

在Cisco IOS XE Catalyst SD-WAN边缘上配置服务端VRRP

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简介

本文档介绍如何通过功能模板、配置组和CLI在Cisco IOS® XE Catalyst SD-WAN边缘上配置服务端VRRP。

先决条件

要求

Cisco 建议您了解以下主题：

- Cisco Catalyst软件定义的广域网(SD-WAN)
- 虚拟路由器冗余协议(VRRP)基本操作
- 管理器图形用户界面(GUI)
- 配置组

使用的组件

- 思科IOS® XE Catalyst SD-WAN边缘17.9.4a
- 思科Catalyst SD-WAN管理器20.12.4

本文档中的信息都是基于特定实验室环境中的设备编写的。本文档中使用的所有设备最初均采用原始（默认）配置。如果您的网络处于活动状态，请确保您了解所有命令的潜在影响。

背景信息

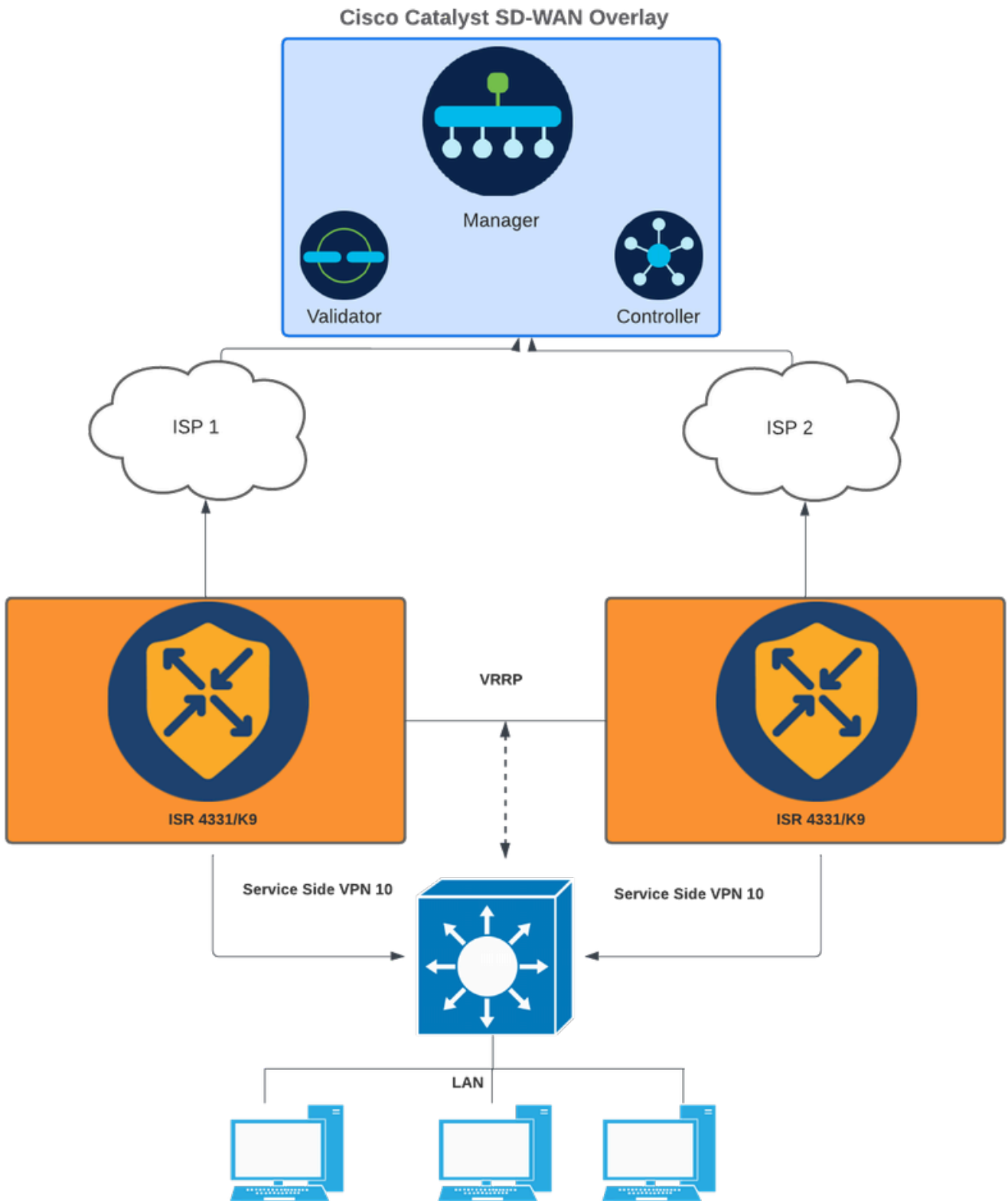
虚拟路由器冗余协议(VRRP)是LAN端协议，为交换机和其他IP终端站提供冗余网关服务。在Cisco

