# L4-L7 routeconferencing met transportfabric - configuratie van doorvoersnelheid

## Inhoud

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## Inleiding

In dit document wordt de doorslag van de configuratie van L4-L7 Service Graph met Route Peering beschreven, waarbij zowel de consument als de leverancier extern zijn van de Application Centric Infrastructure (ACI)-stof.

Bijgedragen door Zahid Hassan, Cisco Advanced Services Engineer.

## Voorwaarden

#### Vereisten

Cisco raadt kennis van de volgende onderwerpen aan:

- Statische VLAN-pools die voor de insluiting van VLAN tussen de externe apparaten en de ACI-stof zullen worden gebruikt
- Externe fysieke en Routed Domein die de locatie (bladknooppunt/pad) van de externe apparaten en de VLAN-pool zal verbinden
- Layer 3 Connection naar een buitennetwerk (L3Out)

De vorige stappen **van Fabric Access** en **L3Out** configuraties worden niet in dit document behandeld en er is van uitgegaan dat deze al zijn voltooid.

#### Gebruikte componenten

De informatie in dit document is gebaseerd op deze softwareversies:

- Cisco Application Policy Infrastructure Controller (Cisco APIC) 1.2(1)m
- Apparaatpakket voor adaptieve security applicatie (ASA) 1.2.4.8
- ASA 5585 9.5(1)
- Nexus 3064 6,0(2)U3(7)

De informatie in dit document is gebaseerd op de apparaten in een specifieke laboratoriumomgeving. Alle apparaten die in dit document worden beschreven, hadden een opgeschoonde (standaard)configuratie. Als uw netwerk live is, moet u de potentiële impact van elke opdracht begrijpen.

## Achtergrondinformatie

Routeswitch is een functie waarmee een servicetechnicus, zoals een laststabilisator of een firewall, de bereikbaarheid van het apparaat via de ACI-structuur naar een extern netwerk kan adverteren.

De hier gepresenteerde use case is een fysieke firewall die wordt ingezet als een servicelijn met twee armen, in twee L3Outs- of externe End Point-groepen (EPG's). De servicesgrafiek is gekoppeld aan een contract tussen de externe EPG op Leaf 101 (N3K-1) en de externe EPG op Leaf 102 (N3K-2). De ACI-stof levert een doorvoerservice voor de routers (N3K-1 en N3K-2) en routeconferencing wordt gebruikt, met Open Shortest Path First (OSPF) als routingprotocol, voor het uitwisselen van routes tussen de firewall en de ACI-structuur.

# Configureren

### Netwerkdiagram

De volgende afbeelding toont hoe het Peering-programma voor de route van begin tot eind werkt:



VRF1 / BD1		VRF2 / BD2					
EXTERNAL-EPG EXTERNAL	EXTERNAL	INTERNAL	INTERNAL EXTERNAL-EPG				
		ASA INTERNAL L3OUT	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							

### Configureren

Stap 1. Configuratie van de Virtual Routing en Forwarding1 (VRF1), VRF2, Bridge Domain1 (BD1) en BD2. Associeer BD1 aan VRF1 en BD2 aan VRF2, zoals in de afbeelding:

ALL TENANTS   Add Tenant   Search. enter name, descr.     common   infra   mgmt   Ti	
Tonant 14 B O	
Networks   Ouck Start   Prenan T1   Papilization Profiles   Papilization	BD BD1

Stap 2. Upload het ASA-apparaatpakket onder L4-L7-apparaat, zoals in de afbeelding, :



Configureer L4-L7 apparaat voor fysieke ASA 5585 (Routed), zoals in de afbeelding:

alialia cisco	System	Tenants	Fabric	VM Networking	L4-L7 Service:	s Admin	Operations	1	ρ	i ,
		Search: enter name, descr	common   T1   infra							
Tenant T1		<ul> <li>O</li> </ul>		ACAEEDE						
💼 Quick Sta	art		L4-L7 Devices	- 4340060						
🔺 😃 Tenant T	1									Policy Parameters Fa
🕨 🚞 Applic	cation Profiles		<b>DU</b>							
🔺 🚞 Netw	orking									
🕨 🚞 Br	idge Domains		General			Device 1				
🕨 🖿 VE	RFs		Manag	ed: 🗹		Management IP Address:	172.23.97.1	Management Port: 443	\$	
) 🖿 E	dernal Bridged Networks		Nan	ne: ASA5585		Chassis:	select a value	- @		
E)	ternal Routed Networks		Device Packa	ge: CISCO-ASA-1.2		Interfaces:				
🕨 🛄 Ri	oute Profiles		Service Typ	pe: Firewall						
🕨 🖿 Pr	rotocol Policies		Device Ty Physical Doma	In: T1 DHY			▲ Name		Path	
L4-L7	f Service Parameters				<u> </u>		GigabitEthernet0/0		Node-105/eth1/2	
4 🖬 Secu	rity Policies		Context Awa	re: Single			GigabitEthernet0/1		Node-106/eth1/2	
	ontracts		Function Ty	se: GoThrough GoTo						
18	aboo Contracts		Cluster Mo	de: Single Node						
b = 0	Iponed Contracts		Cradantiala			Cluster				
E Trout	nero		Useman	18: admin		Management IP Address:	172.23.96.228	Management Port: 443	<b></b>	
🕨 💼 Monit	orina Policies		Passwo	rd:	-	Olustas Istantas	172.20.07.1	¥		
🔺 💼 L4-L3	7 Services		Confirm Passwo	rd:	_	Cluster Interfaces:				
E L4	I-L7 Service Graph Templates		0011111100010		_		Туре	<ul> <li>Name</li> </ul>	Concrete Interfaces	
🕨 🚞 R(	outer configurations		Configuration S	State			provider	inside	ASA5585_Device_1/[Gig	gabitEthernet0/1]
🕨 🖿 Fu	unction Profiles		Configuration Issue	es:					ASA5585 Device 1//Gir	abitEthernet0/01
🔺 🛄 L4	4-L7 Devices		Devices Sta	te: stable			consumer	outside		
▶ 🗉	ASA5585									
🕨 🛄 Im	ported Devices									
🕨 🖿 De	evices Selection Policies									

## Stap 3. Configureer L3Out voor N3K-1 en associeer met BD1 en VRF1.

Extern routed Network wordt gebruikt om de routeconfiguratie in de ACI-structuur voor routeparing te specificeren, zoals in de afbeelding:

