使用DCNM构建Nexus 9000 VXLAN共享边界多 站点部署

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简介

本文档将介绍如何使用DCNM 11.2版本使用共享边界模型部署Cisco Nexus 9000 VXLAN多站点部 署。

拓扑



拓扑的详细信息

DC1和DC2是运行vxlan的两个数据中心位置;

DC1和DC2边界网关与共享边界有物理连接;

共享边界具有外部连接(例如;互联网);因此,VRF Lite连接在共享边界上终止,并且默认路由由共 享边界注入到每个站点的边界网关

在vPC中配置共享边界(使用DCNM部署交换矩阵时,这是要求)

边界网关在任播模式下配置

使用的组件:

运行9.3(2)的Nexus 9k

运行11.2版本的DCNM

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)考虑到本文档基于使用vxlan多站点功能的两个数据中心,必须创建两个Easy Fabric

2)为共享边界创建另一个简单交换矩阵

3)创建MSD并移动DC1和DC2

4)创建外部交换矩阵

5)创建多站点底层和重叠(适用于东/西)

6)在共享边界上创建VRF扩展附件

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"



DCNM Licenses License this copy of DCNM for each managed switch to unlock Performance Collection.



Fabric Builder 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

Create Fabric		
	Create Fabric	

• 接下来是提供交换矩阵名称、模板,然后打开多个选项卡,这些选项卡将需要ASN、交换矩阵 接口编号、任意播放网关MAC(AGM)等详细信息

Add Fabric

			·					
eneral Replication	vPC	Advanced	Resources	Man	ageabili	ty	Bootstrap	Configuration Backup
	* BGP A SN	65000			? 1-4	29496	67295 1-65535[0-65535]
* Fabric Interface	e Numbering	unnumbered		•	🕜 Nui	nbere	d(Point-to-Point)	or Unnumbered
* Underlay Sul	onet IP Mask	30		•	🕜 Ma	sk for	Underlay Subne	t IP Range
* Link-State Rout	ing Protocol	ospf		•	🕐 Sup	opport	ed routing protoc	cols (OSPF/IS-IS)
* Rout	e-Reflectors	2		•	🛛 🕜 Nui	nber (of spines acting a	as Route-Reflectors
* Anycast G	ateway MAC	2020.2020.aaa	a		🕐 Sha	ared N	AC address for	all leafs (xxxx.xxxx.xxxx)
NX-OS Software In	age Version			•	lf S Images	et, Im Can E	age Version Che Be Uploaded Froi	ck Enforced On All Switches. m Control:Image Upload

#交换矩阵接口(主干/枝叶接口)可以是"未编号"或点对点接口;如果使用未编号的,则所需的IP地 址更少(因为IP地址是未编号环回的IP地址)

#交换矩阵中的主机使用AGM作为默认网关MAC地址;所有作为默认网关的枝叶交换机上的情况相 同

• 接下来是设置复制模式

Add Fabric

* Fabric Name : DC1		
* Fabric Template : Easy_Fabric_11	_1	
General Replication vPC	Advanced Resources	Manageability Bootstrap Configuration Backup
* Replication Mode	Multicast	Replication Mode for BUM Traffic
* Multicast Group Subnet	239.1.1.0/25	Multicast address with prefix 16 to 30
Enable Tenant Routed Multicast (TRM)	For Overlay Multicast Suppo	ort In VXLAN Fabrics
Default MDT Address for TRM VRFs	239.100.100.100	IPv4 Multicast Address
* Rendezvous-Points	2	 Number of spines acting as Rendezvous-Point (RP)
* RP Mode	asm	V @ Multicast RP Mode
* Underlay RP Loopback Id	254	(2) 0-512
Underlay Primary RP Loopback Id		0-512, Primary Loopback Bidir-PIM Phantom RP
Underlay Backup RP Loopback Id		0-512, Fallback Loopback Bidir-PIM Phantom RP
Underlay Second Backup RP Loopback Id		0-512, Second Fallback Loopback Bidir-PIM Phantom RP
Underlay Third Backup RP Loopback Id		② 0-512, Third Fallback Loopback Bidir-PIM Phantom RP

#此处选择的复制模式可以是组播或IR-Ingress复制;IR将以单播方式将vxlan VLAN中的任何传入 BUM流量复制到其他VTEP,也称为头端复制,而组播模式将使用为每个网络定义的组播组的外部 目标IP地址将BUM流量发送到主干,主干将基于外部目标IP地址的OIL执行组播复制VTEP

#组播组子网 — >复制BUM流量(如来自主机的ARP请求)所需

#如果需要启用TRM,请选中与TRM对应的复选框,并为TRM VRF提供MDT地址。

• "vPC"的选项卡默认保留;如果备份SVI/VLAN需要任何更改,可在此处定义

•"高级"选项卡是下一部分

Add Fabric

* Fabric Name : DC1								
* Fabric Template : Easy_F	abric_11	_1	•					
General Replication	vPC	Advanced	Resources	Mar	ageability	Bootstrap	Configuration Backup	
* VRF Te * Network Te	emplate	Default_VRF_U	niversal k_Universal	v	Default	Overlay VRF Temj Overlay Network 1	plate For Leafs Template For Leafs	
* VRF Extension Te	mplate	Default_VRF_E	xtension_Universa	•	Default	Overlay VRF Tem	plate For Borders	
* Network Extension Te	mplate	Default_Network	k_Extension_Unive	ersa 🔻	Default	Overlay Network 1	emplate For Borders	
	Site Id	65000			Defaults to F	n multi-Site Supp abric ASN	ort (MIN:1, Max: 2814749767	10655).
* Underlay Routing Loop	back Id	0			0-512			
* Underlay VTEP Loopl	back Id	1			0-512			
* Link-State Routing Proto	col Tag	UNDERLAY			Routing	Process Tag (Ma)	(Size 20)	
* OSPF	Area Id	0.0.0.0			OSPF A	rea Id in IP addres	ss format	J
Enable OSPF Authent	tication	U 19						
OSPF Authentication	Key ID				0-255			
OSPF Authenticat	ion Key				3DES E	ncrypted		
Enable IS-IS Authen	tication							
IS-IS Authentication Keychair	n Name				0			
IS-IS Authentication	Key ID				0-65535	5		
IS-IS Authenticat	ion Key				Cisco Ty	pe 7 Encrypted		
* Power Supply	y Mode	ps-redundant		Ŧ	Default	Power Supply Mod	de For The Fabric	
* CoPP	Profile	strict		•	Provided whe	Vide CoPP Policy. en 'manual' is sele	Customized CoPP policy sho	ould be
Enable VXLA	N OAM	For Ope	erations, Administr	ation, ar	nd Managemei	nt Of VXLAN Fabr	ics	
Enable Tenant	t DHCP	✓ 🕜						
Enab	le BFD							
* Greenfield Cleanup	Option	Disable			Switch (Cleanup Without R	eload When PreserveConfig	=no
Enable BGP Authent	tication							

#此处提及的站点ID在此DCNM版本上自动填充,该版本源自"常规"选项卡下定义的ASN

#填写/修改其他相关字段

• Resources(资源)选项卡是下一个需要环回IP编址方案的选项卡,下一个

Add Fabric

* Fabric Name :	DC1							
* Fabric Template :	Easy_Fabric_11	_1	▼					
General Replicat	tion vPC	Advanced	Resources	Mana	ageability	Bootstrap	Configuration Backup	
Manual Unde	erlay IP Address	🗌 🕐 Checkin	ng this will disable	Dynamic	Underlay IP	Address Allocatior	18	_
* Underlay Routi	ing Loopback IP Range	10.10.10.0/24			Typically	y Loopback0 IP Ac	idress Range	
* Underlay VTEP Loo	pback IP Range	192.168.10.0/24	4		Typically	y Loopback1 IP Ac	idress Range	
* Underlay RP Loo	pback IP Range	10.100.100.0/24	4		Anycast	t or Phantom RP II	P Address Range	
* Underlay \$	Subnet IP Range	10.4.10.0/24			Address	s range to assign P	Numbered and Peer Link SVI IPs	
* Layer 2 VX	(LAN VNI Range	100144,100145	j		Overlay	Network Identifier	r Range (Min:1, Max:16777214)	
* Layer 3 VX	(LAN VNI Range	1001445			🕜 Overlay	VRF Identifier Ra	nge (Min:1, Max:16777214)	
* Netwo	ork VLAN Range	144,145			🕐 Per Swi	itch Overlay Netwo	ork VLAN Range (Min:2, Max:3967)	
* v i	RF VLAN Range	1445			🕐 Per Swi	itch Overlay VRF \	/LAN Range (Min:2, Max:3967)	
* Subinterfa	ice Dot1q Range	2-511			🕐 Per Bor	der Dot1q Range I	For VRF Lite Connectivity (Min:2, Max:5	11)
* VRF I	Lite Deployment	Manual		▼	🕐 VRF Lite	e Inter-Fabric Con	nection Deployment Options	
* VRF Lite \$	Subnet IP Range	10.10.33.0/24			Address	s range to assign F	P2P DCI Links	
* VRF L	ite Subnet Mask.	30			Mask fo	r Subnet Range (I	Min:8, Max:31)	