SD-WAN软件中，您可以在虚拟专用网络(VPN)内的接口（通常在子接口）上配置VRRP。

只有服务端VPN支持VRRP（VPN 0和512不支持VRRP）。

配置

网络图



网络图

配置

这可以通过三种方式实现：

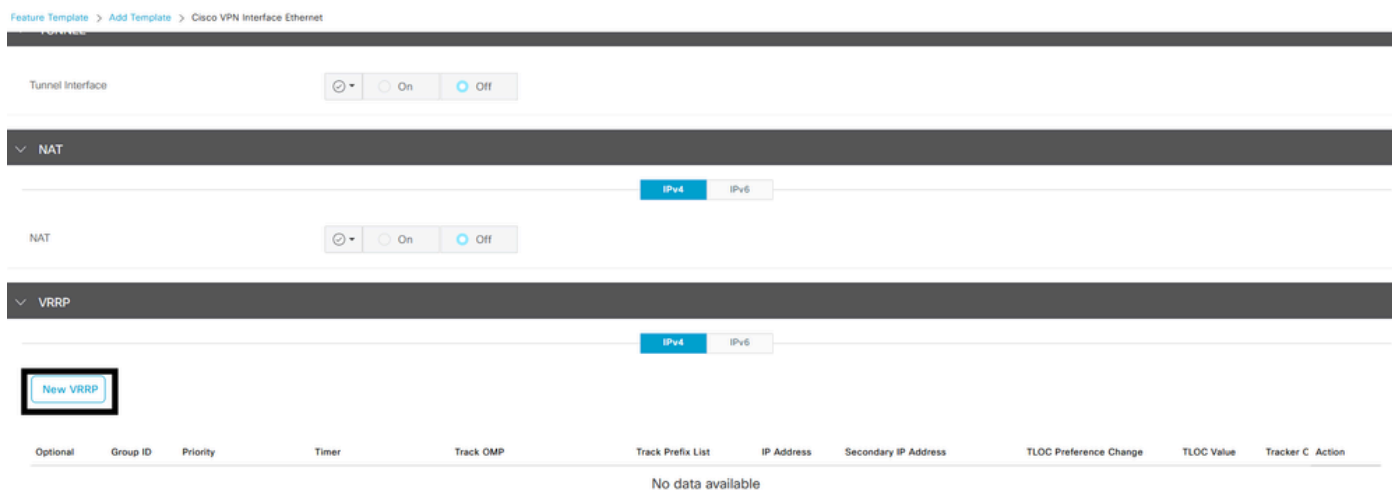
1 — 通过设备功能模板：

在SD-WAN Manager中，导航到配置>模板>功能模板。

如果已经为服务端接口创建了功能模板，请搜索模板名称，然后单击Edit。

如果没有为服务端接口创建功能模板，请点击Add template，搜索设备型号，然后选择Cisco VPN Interface Ethernet。

单击VRRP选项卡和新建VRRP。



VRRP选项卡

配置VRRP参数：

Group ID:范围为1至255。


优先级：范围：1到254。路由器的优先级。具有最高优先级的路由器被选为主要VRRP路由器。如果两台路由器具有相同优先级，具有较高IP地址的路由器将被选为主要VRRP路由器。

计时器（毫秒）：范围为100至40950毫秒。指定主VRRP路由器发送VRRP通告消息的频率。如果从属路由器丢失三个连续的VRRP通告，则它们会选举新的主VRRP路由器。建议使用1000ms作为默认值。

跟踪OMP（可选）

跟踪前缀列表（可选）

IP Address:虚拟IP地址必须与两个路由器接口不同，但位于同一子网（本地和对等）。

 注意：当Cisco IOS® XE Catalyst SD-WAN设备上的VRRP功能模板的计时器为100毫秒时，如果LAN接口上的流量过高，则VRRP将失败。建议将默认计时器设置为1000ms或更高。

