Peering della route L4-L7 con fabric di transito -Procedura dettagliata per la configurazione

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Introduzione

Questo documento descrive la procedura dettagliata per la configurazione del grafico dei servizi L4-L7 con peer route, in cui sia il consumer che il provider sono esterni alla struttura ACI (Application Centric Infrastructure).

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Prerequisiti

Requisiti

Cisco raccomanda la conoscenza dei seguenti argomenti:

- Pool di VLAN statiche che verranno utilizzati per l'incapsulamento della VLAN tra i dispositivi esterni e la struttura ACI
- Domini fisici e di routing esterni che connetteranno la posizione (nodo/percorso foglia) dei dispositivi esterni e il pool di VLAN
- Connessione di livello 3 a una rete esterna (L3Out)

I passaggi precedenti relativi alle configurazioni **Fabric Access** e **L3Out** non sono illustrati in questo documento e si presume che siano già stati completati.

Componenti usati

Le informazioni di questo documento si basano sulle seguenti versioni software:

- Cisco Application Policy Infrastructure Controller (Cisco APIC) 1.2(1m)
- Pacchetto dispositivo Adaptive Security Appliance (ASA) 1.2.4.8
- ASA 5585 9.5(1)
- Nexus 3064 6.0(2)U3(7)

Le informazioni discusse in questo documento fanno riferimento a dispositivi usati in uno specifico ambiente di emulazione. Su tutti i dispositivi menzionati nel documento la configurazione è stata ripristinata ai valori predefiniti. Se la rete è operativa, valutare attentamente eventuali conseguenze derivanti dall'uso dei comandi.

Premesse

Route Peering è una funzionalità che consente a un'appliance di servizio, ad esempio un servizio di bilanciamento del carico o un firewall, di annunciare la raggiungibilità del dispositivo attraverso la struttura ACI fino a una rete esterna.

Lo scenario di utilizzo presentato qui è un firewall fisico distribuito come un Service Graph a due bracci, tra due L3Out o gruppi di endpoint esterni (EPG, External End Point Group). Il grafico del servizio è associato a un contratto tra l'EPG esterno sulla foglia 101 (N3K-1) e l'EPG esterno sulla foglia 102 (N3K-2). L'infrastruttura ACI fornisce un servizio di transito per i router (N3K-1 e N3K-2) e viene utilizzato Route Peering, con Open Shortest Path First (OSPF) come protocollo di routing, per scambiare le route tra il firewall e l'infrastruttura ACI.

Configurazione

Esempio di rete

Nell'immagine seguente viene illustrato il funzionamento end-to-end di Peering route:



VRF1 / BD1		VRF2 / BD2					
EXTERNAL-EPG	EXTERNAL	INTERNAL	INTERNAL EXTERNAL-EPG				
N3K-1 L3OUT	L3OUT EXTERNAL	ASA INTERNAL L3OUT					
10.10.10.0/24 192.168.1.0/30	192.168.1.4/30	.10 192.168.1.8/30	.14 .13 PROVIDER 192.168.1.12/30 20.20.20.0/24				
ping 20.20.20.1 source 10.10.10.1							

Configurazione

Passaggio 1. Configurare Virtual Routing and Forwarding1 (VRF1), VRF2, Bridge Domain1 (BD1) e BD2. Associare BD1 a VRF1 e BD2 a VRF2, come mostrato nell'immagine:



Passaggio 2. Caricare il pacchetto del dispositivo ASA in un dispositivo L4-L7, come mostrato nell'immagine, :



Configurare il dispositivo L4-L7 per l'appliance ASA 5585 (routing) fisica, come mostrato nell'immagine:

ahaha cisco		Tenants							P		w
		earch: enter name, descr	common T1 infra								
Tenant T1		 O 		ACAEEOE							
💼 Quick Sta	rt		L4-L7 Devices	- ASA5565							
🔺 🐣 Tenant T	1									Policy Parameters	: Fa
🕨 🖿 Applic	ation Profiles		GH								
🔺 🚞 Netwo	orking										
🕨 🚞 Bri	dge Domains		General			Device 1					
🕨 🖿 VR	Fs		Manaj	jed: 🗹		Management IP Address:	172.23.97.1	Management Port: 443	÷		
🕨 🖿 Ext	ternal Bridged Networks		Na	me: ASA5585		Chassis:	select a value	- (Ð			
🕨 🖿 Ext	ternal Routed Networks		Device Packs	ige: CISCO-ASA-1.2		Interfaces:					
🕨 🖿 Ro	ute Profiles		Service T	/pe: Firewall							
🕨 🖿 Pri	otocol Policies		Device T	pe: PHYSICAL			 Name 		Path		
🖿 L4-L7	Service Parameters		Physical Dom	ain: T1_PHY	<u>-</u> C		GigabitEthernet0/0		Node-105/eth1/2		
🔺 💼 Secur	ity Policies		Context Aw	are: Single			GigabitEthernet0/1		Node-106/eth1/2		
🕨 🖿 Co	ntracts		Function T	/pe: GoThrough GoTo			-				
🕨 🖿 Tal	boo Contracts		Cluster Mr	ide: Single Node	-						
🕨 🖿 Imj	ported Contracts		oldoter mi	de. bilgie libite		Cluster					
🕨 🖿 Fill	ters		Credentials			Management IP Address:	172.23.96.228	Management Port: 443	•		
🕨 🖿 Troubl	leshoot Policies		Userna	me: admin		Device Manager:	172.23.97.1	~ @			
🕨 💼 Monito	pring Policies		Passw	ord:		Cluster Interfaces:					
🔺 🖿 L4-L7	Services		Confirm Passw	ord:	_						
▶ 💼 L4-	L7 Service Graph Templates				_		Туре	 Name 	Concrete Interfaces		
🕨 🛄 Ro	uter configurations		Configuration	State			provider	inside	ASA5585_Device_1/[Gi	igabitEthernet0/1]	
🕨 🚞 Fu	nction Profiles		Configuration Issu	ies:			concurner	outeide	ASA5585_Device_1/[Gi	igabitEthernet0/0]	
🔺 🛄 L4	-L7 Devices		Devices St	ate: stable			consumer	VUIDIGE			
> 1	ASA5585										
🕨 🛄 Imj	ported Devices										
k 🗖 Do	visos Coloction Polision										

Passaggio 3. Configurare L3Out per N3K-1 e associarlo a BD1 e VRF1.

La rete con routing esterno viene utilizzata per specificare la configurazione di routing nella struttura ACI per il peer route, come mostrato nell'immagine:

ululu cisco				VM Networking	L4-L7 Services	Admin	Operations
		earch: enter name, descr	common infra mgmt T1				
Tenant T1							
Quick Start			L3 Outside - N3K-1	L3001			
🔺 🐣 Tenant T1							
🕨 🖿 Applicatio	n Profiles						
🔺 🚞 Networkin	g						
🕨 🖿 Bridge	Domains		⊖ ±				A O O
🕨 🖿 VRFs			Properties				
🕨 🚞 Extern:	al Bridged Networks		FIUPEILIES	N3K-1 130UT			
🔺 🖿 Extern	al Routed Networks		Description	: optional			
🕨 🔲 Set	Action Rule Profiles		2.5001/2101				
🕨 💻 Mat	ch Action Rule Profiles		Таля				
▶ 😁 AS/	A_IN_L3OUT		- Taga	enter tags separated by	/ comma		
► C AS/			Label	:			
 Mail <li< th=""><th>K-2 L30UT</th><th></th><th>Target DSCP</th><th>: unspecified</th><th></th><th></th><th></th></li<>	K-2 L30UT		Target DSCP	: unspecified			
Route	Profiles		Route Control Enforcement	Import	🗹 Export		
Protoc	ol Policies		VRF	: T1/VRF1	- d2		
🖿 L4-L7 Ser	vice Parameters		Received VPE	TIME1			
🕨 🖿 Security P	olicies		External Routed Domain	: T1 L3OUT	- rB		
🕨 🖿 Troublesh	oot Policies		Route Profile for Interleak	select a value	C		
🕨 🖿 Monitoring	Policies		Route Control For Democring		U		
🕨 🖿 L4-L7 Ser	vices		Route Control For Dampening				
				 Address Family T 	уре		
							No item
							Select Actio
			Enable BOB/ELOPB/OODE				
			Enable BOP/EIGRP/USPF		LIEIGRP		
			OSPF Area ID	: 0.0.0.1			
			OSPE Area Control	Sond radiatribute	d L SAc into NSSA prop		
			Con Alea Control	 Originate summa 	ny LSA		
				Suppress forward	ding address in translated LSA		
			OSPF Area Type	: NSSA area 🛛 Re	egular area Stub area		
			OSPF Area Cost	: 1	¢		

Nota: Tutte le interfacce L3Out utilizzate per il routing peer devono essere configurate come interfaccia virtuale dello switch (SVI) con l'encap VLAN corrispondente.

