FIPS 140-2 Non-proprietary Security Policy

LogRhythm 7.8.0 AI Engine Server

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1. Introduction

LogRhythm is an integrated log management and security information event management (SIEM) solution. It is a distributed system containing several cryptographic modules, which support secure communication between components. A LogRhythm deployment is made up of distributed components including Advanced Intelligence (AI) Engine Servers, Consoles (Client/Web), Data Indexers, Data Processors, a Platform Manager, and System Monitor Agents. An AI Engine Server analyzes log metadata for complex events, which it may forward to Platform Manager. A LogRhythm Console provides a graphical user interface (GUI) to view log messages, events, and alerts. LogRhythm Consoles are also used to manage LogRhythm deployments. Data Indexers deliver distributed and highly scalable indexing of machine and forensic data. Data Indexers run Elasticsearch and LogRhythm services to provide raw log and metadata persistence and search capabilities. Indexers can be clustered to enable high availability and improved performance. A Data Processor aggregates log data from System Monitor Agents, extracts metadata from the logs, forwards logs/metadata to Elasticsearch for persistence and search, and analyzes content of logs and metadata. A Data Processor may forward log metadata to an AI Engine Server and may forward significant events to Platform Manager. A Platform Manager manages configuration, alarms, notifications, and case and security incident management. A System Monitor Agent collects log data from network sources. LogRhythm relies on Microsoft SQL Server. LogRhythm stores log data in SQL Server databases on Data Processor and Platform Manager. It stores configuration information in SQL Server databases on Platform Manager. System Monitor Agent, Data Processor, AI Engine Server, Platform Manager, and Console each include a cryptographic module.

This document describes the security policy for the LogRhythm AI Engine Server cryptographic module. It covers the secure operation of the AI Engine Server cryptographic module including initialization, roles, and responsibilities for operating the product in a secure, FIPS-compliant manner. This module is validated at Security Level 1 as a multi-chip standalone module. The module relies on the following cryptographic modules for the corresponding LogRhythm versions:

Table 1 Bounded Modules

LogRhythm version	Cryptographic Module
7.8.0	Microsoft Windows Server 2019 Cryptographic Primitives Library (bcryptprimitives.dll) (CMVP Certificate #3197)

2. Overview

The LogRhythm AI Engine Server cryptographic module provides cryptographic services to an AI Engine Server. In particular, these services support secure communication with LogRhythm Data Processors and Platform Manager SQL Server databases.

An AI Engine Server is a server running the LogRhythm AI Engine Communication Manager (LRAIEComMgr) and AI Engine (LRAIEEngine) services. The AI Engine Communication Manager service marshals log message data received from Data Processors. The AI Engine service processes the log message data. AI Engine Server cryptographic module runs on a general purpose computer (GPC). The AI Engine Server operating system is Windows Server 2019 (x64). The AI Engine Server cryptographic module was tested on a Dell PowerEdge R740 Server with an Intel Xeon Silver 4114 processor, both with and without PAA (AES-NI acceleration).

The AI Engine Server cryptographic module is a software module. Its physical boundary is the enclosure of the standalone GPC on which the AI Engine Server services run. The software within the logical cryptographic boundary consists of all software assemblies for the AI Engine Communications Manager service and the AI Engine service. The AI Engine Server cryptographic module software consists of the following files in "C:\Program Files\LogRhythm\LogRhythm AI Engine":

- clrzmq.dll
- Google.ProtocolBuffers.dll
- LogRhythm.CrossCutting.dll
- LogRhythm.Data.dll
- LogRhythm.DTO.dll
- LogRhythm.Protobuffers.dll
- LRAIEComMgr.exe
- lraiecommgr.hsh
- LRAIEEngine.exe
- lraieengine.hsh
- lraiutils.exe
- lraiutils.hsh
- lrhmcommgr.dll
- lrhmengine.dll
- lrhmenginesvr.dll
- lrhmschema.dll
- lrsecurity.dll
- nsoftware.IPWorks.dll
- nsoftware.IPWorksSSH.dll
- nsoftware.IPWorksSSL.dll
- nsoftware.IPWorksSSNMP.dll

