Configuración de NAT 64 en firewall seguro gestionado por FMC

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Introducción

Este documento describe cómo configurar NAT64 en Firepower Threat Defence (FTD) gestionado por Fire Power Management Center (FMC).

Prerequisites

Requirements

Cisco recomienda que tenga conocimientos sobre Secure Firewall Threat Defence y Secure Firewall Management Center.

Componentes Utilizados

- Firepower Management Center 7.0.4.
- Firepower Threat Defense 7.0.4.

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

Configurar

Diagrama de la red



Configurar objetos de red

• Objeto de red IPv6 para hacer referencia a la subred de cliente IPv6 interna.

En la GUI de FMC, navegue hasta **Objetos > Administración de objetos > Seleccionar red desde el menú de la izquierda > Agregar red > Agregar objeto**.

Por ejemplo, el objeto de red Local_IPv6_subnet se crea con la subred IPv6 FC00:0:0:1::/96.

		•
Name		
Local_IPv6_subnet		
Description		
J		
Network ○ Host ○ Range ● Network	⊖ FQDN	
Network Host Range Network FC00:0:0:1::/96		
Network Host Range Network FC00:0:0:1::/96	○ FQDN	
Network Host Range Network FC00:0:0:1::/96 Allow Overrides	○ FQDN	
Network Host Range Network FC00:0:0:1::/96 Allow Overrides	⊖ FQDN	

• Objeto de red IPv4 para traducir clientes IPv6 a IPv4.

En la GUI de FMC, navegue hasta **Objetos > Gestión de objetos > Seleccionar red desde el menú de la** izquierda > Agregar red > Agregar grupo.

Por ejemplo, el objeto de red 6_mapeado_a_4 se crea con el host IPv4 192.168.0.107.

En función de la cantidad de hosts IPv6 que se asignarán en IPv4, puede utilizar una red de un solo objeto, un grupo de red con varios IPv4 o solo NAT para la interfaz de salida.

New Network Group			0
Name			
6_mapped_to_4			
Description			
Allow Overrides			
Available Networks C	+	Selected Networks	
Q, Search		्, Search by name	
6_mapped_to_4 any_IPv4	Add	192.168.0.107	Ĩ
Any_ipv6			
google_dns_ipv4			
google_dns_ipv4_group			
anonle das inv6			Add

• Objeto de red IPv4 para hacer referencia a los hosts IPv4 externos en Internet.

En la GUI de FMC, navegue hasta **Objetos > Administración de objetos > Seleccionar red desde el menú de la izquierda > Agregar red > Agregar objeto**.

Por ejemplo, el objeto de red Any_IPv4 se crea con la subred IPv4 0.0.0/0.

New Network Object	0
Name Any_IPv4 Description	
Network Host Range Network 0.0.0.0/0 Allow Overrides	FQDN
	Cancel Save

• Objeto de red IPv6 para traducir un host IPv4 externo a nuestro dominio IPv6.

En la GUI de FMC, navegue hasta **Objetos > Gestión de objetos > Seleccionar red desde el menú de la** izquierda > Agregar red > Agregar objeto.

Por ejemplo, el objeto de red 4_mapeado_a_6 se crea con la subred IPv6 FC00:0:0:F::/96.

Edit Network Object	0
Name 4_mapped_to_6	
Network Host Range Network	FQDN
fc00:0:0:f::/96 Allow Overrides	
	Cancel Save

Configuración de interfaces en FTD para IPv4/IPv6

Vaya a **Devices > Device Management > Edit FTD > Interfaces** y configure las interfaces interna y

externa.

Ejemplo:

interfaz Ethernet 1/1

Nombre: Interior

Zona de seguridad: Inside_Zone

Si no se crea la zona de seguridad, puede crearla en el **menú desplegable Zona de seguridad > Nuevo**.

÷.

Dirección IPv6: FC00:0:0:1::1/96

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

	Edit Phys	ical Inter	face							0
ľ	General	IPv4	IPv6	Adv	/anced	Hardware Conf	iguration	n F	MC Access	
	Basic	Address	Prefix	es	Settings					
		Enab	le IPV6:	≤						
Ŀ		Enforce	EUI 64:							
	I	Link-Local a	ddress:							
		Autoconfig	uration:							
	Enable	DHCP for a	address config:							
	Enable DH0	CP for non-a	address config:							
									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					

interfaz Ethernet 1/2

Nombre: Fuera

Zona de seguridad: Outside_Zone

Si no se crea la zona de seguridad, puede crearla en el **menú desplegable Zona de seguridad > Nuevo**.

