# **Configureer NAT 64 op beveiligde firewall die door FMC wordt beheerd**

### Inhoud

Inleiding Voorwaarden Vereisten Gebruikte componenten Configureren Netwerkdiagram Netwerkobjecten configureren Interfaces op FTD voor IPv4/IPv6 configureren Standaardroute configureren NAT-beleid configureren NAT-regels configureren Verificatie

### Inleiding

Dit document beschrijft hoe u NAT64 kunt configureren bij Firepower Threat Defence (FTD), beheerd door Fire Power Management Center (FMC).

### Voorwaarden

#### Vereisten

Cisco raadt u aan kennis te hebben over Secure Firewall Threat Defence en Secure Firewall Management Center.

#### Gebruikte componenten

- Firepower Management Center 7.0.4
- Verdediging van vuurkracht 7.0.4.

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 zorgen dat u de potentiële impact van elke opdracht begrijpt.

# Configureren

Netwerkdiagram



#### Netwerkobjecten configureren

• IPv6-netwerkobject voor verwijzing naar het interne IPv6-clientsubsysteem.

In de FMC GUI, navigeer naar **Objecten > Objectbeheer > Selecteer Netwerk uit linkermenu > Netwerk toevoegen > Object toevoegen**.

Zo wordt bijvoorbeeld Network Object Local\_IPv6\_Subnet gemaakt met het IPv6-subnetbestand FC00:0:0:1::/96.

Edit Network Object	0
Name Local_IPv6_subnet	
Description	
Network O Host O Range   Network	
FC00:0:0:1::/96 Allow Overrides	
	Cancel Save

• IPv4-netwerkobject om IPv6-clients naar IPv4 te vertalen.

Ga in de FMC GUI naar **Objecten > Objectbeheer > Netwerk selecteren in het linkermenu > Netwerk toevoegen > Groep toevoegen**.

Zo is bijvoorbeeld Network Object 6\_mapped\_to\_4 gemaakt met IPv4 host 192.168.0.107.

Afhankelijk van de hoeveelheid IPv6-hosts die in IPv4 moeten worden toegewezen, kunt u één objectnetwerk, een netwerkgroep met meerdere IPv4, of alleen NAT gebruiken voor de uitgaande interface.

Name 6_mapped_to_4 Description Allow Overrides Available Networks C + Q. Search 6_mapped_to_4 any_IPv4 Any_ipv6 google_dns_ipv4 google_dns_ipv6 Selected Networks Q. Search by name 192.168.0.107 Add	New Network Group			0
6_mapped_to_4 Description Allow Overrides Available Networks C + Q. Search G.mapped_to_4 any_IPv4 Any_ipv6 google_dns_ipv4 google_dns_ipv4 google_dns_ipv6	Name			
Description         Allow Overrides         Available Networks C         Q. Search         6_mapped_to_4         any_IPv4         Any_ipv6         google_dns_ipv4         google_dns_ipv6         google_dns_ipv6	6_mapped_to_4			
Allow Overrides Available Networks C + Q. Search 6_mapped_to_4 any_IPv4 Any_ipv6 google_dns_ipv4 google_dns_ipv4 google_dns_ipv6	Description	_		
Q. Search     Q. Search by name       6_mapped_to_4     Add       any_IPv4     192.168.0.107       Any_ipv6     192.168.0.107       google_dns_ipv4     Add       google_dns_ipv6     Add	Allow Overrides	+	Selected Networks	
6_mapped_to_4 any_IPv4 Any_Ipv6 google_dns_ipv4 google_dns_ipv6 Add 192.168.0.107 Add Add Add	Q, Search		्, Search by name	
google_dns_ipv4_group google_dns_ipv6 Add	6_mapped_to_4 any_IPv4 Any_ipv6 google_dns_ipv4	Add	192.168.0.107	Ĩ
	google_dns_ipv4_group google_dns_ipv6	_		Add
			Cancel	Save

• IPv4 Network Object voor verwijzing naar de externe IPv4-hosts op internet.

In de FMC GUI, navigeer naar **Objecten > Objectbeheer > Selecteer Netwerk uit linkermenu > Netwerk toevoegen > Object toevoegen**.

Netwerkobject Any\_IPv4 wordt bijvoorbeeld gemaakt met het IPv4-subnetnummer 0.0.0.0/0.

New Network Object	0
Name Any_IPv4 Description	
Network Host Range Network 0.0.0/0	○ FQDN
Allow Overrides	Cancel

• IPv6 Network Object om externe IPv4-host naar ons IPv6-domein te vertalen.

