使用DCNM构建Nexus 9000 VXLAN多站点TRM

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简介

本文档将介绍如何部署Cisco Nexus 9000 VXLAN多站点TRM交换矩阵,其中边界网关通过DCI交换 机连接



拓扑详细信息

- DC1和DC2是运行VXLAN的两个数据中心位置。
- DC1和DC2边界网关通过DCI交换机相互连接。
- DCI交换机不运行任何VXLAN;这些设备正在为底层运行eBGP,以实现从DC1到DC2的可达性 ,反之亦然。此外,DCI交换机还配置了租户vrf;在本例中,它为vrf- "tenant-1"。
- DCI交换机还连接到非VXLAN的外部网络。
- VRFLITE连接在边界网关上终止(支持从NXOS-9.3(3)和DCNM-11.3(1)开始的VRFLITE和边界 网关功能共存)
- 边界网关在任播模式下运行;在此版本上运行TRM(租户路由组播)时,边界网关不能配置为 vPC(请参阅多站点TRM配置指南了解其他限制)
- 对于此拓扑,所有BGW交换机都有两个到每个DCI交换机的物理连接;一个链路将处于默认 VRF中(将用于站点间流量),而另一个链路将处于VRF租户–1中,该租户用于将VRFLITE扩 展到非vxlan环境。

PIM/组播详细信息(TRM特定)

- 两个站点的底层PIM RP是主干交换机,环回254配置为相同。使用底层PIM RP,以便VTEP可 以将PIM寄存器和PIM加入发送到主干(用于各种VNID的BUM流量复制)
- 对于TRM,RP可以通过不同的方式指定;在本文中,PIM RP是位于拓扑顶部的核心路由器 ,位于VXLAN交换矩阵外部。
- •所有VTEP的核心路由器将指定为在各自VRF中配置的PIM RP

- DC1-Host1正在向组239.144.144.144发送组播;DC2-Host1是DC2中此组的接收方,而 vxlan的外部主机(172.17.100.100)也订阅此组
- DC2-Host1正在向组239.145.145.145发送组播;DC1-Host1是DC1中此组的接收方,而 vxlan的外部主机(172.17.100.100)也订阅此组
- DC2-Host2位于Vlan 144中,是组播组239.144.144.144和239.100.100.100的接收方
- 外部主机(172.17.100.100)正在发送DC1-Host1和DC2-Host1都是接收方的流量。
- 这包括东/西VLAN间和VLAN内以及北/南组播流量

使用的组件

- •运行9.3(3)的Nexus 9k交换机
- DCNM运行11.3(1)

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。如果您使用的是真实网络,请确保您已经了解所有命令的潜在影响。

高级步骤

1)考虑到本文档基于两个使用VXLAN多站点功能的数据中心,必须创建两个简易交换矩阵

2)创建MSD并移动DC1和DC2

3)创建外部交换矩阵并添加DCI交换机

4)创建多站点底层和重叠

5)在边界网关上创建VRF扩展附件

6)单播流量验证

7)组播流量验证

步骤 1:为DC1创建简易交换矩阵

• 登录DCNM,从控制面板中选择选项 — > "Fabric Builder"

Good morning, admin! Let's get started.





Creates a managed and controlled SDN fabric.



Networks & VRFs Simple network overlay provisioning for N9K VXLAN EVPN Fabrics.



Documentation Access cisco.com from documentation on configuration, maintenance and operation.

•选择"创建交换矩阵"选项



Fabric Builder creates a managed and controlled SDN fabric. Select an existing fabric below or define a new VXLAN fabric, add switches using *Power On Auto Provisioning (POAP)*, set the roles of the switches and deploy settings to devices.



• 接下来,提供交换矩阵名称、模板,然后在"常规"选项卡下填写相关ASN、交换矩阵接口编号 、任何广播网关MAC(AGM)

_1	
Protocols Advanced Reso	ources Manageability Bootstrap Configuration Backup
65000	1-4294967295 1-65535[.0-65535]
unnumbered T	Numbered(Point-to-Point) or Unnumbered
	Mask for Underlay Subnet IP Kange Mask for Underlay Subnet IPv6 Range
2	Suppported routing protocols (OSPF/IS-IS) Number of spines acting as Route-Reflectors
Cc46.d6ba.c555	Shared MAC address for all leafs (xxxx.xxxx.xxxx) If Set, Image Version Check Enforced On All Switches.
	_1 ▼ Protocols Advanced Reso 65000 © © unnumbered ▼ 30 ▼ 0spf ▼ 2 cc46.d6ba.c555

#交换矩阵中的主机将AGM用作默认网关MAC地址。所有枝叶交换机上的情况相同(因为交换矩阵 内的所有枝叶交换机都运行任播交换矩阵转发)。 所有枝叶交换机上的默认网关IP地址和MAC地址 将相同

• 接下来是设置复制模式

* Fabric Name :	DC1								
* Fabric Template :	Easy_Fabric_11	_1	•						
General Replicat	ion vPC	Protocols	Advanced	Reso	urces	Mana	eability	Bootstrap	Configuration Backup
* R	eplication Mode	Multicast		•	🕜 Re	plication Nic	ode for BUN	A Traffic	
* Multicas	st Group Subnet	239.1.1.0/24			🕐 Mu	lticast adore	ess with pre	efix 16 to 30	
Enable Tenant Routed	Multicast (TRM)	For Ov	erlay Multicast Su	Ipport In \	/XLAN Fa	abrics			
Default MDT Addres	239.1.1.0			@ IPv	4 Multicast	Address			
* Rendezvous-Points 2			•	Nu	mber of spin	nes acting a	as Rendezvous-P	Point (RP)	
	* PP Mode	asm				lticast PPN	Inde		
	RF MODE	asiii		1		1003170	nouc		
* Underlay	RP Loopback Id	254			(M	n:0, Max: 0	023)		
l	Jnderlay Primary RP Loopback Id				(Min:0,	ed for Bidi - Max:1023	PIM Phanto	om RP	
	Underlay Backup RP Loopback Id				(Min:0,	ed for Fall <mark>p</mark> a Max:1023	ack Bidir-Pl	M Phantom RP	
Underlay	Second Backup RP Loopback Id				(Min:0,	ed for secor Max:1023	nd Fallback	Bidir-PIM Phanto	om RP
Under	lay Third Backup RP Loopback Id				(Min:0,	ed for third I Max:1023	Fallback Bi	dir-PIM Phantom	RP
						J			

#本文档目的的复制模式是组播;另一个选项是使用入口复制(IR)

#组播组子网是VTEP用于复制BUM流量(如ARP请求)的组播组

#必须启用"启用租户路由组播(TRM)"复选框

#根据需要填写其他框。

• vPC的选项卡保持不变,因为此处的拓扑未使用任何vPC

• 接下来是"协议"选项卡

* Fabric Name : DC1 * Fabric Template : Easy_Fabric_11	_1	
General Replication vPC	Protocols Advanced Reso	urces Manageability Bootstrap Configuration Backup
* Underlay Routing Loopback Id * Underlay VTEP Loopback Id Underlay Anycast Loopback Id * Link-State Routing Protocol Tag * OSPF Area Id Enable OSPF Authentication OSPF Authentication Key ID OSPF Authentication Key	0 1 UNDERLAY 0.0.0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	 (Min:0, Max:1023) (Min:0, Max:1023) Used for vPC Peering in VXLANv6 Fabrics (Min:0, Max:1023) Routing Process Tag (Max Size 20) OSPF Area Id in IP address format (Min:0, Max:255) 3DES Encrypted
IS-IS Level Enable IS-IS Authentication	· · · · · · · · · · · · · · · · · · ·	Supported IS types: level-1, level-2
IS-IS Authentication Keychain Name IS-IS Authentication Key ID IS-IS Authentication Key		 (Min:0, Max:65535) Cisco Type 7 Encrypted
BGP Authentication BGP Authentication Key Encryption Type BGP Authentication Key		 BGP Key Encryption Type: 3 - 3DES, 7 - Cisco Encrypted BGP Authentication Key based on type
Enable BFD For iBGP Enable BFD For OSPF Enable BFD For OSPF Enable BFD For ISIS Enable BFD For PIM Enable BFD Authentication	valid for IPV4 Underlay only 0 0 0 0 0 0 0 0 0 0 0 0	
BFD Authentication Key ID BFD Authentication Key		Encrypted SHA1 secret value

#根据需要修改相关框。

• 接下来是"高级"选项卡

* Fat	bric Name :	DC1							
* Fabric	Template :	Easy_Fabric_11	_1	•					
General	Replicat	ion vPC	Protocols	Advanced	Reso	urces	Manageability	Bootstrap	Configuration Backup
		VRF Template	Default_VRF_U	Jniversal	•	🕜 De	fault Overlay VRF Tem	plate For Leafs	
	* Ne	twork Template	Default_Netwo	rk_Universal	Ŧ	🕜 De	fault Overlay Network	Template For Lea	fs
	* VRF Exte	nsion Template	Default_VRF_E	Extension_Univers	al 🔻	🕜 De	fault Overlay VRF Tem	plate For Borders	:
* 1	Network Exte	nsion Template	Default_Netwo	rk_Extension_Uni	versa 🔻	🕜 De	fault Overlay Network	Template For Bor	ders
		Site Id	65000			Pefaults	r EVPN Multi-Site Sup) s to Fabric ASN	oort (Min:1, Max: ;	281474976710655).
	* Intra Fabri	c Interface MTU	9216			🕜 (M	in:576, Max:9216). Mu	st be an even nun	nber
*	Layer 2 Hos	t Interface MTU	9216			🕜 (M	n:1500, Max:9216). M	ust be an even nu	mber
	* Powe	er Supply Mode	ps-redundant		•	🕜 De	fault Power Supply Mo	de For The Fabric	2
		* CoPP Profile	strict		٣	Provide	bric Wide CoPP Policy. d when 'manual' is sele	Customized CoF	PP policy should be
	VTEP I	HoldDown Time	180			O NV	E Source Inteface Hol	dDown Time (Min	:1, Max:1500) in seconds
Brown	nfield Overlay	Network Name Format	Auto_Net_VN	\$\$VNI\$\$_VLAN\$	\$VLAN_	🕜 Ge	nerated network name	should be < 64 c	haracters
	Enab	le VXLAN OAM	☑ 🕜						
	Enabl	le Tenant DHCP	☑ Ø						
		Enable NX-API							
	Enable N	IX-API on HTTP	⊻ 🕜						
Enable	Policy-Based	Routing (PBR)	0						
Enab	ble Strict Con	fig Compliance							
E	Enable AAA I	P Authorization	Enable	e only, when IP Au	thorization	n is enab	led in the AAA Server		
	Enable DCN	IM as Trap Host	☑ Ø			-			
•	* Greenfield	Cleanup Option	Disable		•	When F	itch Cleanup Without F PreserveConfig=no	Reload	
Enable Pr	recision Time	Protocol (PTP)	0						
	PTP Sou	irce Loopback Id				🕜 (M	in:0, Max:1023)		
		PTP Domain Id				On a Sir	ltiple Independent PTF ngle Network (Min:0, M	⊂ Clocking Subdoi lax:127)	mains
	Enable	MPLS Handoff	0			0 []s	ed for VXLAN to MPLS	S SR/LDP Handof	r

