MSE軟體8.0版高可用性配置和部署指南

目錄

簡介 背景資訊 准則和限制 MSE虛擬裝置的HA配置方案(已連線網路) 設定輔助MSE 從Cisco Prime NCS(或Prime Infrastructure)管理它們 將輔助MSE新增到Cisco Prime NCS 使用直接連線的HA配置 MSE物理裝置的HA配置方案 驗證 MSE HA的基本故障排除 故障轉移/故障回覆場景 主裝置已啟動,輔助裝置已準備好接管 故障轉移到輔助裝置 回切到主節點 HA狀態矩陣 關於HA的重要評論和事實

HA故障排除

簡介

本檔案介紹適用於將Mobility Services Engine(MSE)高可用性(HA)新增以及將Context Aware Services和/或Adaptive Wireless Intrusion Prevention System(AwIPS)執行Cisco Unified Wireless LAN(WLAN)的使用者的設定和部署指南,以及疑難排解技巧。本文檔旨在解釋MSE HA的准則並 為MSE提供HA部署方案。

附註:本文檔不提供與MSE HA不相關的MSE和相關元件的配置詳細資訊。其他檔案中提供了 此資訊,並提供參考資料。自適應wIPS配置也不在本文檔中介紹。

背景資訊

MSE是一個能夠運行多個相關服務的平台。這些服務提供高級服務功能。因此,考慮HA對於保持最高的服務信心至關重要。

啟用HA後,每個活動MSE都由另一個非活動例項備份。MSE HA引入了健康監控器,可在其中配置 、管理和監控高可用性設定。維護主和輔助MSE之間的心跳。運行狀況監視器負責設定資料庫、檔 案複製和監視應用程式。當主MSE發生故障且輔助節點接管時,主MSE的虛擬地址會透明地交換。

此設定(參見圖1.)演示了典型的Cisco WLAN部署,其中包括為HA啟用的Cisco MSE。

HA支援在MSE-3310、MSE-3350/3355、3365和ESXi上的虛擬裝置上提供。



准則和限制

以下資訊有關MSE HA架構:

- MSE虛擬裝置僅支援1:1 HA
- •一個輔助MSE最多可以支援兩個主要MSE。請參閱HA配對矩陣(圖2和3)
- HA支援網路連線和直接連線
- 僅支援MSE第2層冗餘。運行狀況監視器IP和虛擬IP必須位於同一子網上,並且不能從網路控制 系統(NCS)第3層冗餘訪問
- 運行狀況監視器IP和虛擬IP必須不同
- 您可以使用手動或自動故障切換
- 您可以使用手動或自動故障恢復
- 主MSE和輔助MSE必須在相同的軟體版本上
- 每個活動的主MSE都由另一個非活動例項備份。只有在啟動故障切換過程後,輔助MSE才會變為活動狀態。
- 故障切換過程可以是手動或自動

•每個註冊的主要MSE都有一個軟體和資料庫例項。

圖2. MSE HA支援配對矩陣

Primary Server Type	Secondary Server Type								
	3310	3350	3355	VA-Low	VA-Standard	VA-High			
3310	Y	Y	Y	N	N	N			
3350	N	Y	Y	N	N	N			
3355	N	Y	Y	N	N	N			
VA-Low	N	N	N	Y	Y	Y			
VA-Standard	N	N	N	N	Y	Y			
VA-High	N	N	N	N	N	Y			

此矩陣的基準是,輔助例項必須始終與主例項具有相等或較高的規格,無論它們是裝置還是虛擬機 器。

MSE-3365隻能與另一個MSE-3365配對。未測試/支援任何其他組合。

圖3. MSE HA N:1配對矩陣

Secondary Server	Primary Server
3310	N:1 not supported
3350	Two 3310 servers are supported
3355	Two 3310 servers are supported
3355	Two 3350 servers are supported
3355	One 3310 and one 3350 are supported

MSE虛擬裝置的HA配置方案(已連線網路)

此示例顯示MSE虛擬裝置(VA)的HA配置(請參見<u>圖4</u>)。 在此案例中,設定了以下設定:

• 主MSE VA:

Virtual IP - [10.10.10.11]

Health Monitor interface (Eth0) - [10.10.10.12]
• 輔助MSE VA:

附註:每個VA都需要一個啟用許可證(L-MSE-7.0-K9)。這是配置VA的HA所必需的。

圖4. HA中的MSE虛擬裝置



有關詳細資訊,請參閱<u>MSE虛擬裝置上的Cisco文檔</u>。

以下是一般步驟:

1. 完成MSE的VA安裝並驗證是否滿足所有網路設定,如下圖所示。

MSE1 on kft-fx File View VM 🖬 🔢 🕨 😋 🔯 🖓 🗊 🕪 🕪 to complete. reparing to install... xtracting the JRE from the installer archive... Unpacking the JRE... Extracting the installation resources from the installer archive... Configuring the installer for this system's environment... Launching installer... Preparing SILENT Mode Installation... isco Mobility Services Engine (created with InstallAnywhere by Macrovision) Command.run(): process completed before monitors could start. nstalling...

2. 首次登入時通過安裝嚮導設定引數,如下圖所示。

Cisco Mobility Service Engine mse login: root Password: Last login: Mon Feb 13 17:31:37 on tty1 Enter whether you would like to set up the initial parameters manually or via the setup wizard. Setup parameters via Setup Wizard (yes/no) [yes]: ____ 3. 輸入所需的條目(主機名、域等)。在配置高可用性的步驟中輸入YES。 Eurrent hostname=[mse]

Configure hostname? (Y)es/(S)kip/(U)se default [Yes]: The host name should be a unique name that can identify the device on the network. The hostname should start with a letter, end with a letter or number, and contain only letters, numbers, and dashes. Enter a host name [mse]: mse1 Current domain=[] Configure domain name? (Y)es/(S)kip/(U)se default [Yes]: s Current role=[Primary] Configure High Availability? (Y)es/(S)kip/(U)se default [Yes]: 4. 輸入此資訊並如下圖所示。選擇Role - [1 for Primary]。運行狀況監視器介面 — [eth0]^{**}對映到 網路介面卡1的網路設定

lardware Options Resources		
	Add Remove	Device Status
SHOW AIL DEVICES		Connected
Hardware	Summary	 Connect at power on
🌉 Memory (edited)	8192 MB	- Adapter Turca
CPUs	2	Adapter Type
🕎 Video card	Video card	Current adapter: E1000
VMCI device	Restricted	
SCSI controller 0	LSI Logic Parallel	MAC Address
😅 Hard disk 1	Virtual Disk	00:50:56:89:01:d9
CD/DVD Drive 1	CD/DVD Drive 1	Automatic Manual
Network adapter 1 (edite	vlan 10	
Network adapter 2 (edite	vlan 10	Network Connection Network label:
		vlan 10
		VM Network vlan 104 vlan 21 vlan 20 vlan 12 vlan 11
		vlan 10
		DM2
ter a host name [mse]: mse1		
rrent domain=[]		
nfigure domain name? (Y)es∕	(S)kip/(U)se default [Yes]: s
rrent role=[Primary] nfigure High Availability?	(Y)es/(S)kip/(U)se de	fault [Yes]:
gh availability role for th	is MSE (Primary/Second	ary)
lect role [1 for Primary, 2	for Secondary] [1]:	
alth monitor interface hold is IP address is used by Se	s physical IP address condary, Primary MSE s	of this MSE server. ervers and WCS to communica
mong themselves		

5. 選擇直接連線介面[none] ,如下圖所示。

Health monitor interface holds physical IP address of this MSE server.
This IP address is used by Secondary, Primary MSE servers and WCS to communicate among themselves
Select Health Monitor Interface [eth0/eth1] [eth0]:
Direct connect configuration facilitates use of a direct cable connection betwee n the primary and secondary MSE servers.
This can help reduce latencies in heartbeat response times, data replication and failure detection times.
Please choose a network interface that you wish to use for direct connect. You s hould appropriately configure the respective interfaces.
"none" implies you do not wish to use direct configuration.

Select direct connect interface [eth0/eth1/none] [none]: _

6. 輸入以下資訊,如下圖所示:虛擬IP地址 — [10.10.10.11]網路掩碼 — [255.255.255.0]在恢復 模式下啟動MSE - [否

Select direct connect interface [eth0/eth1/none] [none]:

Enter a Virtual IP address for first this primary MSE server

Enter Virtual IP address [1.1.1.1]: 10.10.10.11

Enter the network mask for IP address 10.10.10.11.

