

# 使用ERS API创建网络设备

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## 简介

本文档介绍使用PostMan作为REST客户端通过ERS API在ISE上创建网络访问设备(NAD)的过程。

## 先决条件

### 要求

Cisco 建议您了解以下主题：

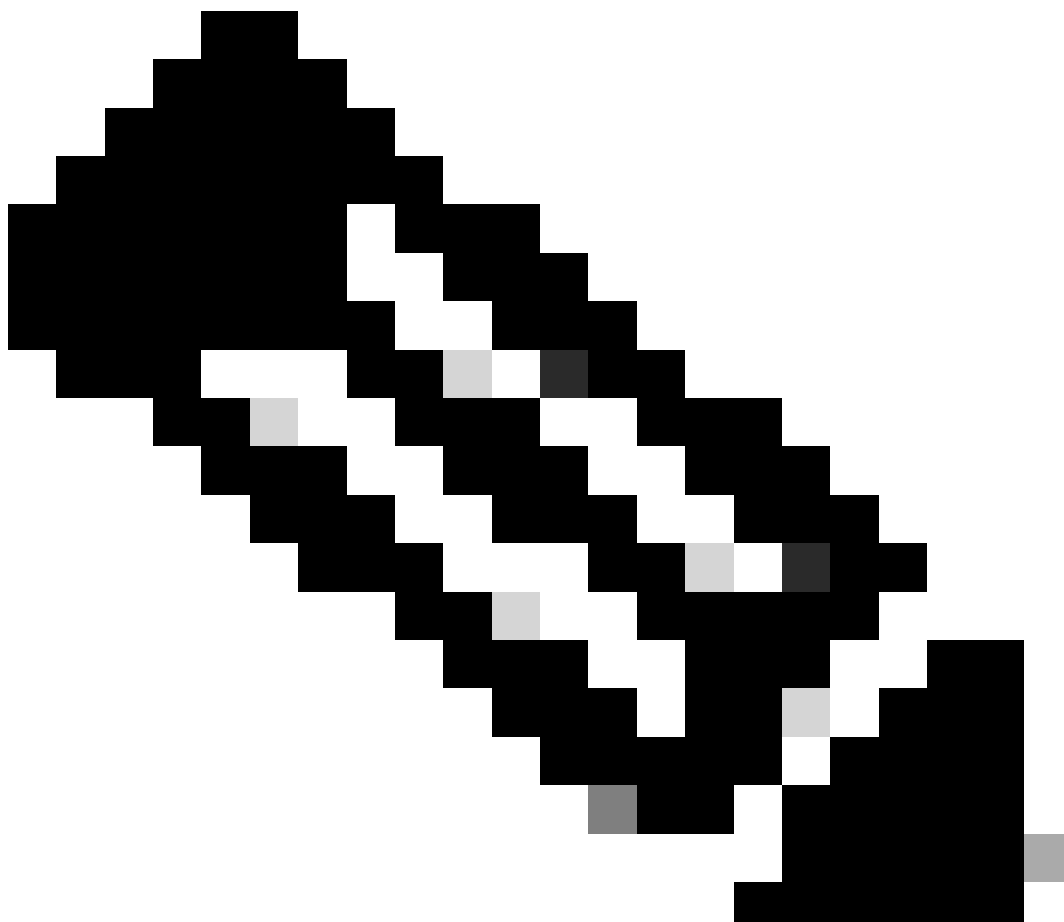
- ISE ( 身份服务引擎 )
- ERS ( 外部RESTful服务 )
- REST客户包括Postman、RESTED、Insomnia等。

### 使用的组件

本文档中的信息基于以下软件版本：

- 思科ISE ( 身份服务引擎 ) 3.1补丁6
- Postman REST客户端v10.17.4

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注意：其他ISE版本和REST客户端的步骤类似或相同。除非另有说明，您可在所有2.x和3.x ISE软件版本上使用这些步骤。

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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。

## 配置

### 启用ERS（端口9060）

ERS API是只使用HTTPS的REST API，在端口443和端口9060上运行。端口9060默认关闭，因此需要先打开。如果尝试访问此端口的客户端不首先启用ERS，则会出现服务器超时。因此，第一个要求是从Cisco ISE管理员UI启用ERS。

导航到管理>设置> API设置并启用ERS（读/写）切换按钮。

- Client Provisioning
  - FIPS Mode
  - Security Settings
  - Alarm Settings
- Feature >
- Profiling
- Protocols >
- Endpoint Scripts >
  - Proxy
  - SMTP Server
  - SMS Gateway
  - System Time
- API Settings**
- Network Success Diagnostics >
  - DHCP & DNS Services
  - Max Sessions
  - Light Data Distribution
  - Interactive Help
  - Enable TAC Support Cases