Dirección IPv4: 192.168.0.106/24

Edit Physic	cal Inter	face			
General	IPv4	IPv6	Advanced	Hardware Configuration	FMC Access
Name:					
Outside					
Enabled					
Manager	ment Only				
Description:					
Mode:					
None			•		
Security Zon	0'				
Outside 7	one				
ntorface ID:	one				
Ethernet1/	2				
etternet i /	<u></u>				
1500			_		
(64 = 0108)					
Propagate Se	ecurity Gr	oup Tag:			
Topagate of	county on	oup rag.			
					Cancel OK
dit Physic	cal Inter	face			0

Conorol IDv4	Du6 Advanced	Hardware Configuration	EMC Assess
General IPv4	IPV6 Advanced	Hardware Configuration	FMC Access
Type:			
Use Static IP	•		
Address:			
192.168.0.106/24			

Configurar ruta predeterminada

Vaya a Dispositivos > Administración de dispositivos > Editar FTD > Enrutamiento > Enrutamiento estático > Agregar ruta.

Por ejemplo, la ruta estática predeterminada en la interfaz externa con el gateway 192.168.0.254.

Edit Static Route Co	nfiguration		0			
Type: IPv4 Interface* Outside (Interface starting with thi	 IPv6 is icon @signifies it is av 	ailable for route leak)				
Available Network C	+	Selected Network				
Q, Search	Add	any-ipv4	ĩ			
6_mapped_to_4 any-ipv4 any_IPv4 google_dns_ipv4 google_dns_ipv4_group google_dns_ipv6_group						
Ensure that egress virtual	router has route to that d	estination				
Gateway						
192.168.0.254	• +					
Metric:						
1						
(1 - 254)						
Tunneled: (Used only	y for default Route)					
Route Tracking:						
	• +					
		C	ancel OK			
Firewall Management	t Center Overview	Analysis Policies Devic	es Objects Integration			Deploy Q
FTD_LAB						
Device Protion Interface	e Inline Sete DUPD 9	CAMAD				
Device Housing Interface	s inime oets DHOP c	shawer-				
Manage Virtual Routers						
Global 👻	Network +	Interface	Leaked from Virtual Router	Gateway	Tunneled	Metric
Virtual Router Properties	▼ IPv4 Routes					
ECMP	any-ipv4	Outside	Global	192.168.0.254	false	1
OSPF	▼ IPv6 Routes					
OSPFv3						
EIGRP						
RIP						
IPv4						
IPv6						
Static Route						

Configuración de la política NAT

En la GUI de FMC, navegue hasta **Devices > NAT > New Policy > Threat Defence NAT** y cree una política NAT.

Por ejemplo, la política NAT FTD_NAT_Policy se crea y se asigna al FTD FTD_LAB de prueba.

New Policy	0
Name: FTD_NAT_Policy Description:	Selected Devices FTD_LAB
	Cancel Save

Configurar reglas NAT

NAT de salida.

En la GUI de FMC, navegue hasta **Dispositivos > NAT > Seleccione la política NAT > Agregar regla** y cree la regla NAT para traducir la red IPv6 interna al conjunto IPv4 externo.

Por ejemplo, Objeto de red Local_IPv6_subnet se traduce dinámicamente al Objeto de red 6_mapeado_a_4.