Enter network mask [1.1.1.1]: 255.255.255.0

Choose to start the server in recovery mode. You should choose yes only if this primary was paired earlier and you have now l ost the configuration from this box. And, now you want to restore the configuration from Secondary via NCS Do you wish to start this MSE in HA recovery mode ?: (yes/no): no_

7. 輸入以下資訊,如下圖所示:配置Eth0 - [是]輸入Eth0 IP地址 — [10.10.10.12]網路掩碼 — [255.255.255.0]預設網關 —

[10.10.10.1]

Current IP address=[1.1.1.10] Current eth0 netmask=[255.255.255.0] Current gateway address=[1.1.1.1] Configure eth0 interface parameters? (Y)es/(S)kip/(U)se default [Yes] Enter an IP address for first ethernet interface of this machine. Enter eth0 IP address [1.1.1.10]: 10.10.10.12 Enter the network mask for IP address 10.10.10.12. Enter network mask [255.255.255.0]: Enter an default gateway address for this machine. Note that the default gateway must be reachable from the first ethernet interface. Enter default gateway address [1.1.1.1]: 10.10.10.1

8. 第二個乙太網介面(Eth1)未使用。設定eth1介面 — [skip],如下圖所示。

The second ethernet interface is currently disabled for this machine. Configure eth1 interface parameters? (Y)es/(S)kip/(U)se default [Yes]: s

9. 如圖所示繼續完成安裝嚮導。啟用NTP伺服器以同步時鐘至關重要。首選時區為UTC。 Domain Name Service (DNS) Setup DNS is currently enabled. No DNS servers currently defined Configure DNS related parameters? (Y)es/(S)kip/(U)se default [Yes]: s Current timezone=[America/New_York] Configure timezone? (Y)es/(S)kip/(U)se default [Yes]: Enter the current date and time. Please identify a location so that time zone rules can be set correctly. Please select a continent or ocean. 1) Africa 2) Americas 3) Antarctica 4) Arctic Ocean 5) Asia 6) Atlantic Ocean Australia 8) Europe 9) Indian Ocean 10) Pacific Ocean UTC - I want to use Coordinated Universal Time. 12) Return to previous setup step (^). #? 11 Network Time Protocol (NTP) Setup. If you choose to enable NTP, the system time will be configured from NTP servers that you select. Otherwise, you will be prompted to enter the current date and time. NTP is currently disabled. Configure NTP related parameters? (Y)es/(S)kip/(U)se default [Yes]: Enter whether or not you would like to set up the Network Time Protocol (NTP) for this machine. If you choose to enable NTP, the system time will be configured from NTP servers that you select. Otherwise, you will be prompted to enter the current date and time. Enable NTP (yes/no) [no]: yes Enter NTP server name or address: ntp.network.local 下面彙總了MSE VA主要設定: -----BEGIN-----Role=1, Health Monitor Interface=eth0, Direct connect interface=none Virtual IP Address=10.10.10.11, Virtual IP Netmask=255.255.255.0 Eth0 IP address=10.10.10.12, Eth0 network mask=255.0.0.0 Default Gateway=10.10.10.1 -----END------

10. 輸入**yes**以確認所有設定資訊均正確,如下圖所示。



12. 重新開機後,使用/etc/init.d/msed start或service msed start命令啟動MSE服務,如下圖所示

[root@mse1 ~]# getserverinfo Health Monitor ĭs not running [root@mse1 ~]# /etc/init.d/msed start Starting MSE Platform ip_tables: (C) 2000-2006 Netfilter Core Team Netfilter messages via NETLINK v0.30. ip_conntrack version 2.4 (8192 buckets, 65536 max) - 304 bytes per conntrack Starting Health Monitor, Waiting to check the status. Starting Health Monitor, Waiting to check the status. Health Monitor successfully started Starting Admin process... Started Admin process. Starting database Database started successfully. Starting framework and services .. Framework and services successfully started

[root@mse1 ~]#

13. 所有服務啟動後,使用getserverinfo命令確認MSE服務是否正常工作。操作狀態必須顯示為「Up」,如下圖所示。

Active Wired Clients: 0 Active Elements(Wireless Clients, Rogue APs, Rogue Clients, Interferers, Wired lients, Tags) Limit: 100 Active Sessions: 0 Active Sessions: 0 Jireless Clients Not Tracked due to the limiting: 0 Fags Not Tracked due to the limiting: 0 Rogue APs Not Tracked due to the limiting: 0 Rogue Clients Not Tracked due to the limiting: 0 nterferers Not Tracked due to the limiting: 0 Wired Clients Not Tracked due to the limiting: 0 fotal Elements(Wireless Clients, Rogue APs, Rogue Clients, Interferers, Wired Cl ents) Not Tracked due to the limiting: 0 Context Aware Sub Services Subservice Name: Aeroscout Tag Engine admin Status: Disabled Operation Status: Down Subservice Name: Cisco Tag Engine Admin Status: Enabled peration Status: Up [root@mse1 ~]#

設定輔助MSE

這些步驟是輔助MSE VA設定的一部分:



[10.10.10.1]

Select direct connect interface [eth0/eth1/none] [none]: Current IP address=[1.1.1.10] Current eth0 netmask=[255.255.255.0] Current gateway address=[1.1.1.1] Configure eth0 interface parameters? (Y)es/(S)kip/(U)se default [Yes]: Enter an IP address for first ethernet interface of this machine. Enter eth0 IP address [1.1.1.10]: 10.10.10.13 Enter the network mask for IP address 10.10.10.13. Enter network mask [255.255.255.0]: Enter an default gateway address for this machine. Note that the default gateway must be reachable from the first ethernet interface. Enter default gateway address [1.1.1.1]: 10.10.10.1.

3. 設定eth1介面 — [Skip],如下圖所示。

Configure eth0 interface parameters? (Y)es/(S)kip/(U)se default [Yes]: Enter an IP address for first ethernet interface of this machine. Enter eth0 IP address [1.1.1.10]: 10.10.10.13 Enter the network mask for IP address 10.10.10.13. Enter network mask [255.255.255.0]: Enter an default gateway address for this machine. Note that the default gateway must be reachable from the first ethernet interface. Enter default gateway address [1.1.1.1]: 10.10.10.1 The second ethernet interface is currently disabled for this machine. Configure eth1 interface parameters? (Y)es/(S)kip/(U)se default [Yes]: s

4. 如圖所示設定時區 — [UTC]。

Current timezone=[America/New_York] Configure timezone? (Y)es/(S)kip/(U)se default [Yes]: Enter the current date and time. Please identify a location so that time zone rules can be set correctly. Please select a continent or ocean. 1) Africa 2) Americas 3) Antarctica 4) Arctic Ocean 5) Asia 6) Atlantic Ocean Australia 8) Europe 9) Indian Ocean 10) Pacific Ocean 11) UTC - I want to use Coordinated Universal Time. 12) Return to previous setup step (^). #? 11 5. 如圖所示啟用NTP伺服器。 Network Time Protocol (NTP) Setup. If you choose to enable NTP, the system time will be configured from NTP servers that you select. Otherwise, you will be prompted to enter the current date and time. NTP is currently disabled. Configure NTP related parameters? (Y)es/(S)kip/(U)se default [Yes]: Enter whether or not you would like to set up the Network Time Protocol (NTP) for this machine. If you choose to enable NTP, the system time will be configured from NTP servers that you select. Otherwise, you will be prompted to enter the current date and time. Enable NTP (yes/no) [no]: yes Enter NTP server name or address: ntp.network.local_ 完成安裝嚮導的其餘步驟並確認安裝資訊,以儲存配置,如下圖所示。 lease verify the following setup information. ----BEGIN------Host name=mse2 Role=2, Health Monitor Interface=eth0, Direct connect interface=none Eth0 IP address=10.10.10.13, Eth0 network mask=255.255.255.0 Default gateway=10.10.10.1 Time zone=UTC Enable NTP=yes, NTP servers=10.10.10.10 ----END-----You may enter "yes" to proceed with configuration, "no" to make more changes, or "^" to go back to the previous step. Configuration Changed Is the above information correct (yes, no, or ^): yes_ 7. 重新啟動並啟動服務,與之前對主MSE執行的步驟相同,如下圖所示。

[root@mse2 ~]# /etc/init.d/msed start Starting MSE Platform ip_tables: (C) 2000-2006 Netfilter Core Team Netfilter messages via NETLINK v0.30. ip_conntrack version 2.4 (8192 buckets, 65536 max) - 304 bytes per conntrack Starting Health Monitor, Waiting to check the status. Starting Health Monitor, Waiting to check the status. Starting Health Monitor, Waiting to check the status. Health Monitor successfully started Starting Admin process... Started Admin process... Started Admin process. Starting database Database started successfully. Starting framework and services Framework and services successfully started Iroot@mse2 ~]# __