ululu cisco		Tenants		VM Networking	L4-L7 Services	Admin	Operations
		earch: enter name, descr	common   infra   mgmt				
Tenant T1 Quick Start		S 10	L3 Outside - N3	K-1_L3OUT			
🔺 🐣 Tenant T1							
🕨 🚞 Applicatio	n Profiles						
🔺 💼 Networkir	g						A A <b>A</b> A
Bridge	Domains						
VRFS	al Bridged Networks		Properties				
A DE Extern	al Routed Networks		N	ame: N3K-1_L3OUT			
▶ 🖿 Set	Action Rule Profiles		Descri	ption: optional			
🕨 🚞 Mai	ch Action Rule Profiles						
🕨 🕾 AS/	A_IN_L3OUT		1	Fags:	<b>•</b>		
🕨 🕾 AS/	LOUT_L3OUT		L	enter taga separated b abel:	ycomma		
🕨 🕮 N3	<-1_L30UT		Target D	SCP: unspecified			
▶ 🖽 N3	K-2_L3OUT		Route Control Enforcer	ment:	- Evnort		
Route	Profiles				Export		
	ui Policies vice Parameters		L	VRF: T1/VRF1	੯₽		
Equity P	olicies		Resolved External Pouted Dor	VRF: T1AVRF1	-0		
🕨 🚞 Troublesh	oot Policies		Boute Brofile for Inter		C <sup>2</sup>		
🕨 🖿 Monitoring	Policies		Rodie Florie for Intel	nine select a value	<u>*</u> ଫ		
🕨 🖿 L4-L7 Sei	vices		Route Control For Dampe	ning:			
				<ul> <li>Address Family</li> </ul>	Гуре		
							No item
							Select Actio
			Enable BGP/EIGRP/O	SPF: BGP	EIGRP		
				🗹 OSPF			
			OSPF Are	a ID: 0.0.0.1			
			OSPF Area Co	ntrol: 🗹 Send redistribute	d LSAs into NSSA area		
				Originate summa	ary LSA ding address in translated LSA		
			0005 4		ang address in translated LSR		
			OSPF Area	Type. NSSA area R	egular area Stub area		
			USPF Area		<b>\$</b>		

dienovereenkomstig worden geconfigureerd als een Switch Virtual Interface (SVI) met VLAN-encap.

uluilu cisco										i A
		mh: enter name, descr	common   infra   mgmt   T1							
Tenant T1		<ul> <li>Ø</li> </ul>	Logical Interface Pr	ofile - N3K-1	IP					
💼 Quick Start			Logical interface Fi	one - Nore I_						_
🔺 🐣 Tenant T1										Policy Fault
Application	Profiles		Ð₩							
🔺 🚞 Networking	2									
🕨 🚞 Bridge 🛙	Domains		Properties							
🕨 🚞 VRFs				Name: N3K-1_IP						
🕨 💼 External	I Bridged Networks		Des	ription: optional						
🔺 🖿 External	I Routed Networks									
▶ 🔲 Set /	Action Rule Profiles			Label:						
Matc	h Action Rule Profiles		ND	policy: select a value	<b>•</b>					
► 😁 ASA	_IN_L3OUT		Egress Data Plane Policing	Policy: select a value	*					
P CD ASA			Ingress Data Plane Policing	Policy: select a value	•					
- CD N3K	oriael Alaria Drofiles		Routed Inte	rfaces:						
	NOV 1 ND									
	I norcal Interface Profiles			A Path		IP Address	M	AC Address	MTU (Byte	es)
	▲ 💷 N3K-1 IP						No items have been	en found.		
	USPF Interface Profile						Select Actions to creat	te a new kent.		
	Configured Nodes		4							
	▶ 📃 topology/pod-1/node-105			SVI:						
🕨 🖿 N	letworks									
🖿 R	Route Profiles			A Path	IP Address	Side A IP	Side B IP	MAC Address	MTU (Bytes)	Encap
▶ 🕾 N3K	-2_L30UT			Node-105/eth1	/3 192.168.1.2	2/30		00:22:BD:F8:19:FF	1500	vlan-100
🕨 🚞 Route P	Profiles									
🕨 🚞 Protoco	I Policies									
🔲 L4-L7 Servi	ice Parameters		Deuted Out-Inte							
Security Po	licies		Rouled Sub-Inte	maces.						
Troublesho	oot Policies			A Path		IP Address	MAC Address	MTU (Bytes)		Encap
Monitoring	Policies						No items have been	en found.		
L4-L7 Servi	ices						Select Actions to creat	te a new item.		

Configureer de controle van de invoer/uitvoer van subnetten voor N3K-1 L3Out Extern EPG zoals in de afbeelding:

cisco								٩
		earch: enter name, descr	common   infra   mgmt					
Tenant T1		<ul> <li>Ø</li> </ul>	External Network	Instance Profile	- N3K-1 EXT NET	r.		
🔲 Quick Start			External Network	instance Frome				
🔺 🐣 Tenant T1								Policy Operation
🕨 🖿 Applicat	ion Profiles							Canaval
🔺 🚞 Network	ing							General
🕨 🖿 Bridg	je Domains		⊖±				🗥 🛕 🕕 🕕 🚺 100	
VRFs	3		Properties					
Exter	nal Bridged Networks		Name	N3K-1 EXT NET				
4 Exter	nal Routed Networks		Tags:	1 8	<b>.</b>			
> = s	et Action Rule Profiles			enter tags separated by comm	18			
▶ <b>■</b> M	atch Action Rule Profiles		Description:	optional				
P CD A	SA_IN_L3OUT							
			Configued VRF name:	VRF1				
	I arrivel Mede Drefilee		Resolved VRF:	uni/tn-T1/ctx-VRF1				
	Logical Node Profiles		QoS Class:	Unspecified -	<u>_</u>			
-	A Dirical Interface Profiles		Target DSCP:	unspecified				
	▶ ■ N3K-1 IP		Configuration Status:	applied				
	Configured Nodes		Configuration Issues:					
	topology/pod-1/node-105		subnets:					
	Networks			<ul> <li>IP Address</li> </ul>	Scope		Aggregate	Route Control Profile
4	N3K-1_EXT_NET			10.10.10.0/24	External Sub	nets for the External EPG	1	
	🔲 L4-L7 Service Parameters			20.20.20.0/24	Export Boute	Control Subnet	1	
	Route Profiles			10.10.10.0114	Exportition	o on a or o dishier		
▶ 🕾 N	13K-2_L3OUT							
Rout	e Profiles		Route Control Profile:					
Prote	acol Policies							
L4-L7 S	ervice Parameters			▲ Name			D	irection
Security	Policies						No items have b	een found.
Trouble:	shoot Policies						Select Actions to cre	ate a new item.
Monitori	ng Policies							

Configureer L3Out voor ASA-externe interface en associeer met BD1 en VRF1, zoals in de afbeelding wordt weergegeven:

ululu cisco							٩
		reh: enter name, descr	common   T1   infra   mgr				
Tenant T1		0 E	120444				
💼 Quick Start			L3 Outside - ASA	_001_13001			
🔺 🚢 Tenant T1							
🕨 🖿 Application	n Profiles						
🔺 🚞 Networkin	g						
🕨 🖿 Bridge	Domains		⊙ <b>±</b>				
🕨 🖿 VRFs			Durantin				
🕨 🖿 Externa	al Bridged Networks		Properties				
🔺 🚞 Extern:	al Routed Networks		Nam	ne: ASA_OUI_L3OUI			
🕨 🖿 Set	Action Rule Profiles		Descriptio	JII, opnorial			
🕨 🖿 Mat	ch Action Rule Profiles						
🕨 🕾 ASA	LIN_L3OUT		Тар	26:	· · ·		
4 🕾 AS/	A_OUT_L3OUT		Lab	enter taga separated by c el:	omma		
► <b>■</b>	Logical Node Profiles		Target DSC	P: upspecified			
• • • •	Networks		D. 1. 0. 1. 15.				
> <b>m</b>	Route Profiles		Houte Control Enforceme	nt 🗌 Import	Export		
▶ 🕾 N3F	<-1_L30UT		VE	RF: T1/VRF1	<u>▼</u> @		
▶ 🕾 N3I	K-2_L30UT		Resolved VF	RF: T1/VRF1			
Route	Profiles		External Routed Doma	in: T1_L3OUT	▼ ₽		
Protoc	ol Policies		Route Profile for Interlea	ak: select a value	- @		
L4-L7 Ser	vice Parameters		Route Control For Dampenir	ng:			
Security P	olicies						
Troublesh	ioot Policies			<ul> <li>Address Family Type</li> </ul>	pe	Route Dampenii	ng Policy
Monitoring	Policies					No items have been found.	
L4-L7 Ser	vices					Select Actions to create a new item.	
			Enable BGP/EIGRP/OSE	PF- 0 BOD			
			Enable BornElona room	OSPE			
			OSPF Area I	D: 0			
			0005 000 0000				
			USPF Area Contr	OI: Send redistributed Originate summan	LSAs into NSSA area (LSA		
				Suppress forwardin	ng address in translated LSA		
			OSPF Area Typ	e: NSSA area Reg	ular area Stub area		
			OSPF Area Co.	st: 0	÷		