#在本文档中,所有字段都保留为默认值。

#ASN自动填充自"常规"选项卡中提供的ASN

• 接下来是填写"资源"选项卡中的字段

* Fabric	Name : DC1								
* Fabric Te	mplate : Easy	_Fabric_11	_1	•					
General	Replication	vPC	Protocols	Advanced	Resou	urces	Manageability	Bootstrap	Configuration Backup
Mar	nual Underlay IP A	Address	Checki	ng this will disable	e Dynamic	: Underla	ay IP Address Allocation	าร	
* Under	rlay Routing Loo	pback IP Range	10.10.10.0/24			О Тур	pically Loopback0 IP A	ddress Range	
* Underlay \	VTEP Loopback	IP Range	192.168.10.0/2	4		🕜 Тур	pically Loopback1 IP A	ddress Range	
* Underla	* Underlay RP Loopback IP Range 10.254.10.0/24				🕜 An	ycast or Phantom RP I	P Address Range		
* u	Inderlay Subnet	IP Range	10.4.10.0/24			🕜 Ad	dress range to assign i	Numbered and Pe	er Link SVI IPs
Underlay	MPLS Loopback	IP Range				😮 Us	ed for VXLAN to MPLS	SR/LDP Handoff	
Under	lay Routing Loop	back IPv6 Range				() Тур	pically Loopback0 IPv6	Address Range	
Und	erlay VTEP Loop	back IPv6 Range				() Тур	pically Loopback1 and	Anycast Loopbaci	< IPv6 Address Range
Un	nderlay Subnet IP	v6 Range				1 IPv	/6 Address range to as	sign Numbered ar	nd Peer Link SVI IPs
BGF	P Router ID Rang	e for IPv6 Underlay				0			
* L	ayer 2 VXLAN V	'NI Range	100144,10014	5		OV OV	erlay Network Identifie	r Range (Min:1, M	ax:16777214)
* L	ayer 3 VXLAN V	'NI Range	1001445			O OV	erlay VRF Identifier Ra	nge (Min:1, Max:1	16777214)
	* Network VLA	AN Range	144,145			🕜 Pe	r Switch Overlay Netw	ork VLAN Range ((Min:2, Max:3967)
	* VRF VLA	AN Range	1445			🕜 Pe	r Switch Overlay VRF	VLAN Range (Min	:2, Max:3967)
* s	ubinterface Dot	1q Range	2-511			🕜 Pe	r Border Dot1q Range	For VRF Lite Con	nectivity (Min:2, Max:4093)
	* VRF Lite De	ployment	Manual		•	😗 VR	RF Lite Inter-Fabric Con	nection Deployme	ent Options
* v	/RF Lite Subnet	IP Range	10.33.10.0/24			🕜 Ad	dress range to assign i	P2P Interfabric Co	nnections
	* VRF Lite Sub	net Mask	30			🕜 (M	in:8, Max:31)		
* Serv	ice Network VLA	AN Range	3000-3199			Pe Pe	r Switch Overlay Servi	ce Network VLAN	Range (Min:2, Max:3967)
* Route Map	Sequence Numb	er Range	1-65534			🕜 (M	in:1, Max:65534)		

#底层路由环回IP范围是用于BGP、OSPF等协议的范围

#底层VTEP环回IP范围是将用于NVE接口的IP范围。

#底层RP用于BUM组播组的PIM RP。

• 用相关信息填写其他选项卡,然后"保存"

步骤 2:为DC2创建简易交换矩阵

- •执行与步骤1相同的任务,为DC2创建Easy Fabric
- •确保在Resources for NVE and Routing Loopbacks(NVE和路由环回)和任何其他相关区域下 提供不同的IP地址块
- ASN也应不同
- 第2层和第2层VNID相同

步骤 3:为多站点创建MSD

• 必须创建MSD交换矩阵,如下所示。

Fabric Builder	Add Fabric * Fabric Name : Multisite-MSD	
Fabrics (2)	Fabric Template : MSD_Fabric_11_1 General DCI Resources * Layer 2 VXLAN VNI Range 100144,100145 Overlay Network Identifier Range (Min:1, Max:16777214,)
DC1 Type: Switch Fabric ASN: 65000	* Layer 3 VXLAN VNI Range 1445 ② Overlay VRF Identifier Range (Min:1, Max:16777214) * VRF Template Default_VRF_Universal ▼ ③ Default Overlay VRF Template For Leafs * Network Template Default_Network_Universal ▼ ④ Default Overlay Network Template For Leafs	
Replication Mode: Multicast Technology: VXLAN Fabric	VRF Extension Template Default_VRF_Extension_Universal Verf extension Template Default_VRF_Extension_Universal Default_Overlay VRF Template For Borders Default_Network_Extension_Universal Operation Stateman MAC Codd dbha c555 Shared MAC address for all leaves	
	Multi-Site Routing Loopback Id 100 @ (Min.0, Max:1023) ToR Auto-deploy Flag @ Enables Overlay VLANs on uplink between ToRs and Leafs	

• 同时填写DCI选项卡

Add Fabric

* Eab	rio Namo :	Multisite-MSD]	
Fab	ne name .	Multisite-MOD		J	
* Fabric	Template :	MSD_Fabric_11	_1 •	J	
General	DCI	Resources			
	* Multi- Dep	Site Overlay IFC loyment Method	Direct_To_BGWS	T	Auto Overlay EVPN Peering to Route Servers, Auto Overlay EVPN Direct Peering to Border Gateways
	Multi-Site	Route Server List			Multi-Site Router-Server peer list, e.g. 128.89.0.1, 128.89.0.2
	Multi-Site Route Server BGP ASN List				🕐 1-4294967295 1-65535[.0-65535], e.g. 65000, 65001
	Multi-S Auto E	ite Underlay IFC Deployment Flag	□ ?		
	Del	lay Restore time	300		Multi-Site underlay and overlay control plane convergence time (Min:30, Max:1000) in seconds

#多站点重叠IFC部署方法为"Direct_To_BGWS",因为DC1-BGW将与DC2-BGW形成重叠连接。拓 扑中显示的DCI交换机只是中转第3层设备(以及VRFLITE)

• 下一步是提及多站点环回范围(此IP地址将用作DC1和DC2 BGW上的多站点环回IP;DC1-BGW1和DC1-BGW2共享相同的多站点环回IP;DC2-BGW1和DC2-BGW2共享相同的多站点环 回IP,但与DC1-BGW不同

* Fabric Name : Multisite-MSD		
* Fabric Template : MSD_Fabric_11	1	
General DCI Resources		
* Multi-Site Pouting Loophack IP		
Range	192.168.200.0/24	Typically Loopback100 IP Address Range
DCI Subnet IP Range	10.10.1.0/24	Address range to assign P2P DCI Links
Subnet Target Mask	30	(2) Target Mask for Subnet Range (Min:8, Max:31)

#填写字段后,点击"保存"。

#完成步骤1至3后,交换矩阵构建器页面如下所示。

Fabrics (3)					
DC1	$\Leftrightarrow \times$	DC2	$\diamond \times$	Multisite-MSD	$\diamond \times$
Type: Switch Fabric ASN: 65000 Replication Mode: Multicast Technology: VXLAN Fabric		Type: Switch Fabric ASN: 65002 Replication Mode: Hulticast Technology: VXLAN Fabric		Type: Multi-Fabric Donain Member Fabrics: None	

步骤 4:将DC1和DC2交换矩阵移入多站点MSD

#在此步骤中,DC1和DC2交换矩阵移至步骤3中创建的多站点MSD。以下是如何实现相同的屏幕截 图。

ions - - 53 Tabular view Refresh topology Save layout Delete saved layout Dustom saved layout Fabric Settings Move Fabrics Move Fabrics Selected 0 / Total 2 Fabric State O DC1 standalone O DC2 standalone	ctions - + - 53 Tabular view Tabular view Refresh topology Save layout Delete saved layout Delete saved layout Custom saved layout Fabric Settings Refresh topology Selected 0 / Total 2 Fabric State DC1 standalone DC2 standalone	Initial Section Tabular view Refresh topology Save layout Delete saved layout Delete saved layout Delete saved layout Complexed point Settings Move Fabrics Selected 0 / Total 2 © Fabric Stating Selected 0 / Total 2 © Fabric Name Fabric State DC1 Standalone DC2	Fabric Builder: Multisite-MSD			
- 53 * Tabular view Refresh topology Save layout Delete saved layout Custom saved layout • Pease note that it may take a few minutes if there is a large number of VRFs/NWs in the fabrics Selected 0 / Total 2 • Fabric Statings Move Fabrics •	+ - 33 Tabular view 3 Refresh topology Save layout Save layout Custom saved layout Fabric Settings Move Fabrics Move Fabrics Selected 0 / Total 2 Fabric State DC1 standalone	- 33 Tabular view Refresh topology Save layout Delete saved layout Dustom saved layout Patric Settings Move Fabrics Selected 0 / Total 2 Fabric State DC1 standalone DC2	Actions –			
Tabular view Refresh topology Save layout Delete saved layout Dustom saved layout Fabric Settings Move Fabrics Move Fabrics Fabric Name Fabric State O DC1 standalone DC2 standalone	Tabular view Refresh topology Save layout Delete saved layout Custom saved layout Pabric Settings Move Fabrics Move Fabrics Delete saved layout <p< th=""><th>Tabular view Refresh topology Save layout Delete saved layout Custom saved layout Custom saved layout Prease note that it may take a few minutes if there is a large note of VRFs/NWs in tearlosts Selected 0 / Total 2 Tabric Sattings Move Fabrics Selected 0 / Total 2 Control Standalone Dc1 standalone Dc2 standalone</th><th>- 25 🛆</th><th></th><th></th><th></th></p<>	Tabular view Refresh topology Save layout Delete saved layout Custom saved layout Custom saved layout Prease note that it may take a few minutes if there is a large note of VRFs/NWs in tearlosts Selected 0 / Total 2 Tabric Sattings Move Fabrics Selected 0 / Total 2 Control Standalone Dc1 standalone Dc2 standalone	- 25 🛆			
Refresh topology Save layout Delete saved layout Custom saved layout Fabric Settings Move Fabrics Selected 0 / Total 2 © Fabric State O DC1 Standalone O DC2 standalone	 Refresh topology Save layout Custom saved layout • Fabric Settings Move Fabrics Move Fabrics Selected 0 / Total 2 Fabric State DC1 standalone DC2 standalone 	Refresh topology Save layout Delete saved layout Custom saved layout •	E Tabular view			
Save layout Delete saved layout Custom saved layout Fabric Settings Move Fabrics Selected 0 / Total 2 © Fabric Name Fabric State O DC1 standalone DC2 standalone	 Save layout Delete saved layout Custom saved layout Fabric Settings Move Fabrics Move Fabrics Selected 0 / Total 2 5 Fabric Name Fabric State DC1 standalone DC2 standalone 	Save layout Delete saved layout Dustom saved layout Fabric Settings Move Fabrics Move Fabrics	J Refresh topology			
Delete saved layout Dustom saved layout Fabric Settings Move Fabrics Move Fabrics	A Delete saved layout Custom saved layout Fabric Settings Move Fabrics Move Fabrics Selected 0 / Total 2 5 Fabric Name Fabric State O DC1 Standalone DC2 standalone	Delete saved layout Custom saved layout Fabric Settings Move Fabrics Selected 0 / Total 2 5 Fabric Name Fabric State DC1 standalone DC2	Save layout			
Custom saved layout Fabric Settings Move Fabrics Move Fabrics Description Move Fabrics Description Description Description Description Descrip	Custom saved layout	Custom saved layout Fabric Settings Move Fabrics Selected 0 / Total 2 Fabric Name Fabric State O DC1 Standalone DC2 Standalone	X Delete saved layout	Mo	ve Fabric	X
Fabric Settings Selected 0 / Total 2 ① Move Fabrics Fabric Name Fabric State O DC1 standalone O DC2 standalone	Selected 0 / Total 2 Selected 0 / Total 2	Fabric Settings Selected 0 / Total 2 Sele	Custom saved layout •	() Ple	ase note that it may take a few minu	utes if there is a large
Move Fabrics Fabric Name Fabric State O DC1 standalone O DC2 standalone	Move Fabrics Fabric Name Fabric State O DC1 standalone O DC2 standalone	Move Fabrics Move Fabrics O DC1 Standalone O DC2	Fabric Settings	hand	er or versnivvs in the labitus:	Selected 0 / Total 2 💭
DC1 standalone DC2 standalone	DC1 standalone DC2 standalone	DC1 standalone DC2 standalone	ve Fabrics		Fabric Name	Fabric State
O DC2 standalone	O DC2 standalone	O DC2 standalone		0	DC1	standalone
				0	DC2	standalone
					\square	
				4		Þ
					Add	Remove Cancel
Add Remove Cancel	Add Remove Cancel	Add Remove Cancel				A

