Implementación del routing de tránsito de ACI (multipod)

Contenido

ntroducción
rerequisites
Requirements
Componentes Utilizados
ntecedentes
Configurar
Diagrama de la red
Configuraciones
nformación Relacionada

Introducción

Este documento describe cómo configurar el ruteo de tránsito en un entorno multipod de Infraestructura centrada en aplicaciones (ACI).

Prerequisites

Requirements

Cisco recomienda que tenga conocimiento sobre estos temas:

- 1. multipod ACI
- 2. L3Out
- 3. Contratos
- 4. Protocolos de ruteo

Componentes Utilizados

La información que contiene este documento se basa en las siguientes versiones de software y hardware.

- 1. 2 switches N5K-C5548UP, ambos en NXOS versión 7.3(8) (se utilizan como routers externos)
- 2. 1 switch de hoja N9K-C9332PQ y 1 switch de hoja N9K-C93108TC-EX, ambos en ACI versión 14.2(7f)
- 3. 2 switches de columna N9K-C9336PQ, ambos en ACI versión 14.2(7f)
- 4. 1 switch N9K-C9232C (utilizado como dispositivo IPN) en NXOS versión 10.3(3)

La información de este documento se creó utilizando los dispositivos anteriores en un entorno de laboratorio específico. Todos los dispositivos que se utilizan en este documento se pusieron en funcionamiento con una configuración verificada (predeterminada). Si tiene una red en vivo, asegúrese de entender el posible impacto de cualquier comando.

Antecedentes

En el routing de tránsito, el fabric de Cisco ACI anuncia las rutas que se aprenden de una conexión de salida de capa 3 (L3Out) a otra conexión L3Out. Los dominios de capa 3 externos se emparejan con el fabric en los switches de hoja de borde. El fabric es un dominio de protocolo de gateway fronterizo multiprotocolo (MP-BGP) de tránsito entre los pares.

Configurar

Diagrama de la red



Diagrama de la red

Configuraciones

Un perfil de nodo lógico se utiliza para identificar el switch de hoja que está conectado a redes externas y que puede implementar el protocolo de ruteo o rutas estáticas hacia él. Para ver el perfil de nodo lógico en el L3Out, desplácese hasta el Tenant > Networking > L3Outs > L3Out > Logical Node Profile > Logical Node Profile como se muestra en la imagen.



Perfil de nodo lógico para LEAF102

MR Pao	Lociotikish Dedis - M	0.0005						
	Logical Node Profile - Mi	R-OSPF_nodePronie					_ G	
O Quick Start					Policy	Faults	Hist	ory
∼ ∰ MR								
> E Application Profiles						Ó	+	**-
V 🚞 Networking	Properties							
> 🧮 Bridge Domains	Name:	MR-OSPF_nodeProfile						
> 🚞 VRFs	Description:	optional						
> 🧰 External Bridged Networks								
✓	Alias:							
> 🚯 MR-BGP	Target DSCP:	Unspecified 🗸						
> 🚯 MR-EIGRP	Nodes:							+
V 🚯 MR-OSPF		 Node ID 	Router ID	Loopback Address				_
V 🚞 Logical Node Profiles		topology/pod-2/node-202	1.1.1.111	1.1.1.111				
V F MR-OSPF_nodeProfile								
V 🚞 Logical Interface Profiles								
> MR-OSPF_interfaceProfile								
Configured Nodes								
✓								
ARP for VRF-MR:MR-VRF	Create BGP Protocol Profile:							
BGP for VRF-MR:MR-VRF								
> 🐺 ND for VRF- MR:MR-VRF								
> F OSPF for VRF-MR:MR-VRF								
V 🚞 External EPGs								
MR-OSPF-EXT-EPG								

Perfil de nodo lógico para LEAF202

Se utiliza un perfil de interfaz lógica para identificar la interfaz L3Out que se conecta al dispositivo externo. Puede ver varios elementos de función definidos para el routing y el reenvío virtuales (VRF): protocolo de resolución de direcciones (ARP), protocolo de gateway fronterizo (BGP), detección de vecinos y ruta de acceso más corta primero (OSPF) como consecuencia de ambos perfiles. Para ver el perfil de interfaz lógica en el L3Out, desplácese hasta el Tenant > Networking > L3Outs > L3Out > Logical Node Profile > Logical Interface Profiles > Logical Interface Profile. En estos ejemplos, se configura una SVI en el perfil de interfaz lógica.