Regla NAT: regla NAT automática

Tipo: Dinámico

Objetos de la interfaz de origen: Inside_Zone

Objetos de interfaz de destino: Outside_Zone

Origen original: Local_IPv6_subnet

Origen traducido: 6_mapeado_a_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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Dynamic	Type:						
Interface Objects Translated Valiable Interface Objects C Search by name Add to Source Group_Inside Add to Destination Group_Juside Add to Destination Inside_Zone Inside_Zone Outside_Zone Inside_zone Inside_Zone Inside_zone Inside_Zone Inside_zone Inside_Zone Inside_zone Inside_Zone Inside_zone Inside_Zone Inside_zone Interface Objects Translated Port: <t< td=""><td>Dynamic</td><td>Ŧ</td><td></td><td></td><td></td><td></td><td></td></t<>	Dynamic	Ŧ					
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Available Interface Objects C Q. Search by name Group_Juside Group_Outside Inside_Zone Outside_Zone Outside_Zone Outside_Zone Outside_Zone Cancel Ot Edit NAT Rule MAT Rule MAT Rule MAT Rule Mathematical Source: Dynamic Phynamic P	Interface Objects Transl	lation PAT Pool	Advanced				
Q. Search by name Group_Inside Group_Outside Inside_Zone Outside_Zone Outsid	Available Interface Objects	C	Sourc	e Interface Objects	(1)	Destination Interfa	ce Objects (
Group_Inside Group_Outside Inside_Zone Outside_Zone Outside_Zone Cancel OK Edit NAT Rule Edit NAT Rule VAT Rule VAT Rule VAT Rule Vation NAT Rule Vation NAT Rule Type: Dynamic Interface Objects Translation PAT Pool Advanced Original Packet Original Packet Translated Packet Tran	Q. Search by name		Ins	side_Zone	Ŵ	Outside_Zone	1
Group_Outside Add to Destination Inside_Zone Otto Outside_Zone Otto Outside_Zone Image: Concel Otto Otto Edit NAT Rule Image: Concel VAT Rule Image: Concel VAT Rule Image: Concel Opmanic Image: Concel Interface Objects Translated Pable Image: Concel Original Packet Translated Packet Original Packet Image: Concel Original Packet Image: Concel Image: Concel Concel Image: Concel Concel Image: Concel Concel Image: Concel Image: Concel Image: Concel Image: Concel Image: Concel Image: Concel Image: Concel Image: Concel Image: Concel	Group_Inside	Add to So	ource				
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Cancel OK Cancel	Inside Zone						
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Cancel OK							
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NAT Rule: Auto NAT Rule							Cancel
NAT Rule: Auto NAT Rule Type: Dynamic Dynamic Enable Interface Objects Translation PAT Pool Advanced Original Packet Translated Packet Original Source:* Local_IPv6_subnet + Criginal Port: TCP TCP TCP TCP TCP TCP TCP TCP TCP TC	Edit NAT Rule						Cancel
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Dynamic	Edit NAT Rule NAT Rule: Auto NAT Rule	Ψ					Cancel
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Original Packet Translated Packet Original Source:* Translated Source: Local_IPv6_subnet + Original Port: 6_mapped_to_4 TCP *	Edit NAT Rule NAT Rule: Auto NAT Rule Type: Dynamic Enable	v V	Advanced				Cancel
Original Source:* Translated Source: Local_IPv6_subnet + Original Port: 6_mapped_to_4 TCP *	Edit NAT Rule NAT Rule: Auto NAT Rule Type: Dynamic Enable Interface Objects Trans	v v lationPAT Pool	Advanced				Cancel
Local_IPv6_subnet + Address Original Port: 6_mapped_to_4 + TCP * Translated Port:	Edit NAT Rule NAT Rule: Auto NAT Rule Type: Dynamic Constant Enable Interface Objects Trans Original Packet	v v ilation PAT Pool	Advanced	Translated Packet	t		Cancel
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Original Port: 6_mapped_to_4 + TCP Translated Port: +	Edit NAT Rule NAT Rule: Auto NAT Rule Type: Dynamic Enable Interface Objects Original Packet Original Source:* Local IPu6 subset	v V Iation PAT Pool	Advanced	Translated Packet Translated Source:	t.		Cancel
TCP Translated Port:	Edit NAT Rule NAT Rule: Auto NAT Rule Type: Dynamic Enable Interface Objects Original Packet Original Source:* Local_IPv6_subnet	v V Hation PAT Pool	Advanced	Translated Packet Translated Source: Address	t		Cancel
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	Edit NAT Rule NAT Rule: Auto NAT Rule Type: Dynamic Enable Interface Objects Original Packet Original Source:* Local_IPv6_subnet Original Port: TCP	v v v v v v v v v v v v v v v v v v v	Advanced	Translated Packet Translated Source: Address 6_mapped_to_4 Translated Port:	t	• •	Cancel
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	Edit NAT Rule NAT Rule: Auto NAT Rule Type: Dynamic Enable Interface Objects Original Packet Original Source:* Local_IPv6_subnet Original Port: TCP	v V Nation PAT Pool	Advanced	Translated Packet Translated Source: Address 6_mapped_to_4 Translated Port:	t	• +	Cancel
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	Edit NAT Rule NAT Rule: Auto NAT Rule Type: Dynamic Enable Interface Objects Original Packet Original Source:* Local_IPv6_subnet Original Port: TCP	v V Nation PAT Pool	Advanced	Translated Packet Translated Source: Address 6_mapped_to_4 Translated Port:	t	• +	Cancel
	Edit NAT Rule NAT Rule: Auto NAT Rule Type: Dynamic Enable Interface Objects Original Packet Original Source:* Local_IPv6_subnet Original Port: TCP	v V Nation PAT Pool	Advanced	Translated Packet Translated Source: Address 6_mapped_to_4 Translated Port:	t	• +	Cancel
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	Edit NAT Rule NAT Rule: Auto NAT Rule Type: Dynamic Enable Interface Objects Original Packet Original Source:* Local_IPv6_subnet Original Port: TCP	v v ilation PAT Pool v +	Advanced	Translated Packet Translated Source: Address 6_mapped_to_4 Translated Port:	t	• • •	Cancel
	Edit NAT Rule NAT Rule: Auto NAT Rule Type: Dynamic Enable Interface Objects Original Packet Original Source:* Local_IPv6_subnet Original Port: TCP	v V V V V V V	Advanced	Translated Packet Translated Source: Address 6_mapped_to_4 Translated Port:		• +	Cancel