#第2层VXLAN VNI范围 — >这些是VNID,稍后将映射到Vlan(将进一步向下显示)

#第3层VXLAN VNI范围 — >这些是第3层VNID,稍后也会映射到第3层VNI VIan到Vn-segment

•此处未显示其他选项卡;如果需要,请填写其他选项卡;

Add Fabric
Add Fabric
Scheduled Time

۵	Dashboard			Fabric Builder
*	Topology			Fabric Builder creates a managed and controlled SDN fabric. Select an existing fabric below or def
٢	Control	٥		Create Fabric
0	Monitor	۲	-	
1 ¢	Administration	٥	Fabrics (1)	
G	Applications		DC1 Type: Swit ASN: 65000 Replicatio Technology	<pre>ch Fabric n Mode: Multicast : VXLAN Fabric</pre>

#此部分显示每个交换矩阵的交换矩阵、ASN和复制模式的完整列表

• 下一步是将交换机添加到DC1交换矩阵

步骤 2:将交换机添加到DC1交换矩阵

单击上图中的DC1,这将提供添加交换机的选项。

	Dashboard	← Fabric Builder: DC1
*	Topology	Actions – + – 53 🖏
٢	Control 📀	■ Tabular view
0	Monitor >	C Refresh topology
1 ¢	Administration 📀	 Save layout Delete saved layout
Ð	Applications	Random
		 Restore Fabric Re-sync Fabric
		+ Add switches
		Fabric Settings

•提供需要导入DC1交换矩阵的交换机的IP地址和凭证(根据本文档开头列出的拓扑,DC1-VTEP、DC1-SPINE、DC1-BGW1和DC1-BGW2是DC1的一部分)

Discover Existing Sw	tches PowerOn Auto Provisioning (POAP)	
Discovery Information	Scan Details	
Seed IP	10.122.165.173,10.122.165.200,10 <i>Ex: *2.2.2.20*; * 10.10.10.40-60*; *2.2.2.20, 2.2.2.21*</i>	
Authentication Protocol	MD5 V	
Jsername	admin	
Password		
Max Hops	10 hop(s)	
Preserve Config	no yes Selecting 'no' will clean up the configuration on switch(es)	

#由于这是绿地部署,请注意,"preserve config"选项被选为"NO";这将在执行导入时删除框的所有 配置,并且将重新加载交换机

#选择"开始发现",以便DCNM根据"种子IP"列中提供的IP地址开始发现交换机

•一旦DCNM完成发现交换机,IP地址和主机名将列在资产管理中

Disc	over Existing Swi	tches	PowerOn Aut	to Provisioning	(POAP)					
Back	k N	ote: Prese	rve Config selection is	'no'. Switch configure	ation will be erased.				(Import into fabric
								Show	Quick Filter	
	Name		IP Address	Model	Version	Status	Progress			
-	D01	×								
2	DC1-SPINE		10.122.165.200	N9K-C933	9.3(1)	manageable				
2	DC1-BGW1		10.122.165.187	N9K-C931	9.3(1)	manageable				
	DC1-BGW2		10.122.165.154	N9K-C931	9.3(1)	manageable				
	DC1-N3K		10.122.165.195	N3K-C317	7.0(3)14(6)	manageable				
	DC1-VTEP		10.122.165.173	N9K-C9332C	9.3(1)	manageable				

#选择相关交换机,然后点击"导入到交换矩阵"

		vvarning manage Do you	g: All s ement, want t	witch co will be o proce	removed ed?	on othe immed	r than iately	after	import	t.
							ОК		Cancel	
eı	ntory Manageme	nt								
/er	ntory Manageme	nt PowerOn Au	to Provisioning	(POAP)						
Yei Disc	ntory Manageme cover Existing Switches covery Information	nt PowerOn Au Scan Details	ıto Provisioning	(POAP)						
/er Disc Bac	ntory Manageme cover Existing Switches covery Information	nt PowerOn Au Scan Details	ito Provisioning s 'no'. Switch configure	(POAP) ation will be erased.						Import into fabric
er iisc	ntory Manageme cover Existing Switches covery Information	nt PowerOn Au Scan Details	ito Provisioning s 'no'. Switch configura	(POAP) ation will be erased.				Show	Quick Filter	Import into fabric
er isc)isc Bac	ntory Manageme cover Existing Switches covery Information S covery Information S covery Information S covery Information S covery Information S cover Pre	nt PowerOn Au Scan Details serve Config selection is	Ito Provisioning	(POAP) ation will be erased. Version	Status	Progress		Show	Quick Filter	Import into fabric
er isc)isc 3ac	ntory Manageme cover Existing Switches covery Information s covery Infor	nt PowerOn Au Scan Details IP Address	Ito Provisioning s 'no'. Switch configure Model	(POAP) ation will be erased. Version	Status	Progress		Show	Quick Filter	Import into fabric
/er	ntory Manageme cover Existing Switches covery Information S covery Information S cover S cov	nt PowerOn Au Scan Details IP Address 10.122.165.200	to Provisioning is 'no'. Switch configure Model	(POAP) ation will be erased. Version 9.3(1)	Status manageable	Progress	0%	Show	Quick Filter	Import into fabric
er Disc Disc	ntory Manageme cover Existing Switches covery Information S covery Infor	nt PowerOn Au Scan Details IP Address 10.122.165.200 10.122.165.187	Ito Provisioning a s 'no'. Switch configured Model N9K-C933 N9K-C931	(POAP) ation will be erased. Version 9.3(1) 9.3(1)	Status manageable manageable	Progress	0%	Show	Quick Filter	Import into fabric
/er	ntory Manageme cover Existing Switches covery Information S ck Note: Pre Dct - SPINE Dc1 - SPINE Dc1 - BGW1 Dc1-BGW2	nt PowerOn Au Scan Details IP Address 10.122.165.200 10.122.165.187 10.122.165.154	Ito Provisioning of the short source of the second	(POAP) ation will be erased. Version 9.3(1) 9.3(1) 9.3(1)	Status manageable manageable manageable	Progress	0%	Show	Quick Filter	Import into fabric
/er Disc Jisc Jac	ntory Manageme cover Existing Switches covery Information S covery Infor	Import PowerOn Au Scan Details Scan Details IP Address International statement 10.122.165.200 10.122.165.187 10.122.165.154 10.122.165.154	Ito Provisioning s 'no'. Switch configure Model N9K-C931 N9K-C931 N9K-C931 N3K-C317	(POAP) ation will be erased. Version 9.3(1) 9.3(1) 9.3(1) 7.0(3)14(6)	Status Status manageable manageab	Progress	0%	Show	Quick Filter	Import into fabric

#导入完成后,交换矩阵构建器下的拓扑可能如下所示;



#通过单击一台交换机并将其与图中的正确位置对齐,可以移动交换机



#按需要布局的顺序重新排列交换机后,选择"保存布局"部分

• 设置所有交换机的角色



#右键单击每台交换机并设置正确的角色;此处,DC1-BGW1和DC1-BGW2是边界网关

DC1-SPINE->将设置为role- Spine , DC1-VTEP->将设置为role-Leaf



• 下一步是保存和部署

DCNM现在将列出交换机,并预览DCNM将推送到所有交换机的配置。

onfig Deple	oyment					
Step 1. Configu	ration Preview	Step 2. Configuration	Deployment Status			
witch Name	IP Address	Switch Serial	Preview Config	Status	Re-sync	Progress
C1-VTEP	10.122.165.173	FDO22260MFQ	301 lines	Out-of-sync	-	100%
C1-SPINE	10.122.165.200	FDO2313001T	520 lines	Out-of-sync	-	100%
C1-BGW1	10.122.165.187	FDO21412035	282 lines	Out-of-sync	-	100%
C1-BGW2	10.122.165.154	FDO20160TQM	282 lines	Out-of-sync		100%
	ſ					
			Deploy Config			
			Deploy Config			

Step 1 Configure	oyment	Step 2 Configuratio	n Denlovment Status	× GW2
Switch Name	IP Address	Status	Status Description	Progress
DC1-VTEP	10.122.165.173	STARTED	Deployment in progress.	30%
DC1-SPINE	10.122.165.200	STARTED	Deployment in progress.	23%
DC1-BGW2	10.122.165.154	STARTED	Deployment in progress.	31%
DC1-BGW1	10.122.165.187	STARTED	Deployment in progress.	29%
			Close	
			Close	

#成功后,状态将反映,交换机将显示为绿色

Config Deployment							
Step 1. Configu	Step 1. Configuration Preview Step 2. Configuration Deployment Status						
Switch Name	IP Address	Status	Status Description	Progress			
DC1-VTEP	10.122.165.173	COMPLETED	Deployed successfully	100%			
DC1-SPINE	10.122.165.200	COMPLETED	Deployed successfully	100%			
DC1-BGW2	10.122.165.154	COMPLETED	Deployed successfully	100%			
DC1-BGW1	10.122.165.187	COMPLETED	Deployed successfully	100%			
			Close				



