <time now>

You may want to change the configured time zone to **Etc/GMT+0** in order to have universal coordinated time across your infrastructure. Perform the following to change the timezone to UTC.

corelight-client configuration update --system.timezone=Etc/GMT+0

14 Enabling Audit Log Export

This is necessary to enable export of audit records as batches using the same mechanism as that used for Zeek logs.

```
corelight-client configuration update \
        --security.auditlog_export.enable=True
```

In order for the records to be exported, the SFTP exporter must be configured and working correctly. To enable the exporter perform the following steps. Replace <remote path> with the correct target path on the SFTP server. The sensor must be able to create directories and files in this path. Replace <destination address> with the IP address or resolvable hostname of the SFTP server. Replace <username> with the username with which the sensor should be authenticated.

```
corelight-client configuration update --bro.export.logs.enable=True
corelight-client configuration update \
        --bro.export.sftp.log.path=<remote path> \
        --bro.export.sftp.log.server=<destination address> \
        --bro.export.sftp.log.user=<username>
```

14.1 SFTP Authentication

The Corelight appliance does not allow the administrator to provide a private SSH key for authentication with the remote SFTP server. This means an administrator cannot make choices about the cryptographic algorithms used to generate the key, as well as parameters, such as the size of the modulus with an RSA key, for instance. The appliance will automatically generate an RSA key, and the administrator will be required to retrieve the key from the sensor, which they will then have to authorize on the SFP server. The details around this are discussed in a later section.

The SFTP batch exporter only supports public key exchange for authentication, thus it is necessary for the SFTP server to support public key authentication, and it must be configured correctly for the user specified in the previous step. The Corelight sensor does not allow the user to provide keys for key exchanges between it and the SFTP server, instead it generates its own keypair. Generated key is an RSA key with a 3072-bit modulus. In order to authorize the sensor to access the remote SFTP destination, the public key part of the generated key pair will be required on the remote end. The public key is obtained from the sensor with the following command.

```
corelight-client keys exporter get
```

This public key which must be added to the authorized_keys file or its equivalent, associated with the remote user with which the sensor is going to be authenticating. Once the public key is configured on the SFTP server, establishing a trust, the sensor will create a connection automatically.

14.2 Disabling Corelight Cloud Service connectivity

Disabling remote connectivity will mean that updates must be performed via an offline updater mechanism. Corelight's Support and Customer Success teams will be able to assist with this.

```
corelight-client configuration update \
        --remote.enable=False \
        --remote.download.license=False
```

15 Key-based Authentication with SSH

As already mentioned the administration of the sensor is limited to a single user. This account is named **admin**, and this default administrative account ships with the sensor Cryptographic functions are restricted to security administrators (admin). While the sensor is not limited to a single user, our Common Criteria compliance implementation choice is enforcing this.

It is possible to switch off password-based authentication on the sensor and enable public key based authentication, which eliminates the need for passing the administrator's password between the remote ssh client and sensor. Public key authentication is a more secure authentication mechanism relative to password based, and will not be subject to account locking. The public key string should be taken verbatim from the public key file, most commonly generated via the ssh-keygen command. The sensor can only support keys compatible with OpenSSH. There are two formats that OpenSSH supports, a PEM format, which has been used historically and a more recent OpenSSH-specific format. Both formats are allowed. While the sensor supports multiple key exchange algorithms, RSA keys are most commonly used, and recommended.

If you are unsure about the format of the private key, or if this key is used with an ssh implementation other than OpenSSH, you should be able to tell if it is compatible by inspecting the first or last lines of the key. All compatible RSA keys will have one of the following two first lines.

```
-----BEGIN OPENSSH PRIVATE KEY-----
-----BEGIN RSA PRIVATE KEY-----
```

The last line of the key will have one of the following two lines.

```
-----END OPENSSH PRIVATE KEY-----
-----END RSA PRIVATE KEY-----
```