cisco										i ven
		n: enter name, descr	common infra mgmt 1							
Tenant T1		S 0	Logical Interface	Drofile N2K 1	ID					
💼 Quick Start			Logical Interface	Profile - NSK-1_	11-					
🔺 🐣 Tenant T1										Policy Fault
🕨 🖿 Applicatio	n Profiles									
🔺 🚞 Networkin	g									
🕨 🖿 Bridge	Domains		Properties							
🕨 🖿 VRFs				Name: N3K-1_IP						
🕨 🚞 Extern	al Bridged Networks		D	escription: optional						
🔺 🚞 Extern	al Routed Networks									
🕨 🚞 Set	Action Rule Profiles			Label:						
🕨 🚞 Mai	tch Action Rule Profiles		1	ND policy: select a value	*					
🕨 🕾 AS/	A_IN_L3OUT		Egress Data Plane Polic	ing Policy: select a value	•					
🕨 🕾 ASJ	_OUT_L3OUT		Ingress Data Plane Polic	ing Policy: select a value						
🔺 🕮 N3	K-1_L30UT		Devited	Interference	<u> </u>					
	Logical Node Profiles		Routed	Interfaces:						
A 1	N3K-1_NP			A Path		IP Address	MAC	Address	MTU (Bytes	0
	Logical Interface Profiles						No items have been f	aund		
	N3K-1_IP						Select Actions to create a	new item.		
	SPF Interface Profile									
	Configured Nodes		4							
	topology/pod-1/node-105			SVI:						
	Networks			A Path	IP Address	Side & IP	Side B ID	MAC Address	MTU (Bides)	Facen
	Route Profiles			hede 405/elb4	1 7454664 2/20	000741	04001	00/32/00/50/00/55	4500	ulae 400
▶ 🚍 N3	R=2_L3001			Node-Tosvetri	13 192.100.1.2/30	1		00.22.BD.F0.19.FF	1500	Vian-100
P Route	Profiles									
= 1417.8or	via Policies									
Equip B	olicios		Routed Sub-	Interfaces:						
Troublest	unit Policies									
Monitoring	Policies			A Path	IP	Address	MAC Address	MTU (Bytes)		Encap
▶ ■ L4-L7 Set	vices						No items have been f	ound.		
							SHELL ALLOIS TO CREATE &	10077 8/0011		

Configurare il controllo route di importazione/esportazione nelle subnet per l'EPG esterno N3K-1 L3Out, come mostrato nell'immagine:

ululu cisco								Q
		arch: enter name, descr	common infra mgmt					
Tenant T1		a 0	External Network	Instance Profile	- N3K-1 EXT NET			
🔲 Quick Start			External NetwOrk	matarice Fruille	NOR-LEATINET			
🔺 🐣 Tenant T1								Policy Operatic
🕨 🕨 Applicatio	n Profiles							or and the
🔺 🖿 Networkir	ıg							General
🕨 🖿 Bridge	Domains		₽₹				100 🕕 100	
VRFs			Properties					
🕨 🖿 Extern	al Bridged Networks		Name	N3K-1 EXT NFT				
🔺 🛄 Extern	al Routed Networks		Tags:	1 8				
▶ 💻 Set	t Action Rule Profiles			enter taga separated by comma	2			
🕨 💻 Ma	tch Action Rule Profiles		Description:	optional				
▶ 🖽 AS.	4_IN_L3OUT							
▶ 🖽 AS:	A_OUT_L3OUT		Configued VRF name:	VRF1				
M3	K-1_L30UT		Resolved VRF:	uni/tn-T1/ctx-VRF1				
	Logical Node Profiles		QoS Class:	Unspecified 🗸				
1	INGK-1_NP I maint late Control Profile		Target DSCP:	unspecified				
	Logical Interface Profiles		Configuration Status:	applied				
	 E N3K-1_IP Configured bladge 		Configuration Issues:					
	Contigured Nodes		Subnets:					
	 Networks 			• ID Address	e		Agamant-	Boute Control Profile
	N3K-1 EXT NET				scope		Mggregate	KUBLE CONTROLPTOTILE
	L4-L7 Service Parameters			10.10.10.0/24	External Subne	ets for the External EPG		
-	Route Profiles			20.20.20.0/24	Export Route C	Control Subnet		
▶ 🕾 N3	K-2_L30UT							
🕨 🖿 Route	Profiles							
🕨 🖿 Protoc	ol Policies		Route Control Profile:					
🖿 L4-L7 Ser	vice Parameters			▲ Name			Di	rection
🕨 🖿 Security P	olicies						No itame have be	en found.
🕨 🖿 Troublesh	100t Policies						Select Actions to crea	ate a new item.
🕨 🖿 Monitoring	1 Policies							
. 		h.						

Configurare L3Out per l'interfaccia esterna ASA e associarlo a BD1 e VRF1, come mostrato nell'immagine:

uluilu cisco		Tenants					٩
		arch: enter name, descr	common T1 infra mgm				
Tenant T1 Quick Start		⊴ 0	L3 Outside - ASA_	OUT_L3OUT			
Applicatio Applicatio Applicatio Networkin Bridge VRFs Extern: Extern:	n Profiles ig Domains al Bridged Networks al Paulad Networks		Properties	e: ASA_OUT_L3OUT			
Extern Extern Extern Extern Extern Set Se	al Houte A Networks Action Rule Profiles Action Rule Profiles A_IN_L3OUT Logical Node Profiles Networks Route Profiles <-1_L3OUT K-2_L3OUT Profiles		Description Tage Labe Target DSCF Route Control Enforcemen VRF Resolved VRF Resolved VRF External Routed Domain	c optional control tags separated by co co c control tags separated by co c control tags control tags	mma *		
L4-L7 Ser Security P Troublesh	ol Policies vice Parameters olicies voot Policies		Route Profile for Interleal	C select a value	 ₽	Route D	ampening Policy
 Monitoring L4-L7 Ser 	; Policies vices					No items have been fou Select Actions to create a ne	nd. wikem.
			Enable BOP/EIGRPIOSPF	BOP OSFF OSFF Orginate summary Orginate summary Suppress forwarding NSSA area Fegu t:	EIGRP		

uluiju cisco	System	Tenants	Fabric VM P	letworking	L4-L7 Services	Admin	Operations	٩	i	Adva welcor
		arch: enter name, descr	common T1 infra mgmt							
Tenant T1			Logical Interface Profil	- ASA OUT						
💼 Quick Start			Logical Interface Profil	e-ASA_001	1216					
🔺 🚢 Tenant T1										Policy Faults
🕨 🖿 Application	Profiles									
🔺 🚞 Networkin	3									
🕨 🖿 Bridge	Domains		Properties							
🕨 🖿 VRFs			Nam	e: ASA_OUT_IP						
🕨 🖿 Externa	I Bridged Networks		Descriptio	n; optional						
🔺 💼 Externa	I Routed Networks									
🕨 🖿 Set	Action Rule Profiles		Lab	el:						
🕨 🖿 Mat	h Action Rule Profiles		ND polic	select a value	-					
🕨 🕾 ASA	IN_L3OUT		Faress Data Plane Policing Polic	r solast e velue						
🖌 🕾 ASA	_OUT_L3OUT		lances Date Place Pallala Palla	y- aciect a value						
A 🖬	ogical Node Profiles.		Ingress Data Plane Policing Polic	y: select a value	· ·					
∡ [ASA_OUT_NP		Routed Interface	s:						
	🔲 Logical Interface Profiles			 Path 		IP Address		MAC Address	MTU (Bytea)	
	ASA_OUT_IP									
	📃 OSPF Interface Profile						No items have b Select Actions to cre	een found. ate a new item.		
	E Configured Nodes									
	🔺 📃 topology/pod-1/node-105		4							
	BGP for VRF-T1.VRF1		s	/1:						
	OSPE for VRF-T1.VRF1									
) i 🗎 🖬 1	letworks			A Path	IP Address	Side A IP	Side B IP	MAC Address	MTU (Bytes)	Encap
> m	Route Profiles			Node-105/eth1/2	192.168.1.6/3	0		00:22:8D:F8:19:FF	1500	vlan-101
▶ 🕾 N3F	-1_L30UT									
🕨 🖽 N3ł	-2_L3OUT									
🕨 🖿 Route I	Profiles									
🕨 🖿 Protoce	I Policies		Routed Sub-Interface	s:						
🚞 L4-L7 Sen	ice Parameters			 Path 	IF	^o Address	MAC Address	MTU (Bytes)	E	лсар
🕨 🚞 Security Pi	licies			_						
🕨 🖿 Troublesh	oot Policies						No items have b Select Actions to cre	een round. sate a new item.		
🕨 🖿 Monitoring	Policies									
L4-L7 Ser	ices									

Configurare il controllo route di importazione/esportazione nelle subnet per l'EPG esterno L3Out ASA, come mostrato nell'immagine:

cisco								م ا	i
		Search: enter name, descr	common T1 infra mg						
Tenant T1		a 🖸	External Notwork	Instance Profile		NET			
🔲 Quick Start				mistance Fruille	- ASA_OUT_EXT	THE L			-
🔺 🐣 Tenant T1		ì						Policy	Operational Stats
🕨 🖿 Applicatio	in Profiles	1							Contrasta
🔺 🖿 Networkir	ng	1							Contracts
🕨 🖿 Bridge	• Domains	ì					🛆 🛕 🕕 🛑 100		
🕨 🖿 VRFs		1	Branartian						
🕨 🚞 Extern	al Bridged Networks	h h	Froperties	ASA OUT EXT NET					
🔺 🛅 Extern	al Routed Networks	1	Name: Tags:	A3A_UUI_EAI_NEI					
🕨 🖿 Sei	t Action Rule Profiles	h h	raga.	enter tags separated by comma	8				
🕨 🚞 Mai	tch Action Rule Profiles	1	Description:	optional					
🕨 🕾 AS	A_IN_L3OUT	h h							
🔺 🕾 AS	A_OUT_L3OUT	h h	Configued VRF name:	VRF1					
> =	Logical Node Profiles	h h	Resolved VRF	uni/tn-T1/ctx-VRF1					
	Networks		QoS Class:	Unspecified 🗸					
4 .	ASA_OUT_EXT_NET		Target DSCP:	unspecified					
_	L4-L7 Service Parameters		Configuration Status	annlind					
▶ 💼	Route Profiles	h h	Configuration Status:	applied					
▶ 🗠 N3.	1K-1_L30UT	1	Subnate						
🕨 🕾 N3	3K-2_L30UT	1	4						
🕨 🖿 Route	Profiles	h h		 IP Address 	Scope		Aggregate	Route Control Profile	Route Summa
🕨 🖿 Protoc	col Policies	1		10.10.10.0/24	Export Rou Shared Rou	te Control Subnet			
L4-L7 Sei	rvice Parameters	1		20 20 20 0/24	External Su	bnets for the External EPG			
Security P	Policies	h h			Shared Ro	ute Control Subnet			
Troublest	hoot Policies	h h							
Monitoring	g Policies	h h	Route Control Profile:						
L4-L7 Sei	nvices	1							
		ì		 Name 			Direction		
							No items have been found. Select Actions to create a new item.	с.	