步骤 3: 网络/VRF的配置

•网络/VRF的配置

#选择DC1交换矩阵(从右上角下拉菜单),控制> VRF



#接下来是创建VRF

/RFs				
+ / × @ •				
VE F Name	VRF ID	Status		
No data available				
			Create VRF	×
			▼ VRF Information	1
			* VRF IC 1001445	11
			VRF Name tenant-1	11
			VRF rempire VFF_Conversal VRF Extension Default_VRF_Extension Universal	11
			Template	11
			▼ VRF Profile	Ш
			General VEF Vian Name	Ш
			Advanced VRF Introduction @	11
			VRF Description	Ш
				Ш
				Ш
				÷.
			Create VRI	

11.2 DCNM版本自动填充VRF ID;如果其不同,请键入所需的VRF并选择"创建VRF"

#此处使用的第3层VNID是1001445

• 下一步是创建网络

Network Name	 Network ID 	VRF Name	IPv4 Gateway/Subnet	IPv6 Gateway/Prefix	Status	VLAN ID				
tata available										
					Create Netw	ork				
					 Network Ir 	formation				
						* Network ID	100144			
						* VRF Name	MyNetwork_ tenant-1	100144	+	
						Layer 2 Only				
					* Net	work Template	Default_Net	work_Universal		
						Template VLAN ID	144		Propose VL	AN Ø
					Network P Generate Mult	rofile	ase click on	v to nenerate a New Multicass	Group Address	and overide the default value!
					General					
					Advanced	IPv4 Gatewa	y/NetMask way/Prefix	172.16.144.254/24		 example 192.0.2.1/24 example 2001:db8::1/64
							Vian Name			If > 32 chars enable:system vian long-n
						Interface D	escription			0
						MTU for L	3 interface			68-9216
						IPv4 Secor	ndary GW1			example 192.0.2.1/24
						-	2 0100		1	48 ovembio 102.0.2.1.04

#提供网络ID(即第2层VLAN的对应VNID)

#提供SVI应属于的VRF;默认情况下,DCNM 11.2将VRF名称填充到之前创建的名称;根据需要更 改

VLAN ID将是映射到此特定VNID的第2层VLan

IPv4 Gateway->这是任播网关IP地址,将在SVI上配置,并且对于交换矩阵中的所有VTEP将相同

• "高级"(Advanced)选项卡有额外的行,如果如此,则需要填写;DHCP中继正在使用;

Create Network		×
 Network Information 		^
* Network ID	100144	
* Network Name	MyNetwork_100144	
* VRF Name	tenant-1 💌 🕇	
Layer 2 Only		
* Network Template	Default_Network_Universal	
* Network Extension Template	Default_Network_Extension_Univer	
VLAN ID	144 Propose VLAN	
 Network Profile Generate Multicast IP General Advanced Ingress Mul DHC DHCPv4 Loopback Relay inter 	Suppression Suppression Replication Read-only per network, Fabric-wide setting ticast Group Address 239.1.1.0 Pv4 Server 1 Pv4 Server 2 DHCP R lay IP Server VRF ID for DHCP ID for DHCP rface (Min:0, Max:1023)	*
	Create Netwo	rk

#填写字段后,点击"创建网络"。

#创建需要加入此交换矩阵的任何其他网络;

•目前,VRF和网络刚刚在DCNM中定义;但未从DCNM推送到交换矩阵中的交换机。这可通过 以下方式进行验证

Netwo	Network / VRF Selection Network / VRF Deployment							
Netwo	orks							
+								
	Network Name	•	Network ID	VRF Name	IPv4 Gateway/Subnet	IPv6 Gateway/Prefix	Status	VLAN ID
	MyNetwork_100144		100144	tenant-1	172.16.144.254/24		NA	144
\checkmark	MyNetwork_100145		100145	tenant-1	172.16.145.254/24		NA	145

#如果未部署到交换机,则状态将处于"NA"状态。由于这是多站点且涉及边界网关,因此网络 /VRF的部署将进一步深入讨论。

步骤 4:对DC2重复相同步骤

- •既然DC1已完全定义,DC2也将执行相同的步骤
- DC2完全定义后,如下所示



步骤 5:为共享边界创建简单交换矩阵

- 这是创建另一个简单交换矩阵的地方,该交换矩阵将包括vPC中的共享边界
- ●请注意,通过DCNM部署时的共享边界应配置为vPC,否则,在DCNM上执行"重新同步"操作后,交换机间链路将关闭
- •共享边界中的交换机将设置为"边界"角色

← Fabric Builder: St	hared-Borders				
Fabric Builder: St Actions + - 03 Tabular view Statesh topology Bartesh topology Bave layout Sove layout Costom saved layout Actions Fabric Actions Fabric Fabric Settings Fabric Settings	hared-Borders	1 T Advanced Resources Man 65001 unnumbered T 30 T	ageability Bootstrap Configuration Backup 1-4394967295 1-65535(0-65535) Mumbered(Point-6-Point) or Unnumbered Mask for Underlay Subnet IP Range	DC1	DC2
	 Fabric Interface Numbering * Underlay Subnet IP Mask 	30 T	Mumberea(Point-to-Point) or Unnumberea Mask for Underlay Subnet IP Range		
	* Link-State Routing Protocol	ospf	Supported routing protocols (OSPF/IS-IS)		
	* Route-Reflectors	2	Window Number of spines acting as Route-Reflectors		
	* Anycast Gateway MAC	2020.2020.aaaa	Shared MAC address for all leafs (xxxx xxxx xxxx)		
	NX-OS Software Image Version	•	If Set, Image Version Check Enforced On All Switches. Images Can Be Uploaded From Control Image Upload	SHARERDER1	SHARERDER2
			Save Canc		

#VRF的创建方式与DC1和DC2交换矩阵相同

#共享边界上不需要网络,因为共享边界上没有任何第2层VLAN/VNID;共享边界不是从DC1到 DC2的任何东/西流量的隧道终端;只有边界网关在EAST/West DC1的vxlan封装/解封方面起作用 <>DC2流量

第6步 — 创建MSD并移动DC1和DC2交换矩阵

转到交换矩阵构建器并创建新交换矩阵,然后使用模板 — > MSD_Fabric_11_1

Fabric Builder Fabric Builder Fabric Builder creates a managed and controlled SDN fabric. Select an existing fabric Create 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.	
Fabrics (3) DC1	Add Fabric X Pyer: Sidter Am: 6902 Restarting Technology: General DCI Resources Layer 2 VXLAN VNI Range (101144,100145 Coverlay Aletwork Identifier Range (Iden 1, Max: 16777214)	
	Corray VRF Identifier Range (Min 1, Max 1677214) VRF Template Default, VRF_Universal Corray VRF Identifier Range (Min 1, Max 1677214) VRF Template Default, VRF_Universal Corray VRF Identifier Range (Min 1, Max 1677214) Orderat Oversay VRF. Template For Leads VRF Default Oversay VRF. Template For Leads VRF Extension Template Default_VRF_Extension_Universal Orderat Oversay VRF. Template For Borders Network Extension Template Default_VRF_Extension_Universal Orderat Oversay VRF. Template For Borders Network Extension Template Default_VRF_Extension_Universal Orderat Oversay VRF. Template For Borders Network Extension Template Default_VRF_Extension_Universal Orderat Oversay VRF. Template For Borders Network Extension Template Default_VRF_Extension_Universal Orderat Oversay VRF. Template For Borders Network Extension Template Default_VRF_Extension_Universal Orderat Oversay VRF. Template For Borders Network Extension Template Default_VRF_Extension_Universal Orderat Oversay VRF. Template For Borders Network Extension Template Default_VRF_Extension_Universal Orderat Oversay VRF. Default Oversay VRF. Default Oversay VRF. Default Oversay VRF. Default_VRF. Default_VRF_Extension_Universal Orderat Oversay VRF. Default_VRF. Default_VRF	
	Cancel	-

* Fabric Name :	MSD			
* Fabric Template :	MSD_Fabric_11	_1		
General DCI	Resources			_
DCI S	ubnet IP Range	10.10.1.0/24	Address range to assign P2P DCI Links	
Subi	net Target Mask	30	Target Mask for Subnet Range (Min:8, Max:31)	
* Multi-8 Depl	Site Overlay IFC oyment Method	Centralized_To_Route_Server	Manual, Auto Overlay EVPN Peering to Route Servers, Auto Overlay EVPN Direct Peering to Border Gateways	
* Multi-Site R	oute Server List	10.10.100.1,10.10.100.2	Wulti-Site Router-Server peer list, e.g. 128.89.0.1, 128.89.0.2	
* Multi-Si	te Route Server BGP ASN List	65001,65001	1-4294967295 1-65535[.0-65535], e.g. 65000, 65001	
Multi-Si Auto D	te Underlay IFC eployment Flag			
			Save Cancel	