ululu cisco	System	Tenants	Fabric	VM Networking	L4-L7 Services	Admin	Operations		P	i		Adva welcor
		arch: enter name, descr	common   T1   infra   mgmt									
Tenant T1		S 2		51 A.O.A. O								
Quick Start			Logical Interface Pr	offie - ASA_U								
🔺 🚢 Tenant T1											Policy	Faults
🕨 💼 Applicatio	on Profiles		GE									
🔺 🚞 Networki	ng											A
🕨 🖿 Bridg	e Domains		Properties									
🕨 🖿 VRFs				Name: ASA_OUT_IP								
🕨 💼 Extern	al Bridged Networks		Desc	cription: optional								
🔺 🚞 Exteri	nal Routed Networks											
🕨 💼 Se	t Action Rule Profiles			Label:								
🕨 💼 Ma	atch Action Rule Profiles		ND	nolicy: select a value								
🕨 🕾 As	A_IN_L3OUT		Egress Data Place Policing	Policy: coloct o volue								
4 🕾 AS	SA_OUT_L3OUT		Egress Data Plane Policing	Policy. select a value	<u> </u>							
A 🖬	Logical Node Profiles		Ingress Data Plane Policing	Policy: select a value	•							
	📃 ASA_OUT_NP		Routed Inte	erfaces:								
	🔺 💼 Logical Interface Profiles			<ul> <li>Path</li> </ul>		IP Address		MAC Address		MTU (Bytes)	I.	
	ASA_OUT_IP		1									
	📃 OSPF Interface Profile						Sele	No items have been found. ct Actions to create a new item.				
	🔺 💼 Configured Nodes											
	🔺 📃 topology/pod-1/node-105		•									
	BGP for VRF-T1:VRF1			SVI:								
	OSPE for VRF-T1:VRF1											
> <b>•</b>	Networks			A Path	IP Addres	s Sid	te A IP Si	de B IP	MAC Address	MTU (Bytes)	Encap	
▶ 💼	Route Profiles			Node-105/eth	1/2 192.168.1	.6/30			00:22:BD:F8:19:FF	1500	vlan-101	
🕨 🕾 N.	3K-1_L30UT											
🕨 🕮 N	3K-2_L3OUT											
🕨 🖿 Route	Profiles											
🕨 🖿 Proto	col Policies		Routed Sub-Inte	ertaces:								
🖿 L4-L7 Se	rvice Parameters			A Path		IP Address	MAC Add	freas	MTU (Bytes)	E	incap	
🕨 🖿 Security I	Policies							No items have been found				
🕨 🖿 Troubles	hoot Policies						Sele	ct Actions to create a new item.				
🕨 🖿 Monitorin	g Policies											
🕨 🖿 L4-L7 Se	rvices											

Configureer routecontrole van invoer/export op subnetten voor ASA-Extern L3Out Extern EPG, zoals in de afbeelding:

ahaha cisco		Tenants						P	i
		arch: enter name, descr	common   T1   infra   mg						
Tenant T1		<ul> <li>O</li> </ul>	Extornal Notwork	Instance Profile		NET			
💼 Quick Start			LALEINAI NELWOIK	Instance Frome	- ASA_001_LA1_				
🔺 🚢 Tenant T1								Policy	Operational Stats
🕨 🖿 Applicatio	n Profiles								Orange Construction
🔺 🖿 Networkir	g								Contracts
🕨 🖿 Bridge	Domains		⊖±				🛆 🛕 🕕 🚺 100		
🕨 🖿 VRFs			Dreparties						
🕨 🖿 Eidern	al Bridged Networks		Properties	AGA OUT EVE NET					
🔺 🚞 Extern	al Routed Networks		Name. Terre:	ASA_OUT_EXT_NET					
🕨 🖿 Set	Action Rule Profiles		1680.	enter tags separated by comm	na				
🕨 🖿 Ma	tch Action Rule Profiles		Description:	optional					
🕨 🕾 ASi	A_IN_L3OUT								
🥌 🗥 AS	A_OUT_L3OUT		Continued VRF name:	V/RF1					
> <b>m</b>	Logical Node Profiles		Resolved VRF:	uni/m-T1/ctx-VRF1					
A 💼	Networks		QoS Class:	Unspecified					
A 1	ASA_OUT_EXT_NET		Target DSCP:	unspecified	-				
	L4-L7 Service Parameters		Configuration Status:	amplied					
► <b>m</b>	Route Profiles		Configuration Issues:	applieu					
🕨 🕾 N3	K-1_L30UT		Subnete:						
🕨 🕾 N3	K-2_L30UT		4						
🕨 🖿 Route	Profiles			<ul> <li>IP Address</li> </ul>	Scope		Aggregate	Route Control Profile	Route Summa
🕨 🗖 Protoc	ol Policies			10.10.10.0/24	Export Rout Shared Rou	e Control Subnet ite Control Subnet			
L4-L7 Ser	vice Parameters			20.20.20.0/24	External Su	bnets for the External EPG			
Security P	olicies				Shared Rol	ite Control Subnet			
Troublest	ioot Policies								
Monitorini	Policies		Route Control Profile:						
L4-L7 Set	VICES								
				<ul> <li>Name</li> </ul>			Direc	ion	
							No items have been f Select Actions to create a	ound. new item.	

Configureer L3out voor ASA-intern en associeer met BD2 en VRF2, zoals in de afbeelding wordt weergegeven:

cisco								P
		rch: enter name, descr	common   T1   infra   mg					
Tenant T1		S (0)	1.2 Outoida ACA					
🔲 Quick Start			L3 Outside - ASA	_IN_L3001				
🔺 🐣 Tenant T1								
🕨 🖿 Applicatio	in Profiles							
🔺 🚞 Networkii	ng							
🕨 🖿 Bridge	Domains		<b>⊖ ±</b>			Δ Δ Ο Ο		
🕨 🖿 VRFs			Drapartico					
🕨 🖿 Extern	al Bridged Networks		Figures	me: ASA IN LOUIT				
🔺 🖿 Extern	al Routed Networks		Descrint	ion: optional				
🕨 🖿 Se	t Action Rule Profiles							
🕨 🖿 Ma	tch Action Rule Profiles		т.					
🔺 🕾 AS	A_IN_L3OUT			enter taga separated by	comma			
4	Logical Node Profiles		La	bel:				
	ASA_IN_NP		Target DS	CP: unspecified				
	Networks		Route Control Enforcem	ent Import	- Export			
Þ 🖱 10	Route Profiles				Export			
▶ 🖾 AS	A_001_L3001		Ľ	RF: T1/VRF2	<u> </u>			
▶ 🗠 N3	IK-1_L3001		Resolved \	RF: T1A/RF2	_			
Route	Profiles		External Routed Dom	ain: T1_L3OUT	<u> </u>			
P Intodas	n Policies		Route Profile for Interle	sak: select a value	<u> </u>			
🗖 L4-L7 Sei	rvice Parameters		Route Control For Dampen	ing:				
🕨 🖿 Security F	olicies			<ul> <li>Address Family Ty</li> </ul>	pe	R	oute Dampening Policy	
🕨 🖿 Troublest	hoot Policies							
🕨 🖿 Monitorin	g Policies					Select Actions to crea	en roung. Ite a new item.	
🕨 🕨 🖿 L4-L7 Se	rvices							
			Enable BGP/EIGRP/08	SPF: BGP	EIGRP			
				OSPF				
			OSPF Area	ID: 0				
			OSPF Area Con	trol: 🗹 Send redistributed	LSAs into NSSA area			
				Originate summar	/ LSA na addrees in translated I CA			
				ouppress iofwardi	ng auaress in translated LSA			
			OSPF Area T	ype: NSSA area Re(	ular area Stub area			
			OSPF Area C	ost: 0	\$			

ululu cisco	System	Tenants	Fabric VM N	etworking	L4-L7 Services	Admin	Operations	P	i		Advanced Mor relcome, admin
		ch: enter name, descr	common   T1   infra   mgmt								
Tenant T1			Logical Interface Brofil		2						
💼 Quick Start			Logical Interface From	= - ASA_IN_II							
🔺 🚢 Tenant T1										Policy Fa	ults Histor
🕨 🖿 Applicatio	n Profiles										ACTIONS +
🔺 🚞 Networkin	g										
🕨 🚞 Bridge	Domains		Properties								
VRFs			Nam	: ASA_IN_IP							
🕨 🛄 Externi	al Bridged Networks		Descriptio	n: optional							
🔺 🛄 Extern	al Routed Networks										
▶ 🛄 Set	Action Rule Profiles		Labe	l:							
Mai	ch Action Rule Profiles		ND polic	n select a value	¥						
A CED AS	LIN_L30UT		Egress Data Plane Policing Polic	select a value	*						
	Logical Node Profiles		Ingress Data Plane Policing Polic	select a value	*						
1	ASA_IN_NP		Routed Interface:								
	Logical Interface Profiles										~ +
				A Path		IP Address	MAC Addre	188	MTU (Bytes)		
	Configured Nodes						No items have been found.				
	Comigarea Nodes						Select Actions to create a new it	cem.			
F 💼	Networks										
> <b>m</b>	Route Profiles										
► 🕾 AS/	OUT LIGUT		51	1.							× +
▶ 🗇 N3	<1 L30UT			A Path	IP Address	Side A IP	Side B IP	MAC Address	MTU (Bytes)	Encap	
🕨 🙆 N3				Node-106/eth1/2	192.168.1.10/30			00:22:BD:F8:19:FF	1500	vlan-102	
🕨 🖿 Route	Profiles										
🕨 🖿 Protoc	ol Policies										
🖿 L4-L7 Ser	vice Parameters										
🕨 🖿 Security P	olicies		Routed Sub-Interface	8:							× +
🕨 🚞 Troublesh	oot Policies			- Path	IP Add	reaa	MAC Address	MTU (Bytes)	Encap		
🕨 🖿 Monitoring	Policies						No Rome have been found				
🕨 🚞 L4-L7 Ser	vices						Select Actions to create a new it	iem.			

Configuratie van de Controle van de Toevoer/van de Uitvoer op Subnetten voor ASA-Interne L3Out Extern EPG, zoals in de afbeelding getoond:

uluiju cisco								Q
		arch: enter name, descr	common   T1   infra   mg					
Tenant T1		0	External Network	Instance Profile	- ASA IN EXT N	ET		
💼 Quick Start			External Network	Instance Frome				
🔺 🐣 Tenant T1								Policy Ope
🕨 🖿 Applicatio	on Profiles							Gapar
🔺 🚞 Networki	ing							Other
🕨 🖿 Bridgi	e Domains		⊖±				A 🚺 🚺 100	
VRFs			Properties					
Extern	nal Bridged Networks		Name:	ASA IN EXT NET				
A Extern	nal Routed Networks		Tags:		•			
	et Action Rule Profiles			enter tags separated by comm	18			
	ALCH ACTION RUIE PROTIES		Description:	optional				
	Lonical Node Profiles							
	Networks		Configued VRF name:	VRF2				
Þ	ASA IN EXT NET		Resolved VRF:	uni/tn-T1/ctx-VRF2				
	Route Profiles		Qo5 Class:	Unspecified -	-			
► 🕾 AS	SA_OUT_L3OUT		Target DSCP:	unspecified				
▶ 🕮 N3	3K-1_L3OUT		Configuration Status:	applied				
▶ 🕾 N	3K-2_L3OUT		Configuration Issues:					
🕨 🖿 Route	e Profiles		Subnets:					
🕨 🖿 Proto	col Policies			<ul> <li>IP Address</li> </ul>	Scope		Aggregate	Route Control Profile
🔲 L4-L7 Se	ervice Parameters			10.10.10.0/24	External Su Shared Ro	bnets for the External EPG ute Control Subnet		
Security I	Policies			20.20.20.0/24	Export Rout	te Control Subnet		
I roubles	noot Policies				Shared Rui	ute control subnet		
Monitorin	ig Policies							
P Le-L/ 06	1141665		Route Control Profile:					
				<ul> <li>Name</li> </ul>				Direction
							Ala Baar - I I	have formed
							Select Actions to cre	eate a new item.

Configureer L3Out voor N3K-2 en associeer met BD2 en VRF2, zoals in de afbeelding wordt weergegeven:

ululu cisco								ρ
		earch: enter name, descr	common   T1   infra   mgmt					
Tenant T1								
Quick Start			L3 Outside - N3K-2	2_L3OUT				
🔺 🐣 Tenant T1								
🕨 🖿 Applicati	on Profiles							
🔺 🚞 Network	ing							
🕨 🖿 Bridg	e Domains		⊖±			🛆 🔺 🕕 🕕		
🕨 🖿 VRFs			Branartian					
🕨 🖿 Exter	nal Bridged Networks		Froperties	N2K 2 L2OUT				
🔺 🖿 Exter	nal Routed Networks		Description	contional				
🕨 🖬 Si	et Action Rule Profiles		Description	. opnoral				
▶ 💼 M	atch Action Rule Profiles		Tees					
► 🕾 A3	BA_IN_L3OUT		lags	enter tags separated by o	omma			
▶ 🖽 AS	BA_OUT_L3OUT		Label	:				
► 🖽 N	3K-1_L30UT		Target DSCP	: unspecified				
	Jagical Mode Profiles		Route Control Enforcement	t Import	Export			
	Networks		VDE	T10/052				
	Route Profiles		VKF	: TI/VRF2	<u> </u>			
E Route	e Profiles		Resolved VRF	T1/VRF2	-			
Proto	col Policies		External Rooted Domain		<u> </u>			
🖿 L4-L7 Se	ervice Parameters		Route Profile for Interleak	allect a value	<u> </u>			
🕨 🖿 Security	Policies		Route Control For Dampening					
🕨 🖿 Troubles	shoot Policies			<ul> <li>Address Family Typ</li> </ul>	pe	Route	e Dampening Policy	
🕨 🖿 Monitorir	ng Policies					No items have been f	Found	
🕨 🖿 L4-L7 S	ervices					Select Actions to create a	a new item.	
			Enable BGP/EIGRP/OSPF	: 🔲 BGP	EIGRP			
				OSPF				
			OSPF Area ID	: 0.0.0.1				
			OSPF Area Control	🗄 🗹 Send redistributed I	LSAs into NSSA area			
				Originate summary Summess forwarding	LSA on address in translated LSA			
			0005 444 7 44					
			OSPF Area Type	NSSA area Reg	ular area Stub area			
			USPF Area Cost	. 0	•			
1								
cisco								