To generate a compliant RSA key pair, the following command may be used, on a trusted, and secure system. Because versions of the ssh-keygen command vary, and are affected by the version of the OpenSSH package and the operating system, it is important to consult the documentation for the specific version of the OpenSSH package on the system where the keys are actually generated. Always use the latest version of the OpenSSH package, and by extension latest version of the ssh-keygen utility.

```
ssh-keygen -m PEM -t rsa -f id_rsa
```

It is possible to specify the size of the modulus, which is the equivalent of the key's size, and cryptographic strength. The only supported sizes are a 2048-bit and 3072-bit moduli. Replace the <modulus bits> in the following command with 2048 or 3072, which corresponds to a 2048-bit or 3072-bit modulus.

ssh-keygen -t rsa -b <modulus bits> id_rsa

This will generate a key with 3072-bit long modulus. The output of the above command should look similar to the following example. Note that -m PEM will result in the creation of the traditional PEM formatted private key. This may be necessary if the same key is going to be used from a system with older version of the ssh command, which does not understand the more recent OpenSSH format.

```
$ ssh-keygen -m PEM -t rsa -f ./id_rsa
Generating public/private rsa key pair.
Enter passphrase (empty for no passphrase):
Enter same passphrase again:
Your identification has been saved in ./id_rsa
Your public key has been saved in ./id_rsa.pub
The key fingerprint is:
SHA256:l5vKJzgOcAaa/+rswFsKIcVYvISSaJQi1Z8c5BM2nfI demouser@demo-machine.local
The key's randomart image is:
+---[RSA 3072]----+
|o*+. .=. .       |
|B*o .oooo        |
|*.+. oo=         |
| +..  +.E .      |
|= . o   S o      |
|oo +     . o     |
|o....  .  o      |
|.o+. .o....      |
| ==.....oo       |
+----[SHA256]-----+
```

It is also possible to generate a key pair in a similar fashion with the openssl command if for any reason ssh-keygen is not available or from a very old version of the OpenSSH package. Depending on the version of openssl, the method is going to vary. For this reason there is no example provided.

Elliptic Curve Cryptography based keys are generated in a similar fashion. Replace the <prime curve> in this command with your chosen prime curve, which will be one of 256, 384 or 521, corresponding to P256, P384, and P521 prime curves. Replace <curve size> with one of 256, 384 or 521 in the following command.

ssh-keygen -t ecdsa -b <curve size> -f id_ecdsa

The output of the above command should look similar to the following examples of generating Elliptic Curve key pairs with the three supported prime curve sizes: 256, 384 and 512 on a system with a recent version of OpenSSH.

```
$ ssh-keygen -t ecdsa -b 256 -f id_ecdsa
Generating public/private ecdsa key pair.
Enter passphrase (empty for no passphrase):
Enter same passphrase again:
Your identification has been saved in id_ecdsa
Your public key has been saved in id_ecdsa.pub
The key fingerprint is:
SHA256:4kCPAl/zCIzsYcx0Q0fFsRV9taMpu0FYIyVAByTrE6c demouser@demohost
The key's randomart image is:
+---[ECDSA 256]---+
| ..+.+=B+=o.  .. |
|=o. o o.+ o. .  .|
|o*o +o o . o.  o |
|oo.+.*+   + . o .|
| .o +E+ S. o o   |
|   . o..  . o    |
|     .   o    |
|         o    |
|        .    |
+----[SHA256]-----+

$ ssh-keygen -t ecdsa -b 384 -f id_ecdsa
Generating public/private ecdsa key pair.
Enter passphrase (empty for no passphrase):
Enter same passphrase again:
Your identification has been saved in id_ecdsa
Your public key has been saved in id_ecdsa.pub
The key fingerprint is:
SHA256:i+fuzTJ2orEc72AEgmMn85caa7RpOGL0lj7CnLIxobM demouser@demohost
The key's randomart image is:
+---[ECDSA 384]---+
|               |
| .             |
|o+...          |
|..=. ..        |
|.. + o. S      |
|o.+ O. . .     |
|O+.@  * o      |
```

```
|+X*. o O=o.      |
|E.... +**=o      |
+----[SHA256]-----+
```

```
ssh-keygen -t ecdsa -b 521 -f id_ecdsa
Generating public/private ecdsa key pair.
Enter passphrase (empty for no passphrase):
Enter same passphrase again:
Your identification has been saved in id_ecdsa
Your public key has been saved in id_ecdsa.pub
The key fingerprint is:
SHA256:T3DmPQO5G2Z5kG1kCMkxycUDiSFZ0ozXB+GooWSwf/s demouser@demohost
The key's randomart image is:
+---[ECDSA 521]---+
|.   o*o*B%..o    |
| o  oo=oB.=*     |
|. o ... o.B.o    |
| + . o   = B     |
| o o   S O =     |
|  . .   = + o    |
|   .     o       |
|    .            |
|     E           |
+----[SHA256]-----+
```