Configurare L3out per ASA-Internal e associarlo a BD2 e VRF2, come mostrato nell'immagine:

ululu cisco								P
		rich: enter name, descr	common T1 infra mgm					
Tenant T1		S 0						
Quick Start			L3 Outside - ASA_	IN_L3001				
🔺 🚢 Tenant T1								
🕨 🖿 Applicatio	n Profiles							
🔺 🚞 Networkin	g							
🕨 🖿 Bridge	Domains		⊖±					
🕨 🖿 VRFs			Dreparties					
🕨 🖿 Externa	al Bridged Networks		Properties	AFA IN LOUIT				
🔺 🚞 Extern	al Routed Networks		Nam	e: asa_in_Loooi				
🕨 🖿 Set	Action Rule Profiles		Descriptio	. optional				
🕨 🖿 Mat	ch Action Rule Profiles		T					
🔺 🕾 AS/	A_IN_L3OUT		lag.	enter taga separated by c				
4 •	Logical Node Profiles		Labe	d:				
► 1	📃 ASA_IN_NP		Target DSCF	o: unspecified				
	Networks		Route Control Enforcemen	1 Dimnait	- Evnort			
	Route Profiles							
▶ 65 AS/	(_OUI_L3OUI		VRI	F: T1/VRF2	<u> </u>			
▶ 🗠 N3	K-1_L3001		Resolved VR	F: T1/VRF2				
P 😅 N3	R-2_L3UUT		External Routed Domain	n: T1_L3OUT	<u> </u>			
P Rodie	ol Policiae		Route Profile for Interlea	k: select a value	<u> </u>			
14-17 Ser	vice Parameters		Route Control For Dampenin	g:				
En En El roci	olicies			 Address Family Ty 	De		Route Dampening Policy	
Troublesh	oot Policies				-			
🕨 🖿 Monitoring	Policies					No items have t Select Actions to cre	seen found. sate a new item.	
🕨 🕨 🖿 L4-L7 Ser	vices							
			Enable BGP/EIGRP/OSP	F: 🔲 BGP	EIGRP			
				OSPF				
			OSPF Area II	D: 0				
			OSPF Area Contro	ol: 🗹 Send redistributed	LSAs into NSSA area			
				Originate summan	/LSA			
					ng address in salislated LOA			
			OSPF Area Typ	e: NSSA area Rec	ular area Stub area			
			OSPF Area Cos	t: 0				

uluilu cisco	System	Tenants	Fabric	VM Networking	L4-L7 Services	Admin	Operations	Q	i		Advanced Moo welcome, admin
		arch: enter name, descr	common T1 infra mgr								
Tenant T1		 O 	Logical Interface	Profile - ASA IN	ID						
💼 Quick Start			Logical interface i	FIGHE - AGA_IN	_1r						
🔺 🚢 Tenant T1										Policy	Faults Histor
🕨 🚞 Application	Profiles										ACTIONS -
🔺 🚞 Networking											ACTIONS
🕨 🖿 Bridge D	Domains		Properties								
🕨 🖿 VRFs				Name: ASA_IN_IP							
🕨 🖿 External	Bridged Networks		D	escription: optional							
🔺 🚞 External	Routed Networks										
🕨 🖿 Set A	ction Rule Profiles			Label:							
🕨 🚞 Matel	h Action Rule Profiles		,	ND policy: select a value	•						
🔺 🕾 ASA	IN_L30UT		Egress Data Plane Polici	ing Policy: select a value							
🔺 💼 U	ogical Node Profiles		Ingress Data Place Polici	ing Policy: select a value							
4 📜	ASA_IN_NP		ingreas cereir reine ronch	ing Folicy: select a value							
4	Logical Interface Profiles		Routed	Interfaces:							× +
	🔺 🗒 ASALINLIP			- Path		IP Address	MAG	Address	MTU (Bytes)		
	📃 OSPF Interface Profile						Ale Rener brue brees	found			
4	Configured Nodes						Select Actions to create	a new item.			
	topology/pod-1/node-106										
▶ 🛄 N	etworks		*								
🕨 🛄 R	toute Profiles			SVI:							× +
► 🖽 ASA_	OUT_L3OUT				1D. Andreas	014- 410	0.45 0.10	MAG Address	MTU (Desca)		
▶ 🕮 N3K-	1_L30UT			A Path	IF Address	Side A IP	Side b IP	MAC Address	MID (bytes)	Encap	
▶ 🖾 N3K-	-2_L3OUT			Node-106/eth	/2 192.168.1.1	0/30		00:22:BD:F8:19:FF	1500	vlan-102	
Route P	rofiles										
Protocol	Policies										
L4-L7 Servi	ce Parameters		Routed Sub-	Interfaces:							
Security Pol	licies										× +
Troublesho	ot Policies			🔺 Path		IP Address	MAC Address	MTU (Bytea)	Encap		
Monitoring F	Policies						No items have been	found.			
🖻 💻 L4-L7 Servi	Ces						Select Actions to create	a new item.			

Configurare il controllo route di importazione/esportazione sulle subnet per l'EPG esterno L3Out interno ASA, come mostrato nell'immagine:

uluilu cisco								٩
		nch: enter name, descr	common T1 infra mg					
Tenant T1		 O 	External Network	Instance Profile	- ASA IN EXT NE	=т		
💼 Quick Start			External Network	instance Frome		- '		
🔺 🐣 Tenant T1								Policy Ope
🕨 🖿 Applicatio	on Profiles							Consta
🔺 🚞 Networki	ng							Cenera
🕨 🛑 Bridge	e Domains		⊖±				🗥 🛕 🕕 🕕 🚺 100	
VRFs			Properties					
Extern	nal Bridged Networks		Name:	ASA IN EXT NET				
4 🔳 Extern	nal Routed Networks		Tags:		•			
Se Se	It Action Rule Profiles			enter tags separated by comma	9			
Ma	Iten Action Hule Profiles		Description:	optional				
	Logical Node Profiles							
	Logical Node Frontes		Configued VRF name:	VRF2				
	ASA IN EXT NET		Resolved VRF:	uni/tn-T1/ctx-VRF2				
	Route Profiles		QoS Class:	Unspecified -				
► 🖨 AS	A OUT LIGUT		Target DSCP:	unspecified				
▶ 🕾 N3	=		Configuration Status:	applied				
▶ 🕾 N3	- 3K-2_L3OUT		Configuration Issues:					
🕨 🖿 Route	Profiles		subnets:					
🕨 🖿 Proto	col Policies			 IP Address 	Scope		Aggregate	Route Control Profile
🖿 L4-L7 Se	rvice Parameters			10.10.10.0/24	External Sub	nets for the External EPG)	
🕨 🖿 Security F	Policies			20.20.20.021	Export Route	e Control Subnet	4	
🕨 🖿 Troubles	hoot Policies			20.20.20.0/24	Shared Rout	te Control Subnet		
🕨 💼 Monitorin	g Policies							
▶ 🖿 L4-L7 Se	rvices		Route Control Profile:					
							_	
				▲ Name			D	irection
							No items have be Select Actions to crea	ten found.
							2000 1000 000	