#选择MSD,点击"移动交换矩阵",然后依次选择DC1和DC2,然后选择"添加"。

#移动两个结构后,主页将如下所示

Fabrics (3)					
DC1	$\Leftrightarrow \times$	DC2	¢×	Multisite-MSD	¢ ×
Type: Switch Fabric ASN: 65000 Replication Mode: Multicast		Type: Switch Fabric ASN: 65002 Replication Mode: Multicast		Type: Multi-Fabric Domain Member Fabrics: DC1, DC2	
Technology: VXLAN Fabric		Technology: VXLAN Fabric			

#多站点 — MSD将DC1和DC2显示为成员结构

步骤 5: 创建VRF

#可以从MSD交换矩阵创建VRF,这将适用于两个交换矩阵。下面是实现相同效果的屏幕截图。

	Ŧ	Control	nter Network Manager scor	Multisite-M	SD 🔻
🕥 Dashboard		Fabrics	Network / VRF Deployment		Net
		Fabric Builder Interfaces	Fabric Selected: Multisite-MSD		
🔆 Topology		Networks VRFs			Selecte
Control	⊘	Services	<u>e</u>	Show	All

Network / VRF Selectio	Create VRF				
VRFs	 VRF Inform 	mation			
+	* VRF ID 1445				
		* VRF Name	tenant-1		
VRF Name	*	VRF Template	Default_VRF_Universal	▼	
No data available	*	VRF Extension Template	Default_VRF_Extension_Universal		
		VLAN ID	1445		Propose VLAN
	 VRF Profil General Advanced 	e VRF VRF Intf VRF	⁼ VIan Name Description Description		if > 32 cha

#填写高级选项卡,然后"创建"

步骤 6: 创建网络

#创建VLAN和相应的VNID时,SVI可以从MSD交换矩阵中完成,这两个交换矩阵都适用。

	Ŧ	Control	nter Network Manager	SCOPE: Multisite-MSD	•
	Dashboard	Fabrics	site-MSD		
-	Dashboard	Fabric Builder			
*	Topology	Interfaces Networks VRFs	-		C •
٢	Control >	Services Management			

Network / VRF Sele	Create Network			×		
	 Network Information 			•		
Networks	* Network	100144				
+ / ×	* Network Nam	MyNetwork_100144		- 1		
Network N	* VRF Nam	e tenant-1	• +	- 1		
No data available	Layer 2 On					
	* Network Templa	e Default_Network_Universal	▼	- 1		
* Network Extension Template		Default_Network_Extension_Univer	Default_Network_Extension_Univer			
	VLAN	D 144	Propose VLAN	- 1		
	 Network Profile General Advanced IPv6 	eway/NetMask 172.16.144.254/24 Gateway/Prefix Vian Name	 example 192.0.2.1/24 example 2001:db8::1/64 if > 32 chars enable:system vlan long- 	-name		
		r	Create Net	work		

#在"高级"选项卡中,如果BGW需要成为网络网关,请启用复选框

#填写所有字段后,点击"创建网络"

#对任何其他VLAN/网络重复相同步骤

步骤 7:为DCI交换机创建外部交换矩阵

#本示例考虑了数据包从DC1到DC2(就站点间通信而言)路径中的DCI交换机,当有2个以上交换 矩阵时,通常会看到这些交换机。

#外部交换矩阵将包括位于本文档开头所示拓扑顶部的两个DCI交换机

#使用"外部"模板创建交换矩阵并指定ASN

#修改部署的任何其他相关字段



步骤 8::将交换机添加到每个交换矩阵

#在此,每个交换矩阵的所有交换机都将添加到相应交换矩阵。

添加交换机的步骤如下屏幕截图所示。

← Fabric Builder: DC1	Inventory Manage	ement
Actions –	Discover Existing Sw	tches PowerOn Auto Provisioning (POAP)
+ - 53 🛆	Discovery Information	Scan Details
Tabular view	Seed IP	10.122.165.173,10.122.165.227,10
Ø Refresh topology		Ex: "2.2.2.20"; "10.10.10.40-60"; "2.2.2.20, 2.2.2.1"
Save layout	Authentication Protocol	MD5 •
× Delete saved layout	Username	admin
Custom saved layout •	Password	••••••
 Restore Fabric 	Max Hops	10 hop(s)
S Backup Now	Preserve Config	no yes
Ø Re-sync Fabric		Selecting 'no' will clean up the configuration on switch(es)
+ Add switches	Start discovery	
Settings		

#如果"保留配置"为"否";现有的任何交换机配置都将被清除;VRF环境管理中的主机名、引导变量、MGMT0 IP地址、路由是例外

#正确设置交换机上的角色(通过右键单击交换机、设置角色和相关角色

#还会相应地排列交换机的布局,然后单击"保存布局"









步骤 9: 单个交换矩阵的TRM设置

• 下一步是在每个交换矩阵上启用TRM复选框

Herwork Hume	A Network ID	VRE Name	IPv4 Gateway/Subpet	IPv6 Gateway/Prefix	Status	VLANID	
MyNetwork 100144	100144	tenant-1	172 16 144 254/24	ir vo Gatewayn renx	NA	144	
MyNetwork 100145	100145	tenant-1	172 16 145 254/24		NA	145	
		E	Edit Network				×
			 Network Information 				A
			* Network IE	100144			- 11
			* Network Name	e MyNetwork_100144			- 11
			Laver 2 Only	v	Ŧ		- 11
			* Network Template	Default_Network_Un	iversal 🔻		- 11
			* Network Extension	Default Network Ex	lension_Univer		- 11
			Template VLAN IE	e	PI	opose VLAN	- 11
			 Network Profile Generate Multicast IP General Advanced DHCP Loopbace 	DPlease click only to gene Address COVA CPV4 Server 1 CPV4 Server 2 v4 Server VRF ck ID for DHCP	rate a New Multicast Grou	p Address and overide the default value!	