Op FMC GUI, navigeer naar **Objecten > Objectbeheer > Selecteer Netwerk uit linkermenu > Netwerk toevoegen > Object toevoegen**.

Zo is bijvoorbeeld Network Object 4\_mapped\_to\_6 gemaakt met IPv6-subnetwerkkaart FC00:0:0:F:/96.

Edit Network Object	0
Name 4_mapped_to_6	
Description	
Network O Host O Range  Network	
fe00:0:0:f::/06	
Allow Overrides	

#### Interfaces op FTD voor IPv4/IPv6 configureren

Navigeren naar Apparaten > Apparaatbeheer > FTD bewerken > Interfaces en Inside en Outside

interfaces configureren.

Voorbeeld:

Interface Ethernet 1/1

Naam: Inside

Security Zone: binnen\_zone

Als de security zone niet is gemaakt, kunt u deze maken in het **vervolgkeuzemenu Security Zone** > **Nieuw**.

IPv6-adres: FC00:0:0:1:1/96

Edit Physic	cal Inter	face				0
General	IPv4	IPv6	Advanced	Hardware Configuration	FMC Access	
Name:						
inside						
Enabled						
Manager	ment Only					
Description:						
Mode:						
None			•			
Security Zone	e:					
Inside_Zon	e		•			
Interface ID:						
Ethernet1/1	1					
MTU:						
1500						
(64 - 9198)						
Deservate Co	ecurity Gro	oup Tag:				

	Edit Phys	sical Inter	face						0
ľ	General	IPv4	IPv6	Adv	/anced	Hardware Configu	ration	FMC Access	
	Basic	Address	Prefix	es	Settings				
		Enab	le IPV6:	$\checkmark$					
Ŀ		Enforce	EUI 64:						
	1	Link-Local a	ddress:						
		Autoconfig	uration:						
	Enable	e DHCP for a	address config:						
	Enable DH	CP for non-a	address						
			e e						
								Cancel	ОК

ieneral IPv4	IPv6 H	lardware Configuration	A design of the second s		
			Manager Access	Advanced	
asic Address	Prefixes	Settings			
					+ Add Add
ddress				EU164	
000-0-0-11/96					

Interface Ethernet 1/2

Naam: Buiten

Security Zone: buiten\_zone

Als security zone niet is gemaakt, kunt u deze maken in het **Security Zone vervolgkeuzemenu > Nieuw**.

IPv4-adres: 192.168.0.106/24

General	IPv4	IPv6	Advanced	Hardware Configuration	FMC Access
lama					
outside					
Outside					
Enabled					
Managem	ent Only				
Description:					
As day					
Node:					
None			•		
Security Zone:					
Outside_Zor	ne		•		
nterface ID:					
Ethernet1/2					
UTU:					
1500					
64 - 9198)					
Propagate Sec	curity Gro	oup Tag:	$\checkmark$		
					Cancel OK

General IPv4	IPv6	Advanced	Hardware Configuration	FMC Access	
Type:					
Use Static IP		v			
Address:					
192.168.0.106/24					
<b>192.168.0.106/24</b>	i.128 or 192	.0.2.1/25			
192.168.0.106/24	i.128 or 192	.0.2.1/25			
192.168.0.106/24	i. 128 or 192	.0.2.1/25			
<b>192.168.0.106/24</b> 1. 192.0.2.1/255.255.255	5.128 or 192.	.0.2.1/25			
<b>192.168.0.106/24</b> 1. 192.0.2.1/255.255.255	5.128 or 192	.0.2.1/25			
192.168.0.106/24	5.128 or 192	.0.2.1/25			
<b>192.168.0.106/24</b>	5.128 or 192.	.0.2.1/25			

### Standaardroute configureren

Navigeer naar Apparaten > Apparaatbeheer > FTD bewerken > Routing > Statische routing > Add Route.

Bijvoorbeeld, standaard statische route op de buiteninterface met gateway 192.168.0.254.

Edit Static Route Co	onfiguration		0			
Type: IPv4 Interface* Outside (Interface starting with the Available Network C Q. Search	4 O IPv6 v iis icon @signifies it is av + Add	ailable for route leak) Selected Network any-ipv4	Ĩ			
6_mapped_to_4 any-ipv4 any_IPv4 google_dns_ipv4 google_dns_ipv4_grou google_dns_ipv6_grou	p					
Ensure that egress virtual	router has route to that d	estination				
Gateway						
192.168.0.254	• +					
Metric:						
1						
(1 - 254)						
Tunneled: (Used onl	ly for default Route)					
Route Tracking:						
	• +					
		C	oncel OK ,			
Firewall Managemen Devices / Secure Firewall Roo	t Center Overview	Analysis Policies Devic	es Objects Integration			Deploy Q
FTD_LAB						
Cisco Firepower 1010 Threat Defense	se					
Device Routing Interface	es Inline Sets DHCP S	SNMP				
Manage Virtual Routers						
Giobal	Network +	Interface	Leaked from Virtual Router	Gateway	Tunneled	Metric
Virtual Router Properties	▼ IPv4 Routes					
BFD	any-ipv4	Outside	Global	192.168.0.254	false	1
OSPF	▼ IPv6 Routes					
OSPFv3						
EIGRP						
∼ BGP						
IPv4						
IPv6						
Static Route						