CISCO								
ALL TENANTS   Add Tenant   Search: enter name, descr	I common   T1   infra   mgmt							
Tenant T1 🧧 🛃	I ogical Interface Profile	- N3K-2 ID						
🖿 Quick Start	Logical Interface Frome	- NSIC-2_IF						
🔺 🚢 Tenant T1								Policy Fa
Application Profiles								
🔺 💼 Networking								
🕨 💼 Bridge Domains	Properties							
VRFs	Name	N3K-2_IP						
🕨 💼 External Bridged Networks	Description:	optional						
🔺 🖿 External Routed Networks								
Set Action Rule Profiles	Label:							
Match Action Rule Profiles	ND policy:	select a value						
🕨 🚳 ASA_IN_L3OUT	Egress Data Plane Policing Policy:	select a value						
ASA_OUT_L3OUT	Jagreen Date Diage Deliging Delige							
M3K-1_L3OUT	lingless Data Halle Folicing Folicy.	select a value						
A 🕾 N3K-2_L3OUT	Routed Interfaces:							
🔺 🖿 Logical Node Profiles		A Path		IP Address	MAG	Address	MTU (Bytes)	
и 🔲 N3K-2_NP								
🔺 🧮 Logical Interface Profiles					No items have been Select Actions to create	round. a new item.		
IN3K-2_IP								
📃 OSPF Interface Profile	4							
Configured Nodes	SVI:							
Networks								
Route Profiles		A Path	IP Address	Side A IP	Side B IP	MAC Address	MTU (Bytes)	Encap
Route Profiles		Node-106/eth1/4	192.168.1.14/30			00:22:8D:F8:19:FF	1500	vlan-103
Protocol Policies								
L4-L7 Service Parameters								
Security Policies								
Troubleshoot Policies	Routed Sub-Interfaces:							
Monitoring Policies		A Path	IP Addre	88	MAC Address	MTU (Bytes)	B	ncap
▶ 🖿 L4-L7 Services					No items have been Select Actions to create	found. a new item.		

Configureer de controle van de import/export-route op subnetten voor N3K-2 L3Out voor externe EPG, zoals in de afbeelding:

ululu cisco								٩
		arch: enter name, descr	common   T1   infra   mg					
Tenant T1		<ul> <li>O</li> </ul>	External Network	Instance Profile	- NSK-2 EXT NET	г		
💼 Quick Start			LALEITIAI NELWOIK	instance Frome	- NOR-2_EXT_NE	1		
🔺 🐣 Tenant T1								Policy Operational
🕨 🖿 Application	Profiles							Concerd
🔺 🖿 Networkin	g							General Ct
🕨 🖿 Bridge	Domains		⊖±				Δ 🛕 🕕 🕛 100	
🕨 🖿 VRFs			Dranartino					
🕨 🖿 Externa	I Bridged Networks		Floperties					
🔺 🚞 Externa	al Routed Networks		Tags:	NJR-Z_EAT_NET				
🕨 🖿 Set	Action Rule Profiles			enter taga separated by comm				
🕨 🖿 Mat	ch Action Rule Profiles		Description:	optional				
🕨 🕾 ASA	_IN_L3OUT							
🕨 🖾 ASA	_OUT_L3OUT		Configued VRF name:	VRF2				
► 🕾 N3k	-1_L30UT		Resolved VRF:	uni/tn-T1/ctx-VRF2				
M3F	(-2_L30UT		QoS Class:	Unspecified 🗸 🗸				
> <b>=</b> 1	_ogical Node Profiles		Target DSCP:	unspecified				
4	Vetworks		Configuration Status:	applied				
<b>∠</b> (	N3K-2_EXT_NET		Configuration Issues:					
	L4-L7 Service Parameters		Subnets:					
h 🗖 Durit (	Route Profiles		1					
Route r	Tomes			<ul> <li>IP Address</li> </ul>	Scope		Aggregate	Route Control Profile F
1.4-1.7 Sen	ire Parametere			10.10.10.0/24	Export Route	e Control Subnet		
E4 EF 6610	licies			20.20.20.0/24	External Sub	onets for the External Ef	PG	
Troublesh	not Policies							
Monitoring	Policies							
▶ 🚞 L4-L7 Sen	rices		Route Control Profile:					
				<ul> <li>Name</li> </ul>			Di	rection
							No item - have been	en found
							Select Actions to crea	te a new item.

Stap 4. Maak de functiegroep van Functie en configuratie Functieprofiel van bestaande sjabloon, zoals in de afbeelding:

ululu cisco										Adv welco
		earch: enter name, descr	common   T1   infra							
Tenant T1		<ul> <li>O</li> </ul>	1417 Somioor	- Eurotion Profile	ACASSOS ED					
💼 Quick Start			L4-L7 Services	s Function Frome	- ASA5565_FF					
🔺 🐣 Tenant T1										General Faults
🕨 🖿 Applicatio	in Profiles									A
🕨 🚞 Networki	ng									
🚞 L4-L7 Se	rvice Parameters		Properties							
🕨 🖿 Security F	Policies		Nar	me: ASA5585_FP						
Troubles	hoot Policies		Descripti	ion:						
Monitorin	g Policies		Associated Functi	ion: CISCO-ASA-1.2/Firewall						
4 💻 L4-L7 Se	rvices									
▶ ■ L4-L7	Service Graph Templates									
P Route	r contigurations									
	A5585 FPG									
	ASA5585 FP									
▶ L4-L7	Devices		FEATORES AN	ND FARAIVIETERS						
🕨 🖿 Impor	ted Devices		Features:	Basic Par	rameters All Parameters					
🕨 🖿 Device	es Selection Policies		Interfaces	Meta Folde	r/Param Key		Name V	falue Mandatory	Locked	Shared
🕨 🖿 Deplo	yed Graph Instances		interraces	🔺 🚔 Der	vice Config		Device			
🕨 🚞 Deplo	yed Devices		ACCESSLISTS	> 🛄 .	Access List		access-list-inbound		false	false
📃 Inban	d Management Configuration for L4-L	_7 devices	NAT	· · · · ·	Interface Related Configuration	n	externallf		false	false
Device	e Managers		TrafficSelectionO	ibjects	Interface Related Configuration	n	internallf		false	false
🕨 🛄 Chas	sis		All	4 😅 Fur	nction Config		Function			
					Eidernal Interface Configuratio	on	ExtConfig		false	false
					Internal Interface Configuratio	n	IntConfig		false	false
1				11						