#对所有交换矩阵的所有网络执行此步骤。

• 完成此操作后,各交换矩阵中的VRF还需要进行一些更改并添加信息,如下所示。

VRFS Image: Control of the control								
VIE'S VIE S VIE D Status VIE'S VIE D Status VIE'S VIE'S VIE'S PENCING Edit VRF VIE'S VIE'S Information VIE'S VIE'S VIE						l	Fabric Selected: DC2	
Image: Comparison of the comparison	/KFS							
VPF Name VPF ND Versee 146 PROUND Edit VRF VPF Name VPF Nam VPF Name VPF Name	+ / × @ @							
weard 1440 PENDIND Edit VRF • VRF Information • VRF Information • VRF Information • VRF Information • VRF Information • VRF Profile • VRF Profile • VRF Profile • VRF Profile • VRF Profile • VRF Profile • VRF Information • VRF Profile • VRF Profile • VRF Address • VRF Profile • VRF Address • VRF Information • VRF Profile • VRF Information • VRF Information • VRF Profile • VRF Information • VRF Information • VRF Information • VRF Information • VRF Information • VRF Profile • VRF Information • VRF Information • VRF Information • VRF Informatin the fabric • Profile	VRF Name	VRF ID	Status					
Edit VRF • VRF Information • VRF Information • VRF Information • VRF Information • VRF Profile • VRF Prof	tenant-1	1445	PENDING					
Edit VRF VRF Information VRF Information VRF Template VRF Template								
Edit VRF VRF Information VRF Information VRF Information VRF Information VRF Template VRF Template VRF Template VRF Profile Finders Treases Routed Multicast VLAN ID 550 Finders Treases Routed Multicast VRF Profile Finders Streases RP Looptack ID VRE Streams RP Looptack ID Profile VRE Streams RP Looptack ID Profile P								
VRF Information VRF III [143] VRF Name [winf1] VRF Template </td <td></td> <td></td> <td></td> <td>Edit VRF</td> <td></td> <td></td> <td></td> <td>></td>				Edit VRF				>
VRF ID VRF I				▼ VRF Ir	formation			
* VRF Name * VRF Template * VRF Template * VRF Template * VRF Template * VRF Template * VRF Template * VRF Template * VLN ID * Ld5 * VRF Profile * Canabe Tenant Routed Muticost * VRF Profile * SRP external © is RP external to the fabric? * Universal Fibst Induced Muticost * Propose VLAN * Universal Fibst Induced Muticost * Propose VLAN * VRF Profile * RP Address * Universal Fibst Induced Muticost * Propose VLAN * Propose VLAN * Propose VLAN * Universal Fibst Induced Muticost * Propose VLAN * Universal Fibst Induced * Propose VLAN * Propose VLAN * Propose VLAN * Propose VLAN * Propose VLAN * Propose VLAN * Propose V					* VRF ID			
*VRF Template *VRF Template * VRF Template * VRF Profile * VRF Profile * VRF Profile * RF External To the fabore? * RF Address RP Loopback ID * Undet ay Mcast Add 239.12.100 * IP & Multicast Address * Undet ay Mcast Add 239.12.100 * IP & Multicast Address * Undet ay Mcast Add 239.12.100 * IP & Multicast Address * Undet ay Mcast Add 239.12.100 * IP & Multicast Address * Inable TRM BGW Mistle * * * Tables IPv6 link-local Option under VRF Sv1 * Table TRM BGW Mistle * * * and 1:38 Routes to Edge Rout					* VRF Name			
* VRF Extension Default, VFF_Extension Propose VLAN VLAN ID 14d5 Propose VLAN * VRF Profile R Enable General Advanced Is Re Extension General Advanced Is Re Extension General VLAN ID 10 200 2000 General Advanced Is Re Extension General VLAN ID Is Re Extension General Is Re Extension General Is Re Extension VLAN ID Is Re Extension General Is Re Extension General Is Re Extension Vulnet as Mcasts Add 12 200 2000 Go + 623 Vulnet as Mcasts Add 239.12.100 Go + 6239.255.255.255.455.455.455.455.455.455.455					* VRF Template	Default_VRF_Universal	v	
VLAN ID 145 Propose VLAN @					* VRF Extension Template	Default_VRF_Extension_Universal	v	
 VRF Profile General Advanced RM Enable Z B RP external to the fabric? RP Loopback ID C R P Loopback ID C R R R R R R R R R R R R R R R R R R R					VLAN ID		Propose VLAN	
 ✓ VRF Profile General Advanced [*] VRF Profile [*] RP Address [*] Reddress [*] Reddress [*] Reddress [*] Red								
General Advanced General Advanced TRM Enable C Extend				VRF P	rofile	\frown		
Advanced Advanced Is RP External Is RP external to the fabric? * RP Address 10200 200 200 Image: Address RP Loopback ID Image: Address Image: Address 'Under ay Mozast Add 239 1.2.100 Image: Performance Address Overly Meast Groups Image: Performance Address Image: Performance Address Overly Meast Groups Image: Performance Address Image: Performance Address Image: Performance Address Image: Performance Address Image: Performance Address Image: Performance Address Image: Performance Address Image: Performance Address Image: Performance Address Image: Performance Address Image: Performance Address Image: Performance Address Image: Performance Address Image: Performance Address Image: Performance Address Image: Performance Address Image: Performance Address Image: Performance Address Image: Performance Address Image: Performance Address Image: Performance Address Image: Performance Address Image: Performance Address Image: Performance Address Image: Performance Address Image: Performance Address Image: Performance Address Image: Performance Address Image: Performance Address				General		TRM Enable 🗹 🕜 Enable Tenant R	louted Multicast	•
* Pr Address 10 200 200 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0				Advance	d	RP External 🗹 🕜 Is RP external to	the fabric?	
RP Loopback ID RP Loopback ID Under ay Mozst Add 239.1.2.100 P # Multicast Address Overlux Mozst Groups P # Dable IPv8 link.local Option Under VRF SVI Enable IPv8 link.local Option Under V					ſ	RP Address 10.200.200	G IPA4 Address	
• Undel ay Mcast Adu. 29 12.100 @ Jone Autoress Overlay Meast Groups @ 23 0.0.04 to 239 255 255 255 4 Enable IPV6 link-local Cpdure VIPF SVI Enable IPV6 link-local Cpdure VIPF SVI Fourter VIPF SV					RP	Loopback ID	0.1023	- 1
Overta Mass Groups Image: State					Underlay	Mcast Add 239.1.2.100	Address	- 1
Enable TRM BOW MSIte 🗹 🖗 nable TRM on Border Gateway Multisite Reventse Host Rounes 🕞 🐨 Fisq to Control Advertisement of /32 and /128 Routes to Edge Routers Save Can					Enable IP	R link-los	k-local Option under VRE SVI	- 1
Reventor House Ho					Enable TRN	BGW MSite 🗹 🕜 Inable TRM on I	Border Gateway Multisite	- 1
Save Can					Auvertise	Host Routes 📃 🎧 Plag to Control A	dvertisement of /32 and /128 Routes to Edge Routers	•.
Save Car								Canada'
							Save	Gancel

#这必须在DC1和DC2以及VRF部分中完成。

#请注意,VRF-> 239.1.2.100的组播组已手动从自动填充的组更改;最佳实践是为第3层VNI VRF和

任何第2层VNI VLAN的BUM流量组播组使用不同的组

步骤 10:边界网关上的VRFLITE配置

#从NXOS 9.3(3)和DCNM 11.3(1)开始,边界网关可以充当边界网关和VRFLITE连接点(这将使边 界网关与外部路由器具有VRFLITE邻居关系,因此外部设备可以与交换矩阵中的设备通信)

#在本文档中,边界网关与DCI路由器(位于上图所示拓扑的北部)形成VRFLITE邻居关系。

#有一点需要注意:VRFLITE和多站点底层链路不能是同一物理链路。必须将单独的链路向上旋转 ,以形成虚拟站点和多站点底层

#下面的屏幕截图将说明如何在边界网关上实现VRF LITE和多站点扩展。

Fabric Builder: Mul	tisite-N	1SD
Actions	-	
+ - 53		
■ Tabular view]	
C Refresh topology		
🗎 Save layout		
X Delete saved layout		
Custom saved layout	•	
Fabric Settings		
Move Fabrics		

				Link Management	t - Edit Link		
+ /	Xet			Link Management	C - Luit Link		
	Fabric Name	Name	Policy	* Link Type		V	
1 0	001	DC1 VTED_Ethernel1/2_DC1 M2K_Ethernel1/4		* Link Sub-Type		v	
2 0	000	DC2 V/TEP-Elitemet1/1_DC2 N2K-Ethemet1/1/		* Link Template	ext_fabric_setup_11_1	•	
2	002	DC2-VTEP=Ememeri/1DC2-N3K=Ememeri/1/1	and summ multiplin supplies actum	* Source Fabric		~	
•	0014-5002	DC1-BCW1-keepback0-DC2-BCW2-keepback0	ext_evpn_multisite_ovenay_setup	* Destination Fabric		V	
5 0	DC1<>DC2	DC1-BGW2-loopback0DC2-BGW2-loopback0	ext_evpir_multisite_overlay_setup	Source Device			
6 0	D01<0002	DC1-BGW2-loopback0DC2-BGW2-loopback0	ext_evpn_multisite_overlay_setup	* Destination Device		-	
7	001	DC1.VTEP~Ethemet1/1DC1.SPINE~Ethemet1/1	int intra fabric uppum link 11.1	* Destination Interface			
8	DC1	DC1-BGW2~Ethernet1/2DC1-SPINE~Ethernet	int_intra_fabric_unnum_link_11_1				
•	DC1	DC1-BGW1-Ethernet1/3DC1-SPINE-Ethernet	int_intra_fabric_unnum_link_11_1	 Link Profile 			
	DC2	DC2-BGW2~Ethernet1/1DC2-SPINE~Ethernet	int intra fabric num link 11 1	General			
1	DC2	DC2-BGW1~Ethernet1/1DC2-SPINE~Ethernet	int intra fabric num link 11 1	Advanced	* BGP Local ASN	65000	Local BGP Autonomous System Number
2	DC2	DC2-VTEP~Ethernet1/3DC2-SPINE~Ethernet1/3	int intra fabric num link 11 1		* IP Address/Mask	10.33.10.5/30	IP address for sub-interface in each VRF
3	DC2<->DCI	DC2-BGW2~Ethernet1/5DCI-1~Ethernet1/8	ext multisite underlay setup 1.		* BGP Neighbor IP	10.33.10.6	Neighbor IP address in each VRF
4	DC2<->DCI	DC2-BGW2~Ethernet1/6DCI-2~Ethernet1/8	ext multisite underlay setup 1		* BGP Neighbor ASN	65001	Neighbor BGP Autonomous System Numb
5 [DCI<->DC2	DCI-2~Ethernet1/8DC2-BGW2~Ethernet1/8	/_ /_		Link MTU	9216	Interface MTU on both ends of VRF Lite IF
6 🗸	DC1<->DCI	DC1-8GW1~Ethernet1/1DCI-2~Ethernet1/1	ext_fabric_setup_11_1		Auto Deploy Flag	Flag that co	ontrols Auto VRF Lite Deployment on both ends for Managed devices
7	DC1<->DCI	DC1-BGW2~Ethernet1/5DC1-2~Ethernet1/5	ext_multisite_underlay_setup_1				
8	DC2<->DCI	DC2-BGW1~Ethernet1/4DCI-2~Ethernet1/6	ext_multisite_underlay_setup_1				
9	DC1<->DCI	DC1-BGW1~Ethernet1/5DCI-2~Ethernet1/7	ext_multisite_underlay_setup_1				
20	DC1<->DCI	DC1-BGW2~Ethernet1/4DCI-1~Ethernet1/5	ext_multisite_underlay_setup_1				
21	DC2<->DCI	DC2-BGW1~Ethernet1/5DCI-1~Ethernet1/6	ext_multisite_underlay_setup_1				
22	DC1<->DCI	DC1-BGW1~Ethernet1/4DCI-1~Ethernet1/7	ext_multisite_underlay_setup_1				

#切换到"表格视图"

#移至选项卡"links",然后添加"交换矩阵间VRFLITE"链接,并且必须将源交换矩阵指定为DC1,将 目标交换矩阵指定为DCI

#为指向正确DCI交换机的源接口选择正确的接口

#在链路配置文件下,提供本地和远程IP地址

#还启用复选框 — "自动部署标志",以便VRFLITE的DCI交换机配置也自动填充(这在以后的步骤 中完成)

自动填充ASN数量

#填写所有字段并填写正确信息后,单击"保存"按钮

- •上述步骤必须对指向两台DCI交换机的所有4个边界网关上的所有BGW到DCI连接执行。
- •考虑到本文档的拓扑,共有8个交换矩阵间VRF LITE连接,如下所示。