- nsoftware.System.dll
- scshared.dll
- scvbcomn.dll
- Xceed.Compression.dll
- Xceed.Compression.Formats.dll
- Xceed.FileSystem.dll
- Xceed.GZip.dll
- Xceed.Tar.dll
- Xceed.Zip.dll

Other files and subdirectories of "C:\Program Files\LogRhythm\LogRhythm AI Engine" are outside the logical cryptographic boundary. The excluded files are:

- EULA.rtf
- LRAIEComMgr.exe.config
- lraiecommgr.Log4Net
- LRAIEEngine.exe.config
- lraieengine.Log4Net
- lraiutils.exe.config
- AIEngine001.lrhm.cs
- AIEngine001.lrhm.dll
- DocumentFormat.OpenXml.dll
- Infragistics2.Shared.dll
- Infragistics2.Win.Misc.dll
- Infragistics2.Win.UltraWinDataSource.dll
- Infragistics2.Win.UltraWinEditors.dll
- Infragistics2.Win.UltraWinGrid.dll
- Infragistics2.Win.UltraWinTabControl.dll
- Infragistics2.Win.UltraWinToolbars.dll
- Infragistics2.Win.dll
- libzmq.dll
- Logger.Log4Net
- LogRhythm.Business.dll
- log4net.dll
- lrconfig.exe
- lrconfig.exe.config
- lrconfig.visualelementsmanifest.xml
- lrhmenginesvc.visualelementsmanifest.xml
- lrhmperf.dll

- lrhmuicomn.dll
- Newtonsoft.Json.dll
- SimpleInjector.dll
- SimpleInjector.Extensions.LifetimeScoping.dll
- sccscomn.dll
- sccsuicomn.dll

The excluded directories (along with their subdirectories) are:

- config
- logs
- state
- data

Figure 1 Cryptographic Module Boundaries illustrates the relationship between the AI Engine Server cryptographic module and the AI Engine Server as a whole. It shows physical and logical cryptographic boundaries of the module.

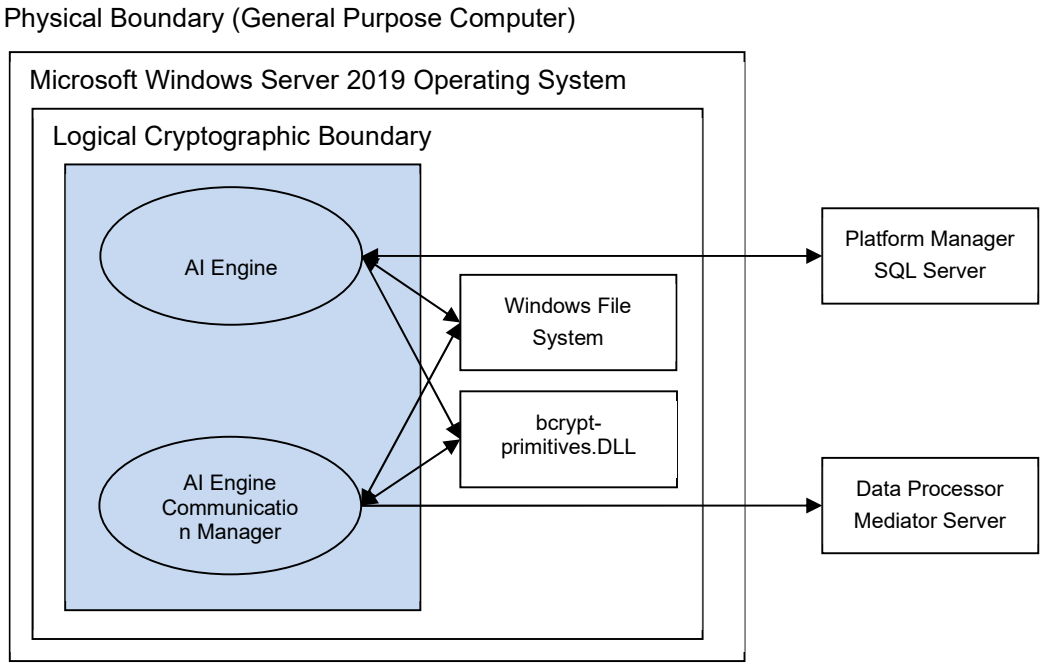

Figure 1 Cryptographic Module Boundaries

2.1. Ports and Interfaces

The AI Engine Server cryptographic module ports consist of one or more network interface cards (NIC) on the AI Engine Server GPC. NIC are RJ45 Ethernet adapters, which are connected to IP network(s). The specific ports on the tested platform as well as the mappings to the logical interfaces are as follows:

Table 2: Physical to Logical Interface Mappings

Physical Interface	Logical Interface
4 x 10GbE Ethernet Ports	Data Input, Data Output, Control Input, Status Output
1 x Dedicated iDRAC Ethernet Port	N/A – Not used by module
1 x Dedicated iDRAC direct USB Ports	N/A – Not used by module
2 x USB 2.0 Ports	N/A – Not used by module

2 x USB 3.0 Ports	N/A – Not used by module
1 x Serial Port	N/A – Not used by module
1 x VGA Port	N/A – Not used by module

All data enters the AI Engine Server physically through the NIC and logically through the GPC's network driver interface to the module. Hence, the NIC correspond to the data input, data output, control input, and status output interfaces defined in [FIPS 140-2]. Although located on the same GPC as the cryptographic module, the Windows operating system file system and Windows Event Log are outside the logical cryptographic boundary. Hence, the file system and Windows Event Log also present data input, data output, control input, and status output logical interfaces.

Data input to AI Engine is made up of log message data. Data Processor processes log messages collected by System Monitor Agents and sends log message data to the AI Engine Communications Manager over a TLS socket connection. Data output from AI Engine Server comprises log message data sent to the Platform Manager SQL Server as well as data written to the local file system. AI Engine Server sends event data to the Platform Manager SQL Server over a TLS socket connection. Data output to the local file system consists of suspense log files and unprocessed logs. The Console provides a graphical interface to configure the AI Engine Server cryptographic module, but configuration information reaches the module indirectly through the Platform Manager SQL Server. (The Console is a separate and distinct component of a LogRhythm deployment.) The Console connects to Platform Manager SQL Server and stores configurations in a database. The AI Engine service retrieves the configuration information from the database. Hence, the TLS connection to the Platform Manager SQL Server serves as the control input interface. The status output interface comprises the TLS connection to the Platform Manager SQL Server, the local file system, and the Windows Event Log. The AI Engine Server sends status information to Platform Manager SQL Server using TLS, which makes it available to the Console. The AI Engine Server writes status information to log files in the file system and the Windows Event Log.

2.2. Modes of Operation

The AI Engine Server cryptographic module has two modes of operation: Approved and non-Approved. Approved mode is a FIPS-compliant mode of operation. The module provides the cryptographic functions listed in Table 3 and Table 4 below. While the functions in Table 4 are not FIPS Approved, they are allowed in Approved mode of operation when used as part of an approved key transport scheme where no security is provided by the algorithm.

Table 3 FIPS Approved Cryptographic Functions (please see section 6.1 for specific modes used).

Label	Approved Cryptographic Function	Standard
AES	Advanced Encryption Algorithm	FIPS 197
CVL	Transport Layer Security Key Derivation Function	SP 800-135 Rev. 1

Label	Approved Cryptographic Function	Standard
DRBG	Deterministic Random Bit Generator	SP 800-90A Rev. 1
HMAC	Keyed-Hash Message Authentication Code	FIPS 198-1
RSA	Rivest Shamir Adleman Signature Algorithm	FIPS 186-4
SHS	Secure Hash Algorithm	FIPS 180-4
Triple-DES	Triple Data Encryption Algorithm	SP 800-67 Rev. 2

Table 4 FIPS Non-Approved but allowed Cryptographic Functions

Label	Non-Approved Cryptographic Function
MD5	Message-Digest Algorithm 5
NDRNG	The module depends on the Cryptographic Primitives Library (Cert. #3197) for AES-CTR DRBG Entropy Input. The DRBG is provided at least 256 bits of entropy from the NDRNG
RSA	Key Wrapping using PKCS 1 v1.5

The AI Engine Server cryptographic module does not implement a bypass capability.