從Cisco Prime NCS(或Prime Infrastructure)管理它們

接下來的步驟顯示如何將主和輔助MSE VA新增到NCS。執行將MSE新增到NCS的正常過程。如需 幫助,請參閱配置指南。

1. 從NCS導航到Systems > Mobility Services, 然後選擇Mobility Services Engine, 如下圖所示



2. 從下拉選單中選擇Add Mobility Services Engine。然後,按一下「Go」,如下圖所示。



3. 按照MSE的NCS配置嚮導操作。在本檔案的案例中,這些值為:輸入裝置名稱 — 例如 [MSE1]IP地址- [10.10.10.12]使用者名稱和密碼(每個初始設定)按一下「Next」,如下圖所 示。

cisco Network Control System		
	Add Mobility Services Engine	
Add MSE Configuration		
Licensing	Device Name	mse1
Select Service	IP Address	10.10.10.12
Tracking		
Assign Maps	Contact Name	
	Username 🏵	admin
	Password III	•••••
	нттр⊉	□ Enable
	Delete synchronized service assign	ments 🔽 (Network designs, controllers, wired switche
	O Selecting Delete synchronized se Existing location history data is retained	ervice assignments permanently removes all service a d, however you must use manual service assignments to

4. 新增所有可用許可證,然後按一下**下一步**,如下圖所示。

cisco Prime Network Control Syst	tem		4 / 2		
	MSE License Su	immary			
Edit MSE Configuration	0 Permanent licen	ses includ	e installed licens	e counts and in-built lic	cense counts.
Licensing					
Select Service	MSE Name (UDI)	Service	Platform Limit	Туре	Installed Limit
Tracking	mse1 Activated ((AIR-MS	E-VA-K9:V01:	mse1_d5972642-56	96-11e1-bd0
Assign Maps		CAS	2000	CAS Elements	100
	- w/TD	WIDS	wTPS 2000	wIPS Monitor Mode APs	10
			2000	wIPS Local Mode AP:	10
		MSAP	2000	Service Advertisemer Clicks	^{nt} 1000
	Add License	Remove	License		

5. 選擇MSE services,然後按一下Next(如下圖所示)。

cisco No	sco Prime etwork Control System		
	Se	elect Mo	bility Service
Edit MSE Config.	uration		
Licensing	F	v 0	intext Aware Service
Select Service	, in the second s		
Tracking		•	Cisco Context-Aware Engine for Clients and Tags
Assign Maps		С	Partner Tag Engine 🔍
	r	Π w	ireless Intrusion Protection Service
	r	П м	SAP Service

6. 啟用跟蹤引數,然後按一下**下一步**,如下圖所示。

cisco	Cisco Prime Network Control System	
		Select Tracking & History Parameters.
Edit MSE Cor	nfiguration	
Licensing		Tracking
Select Servic	e	✓ Wired Clients
Tracking		✓ Wireless Clients
Assign Maps		Rogue AccessPoints
		Exclude Adhoc Rogue APs
		Rogue Clients
		Interferers
		Active RFID Tags

7. 分配對映和同步MSE服務是可選的。按一下**完成**以完成將MSE新增到NCS的過程,如下圖所 示。

cisco Net	o Prime work Control System	m
Edit MSE Configur	ation	
Licensing		Name
Select Service		
Tracking Assign Maps		



將輔助MSE新增到Cisco Prime NCS

下一個螢幕截圖顯示已新增主MSE VA。現在,完成以下步驟以新增輔助MSE VA:

1. 找到「Secondary Server」列,然後按一下要配置的連結,如下圖所示。

	-il ci	SCO Network Control S	System			Virtual Domain: ROOT	DOMMAN root + Lo	+Q tot		÷
I	Å	Hame Manitor • Car	nfigure • Services • Reports	 Administration 	•					* 3 0
N Si	lob rvic	ility Services Engines 15 > Mubility Services Engines						Select	a command	• Go
1		Device Name	Device Type	IP Address	Version	Reachability Status	Secondary Server	Name	Admin Status	Service
		msel	Cisco Mobility Services Engine - Virtual Appliance	10.10.10.12	7.2.103.0	Reachable	N/A (Click here to configure)	Context Aware Service wIPS Service MSAP Service	Enabled Disabled Disabled	Up Dawn Dawn

2. 在此方案中,使用配置新增輔助MSE VA:輔助裝置名稱- [mse2]輔助IP地址-[10.10.13]Secondary Password* - [預設或來自安裝指令碼]故障切換型別* - [自動或手動]回 退型別*長故障切換等待*按一下「Save」。*按一下資訊圖示或參閱MSE文檔(如果需要)。

医主加 及此降奶沃夺付 汝	
HA Configuration : mse1 Services > Mobility Services Engines	> System > Services High Availability > Configure High Availability Parameters
Configure High Availability Pa	rameters
Primary Health Monitor IP	10.10.10.12
Secondary Device Name	mse2
Secondary IP Address	10.10.13
Secondary Password 🕸	••••
Failover Type 🏵	Automatic 👻
Failback Type 🕸	Manual 💌
Long Failover Wait 🕸	10 seconds
Save	

3. 當NCS提示配對兩個MSE時,按一下**OK**,如下圖所示。



4. 按一下「OK」,找到「License File」以啟用「Secondary」,如下圖所示。

HA Configuration : mse1 Services > Mobility Services Engines > System > Services High Availability > Configure High Availability Parameters

Configuration	
Primary Health Monitor IP	10.10.10.12
Secondary Device Name	mse2
Secondary IP Address	10.10.10.13
Secondary Password @	••••
Secondary Platform UDI	AIR-MSE-VA-K9:V01:mse2_666f2046-5699-11e1-b1b1-0050568
Secondary Activation Status	Not Activated
Activate Secondary with License	Browse
Failover Type 🕸	Automatic 💌
Failback Type 🏶	Manual 💌
Long Failover Wait 🏵	10 seconds
Save Delete	
啟用輔助MSE VA後,按一下 Sav	e以完成配置,如下圖所示。

5. 扂	的 と 用 輔 助 M S E	VA後,	按一	下 Save 以爿	宅成配置 .	如下圖所示。
------	--------------------------------------	------	----	------------------	--------	--------

HA Configuration : mse1 Services > Mobility Services Engines > System > Services High Availability > Configure High Availability Parameters						
Configuration						
Primary Health Monitor IP	10.10.10.12					
Secondary Device Name	mse2					
Secondary IP Address	10.10.10.13					
Secondary Password @	•••••					
Secondary Platform UDI	AIR-MSE-VA-K9:V01:mse2_666f2046-5699-11e1-b1b1-005					
Secondary Activation Status	Activated					
Delete Secondary Activation license \circledast						
Failover Type 🕸	Automatic 💌					
Failback Type 🕸	Manual 💌					
Long Failover Wait 🕸	10 seconds					
Save Delete Switchover						

6. 導航到NCS > Mobility Services > Mobility Services Engine。NCS顯示此螢幕,其中輔助

MSE出現在輔助伺服器的列中

Mobility Services Engines Services > Mobility Services Engines Go									
	Device Name	Device Type	IP Address	Version	Reachability Status	Secondary Server	Name	Admin Status	Service Status
	meel	Cisco Mobility Services Engine - Virtual Appliance	10.10.10.11	7.2.103.0	Reachable	mee2	Context Aware Service MPS Service MSAP Service	Enabled Disabled Disabled	Up Down Down

7. 若要檢視HA狀態,請導覽至NCS > Services > High Availability,如下圖所示。

Cisco Prime Cisco Network C	e Control System				
💧 Home Monitor	🔻 Configure 🔻	Services 🔻	Reports	 Admin 	istration 🔻
Mobility Services Eng Services > High Availability	ines	Hobility Mobility S Synchron	Services iervices Engi ize Services	ines	
Secondary Server Name	Secondary HM IP Ad	Synchron High Avai Context	ization Histo Iability Aware Notifi	orv ications	Version
mse2	10.10.10.13	MSAP			7.2.10
		Identity	Services		

在HA狀態中,您可以通過MSE對檢視目前的狀態和事件,如下圖所示。

cisco Prime Cisco Network Control System	n (1) (1) (1)	Virtual Domain:	ROOT-DOMAIN root + Log Out	ρ.
🛕 Home Monitor 🔹 Configure	▼ Services ▼ Reports ▼ Ad	ministration 🔹		
System 🗸	HA Configuration : mse1 Services > Mobility Services Engines > System : Current High Availability Status	- Services High Availability > Current High Ava i	lability Status	
Trap Destinations	Status Heartheats	Active		
Logs Services High Availability Ho Configuration	Data Replication Mean Heartbeat Response Time	Up 6 millisec		
HA Status	Events Log			
Accounts Lisers	Event Description	Generated By Primary	Timestamp 2012-Feb-14, 00:22:26 UTC	Remarks
 Groups Status 	Heartbeats have been setup successfully	Primary	2012-Feb-14, 00:19:00 UTC	
Sorver Events Audit Logs	Primary and secondary server synchronization in progress	Primary	2012-Feb-14, 00:18:56 UTC	
NCS Alarms NCS Events	Configuration successfully created Refresh Status	Primary	2012-Feb-14, 00:18:56 UTC	-

設定初始同步和資料複製可能需要幾分鐘時間。NCS會提供進度%指示,直到HA對完全處於 活動狀態(如上所示)為止。

Current High Availability Status		
Status	Primary and secondary server synchronization in progress	(68% complete)
Heartbeats	Up	
Data Replication	Setting up	
Mean Heartbeat Response Time	108 millisec	