Configurare L3Out per N3K-2 e associarlo a BD2 e VRF2, come mostrato nell'immagine:

ululu cisco							Ą
		earch: enter name, descr	common T1 infra mgmt				
Tenant T1		0 10	L2 Outside N2K 2				
💼 Quick Start			L3 Outside - NSK-2	_L3001			
🔺 🐣 Tenant T1							
🕨 🖿 Applicatio	n Profiles						
🔺 💼 Networkin	1g						
🕨 🖿 Bridge	Domains		⊖±			🛆 🔺 🕕 🕕	
VRFs			Dreparties				
🕨 🖿 Externa	al Bridged Networks		Properties				
🔺 🚞 Extern	al Routed Networks		Name.	non-z_Loui			
🕨 🖿 Set	Action Rule Profiles		Description.	opuonar			
🕨 🖿 Mat	tch Action Rule Profiles						
🕨 🕾 AS/	A_IN_L3OUT		Tags:		<u> </u>		
🕨 🕾 AS/	A_OUT_L3OUT		Label:	emer tağa separated by d	Jinna		
▶ 🙆 N3I	K-1_L3OUT		Tarriet DSCP	unspecified			
🔺 🕾 N3	K-2_L3OUT		Dente Control Enformente		- <u>-</u>		
> •	Logical Node Profiles		Route Control Enforcement	lmport	✓ Export		
> •	Networks		VRF:	T1/VRF2	<u>▼</u> 🗗		
> •	Route Profiles		Resolved VRF.	T1/VRF2			
Route	Profiles		External Routed Domain:	T1_L3OUT	<u>▼</u> @		
Protoc	ol Policies		Route Profile for Interleak:	select a value	- ₽		
L4-L7 Ser	vice Parameters		Route Control For Dampening				
Security P	olicies						
Troublesh	noot Policies			 Address Family Typ 	98	Route	Dampening Policy
Monitoring	g Policies					No items have been fi	ound.
L4-L7 Ser	vices					belect Actions to create a	new item.
			Enable BGP/EIGRP/OSPF	BOP			
				OSPF			
			OSPF Area ID:	0.0.0.1			
			ORDE Area Control	🛛 Oossed op diedeikude di	Otto into NOOt or a		
			COPP Alea Collab.	Originate summary	LSA		
				Suppress forwardin	g address in translated LSA		
			OSPF Area Type:	NSSA area Reg	ular area Stub area		
			OSPF Area Cost:	0	•		
					<u>.</u>		
1							

ululu cisco	System	Tenants	Fabric VM	Networking	L4-L7 Services	Admin	Operations	Q	i	
		sarch: enter name, descr	common T1 infra mgmt							
Tenant T1		0 N	Logical Interface Profi	la - N3K-2 ID						
🔲 Quick Start			Logical Interface From	ic - Noic 2_ii						_
🔺 🚢 Tenant T1										Policy Fau
🕨 🖿 Application	n Profiles		Ð₩							
🔺 🚞 Networkin	g									
🕨 🚞 Bridge	Domains		Properties							
🕨 🖿 VRFs			Nar	ne: N3K-2_IP						
🕨 💼 Externa	al Bridged Networks		Descripti	on: optional						
🔺 🚞 Externa	al Routed Networks									
🕨 🖿 Set	Action Rule Profiles		Lat	el:						
🕨 🖿 Mat	ch Action Rule Profiles		ND poli	cy: select a value	•					
► 🖽 ASA	_IN_L3OUT		Egress Data Plane Policing Poli	cy: select a value	-					
► 🖽 ASA	_OUT_L3OUT		Ingress Data Plane Policing Poli	cy: select a value	•					
▶ 🖽 N3F	(-1_L3OUT		Douted Interfee		<u> </u>					
A GP N31	<-2_L3OUT		Rouled Internac	85.						
4	Logical Node Profiles			A Path		IP Address	MAC A	ddress	MTU (Bytes)	
4.1	N3K-2_NP						No items have been fou	ind.		
-	Logical Interface Profiles						Select Actions to create a n	iew item.		
	▲ N3K-2_IP									
	USPF Interface Profile		•							
	 Contigured Nodes 		5	WI:						
	Networks Route Profiles			A Path	IP Address	Side A IP	Side B IP	MAC Address	MTU (Bytes)	Encap
k 🗖 Routo I	Profile Profiles			Node-106/eth1/4	192 168 1 14/30			00:22:BD:E8:19:EE	1500	vian-103
Protoco	1 Policies							and a second second second		
L4-L7 Sen	vice Parameters									
En En Security Pr	nlicies									
Troublesh	not Policies		Routed Sub-Interfac	es:						
🕨 🚞 Monitoring	Policies			. Doth	ID Addee		MAC Address	MTU (Dates)	Feed	
L4-L7 Ser	vices			- Faul	IP Addre	55 55	WAG AUGIESS	wito (bytes)	Enca	P
							No items have been for Select Actions to create a n	und. Jew item.		

Configurare il controllo route di importazione/esportazione nelle subnet per N3K-2 L3Out per EPG esterno, come mostrato nell'immagine:

cisco								م
		arch: enter name, descr	common T1 infra mg					
Tenant T1		S 🖸	Extornal Notwork	Instance Profile	N2K 2 EXT NET	т		
🔲 Quick Start			External Network	Instance Prome	- NOR-2_EAT_INE	1		
🔺 🚢 Tenant T1								Policy Operational
🕨 🖿 Application	n Profiles							Our set
🔺 🖿 Networkin	g							General C
🕨 🖿 Bridge	Domains		⊖ ±				Δ 🛕 🕕 🕛 🚺 100	
🕨 🖿 VRFs			Dranartino					
🕨 🖿 Externa	al Bridged Networks		Flopenties	NSK 2 EVT NET				
🔺 🖿 Externa	al Routed Networks		Tags:	NSN-2_EXT_NET	<u> </u>			
🕨 🖿 Set	Action Rule Profiles			enter taga separated by comm	18			
🕨 🛄 Mat	ch Action Rule Profiles		Description:	optional				
► 🖾 ASA	LIN_L3OUT							
► 🖽 ASA	L3OUT_L3OUT		Configued VRF name:	VRF2				
▶ 🖽 N3ł	<-1_L30UT		Resolved VRF:	uni/tn-T1/ctx-VRF2				
A GO N31	K-2_L30UT		QoS Class:	Unspecified -				
	Logical Node Profiles		Target DSCP:	unspecified	-			
4	Networks		Configuration Status:	applied				
× 1	N3K-2_EXT_NET		Configuration Issues:					
	L4-L7 Service Parameters		Subnets:					
h 🗖 Douto I	Route Promes							
Rotier	ol Policioc			 IP Address 	Scope		Aggregate	Route Control Profile
= 14-17 Sen	dre Parameters			10.10.10.0/24	Export Route	e Control Subnet		
E4-Lr Service Provide Provi	nlicies			20.20.20.0/24	External Sub	bnets for the External	IEPG	
Troublesh	ont Policies							
Monitoring	Policies							
▶ 🔲 4- 7 Ser	VICES		Route Control Profile:					
				 Name 			D	lirection
							No items have be Select Actions to crea	sen found. ate a new Rem.

Passaggio 4. Creare il gruppo di profili di funzione e configurare il profilo di funzione dal modello esistente, come mostrato nell'immagine:

							۵ ۵) j	welco
	arch: enter name, descr	common T1 infra							
	0 🖻	1417 Sonvisor	Eurotion Profile	ASA5595 ED					
		L4-L7 Services	Function Frome	- ASA5565_FF					
									General Faults
		$\mathbf{O} \mathbf{I}$							A
eters		Properties							
		Nan	ne: ASA5585_FP						
3		Descriptio	on:						
		Associated Function	on: CISCO-ASA-1.2/Firewall						
ph Templates									
ons									
·F		FEATURES AN	ID PARAMETERS	5					
		Features:	Basic Pa	rameters All Parameters					
Policies			Meta Folde	sr/Param Key		Name	Value Mandator	Lacked	Shared
nstances		Interfaces	🖌 😂 De	vice Confia		Device			
		AccessLists		Access List		access-list-inbound		false	false
ent Configuration for L4-L1	7 devices	NAT		Interface Related Configuration		externallf		false	false
		TrafficSelectionOl	biects 🔹 🕨	Interface Related Configuration		internallf		false	false
		All	🔺 😅 Fu	nction Config		Function			
			> 💭	External Interface Configuration	L. C.	EitConfig		false	false
			> 💭	Internal Interface Configuration		IntConfig		faise	false
	eters 9 ph Templates ons 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9	eters e eters e Policies sstances e ent Configuration for L4-L7 devices	eters	eters eters eters eters e ters	eters eters eters eters e ters	eters	Properties Name: ASA5985_FP eters Name: ASA5985_FP > Descriptor: Associated Function: (SCO.ASA-1.2Firewall Properties Name: ASA5985_FP Descriptor: Associated Function: (SCO.ASA-1.2Firewall Pedicies Name: Asa5985_FP Descontipe: Asa595_FP Descriptor	eters	eters eters eters ph Templates ors Properties Norme AsASSIG. PP Description: Associated Function CISCO ASA 1.2 Firewall Properties Norme AsaSSIG. PP Properties Norme AsaSSIG. PP Properties Properties Norme AsaSSIG. PP Properties Properties Properties Norme AsaSSIG. PP Properties

i

L4-L7 Services Function Profile - ASA5585_FP

						General Faults	3 Histo
		⚠ ▲ 🕕 🕕					ACTIONS -
Properties Name: ASA5585 Description: Associated Function: CISCO-AS	_FP \$A.1.2/Firewall						
	METERS Basi: Parameters All Parameters						
	Meta Folder/Param Key	Name	Value	Mandatory	Locked	Shared	
Interfaces	✓	Device					
AccessLists	Access List	access-list-inbound			false	false	
NAT	Interface Related Configuration	externallf			false	false	
TrafficSelectionObjects	🔺 🖼 Access Group	ExtAccessGroup			false		
All	🔤 Inbound Access List	name	access-list-inbound	false	false		
	🔺 😅 Interface Specific Configuration	externallfCfg			false		
	🔺 😅 IPv4 Address Configuration	IPv4Address			false		
	IPv4 Address	ipv4_address	192.168.1.5/30	true	false		
	E Security Level	external_security_level	50	false	false		
	Interface Related Configuration	internallf			false	false	
	🔺 😅 Interface Specific Configuration	internallfCfg			false		
	IPv4 Address Configuration	IPv4Address			false		
	IPv4 Address	ipv4_address	192.168.1.9/30	true	false		
	E Security Level	internal_security_level	100	false	false		
	🔺 😅 Function Config	Function					
	External Interface Configuration	ExtConfig			false	false	
	Interface Configuration	ExtConfigrel	externallf	false	false		
	Internal Interface Configuration	IntConfig			false	false	
	└ 国 Interface Configuration	InConfigrel	internallf	false	false		

Passaggio 5. Creare un contratto e modificare il campo Ambito in Tenant, come mostrato nell'immagine:



Passaggio 6. Come mostrato nell'immagine, creare un modello di Service Graph L4-L7 in cui l'associazione di Service Graph implica l'associazione di un criterio di rete con routing esterno e la configurazione del router a un criterio di selezione del dispositivo.