New VRRP

 Mark as Optional Row ⓘ

Group ID	<input type="text" value="1"/>
Priority	<input type="text" value="200"/>
Timer (milliseconds)	<input type="text" value="1000"/>
Track OMP	<input type="radio"/> On <input checked="" type="radio"/> Off
Track Prefix List	<input type="text"/>
IP Address	<input type="text" value="192.168.23.1"/>
VRRP Secondary IP Address (Maximum: 4)	Add
TLOC Preference Change	<input type="radio"/> On <input checked="" type="radio"/> Off
Object Tracker	Add Tracking Object

Add Cancel

VRRP配置示例主设备

单击Add，然后单击Save。

对VRRP对等体/备用体执行相同的过程（除VRRP优先级外，所有值都必须匹配）。

New VRRP

 Mark as Optional Row ⓘ

Group ID	<input type="text" value="1"/>
Priority	<input type="text" value="150"/>
Timer (milliseconds)	<input type="text" value="1000"/>
Track OMP	<input type="radio"/> On <input checked="" type="radio"/> Off
Track Prefix List	<input type="text"/>
IP Address	<input type="text" value="192.168.23.1"/>
VRRP Secondary IP Address (Maximum: 4)	Add
TLOC Preference Change	<input type="radio"/> On <input checked="" type="radio"/> Off
Object Tracker	Add Tracking Object

Add Cancel

VRRP配置示例备用设备

将VPN接口以太网功能模板添加到所需服务VPN下的设备模板，然后点击保存。

屏幕上将显示将更改推送到设备以完成此过程。

等效的 CLI 命令

首选：

```
interface GigabitEthernet0/0/1
<snipped>
  vrf forwarding 10
```

```
ip address 192.168.23.2 255.255.255.0
no ip redirects
ip mtu 1496
vrrp 1 address-family ipv4
  timers advertise 1000
  priority 200
  vrrpv2
  address 192.168.23.1 primary
exit-vrrp
arp timeout 1200
end
```

备用：

```
interface GigabitEthernet0/0/1
<snipped>
  vrf forwarding 10
  ip address 192.168.23.3 255.255.255.0
  no ip redirects
  ip mtu 1496
  vrrp 1 address-family ipv4
    timers advertise 1000
    priority 150
    vrrpv2
    address 192.168.23.1 primary
  exit-vrrp
arp timeout 1200
end
```

2 — 通过配置组：

导航到配置>配置组。

导航到现有配置组，然后选择编辑。

导航到服务配置文件部分，并查找功能LAN接口。

The screenshot shows the Cisco Catalyst SD-WAN Configuration Groups page. The page title is "test_vrrp" and it includes an "Edit" link. Below the title, there are three columns: "DEVICE SOLUTION" (sdwan), "MODIFIED BY" (Amalios), and "LAST UPDATED" (Nov 28, 2024 02:08:57). There are two tabs: "Feature Profiles" and "Associated Devices". The "Associated Profiles (3)" section is expanded, showing three profiles:

Profile Name	Shared	Groups	Actions
> System Profile: test_vrrp_Basic	Shared	1 Groups	Actions
> Transport & Management Profile: test_vrrp_WAN	Shared	1 Groups	Actions
> Service Profile: test_vrrp_LAN	Shared	1 Groups	Actions

The "Service Profile: test_vrrp_LAN" row is highlighted with a black box.

单击Edit Feature。

Service Profile: test_vrrp_LAN Shared: 1 Groups Actions

Search Table

Add Feature

Type	Feature Name	Description	Sub-Feature	Actions
VPN	Local_Internet_for_Guests	LAN VPN	-	...
	VPN_Local_Internet_for_Guests_99_Interface	LAN Interface	-	...
VPN	Corporate_Users	LAN VPN	-	...
	VPN_Corporate_Users_10_Interface	LAN Interface	-	...
VPN	Payment_Processing_Network	LAN VPN	-	...
	VPN_Payment_Processing_Network_12_Interface	LAN Interface	-	...
VPN	Physical_Security_Devices	LAN VPN	-	...
	VPN_Physical_Security_Devices_13_Interface	LAN Interface	-	...

1 Record Items per page: 25 1 - 1 of 1 |< < > >|

View Details
Associate Sub-Feature
Add Sub-Feature
Edit Feature
Delete Feature

Edit Feature部分

在新选项卡中，单击VRRP部分，然后单击Add VRRP IPv4。

Edit Ethernet Interface Feature

LAN / Service VPN / Ethernet Interface

Name: VPN_Corporate_Users_10_Interface Description: LAN Interface

Associated VPN: Corporate_Users

Basic Configuration NAT **VRRP** ARP ACL/QoS Advanced

IPv4 Settings

VRRP IPv4 (Maximum: 1)

Add VRRP IPv4

Group ID	Priority	Timer	Track OMP	IP Address	VRRP Secondary	Tloc Prefix Change	Tloc Prefix Change Value	Tracking	Action
There is no data.									