The OpenSSH public key file will normally contain a single line, with two or three columns. The first two columns identify the type of key as well as provide the actual content of the public key. The third column is a comment and strictly optional. The most convenient way to extract the exact content that needs to be passed to the sensor, in order to set up key exchange is to do the following, where /path/to/ssh/private/key is the path to the private key. Frequently, this will be in your home directory, under the .ssh directory.

```
ssh-keygen -m PEM -y -f /path/to/ssh/private/key
```

Finally, pass the output of the previous command to the sensor with the following command. Be sure to quote the string as shown below to prevent token splitting by the shell.

```
corelight-client configuration update \
        --security.user.admin.ssh_public_key='<SSH public key string>'
```

To comply with the Common Criteria certification, RSA keys must have 2048-bit or 3072-bit modulus. If you are unsure about previously generated keys meeting this requirement, you can

discover the modulus size of the key using one of the following methods. In the first example, the openssl command is used, and in the second ssh-keygen is used. In both cases the file name of the private key is id_rsa, and it is located in the same directory from which the command is executed. Notice that in this example the size is 1024-bit as reported by both commands, albeit with quite different output formats. This is a smaller modulus than what is compliant with the Common Criteria certification. If using RSA keys, the recommended size is 3072. All reasonably modern versions of the OpenSSH package, and therefore the ssh-keygen tool will automatically choose to use 3072 with RSA keys.

```
$ ls id_rsa*
id_rsa        id_rsa.pub

$ openssl rsa -text -noout -in id_rsa | head -1
RSA Private-Key: (1024 bit, 2 primes)

$ ssh-keygen -lf id_rsa
1024 SHA256:bZoaqqcZAdJuP1eeL4qhtdazxHUlmwPT2FCafxdHVaE demouser@demo-
machine.local (RSA)
```

Private keys must be treated with the same care and attention as passwords. Generation and secure handling of private keys are a complex topic and beyond the scope of this document. Corelight's Support and Customer Success teams will be able to assist with this.

16 Enabling Inactivity Timeout

The value for the inactivity timeout is in minutes, not seconds, please adjust accordingly if the existing policy is in seconds. This setting will lead to sessions which remained inactive for this many minutes to be disconnected.

```
corelight-client configuration update
        --security.auto_logout.enable=True \
        --security.auto_logout.timeout=<idle minutes>
```

The default inactivity time period is 60 minutes for both the CLI and SSH interfaces.

16.1 Enabling temporary account lockout for remote connections

This mechanism is intended to lock out the **admin** user logging in remotely (ssh), for some period of time after a threshold of unsuccessful authentication attempts has been exceeded. Default value is 600 seconds. The admin user is never completely locked out. While the account may be locked out from authenticating remotely, it is still possible to login with the same account at the local console. The account is never locked if logging in locally, no matter how many consecutive unsuccessful authentication attempts have been made.

```
corelight-client configuration update \
        --authentication.local.lockout.enable=True
```

To adjust the time the account remains locked, once the threshold has been reached, change the value of authentication.local.lockout.unlock_after_secs. The range for this value is from 180 to 86400 seconds (24 hours).

```
corelight-client configuration update \
        --authentication.local.lockout.unlock_after_secs=<lockout secs>
```