#请注意,多站点重叠IFC部署方法必须为"**centralized_To_Route_Server**";此处,共享边界被视为 路由服务器,因此从下拉列表使用此选项

#在"多站点路由服务器列表";在此,查找共享边界上Loopback0(即路由环回)的环回IP地址并填写

ASN 是共享边界上的ASN(有关详细信息,请参阅本文档顶部的图);在本文档中,两个共享边 界都配置在同一ASN中;相应地填写

•下一个选项卡是提供多站点环回IP范围的位置,如下所示

Add Fabric			×
* Fabric Name : * Fabric Template :	MSD MSD_Fabric_11_1		
General DCI	Resources		
* Multi-Site Rout	ting Loopback IP Range	Ypically Loopback100 IP Address Range	
			Save Cancel

#填写所有字段后,点击"保存"按钮,将使用模板 — > MSD创建新交换矩阵

#接下来是将DC1和DC2交换矩阵移至此MSD

ns –			
- 8 &			
Tabular view			
efresh topology			
ave layout			
lete saved layout			
om 🔹		Move Fabric	\times
		Please note that it may take a few i	ninutes if there is a large
c Settings		number of vRPs/wws in the labrics:	Selected 0 / Total 3 🧊
e Fabrics		Fabric Name	Fabric State
		O DC1	standalone
		O DC2	standalone
		 Shared-Borders 	standalone
		4	•
		Add	Remove Cancel

#交换矩阵移动后,如下所示



#完成后,点击"保存并部署"按钮,该按钮将按所需配置,只要涉及多站点到边界网关

Fabric Builder: MSD					Size & Doptoy
Challen					Country Eabler Information
Actors -					Total Networks: 2 Total Veteriors: 2
* = : @					
Tabular view					
Ø Rehesh topology					
M Save layout	Config Deployme	nt		×	
X Delete saved layout					
Custom saved layout +	Sirp 1. Configuration Pl	eview Step 2. Configural	ion Deployment Status		
	Switch Name IP A	ddress Status	Status Description	Progress	
O Fabric Settings	DC2-8GW2 10	22.165.188 STARTED	Deployment in progress.	-	
B Move Fabrice	DC2-8GW1 101	22.165.189 STARTED	Deployment in progress.		
	DC1-8GW2 10.1	22.165.154 STARTED	Deployment in progress.		
	DC1-8GW1 10 1	22.965.987 STARTED	Deployment in progress.	2	
			Close		

步骤 7:创建外部交换矩阵

#创建外部交换矩阵并将外部路由器添加到外部交换矩阵,如下所示;

Add Fabric

* Fabric Name :	External				
* Fabric Template :	External_Fabric_11_1				
General Advance	ed Resources DCI Configuration Backup Bootstrap				
* BGP AS # 65100 (2) 1-4294967295 1-65535[.0-65535] Fabric Monitor Mode (2) (2) If enabled, fabric is only monitored. No configuration will be deployed					

#命名交换矩阵并使用模板 — > "External_Fabric_11_1";

#提供ASN

#最后,各种交换矩阵如下所示

- Fabric Builder: Shared-Borders	
Actions –	
+ - = =	
≡ Tabular view	
Ø Refresh topology	
🛗 Save layout	
X Delete saved layout	External
Custom saved layout ·	
	Λ
Restore Fabric	
Ø Re-sync Fabric	
+ Add switches	
Fabric Settings	
	OTHER STREE. NOEKZ
	and the second second second
	FIRST. STREET, STRE
	DC1 DC2

步骤 8::用于BGW(共享边界之间的iBGP)之间环回可达性的 eBGP底层

#共享边界运行eBGP l2vpn evpn,该evpn与边界网关和指向外部路由器的VRF-LITE连接

#在与环回形成eBGP l2vpn evpn之前,需要确保通过某种方法可到达环回;在本示例中,我们使用 eBGP lPv4 AF从BGW到共享边界,然后通告环回以进一步形成l2vpn evpn邻居关系。



#选择MSD交换矩阵后,切换到"表格视图"

← Fabric	Builder: MSD
Switches	Links
+	

I	ink Management	: - Add Link			×
1	* Link Type	Inter-Eabric			
	* Link Sub-Type	MULTISITE UNDERLAY			
	* Link Template	ext multisite underlay setup '	- -		
	* Source Fabric	DC1	- -		
	* Destination Fabric	Shared-Borders	7		
	* Source Device	DC1-BGW1	-		
	* Source Interface	Ethernet1/2	•		
	* Destination Device	SHARED-BORDER1	•		
	* Destination Interface	Ethernet1/1			
	General Advanced	4	* BGP Local ASN * IP Address/Mask * BGP Neighbor IP * BGP Neighbor ASN * BGP Maximum Paths * Routing TAG	65000 10.4.10.1/30 10.4.10.2 65001 1 54321	 Local BGP Autonomous Sy IP address with mask (e.g. Neighbor IP address Neighbor BGP Autonomou Maximum number of iBGP, Routing tag associated with
					Save

#选择"交换矩阵间"并使用"Multisite_UNDERLED"

#我们在此尝试与共享边界路由器形成IPv4 BGP邻居关系;因此,请相应地选择交换机和接口。

#请注意,如果CDP检测到从DC1-BGW1到SB1的邻居,则只需在本节中提供IP地址,并在执行"保 存和部署"后在相关接口上有效配置IP地址

÷	Fabric	Builder: MSD								Save & D
Sw	itches	Links								
										Selected 1 / Total 24 💋
+										Show All 🔻
		Fabric Name	Name		Policy	Info		Admin State	Oper State	
1		DC1	DC1-VTEP~Ethernet1/2DC1-N3							
2		DC1<->Shared-Bor	DC1-BGW1~loopback0SHAREE	Config Dep	loyment				×	
3		DC1<->Shared-Bor	DC1-BGW1~loopback0SHAREE						Config Preview - Switch 10.122.165.187	×
4		DC1<->Shared-Bor	DC1-BGW2~loopback0SHAREE		uration Preview					
5		DC1<->Shared-Bor	DC1-BGW2~loopback0SHAREE	Switch Name	IP Address	Switch Senai	Preview Goot	ig Status	Pending Config Side-by-side Comparison	
6		DC2	DC2-VTEP~Ethernet1/1DC2-N3	DC1-BGW1	10.122.165.187	FDO21412035	21 lines	Out-of-sync	interface ethernet1/2	*
7		DC2<->Shared-Bor	DC2-BGW1~loopback0SHARED	DC1-BGW2	10.122.165.154	FDO20160TQM	0 lines	In-Sync	no switchport ip address 10.4.10.1/30 tag 54321	
8		DC2<->Shared-Bor	DC2-BGW1~loopback0SHAREE	DC2-BGW2	10.122.165.188	FD022273T3B	0 lines	In-Sync	evpn multisite dci-tracking mtu 9216	
9		DC2<->Shared-Bor	DC2-BGW2~loopback0SHAREE	DC2-BGW1	10.122.165.189	FDO21412HUV	0 lines	In-Sync	no shutdown nouter bgp 65000	
10		DC2<->Shared-Bor	DC2-BGW2~loopback0SHAREE						address-family ipv4 unicest maximum-paths 64	
11		DC1	DC1-VTEP~Ethernet1/1DC1-SP						exit	
0		241	DC1-BGW1~Ethernet1/3DC1-SF						address-mamily 1pve unicest maximum-paths 64	
13		DC1<->Shared-Bor	DC1-BGW1~Ethernet1/2SHARE						exit	
-	-0	De1<->Shared-Bor	DC1-BGW1~Ethernet1/1SHARE						remote-as 65001	
15		DC1<->Shared-Bor	DC1-BGW2~Ethernet1/3SHARE						address-family jov4 unicast	
16		DC1	DC1-BGW2~Ethernet1/2DC1-SF						configure terminal	
17		DC1<->Shared-Bor	DC1-BGW2~Ethernet1/1SHARE							· · · · · · · · · · · · · · · · · · ·
18		DC2	DC2-VTEP~Ethernet1/3DC2-SP							4
19		DC2<->Shared-Bor	DC2-BGW1~Ethernet1/2SHARE							
20		DC2<->Shared-Bor	DC2-BGW1~Ethernet1/3SHARE				Deploy Conf			
21		DC2	DC2-BGW1~Ethernet1/1DC2-SF							
22		DC2	DC2-BGW2~Ethernet1/1DC2-SP	INE~Ethernet	int_intra_fabric_unnum	_link_11_1 Link	Present	Up:Up	Up:Up	