IPv6 Settings

VRRP部分配置组

配置VRRP参数：

Group ID:范围为1至255。


优先级：范围：1到254。路由器的优先级。具有最高优先级的路由器被选为主要VRRP路由器。如果两台路由器具有相同优先级，具有较高IP地址的路由器将被选为主要VRRP路由器。

计时器 (毫秒) : 范围为100至40950毫秒。指定主VRRP路由器发送VRRP通告消息的频率。如果从属路由器丢失三个连续的VRRP通告，则它们会选举新的主VRRP路由器。建议使用1000ms作为默认值。

跟踪OMP (可选)

跟踪前缀列表 (可选)

IP Address:虚拟IP地址必须与两个路由器接口不同，但位于同一子网 (本地和对等)。

 注意：当Cisco IOS XE Catalyst SD-WAN设备上的VRRP功能模板的计时器为100毫秒时，如果LAN接口上的流量过高，则VRRP将失败。建议将默认计时器设置为1000ms或更高。

Add VRRP IPv4 ✕

Group ID*	Priority*
<input type="text" value="1"/>	<input type="text" value="200"/>
Timer*	Track OMP*
<input type="text" value="1000"/>	<input type="checkbox"/>
IP Address*	Tloc Prefix Change*
<input type="text" value="192.168.23.1"/>	<input type="checkbox"/>

VRRP IP Address Secondary

[Add VRRP IP Address Secondary](#)

VRRP Tracking Object

[Add VRRP Tracking Object](#)

Cancel

Add

VRRP配置示例主要

然后，单击Add按钮。

验证配置已添加，然后点击保存。

Edit Ethernet Interface Feature



LAN / Service VPN / Ethernet Interface

Name* VPN_Corporate_Users_10_Interface Description LAN Interface

Associated VPN Corporate_Users

Basic Configuration NAT **VRRP** ARP ACL/QoS Advanced

IPv4 Settings

VRRP IPv4 (1) (Maximum: 1)

Add VRRP IPv4

Group ID	Priority	Timer	Track OMP	IP Address	VRRP Secondary	Tloc Prefix Change	Tloc Prefix Change Value	Tracking	Action
1	200	1000	false	192.168.23.1		false			

IPv6 Settings

Cancel

Save

保存VRRP配置

然后，在主设备中部署更改。

对VRRP对等体/备用体执行相同的过程（除VRRP优先级外，所有值都必须匹配）。

Add VRRP IPv4

Group ID*

1

Priority*

150

Timer*

1000

Track OMP*



IP Address*

192.168.23.1

Tloc Prefix Change*



VRRP IP Address Secondary

[Add VRRP IP Address Secondary](#)

VRRP Tracking Object

[Add VRRP Tracking Object](#)

Cancel

Add

VRRP配置示例备用

3 — 通过CLI:

CLI示例配置。

主

```
<#root>
```

```
Device#
```

```
config-transaction
```

```
Device (config)#
```

```
interface GigabitEthernet0/0/1
```

```
Device (config-if)#
```

```
vrrp 1 address-family ipv4
```

```
Device (config-if-vrrp)#
```

```
timers advertise 1000
```

```
Device (config-if-vrrp)#
```

```
priority 200
```

```
Device (config-if-vrrp)#
```

```
vrrpv2
```

```
Device (config-if-vrrp)#
```

```
address 192.168.23.1 primary
```

```
Device (config-if-vrrp)#
```

```
commit
```

备用：

```
<#root>
```

```
Device#
```

```
config-transaction
```

```
Device (config)#
```

```
interface GigabitEthernet0/0/1
```

```
Device (config-if)#
```

```
vrrp 1 address-family ipv4
```

```
Device (config-if-vrrp)#
```

```
timers advertise 1000
```

```
Device (config-if-vrrp)#
```

```
priority 150
```

```
Device (config-if-vrrp)#
```

```
vrrpv2
```

```
Device (config-if-vrrp)#
```

```
address 192.168.23.1 primary
```

```
Device (config-if-vrrp)#
```

commit

验证

<#root>

Device#

show vrrp all

Vlan10 - Group 1 - Address-Family IPv4

State is MASTER

State duration 2 hours 0 mins 49 secs

Virtual IP address is 192.168.23.1

Virtual MAC address is 0000.5E00.0164

Advertisement interval is 1000 msec

Preemption enabled

Priority is 200

Master Router is 192.168.23.2 (local), priority is 200

Master Advertisement interval is 1000 msec (expires in 256 msec)