MR () () () ()	Logical Interface Profi	le - MR-BGP_i	nterfaceProfile						0 0
> O Quick Start								Policy	Faults History
→ III MR									1
> C Application Profiles					General Ro	outed Sub-Interface:	s Routed Int	terfaces	SVI Floating SVI
V Providence Networking									o +
> 🚍 Bridge Domains									0 =
> 🚞 VRFs									≡ +
> 🧮 External Bridged Networks	 Path 	Side A IP	Side B IP	Secondary IP Address	IP Address	MAC Address	MTU (bytes)	Encap	Encap Scope
✓ ➡ L3Outs	Pod-1/Node-102/eth1/1				50 50 50 51/24	00:22 BD F8 19 FF	inherit	vlan-499	Local
✓ ▲ MR-BGP									
V 🚞 Logical Node Profiles									
V = MR-BGP_nodeProfile									
Logical Interface Profiles									
> F MR-BGP_interfaceProfile									
Configured Nodes									
topology/pod-1/node-102									
ARP for VRF-MR:MR-VRF									
BGP for VRF-MR:MR-VRF									
> 📻 ND for VRF- MR:MR-VRF									
> 🗧 OSPF for VRF-MR:MR-VRF									
V 🚞 External EPGs									
MR-BGP-EXT-EPG									
Route map for import and export route control									

Perfil de interfaz lógico para LEAF102, eth1/1

MR	$\bigcirc \bigcirc \bigcirc \bigcirc$	Logical Interface Profile	- MR-OSPF_interfacel	Profile				0.0
> C • Quick Start							Policy Faults	History
Application Profiles				Gen	eral Routed Sub-In	terfaces Routed Inter	rfaces SVI	Floating SVI
V I Networking								4 1
> 🚞 Bridge Domains								0 +
> 🚞 VRFs								11 +
> 🧮 External Bridged Networks		 Path 	IP Address	Secondary IP Address	MAC Address	MTU (bytes)	PTP	
V 🖿 L3Outs		Pod-2/Node-202/eth1/2	10.101.101.101/24		00:22:BD:F8:19:FF	9000	Disabled	
> 🚯 MR-BGP								
> 合 MR-EIGRP								
V 合 MR-OSPF								
V 🚞 Logical Node Profiles								
V MR-OSPF_nodeProfile								
V 🚞 Logical Interface Profil	les							
> F MR-OSPF_interfac	eProfile							
Configured Nodes								
V 📰 topology/pod-2/no	xde-202							
ARP for VRF-M	R:MR-VRF							
> = BGP for VRF-M	R:MR-VRF							
> 📑 ND for VRF- MF	R:MR-VRF							
> 📰 OSPF for VRF-M	MR:MR-VRF							
V External EPGs								
MR-OSPF-EXT-EPG								
Route map for import and exponent and exp	port route control							

Perfil de interfaz lógico para LEAF202, eth1/2

Un perfil de instancia de EPG externo (EPG externo, EPG L3Out) representa un grupo de subredes externas que tienen el mismo comportamiento de seguridad. Otras subredes también se pueden asociar a otros ámbitos, que definen el comportamiento de enrutamiento de esa subred. Para ver el EPG externo en el L3Out, desplácese hasta el Tenant > Networking > L3Outs > L3Out > External EPG s > External EPG como se muestra en la imagen.