#选择"保存并部署"后,DC1-BGW1所需的配置行将被传播;选择"共享边界"交换矩阵后,也必须执 行相同的步骤。

4	Fabric	Builder: Shared-Bor	ders						Sine & Day
S	vitches	Links							
									Selected 0 / Total 23 💭 P
									Show All 🔻
		Fabric Name	Name	Policy		Info	Admin State	Oper State	
		DC1<->Shared-Bor	DC1-BGW1~loopback0SHAREC						
	2	DC1<->Shared-Bor	DC1-BGW1~loopback0SHAREE	Config Deployment					×
		DC1<->Shared-Bor	DC1-BGW2~loopback0SHAREE						
	:	DC1<->Shared-Bor	DC1-BGW2~loopback0SHAREE						
	5	DC2<->Shared-Bor	DC2-BGW1~loopback0SHARED	Switch Name	IP Address	Switch Serial	Preview Config	Status	Damas D
	5	DC2<->Shared-Bor	DC2-BGW1~loopback0SHAREE	SHARED-BORDER1	10 122 165 198	FD0221410DG	60 lines	Out-of-svt	Config Preview - Switch 10.122.165.198
	1	DC2<->Shared-Bor	DC2-BGW2~loopback0SHAREE	SHARED-BORDER2	10 122 165 178	FD02213140C	40 lines	Out-of-svt	
		DC2<->Shared-Bor	DC2-BGW2~loopback0SHARED					our or oyr	Pending Config Side-by-side Comparison
	•	DC1<->Shared-Bor	DC1-BGW1~Ethernet1/2SHARE						Interface etheroet1/1
1		DC1<->Shared-Bor	DC1-BGW1~Ethernet1/1SHARE						no switchport ip eddress 10.4.10.2/30 tee 54321
1		DC1<->Shared-Bor	DC1-BGW2~Ethernet1/3SHARE						mtu 9216 no shutdown
1	2	DC1<->Shared-Bor	DC1-BGW2~Ethernet1/1SHARE						router bgo 65001 address-family jov4 unicast
1	•	DC2<->Shared-Bor	DC2-BGW1~Ethernet1/2SHARE						maximum-paths 64 maximum-paths ibgp 64
1	:	DC2«->Shared-Bor	DC2-BGW1~Ethernet1/3SHARE						exit address-family jov6 unicast
1	5	Shared-Borders<->	SHARED-BORDER1~Ethernet1/45						maximum-paths 64 maximum-paths ibgp 64
1	5	Shared-Borders<->	SHARED-BORDER1~Ethernet1/5:						exit neighbor 10.4.10.1
1	1	Shared-Borders<->	SHARED-BORDER1~Ethernet1/4-						remote-as 65000 update-source Ethernet1/1
1	3	Shared-Borders	SHARED-BORDER2~Port-channe						address-family ipv4 unicast next-hop-self
1	•	Shared-Borders<->	SHARED-BORDER2~Ethernet1/5						exit exit
2		Shared-Borders	SHARED-BORDER2~Ethernet1/10			Deploy Cor	100		reste-as 65000
2		Shared-Borders	SHARED-BORDER2~Ethernet1/5(bepie) ee			UDSET#15UPC# TOOPSEDB

#在CLI中,使用以下命令可检验相同情况;

DC1-BGW1# show ip bgp sum BGP summary information for VRF default, address family IPv4 Unicast BGP router identifier 10.10.10.1, local AS number 65000 BGP table version is 11, IPv4 Unicast config peers 1, capable peers 1 2 network entries and 2 paths using 480 bytes of memory BGP attribute entries [1/164], 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

 10.4.10.2
 4 65001
 6
 7
 11
 0
 0 00:00:52
 0

 #请注意, "保存和部署"也必须在DC1交换矩阵上完成(选择DC1的下拉菜单,然后执行相同操作
),以便相关IP编址、BGP配置传播到DC1(边界网关)中的交换机;

#此外,多站点底层必须从DC1-BGW、DC2-BGW创建到共享边界;因此,同样的步骤也必须执行

0

#最后,共享边界将与DC1和DC2中的所有BGW具有eBGP IPv4 AF邻居关系,如下所示;

SHARED-BORDER1#	sł	ı ip bgp	sum						
BGP summary info	<pre>SP summary information for VRF default, address family IPv4 Unicast</pre>								
BGP router ident	:if	Eier 10.1	0.100.1	, local 1	AS number	c 650	01		
BGP table version	on	is 38, I	Pv4 Uni	cast con	fig peers	з4,	capab	le peers	4
18 network entri	ies	s and 20	paths u	using 456	0 bytes d	of me	emory		
BGP attribute en	ntı	ries [2/3	- 281, во	SP AS pat	h entries	5 [2/	121		
BGP community er	nti	ries [0/0	I. BGP	clusterl	ist entri	ies (0/01		
	101	100 [0/0], 201	01400011	100 011011		, .]		
Neighbor	V	AS Ms	gRcvd M	IsgSent	TblVer	InQ	OutQ	Up/Down	State/PfxRcd
10.4.10.1	4	65000	1715	1708	38	0	0	1d03h	5
10.4.10.6	4	65000	1461	1458	38	0	0	1d00h	5
10.4.10.18	4	65002	1459	1457	38	0	0	1d00h	5
10.4.10.22	4	65002	1459	1457	38	0	0	1d00h	5
SHARED-BORDER2#	sł	ı ip bgp	sum						
BGP summary info	orr	nation fo	or VRF d	lefault,	address f	Eamil	y IPv	4 Unicast	-
BGP router ident	:if	Eier 10.1	0.100.2	2, local 2	AS number	650	01		
BGP table version	on	is 26, I	Pv4 Uni	cast con	fig peers	s 4,	capab	le peers	4
18 network entri	les	s and 20	paths u	using 456	0 bytes o	of me	emory		
BGP attribute en	nti	ries [2/3	28], BG	P AS pat	h entries	5 [2/	12]		
BGP community er	ntı	ries [0/0], BGP	clusterl	ist entri	Les [0/01		
-		•							
Neighbor	V	AS Ms	gRcvd M	IsgSent	TblVer	InQ	OutQ	Up/Down	State/PfxRcd
10.4.10.10	4	65000	1459	1458	26	0	0	1d00h	5
10.4.10.14	4	65000	1461	1458	26	0	0	1d00h	5
10.4.10.26	4	65002	1459	1457	26	0	0	1d00h	5

10.4.10.30

4 65002

1459

1457

#以上是建立从BGW到共享边界的l2vpn evpn邻居关系之前的先决条件(请注意,使用BGP并非必需 条件;交换环回前缀的任何其他机制);最后,基本要求是所有环回(共享边界、BGW)应可从所有 BGW访问

26

0

0

1d00h 5

#另请注意,iBGP IPv4 AF邻居关系需要在共享边界之间建立;截至目前,DCNM没有在共享边界 之间使用模板/下拉列表构建iBGP的选项;为此,必须执行如下所示的自由形式配置;

← Fabric Builder: Shared-Borders									
Switches Links									
+ > / U X	View/Edit Policies	Manag	e Interfaces History	Deploy					
Name	IP Address	Role	Serial Number	Fabric Name					
1 🥑 🦪 SHARED-BORD	10.122.165.178	border	FDO221314QC	Shared-Borders					
2 📄 SHARED-BORD	10.122.165.198	border	FDO22141QDG	Shared-Borders					

View/Edit Policie	s for SHARED-BORDE	R1 (FDO2214	1QDG)				×
+ / × •	/iew View All Push C	onfig Current S	witch Config		Selected Show Quick Filter	1 / Total 1 💭	
Template	× Policy ID	Fabric Name	Serial Number	Editable	Entity Type	Entity Name	
switch_freeform	POLICY-78700	Shared-Borders	FDO22141QDG	true	SWITCH	SWITCH	
Edit Policy Policy ID: POLICY-7 Entity Type: SWITCH * Priority (1-1000): 50	78700 00 General	Template Name: sv Entity Name: S ¹	vitch_freeform WITCH				
Variables:	* Switch Freeform Conf	route-map direct router bgp 65001 address-family ip redistribute dire neighbor 10.100 remote-as 6500 address-family next-hop-self	iv4 unicast ct route-map direct 100.2 i1 ipv4 unicast			ħ	•
×				Sav	e Push Config	Cancel	

#查找在共享边界的备份SVI上配置的IP地址;如上所示,自由形式将添加到共享边界1交换机上 ,指定的iBGP邻居是共享边界2(10.100.100.2)的邻居

#请注意,在DCNM中提供自由格式中的配置时,请在每个命令后提供正确的间隔(保留偶数空格 ;这意味着,在路由器bgp 65001之后,提供两个空格,然后给neighbor <>命令等)

#还要确保对BGP中的直接路由(环回路由)或其他形式执行重分布直接来通告环回;在上例中 ,创建路由映射直接以匹配所有直接路由,然后在IPv4 AF BGP内完成重分布直接

#从DCNM"保存并部署"配置后,iBGP邻居关系形成如下所示;

SHARED-BORDER1# sh ip bgp 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 57, IPv4 Unicast config peers 5, capable peers 5 18 network entries and 38 paths using 6720 bytes of memory BGP attribute entries [4/656], 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 4 65000 1745 1739 57 0 0 1d04h 5 10.4.10.1 4 65000 1491 1489 57 0 0 10.4.10.6 1d00h 5 0 1490 1487 57 0 4 65002 1d00h 5 10.4.10.18 57 0 10.4.10.22 1490 4 65002 1487 0 1d00h 5 10.100.100.2 4 65001 14 6 57 0 0 00:00:16 18 # iBGP neighborship from #下一步是构建多站点重叠;

