在独立机架式服务器上配置远程密钥管理

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简介

本文档介绍在独立机架式服务器上配置密钥管理互操作性协议(KMIP)。

先决条件

要求

Cisco 建议您了解以下主题:

- •思科集成管理控制器(CIMC)
- 自加密驱动器(SED)
- KMIP

使用的组件

本文档中的信息基于以下软件和硬件版本:

- UCSC-C220-M4S, CIMC版本: 4.1(1h)
- SED驱动器
- 800GB企业性能SAS SED SSD(10 FWPD)- MTFDJAK800MBS
- 驱动器部件ID:UCS-SD800GBEK9
- •供应商:微米
- 型号: S650DC-800FIPS
- Vormetric作为第三方密钥管理器

本文档中的信息都是基于特定实验室环境中的设备编写的。本文档中使用的所有设备最初均采用原 始(默认)配置。如果您的网络处于活动状态,请确保您了解所有命令的潜在影响。

背景信息

KMIP是一种可扩展的通信协议,它定义了用于在密钥管理服务器上处理加密密钥的消息格式。由于 简化了加密密钥管理,这有利于数据加密。

SED驱动器

SED是硬盘驱动器(HDD)或固态驱动器(SSD),驱动器内置加密电路。它以透明方式加密写入介质 的所有数据,并在解锁后以透明方式解密从介质读取的所有数据。

在SED中,加密密钥本身不会离开SED硬件的范围,因此可以安全抵御操作系统级别的攻击。

SED驱动工作流程:



1. SED驱动器流

使用**本地密钥管理**配置可以在本地获取解锁驱动器的密码,用户负责记住密钥信息。它也可以通过 远程密钥管理获取,其中从KMIP服务器创建并获取安全密钥,用户负责在CIMC中配置KMIP服务器 。

配置

创建客户端私钥和客户端证书

这些命令将使用OpenSSL包在Linux计算机上输入,而不是在Cisco IMC中。确保根CA证书和客户 端证书中的公用名相同。

注意:确保Cisco IMC时间设置为当前时间。

1.创建2048位RSA密钥。

openssl genrsa -out client_private.pem 2048 2.使用已创建的密钥创建自签名证书。

openssl req -new -x509 -key client_private.pem -out client.pem -days 365 3.有关获取根CA证书的详细信息,请参阅KMIP供应商文档。

注意:Vormetric要求RootCa证书中的公用名称与Vormetric主机的主机名匹配。

在CIMC上配置KMIP服务器

1.导航到Admin > Security Management > Secure Key Management。

清晰的配置显示 Export/Delete buttons grayed out, only Download buttons are active.

	Se Cisco Integrated Management Controller						
	Image: A security Management / Secure Key Management *						
Chassis •	Certificate Management Secure Key I						
Compute	Download Root CA Certificate Export Root CA Certificate Delete Root CA Certificate Download Client Certificate Export Client Certificate						
Networking •	Delete Client Certificate Download Client Private Key Export Client Private Key Delete Client Private Key Delete KMIP Login						
Thomas in a second seco	Enable Secure Key Management:	Enable Secure Key Management:					
Storage +	KMIP Servers						
Admin 👻	Delete Test Connection						
User Management	ID IP Addres	s Port	Timeout				
Networking	1	5696	5				
Communication Services	2	5696	5				
Security Management							
Event Management	▼ KMIP Root CA Certificate		▼ KMIP Client Certific	ate			
Firmware Management	Server Root CA Certificate:	Not Available	Client Certificate	c Not Available			
Utilities	Download Status:	NONE	Download Statu	K NONE			
Device Connector	Download Progress:	0	Download Progress	к 0			
	Export Status:	NONE	Export Statu	< NONE			
	Export Progress:	0	Export Progress	к 0			
	 KMIP Login Details 		 KMIP Client Private 	Key			
	Use KMIP Login:	0	Client Private Key	Not Available			
	Login name to KMIP Server:	Enter User Name	Download Statu	< NONE			
	Password to KMIP Server:		Download Progress	κ 0			
	Change Password:		Export Statu	E NONE			
			Export Progress	к 0			