		General	Faults	Histor
	A A O O		AC	TIONS *
Properties Name: ASA5585_FP Description:				
Associated Function: CISCO-ASA-1.2/Firewall				

#### FEATURES AND PARAMETERS

1

Features:	Basic Parameters All Parameters					
had the second	Meta Folder/Param Key	Name	Value	Mandatory	Locked	Shared
Interfaces	✓ ➡ Device Config	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	
	El 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	
	El Security Level	internal_security_level	100	false	false	
	Function Config	Function				
	External Interface Configuration	ExtConfig			false	false
	<ul> <li>Interface Configuration</li> </ul>	ExtConfigrel	externallf	false	false	
	Internal Interface Configuration	IntConfig			false	false
	- 🔄 Interface Configuration	InConfigrel	internallf	false	false	

Stap 5. Maak een contract en wijzig het veld Toepassingsgebied in huurder, zoals in de afbeelding:

ululu cisco				VM Networking	L4-L7 Services		Operations
		earch: enter name, descr	common   T1   infra   m				
Tenant T1		S 0	Contract - PERM	IIT ALL			
Quick Star	t						
Annlica	tion Profiles						
⊿ 🖿 Netwo	'king						
🕨 🖿 Brid	- Ige Domains		Properties				
🕨 🖿 VRF	s		Name	PERMIT_ALL			
🕨 🖿 Exte	rnal Bridged Networks		Label:				
🕨 🖿 Exte	ernal Routed Networks		Scope:	Tenant 🗸			
🕨 🖿 Rou	ite Profiles		QoS Class:	Unspecified 🚽 🚽			
🕨 🖿 Pro	tocol Policies		Target DSCP:	unspecified			
L4-L7 :	Service Parameters			For "unapecified", put "64"			
🔺 🖿 Securi	y Policies		Description	optional			
	ntracts						
A @	PERMIT_ALL		Subjects:				
	PERMIT_ALL			<ul> <li>Name</li> </ul>	Filters		
	oo Contracts		4		T1/PEPMI	TALI	
Imp E min	oned Contracts			TERMIT_NEE	The Erowi	1_055	
	sta achoot Policies						
Monito	ing Policies						
▶ ■ L4-L7	Bervices						

Stap 6. Zoals in de afbeelding wordt getoond, kunt u L4-L7 Service Graph sjabloon maken waar de associatie Service Graph is gekoppeld aan een extern routed Network Policy en routerconfiguratie met een beleid voor apparaatselectie.

ALL TENANTS   Add Tenant   Search: enter name, descr	I common   T1   Inffa   mgmt	
Tenant T1 🛛 🖉 🖸	1417 Service Orach Terrelate ACASSAS COT	
Cuick Start	L4-L7 Service Graph Template - ASA5585_SGT	
🖌 🚢 Tenant T1		Topology Policy
Application Profiles		
Networking	Consumer Provi	der
L4-L7 Service Parameters		3
Security Policies		
Monitoring Policies	A\$A5585	
L4-L7 Services		
L4-L7 Service Graph Templates	N1	
ASA5585_SGT	- ASA555 httm#lin	
El Function Node - N1	Firewall: Routed	
Router configurations	Profile: ASA5585_FP	
Function Profiles		
L4-L7 Devices		
Imported Devices		
Devices Selection Policies     Devices		
Deployed Graph Instances     Deployed Graph Instances		
Inband Management Configuration for L4-L7 devices		
Device Managers		
🕨 🛄 Chassis		
Create L4-L7 Service Graph Template		<b>A</b>
Drag dovice clusters to create graph podes		
Diag device clusters to create graph hodes.		
Device Clusters	Graph Name: ASA5585_SGT	
	Graph Type: Ocreate A New One Clone An Existing One	
T1 /ASA5585 (Managed Firewall)	Conclusion	Brouidor
	CONSUME	Flovidei
	EPG P	EPG
	ASA5585	
	N1	
	Please drag a device from devices table and drop it here to create a service node.	
	- ASA5585 Information	
	rnewan. • Rouled • Transparent	
	Profile: T1/ASA5585_FPG/ASA5585_FP 🛛 🗸 📳	
	· · · · · · · · · · · · · · · · · · ·	

Routerconfiguratie om de router-ID te specificeren die op de Service-applicatie (ASA 5585) gebruikt zal worden, zoals in de afbeelding:

cisco		Tenants	Fabric	VM Networking	L4-L7 Services	Admin
	ALL TENANTS   Add Tenant   8	Search: enter name, descr	common   T1   infra			
Tenant T1		<ul> <li>O</li> </ul>	Router configu	ation - ASA5585		
Quick Start						
Application	n Profiles					
🕨 🖿 Networki	ng					
🖿 L4-L7 Se	rvice Parameters		Properties			
🕨 🖿 Security F	Policies		Nar	ne: ASA5585		
🕨 🖿 Troubles	noot Policies		Router	D: 3.3.3.3		
🕨 🖿 Monitorin	g Policies		Descripti	on: optional		
4 🖿 L4-L7 Se	rvices					
L4-L7	Service Graph Templates					
Route	r configurations					
	A5585					
Functi	on Profiles					
E4-L7	bences Ind Devices					
Devici	es Selection Policies					
Deplo	ved Graph Instances					
🕨 🖿 Deplo	yed Devices					
📃 Inban	d Management Configuration for L4-	L7 devices	•			
🕨 🖿 Devic	e Managers					
🕨 🖿 Chas	sis					

Verandert het type nabijheid van L2 tot L3, zoals in het beeld wordt getoond:

L4-L7 Services Admin Operations $ ho$ i					cisco
		common   T1   infra   mgm	earch: enter name, descr		
- ASA5585 SGT	ranh Template - ASA5585 SGT	14-17 Service Gra	S 0		Tenant T1
	Taph Template - A6A5565_661			t	🔲 Quick Sta
Topology					🔺 🐣 Tenant Ti
		Ð↓		ation Profiles	🕨 🖿 Applic
				iking	🕨 🖿 Netwo
		Properties		Service Parameters	🖿 L4-L7
	ASA5585_SGT	Name: A		y Policies	🕨 🕨 Securi
	UNSPECIFIED	Template Name: U		eshoot Policies	🕨 🖿 Troubl
		Configuration Issues:		ring Policies	🕨 🖿 Monito
	optional	Description:		Services	🔺 🖿 L4-L7
				L7 Service Graph Templates	🔺 🗖 L4
		Label:		ASA5585_SGT	· •*
Function Name Function Type Description	- Name	Function Nodes:		Eunction Node - N1	1
CISCO-ASA-1.2/Firewall 00To	N1	-		📃 consumer	
				📃 provider	
				iter configurations	P Ro
				iction Profiles	P Fu
				L7 Devices	▶ ■ L4-
		1		ioned Devices	
				loved Granh Instances	▶ ■ De
Provider/Consumer Description	<ul> <li>Name</li> </ul>	Terminal Nodes:		aloved Devices	▶ ■ De
Concernant	T1	-	7 devices	and Management Configuration for L4-L	
				rice Managers	▶ 🖿 De
Provider	12			assis	▶ 🖿 Ch
Connected Nodes Unicast Route Adjacency Type Description	<ul> <li>Name</li> <li>Connected Nodes</li> </ul>	Connections:			
N1, T1 True L3	C1 N1, T1				
N1, T2 True L3	C2 N1, T2				
Function Name     Function Type     De       CISCO-ASA-1.2/Firewall     0oTo       CISCO-ASA-1.2/Firewall     0oTo         Provider/Consumer     Description       Consumer     Provider/Consumer       Provider/Consumer     Description       Consumer     Unicast Route     Adjacency Type       Connected Nodes     Unicast Route     Adjacency Type       N1, T1     True     13       N1, T2     True     13	* Name	Label; Function Nodes; Terminal Nodes; Connections;	7 devices	ASASSB_GOT	<ul> <li>R R0</li> <li>R R1</li> <li< th=""></li<></ul>