2.3. Module Validation Level

The module meets an overall FIPS 140-2 compliance of Security Level 1.

Table 5 LogRhythm 7.8.0 AI Engine Server Security Levels

Security Requirements Section	Level
Cryptographic Module Specification	1
Cryptographic Module Ports and Interfaces	1
Roles, Services, and Authentication	1
Finite State Model	1
Physical Security	N/A
Operational Environment	1
Cryptographic Key Management	1
Electromagnetic Interference/Electromagnetic Compatibility (EMI/EMC)	1
Self-Tests	1
Design Assurance	1
Mitigation of Other Attacks	N/A

3. Roles

In Approved mode, AI Engine Server cryptographic module supports four roles which correspond to the FIPS 140-2 Crypto Officer and User roles. Roles are assumed implicitly, since the module does not provide user authentication.

Crypto Officer Role: Operators with the Crypto Officer role have direct access to the cryptographic module. Responsibilities of the Crypto Officer role include initial configuration, on-demand self test, and status review.

User Role: Operators with the User role are other components of a LogRhythm deployment configured to interact with the AI Engine Server. These are: Data Processor and Platform Manager. The User Role can be further divided into the following LogRhythm Roles

Table 6 LogRhythm User roles

LogRhythm Role	Description
LogRhythmGlobalAdmin	Allows for complete read and write access to both the configuration of the module and the data it collects.
LogRhythmRestrictedAdmin	Allows for read and write access to configuration changes and the data as permitted by LogRhythmGlobalAdmin.
LogRhythmGlobalAnalyst	Allows for read only access to all data and configuration resources.
LogRhythmRestrictedAnalyst	Allows for read only access to data and configuration as permitted by LogRhytmGlobalAdmin.

4. Services

In Approved mode, the services available to an operator depend on the operator's role.

4.1. User Services

4.1.1. Data Processor Write Log Data

This service provides a protected communication channel to transfer log message data from Data Processor to an AI Engine Server. The channel is established in accordance with the AI Engine Server configuration. (See service Write AI Engine Server Configuration.) Please see Appendix A for the list of supported cipher suites used in the TLS 1.0/1.2 connections.

4.1.2. Platform Manager Read Log Data

This service provides a protected communication channel to transfer log message data to the Platform Manager SQL Server from the AI Engine Server. The channel is established in accordance with the AI Engine Server configuration. (See service Write AI Engine Server Configuration.) Please see Appendix A for the list of supported cipher suites used in the TLS 1.0/1.2 connections.

4.1.3. Write AI Engine Server Configuration

This service provides a protected communication channel to transfer configuration data from the Platform Manager SQL Server to the AI Engine Server. An operator in the Crypto Officer role sets up communication between the AI Engine Server and the Platform Manager SQL Server during deployment. After set up, the Platform Manager SQL Server uses this service to propagate configuration changes to the AI Engine Server. Please see Appendix A for the list of supported cipher suites used in the TLS 1.0/1.2 connections.

Note that an AI Engine Server's configuration originates from the Console. The Console transfers the configuration information to the Platform Manager SQL Server.

4.2. Crypto Officer Services

4.2.1. Configure AI Engine Server Communication

After the AI Engine Server has been installed, this service provides an operator in the Crypto Officer role with the capability to configure the AI Engine Server to communicate with Platform Manager. This consists of setting the IP address for the Platform Manager. The Platform Manager SQL Server provides all other configuration information. (See service Write AI Engine Server Configuration.)

4.2.2. Perform Self-Tests

AI Engine Server module performs a (start-up) power-on software integrity self test to verify the integrity of the module software. If the module fails a software integrity test, it reports status indicating which failure occurred and transitions to an error state, in which the module ceases to continue processing. The AI Engine Server will not be able to receive logs and cannot output data to an SQL Server database when it is in an error state.

An operator can run the software integrity test on demand by stopping and starting the module. The system integrity test will always run at startup regardless of FIPS Mode.