與HA相關的MSE軟體版本7.2中引入的新命令是gethainfo。此輸出顯示Primary和Secondary:

[root@msel ~]#gethainfo

Health Monitor is running. Retrieving HA related information

Base high availability configuration for this server

Server role: Primary Health Monitor IP Address: 10.10.10.12 Virtual IP Address: 10.10.10.11 Version: 7.2.103.0 UDI: AIR-MSE-VA-K9:V01:mse1 Number of paired peers: 1

Peer configuration#: 1

Health Monitor IP Address 10.10.10.13 Virtual IP Address: 10.10.10.11 Version: 7.2.103.0 UDI: AIR-MSE-VA-K9:V01:mse2_666f2046-5699-11e1-b1b1-0050568901d9 Failover type: Manual Failover type: Manual Failover wait time (seconds): 10 Instance database name: mseos3s Instance database port: 1624 Dataguard configuration name: dg_mse3 Primary database alias: mseop3s Direct connect used: No Heartbeat status: Up Current state: PRIMARY_ACTIVE

[root@mse2 ~]#gethainfo

Health Monitor is running. Retrieving HA related information

Base high availability configuration for this server

Server role: Secondary Health Monitor IP Address: 10.10.10.13 Virtual IP Address: Not Applicable for a secondary Version: 7.2.103.0 UDI: AIR-MSE-VA-K9:V01:mse2 Number of paired peers: 1 Peer configuration#: 1

Health Monitor IP Address 10.10.10.12 Virtual IP Address: 10.10.10.11 Version: 7.2.103.0 UDI: AIR-MSE-VA-K9:V01:msel_d5972642-5696-11e1-bd0c-0050568901d6 Failover type: Manual Failback type: Manual Failover wait time (seconds): 10 Instance database name: mseos3 Instance database port: 1524 Dataguard configuration name: dg_mse3 Primary database alias: mseop3s Direct connect used: No Heartbeat status: Up Current state: SECONDARY_ACTIVE

使用直接連線的HA配置

網路連線的MSE HA會使用網路,而直接連線組態會促進使用主要MSE伺服器和輔助MSE伺服器之間的直接纜線連線。這有助於減少心跳響應時間、資料複製和故障檢測時間方面的延遲。在此場景中,主物理MSE連線到介面eth1上的輔助MSE(如圖5所示)。請注意,Eth1用於直接連線。每個介面需要一個IP地址。

圖5:含直接連線的MSE HA



1. 設定主MSE。安裝指令碼中的配置摘要:

-----BEGIN------Host name=mse3355-1 Role=1 [Primary]

```
Health Monitor Interface=eth0
Direct connect interface=eth1
Virtual IP Address=10.10.10.14
Virtual IP Netmask=255.255.255.0
Eth1 IP address=1.1.1.1
Eth1 network mask=255.0.0.0
Default Gateway =10.10.10.1
------END------
```

2. 設定輔助MSE。安裝指令碼中的配置摘要:

```
-----BEGIN-----
Host name=mse3355-2
Role=2 [Secondary]
Health Monitor Interface=eth0
Direct connect interface=eth1
Eth0 IP Address 10.10.10.16
Eth0 network mask=255.255.255.0
Default Gateway=10.10.10.1
Eth1 IP address=1.1.1.2,
Eth1 network mask=255.0.0.0
```

3. 將主MSE新增到NCS,如下圖所示。(請參閱前面的示例,或參閱配置指南)。

	Cisco Prime Cisco Network Control System Virtual Domain: ROOT-DOMAIN root v Log Out								oot 🔻 Log Out
	💧 Home	Monitor	•	Configure 🔻	Services 🔻	Reports 🔻	Administration	•	
M(Ser	Mobility Services Engines Services > Mobility Services Engines								
	Device !	lame		Device Type		IP Address	Version	Reachability Status	Secondary Server
	mse335	5-1		Cisco 3355 N Engine	fobility Services	10.10.10.14	¥ 7.2.103.0	Reachable	N/A (Click <mark>here</mark> to configure)

4. 要設定輔助MSE,請導航到NCS > configure Secondary Server。輸入輔助裝置名稱-[mse3355-2]輔助IP地址- [10.10.10.16]完成其餘引數並按一下Save,如下圖所示。

Cisco Prime CISCO Network Control System	n 🚺 📶	Virtual Domain: ROOT-							
🛕 Home Monitor 🔻 Configure	▼ Services ▼ Report	s 🔻 Administration 🔻							
System 🗸	HA Configuration : ms Services > Mobility Services Engin	e3355–1 es > System > Services High Availabili							
General Properties	Configure High Availability	Parameters							
Trap Destinations	Primary Health Monitor IP	10.10.10.15							
Advanced Parameters	Secondary Device Name	mse3355-2							
 Logs Services High Availability 	Secondary IP Address	10.10.10.16							
HA Configuration	Secondary Password 🕸	••••							
 Accounts 	Failover Type 🕸	Manual 💌							
Users	Failback Type 🕀	Manual 💌							
 Status 	Long Failover Wait 🕸	10 seconds							
Server Events	Save								
5. 按一下「OK」以確認兩個MSE的配對,	如下圖所示。								
The page at https://10.1	The page at https://10.10.10.20 says: 🛛 🗙								

Are you sure you want to pair up these two servers?						
OK Cancel						
NCS需要一段時間才能新增輔助伺服器配置,如下圖所示。						
Please Wait. High Availability configuration is being created at the Primary and Secondary servers. This will take a few seconds						
• • • •						

6. 完成後,對HA引數進行任何更改。按一下「**Save**」,如下圖所示。

HA Configuration : mse3355-1 Services > Mobility Services Engines > System > Services High Availability > Configure High Availability Parameters

Configuration

<u>z</u>			
Primary Health Monitor IP	10.10.10.15		
Secondary Device Name	mse3355-2		
Secondary IP Address	10.10.10.16		
Secondary Password 🕸	•••••		
Secondary Platform UDI	AIR-MSE-3355-K9:V01:K0		
Failover Type 🕸	Manual		
Failback Type 🔍	Manual		
Long Failover Wait 🔍	10 seconds		
Save Delete Switchover			

7. 檢視新MSE HA配對的即時進度的HA狀態,如下圖所示。

cisco Network Control Syste	m 70 17	Virtual Domain: ROOT-DOMAIN	root + Log Out P+	÷
🛕 Home Monitor 🔻 Configure	a 🔹 Services 🔻 Reports 🔻	Administration 💌		🔶 🖨 😣
System 🗸	HA Configuration : mse33 Services > Mobility Services Engines > S Current High Availability Status	55–1. lystem > Services High Availability > Car	rent High Availability Status	
Active Sessons Trap Destinations Advanced Parameters Logs Services High Availability HA Configuration	Status Heartbeats Data Replication Mean Heartbeat Response Time	Primary and secondary server s Up Setting up 8 milisec	synchronization in progress (66)	% complete)
HA Status	Events Log			
Accounts Accounts	Event Description	Generated By	Timestamp	Remarks
🛔 Groups	Configuration updated	Primary	2012-Feb-15, 20:10:56 UTC	Fallover mode set to AUTOMATIC.
 Status Source Events 	Heartbeats have been setup successfully	Primary	2012-Feb-15, 20:10:11 UTC	
Audit Logs	Primary and secondary server synchronization in progress	Primary	2012-Feb-15, 20:10:09 UTC	
NCS Alarms	Configuration successfully created	Primary	2012-Feb-15, 20:10:09 UTC	
NMSP Connection Status	Refresh Status			

8. 導覽至NCS > Services > Mobility Services > Mobility Services Engine,確認已將MSE(直接 連線)HA新增到NCS,如下圖所示。

·1	IIII Cisco Prime ISCO Network Contr	rol System		Virtual Domain	ROOT-DOMAIN	not v Log Out		
4	Home Monitor 🔻	Configure 🔻 Services 🔻 f	Reports 🔻 Ad	ministration	•	Change Password		
Mol Servio	Mobility Services Engines Services > Mobility Services Engines							
	Device Name	Device Type	IP Address	Version	Reachability Status	Secondary Server		
	mse3355-1	Cisco 3355 Mobility Services Engine	10.10.10.14	7.2.103.0	Reachable	mse3355-2		

9. 在控制檯中,也可使用gethainfo命令檢視確認。以下是主要和次要輸出: [root@mse3355-1~]#gethainfo

Health Monitor is running. Retrieving HA related information

Base high availability configuration for this server

Health Monitor IP Address: 10.10.10.15 Virtual IP Address: 10.10.10.14 Version: 7.2.103.0 UDI: AIR-MSE-3355-K9:V01:KQ37xx Number of paired peers: 1