:	
ALL TENANTS Add Tenant Search: enter name	cr i common i Ti i infa i mgmt
Tenant T1	C L4L7 Service Grant Template - ASA5585 SGT
💼 Quick Start	L+L/ Service Graph Template - ASA3363_361
🖌 🚢 Tenant T1	Tapalogy Pr
Application Profiles	
Networking	
💼 L4-L7 Service Parameters	Consumer
Security Policies	
🕨 💼 Troubleshoot Policies	A\$A5585
🕨 💼 Monitoring Policies	
L4-L7 Services	NI
🔺 🔤 L4-L7 Service Graph Templates	N1
ASA5585_SGT	- ASA5565 Information
Function Node - N1	Firewall: Routed
🕨 💼 Router configurations	Profile: ASA5585_FP
Function Profiles	
L4-L7 Devices	
Imported Devices	
Devices Selection Policies	
🕨 💼 Deployed Graph Instances	
Deployed Devices	
Inband Management Configuration for L4-L7 devices	
🕨 💼 Device Managers	
🕨 🧰 Chassis	

Create L4-L7 Service Graph Template		i X
Drag device clusters to create graph nodes. Device Clusters T /ASA5585 (Managed Firewall)	Graph Name: ASA5585_SGT Graph Type: Consumer Consumer Consumer Consumer Ceg ASA5585 N1 Please drag a device from devices table and drop it here to create a service node. ASA5585 Information Firewall: Routed Transparent Porfile: T1/ASA5585_FPG/ASA5585_FP C	Provider EPG
	SUBM	AIT CANCEL

Configurazione del router per specificare l'ID del router che verrà utilizzato sull'appliance Service (ASA 5585), come mostrato nell'immagine:

ululu cisco		Tenants	Fabric	VM Networking	L4-L7 Services	Admin
	ALL TENANTS Add Tenant Se	arch: enter name, descr	common T1 infra			
Tenant T1		 O 	Router configu	ration - ASA5585		
🔲 Quick Start						
Applicat	ion Profiles					
 Application Network 	ina		€₹			
L4-L7 S	ervice Parameters		Properties			
🕨 🖿 Security	Policies		Na	me: ASA5585		
🕨 🖿 Trouble	shoot Policies		Router	ID: 3.3.3.3		
🕨 🥅 Monitori	ng Policies		Descript	on: optional		
🤺 🖿 L4-L7 S	ervices					
▶ 💼 L4-L	7 Service Graph Templates					
🔺 🚞 Rou	er configurations					
A	BA5585					
🕨 🖿 Fund	tion Profiles					
▶ 💼 L4-L	7 Devices					
🕨 🚞 Impo	rted Devices					
🕨 🖿 Devi	ces Selection Policies					
🕨 🖿 Depl	oyed Graph Instances					
🕨 💻 Depl	oyed Devices					
📃 Inba	nd Management Configuration for L4-L	7 devices	4			
🕨 💻 Devi	ce Managers					
🕨 💻 Cha	ssis					

Modificate il tipo di adiacenza da L2 a L3, come mostrato nell'immagine:

uluih cisco									ρ	
		arch: enter name, descr	common T1 infra mg							
Tenant T1		 O 	1.4-1.7 Service G	anh Template -	ASA5585 SCT					
💼 Quick Star	t		L-LI Service G	apri rempiate -	A949909_991					
🔺 🐣 Tenant T1										Topology
🕨 🖿 Applica	tion Profiles		Ð₩							
🕨 🖿 Networ	king									
🖿 L4-L7 :	Service Parameters		Properties							
🕨 🖿 Securit	y Policies		Name:	ASA5585_SGT						
Trouble	eshoot Policies		Template Name:	UNSPECIFIED						
Monito	ing Policies		Configuration Issues:							
4 L4-L7	Bervices		Description:	optional						
L4-	L7 Service Graph Templates									
	ASA0080_SGI		Label:							
	Consumer		Function Nodes:	🔺 Name		Function Name	1	Function Type		Description
	nrovider			N1		CISCO-ASA-1.2/Firev	vall	GoTo		
▶ ■ Rot	iter configurations									
► 🖿 Fur	ction Profiles									
▶ 🖿 L4-	_7 Devices									
🕨 🖿 Imp	orted Devices									
▶ 💼 De\	ices Selection Policies		•							
🕨 🖿 Dej	oloyed Graph Instances									
▶ 🖿 De;	loyed Devices		Terminal Nodes:	 Name 		Pi	rovider/Consumer		Description	
📃 Inb	and Management Configuration for L4-L7	7 devices		T1		с	onsumer			
Dev	ice Managers			T2		P	rovider			
🕨 🖿 Chi	issis									
			Connections:	 Name 	Connected Nodes		Unicast Route	Adjacency Type	Desi	cription
				C1	N1, T1		True	L3		
				C2	N1, T2		True	L3		

Applica modello di Service Graph, come mostrato nell'immagine:



Allegare il diagramma assistenza al contratto, come mostrato nell'immagine:

ALTERNATE LAST Tendel 1 State Market	uluilu cisco										
Turnet Ti Image: Decision Profiles Turnet Ti Appliculator Profiles Networking Likit Zientee Praimaters Bescure Profiles Turnet Times Turnet States Tu			Search: enter name, descr	common T1 infra							
 Contract Trouble Stand Application Profiles Application Profiles Security Profiles Security Profiles Security Profiles Contract Contract Detwork: T1/NSK-1_LSOUT/NSK-1_EXT_N ● Contract Contract Detwork: T1/NSK-1_LSOUT/NSK-2_EXT_N ● Contract Contract Detwork: T1/NSK-1_LSOUT/NSK-2_EXT_N ● Contract Profiles Contract Contract Detwork: T1/NSK-1_LSOUT/NSK-1_EXT_N ● Contract Contract Detwork: T1/NSK-1_LSOUT/NSK-2_EXT_N ● Contract Contract Detwork: T1/NSK-1_LSOUT/NSK-1_EXT_N ● Contract Contract Detwork: T1/NSK-1_LSOUT/NSK-2_EXT_N ● Contract Contract Detwork: T1/NSK-1_EXT_N ● Contract Contract Detwork: T1/NSK-1_EXT_N ● Contract Contract Detwork: T1/NSK-1_EXT_N ● Contract Nerre PERT_ALL No Filter (Allow All Taffic) ● 	Tenant T1		 Ø 	Apply L4-L7 Servi	ce Graph Template	To EPGs					i X
L Curdinations Consumer EPG / External Network: T1/NSK-1_ESUTJ/NSK-1_EXT_NI € Provider EPG / External Network: T1/NSK-2_EXT_NI € © Consumer EPG / External Network: T1/NSK-1_EXT_NI € © Consu	Quick Start Quick Start Tenant T1 Application I Detworking	Profiles		STEP 1 > Contra	act					1. Contract	2. Graph
Indexter and a decision of the function of	L4-L7 Service	e Parameters cles it Policies		Config A Contract	Between EPGs			anida EDO / Estan el Maturalo III (2	
 Rouler configurations Function Profiles L4-L7 Derices Dexices Station Policies Deployed Oraph Instances Deployed Oraph Instances Dexice Managers Chassis 	Monitoring F	olicies es rvice Graph Templates		- Contract Information -	Contract: Contract:	ontract	Choose An Existing Co	ntract Subject	3-2_L3001/N3K-2_EAT_NI ♥	5.5	
	Control Contro Control Control Control Control Control Control Con	nnigurations Profiles vices Devices Selection Policies		Contra No Filter (Allow	act Name: PERMIT_ALL						
	Deployer Deployer Deployer Deployer Deployer Deployer Devloe N Devloe N Devloe N	I Graph Instances I Devices anagement Configuration for L4- anagers	-L7 devices								
PREVIOUS NEXT CAN										PREVIOUS	CANCEL



Se necessario, aggiungere/modificare il parametro L4-L7, come mostrato nell'immagine:

uluih cisco										
		Search: enter name, descr	common T1 infra r							
Tenant T1		S 10	Apply L4-L7 Servic	e Graph Template	To EPGs					í) X
Treast 1 Cuck Start Application Cuck Start	Profiles e Parameters cides e Parameters cides e Policies e Profiles e Policies e e Parameters cides e policies e e e e e e e e e e e e e e e e e e e	-L7 devices	Apply L4-L7 Service STEP 3 > ASA55 config parameters Profile Name ASA Features: Interfaces AccessLists MAI TrafficSelectionO All	bised Graph Template bised Graph Template bised of the selected device bi	Graph Templefe2A-applyGraphW d Parameters Al Parameter dotor/Parameters Al Parameter dotor/Parameters Al Parameter dotor/Parameters Al Parameter dotor/Parameters Al Parameter dotor/Parameters Al Parameters dotor/Parameters doto	iew:3:applyFrofile_editic	con' style='display: inline-block; widt Name Device access-list-inbound externalif internalif Function ExtComing	1. Contract	2. Graph	3. ASA5585 Parameters Write Domain
				RED in	dicators parameters needed to b	e updated and GREEN i	niconing	d to the provider EPO.	F	REVIOUS FINISH CANCEL