2.单击IP地址并设置KMIP服务器的IP,确保您能够访问它,如果默认端口已被使用,则无需更改任 何其他内容,然后保存更改。

Enable Secure Key Management: 🗹

KMIP Servers

Delete Test Connection							
	ID	IP Address	Port	Timeout			
	1	10.104.253.26	5696	5			
	2	Save I Cance	el 596	5			

3.将证书和私钥下载到服务器。您可以下载 .pem file or just paste the content.

chaore becare ney	Management:			
MIP Servers				Download Root CA Certificate
ID	IP Address	Port	Timeout	O Download from remote location
0 1	10.104.253.26	5696	5	O Download through browser Client
2		5696	5	Paste Content
				Paste Root CA Certificate Content:
KMIP Root C	A Certificate			
Server	Root CA Certificate: Not Available			
	Download Status: NONE			
	Download Progress: 0			
	Export Status: NONE			Download Root CA Certificate Close

4.上传证书时,您会看到证书显示为Available,对于未上传的缺失证书,您会看到Not Available。

仅当所有证书和私钥都已成功下载到CIMC时,才能测试连接。

 KMIP Root CA Certificate 		 KMIP Client Certificate 				
Server Root CA Certificate:	Available	Client Certificate: Not Available				
Download Status:	NONE	Download Status: NONE				
Download Progress:	0	Download Progress: 0				
Export Status:	COMPLETED	Export Status: COMPLETED				
Export Progress:	100	Export Progress: 100				
✓ KMIP Login Details		 KMIP Client Private Key 				
▼ KMIP Login Details		 KMIP Client Private Key 				
 KMIP Login Details Use KMIP Login: 	0	KMIP Client Private Key Client Private Key: Not Available				
 KMIP Login Details Use KMIP Login: Login name to KMIP Server: 	Enter User Name	KMIP Client Private Key Client Private Key: Not Available Download Status: NONE				
 KMIP Login Details Use KMIP Login: Login name to KMIP Server: Password to KMIP Server: 	Enter User Name	KMIP Client Private Key Client Private Key: Not Available Download Status: NONE Download Progress: 0				
 KMIP Login Details Use KMIP Login: Login name to KMIP Server: Password to KMIP Server: Change Password: 	Enter User Name	 KMIP Client Private Key Client Private Key: Not Available Download Status: NONE Download Progress: 0 Export Status: COMPLETED 				

5.(可选)一旦您拥有所有证书,您可以选择添加KMIP服务器的用户和密码,此配置仅作为第三方 KMIP服务器受SafeNet支持。

6.测试连接,如果证书正确,并且可以通过配置的端口访问KMIP服务器,则会看到连接成功。

→E ^{utadu} Cisco Integrated Management Controller					query on kmip-server run successfully!				
) /	/ / Security Management / Secure Key Management *								
Certifi	cate Management	Secure Key	Management S	ecurity Confi	guration		UN .		
Dow	ninad Roct CA Catlific	ate Export Root	CA Cartificata Dala	In Root CA Ca	rificata Download Client Catilic	ste i Evro	e Chard Cardiersten 1		
Dele	Delete Client Certificate Download Client Private Key Export Client Private Key Delete Kim Delete Kim								
En	able Secure Key Ma	nagement: 🕑							
KM	IIP Servers								
	Delete Test Co	nnection							
	ID	IP Addres	15	Port	Timeout				
] 1	10.104.253	.26	5696	5				
C	2			5696	5				
	KMIP Root CA C	ertificate			✓ KMIP Client	Certificat	te		
	Server Root	t CA Certificate:	Available		Client C	ertificate:	Available		
	Do	ownload Status:	NONE		Downloa	ed Status:	NONE		
	Down	nload Progress:	0		Download	Progress:	0		
		Export Status:	COMPLETED		Expo	ert Status:	COMPLETED		
	E	xport Progress:	100		Export	Progress:	100		
▼ KMIP Login Details				 KMIP Client 	Private K	ley			
	U	ise KMIP Login:			Client Pri	vate Key:	Available		
	Login name t	to KMIP Server:	Enter User Name		Downloa	ed Status:	NONE		
	Password t	to KMIP Server:			Download	Progress:	0		
	Cha	ange Password:			Expo	ert Status:	COMPLETED		
					Export	Progress:	100		