4.2.3. Show FIPS Status

AI Engine Server provides status information about the cryptographic module mode of operation through AI Engine Server log files. When the AI Engine Server component is started, the AI Engine Server processes write messages to the logs indicating the mode of operation, for example:

AI Engine Server running in FIPS mode: YES
AI Engine Communication Manager running in FIPS mode: YES

To determine whether AI Engine Server is in Approved mode, an operator in the Crypto Officer role checks the AI Engine Server process logs, LRAIEComMgr.log and LRAIEEngine.log.

Similarly, LogRhythm provides information about communication encryption through AI Engine Server log files. When the AI Engine Server component is started, the AI Engine Server processes write messages to the log files indicating whether encryption is being used, for example.

AI Engine Server using encryption for SQL Server communications: YES

To determine whether AI Engine Server is encrypting communication, check the AI Engine Server service logs, LRAIEComMgr.log and LRAIEEngine.log. The AI Engine Server cryptographic module must be encrypting communications in order to be considered operating in Approved mode.

The Data Processor cryptographic module may enter an error state and stop (for example, when a self test fails). An operator in the Crypto Officer role checks the AI Engine Server log files (LRAIEComMgr.log and LRAIEEngine.log) and the Windows Event Log for error messages to determine the cause the cryptographic module's error state.

5. Policies

5.1. Security Rules

In order to operate the AI Engine Server cryptographic module securely, the operator should be aware of the security rules enforced by the module. Operators should adhere to rules required for physical security of the module and for secure operation.

The AI Engine Server cryptographic module enforces the following security rules when operating in Approved mode (its FIPS compliant mode of operation). These rules include both security rules that result from the security requirements of FIPS 140-2 and security rules that LogRhythm has imposed.

1. Approved mode is supported on Windows Server 2019 (10.0.17763) in a single-user environment.

2. The AI Engine Server cryptographic module operates in Approved mode only when used with the FIPS approved version of the bounded modules identified in Table 1 operating in FIPS mode.

3. The AI Engine Server cryptographic module is in Approved mode only when it operates in the environment of BCRYPTPRIMITIVES, namely:

   i) FIPS approved security functions are used and Windows is booted normally, meaning Debug mode is disabled and Driver Signing enforcement is enabled;

   ii) One of the following DWORD registry values is set to 1:

      (1) HKLM\SYSTEM\CurrentControlSet\Control\Lsa\FIPSAlgorithmPolicy\-Enabled

      (2) HKLM\SYSTEM\CurrentControlSet\Policies\Microsoft\Cryptography\-Configuration\SelfTestAlgorithms

      (3) HKLM\System\CurrentControlSet\Control\Lsa\FipsAlgorithmPolicy

      (4) HKLM\System\CurrentControlSet\Control\Lsa\FipsAlgorithmPolicy\MDMEnabled

4. When installed on a system where FIPS is enabled, AI Engine Server runs in a FIPS-compliant mode of operation. When communicating with other LogRhythm components, the AI Engine Server encrypts communication including:

   - Module to Data Processor
   - Module to Platform Manager SQL Server

5. The AI Engine Server cryptographic module operates in the Approved mode only when using a pre-placed, user-provided certificate for TLS communication with AI Engine Communication Manager. Dynamically-generated, self-signed certificate for the AI Engine Communication Manager shall not be used in Approved mode. See [Help] section "Certificate Configuration for LogRhythm Component Connections" for detailed configuration instructions. [Help] section "Common Access Card (CAC) Use" covers operational requirements for user-provided certificates (for example, extended key usage values).

6. In accordance with [SP 800-57 P3] and [SP 800-131A] (key length transition recommendations), the size of TLS public/private keys provided for AI Engine Server, Data Processor, and SQL Servers shall be at least 2048 bits.

7. In accordance with [SP 800-57 P3] (key length transition recommendations), the size of public/private keys for the CA issuing AI Engine Server, Data Processor, and SQL Server certificates shall be at least 2048 bits.

5.2. Identification and Authentication Policy

The AI Engine Server cryptographic module does not provide operator authentication. Roles are assumed implicitly. Operating system and SQL Server authentication mechanisms are not within the scope of the validation.

5.3. Access Control Policy and SRDIs

This section specifies the LogRhythm AI Engine Server's Security Relevant Data Items as well as the access control policy enforced by the LogRhythm.