步骤 9:从BGW构建多站点重叠到共享边界

#请注意,此处共享边界也是路由服务器

#选择MSD,然后转到"表格视图",在该视图中可以创建新链接;从那里,必须创建新的多站点重叠 链路,并且相关IP地址必须提供正确的ASN,如下所示;必须对所有l2vpn evpn邻居(从每个 BGW到每个共享边界)执行此步骤

← [abric	Builder: MSD					
Swit	ches	Links		Link Management	t – Add Link		×
(+		× C (5		* Link Type	Inter-Fabric	T	
		Fabric Name	Name	* Link Sub-Type	MULTISITE_OVERLAY	*	
		0.01	DOI 10750. Sthemald R. DOI 1006 Sthemald II	* Link Template	ext_evpn_multisite_overlay_s	se: 🔻	
-		DOI Obread Dec		* Source Fabric	DC1	*	
2		DC1<->Shared-Bor	DC1-BGW1~loopback0SHARED-BORDER2~Loopback0	* Destination Fabric	Shared-Borders	*	
3		DC1<->Snared-Bor	DCT-BGW1~I00pDack0SHARED-BORDER1~L00pDack0	* Source Device	DC1-BGW1	*	
4		DC1<->Shared-Bor	DC1-BGW2~loopback0SHARED-BORDER2~Loopback0	* Source Interface	Loopback0	*	
5		DC1<->Shared-Bor	DC1-BGW2~loopback0SHARED-BORDER1~Loopback0	* Destination Device	SHARED-BORDER1	*	
6		DC2	DC2-VTEP~Ethernet1/1DC2-N3K~Ethernet1/1/1	* Destination Interface	Loopback0	· ·	
7		DC2<->Shared-Bor	DC2-BGW1~loopback0SHARED-BORDER2~Loopback0				
8		DC2<->Shared-Bor	DC2-BGW1~loopback0SHARED-BORDER1~Loopback0	 Link Profile 			
9		DC2<->Shared-Bor	DC2-BGW2~loopback0SHARED-BORDER2~Loopback0	General	* BGP Local ASN	65000	BGP Local Autonomous System Number
10		DC2<->Shared-Bor	DC2-BGW2~loopback0SHARED-BORDER1~Loopback0		* Source IP Address	10.10.10.1	Source IPv4 Address for BGP EVPN Peering
11		DC1	DC1-BGW1~Ethernet1/3DC1-SPINE~Ethernet1/3		* Destination IR Adds	10 10 100 1	Destination IPv4 Address for BGP EVPN Peering
12		DC1	DC1-BGW2~Ethernet1/2DC1-SPINE~Ethernet1/2		* DOD Maintheast Chi	66004	RCP Neinhhor Autonomous System Number
13		DC1	DC1-VTEP~Ethernet1/1DC1-SPINE~Ethernet1/1		BGP Neighbor ASN	65001	g bar Neighou Autonomous System Number
14		Shared-Borders<->	SHARED-BORDER2~Ethernet1/4DC2-BGW2~Ethernet1/4	4			
15		Shared-Borders<->	SHARED-BORDER1~Ethernet1/4DC2-BGW2~Ethernet1/2	4	\square		
16		DC2	DC2-VTEP~Ethernet1/3DC2-SPINE~Ethernet1/3				
17		DC2	DC2-BGW2~Ethernet1/1DC2-SPINE~Ethernet1/1				
18		DC2	DC2-BGW1~Ethernet1/1DC2-SPINE~Ethernet1/2				
19		Shared-Borders<->	SHARED-BORDER1~Ethernet1/3DC2-BGW1~Ethernet1/2	4			
20		Shared-Borders<->	SHARED-BORDER1~Ethernet1/2DC1-BGW2~Ethernet1/3	4			
21		DC1<->Shared-Bor	DC1-BGW1~Ethernet1/2SHARED-BORDER1~Ethernet1/1	4			
22		Shared-Borders<->	SHARED-BORDER2~Ethernet1/1DC1-BGW1~Ethernet1/1				
23		Shared-Borders<->	SHARED-BORDER2~Ethernet1/3DC2-BGW1~Ethernet1/3				
24		Shared-Borders<->	SHARED-BORDER2~Ethernet1/2DC1-BGW2~Ethernet1/1				Save

#以上是一个示例;对所有其他多站点重叠链路执行相同操作,最后,CLI如下所示;

SHARED-BORDER1# sh bgp l2vpn evpn summary BGP summary information for VRF default, address family L2VPN EVPN BGP router identifier 10.10.100.1, local AS number 65001 BGP table version is 8, L2VPN EVPN config peers 4, capable peers 4 1 network entries and 1 paths using 240 bytes of memory BGP attribute entries [1/164], 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	21	19	8	0	0	00:13:52	0
10.10.10.2	4	65000	22	20	8	0	0	00:14:14	0
10.10.20.1	4	65002	21	19	8	0	0	00:13:56	0
10.10.20.2	4	65002	21	19	8	0	0	00:13:39	0

SHARED-BORDER2# sh bgp l2vpn evpn summary BGP summary information for VRF default, address family L2VPN EVPN BGP router identifier 10.10.100.2, local AS number 65001 BGP table version is 8, L2VPN EVPN config peers 4, capable peers 4 1 network entries and 1 paths using 240 bytes of memory BGP attribute entries [1/164], 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	22	20	8	0	0	00:14:11	0
10.10.10.2	4	65000	21	19	8	0	0	00:13:42	0
10.10.20.1	4	65002	21	19	8	0	0	00:13:45	0
10.10.20.2	4	65002	22	20	8	0	0	00:14:15	0

步骤 10:在两个站点上部署网络/VRF

#完成多站点底层和重叠后,下一步是在所有设备上部署网络/VRF;

#从交换矩阵上的VRF开始 — > DC1、DC2和共享边界。





#选择VRF视图后,点击"继续";这将列出拓扑中的设备

#由于VRF必须部署到多台交换机(包括边界网关和枝叶),请选中最右边的复选框,然后选择同时 具有相同角色的交换机;例如:DC1-BGW1和DC1-BGW2可一次选择,然后保存两台交换机;之后 ,选择适用的枝叶交换机(此处为DC1-VTEP)



#如上所示,当选择"部署"选项时,之前选择的所有交换机将开始部署,如果部署成功,最终变为绿 色。

#部署网络时必须执行相同步骤;



Network / VRF	Selection Network / Vi	0 ^o Depkyment					
Fabric Nam Network(s).	e: DC1 Spiected						
	Network Extens	ion Attachme	ent - Attach ext	ensions for given switch(es			8
	Fabric Name: DC1						
	Deployment Option	6					
	Molebuog 1005	Laboration and the second	w 100145				Stand Border
	Switch	 VLAN 	Extend	interfaces	CLI Freeform	Status	
	DC1-BOW1	144	MULTISITE	Applicable to BOW Last - VPC only	Freeform config.)	NA	
	☑ DC1-8GW2	144	MULTISITE	Applicable to BOW Leaf - VPC only	Freeform config)	NA	
		J					
						Sm	DC1-BGWI DC7-BGW2

#现在,状态将从"NA"转为"DEPLOYED",并可使用以下交换机的CLI来验证部署

DC1-VTEP	e# sh nve v	ni					
Codes: C	CP - Contro	l Plane DP	- Data	a Plar	ne		
U	JC - Unconf	igured SA	- Sup	press	ARP		
S	SU - Suppre	ss Unknown Unicas	t				
Х	Kconn - Cro	ssconnect					
Μ	IS-IR - Mul	tisite Ingress Re	plicat	ion			
Interfac	ce VNI	Multicast-group	Stat	e Mode	е Тур	e [BD/VRF]	Flags
nvel	100144	239.1.1.144	Up	CP	L2	[144]	# Network1 which is VLan
144 mapp	ed to VNID	100144					
nve1	100145	239.1.1.145	Up	CP	L2	[145]	<pre># Network2 Which is Vlan</pre>
145 mapp	ed to VNID	100145					
nve1	1001445	239.100.100.100	Up	CP	L3	[tenant-1]	<pre># VRF- tenant1 which is</pre>
mapped t	:0 VNID 100	1445					
DC1-BGW1	# sh nve v	ni					
Codes. C	P - Contro	l Plane DP	- Data	a Plar	۱e		
1	IC - Unconf	igured SA	– Supi	nress	ARP		
.9	SU - Suppre	ss Unknown Unicas	:+ 2002)	P1 000			
x	Conn - Cro	ssconnect	C				
N	(S-TR - Mul	tisite Ingress Re	plicat	ion			
			pricac	1011			
Interfac	ce VNI	Multicast-group	Stat	e Mode	е Тур	e [BD/VRF]	Flags
nvel	100144	239.1.1.144	Up	CP	L2	[144]	MS-IR
nve1	100145	239.1.1.145	Up	CP	L2	[145]	MS-IR
nve1	1001445	239.100.100.100	Up	CP	L3	[tenant-1]	
<u></u>	+ +		. ـــــ		<u>ун</u> 1 5		