### NAT-beleid configureren

Ga in de FMC GUI naar **Apparaten > NAT > Nieuw Beleid > Threat Defense NAT** en voer een NATbeleid in.

Zo wordt NAT-beleid FTD\_NAT\_Policy gemaakt en toegewezen aan de test FTD\_LAB.

New Policy		0
Name: FTD_NAT_Policy Description: Targeted Devices Select devices to which you want to apply this policy. Available Devices	Selected Devices	
Q. Search by name or value         FTD_LAB    Add to Policy	FTD_LAB	
	Cancel Save	

#### **NAT-regels configureren**

Uitgaande NAT.

Ga in de FMC GUI naar **Apparaten > NAT > Selecteer het NAT-beleid > Regel toevoegen** en creëer NAT-regel om het interne IPv6-netwerk naar de externe IPv4-pool te vertalen.

Zo is bijvoorbeeld Network Object Local\_IPv6\_subnet dynamisch vertaald naar Network Object 6\_mapped\_to\_4.

NAT-regel: automatische NAT-regel

Type: Dynamisch

Source Interface Objects: Inside\_Zone

Bestemmingsinterface-objecten: Outside\_Zone

Oorspronkelijke bron: Local\_IPv6\_Subnet

Vertaalde bron: 6\_mapped\_to\_4

NAT Rule: Auto NAT Rule: Vpre: Vpre: Vpre: Vpre: Vpre: Vpre: Vpre: Vpre: Vpre: Vpre: Vpre: Vpre: Computation Interface Objects C Source Interface Objects (1) Destination Interface Objects (1) Restauding Zone Outside Zone Outside Zone Outside Zone Outside Zone Cancel Objects Edit NAT Rule NAT Rule: NAT Rule: NAT Rule: NAT Rule: NAT Rule: NAT Rule: Vpre: Vp							
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Inkomende NAT.

Ga in de FMC GUI naar **Apparaten** > **NAT** > **Selecteer het NAT-beleid** > **Regel toevoegen** en creëer NAT-regel om extern IPv4-verkeer naar interne IPv6-netwerkpool te vertalen. Dit maakt interne communicatie met uw lokale IPv6-subnetverbinding mogelijk.

Schakel bovendien DNS-herschrijving in op deze regel zodat antwoorden van de externe DNS-server kunnen worden geconverteerd van A-records (IPv4) naar AAA-records (IPv6).

Bijvoorbeeld, buiten netwerk Any\_IPv4 wordt statisch vertaald naar IPv6-subnetwerkknooppunt 2100:6400::/96 gedefinieerd in het object 4\_mapped\_to\_6.

NAT-regel: Auto NAT-regel

Type: Statisch

Bron interface-objecten: Outside\_Zone

Bestemmingsinterface-objecten: Inside\_Zone

Oorspronkelijke bron: Any\_IPv4

Vertaalde bron: 4\_mapped\_to\_6

Vertaal DNS antwoorden die overeenkomen met deze regel: Ja (Schakel selectievakje in)

Edit NAT Rule					0
NAT Rule: Auto NAT Rule Type: Static Interface Objects Translati	▼ ▼ ion PAT Pool Advan	ced			
Available Interface Objects C	2	Source Interface Objects	(1)	Destination Interface Objects	(1)
Q Search by name Group_Inside Group_Outside Inside_Zone Outside_Zone	Add to Source	Outside_Zone	V	Inside_Zone	Ŧ
				Cancel	OK

Edit NAT Rule			0
NAT Rule: Auto NAT Rule ▼ Type: Static ▼ Enable Interface Objects Translation	PAT Pool Advanced		
Original Packet Original Source:* any_IPv4 Vriginal Port: TCP V	] +	Translated Packet Translated Source: Address  4_mapped_to_6  + Translated Port:	
		Cancel	)K