Peer configuration#: 1

Health Monitor IP Address 10.10.10.16 Virtual IP Address: 10.10.10.14 Version: 7.2.103.0 UDI: AIR-MSE-3355-K9:V01:KQ45xx Failover type: Automatic Failback type: Manual Failover wait time (seconds): 10 Instance database name: mseos3s Instance database port: 1624 Dataguard configuration name: dg_mse3 Primary database alias: mseop3s Direct connect used: Yes Heartbeat status: Up Current state: PRIMARY_ACTIVE

[root@mse3355-2 ~]#gethainfo

Health Monitor is running. Retrieving HA related information

Base high availability configuration for this server

Server role: Secondary Health Monitor IP Address: 10.10.10.16 Virtual IP Address: Not Applicable for a secondary Version: 7.2.103.0 UDI: AIR-MSE-3355-K9:V01:KQ45xx Number of paired peers: 1

Peer configuration#: 1

```
Health Monitor IP Address 10.10.10.15
Virtual IP Address: 10.10.10.14
Version: 7.2.103.0
UDI: AIR-MSE-3355-K9:V01:KQ37xx
Failover type: Automatic
Failback type: Manual
Failover wait time (seconds): 10
Instance database name: mseos3
Instance database port: 1524
Dataguard configuration name: dg_mse3
Primary database alias: mseop3s
Direct connect used: Yes
Heartbeat status: Up
Current state: SECONDARY_ACTIVE
```

MSE物理裝置的HA配置方案

根據配對矩陣,HA配置中的最大值為2:1。這是為MSE-3355保留的,在輔助模式下,MSE-3310和 MSE-3350可以支援。直接連線在此場景中不適用。



1. 配置每個MSE以演示2:1高可用性場景:

MSE-3310 (Primary1) Server role: Primary Health Monitor IP Address (Eth0): 10.10.10.17 Virtual IP Address: 10.10.10.18 Eth1 - Not Applicable

MSE-3350 (Primary2) Server role: Primary Health Monitor IP Address: 10.10.10.22 Virtual IP Address: 10.10.10.21 Eth1 - Not Applicable

MSE-3355 (Secondary) Server role: Secondary Health Monitor IP Address: 10.10.10.16 Virtual IP Address: Not Applicable for a secondary

2. 配置完所有MSE後,將Primary1和Primary2新增到NCS,如下圖所示。

il c	Lisco Prime Isco Network Control Syste	w	tual Domain: ROOT-DOMAIN						
4	🛕 Home Monitor 🖲 Configure 🖲 Services 💌 Reports 🔹 Administration 💌								
Mol Servi	Mobility Services Engines Services > Mobility Services Engines								
	Device Name	Device Type	IP Address	Version	Reachability Status	Secondary Server			
ø									
	mse3350	Osco 3350 Mobility Services Engine	10.10.10.21	7.2.103.0	Reachable	N/A (Click here to configure)			
ø									
	mse3310	Osco 3310 Mobility Services Engine	10.10.10.18	7.2.103.0	Reachable	N/A (Click here to configure)			

3. 按一下以配置輔助伺服器(如前面的示例所示)。 從任一主要MSE開始,如下圖所示。

Reachability Status	Secondary Server
Reachable	N/A (Click <mark>here</mark> to configure)
Reachable	N/A (Click <u>here to</u> configure)

4. 輸入輔助MSE的引數:輔助裝置名稱:例如[**mse-3355-2**]輔助IP地址- [10.10.10.16]完成其餘 引數。按一下「**Save**」,如下圖所示。

HA Configuration : mse3350 Services > Mobility Services Engines > System > Services High Availability > Configure High Availability Parameters				
Configuration				
Primary Health Monitor IP	10.10.10.22			
Secondary Device Name	mse3355-2			
Secondary IP Address	10.10.10.16			
Secondary Password 🔍	••••			
Secondary Platform UDI	AIR-MSE-3355-K9:V01:KQ4			
Failover Type 🕸	Manual 💌			
Failback Type 🍭	Manual 💌			
Long Failover Wait 🕸	10 seconds			
Save Delete Switchove	er			

5. 請稍等片刻,等待配置第一個輔助項目,如下圖所示。

Please Wait. High Availability configuration is being created at the Primary and Secondary servers. This will take a few seconds...

. . . .

6. 確認已為第一個主MSE新增輔助伺服器,如下圖所示。

Mob Servic	ility Services Engines xs > Mobility Services Engines					
	Device Name	Device Type	IP Address	Version	Reachability Status	Secondary Server
E	mse3350	Osco 3350 Mobility Services Engine	10.10.10.21	7.2.103.0	Reachable	mse3355-2

7. 對第二個主MSE重複步驟3到6, 如下圖所示。

Mobility Services Engines Services > Mobility Services Engines							
Device Name	Device Type	IP Address	Version	Reachability Status	Secondary Server		
mse3350	Cisco 3350 Mability Services Engine	10.10.10.21	7.2.103.0	Reachable	mse3355-2		
nse3310	Osco 3310 Mobility Services Engine	10.10.10.18	7.2.103.0	Reachable	N/A (Click <u>have to</u> configure)		

8. 最終確定第二個主MSE的HA參數,如下圖所示。

HA Configuration : mse3310	
Services > Mobility Services Engines > System > Services High	Availability > Configure High Availability Parameters

Configure High Availability Para	meters	
Primary Health Monitor IP	10.10.10.17	
Secondary Device Name	mse3355-2	
Secondary IP Address	10.10.10.16	
Secondary Password 🕸	•••••	
Failover Type 🕸	Manual 💌	
Failback Type 🔍	Manual 💌	
Long Failover Wait 🕸	10 seconds	
Save		

9. **保**存設定,如下圖所示。

HA Configuration : mse3310
Services > Mobility Services Engines > System > Services High Availability > Configure High Availability Parameters

Configuration	
Primary Health Monitor IP	10.10.10.17
Secondary Device Name	mse3355-2
Secondary IP Address	10.10.10.16
Secondary Password 🕸	••••
Secondary Platform UDI	AIR-MSE-3355-K9:V01:KQ
Failover Type 🕸	Manual 💌
Failback Type 🏵	Manual 💌
Long Failover Wait 🕸	10 seconds
Save Delete Switchov	er

10. 檢查每個主MSE的進度狀態,如下圖所示。



12. 導覽至NCS > Services > Mobility Services,選擇High Availability,如下圖所示。

Cisco Prim	e Control System						
🛕 Home Monitor	 Configure 	 Ser 	vices	•	Reports	•	Adminis
		40	Mobilit Synchi Synchi High A Contei MSAP	ity Se y Se roniz roniz <u>tvaila</u> xt A	Services Eng e Service: ation Hist bility war Dioti	gines s ory ficatio	ins

請注意,已確認MSE-3355的2:1為MSE-3310和MSE-3350的次要,如下圖所示。

cisco Network	Control System	Web	ual Domain: RO	OT-DOMAIN root	Log Out D+	_
🛕 Home Monitor	▼ Configure ▼ Serv	ices 🔻 Reports 🔻 Adm	inistration 🔻			
Mobility Services En Services > High Availability	gines					
	ierver Name Secondary HM IP Address Secondary Device Type Ve		Associated Primary Mobility Service Engines			
Secondary Server Name		Version	Device Name	Device Type	Heartbeats	
100		1.7			Appiance	
	10.10.10.14	Osco 3355 Mobility Services	7.0.100.0	mse3310	Cisco 3310 Mobility Services Engine	Up
mse3355-2 10.10.10.16 Engine		7.2.103.0	mse3350	Cisco 3350 Mobility Services Engine	Up	
				L = n +		

以下是使用gethainfo指令時,所有三個MSE的控制檯上的HA設定輸出範例: [root@mse3355-2~]#gethainfo

Health Monitor is running. Retrieving HA related information

Base high availability configuration for this server

Server role: Secondary Health Monitor IP Address: 10.10.10.16 Virtual IP Address: Not Applicable for a secondary Version: 7.2.103.0 UDI: AIR-MSE-3355-K9:V01:KQ45xx Number of paired peers: 2

Peer configuration#: 1

Health Monitor IP Address 10.10.10.22 Virtual IP Address: 10.10.10.21 Version: 7.2.103.0 UDI: AIR-MSE-3350-K9:V01:MXQ839xx Failover type: Manual Failback type: Manual Failover wait time (seconds): 10 Instance database name: mseos3 Instance database port: 1524 Dataguard configuration name: dg_mse3 Primary database alias: mseop3s Direct connect used: No Heartbeat status: Up Current state: SECONDARY_ACTIVE

Peer configuration#: 2

Health Monitor IP Address 10.10.10.17 Virtual IP Address: 10.10.10.18 Version: 7.2.103.0 UDI: AIR-MSE-3310-K9:V01:FTX140xx Failover type: Manual Failback type: Manual Failover wait time (seconds): 10 Instance database name: mseos4 Instance database port: 1525 Dataguard configuration name: dg_mse4 Primary database alias: mseop4s Direct connect used: No Heartbeat status: Up Current state: SECONDARY_ACTIVE