Passaggio 7: Criteri tag route, configurare i criteri tag route per VRF1 (tag:100), come mostrato nell'immagine:

uluiju cisco		Tenants										A wel
		earch: enter name, descr	common infra mgr									
Tenant T1 Quick Start Quick Start		0 18	VRF - VRF1					Policy	Operational	Stats	Health	Faul
 Application Application Networking 	n Profiles		€¥			🛆 🛦 🕕 🕕 100						
Bridge VREs	Domains		Properties									
🔺 🖻 VR	F1		Route Tag Policy	- VRF1_RTP			i ×					
0	EPG Collection for Context						Policy History					
Extern	iF2 al Bridged Networks		Properties				ACTIONS *					
 Extern Route 	al Routed Networks Profiles		Na	me: VRF1_RTP								
Protoc L4-L7 Se	ol Policies wice Parameters											
 Security F Troublesi 	folicies noot Policies			lag: 100	<u>•</u>							
 Monitorin L4-L7 Se 	g Policies rvices											
				▲ EIGRF	Address Hamily Type	SHOW USAGE	SUBMIT CLOSE					
						No items ha Select Actions to	ve been found. I create a new item.					
				DNS labels: Route Tag Policy: VRF1_RT	P 🗸 🗗							
									s	HOW USAG	E SU	IBMIT

Configurare il criterio Route-Tag per VRF2 (Tag:200), come mostrato nell'immagine:

ululu cisco												
		earch: enter name, descr	common infra mg									
Tenant T1		2 B	VRE - VRE2									
🔲 Quick Start			VIXI - VIXI Z					-				
Tenant T1								Policy	Operational			Fault
Application			<u>਼</u> ₹			Δ \Lambda 🕕 🕕 100						
Interviewerkerkerkerkerkerkerkerkerkerkerkerkerke	e Domains		Route Tag Policy	VENDER BTD								
🔺 🖿 VRFs			Roule Tay Polic	y - VIXEZ_IXTE								
🕨 🖻 VE	RF1						Policy History					
D A	RF2		⊖±				ACTIONS *					
 Extern Extern 			Properties									
Route	e Profiles		N	ame: VRF2_RTP								
🕨 💼 Proto	col Policies		Descrip	otion: optional								
🔲 L4-L7 Se	ervice Parameters		_				_					
Security I	Policies			Tag: 200	•							
Troubles												
Monitorii 1 4-1 7 Se												
							-					
						SHOW USAGE	SUBMIT CLOSE					
			EIGRP CONIEX	Per Aduress Farmiy.								
				FIGRE	Address Family Type		FIGRP Address Family Context					
				- 600	Pladrona renny Typo		Contractional Participation of the Automatic					
						Select Actions to cr	eate a new item.					
				DNS labels:								
				oute Tag Policy: VRF2_RT	· · · ·							
									S	HOW USAGE	SUB	BMIT

Passaggio 8: Controllare lo stato e verificare il criterio di selezione del dispositivo, come mostrato nell'immagine:

ululu cisco							Operations				
		arch: enter name, descr	common T1 infra mg								
Tenant T1		S 🔊	Logical Interface	Context concu	mor						
💼 Quick Start			Logical Interface Context - consumer								
🔺 🐣 Tenant T1											
Application Profiles											
🕨 🖿 Networki	ng										
🖿 L4-L7 Se	rvice Parameters		Properties								
🕨 🖿 Security F	Policies		Connector Name:	consumer							
Troubles	hoot Policies		Cluster Interface:	Cluster Interface: outside V							
Monitoring Policies			Associated Network:	Associated Network: Bridge Domain L3 External Network : L3 External Network: T1/ASA_OUT_L3OUT/4 ~ 10							
▲ ■ L4-L7 Services			L3 External Network:								
L4-L7 Service Graph Templates			Redistribute: bap 🗐 ospf 🗷 👻								
Router configurations											
	Eurotion Profiles										
L4-L/ Devices			Subnets:					×	+		
	es Selection Policies			IP/Mask	Scope	Preferred	Subnet Control				
	BMIT ALL-ASA5585 SGT-N1								_		
	consumer 1					No items have been found. Select Actions to create a new item.					
	provider										
🕨 🚞 Depic	yed Graph Instances										
🕨 🖿 Depic	yed Devices		Virtual IP Addresses:					×	+		
📃 Inban	d Management Configuration for L4-L7	7 devices		 ID Address 							
🕨 🖿 Devic	e Managers			- II Audicaa					-		
🕨 🖿 Chas	sis					No items have been found. Select Actions to create a new item.					

uluih cisco	System	Tenants	Fabric	VM Networking	L4-L7 Services	Admin	Operations				
		earch: enter name, descr	common T1 infra mg								
Tenant T1 🛃 🖸			Logical Interface Context provider								
📖 Quick Start			Cogical Internace	Context - provid							
🔺 🐣 Tenant T1											
Application Profiles			⊡ ↓								
🕨 🖿 Networkin	g										
🖿 L4-L7 Ser	vice Parameters		Properties								
🕨 🖿 Security P	olicies		Connector Name:	provider							
🕨 🖿 Troublest	oot Policies		Cluster Interface:	inside	<u>r</u> 🕑						
🕨 🖿 Monitoring	Policies		Associated Network:	Associated Network Rridge Domain 1.3 External Network							
🔺 🛄 L4-L7 Sei	vices		L3 External Network:								
▶ 🥅 L4-L7	Service Graph Templates		Pediatribute: Les Control de Les								
🕨 🖿 Router	configurations			Cogp Coopi Co							
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4 🖸 PE	RMIT_ALL-ASA5585_SGT-N1					No items have been found. Select Actions to create a new item.					
	consumer										
b 🗖 Daular	provider										
Deploy	red Graph Instances		Virtual IP Addresses:								
Deproyed Devices Inhand Management Configuration for L4 L7 devices								×	+		
Inbanc	mound wanagement configuration for L4-L7 devices Device Managements			 IP Address 							
Device	is					No items have been found.					
						Select Actions to create a new item.	Actions to create a new item.				

Verificare l'istanza di Deployed Graph, come mostrato nell'immagine:

ahaha cisco										Advanced M welcome, adm		
A		enter name, descr	common T1 infra mgr									
Tenant T1		 Ø 	Eurotion Node - N	J1								
💼 Quick Start			- I diletion node - i	N 1								
🔺 🐣 Tenant T1										Policy Faults Hist		
Application Profiles			€ ♦									
Networking												
L4-L7 Service	Parameters		Properties									
Security Polic	es		Name: I	N1								
Troubleshoot	Policies		Function Type: C	Function Type: GoTo								
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4 L4-L7 Service	s						enaces					
L4-L7 Ser	rice Graph Templates			Inside		ASA5585_D	evice_1/[oigabitEthemeturi]			Unknown		
Router col	rolles			outside	side ASA5585_Device_1/[GigabitEthernet0/0]					unknown		
Fullcaure	Function Promites L4-L7 Devices Imported Revices											
Imported I			Function Connectors:	 Name 		Encap		Class ID				
Evices Selection Policies				consumer		vlan-1	01	32773				
🔺 🛅 PERMI	T_ALL-ASA5585_SGT-N1			provider		vlan-1	02	49156				
💷 con	L consumer											
📃 pro	ider											
🔺 🛑 Deployed	Graph Instances		4									
🔺 💙 PERMI	T_ALL-ASA5585_SGT-T1											
📃 Fur	ction Node - N1											
Deployed	Devices		Folders And Par	ameters								
📃 Inband Ma	nagement Configuration for L4-L3	7 devices				-						
Device Ma	nagers		Features:	Basic P	arameters All Parameter	8						
P Chassis				Meta Fold	ler/Param Key		Name	Value	Override Name	e/Value To		
1				11								