←	Fabric	Builder:	Multisite-	MSD
---	--------	----------	------------	-----

Switches Links

Operational View

+	×¢¢					
	Fabric Name	Name	Policy	Info	Admin State	Oper State
1	DC1	DC1-VTEP~Ethernet1/2DC1-N3K~Ethernet1/1		Neighbor Present	Up:-	Up:-
2	DC2	DC2-VTEP~Ethernet1/1DC2-N3K~Ethernet1/1/1		Neighbor Present	Up:-	Up:-
3	DC1	DC1-BGW2~Ethernet1/2DC1-SPINE~Ethernet	int_intra_fabric_unnum_link_11_1	Link Present	Up:Up	Up:Up
4	DC1	DC1-BGW1~Ethernet1/3DC1-SPINE~Ethernet	int_intra_fabric_unnum_link_11_1	Link Present	Up:Up	Up:Up
5	DC1	DC1-VTEP~Ethernet1/1DC1-SPINE~Ethernet1/1	int_intra_fabric_unnum_link_11_1	Link Present	Up:Up	Up:Up
6	DC2	DC2-BGW2~Ethernet1/1DC2-SPINE~Ethernet		Link Present	Up:Up	Up:Up
7	DC2	DC2-VTEP~Ethernet1/3DC2-SPINE~Ethernet1/3		Link Present	Up:Up	Up:Up
8	DC2	DC2-BGW1~Ethernet1/1DC2-SPINE~Ethernet		Link Present	Up:Up	Up:Up
9	DC2<->DCI	DC2-BGW2~Ethernet1/2DCI-1~Ethernet1/4	ext_fabric_setup_11_1	Link Present	Up:Up	Up:Up
10	DC2<->DCI	DC2-BGW2~Ethernet1/4DCI-2~Ethernet1/4	ext_fabric_setup_11_1	Link Present	Up:Up	Up:Up
11	DC1<->DCI	DC1-BGW1~Ethernet1/1DCI-2~Ethernet1/1	ext_fabric_setup_11_1	Link Present	Up:Up	Up:Up
12	DC1<->DCI	DC1-BGW2~Ethernet1/1DCI-2~Ethernet1/2	ext_fabric_setup_11_1	Link Present	Up:Up	Up:Up
13	DC2<->DCI	DC2-BGW1~Ethernet1/3DCI-2~Ethernet1/3	ext_fabric_setup_11_1	Link Present	Up:Up	Up:Up
14	DC2<->DCI	DC2-BGW1~Ethernet1/2DCI-1~Ethernet1/3	ext_fabric_setup_11_1	Link Present	Up:Up	Up:Up
15	DC1<->DCI	DC1-BGW1~Ethernet1/2DCI-1~Ethernet1/1	ext_fabric_setup_11_1	Link Present	Up:Up	Up:Up
16	DC1<->DCI	DC1-BGW2~Ethernet1/3DCI-1~Ethernet1/2	ext_fabric_setup_11_1	Link Present	Up:Up	Up:Up

步骤 11:边界网关上的多站点底层配置

#下一步是在每个交换矩阵的每个边界网关上配置多站点底层。

#为此,我们需要从BGW到DCI交换机的单独物理链路。第10步中用于VRFLITE的链路不能用于多 站点重叠

#这些接口将是"默认vrf"的一部分,而不是前一个接口将是租户vrf的一部分(本例中为tenant-1)

#下面的屏幕截图将帮助您完成执行此配置的步骤。

÷	Fabric	Builder: Multisite-MS	D			Fabric Builder: Multisite-MSD								
Sw	itches	Links Operatio	onal View											
					Li pk Management	Edit Link	_			\bowtie				
+		XCC												
		Eabric Name	Name	Policy	* Link Type		V							
		0.04	DOLUTED Ethernality DOLUDY Ethernality	(only	* Link Sub-Type		*							
1		DC1	DC1-VTEP~Enemet1/2DC1-N3K*Enemet1/1		* Link Template	ext_multisite_underlay_setup_	· •							
2		DC2	DG2-VTEP~Ethemet1/1DG2-N3K~Ethemet1/1/1		* Source Fabric		V							
3		DC1<->DC2	DC1-BGW1~loopback0DC2-BGW1~loopback0	ext_evpn_multisite_overlay_setup	* Destination Fabric		v							
4		DC1<->DC2	DC1-BGW1~loopback0DC2-BGW2~loopback0	ext_evpn_multisite_overlay_setup	* Source Device		v							
5		DC1<->DC2	DC1-BGW2~loopback0DC2-BGW1~loopback0	ext_evpn_multisite_overlay_setup	* Source Interface		~							
6		DC1<->DC2	DC1-BGW2~loopback0DC2-BGW2~loopback0	ext_evpn_multisite_overlay_setup	* Destination Device		V							
7		DC1<->DCI	DC1-BGW1~Ethernet1/1DCI-2~Ethernet1/1	ext_fabric_setup_11_1	Destination Interface	Ethernet1/7	*							
8		DC1<->DCI	DC1-BGW1~Ethernet1/2DCI-1~Ethernet1/1	ext_fabric_setup_11_1	 Link Deefle 									
9		DC1	DC1-BGW1~Ethernet1/3DC1-SPINE~Ethernet	int_intra_fabric_unnum_link_11_1	 Link Profile 									
10		DC1<->DCI	DC1-BGW1~Ethernet1/4DCI-1~Ethernet1/7	ext_multisite_underlay_setup_1	General		* BGP Local ASN	65000	@ Loca	BGP Autonomous Sy				
11		DC1<->DCI	DC1-BGW1~Ethernet1/5DCI-2~Ethernet1/7	ext_multisite_underlay_setup_1	Advanced		* IP Address/Mask	10.4.10.1/30	@ IP acd	ress with mask (e.g.				
12		DC1<->DCI	DC1-BGW2~Ethernet1/1DCI-2~Ethernet1/2	ext_fabric_setup_11_1			* PCP Neighbor IP	10.4.10.2	Ø Neight	or IP address				
13		DC1	DC1-BGW2~Ethernet1/2DC1-SPINE~Ethernet	int_intra_fabric_unnum_link_11_1			BOP Neighbor IP	65001		or RGP Autonomou				
14		DC1<->DCI	DC1-BGW2~Ethernet1/3DCI-1~Ethernet1/2	ext_fabric_setup_11_1			BGP Neighbor ASN	63001	G Hoya	in our has at IRCD				
15		DC1<->DCI	DC1-BGW2~Ethernet1/4DCI-1~Ethernet1/5	ext_multisite_underlay_setup_1			BGP Maximum Paths	1	@ maxim	um number or IBGPs				
16		DC1<->DCI	DC1-BGW2~Ethernet1/5DCI-2~Ethernet1/5	ext_multisite_underlay_setup_1			Routing TAG	54321	@ Routh	g tag associated witi				
17		DC1	DC1-VTEP~Ethernet1/1DC1-SPINE~Ethernet1/1	int_intra_fabric_unnum_link_11_1			Link MTU	9216	@ Interpo	ce MTU on both end				
18		DC2	DC2-VTEP~Ethernet1/3DC2-SPINE~Ethernet1/3	int_intra_fabric_num_link_11_1										
19		DC2	DC2-BGW2~Ethernet1/1DC2-SPINE~Ethernet	int_intra_fabric_num_link_11_1		4								
20		DC2	DC2-BGW1~Ethernet1/1DC2-SPINE~Ethernet	int_intra_fabric_num_link_11_1										
21		DC2<->DCI	DC2-BGW1~Ethernet1/2DCI-1~Ethernet1/3	ext_fabric_setup_11_1										
22		DC2<->DCI	DC2-BGW1~Ethernet1/3DCI-2~Ethernet1/3	ext_fabric_setup_11_1										
23		DC2<->DCI	DC2-BGW1~Ethernet1/4DCI-2~Ethernet1/6	ext_multisite_underlay_setup_1										
24		DC2<->DCI	DC2-BGW1~Ethernet1/5DCI-1~Ethernet1/6	ext_multisite_underlay_setup_1										
25		DC2<->DCI	DC2-BGW2~Ethernet1/4DCI-2~Ethernet1/4	ext_fabric_setup_11_1						Save				
26		DCI<->DC2	DCI-2~Ethernet1/8DC2-BGW2~Ethernet1/8											
27		DC2<->DCI	DC2-BGW2~Ethernet1/6DCI-2~Ethernet1/8	ext_multisite_underlay_setup_1										
28		DC265DCI	DC2.BGW2~Ethernet1/2DCL1~Ethernet1/4	ext fabric setup 11.1	Link Present Lin/Lin	10110				4				

#必须对从BGW到DCI交换机的所有连接执行相同的步骤

#最后,共8个交换矩阵间多站点底层连接将如下所示。

-	Fabric	abric Builder: Multisite-MSD								
Swi	tches	Links Opera	ational View							
+										
		Fabric Name	Name	Policy 🔺	Info	Admin State	Oper State			
1		DC1<->DC2	DC1-BGW1~loopback0DC2-BGW1~loopback0	ext_evpn_multisite_overlay_setup	NA					
2		DC1<->DC2	DC1-BGW1~loopback0DC2-BGW2~loopback0	ext_evpn_multisite_overlay_setup	NA	-1-	-1-			
3		DC1<->DC2	DC1-BGW2~loopback0DC2-BGW1~loopback0	ext_evpn_multisite_overlay_setup	NA	44	-1-			
4		DC1<->DC2	DC1-BGW2~loopback0DC2-BGW2~loopback0	ext_evpn_multisite_overlay_setup	NA	-1-	-1-			
5		DC1<->DCI	DC1-BGW1~Ethernet1/1DCI-2~Ethernet1/1	ext_fabric_setup_11_1	Link Present	Up:Up	Up:Up			
6		DC1<->DCI	DC1-BGW1~Ethernet1/2DCI-1~Ethernet1/1	ext_fabric_setup_11_1	Link Present	Up:Up	Up:Up			
7		DC1<->DCI	DC1-BGW2~Ethernet1/1DCI-2~Ethernet1/2	ext_fabric_setup_11_1	Link Present	Up:Up	Up:Up			
8		DC1<->DCI	DC1-BGW2~Ethernet1/3DCI-1~Ethernet1/2	ext_fabric_setup_11_1	Link Present	Up:Up	Up:Up			
9		DC2<->DCI	DC2-BGW1~Ethernet1/2DCI-1~Ethernet1/3	ext_fabric_setup_11_1	Link Present	Up:Up	Up:Up			
10		DC2<->DCI	DC2-BGW1~Ethernet1/3DCI-2~Ethernet1/3	ext_fabric_setup_11_1	Link Present	Up:Up	Up:Up			
11		DC2<->DCI	DC2-BGW2~Ethernet1/4DCI-2~Ethernet1/4	ext_fabric_setup_11_1	Link Present	Up:Up	Up:Up			
12		DC2<->DCI	DC2-BGW2~Ethernet1/2DCI-1~Ethernet1/4	ext_fabric_setup_11_1	Link Present	Up:Up	Up:Up			
13		DC1<->DCI	DC1-BGW1~Ethernet1/4DCI-1~Ethernet1/7	ext_multisite_underlay_setup_1	Link Present	Up:Up	Up:Up			
14		DC1<->DCI	DC1-BGW1~Ethernet1/5DCI-2~Ethernet1/7	ext_multisite_underlay_setup_1	Link Present	Up:Up	Up:Up			
15		DC1<->DCI	DC1-BGW2~Ethernet1/4DCI-1~Ethernet1/5	ext_multisite_underlay_setup_1	Link Present	Up:Up	Up:Up			
16		DC1<->DCI	DC1-BGW2~Ethernet1/5DCI-2~Ethernet1/5	ext_multisite_underlay_setup_1	Link Present	Up:Up	Up:Up			
17		DC2<->DCI	DC2-BGW1~Ethernet1/4DCI-2~Ethernet1/6	ext_multisite_underlay_setup_1	Link Present	Up:Up	Up:Up			
18		DC2<->DCI	DC2-BGW1~Ethernet1/5DCI-1~Ethernet1/6	ext_multisite_underlay_setup_1	Link Present	Up:Up	Up:Up			
19		DC2<->DCI	DC2-BGW2~Ethernet1/6DCI-2~Ethernet1/8	ext_multisite_underlay_setup_1	Link Present	Up:Up	Up:Up			
20		DC2<->DCI	DC2-BGW2~Ethernet1/5DCI-1~Ethernet1/8	ext_multisite_underlay_setup_1	LinkPresent	Up:Up	Up:Up			