MR () () ()	External EPG Instant	nce Profile - MR-B	GP-EXT-EPG						C) 0
C Quick Start					Policy	Operational	State H	ealth Eaults	Hist	001
∼ III MR					Toney	operational	5445		Thore	Un y
> E Application Profiles						Ge	neral Cont	racts Inherited	Contra	cts
V 🖿 Networking								0		Ro
> 🧮 Bridge Domains								0	÷.	~*
> 🧮 VRFs	Properties	MD-RCD-EVT-EDG								
> 🚞 External Bridged Networks	Alias:	MR*BGF*EXT*EFG								
V 🚞 L3Outs	Taos:									
V 🚹 MR-BGP		enter tags separated by comm	a 🖓							
Logical Node Profiles	Global Alias:									
✓	Description:	optional								
Logical Interface Profiles										
> E MR-BGP_interfaceProfile	pcTag:	49159								
Configured Nodes	Contract Exception Tag:									
topology/pod-1/node-102	Configured VRF Name:	MR-VRF								
RP for VRF-MR:MR-VRF	Resolved VRF:	uni/tn-MR/ctx-MR-VRF								
> BGP for VRF-MR:MR-VRF	QoS Class:	Unspecified	\sim							
> ND for VRF- MR:MR-VRF	Target DSCP:	Unspecified	Y							
> SORE FOR VRF-MR:MR-VRF	Configuration Status:	applied								
V 🚞 External EPGs	Declarged Group Mambers	Turbula Include								
# MR-BGP-EXT-EPG	Preferred Group Member.	Exclude)							
Route map for import and export route control	Subnets:								1	
> 🚯 MR-EIGRP		 IP Address 	Scope	Name	Aggregate	e R	oute Control Profile	Route Summaria Policy	tation	
> 🚯 MR-OSPF		49.49.49.49/32	External Subnets f	or th				100 M		ų.

Perfil de instancia EPG externo para MR-BGP L3Out

MR (D) (C) (C) (C) (C) (C) (C) (C) (C) (C) (C	External EPG Insta	nce Profile - MR-O	SPF-EXT-EPG					(
O Quick Start					Dollary	Operational	State He	alth Foulto His	
∼ ∰ MR					Policy	Operational	Stats He	alun Paulus Pils	tory
> E Application Profiles						Ge	neral Contra	cts Inherited Contra	acts
V 🖿 Networking	0000					_		<i>A</i> +	
> 🧱 Bridge Domains								0 -	×*
> 🚞 VRFs	Properties	ND OCOF FYT FDO							
> 🧮 External Bridged Networks	Alias:	MR-USPF-EAT-EPG							- îi
	Taos:								
> 🐽 MR-BGP	taya.	enter tags separated by comm	na 📉						
> 🐽 MR-EIGRP	Global Alias:								
✓	Description:	optional							
✓									
V MR-OSPF_nodeProfile	pcTag:	49156							- 1
Logical Interface Profiles	Contract Exception Tag:								
> 🗧 MR-OSPF_interfaceProfile	Configured VRF Name:	MR-VRF							
Configured Nodes	Resolved VRF:	uni/tn-MR/ctx-MR-VRF							
✓	QoS Class:	Unspecified	×						- 1
ARP for VRF-MR:MR-VRF	Target DSCP:	Unspecified	\sim						
BGP for VRF-MR:MR-VRF	Configuration Status:	applied							
> P ND for VRF- MR:MR-VRF	Destaced Cases Marshas	Traducto - Instanto							
> SORE for VRF-MR:MR-VRF	Preferred Group Member:	Exclude)						. I
V 🚞 External EPGs	Subnets:							1 H	E I
MR-OSPF-EXT-EPG		 IP Address 	Scope	Name	Aggregati	e R	oute Control Profile	Route Summarization Policy	
Route map for import and export route control		101.101.101.101/32	External Subnets for th	h					I.

Perfil de instancia EPG externo para MR-OSPF L3Out

En estos ejemplos, el MR-PERMIT-ICMPse aplica como contrato suministrado y consumido en ambos EPG externos.

MR	000	External EPG	Instance Prof	file - MR-BGP-EX	T-EPG						00
> C+ Quick Start							Policy	Operational Sta	s Health	Faults	History
∼ III MR							T only	operational ou		rearco	Thotony
> E Application Profiles								General	Contracts	Inherited (Contracts
V 🚞 Networking		Healthy 🕜 🖸								0	4 4.0
> 🧮 Bridge Domains		ame	Tenant	Tenant Alias	Contract Turne	Provided /	OoS Class	State	Label	Suble	- ^*
> 🧮 VRFs		arre	renam	Tenant Anas	Contract Type	Consumed	000 0103	State	Caber	Subje	Laber
External Bridged Networks		Contract Type: Con	ract								
V 🖿 L3Outs	M	IR-PERMIT-ICMP	MR		Contract	Provided	Unspecified	formed			
V 🛧 MR-BGP	M	IR-PERMIT-ICMP	MR		Contract	Consumed	Unspecifier	formed			
Logical Node Profiles			THE S		Contract	Consumou	onspective	- Formed			
✓											
Logical Interface Profiles											
> F MR-BGP_interfacePro	ofile										
Configured Nodes											
v i topology/pod-1/node	-102										
ARP for VRF-MR.M	MR-VRF										
BGP for VRF-MR:	MR-VRF										
> E ND for VRF- MR:M	MR-VRF										
> E OSPF for VRF-MR	EMR-VRF										
V 🚞 External EPGs											
MR-BGP-EXT-EPG											
Route map for import and export	rt route control										