ululu cisco				VM Netw				Operations	
cibeo	ALL TENANTS Add Tenant Search:	enter name, descr	common T1 infra						
Tenant T1		 Image: Comparison of the second second							
Quick Start			Deployed De∨i	ces					
🔺 😃 Tenant T1									
🕨 🖿 Applicatio	n Profiles	€¥							
Networking			Device Name			VRE			
L4-L7 Service Parameters			4945585			none			
Security Policies Troubleshoot Policies			N0/13303			none			
🕨 🖿 Monitoring	g Policies								
🔺 🚞 L4-L7 Ser	rvices								
▶ 🖿 L4-L7 Service Graph Templates									
🕨 🖿 Router	r configurations								
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🔺 🖻 PE	RMIT_ALL-ASA5585_SGT-N1								
12	consumer								
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4 🔲 Deploy	yed Graph Instances		4						
▲ ∨* PE	RMIT_ALL-ASA5585_SGT-T1 Eurotion Node - N1								
	ved Devices								
🔺 💙 AS/	A5585-none								
-	BGP Device Configuration								
_	OSPF Device Configuration								
4 54	PERMIT_ALL-ASA5585_SGT-T1								
	OSPE Graph Instance Configuration								
4	V* N1								
_	📜 Connector N1/consumer								
_	📜 Connector N1/provider								
📃 Inbanc	d Management Configuration for L4-L7 devic	es							
Device) Managers								
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ahaha									
ALL	TENANTS Add Tenant Search: enter name, desc	common T1 infra							
Tenant T1	4		Configurations						
Quick Start			Configurations						
 Personant Fit Personant Fit Application Profi 	les	⊙₹							
Networking	aramatara	Name	Enable	Context Name	Address Family Area	Area Control	Area 1	Type Networks	
 E4-L7 Service Pa Security Policies 	arameters 3	ASA_IN_L3OUT_are	a_0 True	VRF2	IPv4 Backbone are	a Send redistributed LSAs int Originate summary LSA	o NSSA area Regul	lararea ASA_IN_EXT_NET	(10.10.10.0/24)
Troubleshoot Po Monitoring Dalial	olicies	ASA_OUT_L3OUT_a	rea_0 True	VRF1	IPv4 Backbone are	a Originate summary LSA	o NSSA area Regul	iararea ASA_OUT_EXT_N	ET (20.20.20.0/24)
 Monitoring Point L4-L7 Services 	165								
L4-L7 Service	e Graph Templates								
 Function Prot 	files								
L4-L7 Device	35								
 Imponed Dev Devices Sele 	action Policies								
	ALL-ASA5585_SGT-N1								
💷 consu 📜 provide	er								
🔺 💼 Deployed Gr	aph Instances	4							
✓ PERMIT_ ■ Function	ALL-ASA5585_SGT-T1 on Node - N1								
🔺 🚞 Deployed De	wices								
⊿ 🗸 ASA5585- ■ BGP D	-none Device Configuration								
COSPF	Device Configuration								
PERM	IT_ALL-ASA5585_SGT-T1								
00	PF Graph Instance Configuration								
4 🗸 N1 🗐	Connector N1/consumer								
_ 1	Connector N1/provider								
📜 Inband Mana	igement Configuration for L4-L7 devices								
Chassis									

Verifica e risoluzione dei problemi

Configurazione APIC per tenant:

```
apic1# sh running-config tenant T1
# Command: show running-config tenant T1
# Time: Thu Feb 25 16:05:14 2016
   tenant T1
```

```
access-list PERMIT_ALL
 match ip
 exit
contract PERMIT_ALL
 scope tenant
  subject PERMIT_ALL
    access-group PERMIT_ALL both
   1417 graph ASA5585_SGT
    exit
  exit
vrf context VRF1
  exit
vrf context VRF2
  exit
13out ASA_IN_L3OUT
 vrf member VRF2
  exit
13out ASA_OUT_L3OUT
 vrf member VRF1
  exit
13out N3K-1_L3OUT
 vrf member VRF1
  exit
13out N3K-2_L3OUT
 vrf member VRF2
  exit
bridge-domain BD1
 vrf member VRF1
  exit
bridge-domain BD2
 vrf member VRF2
  exit
application AP1
  epg EPG1
   bridge-domain member BD1
   exit
  epg EPG2
   bridge-domain member BD2
    exit
  exit
external-13 epg ASA_IN_EXT_NET 13out ASA_IN_L3OUT
 vrf member VRF2
  match ip 10.10.10.0/24
  exit
external-13 epg ASA_OUT_EXT_NET 13out ASA_OUT_L3OUT
 vrf member VRF1
 match ip 20.20.20.0/24
  exit
external-13 epg N3K-1_EXT_NET 13out N3K-1_L3OUT
  vrf member VRF1
  match ip 10.10.10.0/24
  contract consumer PERMIT_ALL
  exit
external-13 epg N3K-2_EXT_NET 13out N3K-2_L3OUT
  vrf member VRF2
 match ip 20.20.20.0/24
  contract provider PERMIT_ALL
  exit
interface bridge-domain BD1
  exit
interface bridge-domain BD2
  exit
1417 cluster name ASA5585 type physical vlan-domain T1_PHY service FW function go-to
  cluster-device ASA5585_Device_1
```

```
cluster-interface inside
        member device ASA5585_Device_1 device-interface GigabitEthernet0/1
          interface ethernet 1/2 leaf 106
          exit
        exit
      cluster-interface outside
        member device ASA5585_Device_1 device-interface GigabitEthernet0/0
          interface ethernet 1/2 leaf 105
          exit
        exit
      exit
    1417 graph ASA5585_SGT contract PERMIT_ALL
      service N1 device-cluster-tenant T1 device-cluster ASA5585 mode FW_ROUTED
        connector consumer cluster-interface outside
          1417-peer tenant T1 out ASA_OUT_L3OUT epg ASA_OUT_EXT_NET redistribute bgp,ospf
          exit
        connector provider cluster-interface inside
         1417-peer tenant T1 out ASA_IN_L3OUT epg ASA_IN_EXT_NET redistribute bgp,ospf
          exit
       rtr-cfg ASA5585
        exit
      connection C1 terminal consumer service N1 connector consumer
      connection C2 terminal provider service N1 connector provider
      exit
    rtr-cfg ASA5585
     router-id 3.3.3.3
      exit
    exit
apic1#
```

Verificare la relazione tra nodi adiacenti OSPF e la tabella di routing nella foglia 101:

```
leaf101# show ip ospf neighbors vrf T1:VRF1
OSPF Process ID default VRF T1:VRF1
Total number of neighbors: 2
Neighbor ID Pri State
                                    Up Time Address
                                                            Interface
1.1.1.1
                 1 FULL/BDR
                                    02:07:19 192.168.1.1
                                                             Vlan8
3.3.3.3
                  1 FULL/BDR
                                    00:38:35 192.168.1.5
                                                             Vlan9
leaf101# show ip route vrf T1:VRF1
IP Route Table for VRF "T1:VRF1"
'*' denotes best ucast next-hop
'**' denotes best mcast next-hop
'[x/y]' denotes [preference/metric]
'%<string>' in via output denotes VRF <string>
10.10.10.0/24, ubest/mbest: 1/0
   *via 192.168.1.1, vlan8, [110/8], 01:59:50, ospf-default, intra
20.20.20.0/24, ubest/mbest: 1/0
   *via 192.168.1.5, vlan9, [110/22], 00:30:20, ospf-default, inter
100.100.100.100/32, ubest/mbest: 2/0, attached, direct
   *via 100.100.100.100, lo1, [1/0], 02:21:22, local, local
   *via 100.100.100.100, lo1, [1/0], 02:21:22, direct
192.168.1.0/30, ubest/mbest: 1/0, attached, direct
   *via 192.168.1.2, vlan8, [1/0], 02:35:53, direct
192.168.1.2/32, ubest/mbest: 1/0, attached
   *via 192.168.1.2, vlan8, [1/0], 02:35:53, local, local
192.168.1.4/30, ubest/mbest: 1/0, attached, direct
   *via 192.168.1.6, vlan9, [1/0], 02:20:53, direct
192.168.1.6/32, ubest/mbest: 1/0, attached
   *via 192.168.1.6, vlan9, [1/0], 02:20:53, local, local
```

192.168.1.8/30, ubest/mbest: 1/0
 *via 192.168.1.5, vlan9, [110/14], 00:30:20, ospf-default, intra
200.200.200/32, ubest/mbest: 1/0
 *via 192.168.1.5, vlan9, [110/15], 00:30:20, ospf-default, intra
Verificare la relazione di router adiacente OSPF e la tabella di routing nella foglia 102:

```
leaf102# show ip ospf neighbors vrf T1:VRF2
OSPF Process ID default VRF T1:VRF2
Total number of neighbors: 2
                                                          Interface
Neighbor ID Pri State
                                     Up Time Address
                                   00:37:07 192.168.1.9
3.3.3.3
                1 FULL/BDR
2.2.2.2
                 1 FULL/BDR
                                    02:09:59 192.168.1.13
                                                             Vlan15
leaf102# show ip route vrf T1:VRF2
IP Route Table for VRF "T1:VRF2"
'*' denotes best ucast next-hop
'**' denotes best mcast next-hop
'[x/y]' denotes [preference/metric]
'%<string>' in via output denotes VRF <string>
10.10.10.0/24, ubest/mbest: 1/0
    *via 192.168.1.9, vlan14, [110/22], 00:35:22, ospf-default, inter
20.20.20.0/24, ubest/mbest: 1/0
    *via 192.168.1.13, vlan15, [110/8], 02:08:13, ospf-default, intra
192.168.1.4/30, ubest/mbest: 1/0
   *via 192.168.1.9, vlan14, [110/14], 00:35:22, ospf-default, intra
192.168.1.8/30, ubest/mbest: 1/0, attached, direct
    *via 192.168.1.10, vlan14, [1/0], 02:14:29, direct
192.168.1.10/32, ubest/mbest: 1/0, attached
    *via 192.168.1.10, vlan14, [1/0], 02:14:29, local, local
192.168.1.12/30, ubest/mbest: 1/0, attached, direct
   *via 192.168.1.14, vlan15, [1/0], 02:09:04, direct
192.168.1.14/32, ubest/mbest: 1/0, attached
   *via 192.168.1.14, vlan15, [1/0], 02:09:04, local, local
200.200.200.200/32, ubest/mbest: 2/0, attached, direct
    *via 200.200.200.200, lo4, [1/0], 02:10:02, local, local
    *via 200.200.200.200, lo4, [1/0], 02:10:02, direct
```