To adjust the number of consecutive unsuccessful authentication attempts, after which the account is locked out prohibiting further remote authentications (even with correct password, until the lockout time runs out), change the value of authentication.local.lockout.max_attempts. The range for this value is from 3 to 15 within 60 minutes.

```
corelight-client configuration update \
        --authentication.local.lockout.max_attempts=<number of allowed failures>
```

17 Password Requirements

To prevent administrators from choosing insecure passwords, each password must meet the following requirements:

1. Minimum password length shall be configurable to between [8] and [64] characters. The default minimum password length is 8 characters.
2. Passwords shall be able to be composed of any combination of upper and lower case letters, numbers, and the following special characters: [“!”, “@”, “#”, “$”, “%”, “^”, “&”, “*”, “(“, “)”, [“~”, “ ”, “””]];

In order to remain in compliance with the Common Criteria certification, the admin password must not be shorter than 8 characters. This setting is expected to be modified according to the security requirements. The following command enables changing this default. Replace the string <chosen length> with the value which corresponds to your security policy.

```
corelight-client configuration update \
  --mode.password.strict=1 \
  --strict_pw.min_length.enable=1 \
  --strict_pw.min_length=<chosen length>
```

It is not possible to adjust this minimum length above 64. Anything above 64 will result in the command failing.

18 Login Banner

Enabling and setting a pre-login banner is required to be in compliance with the Common Criteria certification. A security banner is simply a text file with the desired contents of the banner, which will be displayed whenever ssh or local connections are made to the sensor. The following command places the banner on the sensor and enables it automatically. Replace **<filename>** with the path to the file containing contents for the banner. It may be a bit awkward to deal with content via ssh. The simplest approach is to ssh as the diag-shell user, create the banner file with vi or cat and then upload using the following command. To change the local login message and to change the remote login message:

corelight-client banner pre-login upload --file <filename>

19 Self-Tests

19.1 Cryptographic POST

Upon initialization of the cryptographic module several self-tests are performed by the module to assure proper function of the cryptographic components, the DRBG, etc. If any one of these tests does not pass, the module will refuse to perform any further work, which will prevent any application attempting to use the module from using possibly compromised cryptography.
When the device detects a failure during one or more of the self-tests, an audit failure event will be raised. The administrator can attempt to reboot the TOE to clear the error. If rebooting the device does not resolve the issue, then the administrator should contact Corelight support for further assistance. All power up self-tests execution is logged for both successful and unsuccessful completion.

19.2 Appliance Software Updates

Normally the Corelight appliance may be updated via an automatic process, where updates are retrieved by the sensor from a repository hosted by Corelight. However, to comply with the choices we made as part of the certification process, only offline updates will be permitted. Offline updates are delivered to the appliance via an archive, which will contain encrypted contents, and upon successful validation of authenticity via signature validation, will be installed on the appliance.

In order to determine the running version of the appliance, the following command may be used.
corelight-client information get | grep 'os\.'

Typical delivery of the offline update image is via a USB stick, which the administrator must insert into one of the available USB ports on the appliance. The following command may be used to install the update from the offline updater which was previously inserted into one of the USB ports on the appliance.

The following command will list all available updates.
corelight-client updates list

The following command will actually install the pending updates.
corelight-client updates apply

After the update is complete, unmount the previously mounted media with the following command.
corelight-client updates unmount

At this point the appliance should be rebooted with the following command. You will be prompted to confirm this action.
corelight-client system reboot

20 Sensitive material zeroization

The appliance will automatically zero out any data on persistent storage when that data is destroyed. Key material, such as SSH keys is destroyed in this manner any time the Administrator triggers re-keying operation.

Sensitive material in memory, such as ephemeral keys, are zeroized as well, before the memory is freed.

21 Rekey Default

The rekey values are by default set in the device and cannot be changed. The time rekey of 1 hour and volume rekey of 1 GB is set in the device and cannot exceed this value.

22 Obscured Password

No specific configuration is required to ensure data is note revealed with entering local CLI login. Password are obscured to the users. For all authentication at the local CLI the TOE displays only "*" characters when the administrative password is entered.