NCS中HA的最終驗證顯示MSE-3310和MSE-3350的狀態均為完全活動,如下圖所示。

cisco Network Control Syste	m hall /	
🛕 Home Monitor 🔻 Configure	🔹 🖲 Services 🔻 Reports 💌 Administra	tion 🔻
Custom	HA Configuration : mse3310	
system 🗸	Services > Mobility Services Engines > System > Services	High Availability > Current High Availability Status
General Properties Active Sessions	Current High Availability Status	
Trap Destinations	Status	Active
ᡖ Advanced Parameters	Heartbeats	Up
🎳 Logs	Data Replication	Up
 Services High Availability HA Configuration 	Mean Heartbeat Response Time	5 millisec
旹 HA Status	Events Log	
 Accounts 	Event Description	Generated By
Users	Active	Primary
Ctable	Heartbeats have been setup successfully	Primary
Server Events	Primary and secondary server synchronization	Primary
ᡖ Audit Logs	In progress	Primary
	Comparator succession a conce	rinney
cisco Network Control System		
🛕 Home Monitor 🔻 Configure	 ▼ Services ▼ Reports ▼ Administration 	•
System 🗸	HA Configuration : mse3350	
General Properties	Services > Mobility Services Engines > System > Services High	h Availability > Current High Availability Status
Active Sessions	Current High Availability Status	
ᡖ Trap Destinations	Status	Active
		Active
ᡖ Advanced Parameters	Heartbeats	Up
Advanced Parameters Logs	Heartbeats Data Replication	Up Up
 Advanced Parameters Logs Services High Availability HA Configuration 	Heartbeats Data Replication Mean Heartbeat Response Time	Up Up 4 milisec
 Advanced Parameters Logs Services High Availability HA Configuration HA Status 	Heartbeats Data Replication Mean Heartbeat Response Time Events Log	Up Up 4 millisec
 Advanced Parameters Logs Services High Availability HA Configuration HA Status Accounts Lines 	Heartbeats Data Replication Mean Heartbeat Response Time Events Log Event Description	Up Up 4 milisec Generated By
Advanced Parameters Logs Services High Availability HA Configuration HA Status Accounts Users Counts Counts	Heartbeats Data Replication Mean Heartbeat Response Time Events Log Event Description Active	Up Up 4 milisec Generated By Primary
 Advanced Parameters Logs Services High Availability HA Configuration HA Status Accounts Users Groups Status 	Heartbeats Data Replication Mean Heartbeat Response Time Events Log Event Description Active Heartbeats have been setup successfully	Up Up 4 milisec Generated By Primary
 Advanced Parameters Logs Services High Availability HA Configuration HA Status Accounts Users Groups Status Server Events 	Heartbeats Data Replication Mean Heartbeat Response Time Events Log Event Description Active Heartbeats have been setup successfully Primary and secondary server synchronization in progress	Up Up 4 millisec Generated By Primary Primary

驗證

目前沒有適用於此組態的驗證程序。

MSE HA的基本故障排除

本節提供的資訊可用於對組態進行疑難排解。

新增輔助MSE時,可以看到如下圖所示的提示。

安裝指令碼期間可能存在問題。

- 運行getserverinfo命令以檢查網路設定是否正確。
- •服務也可能尚未啟動。運行/init.d/msed start命令。
- •如果需要,請再次運行安裝指令碼(/mse/setup/setup.sh),並在最後儲存。

MSE的VA還需要啟用許可證(L-MSE-7.0-K9)。 否則,新增輔助MSE VA時,NCS會提示。獲取並 新增MSE VA的啟用許可證,如下圖所示。

The page at https://10.10.10.20 says:

Secondary MSE needs to be activated with a Virtual Appliance license. Add a license and save the config. X

OK

如果在MSE上交換HA角色,請確保服務已完全停止。因此,請使用/init.d/msed stop命令停止服務 ,然後再次運行安裝指令碼(/mse/setup/setup.sh),如下圖所示。

Applying High Availability configuration *** User has switched roles for this MSE. MSE must be stopped before switching r oles. *** Please stop MSE and then re-run setup.sh. ERROR: One or more of the requested configurations was not applied. Role=2, Health Monitor Interface=eth0, Direct connect interface=none Success [root0mse2_setup]#

運行gethainfo命令以獲取MSE上的HA資訊。這為排除或監控HA狀態和更改提供了有用的資訊。

Health Monitor is running. Retrieving HA related information

_____ Base high availability configuration for this server _____ Server role: Secondary Health Monitor IP Address: 10.10.10.16 Virtual IP Address: Not Applicable for a secondary Version: 7.2.103.0 UDI: AIR-MSE-3355-K9:V01:KQ45xx Number of paired peers: 2 ------Peer configuration#: 1 _____ Health Monitor IP Address 10.10.10.22 Virtual IP Address: 10.10.10.21 Version: 7.2.103.0 UDI: AIR-MSE-3350-K9:V01:MXQ839xx Failover type: Manual Failback type: Manual Failover wait time (seconds): 10 Instance database name: mseos3 Instance database port: 1524 Dataguard configuration name: dg_mse3 Primary database alias: mseop3s Direct connect used: No Heartbeat status: Up Current state: SECONDARY_ACTIVE _____ Peer configuration#: 2 _____ Health Monitor IP Address 10.10.10.17 Virtual IP Address: 10.10.10.18 Version: 7.2.103.0 UDI: AIR-MSE-3310-K9:V01:FTX140xx Failover type: Manual Failback type: Manual Failover wait time (seconds): 10 Instance database name: mseos4 Instance database port: 1525 Dataguard configuration name: dg_mse4 Primary database alias: mseop4s Direct connect used: No Heartbeat status: Up Current state: SECONDARY_ACTIVE

此外,NCS HA View是一個極好的管理工具,可用於檢視MSE的HA設定,如下圖所示。

故障轉移/故障回覆場景

僅在手動故障切換/回切的情況下發生的情況,以便更好地控制。

主裝置已啟動,輔助裝置已準備好接管

配置MSE HA並啟動並運行後,Prime上的狀態如下圖所示:

Current High Availability Status

Status	Active
Heartbeats	Up
Data Replication	Up
Mean Heartbeat Response Time	12 millised

Events Log

Event Description	Generated By	Timestamp
Active	Primary	2015-Mar-08, 12:50:17 CET
Heartbeats have been setup successfully	Primary	2015-Mar-08, 12:39:17 CET
Primary and secondary server synchronization in progress	Primary	2015-Mar-08, 12:39:13 CET
Configuration successfully created	Primary	2015-Mar-08, 12:39:11 CET

以下是主MSE的getserverinfo和gethainfo:

```
[root@NicoMSE ~]# getserverinfo
Health Monitor is running
Retrieving MSE Services status.
MSE services are up, getting the status
```

Server Config

Product name: Cisco Mobility Service Engine Version: 8.0.110.0 Health Monitor Ip Address: 10.48.39.238 High Availability Role: 1 Hw Version: V01 Hw Product Identifier: AIR-MSE-VA-K9 Hw Serial Number: NicoMSE_b950a7c0-b68c-11e4-99d9-005056993b63 HTTPS: null Legacy Port: 8001 Log Modules: -1 Log Level: INFO Days to keep events: 2 Session timeout in mins: 30 DB backup in days: 2 _____ Services _____ Service Name: Context Aware Service Service Version: 8.0.1.79 Admin Status: Disabled Operation Status: Down Service Name: WIPS Service Version: 3.0.8155.0 Admin Status: Enabled Operation Status: Up Service Name: Mobile Concierge Service Service Version: 5.0.1.23 Admin Status: Disabled Operation Status: Down Service Name: CMX Analytics Service Version: 3.0.1.68 Admin Status: Disabled Operation Status: Down Service Name: CMX Connect & Engage Service Version: 1.0.0.29 Admin Status: Disabled Operation Status: Down Service Name: HTTP Proxy Service Service Version: 1.0.0.1 Admin Status: Disabled Operation Status: Down _____ Server Monitor -----Server start time: Sun Mar 08 12:40:32 CET 2015 Server current time: Sun Mar 08 14:04:30 CET 2015

Server timezone: Europe/Brussels Server timezone offset (mins): 60 Restarts: 1 Used Memory (MB): 197

Allocated Memory (MB): 989 Max Memory (MB): 989 DB disk size (MB): 17191 _____ Active Sessions _____ Session ID: 5672 Session User ID: 1 Session IP Address: 10.48.39.238 Session start time: Sun Mar 08 12:44:54 CET 2015 Session last access time: Sun Mar 08 14:03:46 CET 2015 Default Trap Destinations _____ Trap Destination - 1 _____ IP Address: 10.48.39.225 Last Updated: Sun Mar 08 12:34:12 CET 2015 [root@NicoMSE ~]# gethainfo Health Monitor is running. Retrieving HA related information _____ Base high availability configuration for this server _____ Server role: Primary Health Monitor IP Address: 10.48.39.238 Virtual IP Address: 10.48.39.224 Version: 8.0.110.0 UDI: AIR-MSE-VA-K9:V01:NicoMSE_b950a7c0-b68c-11e4-99d9-005056993b63 Number of paired peers: 1 _____ Peer configuration#: 1 _____ Health Monitor IP Address 10.48.39.240 Virtual IP Address: 10.48.39.224 Version: 8.0.110.0 UDI: AIR-MSE-VA-K9:V01:NicoMSE2_1c6b1940-b6a5-11e4-b017-005056993b66 Failover type: Manual Failback type: Manual Failover wait time (seconds): 10 Instance database name: mseos3s Instance database port: 1624 Dataguard configuration name: dg_mse3 Primary database alias: mseop3s Direct connect used: No Heartbeat status: Up Current state: PRIMARY_ACTIVE 輔助MSE的情況也是如此:

[root@NicoMSE2 ~]# getserverinfo
Health Monitor is running
Retrieving MSE Services status.