Verificare la configurazione, la relazione tra nodi adiacenti OSPF e la tabella di routing su ASA 5585:

```
ASA5585# sh run interface
!
interface GigabitEthernet0/0
no nameif
security-level 0
no ip address
!
interface GigabitEthernet0/0.101
nameif externalIf
security-level 50
ip address 192.168.1.5 255.255.255.252
!
interface GigabitEthernet0/1
no nameif
security-level 100
no ip address
!
interface GigabitEthernet0/1.102
```

```
nameif internalIf
security-level 100
ip address 192.168.1.9 255.255.255.252
1
interface Management0/0
management-only
nameif management
security-level 0
ip address 172.23.97.1 255.255.254.0
ASA5585# sh run router
router ospf 1
router-id 3.3.3.3
network 192.168.1.4 255.255.255.252 area 0
network 192.168.1.8 255.255.255.252 area 0
area O
log-adj-changes
1
ASA5585# sh ospf neighbor
Neighbor ID
                                    Dead Time Address
              Pri State
                                                               Interface
100.100.100.100 1 FULL/DR
                                    0:00:38
                                               192.168.1.6
                                                              externalIf
200.200.200.200 1 FULL/DR
                                               192.168.1.10
                                    0:00:33
                                                               internalTf
ASA5585# sh route ospf
Routing Table: T1
Codes: L - local, C - connected, S - static, R - RIP, M - mobile, B - BGP
       D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
      N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
      E1 - OSPF external type 1, E2 - OSPF external type 2
       i - IS-IS, su - IS-IS summary, L1 - IS-IS level-1, L2 - IS-IS level-2
       ia - IS-IS inter area, * - candidate default, U - per-user static route
       o - ODR, P - periodic downloaded static route, + - replicated route
Gateway of last resort is not set
Ο ΙΑ
        10.10.10.0 255.255.255.0
          [110/18] via 192.168.1.6, 00:22:57, externalIf
        20.20.20.0 255.255.255.0
O IA
          [110/18] via 192.168.1.10, 00:22:47, internalIf
        200.200.200.200 255.255.255.255
0
           [110/11] via 192.168.1.10, 00:22:47, internalIf
ASA5585# sh access-list
access-list cached ACL log flows: total 0, denied 0 (deny-flow-max 4096)
           alert-interval 300
access-list access-list-inbound; 3 elements; name hash: 0xcb5bd6c7
access-list access-list-inbound line 1 extended permit tcp any any eq www (hitcnt=0) 0xc873a747
access-list access-list-inbound line 2 extended permit tcp any any eq https (hitcnt=0)
0x48bedbdd
```

access-list access-list-inbound line 3 extended permit icmp any any (hitcnt=6) 0xe4b5a75d Verificare la configurazione, la relazione tra nodi adiacenti OSPF e la tabella di routing in N3K-1:

```
N3K-1# sh run ospf
!Command: show running-config ospf
!Time: Thu Feb 25 15:40:55 2016
version 6.0(2)U3(7)
feature ospf
router ospf 1
 router-id 1.1.1.1
interface Ethernet1/21
  ip router ospf 1 area 0.0.0.1
interface Ethernet1/47
  ip router ospf 1 area 0.0.0.1
N3K-1# sh ip ospf neighbors
OSPF Process ID 1 VRF default
Total number of neighbors: 1
                                    Up Time Address
Neighbor ID
               Pri State
                                                             Interface
                                    01:36:24 192.168.1.2
100.100.100.100 1 FULL/DR
                                                             Eth1/47
N3K-1# sh ip ospf route
OSPF Process ID 1 VRF default, Routing Table
  (D) denotes route is directly attached (R) denotes route is in RIB
10.10.10.0/24 (intra)(D) area 0.0.0.1
    via 10.10.10.0/Eth1/21* , cost 4
20.20.20.0/24 (inter)(R) area 0.0.0.1
    via 192.168.1.2/Eth1/47 , cost 62
100.100.100.100/32 (intra)(R) area 0.0.0.1
    via 192.168.1.2/Eth1/47 , cost 41
192.168.1.0/30 (intra)(D) area 0.0.0.1
    via 192.168.1.1/Eth1/47* , cost 40
```

Verificare la configurazione, la relazione tra nodi adiacenti OSPF e la tabella di routing in N3K-2:

```
N3K-2# sh run ospf
!Command: show running-config ospf
!Time: Thu Feb 25 15:44:47 2016
version 6.0(2)U3(7)
feature ospf
router ospf 1
router-id 2.2.2.2
interface loopback0
ip ospf network point-to-point
ip router ospf 1 area 0.0.0.0
interface Ethernet1/21
ip router ospf 1 area 0.0.0.1
```

N3K-2# sh ip ospf neighbors OSPF Process ID 1 VRF default Total number of neighbors: 1 Neighbor ID Pri State Up Time Address Interface 200.200.200.200 1 FULL/DR 01:43:50 192.168.1.14 Eth1/47 N3K-2# sh ip ospf route OSPF Process ID 1 VRF default, Routing Table (D) denotes route is directly attached (R) denotes route is in RIB 2.2.2.0/30 (intra)(D) area 0.0.0.0 via 2.2.2.0/Lo0* , cost 1 10.10.10.0/24 (inter)(R) area 0.0.0.1 via 192.168.1.14/Eth1/47 , cost 62 20.20.20.0/24 (intra)(D) area 0.0.0.1 via 20.20.20.0/Eth1/21* , cost 4 192.168.1.12/30 (intra)(D) area 0.0.0.1 via 192.168.1.13/Eth1/47* , cost 40

Verificare le regole di filtro del contratto sulla foglia e il numero di riscontri del pacchetto:.

leaf101# show system internal policy-mgr stats Requested Rule Statistics [CUT] Rule (4107) DN (sys/actrl/scope-3112964/rule-3112964-s-32773-d-49158-f-33) Ingress: 1316, Egress: 0, Pkts: 0 RevPkts: 0 Rule (4108) DN (sys/actrl/scope-3112964/rule-3112964-s-49158-d-32773-f-33) Ingress: 1317, Egress: 0, Pkts: 0 RevPkts: 0 leaf101# show system internal policy-mgr stats Requested Rule Statistics [CUT] Rule (4107) DN (sys/actrl/scope-3112964/rule-3112964-s-32773-d-49158-f-33) Ingress: 2317, Egress: 0, Pkts: 0 RevPkts: 0 Rule (4108) DN (sys/actrl/scope-3112964/rule-3112964-s-49158-d-32773-f-33) Ingress: 2317, Egress: 0, Pkts: 0 RevPkts: 0

leaf102# show system internal policy-mgr stats Requested Rule Statistics [CUT] Rule (4103) DN (sys/actrl/scope-2752520/rule-2752520-s-49156-d-6019-f-default) Ingress: 3394, Egress: 0, Pkts: 0 RevPkts: 0 Rule (4104) DN (sys/actrl/scope-2752520/rule-2752520-s-6019-d-49156-f-default) Ingress: 3394, Egress: 0, Pkts: 0 RevPkts: 0 [CUT] leaf102# show system internal policy-mgr stats Requested Rule Statistics [CUT] Rule (4103) DN (sys/actrl/scope-2752520/rule-2752520-s-49156-d-6019-f-default) Ingress: 4392, Egress: 0, Pkts: 0 RevPkts: 0 Rule (4104) DN (sys/actrl/scope-2752520/rule-2752520-s-6019-d-49156-f-default) Ingress: 4392, Egress: 0, Pkts: 0 RevPkts: 0 [CUT]

Prova di raggiungibilità tra N3K-1 e N3K-2:

N3K-1# ping 20.20.20.1 source 10.10.10.1 PING 20.20.20.1 (20.20.20.1) from 10.10.10.1: 56 data bytes 64 bytes from 20.20.20.1: icmp_seq=0 ttl=250 time=2.098 ms 64 bytes from 20.20.20.1: icmp_seq=1 ttl=250 time=0.922 ms 64 bytes from 20.20.20.1: icmp_seq=2 ttl=250 time=0.926 ms 64 bytes from 20.20.20.1: icmp_seq=3 ttl=250 time=0.893 ms 64 bytes from 20.20.20.1: icmp_seq=4 ttl=250 time=0.941 ms --- 20.20.20.1 ping statistics ---5 packets transmitted, 5 packets received, 0.00% packet loss round-trip min/avg/max = 0.893/1.156/2.098 ms

N3K-2# ping 10.10.10.1 source 20.20.20.1 PING 10.10.10.1 (10.10.10.1) from 20.20.20.1: 56 data bytes 64 bytes from 10.10.10.1: icmp_seq=0 ttl=250 time=2.075 ms 64 bytes from 10.10.10.1: icmp_seq=1 ttl=250 time=0.915 ms 64 bytes from 10.10.10.1: icmp_seq=2 ttl=250 time=0.888 ms 64 bytes from 10.10.10.1: icmp_seq=3 ttl=250 time=1.747 ms 64 bytes from 10.10.10.1: icmp_seq=4 ttl=250 time=0.828 ms --- 10.10.10.1 ping statistics ---5 packets transmitted, 5 packets received, 0.00% packet loss round-trip min/avg/max = 0.828/1.29/2.075 ms

In allegato è il file di configurazione XML per il tenant e il profilo delle funzioni ASA, utilizzato per questa dimostrazione.