#以上也来自BGW;简而言之,我们之前在步骤中选择的所有交换机都将与网络和VRF一起部署

#交换矩阵DC2和共享边界也必须执行相同步骤。请记住,共享边界不需要任何网络或第2层 VNID;仅需要L3 VRF。

步骤 11:在枝叶交换机/VTEP上创建下游中继/接入端口

#在此拓扑中,DC1-VTEP和DC2-VTEP的端口Eth1/2和Eth1/1分别连接到主机;因此,将这些端口 作为DCNM GUI中的中继端口进行移动,如下所示



Edit Configuration			
Name DC1-VTEP:Ethernet1/2			
Policy: int_trunk_host_11_1	Y		
General			
* Enable BPDU Guard	no	Enable spanning-tree bpduguard	i
Enable Port Type Fast	Enable spanning-tree edge port b	ehavior	
* мто	jumbo	MTU for the interface	
* SPEED	Auto	Interface Speed	
* Trunk Allowed Vlans	ali	Allowed values: 'none', 'all', or vian ranges (ex.	1-200,500-2000,3000)
Interface Description		Add description to the interface (Max Size 254))
			Note ! All configs she
Freeform Config			strictly match 'show run' c with respect to case and Any mismatches will yiek unexpected diffs during o
4	1		•

#选择相关接口,将"允许的vlan"从none更改为"all"(或仅允许的vlan)

步骤 12:共享边框上需要的自由

#由于共享边界交换机是路由服务器,因此需要对BGP I2vpn evpn邻居关系进行一些更改

#站点间BUM流量使用单播复制;表示在BGW到达VLAN 144(例如)中的任何BUM流量;根据哪 个BGW是指定转发器(DF),DF将执行到远程站点的单播复制;此复制在BGW从远程BGW接收第3类 路由后实现;在此,BGW仅与共享边界形成l2vpn对等;共享边界不应有任何第2层VNID(如果创 建,将导致东/西流量黑洞)。由于第2层VNID缺失,且路由类型3由每个VNID的BGW产生,因此 共享边界不会遵守从BGW传入的BGP更新;要解决此问题,请在AF l2vpn evpn下使用"retain route-target all"

#另一点是确保共享边界不更改下一跳(默认情况下,BGP更改eBGP邻居关系的下一跳);此处 ,站点1到2的单播流量的站点间隧道应从BGW到BGW(从dc1到dc2,反之亦然);为此,必须为 每个l2vpn evpn邻居(从共享边界到每个BGW)创建并应用路由映射

#对于上述两点,必须在共享边框上使用自由形式,如下

route-map direct
route-map unchanged
set ip next-hop unchanged
router bgp 65001
address-family ipv4 unicast
redistribute direct route-map direct
address-family 12vpn evpn
retain route-target all

```
neighbor 10.100.100.2
 remote-as 65001
 address-family ipv4 unicast
   next-hop-self
neighbor 10.10.10.1
  address-family 12vpn evpn
    route-map unchanged out
neighbor 10.10.10.2
  address-family 12vpn evpn
   route-map unchanged out
neighbor 10.10.20.1
 address-family 12vpn evpn
   route-map unchanged out
neighbor 10.10.20.2
  address-family 12vpn evpn
   route-map unchanged out
```

			Selected 1 / Total 1	Ω \$ ·
+ / X View	View All	Push Config Current Switch	Config Show Quick Filter	
Template	Policy ID	Edit Policy		
fre ×		Policy ID: POLICY-78700 Entity Type: SWITCH	Template Name: switch_freeform Entity Name: SWITCH	
switch_freeform	POLICY-7	* Priority (1-1000): 500		
		General		
4	,	Variables: * Swit	coute-map direct route-map unchanged set ip next-hop unchanged router topp 65001 address-family ipv4 unicast redistribute direct route-map direct address-family izvyn evpn retain route-target all neighbor 10.100.100.2 remote-as 65001 address-family ipv4 unicast next-hop-self next-hop-self didhobr 10.10.10.1 address-family izvyn evpn route-map unchanged out neibhor 10.10.2	

步骤 13:BGW上租户VRF内的环回

#对于来自枝叶交换机内连接的主机的北/南流量,BGW使用NVE Loopback1 IP地址的外部SRC IP;默认情况下,共享边界仅与BGW的多站点环回IP地址形成NVE对等;因此,如果vxlan数据包与 BGW Loopback1的外部SRC IP地址到达共享边界,则该数据包将因SRCTEP丢失而被丢弃;为避 免这种情况,必须在每台BGW交换机上创建租户VRF中的环回,然后通告给BGP,以便共享边界接 收此更新,然后与BGW Loopback1 IP地址形成NVE对等;

#最初,NVE对等在共享边界上如下所示

Multisite	Loopback 100 IP address of DC1-BGWs					
nvel	10.222.222.1	Up	СР	01:20:09	0200.0ade.de01	#
Interface	Peer-IP	State	LearnType	Uptime	Router-Mac	_
SHARED-BOR	DER1# sh nve pee					

nve1	10.222.2	222.2				Up	CP	01:17:43 0200.0ade.de02 #
Multisite	Loopbacl	c 100	IP	address o	of DC2-BG	Ws		
Add Interface								:
					* туре	: Loopback	Ŧ	
					* Select a device	e DC1-BGW2	•	
					* Loopback I	2		
					* Policy	: int_loopback_11_1	•	
General								
		`				*		
Interface V	RF tenant-1			Interface VRF name, def	ault VRF if not specified			
* Loopback	IP 172.17.10.2			IP address of the loopbac	ck			
Route-Map T	AG 12345			Route-Map tag associate	d with interface IP			
Interface Descript	ion			Add description to the int	erface (Max Size 254)			
Freeform Cor	fig				Stric with Any une	Note I All configs shi fly match show run (respect to case and mismatches will yiek spected affs during a		

Save Preview Deploy

#如上所示,loopback2是从DCNM创建的,并在租户1 VRF中配置,并给予标记12345,因为这是 路由映射在进行通告时用于匹配环回的标记

```
DC1-BGW1# sh run vrf tenant-1
!Command: show running-config vrf tenant-1
!Running configuration last done at: Tue Dec 10 17:21:29 2019
!Time: Tue Dec 10 17:24:53 2019
version 9.3(2) Bios:version 07.66
interface Vlan1445
 vrf member tenant-1
interface loopback2
 vrf member tenant-1
vrf context tenant-1
 vni 1001445
 ip pim rp-address 10.49.3.100 group-list 224.0.0.0/4
 ip pim ssm range 232.0.0/8
 rd auto
 address-family ipv4 unicast
   route-target both auto
   route-target both auto mvpn
   route-target both auto evpn
 address-family ipv6 unicast
   route-target both auto
    route-target both auto evpn
router bgp 65000
vrf tenant-1
    address-family ipv4 unicast
     advertise 12vpn evpn
redistribute direct route-map fabric-rmap-redist-subnet
     maximum-paths ibgp 2
    address-family ipv6 unicast
      advertise 12vpn evpn
      redistribute direct route-map fabric-rmap-redist-subnet
      maximum-paths ibgp 2
```

DC1-BGW1# sh route-map fabric-rmap-redist-subnet
route-map fabric-rmap-redist-subnet, permit, sequence 10
Match clauses:
tag: 12345
Set clauses:

#在此步骤后,NVE对等项将显示所有Loopback1 IP地址以及多站点环回IP地址。

SHARED-BOR	DER1# sh nve pee				
Interface	Peer-IP	State	LearnType	Uptime	Router-Mac
nve1	192.168.20.1	Up	CP	00:00:01	b08b.cfdc.2fd7
nve1	10.222.222.1	Up	CP	01:27:44	0200.0ade.de01
nve1	192.168.10.2	Up	CP	00:01:00	e00e.daa2.f7d9
nve1	10.222.222.2	Up	CP	01:25:19	0200.0ade.de02
nve1	192.168.10.3	Up	CP	00:01:43	6cb2.aeee.0187
nve1	192.168.20.3	Up	CP	00:00:28	005d.7307.8767
#在此阶段	,应正确转发East/West流量				

步骤 14:从共享边界到外部路由器的VRFLITE扩展

#交换矩阵外部的主机将不得不与交换矩阵内的主机通信。在本例中,共享边界也使这一点成为可能 ;

#任何位于DC1或DC2中的主机都可以通过共享边界交换机与外部主机通信。

#为此,共享边界终止VRF Lite;在本示例中,eBGP从共享边界运行到外部路由器,如开头的图所示 。

#要从DCNM配置此功能,需要添加vrf扩展附件。为实现这一目标,需要执行以下步骤。

a)将交换矩阵间链路从共享边界添加到外部路由器



<	Fabric	Builder: Shared-Borders
Sv	vitches	Links
+	• (5	し、 View/Edit F
		Name
1		SHARED-BORDER2
2		SHARED-BORDER1