Contrato MR-PERMIT-ICMP aplicado a MR-BGP-EXT-EPG

MR () ()	External EPG	Instance Pr	ofile - MR-OSPF-EX	(T-EPG					00
> C► Quick Start < Ⅲ MR						Policy	Operational	Stats Health	Faults History
> E Application Profiles							Gener	al Contracts	Inherited Contracts
V 🚞 Networking	Chicaltha (C) (- + ««
> 🧮 Bridge Domains	Vrieality 🕑 🔾		Terror Aller	0	Description of A	0-0.01		1 sh st	
> 🚞 VRFs	Name	 Tenant 	Tenant Alias	Contract Type	Consumed	QoS Class	s State	Label	Subject Label
External Bridged Networks	Contract Type: Con	tract							
V 🚞 L3Outs	MR-PERMIT-ICMP	MR		Contract	Provided	Unspecified	d formed		
> 🚯 MR-BGP	MD. DEDMIT-ICMD	MD		Contract	Coorumed	Harnasifiar	d formed		
> 🚯 MR-EIGRP	MR-PERMIT-IGMP	MR		Contract	Consumed	Unspecineo	u tormed		
V 🚯 MR-OSPF									
V 🚞 Logical Node Profiles									
V MR-OSPF_nodeProfile									
Logical Interface Profiles									
> MR-OSPF_interfaceProfile									
Configured Nodes									
✓ topology/pod-2/node-202									
ARP for VRF-MR.MR-VRF									
> ■ BGP for VRF-MR:MR-VRF	1								
> E ND for VRF- MR:MR-VRF									
> 🗧 OSPF for VRF-MR.MR-VRF									
V 🚞 External EPGs									
MR-OSPF-EXT-EPG									
Route map for import and export route con	trol								

Contrato MR-PERMIT-ICMP aplicado a MR-OSPF-EXT-EPG

Encendido LEAF102, BGP se establece con el vecino 50.50.50.50 y está recibiendo la red externa 49.49.49/32.