5.3.1. Cryptographic Keys, CSPs, and SRDIs

While operating in a FIPS-compliant manner, the LogRhythm AI Engine Server contains the following security relevant data items:

Table 7 Cryptographic Keys CSPs and SRDIs

ID	Key type	Size	Description	Origin	Storage	Zeroization Method
Secret and Private Keys						
TLS private key	RSA	2048-bits, 3072-bits	Used for TLS session establishment	External (entered through Windows operating system)	Volatile memory and the operating system	As per guidance for bound module [Win BCRYPT] and Windows operating system guidance
TLS Pre-master Secret	Symmetric	384-bits	Used for TLS Master Secret derivation	Generated internally via DRBG (client), Generated externally (server)	Plaintext in volatile memory	As per guidance for bound module [Win BCRYPT]
TLS Master Secret	Symmetric	384-bits	Used for TLS session key derivation	Derived from Pre-master Secret	Plaintext in volatile memory	As per guidance for bound module [Win BCRYPT]
TLS session encryption keys	AES CBC	128-bits, 256-bits	Used for TLS communication	Generated through TLS handshake via SP 800-135 KDF	Plaintext in volatile memory	As per guidance for bound module [Win BCRYPT]
	Triple-DES CBC	192-bits				
TLS session integrity keys	HMAC-SHA1, SHA-256	160-bits, 256-bits	Used for TLS communication	Generated through TLS handshake via SP 800-135 KDF	Plaintext in volatile memory	As per guidance for bound module [Win BCRYPT]
Public Keys						
TLS public key	RSA	2048-bits, 3072-bits	Used for TLS communication with Data Processors and Platform Manager SQL Server	N/A (entered through Windows operating system)	Volatile memory and the operating system	As per guidance for bound module [Win BCRYPT] and Windows operating system guidance
Data Processor public key	RSA	2048-bits, 3072-bits	Used for TLS communication with Data Processors	N/A (entered through TLS handshake)	Volatile memory	As per guidance for bound module [Win BCRYPT]
CA public key	RSA	2048-bits, 3072-bits	Used for TLS communication with Data Processors and Platform Manager SQL Server	N/A (entered through Windows operating system)	Volatile memory and the operating system	As per guidance for bound module [Win BCRYPT] and Windows operating system guidance

ID	Key type	Size	Description	Origin	Storage	Zeroization Method
SQL Server public key	RSA	2048-bits, 3072-bits	Used for TLS communication with Platform Manager SQL Server	N/A (entered through TLS handshake)	Volatile memory	As per guidance for bound module [Win BCRYPT]
Other Keys/CSPs						
Power-up integrity test key	HMAC-SHA1	160 bits	Used to verify integrity of cryptographic module image on power up	Preplaced in module by LogRhythm	Obscured in volatile memory	Re-initialize module

5.3.2. Access Control Policy

The AI Engine Server cryptographic module allows controlled access to the SRDIs contained within it. The following table defines the access that an operator or application has to each SRDI while operating the AI Engine Server in a given role performing a specific AI Engine Server cryptographic module service. The permissions are categorized as a set of four separate permissions: read, write, execute, delete (r, w, x, and d, respectively, in the table). If no permission is listed, then an operator outside the Data Processor has no access to the SRDI.

Table 8 Access Control

LogRhythm Data Processor Server Access Policy [Key: r: read w: write x: execute d: delete]	Security Relevant Data Item	TLS private key	TLS Pre-master Secret	TLS Master Secret	TLS session encryption keys	TLS session Integrity keys	TLS public key	Data Processor public key	CA public key	SQL Server public key	Power-up integrity test key
Role/Service											
User Role											
Data Processor Write Log Data		x	w,x,d	w,x,d	w,x,d	w,x,d	x	w,x,d	x		
Platform Manager Read Log Data		x	w,x,d	w,x,d	w,x,d	w,x,d	x		x	w,x,d	
Write AI Engine Server Configuration		x	w,x,d	w,x,d	w,x,d	w,x,d	x		x	w,x,d	
Crypto-officer Role											
Configure AI Engine Server Communication		r,w,d					r,w,d		r,w,d		

LogRhythm Data Processor Server Access Policy [Key: r: read w: write x: execute d: delete]	Security Relevant Data Item	TLS private key	TLS Pre-master Secret	TLS Master Secret	TLS session encryption keys	TLS session Integrity keys	TLS public key	Data Processor public key	CA public key	SQL Server public key	Power-up integrity test key
Perform Self Tests											x
Show FIPS Status											

5.4. Physical Security

This section is not applicable.