#选择链路并添加"交换矩阵间"链路,如下所示

[*] Link Type	Inter-Fabric	•	
* Link Sub-Type	VRF_LITE	V	
* Link Template	ext_fabric_setup_11_1	•	
* Source Fabric	Shared-Borders	T	
Destination Fabric	External	T	
* Source Device		V	
* Source Interface	Ethernet1/49	V	
Destination Device	EXT_RTR	V	
estination Interface	Ethernet1/50	•	
Link Profile General Advanced	* BGP Local AS	65001	Local BGP Autonomous System Number
Link Profile General Advanced	* BGP Local ASM * IP Address/Masi	65001 172.16.222.1/24	Local BGP Autonomous System Number IP address for sub-interface in each VRF
Link Profile General Advanced	* BGP Local ASM * IP Address/Masi * BGP Neighbor IF	65001 172.16.222.1/24 172.16.222.2	Local BGP Autonomous System Number IP address for sub-interface in each VRF Neighbor IP address in each VRF
Link Profile General Advanced	* BGP Local ASM * IP Address/Masl * BGP Neighbor IF * BGP Neighbor ASM	65001 172.16.222.1/24 172.16.222.2 65100	 <i>Q</i> Local BGP Autonomous System Number <i>Q</i> IP address for sub-interface in each VRF <i>Q</i> Neighbor IP address in each VRF <i>Q</i> Neighbor BGP Autonomous System Number
Link Profile General Advanced	* BGP Local ASM * IP Address/Masi * BGP Neighbor IF * BGP Neighbor ASM	65001 172.16.222.1/24 172.16.222.2 65100	 <i>i</i> Local BGP Autonomous System Number <i>i</i> P address for sub-interface in each VRF <i>i</i> Neighbor IP address in each VRF <i>i</i> Neighbor BGP Autonomous System Number
Link Profile General Advanced	* BGP Local ASN * IP Address/Masl * BGP Neighbor IF * BGP Neighbor ASN	65001 172.16.222.1/24 172.16.222.2 65100	 Local BGP Autonomous System Number IP address for sub-interface in each VRF Neighbor IP address in each VRF Neighbor BGP Autonomous System Number
Link Profile General Advanced	* BGP Local ASM * IP Address/Masl * BGP Neighbor IF * BGP Neighbor ASM	65001 172.16.222.1/24 172.16.222.2 65100	 <i>Q</i> Local BGP Autonomous System Number <i>Q</i> IP address for sub-interface in each VRF <i>Q</i> Neighbor IP address in each VRF <i>Q</i> Neighbor BGP Autonomous System Number
Link Profile General Advanced	* BGP Local ASN * IP Address/Masl * BGP Neighbor IF * BGP Neighbor ASN	65001 172.16.222.1/24 172.16.222.2 65100	 Local BGP Autonomous System Number IP address for sub-interface in each VRF Neighbor IP address in each VRF Neighbor BGP Autonomous System Number
Link Profile General Advanced	* BGP Local ASN * IP Address/Masl * BGP Neighbor IF * BGP Neighbor ASN	65001 172.16.222.1/24 172.16.222.2 65100	 Local BGP Autonomous System Number IP address for sub-interface in each VRF Neighbor IP address in each VRF Neighbor BGP Autonomous System Number

Save

#必须从下拉列表中选择VRF LITE子类型

#源交换矩阵是共享边界,目标交换矩阵是外部,因为这将是从SB到外部的VRF LITE

#选择指向外部路由器的相关接口

#提供IP地址、掩码和邻居IP地址

#ASN将自动填充。

#完成此操作后,点击Save

#对共享边界和VRFLITE中的所有外部第3层连接执行相同操作

b)添加VRF扩展

#转到共享边界VRF部分

#VRF将处于部署状态;选中右侧的复选框,以便可以选择多台交换机

#选择共享边框,"VRF EXtension attachment"窗口将打开

#在"extend"下,从"None"更改为"VRFLITE"

#对两个共享边界执行相同操作

#完成后,"Extension Details"(扩展详细信息)将填充上述步骤a)中之前给出的VRF LITE接口。



DOT1Q ID自动填充为2

#其他字段也自动填充

#如果IPv6邻居关系必须通过VRFLITE建立,则应对IPv6执行步骤a)

#现在点击Save

#最后,在网页右上角执行"部署"。

#成功部署将导致将配置推送到共享边界,包括在这些子接口上设置IP地址和与外部路由器建立 BGP IPv4邻居关系

#请记住,在本例中,外部路由器配置(在子接口上设置IP地址和BGP邻居语句)由CLI手动完成。

CLI验证可以通过以下命令在共享边界上完成;

SHARED-BORDER1# sh ip bgp sum vr tenant-1
BGP summary information for VRF tenant-1, address family IPv4 Unicast
BGP router identifier 172.16.22.1, local AS number 65001
BGP table version is 18, IPv4 Unicast config peers 1, capable peers 1
9 network entries and 11 paths using 1320 bytes of memory
BGP attribute entries [9/1476], BGP AS path entries [3/18]
BGP community entries [0/0], BGP clusterlist entries [0/0]

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

 172.16.22.2
 4
 65100
 20
 20
 18
 0
 00:07:59
 1

SHARED-BORDER2# sh ip bgp sum vr tenant-1
BGP summary information for VRF tenant-1, address family IPv4 Unicast
BGP router identifier 172.16.222.1, local AS number 65001
BGP table version is 20, IPv4 Unicast config peers 1, capable peers 1
9 network entries and 11 paths using 1320 bytes of memory
BGP attribute entries [9/1476], BGP AS path entries [3/18]
BGP community entries [0/0], BGP clusterlist entries [0/0]

Neighbor V AS MsgRcvd MsgSent TblVer InQ OutQ Up/Down State/PfxRcd 172.16.222.2 4 65100 21 21 20 0 0 00:08:02 1 #在上述所有配置下,北/南连通性也将如下所示(从外部路由器对交换矩阵中的主机执行ping操作)

EXT_RTR# ping 172.16.144.1 Fabric PING 172.16.144.1 (172.16.144.1): 56 data bytes 64 bytes from 172.16.144.1: icmp_seq=0 ttl=251 time=0.95 ms 64 bytes from 172.16.144.1: icmp_seq=1 ttl=251 time=0.605 ms 64 bytes from 172.16.144.1: icmp_seq=2 ttl=251 time=0.598 ms 64 bytes from 172.16.144.1: icmp_seq=3 ttl=251 time=0.568 ms 64 bytes from 172.16.144.1: icmp_seq=4 ttl=251 time=0.66 ms ^[[A^[[A --- 172.16.144.1 ping statistics ---5 packets transmitted, 5 packets received, 0.00% packet loss round-trip min/avg/max = 0.568/0.676/0.95 ms EXT_RTR# ping 172.16.144.2 # 172.16.144.2 is Host in DC2 Fabric PING 172.16.144.2 (172.16.144.2): 56 data bytes 64 bytes from 172.16.144.2: icmp_seq=0 ttl=251 time=1.043 ms 64 bytes from 172.16.144.2: icmp_seq=1 ttl=251 time=6.125 ms 64 bytes from 172.16.144.2: icmp_seq=2 ttl=251 time=0.716 ms 64 bytes from 172.16.144.2: icmp_seq=3 ttl=251 time=3.45 ms

172.16.144.1 is Host in DC1

64 bytes from 172.16.144.2: icmp_seq=4 ttl=251 time=1.785 ms

--- 172.16.144.2 ping statistics ---5 packets transmitted, 5 packets received, 0.00% packet loss round-trip min/avg/max = 0.716/2.623/6.125 ms

Traceroutes还指向数据包路径中的正确设备

EXT_RTR# traceroute 172.16.144.1

traceroute to 172.16.144.1 (172.16.144.1), 30 hops max, 40 byte packets

1 SHARED-BORDER1 (172.16.22.1) 0.914 ms 0.805 ms 0.685 ms

2 DC1-BGW2 (172.17.10.2) 1.155 ms DC1-BGW1 (172.17.10.1) 1.06 ms 0.9 ms

3 ANYCAST-VLAN144-IP (172.16.144.254) (AS 65000) 0.874 ms 0.712 ms 0.776 ms

4 DC1-HOST (172.16.144.1) (AS 65000) 0.605 ms 0.578 ms 0.468 ms

EXT_RTR# traceroute 172.16.144.2 traceroute to 172.16.144.2 (172.16.144.2), 30 hops max, 40 byte packets 1 SHARED-BORDER2 (172.16.222.1) 1.137 ms 0.68 ms 0.66 ms 2 DC2-BGW2 (172.17.20.2) 1.196 ms DC2-BGW1 (172.17.20.1) 1.193 ms 0.903 ms 3 ANYCAST-VLAN144-IP (172.16.144.254) (AS 65000) 1.186 ms 0.988 ms 0.966 ms 4 172.16.144.2 (172.16.144.2) (AS 65000) 0.774 ms 0.563 ms 0.583 ms EXT_RTR#