Sjabloon voor servicesdiagram toepassen, zoals in de afbeelding wordt getoond:



Hang de servicesdiagram aan contract, zoals in de afbeelding:

uluilu cisco										
		Search: enter name, deacr	common   T1   infra   r							
Tenant T1		S 2	Apply L4-L7 Servi	ce Graph Template	To EPGs					<b>AX</b>
💼 Quick Start										
🔺 🐣 Tenant T1			STED 1 > Contra	uct.					1 Contract	2 Graph
Application	Profiles		STEP TP COILIA	ICI						an ereipin
🕨 🚞 Networkin	1									
🛄 L4-L7 Sen	ice Parameters		Config A Contract	Between EPGs						
Security Pr	plicies		EPGs Information							
Troublesh	oot Policies		Consumer	EPG / External Network: T	1/N3K-1_L3OUT/N3K-1_EXT_N	NI 👻 🕑 Provid	der EPG / External Network: T1/	N3K-2_L3OUT/N3K-2_EXT_NI 👻 🛃	S	
Monitoring	Policies									
L4-L7 Ser	lices		- Contract Information							
L4-L7	service Graph Templates			Contract: 💿 Create A New (	Contract 🔘	Choose An Existing Contra	ct Subject			
Router	configurations		Contra	act Name: PERMIT_ALL						
Functio	n Profiles			All Tradition -						
▶ 💼 L4-L7 0	Devices		NU FILLER (ALLOW A	All Trainc). 🗹						
🕨 💼 Importe	d Devices									
▶ 💼 Device	s Selection Policies									
🕨 💼 Deploy	ed Graph Instances									
🕨 🖿 Deploy	ed Devices									
📃 Inband	Management Configuration for L4-	L7 devices	4							
Device	Managers									
🕨 🖿 Chass	Is									
									PREVIOUS NEXT	CANCEL



Voeg, indien nodig, L4-L7 parameter toe, zoals in het beeld wordt getoond:



Stap 7: Route-tag Policy, configureer routeswitchbeleid voor VRF1 (Tag:100), zoals in de afbeelding:

alialia cisco	System	Tenants	Fabric	VM Networking	L4-L7 Services	Admin	Operations		P		i		A web
		earch: enter name, descr	common   infra   mg	mt   T1									
Tenant T1 Quick Start		S 0	VRF - VRF1						Policy	Operational			Faul
<ul> <li>Applicatio</li> <li>Application</li> </ul>	n Profiles Ia		€₹				▲ ● ● 100						
🕨 🖿 Bridge	Domains		Properties										
VRFs	F1		Route Tag Policy	- VRF1_RTP				() X					
	Deployed VRFs (Simple Mode) EPG Collection for Context							Policy History					
🕨 🖻 VR	F2		⊙±					ACTIONS *					
Estem     Estem     Editem     Estem     Estem	al Pridged Networks al Routed Networks Profiles of Policies Officies and Policies of Policies offices		Properties No. Descrip	ame: VRF1_RTP Bon: lopional Teg: 100	<u>•</u>								
							SHOW USAGE	SUBMIT CLOSE					
				▲ EIGRP	Address Family Type			LIGRP Address Family Context					
							Select Actions to c	reate a new item.					
				DNS labels: Route Tag Policy: VRF1_RT	P 🗸 🗗								
										s	HOW USAG	e su	BMIT

Configureer routeswitchbeleid voor VRF2 (tag:200), zoals in de afbeelding:

uluih cisco	System	Tenants	Fabric	VM Networking	L4-L7 Services	Admin	Operations		P		i		A weli
		Search: enter name, descr	common   infra   mgmt										
Tenant T1  Culck Start		0 12	VRF - VRF2						Policy				
<ul> <li>Application</li> <li>Metworki</li> </ul>	on Profiles ing		⊙¥				A O O 100						
Bridge VRFs NRFs	e Domains		Route Tag Policy -	VRF2_RTP									
► 🖻 VF	RF2		0 <b>I</b>					ACTIONS *					
Extern     Extern     Extern     Extern     Extern     Coute     Extern     Troubles     Monitorin     L4-L7 Se	na Brūdgo Metworks al Routed Networks I Profiles col Policies Policies Policies go Policies go Policies		Properties Name Description	2 VH82_RTP τ polonal 2 200 Φ	<u>-</u>								
							SHOW USAGE	SUBMIT CLOSE					
			EIGKP CONTEXT PER	Audress Farminy.	Address Family Type		EIG EIG	GRP Address Family Context					
							No items have be Select Actions to crea	en found. te a new item.					
				DNS labels:	<b>-</b> ₽								
										SI	IOW USAGE	SUBMIT	5

Stap 8: Controleer de status en controleer het beleid voor apparaatselectie zoals in de afbeelding:

cisco							Operations				
		earch: enter name, descr	common   T1   infra   mg								
Tenant T1		S 0	Logical Interface	Context - cons	Imer						
🔲 Quick Start			Logiour internade	Context Cons.	amor						
Tenant T1											
P Applicati	on Profiles		⊖±								
	ing		Deservice								
E4-L7 5	Policico		Connector Mamo	concurren							
Security	ruities		Cluster Interface:	outside	<b>-</b> - f⊠						
Monitoriu	n Policies										
4 🗖 L4-L7 S	avices		Associated Network:	Bridge Domain	External Network						
L4-L7 Service Graph Templates			L3 External Network:	L3 External Network: T1/ASA_OUT_L3OUT/A v 🗗							
🕨 🚞 Rout	er configurations		Redistribute:	bgp 🗷 ospf 🗷 🔻							
🕨 🖿 Func	tion Profiles										
▶ 🖿 L4-L	7 Devices		Subpoto:								
🕨 🖿 Impo	rted Devices		oubliets.					×	+		
🔺 🕅 Devi	es Selection Policies			IP/Mask	Scope	Preferred	Subnet Control		_		
🔺 🖸 P	ERMIT_ALL-ASA5585_SGT-N1					No items have been found.					
	, consumer					Select Actions to create a new item.					
E	provider										
🕨 🖿 Depl	oyed Graph Instances		•								
🕨 🖿 Depl	oyed Devices		Virtual IP Addresses:					$\times$	+		
📃 Inbar	nd Management Configuration for L4-L	7 devices		<ul> <li>IP Address</li> </ul>							
Device	e Managers					No items have been found.					
P Chas	sis					Select Actions to create a new item.					