6. Crypto Officer Guidance

6.1. Secure Operation Initialization Rules

The LogRhythm software is delivered with the LogRhythm Appliance or standalone as part of the LogRhythm Solution Software (LRSS).

LRSS is the software-only solution for installation and configuration on your own dedicated custom hardware or a supported virtualization platform. Follow the instructions in [Help] section "Install LogRhythm" to install an AI Engine Server. Once AI Engine Server is installed, enable Approved mode as described below. See the LogRhythm Solution Software Installation Guide for more details.

The LogRhythm AI Engine Server provides the cryptographic functions listed in section Modes of Operation above. The following table identifies the FIPS algorithm certificates for the Approved cryptographic functions along with modes and sizes. Note that while the algorithm certificates list more modes and options than what is contained in the table below, that the algorithms listed in the table are the only ones utilized by the module.

Table 9 Cryptographic Algorithms

Algorithm Type	Modes/Mod sizes	Algorithm Cert No.
BCRYPTPRIMITIVES.DLL Algorithms		
AES	CBC, 128 and 256-bit keys	Cert. #C211
CVL[1]	TLS 1.0/1.1 and TLS 1.2 KDF	Cert. #C211
DRBG	SP 800-90A CTR_DRBG (AES-256)	Cert. #C211
HMAC	SHA-1, SHA-256	Cert. #C211
SHS	SHA-1/256/384/512	Cert. #C211
RSA	ALG [RSASSA-PKCS1_V1_5]: SIG(gen) 2048 and 3072 bits modulus, SHS: SHA-256, SHA-384 and SHA-512 SIG (ver): 1024, 2048 and 3072 bits modulus, SHS: SHA-1, SHA-256, SHA-384 and SHA-512	Cert. #C211
Triple-DES[2]	Triple-DES-CBC, 192-bits	Cert. #C211

[1] This protocol has not been reviewed or tested by the CAVP and CMVP

[2] The use of Triple-DES as part of the IETF Protocols TLS 1.0 and TLS 1.2 (RFC 2246 and 5246) limits the use of a single key to no more than 2^20 encryptions.

6.2. Approved Mode

6.2.1. Establishing Approved Mode

Establishing Approved mode entails:

1. Enabling Windows FIPS security policy on the GPC hosting the AI Engine Server.
2. Providing public key certificate for the AI Engine Communication Manager to support encrypted communication.
3. Enabling encrypted communication between LogRhythm components.

Enabling Windows FIPS security policy affects other LogRhythm components installed on the same GPC as the AI Engine Server. Hence, Windows FIPS security policy should be configured initially for all LogRhythm cryptographic modules in a deployment at the same time. [Help] section "Federal Information Processing Standards (FIPS)" covers the procedures for establishing Windows FIPS security policy across a LogRhythm deployment, including the AI Engine Server cryptographic module.

[Help] section "Public Key Infrastructure (PKI) Support" covers providing public key certificates as well as configuring AI Engine Communication Manager to use the certificate.

Section "TLS Configuration" below describes how to enable encrypted communication. Only those ciphersuites specified in "Appendix A: TLS Cipher Suites" may be used in the approved mode.

When FIPS mode is enabled on a host, all LogRhythm services will connect to SQL Server using Windows Integrated Security regardless of what is configured in their INI files. See [Help] section "Integrated Security" for steps to enable Integrated Security.

6.2.2. TLS Configuration

The cryptographic module supports protected communication between the AI Engine Server and other LogRhythm components. Protection is provided by TLS. In particular, the AI Engine Server module supports TLS between itself and the following external components:

- Data Processor and
- Platform Manager SQL Server.