Master Down interval is unknown

FLAGS: 1/1

<#root>

Device#

show vrrp detail

Vlan10 - Group 1 - Address-Family IPv4

State is MASTER

State duration 2 hours 0 mins 55 secs

Virtual IP address is 192.168.23.1

Virtual MAC address is 0000.5E00.0164

Advertisement interval is 1000 msec

Preemption enabled

Priority is 200

Master Router is 192.168.23.2 (local), priority is 200

Master Advertisement interval is 1000 msec (expires in 717 msec)
Master Down interval is unknown
FLAGS: 1/1
VRRPv3 Advertisements: sent 27392 (errors 0) - rcvd 1220
VRRPv2 Advertisements: sent 27392 (errors 0) - rcvd 4
Group Discarded Packets: 0
VRRPv2 incompatibility: 0
IP Address Owner conflicts: 0
Invalid address count: 0
IP address configuration mismatch : 0
Invalid Advert Interval: 0
Adverts received in Init state: 0
Invalid group other reason: 0
Group State transition:
Init to master: 1 (Last change Mon Nov 27 11:04:00.406)
Init to backup: 3 (Last change Mon Nov 27 15:29:29.265)
Backup to master: 5 (Last change Mon Nov 27 15:29:32.914)
Master to backup: 3 (Last change Mon Nov 27 10:38:15.722)
Master to init: 2 (Last change Mon Nov 27 15:25:12.248)
Backup to init: 1 (Last change Mon Nov 27 10:35:32.215)

<#root>

Device#

show vrrp internal

GroupId:100 AF:IPv4 Interface:Vlan10
ref_cnt:3 flags:0 vrrs_hdl:1
mac_programmed:1 vrrp_mcast_join_v4:1
if_ctx_:0x7F43DE017178
if_oper_state:1
system_ctx_:0x7F43DE029FA0

primary address: 192.168.23.1

operational:1 is_active:1 match_addr:1 compatv2:1

shutdown:0 cfg_shutdown:0 priority:200 cfg_priority:200

state_ctx_:0x7F43DE02A040
hybernation:0 preempt:enabled state_time:2 hours 0 mins 59 secs
preempt_delay:0 secs master_priority:0
ready_to_preempt:90 master_reason:0
timer_ctx_:0x7F43DE02A0B8
master_down_timer:0 msec use_learned_timer:0
master_adv_interval:1000 cfg_adv_interval:1000 master_down_interval:0
comms_ctx_:0x7F43DE02A0F8
v2rtr_valid:1 listen:1
track_ctx_:0x7F43DE02A178
track_count:0 decrement:0 force_shutdown:0

<#root>

Device#

show vrrp statistics

VRRP Global Statistics:

Dropped Packets : 0

VRRP Statistics for Vlan10

Header Discarded Packets: 0

Invalid TTL/Hop Limit: 0

Invalid Checksum: 0

Invalid Version: 0

Invalid Msg Type: 0

Invalid length/Incomplete packet: 0

Invalid group no: 0

Invalid packet other reason: 0

VRRP Statistics for Vlan10 - Group 1 - Address-Family IPv4

State is MASTER

State duration 2 hours 1 mins 3 secs

VRRPv3 Advertisements: sent 27401 (errors 0) - rcvd 1220

VRRPv2 Advertisements: sent 27401 (errors 0) - rcvd 4

Group Discarded Packets: 0

VRRPv2 incompatibility: 0

IP Address Owner conflicts: 0

Invalid address count: 0

IP address configuration mismatch : 0

Invalid Advert Interval: 0

Adverts received in Init state: 0

Invalid group other reason: 0

Group State transition:

Init to master: 1 (Last change Mon Nov 27 11:04:00.406)

Init to backup: 3 (Last change Mon Nov 27 15:29:29.265)

Backup to master: 5 (Last change Mon Nov 27 15:29:32.914)

Master to backup: 3 (Last change Mon Nov 27 10:38:15.722)

Master to init: 2 (Last change Mon Nov 27 15:25:12.248)

Backup to init: 1 (Last change Mon Nov 27 10:35:32.215)

有用的调试:

<#root>

debug vrrp all detail

<#root>

debug vrrp error

<#root>

debug vrrp packet

<#root>

debug vrrp process

<#root>

debug vrrp state

关于此翻译

思科采用人工翻译与机器翻译相结合的方式将此文档翻译成不同语言，希望全球的用户都能通过各自的语言得到支持性的内容。

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