_____ Server Config _____ Product name: Cisco Mobility Service Engine Version: 8.0.110.0 Health Monitor Ip Address: 10.48.39.240 High Availability Role: 2 Hw Version: V01 Hw Product Identifier: AIR-MSE-VA-K9 Hw Serial Number: NicoMSE2_1c6b1940-b6a5-11e4-b017-005056993b66 HTTPS: null Legacy Port: 8001 Log Modules: -1 Log Level: INFO Days to keep events: 2 Session timeout in mins: 30 DB backup in days: 2 _____ Services _____ Service Name: Context Aware Service Service Version: 8.0.1.79 Admin Status: Disabled Operation Status: Down Service Name: WIPS Service Version: 3.0.8155.0 Admin Status: Enabled Operation Status: Up Service Name: Mobile Concierge Service Service Version: 5.0.1.23 Admin Status: Disabled Operation Status: Down Service Name: CMX Analytics Service Version: 3.0.1.68 Admin Status: Disabled Operation Status: Down Service Name: CMX Connect & Engage Service Version: 1.0.0.29 Admin Status: Disabled Operation Status: Down Service Name: HTTP Proxy Service Service Version: 1.0.0.1 Admin Status: Disabled Operation Status: Down _____ Server Monitor _____

Server start time: Sun Mar 08 12:50:04 CET 2015 Server current time: Sun Mar 08 14:04:32 CET 2015 Server timezone: Europe/Brussels

Server timezone offset (mins): 60 Restarts: null Used Memory (MB): 188 Allocated Memory (MB): 989 Max Memory (MB): 989 DB disk size (MB): 17191 [root@NicoMSE2 ~]# gethainfo Health Monitor is running. Retrieving HA related information Base high availability configuration for this server _____ Server role: Secondary Health Monitor IP Address: 10.48.39.240 Virtual IP Address: Not Applicable for a secondary Version: 8.0.110.0 UDI: AIR-MSE-VA-K9:V01:NicoMSE2_1c6b1940-b6a5-11e4-b017-005056993b66 Number of paired peers: 1 _____ Peer configuration#: 1 _____ Health Monitor IP Address 10.48.39.238 Virtual IP Address: 10.48.39.224 Version: 8.0.110.0 UDI: AIR-MSE-VA-K9:V01:NicoMSE_b950a7c0-b68c-11e4-99d9-005056993b63 Failover type: Manual Failback type: Manual Failover wait time (seconds): 10 Instance database name: mseos3 Instance database port: 1524 Dataguard configuration name: dg_mse3 Primary database alias: mseop3s Direct connect used: No Heartbeat status: Up Current state: SECONDARY_ACTIVE

故障轉移到輔助裝置

為了手動觸發,您在Prime Infrastructure中進入MSE HA配置,然後點選Switchover。

很快,兩台伺服器上的gethainfo都將轉換為FAILOVER_INVOKED

primary gethainfo:

[root@NicoMSE ~]# gethainfo
Health Monitor is running. Retrieving HA related information
______Base high availability configuration for this server

Server role: Primary Health Monitor IP Address: 10.48.39.238 Virtual IP Address: 10.48.39.224 Version: 8.0.110.0 UDI: AIR-MSE-VA-K9:V01:NicoMSE_b950a7c0-b68c-11e4-99d9-005056993b63 Number of paired peers: 1

Peer configuration#: 1

Health Monitor IP Address 10.48.39.240 Virtual IP Address: 10.48.39.224 Version: 8.0.110.0 UDI: AIR-MSE-VA-K9:V01:NicoMSE2_1c6b1940-b6a5-11e4-b017-005056993b66 Failover type: Manual Failback type: Manual Failover wait time (seconds): 10 Instance database name: mseos3s Instance database port: 1624 Dataguard configuration name: dg_mse3 Primary database alias: mseop3s Direct connect used: No Heartbeat status: Down Current state: FAILOVER_INVOKED

輔助gethainfo:

[root@NicoMSE2 ~]# gethainfo

Health Monitor is running. Retrieving HA related information

Base high availability configuration for this server

Server role: Secondary
Health Monitor IP Address: 10.48.39.240
Virtual IP Address: Not Applicable for a secondary
Version: 8.0.110.0
UDI: AIR-MSE-VA-K9:V01:NicoMSE2_1c6b1940-b6a5-11e4-b017-005056993b66
Number of paired peers: 1

Peer configuration#: 1

Health Monitor IP Address 10.48.39.238 Virtual IP Address: 10.48.39.224 Version: 8.0.110.0 UDI: AIR-MSE-VA-K9:V01:NicoMSE_b950a7c0-b68c-11e4-99d9-005056993b63 Failover type: Manual Failback type: Manual Failover wait time (seconds): 10 Instance database name: mseos3 Instance database port: 1524 Dataguard configuration name: dg_mse3 Primary database alias: mseop3s Direct connect used: No Heartbeat status: Down Current state: FAILOVER_INVOKED **故障切換完成後,您將在Prime上看到以下映像**:

Events Log

Event Description	Generated By
Instance is in failover active state	Secondary
Failover invoked; starting application instance	Secondary
Failover has been invoked. Reconfiguring instance database	Secondary
Failover invoked; shutting down primary instance	Secondary

主要gethainfo:

[root@NicoMSE ~]# gethainfo Health Monitor is not running. Following information is from the last saved configuration -----Base high availability configuration for this server _____ Server role: Primary Health Monitor IP Address: 10.48.39.238 Virtual IP Address: 10.48.39.224 Version: 8.0.110.0 UDI: AIR-MSE-VA-K9:V01:NicoMSE_b950a7c0-b68c-11e4-99d9-005056993b63 Number of paired peers: 1 _____ Peer configuration#: 1 _____ Health Monitor IP Address 10.48.39.240 Virtual IP Address: 10.48.39.224 Version: 8.0.110.0 UDI: AIR-MSE-VA-K9:V01:NicoMSE2_1c6b1940-b6a5-11e4-b017-005056993b66 Failover type: Manual Failback type: Manual

Direct connect used: No

輔助:

Failover wait time (seconds): 10 Instance database name: mseos3s Instance database port: 1624

Dataguard configuration name: dg_mse3 Primary database alias: mseop3s

Last shutdown state: FAILOVER_ACTIVE

Health Monitor is running. Retrieving HA related information

_____ Base high availability configuration for this server _____ Server role: Secondary Health Monitor IP Address: 10.48.39.240 Virtual IP Address: Not Applicable for a secondary Version: 8.0.110.0 UDI: AIR-MSE-VA-K9:V01:NicoMSE2_1c6b1940-b6a5-11e4-b017-005056993b66 Number of paired peers: 1 _____ Peer configuration#: 1 _____ Health Monitor IP Address 10.48.39.238 Virtual IP Address: 10.48.39.224 Version: 8.0.110.0 UDI: AIR-MSE-VA-K9:V01:NicoMSE_b950a7c0-b68c-11e4-99d9-005056993b63 Failover type: Manual Failback type: Manual Failover wait time (seconds): 10 Instance database name: mseos3 Instance database port: 1524 Dataguard configuration name: dg_mse3 Primary database alias: mseop3s Direct connect used: No Heartbeat status: Down Current state: FAILOVER_ACTIVE 在此階段,故障切換已完成,輔助MSE完全負責。

需要注意的是,當您執行手動切換時,主MSE上的服務會停止(為了模擬主MSE斷開的真實事件)

如果恢復主映像,其狀態將為「TERMINATED」。 它是正常的,輔助節點仍然負責並顯示「 FAILOVER_ACTIVE」

回切到主節點

在回切之前,您必須恢復主映像。

其狀態隨後為「已終止」:

[root@NicoMSE ~]# gethainfo

Health Monitor is running. Retrieving HA related information

```
Base high availability configuration for this server
```

Server role: Primary Health Monitor IP Address: 10.48.39.238 Virtual IP Address: 10.48.39.224 Version: 8.0.110.0 UDI: AIR-MSE-VA-K9:V01:NicoMSE_b950a7c0-b68c-11e4-99d9-005056993b63 Number of paired peers: 1 Peer configuration#: 1