MR () () ()	BGP Peer Entry	y - 50.50.50.	50								0.0
Quick Start											
∼ III MR							General	Address	Health	Faults	History
> E Application Profiles	8 👽 🛆 🔇										0 ±
V Metworking	Properties										
> 🧮 Bridge Domains	1	/rf Name: MR:MF	R-VRF			Lest Denet Dy Lie	1070 01 01	T00-00-00 000-	00.00		
> 🚞 VRFs	BG	P Version: BGP V	ersion 4			Aaior Error Reset By Us	: None	100.00.00.000+	00.00		
> 🧱 External Bridged Networks	Remote	Router Id: 50.50.	50.50		P.	Ainor Error Reset By Us	None				
~ 🖿 L3Outs	В	GP State: Establi	shed	02-00-00		Last Error Value By Us	: 0				
✓ ▲ MR-BGP	Re	mote As: 65001	07-27117.17.22.4	93+00.00		Last Error Len By Us	: 0				
V E Logical Node Profiles	Updat	e Source: vlan14				Last Error Data By Us		TOO. 00. 00. 000.			
	Restart Time A	dvertised Default			Ma	Last Reset By Peer	: 1970-01-01 : None	100:00:00.000+	00:00		
Control Interface Drofiles	н	by Peer: old Time: 180			Min	nor Error Reset By Peer	: None				
Cogical Interface Promos	Keepaliv	e Interval: 60			L	ast Error Value By Peer	: 0				
Mic-Bop_IntenaceProne		Neighbor: 50.50.	50.50			Last Error Len By Peer	: 0				
BGP Peer Connectivity Profile 5		Link: eBGP				Last Error Data By Peer		D			
Configured Nodes	Pe	eer Index: 1				Capabilities Advertised.	multiprotocol	Dynamic Dynam Dynamic old Dy	ic graceful res namic refresh,	fart,Dynamic Graceful restar	t
V 📑 topology/pod-1/node-102	Shutdown	n Reason: Unspe	cified			Canabilities Received	ASA canable	Canability naran	etresh veter Dunamic	Dunamic grace	6.1
RP for VRF-MR:MR-VRF	Directly	Attached				Capatinities Necenter.	restart,Dynar	nic multiprotocol	Dynamic old,E	ynamic refrest	h,Graceful
SGP for VRF-MR.MR-VRF		Interface: Vian 14					TO STATUTE VIEW	incest, remean, r	0110311		
V 🔤 Neighbors	Tcp Md5 Authe	ntication: disable	d								
> = 194.168.1.2	Connection	Dropped: 0									
> 🖻 50.50.50	Connection	Attempts: na									
> P ND for VRF- MR.MR-VRF											
> SOURCE OF STATES OF S	Message Stat	tistics									
External EPGs		Sent	Read								
MR-BGP-EXT-EPG	A	Joint	novu								
Route map for import and export route control	Opens	1	1								
> 🐽 MR-EIGRP	Notifications	0	0								
> 🚯 MR-OSPF	Updates	8	2								
> 🚯 MR-OSPF-BGP	Keepalives	1692	1689								
> 🚞 Dot1Q Tunnels	Route Refresh	0	0								
> E Contracts	Capability	1	1								
> E Policies	Tatal	1700	1000								
> 🖿 Services	Total	1702	1033								
	Total bytes	32485	32186								
	Bytes in queue	0	0								
	Next Hop										

Entrada de peer BGP en LEAF102



Resumen de BGP para VRF MR:MR-VRF en LEAF102



Ruta BGP para VRF MR:MR-VRF en LEAF102

Encendido LEAF202, OSPF se establece con el vecino 1.1.1.222 y está recibiendo la red externa 101.101.101/32.

MR () () ()	OSPF - MR:MR-VRF						0.0
> O+ Quick Start Ⅲ MR</th <th></th> <th></th> <th></th> <th>G</th> <th>eneral Healt</th> <th>n Faults</th> <th>History</th>				G	eneral Healt	n Faults	History
> E Application Profiles	8 👽 🛆 🕥						0 +
V Motworking	PROPERTIES		STATS				
> 🚞 Bridge Domains	Name: MR:MR-	VRF	Int	erface Count: 2			
> 🚞 VRFs	Route ID: 1.1.1.11	1	4	Activeareacnt: 1			
> 🚞 External Bridged Networks	Distance: 110		Active	Nssa Areacnt: 0			
V 🚍 L3Outs	Bandwidth Reference		Active	Ext Areacht: 1			
> 🚯 MR-BGP	(Mbps): 40000			Extareacnt: 1			
> 🚯 MR-EIGRP	Operational State: Up			Nssa Areacnt: 0			
✓				Stubareacnt: 0			
Logical Node Profiles				Areacht: 1			
V			0	pagas Lsacht: 0			
V							
AR-OSPE interfaceProfile	Neighbors						
Configured Nodes	 Neighbor Id 	State	Peer Ip		Interface		
V topology/pod-2/node-202	1.1.1.222	Full	10.101.101	.100	eth1/2		
ARP for VRF-MR-MR-VRF	Page 1 Of 1		Objects Per Page: 1			Displaying Ohie	cts 1 - 1 Of 1
BGP for VRF-MR-MR-VRF	Inter Drotegel Doute Look In		Objects Per Page.			Displaying Obje	cta i - i oi i
> D for VRF= MR:MR-VRF	Inter Protocol Route Leak In	to USPF					
V DSPF for VRF-MR:MR-VRF	 Name 	Redistribution Protocol	Route Map	Scope	Asn		
> 🖿 Areas	MR:MR-VRF	BGP	exp-ctx-proto-2555906	Inter protocol leak	6553	5	
→ Interfaces	MR:MR-VRF	COOP	exp-ctx-st-2555906	Inter protocol leak	1		
F Interface eth1/2	MR:MR-VRF	Direct	exp-ctx-st-2555906	Inter protocol leak	1		
E Interface Io1	MR:MR-VRF	EIGRP	exp-ctx-proto-2555906	Inter protocol leak	1		
Routes	MD-MD-V/DE	Statia	evo_etv_et_2555006	Inter protocol leak	1		
V 🚞 External EPGs	MPCMPC VPC	01800	exp=cix=st=2000000	inter protocorreak			
MR-OSPF-EXT-EPG							
> E Route map for import and export route control							