Edit NAT Rule		0
NAT Rule: Auto NAT Rule Type: Static Enable Interface Objects Translation	▼ ▼	3
<ul> <li>Translate DNS replies that m</li> <li>Fallthrough to Interface PAT(</li> <li>IPv6</li> <li>Net to Net Mapping</li> <li>Do not proxy ARP on Destination</li> <li>Perform Route Lookup for Destination</li> </ul>	natch this rule (Destination Interface) ation Interface lestination Interface	
	Cancel	ОК

#### FTD\_NAT\_Policy Enter Description Rules

	_							
Filter by	Device T Filter	Rules						
						Original Packet		
	Direction	Туре	Source Interface Objects	Destination Interface Objects	Original Sources	Original Destinations	Original Services	Translate Sources
$\sim NA$	✓ NAT Rules Before							
V Au	V Auto NAT Rules							
#	\$	Static	Outside_Zone	Inside_Zone	Faiany_IPv4			🖥 4_ma
н	×	Dyna	Inside_Zone	Outside_Zone	Local_IPv6_subnet			🖾 6_ma
> NA	AT Rules After							

Vervolg de implementatie van wijzigingen in het FTD.

# Verificatie

• Geef interfacenamen en IP-configuratie weer.

<#root>

> show nameif

Interface Name Security
Ethernet1/1 inside 0
Ethernet1/2 Outside 0

> show ipv6 interface brief

inside [up/up]
fe80::12b3:d6ff:fe20:eb48
fc00:0:0:1::1

> show ip

System IP Ad	dresses:		
Interface	Name	IP address	Subnet mask
Ethernet1/2	Outside	192.168.0.106	255.255.255.0

• Bevestig IPv6-connectiviteit van FTD-binnenkant van interface naar client.

IPv6 interne host-IP fc00:0:0:1:100.

FTD Inside interface fc00:0:0:1:1.

<#root>

```
> ping fc00:0:0:1::100
```

```
Please use 'CTRL+C' to cancel/abort...
Sending 5, 100-byte ICMP Echos to fc00:0:0:1::100, timeout is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/1/1 ms
```

• Geef NAT-configuratie op de FTD CLI weer.

<#root>

```
> show running-config nat
!
object network Local_IPv6_subnet
nat (inside,Outside) dynamic 6_mapped_to_4
object network any_IPv4
nat (Outside,inside) static 4_mapped_to_6 dns
```

• Leg verkeer vast.

Neem bijvoorbeeld verkeer op van interne IPv6-host fc00:0:0:1::100 naar DNS-server is

fc00::f:0:0:ac10:a64 UDP 53.

Hier is de doelDNS-server fc00::f:0:ac10:a64. De laatste 32 bits zijn ac10:0a64. Deze bits zijn het octetvoor-octet equivalent aan 172,16,10,100. Firewall 6-to-4 vertaalt IPv6 DNS-server fc00:f:0:0:ac10:a64 naar het equivalent van IPv4 172.16.10.100.

<#root>

> capture test interface inside trace match udp host fc00:0:0:1::100 any6 eq 53 > show capture test 2 packets captured 1: 00:35:13.598052 fc00:0:0:1::100.61513 > fc00::f:0:0:ac10:a64.53: udp 2: 00:35:13.638882 fc00::f:0:0:ac10:a64.53 > fc00:0:0:1::100.61513: udp > show capture test packet-number 1 [...] Phase: 3 Type: UN-NAT Subtype: static Result: ALLOW Config: object network any IPv4 nat (Outside,inside) static 4\_mapped\_to\_6 dns Additional Information: NAT divert to egress interface Outside(vrfid:0) Untranslate fc00::f:0:0:ac10:a64/53 to 172.16.10.100/53 <<<< Destination NAT [...] Phase: 6 Type: NAT Subtype: Result: ALLOW Config: object network Local\_IPv6\_subnet nat (inside,Outside) dynamic 6\_mapped\_to\_4 Additional Information: Dynamic translate fc00:0:0:1::100/61513 to 192.168.0.107/61513 <<<<<< Source NAT

> capture test2 interface Outside trace match udp any any eq 53

2 packets captured

1: 00:35:13.598152 192.168.0.107.61513 > 172.16.10.100.53: udp 2: 00:35:13.638782 172.16.10.100.53 > 192.168.0.107.61513: udp

#### Over deze vertaling

Cisco heeft dit document vertaald via een combinatie van machine- en menselijke technologie om onze gebruikers wereldwijd ondersteuningscontent te bieden in hun eigen taal. Houd er rekening mee dat zelfs de beste machinevertaling niet net zo nauwkeurig is als die van een professionele vertaler. Cisco Systems, Inc. is niet aansprakelijk voor de nauwkeurigheid van deze vertalingen en raadt aan altijd het oorspronkelijke Engelstalige document (link) te raadplegen.