步骤 12:TRM的多站点重叠设置

#当多站点底层完成后,多站点重叠接口/链路将自动填充,并可在多站点MSD交换矩阵内的链路下 的表格视图中看到。

#默认情况下,多站点重叠将仅形成从每个站点BGW到另一个站点的bgp l2vpn evpn邻居关系,这 是从一个站点到另一个站点的单播通信所必需的。但是,当需要在站点(通过vxlan多站点功能连接)之间运行组播时,需要启用TRM复选框,如下所示,适用于多站点MSD交换矩阵内的所有重叠接 口。屏幕截图将说明如何执行此操作。

←	Fabric	Builder: Multisite-	-MSD				Sa	ve & De	eploy
Sw	itches	Links Ope	erational View						
							Selected 0 / Total 29	Ø	÷
+						Show	All	Ŧ	Y
		Fabric Name	Name		Policy	Info	Admin State	Oper	
1		DC1<->DC2	DC1-BGW1~loopback0-	DC2-BGW1~loopback0	ext_evpn_multisite_overlay_setup	NA	->-		•
2		DC1<->DC2	DC1-BGW1~loopback0-	DC2-BGW2~loopback0	ext_evpn_multisite_overlay_setup	NA		-:-	- 1
3		DC1<->DC2	DC1-BGW2~loopback0-	DC2-BGW1~loopback0	ext_evpn_multisite_overlay_setup	NA		->-	
4		DC1<->DC2	DC1-BGW2~loopback0-	DC2-BGW2~loopback0	ext_evpn_multisite_overlay_setup	NA		-:-	
	alah	. Data Oarta						_	
Ð	cisco	, Data Centr	Link Management	- Edit Link					×
←	Fabric	Builder: Multisite							blo
			* Link Type	Inter-Fabric	T				- 1
Sw	vitches	Links Or	* Link Sub-Type	MULTISITE_OVERLAY					- 1
			* Link Template	ext_evpn_multisite_overlay_	se 🔻				ŝ
+			* Source Fabric	DC1	T				
		Fabric Name	* Destination Fabric	DC2					
		D01 () D02	* Source Device	DC1-BGW1	•				
1			* Source Interface	loopback0	V				
2		DC1<->DC2	* Destination Device	DC2-BGW1	T				- 1
3		DC1<->DC2	* Destination Interface	loopback0	T				- 1
4		DC1<->DC2	General						•
5		DC1<->DCI		* BGP Local ASN	65000	BG	P Local Autonomous Sy	stem N	ι
6		DC1<->DCI		* Source IP Address	10.10.10.1	Souther Sou	urce IPv4 Address for B0	GP EVF	2
7		DC1<->DCI		* Destination IP Addr	10.10.20.3	O Des	stination IPv4 Address fo	or BGP	E
8		DC1<->DCI		* BGP Neighbor ASN	65002	😮 BG	P Neighbor Autonomous	Syster	7
9		DC2<->DCI		Enable TRM	Contract Enable Tenant Routed Mu	ılticast			÷
10		DC2<->DCI							
11		DC2<->DCI						Save	
12		DC2<->DCI							10.

步骤 13:在MSD和单个交换矩阵中保存/部署

#执行保存/部署,按照上述步骤推送相关配置

#选择MSD时,将推送的配置将仅适用于边界网关。

#因此,需要为各个交换矩阵保存/部署,这会将相关配置推送到所有常规枝叶交换机/VTEP

步骤 14:MSD的VRF扩展附件

#选择MSD并转至VRF部分

CISCO CONCENTRATION	901											~ ~ ~ ~	w
Network / VRF Selection > Network / VRF Deployment												National View	Continue
							Ew	Prin Selectert Mittebu-MSD					
VREs												Selected 1 / Total 1	00.
+ / X # #											Show 7	41	• •
VRF Name	VRFID	itatus											1.6000
V tenani-1	1445 1	A											
												Dayakay	Dotaled Vew
VRF Extension Attachment - Attach	h extensions for a	given switch(e	es)								×		
													0
Fabric Name: Multiste-MSD Deployment Options													0
D Select the row and click on the cell to edit and selecthanges													ĉ
tenant-1					0								
Switch		 VLA 	N			Extend		CLI Freeform	Status	Loopha	ek Id		
DC1-BOW1		1445			1	AULTISITE + VRF_LITE	9	Freeform config.)	NA				
DC1-BOW2		1445				MULTISITE + VRF_LITE		Freeform config.)	NA				
✓ 00280W1		1445				WULTISITE + VRF_LITE		Freetom config	NA				
Extension Dotalls					l								
E formation A from 15	NAME Part Salleh	Dest interface	00710.10	10 144.51	NEIGURAR IR	NEWWORK ANN			IN NEWLARD	IDVE MASH	<u>.</u>		
DC1-BOW1 VRF_LITE EIN	wnet1/2 DCI-1	Ethemet1/1	2	10.33.10.1/30	10.33.10.2	65001	true	tenant-1			_		
DC1-BOW1 VRF_UTE EIN	mett/1 DCI-2	Ethemet1/1	2	10.33.10.5/30	10.33.10.6	65001	tue	tenart-1					
DC1-BOW2 VRF_UTE ERM	smett/3 DCI-1	Ethemet1/2	2	10.33.10.9/30	10.33.10.10	65001	true	tenant-1					
OC1-BGW2 VRF_UTE EIN	emets/1 DICI-2	Ethemet1/2	2	10.33.10.13/30	10.33.90.14	65001	true	tenant-1					
C DC2-BOW1 VIUF_UTE EIN	smett/2 DCI-1	Ethemet1/3	2	10.33.20.1/30	10.33.20.2	65001	true	tenant-1					
COLORNY WELTE EN	metto DCH2	Ethemett/A	2	10.33.20.5/30	10.33.20.6	65001	The local	tenart.1					
C2-BGW2 VRF_UTE ETW	metti4 DCI-2	Ethemot1/4	2	10.33.20.13/30	10.33.20.14	65001	true	tenant-1					
											*		
	_	_		_	_						Save		

#请注意,扩展选项必须是"MULTISITE+VRF_LITE",如本文档所示,边界网关功能和VRFLITE已 集成到边界网关交换机。

AUTO_VRF_LITE将设置为true

#从BGW到DCI交换机的所有8个VRF名称必须手动填充(此处,示例在DCI交换机上使用相同的 VRF名称),如下所示

#完成后,点击"保存"

VFF Attachment - Attach VFFs for given switch(es).		🐥 🥹 admin
Fabric DC1 Traine Tr	VRF Attachment - Attach VRFs for given switch(es).	Desky Desked Ve
Preprinter option: Image: Imag	Fabric Name: Multisite-MSD	G
Control Presente and August Control Present	Deployment Options	d
Fabric: DC1 YLAH Elevatorscoldy NA C02.VTEP 1445 Freetom condy NA Fabric: DC1 File File C02.VTEP 1445 Freetom condy NA	③ Select the row and click on the cell to edit and save changes	
VLAN CUFFertom Status Looptack to Looptack	tenant-1	
CCLAYEP 143 Fredom cong) M CCLAYEP 143 Fredom cong) NA Fabric: DC1 Fabric: DC1 Fabric: DC1 CCLASENT DC1-BGWZ DC1-SPINE DC1-SPINE DC2-SPINE DC2-SPINE DC2-VTEP	Switch A VLAN CLI Freeform Status Loopback Id Loopback	
CCXYEP 145 Fabric: DC1 Fabric: DC2 Fabric: DC2 Fabric: DC1 Fabric: DC2 Fabric: DC1 Fabric: DC2 Fabric	COLOCI-VTEP 1445 Freeform config) NA	
Fabric: DC1 Fabric: DC2 Fabric: DC2 Fabri	DC2-VTEP 1445 (Freeform config) NA	
Febric: DC1 Febric: DC1 Febric: DC1 Febric: DC2 Febric: DC2 Febri		
Fabric: DC1 Fabric: DC2 B DC1-SFINE DC1-SFINE E DC2-SFINE DC2-SFINE DC2-SFINE DC2-SFINE DC2-SFINE DC2-SFINE		
Fabric: DC1 Fabric: DC2 Fabric: DC2 Fabri		ר אר
Fabric: DC1 Fabric: DC2 Fabric: DC2 Fabri		
Fabric: DC1 Fabric: DC2 Fabric: DC2 Fabri		
Fabric: DC2 Fabric: DC2 Fabri	Fabric: DC1	
B COL-BGW2 DC1-BGW2 DC1-SPINE DC2-SPINE DC2-SPINE DC2-SPINE DC2-SPINE DC2-SPINE DC2-SPINE DC2-SPINE	Table. Dor	Fabric: DC2
DC1-BGW2 DC1-SPINE DC1-SPINE DC2-SPINE DC2-SPINE DC2-SPINE DC2-SPINE		
DC2-BBW1 DC2-BGW2 DC1-SPINE DC2-SPINE DC2-SPINE DC2-SPINE DC2-VTEP	BGW1 DC4-BGW2	
DC1-SPINE DC2-SPINE DC2-SPINE DC2-VTEP DC2-VTEP		DC2-BGW1 DC2-BGW2
DC1-SPINE DC2-SPINE DC2-SPINE DC2-VTEP DC2-VTEP		
DC1-SPINE DC2-SPINE DC2-VTEP DC2-VTEP		
DC1-\$PINE DC2-\$PINE C2-\$PINE DC2-YTEP DC2-YTEP		
E DC1-VTEP DC2-VTEP	DC1-SPINE	DC2-SPINE
E DC1-VTEP DC2-VTEP		
E DC1-VTEP DC2-VTEP		
E DC1-VTEP DC2-VTEP		
DC1-VTEP DC2-VTEP		
DC2-VTEP	DC1_VTEP	
		DC2-VTEP

#在创建VRF扩展时,只有边界网关将具有针对VRFLITE DCI交换机的额外配置 #因此,必须单独选择常规枝叶,然后点击每个租户VRF的"复选框",如上所示。 #点击部署(Deploy)推送配置