7.一旦我们与KMIP的连接成功,您可以启用远程密钥管理。

导航到网络>模块化Raid控制器>控制器信息。

选择Enable Drive Security,然后选择Remote Key Management。

注意:如果之前启用了**本地密钥管理**,则会要求您输入当前密钥以便进行远程管理

Controller Info Physical Drive Info	Virtual Drive Info Battery Backup Unit	Storage Log						
Create Virtual Drive from Unused Physical Drives Create Virtual Drive from an Existing Virtual Drive Group Import Foreign Config Clear Foreign Config								
Clear Boot Drive Get Storage Firmware Log	inable Drive Security	Clear Cache Clear all Configuration Set Factory Defaults						
Switch to Remote Key Management Switch to Le	ocal Key Management							
Enable Drive Security Image: Controller Security: Disabled Comp Key Management: Remote Key Management Local Key Management al: 300 sec								
Conti		Save Cancel te: 30 %						
RAID Chip Temperature	e: 68	Patrol Read Rate: 30 %						
Storage Firmware Log Status	s: Not Downloaded	Consistency Check Rate: 30 %						
		Reconstruction Rate: 30 %						
 Firmware versions 		Cache Flush Interval: 4 sec						
Product Name	Cisco 12G Modular Raid Controller with: (May Drives To Onis Up At Oness						

验证

使用本部分可确认配置能否正常运行。

从CLI,您可以验证配置。

1.验证是否已启用KMIP。

C-Series-12# scope kmip C-Series-12 /kmip # show detail Enabled: yes 2.检验IP地址、端口和超时。

C-Series-12 /kmip # show kmip-server Server number Server domain name or IP address Port Timeout

3.验证证书是否可用。

C-Series-12 /kmip # show kmip-client-certificate KMIP Client Certificate Available: 1 C-Series-12 /kmip # show kmip-client-private-key KMIP Client Private Key Available: 1 C-Series-12 /kmip # show kmip-root-ca-certificate KMIP Root CA Certificate Available: 1

4.验证登录详细信息。

C-Series-12 /kmip # show kmip-login Use KMIP Login Login name to KMIP server Password to KMIP server ------ no ****** 5 测计字体控

5.测试连接。

C-Series-12 /kmip # C-Series-12 /kmip # scope kmip-server 1 C-Series-12 /kmip/kmip-server # test-connectivity Result of test-connectivity: query on kmip-server run successfully!

故障排除

目前没有针对此配置的故障排除信息。

如果与KMIP服务器的测试连接失败,请确保可以ping通服务器。

cisco Cisco Integrated Management Controller			÷ 🗸 2		¢
/ Security Management / Secure Key Management	Retresh Host Pow	ar Launch KVM Ping	CIMC Reboot Locator LED @	•	
rtificate Management Secure Key Management Security Cont	ouration Ping Details	_	e ×		~
Download Root CA Certificate Export Root CA Certificate Delete Root CA Ce Delete Client Certificate Download Client Private Key Export Client Private Ke	* Hostname/IP Address * Number of Retries	10.104.253.26 3			
Enable Secure Key Management: 🗹	* Timeout Ping Status	10 Success	Details		
KMIP Servers Delete Test Connection		P	ing Cancel		

确保在CIMC和KMIP服务器上打开端口5696。您可以在我们的PC上安装NMAP版本,因为此命令在CIMC上不可用。

您可以在本地计算机上安装<u>NMAP</u>,以测试端口是否打开;在文件安装目录下,使用以下命令:

nmap <ipAddress> -p <port>

输出显示KMIP服务的开放端口:



输出显示KMIP服务的关闭端口:



相关信息

- C系列配置指南 自我加密驱动器
- C系列配置指南 密钥管理互操作性协议
- <u>技术支持和文档 Cisco Systems</u>

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