Entrada de vecino OSPF en LEAF202

LEAF202# show : OSPF Process :	ip ospf neighbors vrf ID default VRF MR:MR-V	MR:MR-VRF RF			
Total number of	of neighbors: 1				
Neighbor ID	Pri State	Up Time	Address	Interface	
1.1.1.222	1 FULL/ -	2d04h	10.101.101.100	Eth1/2	

vecino OSPF para VRF MR:MR-VRF en LEAF202



Ruta OSPF para VRF MR:MR-VRF en LEAF202

En ambos LEAF102 y LEAF202, la tabla MP-BGP para el VRF muestra la red BGP externa, 49.49.49.49/32, pero aparece como externo en LEAF102 y interna en LEAF202. La red externa OSPF, 101.101.101.101/32, también aparece en las tablas de BGP en ambos switches hoja; en LEAF202 se muestra como redistribuido desde OSPF y encendido LEAF102 se muestra como interno.

LEAF102# show bgp vp BGP routing table in BGP table version is Status: s-suppressed Path type: i-interna Origin codes: i - IG	nv4 unicast vrf MR formation for VRF 119, local router , x-deleted, S-sta l, e-external, c-c P, e - EGP, ? - in	:MR-VRF overlay-1, add ID is 10.0.23 le, d-dampened confed, l-local complete, -	ress famil 2.68 , h-histor , a-aggreg multipath,	y VPNv4 Unicast y, *-valid, >-best ate, r-redist, I-injected & - backup
Network Route Distinguisher:	Next Hop 102:2555906 (V	Metric /RF MR:MR-VRF)	LocPrf	Weight Path
*>e49.49.49.49/32	50.50.50.50			0 65010 65001 i
*>i101.101.101.101/3	2 20.0.248.0	41	100	9 ?

Tabla MP-BGP para VRF MR:MR-VRF en LEAF102

LEAF202# show bgp vpr BGP routing table in BGP table version is Status: s-suppressed Path type: i-internal Origin codes: i - IGF	NV4 unicast vrf formation for VR 95, local route , x-deleted, S-s L, e-external, c P, e - EGP, ? -	MR:MR-VRF F overlay-1, add r ID is 20.0.248 tale, d-dampened -confed, l-local incomplete, -	ress famil .0 , h-histor , a-aggreg multipath,	ly VPNv4 ry, *-val: gate, r-re & - back	Jnicas id, >-l edist, <up< th=""><th>t Dest I-inje</th><th>ected</th><th>d</th></up<>	t Dest I-inje	ected	d
Network Route Distinguisher:	Next Hop 202:2555906	Metric (VRF MR:MR-VRF)	LocPrf	Weight	Path			
*>i49.49.49.49/32	10.0.232.68		100	0	65010	65001	i	
*>r101.101.101.101/32	2 0.0.0.0	41	100	32768	?			

Tabla MP-BGP para VRF MR:MR-VRF en LEAF202

La tabla BGP IPv4 contiene información equivalente.

```
LEAF102# show bgp ipv4 unicast vrf MR:MR-VRF
BGP routing table information for VRF MR:MR-VRF, address family IPv4 Unicast
BGP table version is 37, local router ID is 50.50.50.55
Status: s-suppressed, x-deleted, S-stale, d-dampened, h-history, *-valid, >-best
Path type: i-internal, e-external, c-confed, l-local, a-aggregate, r-redist, I-injected
Origin codes: i - IGP, e - EGP, ? - incomplete, | - multipath, & - backup
                                          Metric
                                                     LocPrf
  Network
                      Next Hop
                                                                Weight Path
*>e49.49.49.49/32
                      50.50.50.50
                                                                      0 65010 65001 i
*>i101.101.101.101/32 20.0.248.0
                                              41
                                                        100
                                                                      0
                                                                        ?
```

Tabla BGP IPv4 para VRF MR:MR-VRF en LEAF102



Tabla BGP IPv4 para VRF MR:MR-VRF en LEAF202

Sin embargo, la red externa OSPF, 101.101.101/32, no se encuentra en la tabla de enrutamiento de N5K1.