步骤 15:将网络配置从MSD推送到交换矩阵

Network / VRF Selection	Ne	stwork /	VIIF Deployment							VRF View	Continue
									Fabric Selected: Multisle-MSD		\square
Networks										Selected 2 / Total 2	0 Q -
+ / X @	٥								Store	AL	• •
V Network Name		٠	Network ID	VRF Name	IPv4 Gateway/Subnet	IPv6 Gateway/Prefix	Status	VLAN ID			
MyNetwork_10014	4		100144	tenant-1	172.16.144.25424		NA	144			
MyNetwork_10014	•		100145	tenant-1	172.16.145.254.24		NA	145			
	_										

#选择MSD交换矩阵中的相关网络

otwork Extension								
etwork Extension	Attachme	nt - Attach exte	ensions for given switch(es	.)	3	×		Deploy Decklod Ve
Fabric Name: Multisite-	MSD							G
Deployment Options								c
Select the row and click on the ci	to off and same chara							
Mublobuork 100144	htublohuork	100145						_
Switch	VLAN	Extend	Interfaces	CLI Freeform	Status			
DC1-BGW1	144	MULTISITE	Applicable to ROW Leaf - VPC only	Freeform config)	PENDING			
DC1-BGW2	144	MULTISITE	Applicable to BGW Leaf - VPC only	Freeform config)	PENDING			
DC2-BGW1	144	MULTISITE	Applicable to BGW Leaf - VPC only	Freeform config)	PENDING			
DC2-BGW2	144	MULTISITE	Applicable to BGW Leaf - VPC only	Freeform config)	PENDING			
Fabr	ic: DC1					Fabric: DC2)	
E DC1-BGW1	C: DC1	A-BGW2			DC2-BC	Fabric: DCZ		
DC1-BGW1		E X-BGW2			DC2-BC	Fabric: DC2)	

#请注意,此时仅选择边界网关;执行相同操作,并在本例中选择Regular Leaf switches/VTEPs-> DC1-VTEP和DC2-VTEP。



#完成后,点击"部署"(将配置推送到上述所有6台交换机)

步骤 16:检验所有VRF上的VRF和网络

#此步骤是验证VRF和网络是否在所有交换矩阵上显示为"已部署";如果其显示为挂起,请确保"部署 "配置。

步骤 17:在外部交换矩阵上部署配置

#要将所有相关IP编址、BGP、VRFLITE配置推送到DCI交换机,需要执行此步骤。

#要执行此操作,请选择外部交换矩阵并点击"保存和部署"

DCI-1# sh ip bqp sum BGP summary information for VRF default, address family IPv4 Unicast BGP router identifier 10.10.100.1, local AS number 65001 BGP table version is 173, IPv4 Unicast config peers 4, capable peers 4 22 network entries and 28 paths using 6000 bytes of memory BGP attribute entries [3/504], BGP AS path entries [2/12] BGP community entries [0/0], BGP clusterlist entries [0/0] Neighbor V AS MsgRcvd MsgSent TblVer InQ OutQ Up/Down State/PfxRcd 10.4.10.1 4 65000 11 10 173 0 0 00:04:42 5 10.4.10.9 4 65000 11 10 173 0 0 00:04:46 5 10.4.20.37 4 65002 11 10 173 0 0 00:04:48 5 4 65002 10 173 0 0 00:04:44 5 10.4.20.49 11 DCI-1# sh ip bgp sum vrf tenant-1 BGP summary information for VRF tenant-1, address family IPv4 Unicast BGP router identifier 10.33.10.2, local AS number 65001 BGP table version is 14, IPv4 Unicast config peers 4, capable peers 4 2 network entries and 8 paths using 1200 bytes of memory BGP attribute entries [2/336], BGP AS path entries [2/12] BGP community entries [0/0], BGP clusterlist entries [0/0]

 Neighbor
 V
 AS
 MsgRcvd
 MsgSent
 TblVer
 InQ
 OutQ
 Up/Down
 State/PfxRcd

 10.33.10.1
 4
 65000
 8
 10
 14
 0
 0
 00:01:41
 2

 10.33.10.9
 4
 65000
 10
 11
 14
 0
 0
 00:03:16
 2

 10.33.20.1
 4
 65002
 11
 10
 14
 0
 0
 00:04:40
 2
 10.33.20.14 650021110.33.20.94 6500211 10 14 0 0 00:04:39 2 DCI-2# sh ip bgp sum BGP summary information for VRF default, address family IPv4 Unicast BGP router identifier 10.10.100.2, local AS number 65001 BGP table version is 160, IPv4 Unicast config peers 4, capable peers 4 22 network entries and 28 paths using 6000 bytes of memory BGP attribute entries [3/504], BGP AS path entries [2/12] BGP community entries [0/0], BGP clusterlist entries [0/0] Neighbor V AS MsgRcvd MsgSent TblVer InQ OutQ Up/Down State/PfxRcd Neighbor 10.4.10.5 10.4.10.13 4 65000 12 11 160 0 00:05:10 5
 12
 11
 160
 0
 00:05:11
 5

 12
 11
 160
 0
 00:05:10
 5
 4 65000 10.4.20.45 4 65002 10.4.20.53 4 65002 12 11 160 0 0 00:05:07 5 DCI-2# sh ip bgp sum vrf tenant-1 BGP summary information for VRF tenant-1, address family IPv4 Unicast BGP router identifier 10.33.10.6, local AS number 65001 BGP table version is 14, IPv4 Unicast config peers 4, capable peers 4 2 network entries and 8 paths using 1200 bytes of memory BGP attribute entries [2/336], BGP AS path entries [2/12] BGP community entries [0/0], BGP clusterlist entries [0/0] Neighbor V AS MsgRcvd MsgSent TblVer InQ OutQ Up/Down State/PfxRcd 10.33.10.5 4 65000 10 11 14 0 0 0 0 Neighbor

 10.33.10.13
 4
 65000

 10.33.20.5
 4
 65002

 10.33.20.13
 4
 65002

 11 11 12 11 12 1⁻ 0 14 0 00:04:30 2 0 0 00:05:05 2 14 12 14 0 0 00:05:03 2 11 #部署后,我们将看到4个IPv4 BGP邻居关系从每个DCI交换机到所有BGW,4个IPv4 VRF BGP邻

#部者后,我们将看到4个IPV4 BGP邻居天系从每个DCI交换机到所有BGW,4个IPV4 VRF BGP 居关系(适用于租户VRF EXtension)

第18步:在DCI交换机之间配置iBGP

#考虑到DCI交换机之间有相互连接的链路,iBGP IPv4邻居关系是理想的,因此,如果DCI-1交换机 上的任何下行连接中断,北向南流量仍可通过DCI-2转发

#为此,DCI交换机之间需要iBGP IPv4邻居关系,并且在每端使用next-hop-self。

#必须在DCI交换机上启动自由形式,才能实现此目的。所需的配置行如下所示。

#上述拓扑中的DCI交换机在vPC中配置;因此,备份SVI可用于构建iBGP邻居关系

#选择DCI交换矩阵,右键点击每台交换机并"查看/编辑策略"

ew/Edit Policies for DC	CI-1(FDO22141QDG)				×
			Se	elected 1 / Total 2 🦪	4 v
	Push Config Curren	nt switch Config		-liter •	
Policy ID Templat	Description	Generated Config	Entity Name	Entity Type	Sour
POLICY-450390 witch_fr	eeform management vrf config	juration View	SWITCH	SWITCH	
POLICY-477530 witch_fr	eeform IBGP	View	SWITCH	SWITCH	
General				_	
General	router bgp 65001 neighbor 10.10.8.2 address-family ipv next-hop-self	remote-as 65001 4 unicast			•
General * Switch	router bgp 65001 neighbor 10.10.8.2 address-family ipv next-hop-self	remote-as 65001 4 unicast			Þ
General * Switch Variables:	router bgp 65001 neighbor 10.10.8.2 address-family ipv next-hop-self	remote-as 65001 4 unicast			Þ
General * Switch Variables:	router bgp 65001 neighbor 10.10.8.2 address-family ipv next-hop-self	remote-as 65001 4 unicast			,
General * Switch Variables:	router bgp 65001 neighbor 10.10.8.2 address-family ipv next-hop-self	remote-as 65001 -4 unicast			,

#在DCI-2交换机上执行相同的更改,然后"保存并部署",将实际配置推送到DCI交换机

#完成后,可以使用以下命令完成CLI验证。

DCI-2# sh ip b	ogp s	sum									
BGP summary in	nform	nation	for VRF	default,	address	famil	Ly IPv	74 Unicast	t		
BGP router ide	entif	ier 10	0.10.100	2, local	AS numbe	r 650	001				
BGP table vers	sion	is 18'	7, IPv4 t	Jnicast co	onfig pee	rs 5	capa	able peers	s 5		
24 network ent	ries	and 4	46 paths	using 840	00 bytes	of me	emory				
BGP attribute	entr	cies [0	6/1008],	BGP AS pa	ath entri	es [2	2/12]				
BGP community	entr	cies [(0/0], BGH	cluster	list entr	ies	0/0]				
Neighbor	V	AS	MsgRcvd	MsgSent	TblVer	InQ	OutQ	Up/Down	State	/PfxRcd	
10.4.10.5	4	65000	1206	1204	187	0	0	19:59:17	5		
10.4.10.13	4	65000	1206	1204	187	0	0	19:59:19	5		
10.4.20.45	4	65002	1206	1204	187	0	0	19:59:17	5		
10.4.20.53	4	65002	1206	1204	187	0	0	19:59:14	5		
10.10.8.1	4	65001	12	7	187	0	0	00:00:12	18	# iBGP	neighborship
from DCI-2 to	DCI-	-1									

第19步:验证IGP/BGP邻居关系

OSPF邻居关系

#由于本示例中所有底层IGP都是OSPF,所有VTEP将与主干形成OSPF邻居关系,这还包括一个站 点中的BGW交换机。

DC1-SPINE# show ip ospf neighbors OSPF Process ID UNDERLAY VRF default Total number of neighbors: 3 Neighbor ID Pri State Up Time Address Interface 10.10.10.3 1 FULL/ - 1d01h 10.10.10.3 Eth1/1 # DC1-Spine to DC1-VTEP 10.10.10.2 1 FULL/ - 1d01h 10.10.10.2 Eth1/2 # DC1-Spine to DC1-BGW2 10.10.10.1 1 FULL/ -1d01h 10.10.10.1 Eth1/3 # DC1-Spine to DC1-BGW1

#所有环回(BGP路由器ID、NVE环回)在OSPF中通告;因此,在交换矩阵中,所有环回都通过 OSPF路由协议获取,这有助于进一步形成l2vpn evpn邻居关系

BGP邻居

#在交换矩阵中,此拓扑将具有从主干到常规VTEP以及到边界网关的I2vpn evpn邻居关系。

DC1-SPINE# show bgp l2vpn evpn sum BGP summary information for VRF default, address family L2VPN EVPN BGP router identifier 10.10.10.4, local AS number 65000 BGP table version is 80, L2VPN EVPN config peers 3, capable peers 3 22 network entries and 22 paths using 5280 bytes of memory BGP attribute entries [14/2352], BGP AS path entries [1/6] BGP community entries [0/0], BGP clusterlist entries [0/0]