ululu cisco		Tenants					Operations					
ALL TENANTS   Add Tenant   Search: enter name, descr			common   T1   infra   mg									
Tenant T1 🧃 🖸			Logical Interface	Context - provid	lor							
💼 Quick Start			Eoglear Internace	Context - provid								
🔺 🐣 Tenant T1												
🕨 🖿 Application	Profiles			214								
🕨 🖿 Networking												
🖿 L4-L7 Servi	ce Parameters		Properties									
🕨 🖿 Security Po	licies		Connector Name:	provider								
🕨 🖿 Troublesho	ot Policies		Cluster Interface:	inside	<u>·</u> @							
🕨 🖿 Monitoring	Policies		Associated Network	Bridge Domain	External Network							
🔺 💼 L4-L7 Serv	ces		3 External Network:	A Second Network Table In Local Table - In								
🕨 🖿 L4-L7 Service Graph Templates			D. L. L.	za zweinia network. 11/RAA_IN_23001/AS. V								
Router configurations			Redistribute:	bgp 🙁 ospf 🙁 🔻								
🕨 💼 Function Profiles												
L4-L7 Devices			Subnets:									
🕨 🖿 Importe	Imported Devices							×	+			
🔺 🖿 Devices	Selection Policies			IP/Mask	Scope	Preferred	Subnet Control					
🔺 🔟 PER	MIT_ALL-ASA5585_SGT-N1					No items have been found.						
1. с	onsumer					Select Actions to create a new item.						
p 📃	rovider											
🕨 🖿 Deploye	d Graph Instances		•									
Deployed Devices			Virtual IP Addresses:					$\times$	+			
📃 Inband Management Configuration for L4-L7 devices				<ul> <li>IP Address</li> </ul>								
🕨 🖿 Device 1	lanagers											
🕨 🛄 Chassis						No items have been found. Select Actions to create a new item.						

## Controleer de implementaties van Grafiek, zoals in de afbeelding weergegeven:

		welcome, adm						
	_	_						
	Poli	y Faults Hist						
	•							
Name M								
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		Encap						
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		unknown						
Class ID								
32773								
49156								
•	Override Name/Val	ue To						
	Ciess ID 22773 49166	Ciens ID 32773 49156						

ululu cisco				VM Netwo				Operations
		enter name, descr	common   T1   infra					
Tenant T1		S 2	Dealers of Deale					
💼 Quick Start				ices				
🔺 🚢 Tenant T1								
Application Profiles			⊖₹					
Networking			Device Name			VRF		
Security Policies			ASA5585			none		
Troublest	hoot Policies							
🕨 🖿 Monitorin	g Policies							
🔺 🚞 L4-L7 Se	rvices							
L4-L7 Service Graph Templates								
Route	r configurations							
► ■ L4-L7	Devices							
🕨 🖿 Impor	ted Devices							
🔺 🚞 Device	es Selection Policies							
4 🖸 PE	ERMIT_ALL-ASA5585_SGT-N1							
	consumer							
🛋 🗖 🖌	provider ived Graph Instances							
⊿ 🗸 PE	ERMIT_ALL-ASA5585_SGT-T1							
1	Function Node - N1							
🔺 🛄 Deplo	oyed Devices		l					
AS	A5585-none							
	OSPE Device Configuration							
<b>▲</b> ¥*	PERMIT_ALL-ASA5585_SGT-T1							
	BGP Graph Instance Configuration							
	OSPF Graph Instance Configuration							
4	₩ N1							
	Connector N1/consumer							
📃 Inband	d Management Configuration for L4-L7 dev	ices						
🖿 Device	e Managers							
🗖 Chass	sis							
ahah	Autom Transfer	E altain	ADD Not suggifying	14120	<ul> <li>A structure</li> </ul>	Occurting		•
cisco	System	Fabric		L4-L7 Services				
ALL Tenant T1	L TENANTS   Add Tenant   Search: Conter name, des	icer   common   T1   infra	a   mgmt					
💼 Quick Start		Device OSPF	<sup>-</sup> Configurations					
Tenant T1      Englishting Prof	flan.	Q₩						
Networking	160	Name	Enable	Context Name	Address Family Area	Area Control	Area Type	Networks
L4-L7 Service P	'arameters «	ASA_IN_L3OUT_are	a_0 True	VRF2 I	Pv4 Backbone area	Send redistributed LSAs into N Originate summary LSA	SSA area Regular area	ASA_IN_EXT_NET (10.10.10.0/24)
Troubleshoot Pices	° olicies	ASA_OUT_L3OUT_a	irea_0 True	VRF1 I	Pv4 Backbone area	Send redistributed LSAs into N Originate summary LSA	SSA area Regular area	ASA_OUT_EXT_NET (20.20.20.0/24)
Monitoring Polic	cies							
L4-L7 Servic	ce Graph Templates							
Router config Europian Pro	igurations miles							
🕨 🖿 L4-L7 Device	es							
Imported De Imported De Im	wices lection Policies							
	_ALL-ASA5585_SGT-N1							
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🔺 🖿 Deployed Gr	raph Instances	•						
✓ PERMIT_ □ Functi	_ALL-ASA5585_SGT-T1 ion Node - N1							
🔺 💼 Deployed De	evices							
ASA5585 BGP I	5-none Device Configuration							
OSPF	Device Configuration							
PERM	MIT_ALL-ASA5585_SGT-T1 3P Graph Instance Configuration							
08	SPF Graph Instance Configuration							
4 👫 N1	1 Connector N1/consumer							
	Connector N1/provider							
🔜 Inband Mana 🖿 🔜	agement Configuration for L4-L7 devices agers							
🖿 Chassis								

# Probleemoplossing controleren

#### APIC-configuratie voor 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#
```

Controleer OSPF-buurrelatie en routingtabel op blad 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
200.200.200.200/32, ubest/mbest: 1/0
 \*via 192.168.1.5, vlan9, [110/15], 00:30:20, ospf-default, intra
Controleer OSPF-buurrelatie en routingtabel op blad 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
3.3.3.3
                1 FULL/BDR
                                    00:37:07 192.168.1.9
                                                              Vlan14
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
```

Controleer configuratie, OSPF-relatie en routingtabel op ASA 5585:

```
ASA5585# sh run interface
interface GigabitEthernet0/0
no nameif
security-level 0
no ip address
1
interface GigabitEthernet0/0.101
nameif externalIf
security-level 50
ip address 192.168.1.5 255.255.255.252
1
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
              Pri State
                                   Dead Time Address
                                                               Interface
100.100.100.100 1 FULL/DR
                                    0:00:38 192.168.1.6
                                                              externalIf
                                    0:00:33 192.168.1.10 internalIf
200.200.200.200 1 FULL/DR
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
       10.10.10.0 255.255.255.0
O IA
          [110/18] via 192.168.1.6, 00:22:57, externalIf
O IA
       20.20.20.0 255.255.255.0
          [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 Controleer configuratie, OSPF buurrelatie en routingtabel op 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 Interface
01:36:24 192.168.1.2 Eth1/47
 Neighbor ID Pri State
 100.100.100.100 1 FULL/DR
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
```

Controleer configuratie, OSPF buurrelatie en routingtabel op 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
interface Ethernet1/47
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
                                   01:43:50 192.168.1.14 Eth1/47
200.200.200.200 1 FULL/DR
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
```

#### Controleer de regels van het contractfilter op blad en het pakkethit telt:.

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]

#### Betaalbaarheidsproef tussen N3K-1 en 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
```

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

Bijgevoegd is het XML configuratiebestand voor de huurder en het ASA-functieprofiel, gebruikt voor deze demonstratie.