Health Monitor IP Address 10.48.39.240 Virtual IP Address: 10.48.39.224 Version: 8.0.110.0 UDI: AIR-MSE-VA-K9:V01:NicoMSE2_1c6b1940-b6a5-11e4-b017-005056993b66 Failover type: Manual Failback type: Manual Failover wait time (seconds): 10 Instance database name: mseos3s Instance database port: 1624 Dataguard configuration name: dg_mse3 Primary database alias: mseop3s Direct connect used: No Heartbeat status: Down Current state: TERMINATED 當您從Prime呼叫回切時,兩個節點都進入「FAILBACK ACTIVE」,該狀態不是最終狀態(與「 failover active」相反)。

主要gethainfo:

[root@NicoMSE ~]# gethainfo Health Monitor is running. Retrieving HA related information _____ Base high availability configuration for this server _____ Server role: Primary Health Monitor IP Address: 10.48.39.238 Virtual IP Address: 10.48.39.224 Version: 8.0.110.0 UDI: AIR-MSE-VA-K9:V01:NicoMSE_b950a7c0-b68c-11e4-99d9-005056993b63 Number of paired peers: 1 _____ Peer configuration#: 1 ------Health Monitor IP Address 10.48.39.240 Virtual IP Address: 10.48.39.224 Version: 8.0.110.0 UDI: AIR-MSE-VA-K9:V01:NicoMSE2_1c6b1940-b6a5-11e4-b017-005056993b66 Failover type: Manual

 Failbock type: Manual

 Failback type: Manual

 Failover wait time (seconds): 10

 Instance database name: mseos3s

 Instance database port: 1624

 Dataguard configuration name: dg_mse3

 Primary database alias: mseop3s

 Direct connect used: No

 Heartbeat status: Down

 Current state: FAILBACK_ACTIVE

 輔助gethainfo:

[root@NicoMSE2 ~]# gethainfo

Health Monitor is running. Retrieving HA related information _____ Base high availability configuration for this server _____ Server role: Secondary Health Monitor IP Address: 10.48.39.240 Virtual IP Address: Not Applicable for a secondary Version: 8.0.110.0 UDI: AIR-MSE-VA-K9:V01:NicoMSE2_1c6b1940-b6a5-11e4-b017-005056993b66 Number of paired peers: 1 _____ Peer configuration#: 1 _____ Health Monitor IP Address 10.48.39.238 Virtual IP Address: 10.48.39.224 Version: 8.0.110.0 UDI: AIR-MSE-VA-K9:V01:NicoMSE_b950a7c0-b68c-11e4-99d9-005056993b63 Failover type: Manual Failback type: Manual Failover wait time (seconds): 10 Instance database name: mseos3 Instance database port: 1524 Dataguard configuration name: dg_mse3 Primary database alias: mseop3s Direct connect used: No Heartbeat status: Down Current state: FAILBACK_ACTIVE Prime顯示以下圖片:

Event Description	Generated By
Failback in progress; starting primary database instance	Secondary

當故障回覆完成,但輔助節點仍然忙於將資料傳回主節點時,主節點顯示:

gethainfo

Health Monitor is running. Retrieving HA related information

Base high availability configuration for this server

Server role: Primary
Health Monitor IP Address: 10.48.39.238
Virtual IP Address: 10.48.39.224
Version: 8.0.110.0
UDI: AIR-MSE-VA-K9:V01:NicoMSE_b950a7c0-b68c-11e4-99d9-005056993b63
Number of paired peers: 1

Peer configuration#: 1

Health Monitor IP Address 10.48.39.240

Virtual IP Address: 10.48.39.224 Version: 8.0.110.0 UDI: AIR-MSE-VA-K9:V01:NicoMSE2_1c6b1940-b6a5-11e4-b017-005056993b66 Failover type: Manual Failback type: Manual Failover wait time (seconds): 10 Instance database name: mseos3s Instance database port: 1624 Dataguard configuration name: dg_mse3 Primary database alias: mseop3s Direct connect used: No Heartbeat status: Up Current state: FAILBACK_COMPLETE 輔助顯示: [root@NicoMSE2 ~]# gethainfo Health Monitor is running. Retrieving HA related information _____ Base high availability configuration for this server _____ Server role: Secondary Health Monitor IP Address: 10.48.39.240 Virtual IP Address: Not Applicable for a secondary Version: 8.0.110.0 UDI: AIR-MSE-VA-K9:V01:NicoMSE2_1c6b1940-b6a5-11e4-b017-005056993b66 Number of paired peers: 1 _____ Peer configuration#: 1 _____ Health Monitor IP Address 10.48.39.238 Virtual IP Address: 10.48.39.224 Version: 8.0.110.0 UDI: AIR-MSE-VA-K9:V01:NicoMSE_b950a7c0-b68c-11e4-99d9-005056993b63 Failover type: Manual Failback type: Manual Failover wait time (seconds): 10 Instance database name: mseos3 Instance database port: 1524 Dataguard configuration name: dg_mse3 Primary database alias: mseop3s Direct connect used: No Heartbeat status: Up Current state: SECONDARY_ALONE 如圖所示:

Current High Availability Status

Status	Primary instance is not synchronized with the secondary server. In progress.
Heartbeats	Up
Data Replication	Up
Mean Heartbeat Response Time	13 millisec

Events Log

Heartbeats have been setup successfully Primary	

完成此操作後,所有狀態都將返回原始狀態:PRIMARY_ACTIVE、SECONDARY_ACTIVE和 Prime HA狀態再次顯示為新部署。

HA狀態矩陣

PRIMARY_ACTIVE主MSE處於主、負責且一切正常時的狀態SECONDARY_ACTIVE車助MSE處於開啟狀態但不負責時的狀態(主要仍然是),準備在需要時接管FAILOVER_INVOKED葡酸生故障切換時(即輔助MSE開始其服務載入主MSE的資料庫)顯示在兩個節FAILOVER_ACTIVE當發生故障切換時(即輔助MSE開始其服務載入主MSE的資料庫)顯示在兩個節CAALL松障轉移的最終狀態。輔助MSE視為「啟動並運行」,而主MSE已關閉CAALLMSE節點的狀態,該節點在關閉後恢復服務,並且不是負責節點(因此當服務重)FAILBACK_ACTIVE與故障切換相反,這並不是故障切換的最後階段。這表示已呼叫故障恢復,並且)FAILBACK_COMPLETE主節點重新掌管但仍在忙於從輔助MSE載入資料庫時的狀態FAILBACK_ADTIVE第點重新掌管但仍在忙於從輔助MSE載入資料庫時的狀態

SECONDARY_ALONE 當故障回覆完成且主裝置負責但仍載入資料時輔助MSE的狀態 正常關閉 如果手動重新啟動或停止另一個MSE上的服務,則觸發此狀態,以防出現自動故

關於HA的重要評論和事實

•在進行故障切換後不立即觸發故障恢復非常重要,反之亦然。資料庫需要30分鐘時間才能穩定

- HA配置檔案是/opt/mse/health-monitor/resources/config/中的base-ha-config.properties,但不 應手動編輯(請改用setup.sh)。 但是如果有疑問,您可以檢視
- HA不能手動斷開。唯一簡單的方法是從Prime Infra刪除輔助MSE。任何其他方法(在輔助系統 上運行setup.sh使其成為主裝置、解除安裝、更改ip ...)都將中斷資料庫和狀態機,並且您可能 必須重新安裝兩個MSE

HA故障排除

與HA相關的日誌儲存在/opt/mse/logs/hm目錄下,其中health-monitor*.log為主日誌檔案。

問題:初級與次級均處於活動狀態(分裂大腦狀態)

1.關閉輔助交換機上的虛擬IP介面(VIP)。它將eth0:1 ifconfig eth0:1 關閉

2.重新啟動輔助MSE上的服務

服務msed stop service msed start

3.驗證輔助節點是否已開始從Prime基礎設施與主節點同步返回。

問題:輔助節點與用於HA的主節點的同步長時間停滯在X%

1.停止輔助節點上的服務

服務msed stop

2.刪除 /opt/mse/health-monitor/resources/config/advance-cconfig-<IP-address-of-Primary>.properties 輔助伺服器上的檔案。

3.如果在建立HA時仍存在問題,則它可能會進入不一致狀態,在這種狀態下,我們必須使用**rm -rf** /opt/data/***刪除輔助節點上「data」目錄下的所有內容**

4.重新啟動輔助節點。將其從Prime基礎設施新增到主基礎設施以再次啟動HA。

問題:在PI無法訪問輔助伺服器後,無法將其刪除

1.停止主節點上的服務。

2.刪除 /opt/mse/health-monitor/resources/config/advance-cconfig-<IP-address-of-Primary>.properties 主目錄中的檔案。

3.重新啟動主伺服器上的服務。

4.從PI中刪除主MSE並重新新增它。