Neighbor V AS MsgRcvd MsgSent TblVer InQ OutQ Up/Down State/PfxRcd 10.10.10.1 4 65000 1584 1560 80 0 0 1d01h 10 # DC1-Spine to DC1-BGW1 10.10.10.2 4 65000 1565 1555 80 0 0 1d01h 10 # DC1-Spine to DC1-BGW2 10.10.10.3 4 65000 1550 1554 80 0 0 1d01h 2 # DC1-Spine to DC1-VTEP

#考虑到这是使用eBGP l2vpn evpn从一个站点到另一个站点对等的具有边界网关的多站点部署,可 以在边界网关交换机上使用以下命令来验证相同情况。

DC1-BGW1# show bgp l2vpn evpn sum BGP summary information for VRF default, address family L2VPN EVPN BGP router identifier 10.10.10.1, local AS number 65000 BGP table version is 156, L2VPN EVPN config peers 3, capable peers 3 45 network entries and 60 paths using 9480 bytes of memory BGP attribute entries [47/7896], BGP AS path entries [1/6] BGP community entries [0/0], BGP clusterlist entries [2/8]

Neighbor V AS MsgRcvd MsgSent TblVer InQ OutQ Up/Down State/PfxRcd 10.10.10.4 4 65000 1634 1560 156 0 0 1d01h 8 # DC1-BGW1 to DC1-SPINE 10.10.20.3 4 65002 1258 1218 156 0 0 20:08:03 9 # DC1-BGW1 to DC2-BGW1 10.10.20.4 4 65002 1258 1217 156 0 0 20:07:29 9 # DC1-BGW1 to DC2-BGW2 Neighbor T AS PfxRcd Type-2 Type-3 Type-4 Type-5 10.10.10.4 I 65000 8 2 0 1 5 10.10.20.3 E 65002 9 4 2 0 3 10.10.20.4 E 65002 9 4 2 0 3

TRM的BGP MVPN邻居关系

#TRM配置到位后,所有枝叶交换机(包括BGW)将与主干形成mvpn邻居关系

DC1-SPINE# show bgp ipv4 mvpn summary BGP summary information for VRF default, address family IPv4 MVPN BGP router identifier 10.10.10.4, local AS number 65000 BGP table version is 20, IPv4 MVPN config peers 3, capable peers 3 0 network entries and 0 paths using 0 bytes of memory BGP attribute entries [0/0], BGP AS path entries [0/0] BGP community entries [0/0], BGP clusterlist entries [0/0]

Neighbor	V	AS	MsgRcvd	MsgSent	TblVer	InQ	OutQ	Up/Down	State/PfxRcd
10.10.10.1	4	65000	2596	2572	20	0	0	1d18h	0
10.10.10.2	4	65000	2577	2567	20	0	0	1d18h	0
10.10.10.3	4	65000	2562	2566	20	0	0	1d18h	0
#此外,边界网]关言	需要在	彼此之间]形成mvp	on邻居关系	系,	以便3	东/西组播:	流量能够正确传输。

DC1-BGW1# show bgp ipv4 mvpn summary BGP summary information for VRF default, address family IPv4 MVPN BGP router identifier 10.10.10.1, local AS number 65000 BGP table version is 6, IPv4 MVPN config peers 3, capable peers 3 0 network entries and 0 paths using 0 bytes of memory BGP attribute entries [0/0], BGP AS path entries [0/0] BGP community entries [0/0], BGP clusterlist entries [2/8]

Neighbor	V	AS	MsgRcvd	MsgSent	TblVer	InQ	OutQ	Up/Down	State/PfxRcd
10.10.10.4	4	65000	2645	2571	6	0	0	1d18h	0
10.10.20.3	4	65002	2273	2233	6	0	0	1d12h	0
10.10.20.4	4	65002	2273	2232	6	0	0	1d12h	0

第 20 步:在边界网关交换机上创建租户VRF环回

#在租户VRF中创建环回,在所有边界网关上使用唯一的IP地址。

#为此,选择DC1,右键单击DC1-BGW1,管理接口,然后创建环回,如下所示。

Add Interface			:
	* т	Type: Loopback	
	* Select a de	evice DC1-BGW1	
	* Loopbac	ck ID 2	
	* Po	blicy: int_loopback_11_1	
General			
Interface VRF	tenant-1	Interface VRF name, default VRF if not spece	fied
Loopback IP	172.19.10.1	2 Loopback IP address for V4 underlay	
Loopback IPv6 Address		Doopback IPv6 address for V6 underlay	
Route-Map TAG	12345	Route-Map tag associated with interface IP	
Interface Description		Add description to the interface (Max Size 2)	54)
Freeform Config			Note ! All configs should Strictly match 'show run' output, with respect to case and newlines. Any mismatches will yield unexpected diffs during deploy.
Enable Interface	Uncheck to disable the interface		<i>^D</i>

Save Preview Deploy

第 21 步:DCI交换机上的VRFLITE配置

#在此拓扑中,DCI交换机配置了指向BGW的VRFLITE。VRFLITE也配置为DCI交换机的北部(即 核心交换机)

#出于TRM目的,VRF租户–1中的PIM RP位于通过VRFLITE连接到DCI交换机的核心交换机中

#此拓扑具有从DCI交换机到位于图顶部的VRF租户-1内核心交换机的IPv4 BGP邻居关系。

#为此,创建子接口并为其分配IP地址,同时建立BGP邻居关系(这些由CLI直接在DCI和核心交换 机上完成)

DCI-1# sh ip bgp sum vrf tenant-1 BGP summary information for VRF tenant-1, address family IPv4 Unicast BGP router identifier 10.33.10.2, local AS number 65001 BGP table version is 17, IPv4 Unicast config peers 5, capable peers 5 4 network entries and 10 paths using 1680 bytes of memory BGP attribute entries [3/504], BGP AS path entries [3/18] BGP community entries [0/0], BGP clusterlist entries [0/0]

V Neighbor AS MsgRcvd MsgSent TblVer InQ OutQ Up/Down State/PfxRcd 10.33.10.1 4 65000 6366 6368 17 0 0 4d10h 2 10.33.10.9 4 65000 6368 6369 17 4d10h 2 0 0 10.33.20.1 4 65002 6369 6368 17 0 0 4d10h 2 4 65002 6369 6368 17 0 0 10.33.20.9 4d10h 2 172.16.111.2 4 65100 68 67 17 0 0 00:49:49 2 # This is towards the Core switch from DCI-1 #以红色表示从DCI-1到核心交换机的BGP邻居。

DCI-2# sh ip bgp sum vr tenant-1 BGP summary information for VRF tenant-1, address family IPv4 Unicast BGP router identifier 10.33.10.6, local AS number 65001 BGP table version is 17, IPv4 Unicast config peers 5, capable peers 5 4 network entries and 10 paths using 1680 bytes of memory BGP attribute entries [3/504], BGP AS path entries [3/18] BGP community entries [0/0], BGP clusterlist entries [0/0]

V AS MsgRcvd MsgSent TblVer InQ OutQ Up/Down State/PfxRcd Neighbor 4 65000 6368 6369 17 10.33.10.5 0 0 4d10h 2 10.33.10.13 4 65000 6369 6369 17 0 0 4d10h 2 10.33.20.5 4 65002 6370 6369 17 0 0 4d10h 2 10.33.20.13 4 65002 6370 6369 17 0 0 4d10h 2 172.16.222.2 4 65100 53 52 17 0 0 00:46:12 2 # This is towards the Core switch from DCI-2 #核心交换机(返回DCI-1和DCI-2)上也需要相应的BGP配置

单播验证

从DC1-Host1到DC2-Host1的East/West

#从DCNM和手动CLI推送上述所有配置(步骤1至21)后,单播可达性应在East/West运行

```
64 bytes from 172.16.144.2: icmp_seq=0 ttl=254 time=0.858 ms
64 bytes from 172.16.144.2: icmp_seq=1 ttl=254 time=0.456 ms
64 bytes from 172.16.144.2: icmp_seq=2 ttl=254 time=0.431 ms
64 bytes from 172.16.144.2: icmp_seq=3 ttl=254 time=0.454 ms
64 bytes from 172.16.144.2: icmp_seq=4 ttl=254 time=0.446 ms
```

--- 172.16.144.2 ping statistics --5 packets transmitted, 5 packets received, 0.00% packet loss
round-trip min/avg/max = 0.431/0.529/0.858 ms

从DC1-Host1向北/向南PIM RP(10.200.200.100)

DC1-Host1# ping 10.200.200.100 source 172.16.144.1 PING 10.200.200.100 (10.200.200.100) from 172.16.144.1: 56 data bytes 64 bytes from 10.200.200.100: icmp_seq=0 ttl=250 time=0.879 ms 64 bytes from 10.200.200.100: icmp_seq=1 ttl=250 time=0.481 ms 64 bytes from 10.200.200.100: icmp_seq=2 ttl=250 time=0.483 ms 64 bytes from 10.200.200.100: icmp_seq=3 ttl=250 time=0.464 ms 64 bytes from 10.200.200.100: icmp_seq=4 ttl=250 time=0.485 ms

--- 10.200.200.100 ping statistics --5 packets transmitted, 5 packets received, 0.00% packet loss
round-trip min/avg/max = 0.464/0.558/0.879 ms

组播验证

在本文档中,"租户–1" VRF的PIM RP已配置并呈现在VXLAN交换矩阵外部;根据拓扑,PIM RP在 核心交换机上配置IP地址 — > 10.200.200.100

非vxlan(核心交换机后)的源,DC2的接收器

参考拓扑,如开头所示。

#源自非VXLAN主机的北/南组播流量 — > 172.17.100.100,接收器存在于两个数据中心;DC1-Host1-> 172.16.144.1和DC2-Host1-> 172.16.144.2,组 — > 239.100.100.100

Legacy-SW#ping 239.100.100.100 source 172.17.100.100 rep 1 Type escape sequence to abort. Sending 1, 100-byte ICMP Echos to 239.100.100.100, timeout is 2 seconds: Packet sent with a source address of 172.17.100.100

Reply to request 0 from 172.16.144.1, 3 ms Reply to request 0 from 172.16.144.1, 3 ms Reply to request 0 from 172.16.144.2, 3 ms Reply to request 0 from 172.16.144.2, 3 ms

DC1中的源,DC2中的接收器以及外部

--- 239.144.144.144 ping multicast statistics --- 1 packets transmitted,

From member 172.17.100.100: 1 packet received, 0.00% packet loss From member 172.16.144.2: 1 packet received, 0.00% packet loss --- in total, 2 group members responded ---

DC2中的源,DC1中的接收器以及外部

--- 239.145.145.145 ping multicast statistics --1 packets transmitted,
From member 172.17.100.100: 1 packet received, 0.00% packet loss
From member 172.16.144.1: 1 packet received, 0.00% packet loss
--- in total, 2 group members responded ---