RIB para VRF MR-BGP en N5K1

Del mismo modo, la red externa BGP, 49.49.49/32, no está en N5K2 Es RIB.

N5K2# show ip route vrf MR-OSPF IP Route Table for VRF "MR-OSPF" '*' denotes best ucast next-hop '**' denotes best mcast next-hop '[x/y]' denotes [preference/metric] '% <string>' in via output denotes VRF <string></string></string>
<pre>1.1.1.111/32, ubest/mbest: 1/0 *via 10.101.101, Eth1/5, [110/41], 2d05h, ospf-1, intra 10.101.101.0/24, ubest/mbest: 1/0, attached *via 10.101.101.100, Eth1/5, [0/0], 6d22h, direct 10.101.101.100/32, ubest/mbest: 1/0, attached *via 10.101.101.100, Eth1/5, [0/0], 6d22h, local 101.101.101.101/32, ubest/mbest: 2/0, attached *via 101.101.101.101, Lo101, [0/0], 2d04h, local *via 101.101.101.101, Lo101, [0/0], 2d04h, direct</pre>

RIB para VRF MR-OSPF en N5K2

En BGP L3Out, navegue hasta External EPGs > External EPG > Subnets y seleccione la + situado en la esquina superior derecha de la tabla. Introduzca la dirección IP de la subred externa recibida desde OSPF L3Out, 101.101.101.101/32. Elegir Export Route Control Subnet en el Route Control y borre la External Subnets for the External EPG clasificación. Haga clic en Submit. Export Route Control Subnet permite exportar (anunciar) una red al par externo.

V 🚞 External EPGs		Preferred Group Member:	Exclude Include					_
MR-BGP-EX	T-EPG	Subnets:						(+)
> 🛧 MR-EIGRP			 IP Address 	Scope	Name	Aggregate	Route Control Profile	Route Summarization Policy Create
> 🚹 MR-OSPF			49.49.49.49/32	External Subnets for ti	h			
Crear nueva subre	ed							
Create Subnet								? ×
IP Address: 1	101.101.101.101/32							
80	ddress/mask							
Name:								
Route Control:								
Export R	Route Control Subnet	Ag	gregate			Route Summariza	tion Policy	
Import R	loute Control Subnet					BGP Route Summa	Policy: select an opt	ion 🗸
Shared F	Route Control Subnet						10107.	
Route Control Profile:								÷ 1
	Name				Direction			. +
Route control is	used for filtering extern	al routes advertised ou	it of the fabric, all	lowed into the fabr	ic, or leaked to othe	er VRFs within the fa	bric.	
External EPG classification	on:							
External	Subnets for External EPG							
Shared S	Security Import Subnet							
External EPG cla	ssification is used to ide	entify the external netw	vorks associated	with this external E	PG for policy enfor	cement (Contracts).		
							Car	ncel Submit

Encendido N5K1, la red externa OSPF, 101.101.101.101/32, ahora se recibe sobre BGP.



RIB para VRF MR-BGP en N5K1

En OSPF L3Out, navegue hasta External EPGs > External EPG > Subnets y seleccione la + situado en la esquina superior derecha de la tabla. Ingrese la dirección IP de la subred externa recibida desde el BGP L3Out, 49.49.49.49.32. Elegir Export Route Control Subnet en el Route Control sección y borrar External Subnets for the External EPG clasificación. Haga clic en Submit.