En la GUI de FMC, navegue hasta **Devices > NAT > Select the NAT policy > Add Rule** y cree la regla NAT para traducir el tráfico IPv4 externo al conjunto de redes IPv6 interno. Esto permite la comunicación interna con la subred IPv6 local.

Además, habilite la reescritura de DNS en esta regla para que las respuestas del servidor DNS externo se puedan convertir de registros A (IPv4) a registros AAAA (IPv6).

Por ejemplo, Red externa Any_IPv4 se traduce estáticamente a la subred IPv6 2100:6400::/96 definida en el objeto 4_mapeado_a_6.

Regla NAT: regla NAT automática

Tipo: Estático

Objetos de la interfaz de origen: Outside_Zone

Objetos de interfaz de destino: Inside_Zone

Origen original: Any_IPv4

Origen traducido: 4_mapeado_a_6

Traducir respuestas DNS que coincidan con esta regla: Sí (casilla de verificación Habilitar)

Edit NAT Rule					0
NAT Rule: Auto NAT Rule Type: Static Z Enable Interface Objects Translati	▼ ▼ on PAT Pool Advar	rced			
Available Interface Objects C		Source Interface Objects	(1)	Destination Interface Objects	(1)
Q Search by name Group_Inside Group_Outside Inside_Zone Outside_Zone	Add to Source Add to Destination	Outside_Zone	11	Inside_Zone	Ĩ
				Cancel	ОК

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	OK

Edit NAT Rule	0
NAT Rule: Auto NAT Rule Type: Static ✓ Enable Interface Objects Translation PAT Pool Advanced	3
 Translate DNS replies that match this rule Fallthrough to Interface PAT(Destination Interface) IPv6 Net to Net Mapping Do not proxy ARP on Destination Interface Perform Route Lookup for Destination Interface 	
Cancel	Ж

FTD_NAT_Policy Enter Description Rules Filter by Device Filter Rules

ritter t	Filler by Device 1 Filler bures							
						Original Packet		
	Direction	Туре	Source Interface Objects	Destination Interface Objects	Original Sources	Original Destinations	Original Services	Translate Sources
\sim N	✓ NAT Rules Before							
~ A	Auto NAT Rules							
#	*	Static	Outside_Zone	Inside_Zone	any_IPv4			🖥 4_ma
#	,×	Dyna	Inside_Zone	Outside_Zone	Local_IPv6_subnet			🖾 6_ma
> NAT Rules After								

Continúe con la implementación de cambios en FTD.

Verificación

• Mostrar los nombres de interfaz y la configuración IP.

<#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

• Confirme la conectividad IPv6 desde la interfaz interna de FTD al cliente.

Host interno IPv6 IP fc00:0:0:1::100.

FTD Interfaz interna 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
```

• Mostrar la configuración de NAT en la CLI de FTD.

<#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
```

• Capturar tráfico.

Por ejemplo, la captura del tráfico del host IPv6 interno fc00:0:0:1::100 al servidor DNS es

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

Aquí, el servidor DNS de destino es fc00::f:0:0:ac10:a64. Los últimos 32 bits son ac10:0a64. Estos bits son el octeto por octeto equivalente a 172,16,10,100. Firewall 6-to-4 traduce el servidor DNS fc00::f:0:0:ac10:a64 de IPv6 al equivalente 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

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