In Approved mode, TLS communication is required between all components. Enable TLS communication for the AI Engine cryptographic module:

1. Open the AI Engine Server Local Configuration Manager from where the AI Engine Server resides by clicking Start > All Programs > LogRhythm > AI Engine Configuration Manager.
2. Select the General tab and check 'Encrypt all communication.'
3. To restart the AI Engine Server when the Local Configuration Manager exits, select the Windows Service tab and check 'Start (or restart) the service when the configuration is saved.'

4. Click OK to save the settings and exit.

The TLS communication is not enabled and the module is not in Approved mode until the module is restarted.

6.2.3. Starting and Stopping the Cryptographic Module

The AI Engine Server cryptographic module runs as two Windows services: *LRAIEEngine* and *LRAIEComMgr*. Starting services *LRAIEEngine* and *LRAIEComMgr* starts the AI Engine Server cryptographic module. Similarly, stopping services *LRAIEEngine* and *LRAIEComMgr* stops the cryptographic module. Use the LogRhythm Console, Windows Service Control Manager (SCM), or Windows command line to start or stop the cryptographic module. [Help] section "Restart AI Engine Servers" describes Console operation. The Windows commands for starting and stopping the module are 'net start' and 'net stop,' respectively.

7. Mitigation of Other Attacks

This section is not applicable.

8. Terminology and Acronyms

Table 10 Terms and Accronyms

Term/Acronym	Description
AIE	Advanced Intelligence Engine
CSP	Cryptographic Service Provider
DP	Data Processor
GPC	General Purpose Computer
GUI	Graphical User Interface
Mediator Server service	System Monitor Agents collect logs and send them to a Mediator Server service, which processes the logs
PM	Platform Manager
SIEM	Security Information Event Management
SRDI	Security Relevant Data Item
TLS	Transport Layer Security

9. References

[FIPS 198-1] *Federal Information Processing Standards Publication: The Keyed-Hash Message Authentication Code (HMAC),* Information Technology Laboratory National Institute of Standards and Technology, July 2008.

[FIPS 140-2] *Federal Information Processing Standards Publication: Security Requirements for Cryptographic Modules,* Information Technology Laboratory National Institute of Standards and Technology, 25 May 2001.

[FIPS 140-2 IG] *Implementation Guidance for FIPS PUB 140-2 and the Cryptographic Module Validation Program*, National Institute of Standards and Technology Canadian Centre for Cyber Security, 4 May 2021

[Help] LogRhythm NextGen SIEM 7.8.0 Documentation, Version 7.8.0.

[SP 800-57 P3] *NIST Special Publication 800-57 Part 3, Revision 1*
Recommendation for Key Management Part 3: Application-Specific Key Management Guidance, National Institute of Standards and Technology, January 2015

[SP 800-131A] *NIST Special Publication 800-131A, Revision 2*
Transitioning the Use of Cryptographic Algorithms and Key Lengths, National Institute of Standards and Technology, March 2019

[Win BCRYPT] *Cryptographic Primitives Library (bcryptprimitives.dll and ncryptsslp.dll) in Microsoft Windows 10 Home Edition (32-bit version) Windows 10 Pro Edition (64-bit version) Windows 10 Enterprise Edition (64-bit version) Windows 10 Education Edition (64-bit version) Windows 10 S Edition (64-bit version) Windows 10 Mobile Microsoft Surface Hub Windows Server Standard Core Windows Server Datacenter Core Microsoft Azure Data Box Edge,* Document Version 1.4, 7 May 2020

Appendix A: TLS Cipher Suites

Below is a list of the supported TLS Cipher Suites:

Table 11 TLS Ciphersuites

TLS_RSA_WITH_AES_256_CBC_SHA256	TLS 1.2
TLS_RSA_WITH_AES_128_CBC_SHA256	TLS 1.2
TLS_RSA_WITH_AES_256_CBC_SHA	TLS 1.2, TLS 1.0
TLS_RSA_WITH_AES_128_CBC_SHA	TLS 1.2, TLS 1.0
TLS_RSA_WITH_3DES_EDE_CBC_SHA	TLS 1.2, TLS 1.0