Crear nueva subred

Create Subnet				(2⊗
IP Address:	49.49.49.49/32			
Name:	addressymask			
Route Control:	Route Control Subnet	Aggregate	Route Summarization Policy	
Import		Aggregate Export	select an option	\sim
Shared	d Route Control Subnet			
Route Control Profile:				☆ +
	Name	Direction		1000 I
Route control is External EPG classifical Extern Shared	s used for filtering external routes advertis tion: al Subnets for External EPG d Security Import Subnet	ed out of the fabric, allowed into the fabric, or leaked to o	ther VRFs within the fabric.	
External EPG cl	lassification is used to identify the externa	I networks associated with this external EPG for policy en	forcement (Contracts).	

Cancel

Configure las opciones correctas para la nueva subred

Ahora en N5K2, la red externa BGP, 49.49.49/32, se recibe a través de OSPF.

N5K2# show ip route vrf MR-OSPF
IP Route Table for VRF "MR-OSPF"
'*' denotes best ucast next-hop
'**' denotes best meast next-bon
'[x/y]' denotes [preference/metric]
[x,y] denotes in via output denotes VPE estrings
Asserting/ in via output denotes via (string/
1 1 1 111/22 ubort/mbort, 1/0
1.1.1.111/32, ubest/ mbest: 1/0
*via 10.101.101.101, Eth1/5, [110/41], 2d05h, ospf-1, intra
10.101.101.0/24, ubest/mbest: 1/0, attached
*via 10.101.101.100, Eth1/5, [0/0], 6d22h, direct
10.101.101.100/32, ubest/mbest: 1/0, attached
*via 10.101.101.100, Eth1/5, [0/0], 6d22h, local
49.49.49/32, ubest/mbest: 1/0
*via 10.101.101.101, Eth1/5, [110/1], 00:01:59, ospf-1, type-2, tag 4294967295,
101.101.101/32, ubest/mbest: 2/0, attached
*via 101.101.101.101, Lo101, [0/0], 2d05h, local
*via 101.101.101.101, Lo101, [0/0], 2d05h, direct

RIB para VRF MR-OSPF en N5K2

Ping funciona entre las dos redes debido a la MR-PERMIT-ICMP que se aplicó anteriormente a ambos EPG externos.

```
N5K1# ping 101.101.101.101 vrf MR-BGP source 49.49.49.49

PING 101.101.101.101 (101.101.101) from 49.49.49.49: 56 data bytes

64 bytes from 101.101.101.101: icmp_seq=0 ttl=252 time=3.059 ms

64 bytes from 101.101.101.101: icmp_seq=1 ttl=252 time=2.963 ms

64 bytes from 101.101.101.101: icmp_seq=2 ttl=252 time=7.928 ms

64 bytes from 101.101.101.101: icmp_seq=3 ttl=252 time=2.954 ms

64 bytes from 101.101.101.101: icmp_seq=4 ttl=252 time=2.982 ms

---- 101.101.101.101 ping statistics ----

5 packets transmitted, 5 packets received, 0.00% packet loss

round-trip min/avg/max = 2.954/3.977/7.928 ms
```

Verificación de la comunicación en N5K1

```
N5K2# ping 49.49.49.49 vrf MR-OSPF source 101.101.101.101
PING 49.49.49.49 (49.49.49) from 101.101.101.101: 56 data bytes
64 bytes from 49.49.49.49: icmp_seq=0 ttl=252 time=3.107 ms
64 bytes from 49.49.49.49: icmp_seq=1 ttl=252 time=2.99 ms
64 bytes from 49.49.49.49: icmp_seq=2 ttl=252 time=2.98 ms
64 bytes from 49.49.49.49: icmp_seq=3 ttl=252 time=2.986 ms
64 bytes from 49.49.49.49: icmp_seq=4 ttl=252 time=2.99 ms
--- 49.49.49.49 ping statistics ---
5 packets transmitted, 5 packets received, 0.00% packet loss
round-trip min/avg/max = 2.98/3.01/3.107 ms
```

Verificación de la comunicación en N5K2

Información Relacionada

- Guía de configuración de redes de capa 3 de Cisco APIC, versión 6.0(x)
- Fundamentos de Cisco Application Centric Infrastructure, versión 4.2(x)
- <u>Guía de configuración de redes de capa 3 de Cisco APIC, versión 3.x y anteriores</u>
- Soporte técnico y descargas de Cisco

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