## API Settings

Overview **API Service Settings** API Gateway Settings

### API Service Settings for Administration Node

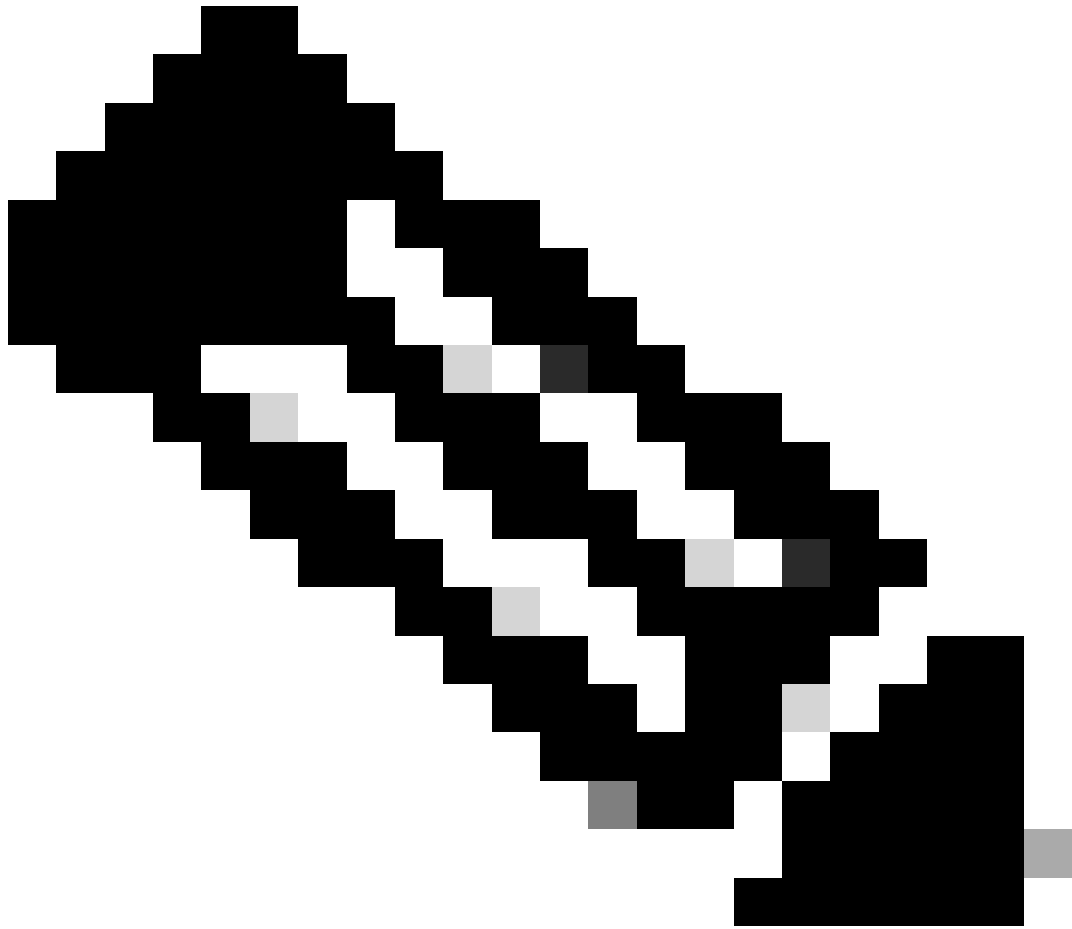
- ERS (Read/Write)** ←
- Open API (Read/Write)

### CSRF Check ( only for ERS Settings )

- Enable CSRF Check for Enhanced Security (Not compatible with pre ISE 2.3 Clients)
- Disable CSRF For ERS Request (compatible with ERS clients older than ISE 2.3)**

Reset

Save



注：ERS API支持TLS 1.1和TLS 1.2。ERS API不支持TLS 1.0，无论在思科ISE GUI的安全设置窗口中启用TLS 1.0(管理>系统>设置>安全设置)。在Security Settings (安全设置)窗口中启用TLS 1.0仅与EAP协议相关，不会影响ERS API。

## 创建ERS管理员

创建思科ISE管理员，分配密码，并将用户作为ERS管理员添加到管理员组。您可以将配置的其余部分留空。

The screenshot shows the configuration page for an Admin User in Cisco ISE. The sections and their fields are as follows:

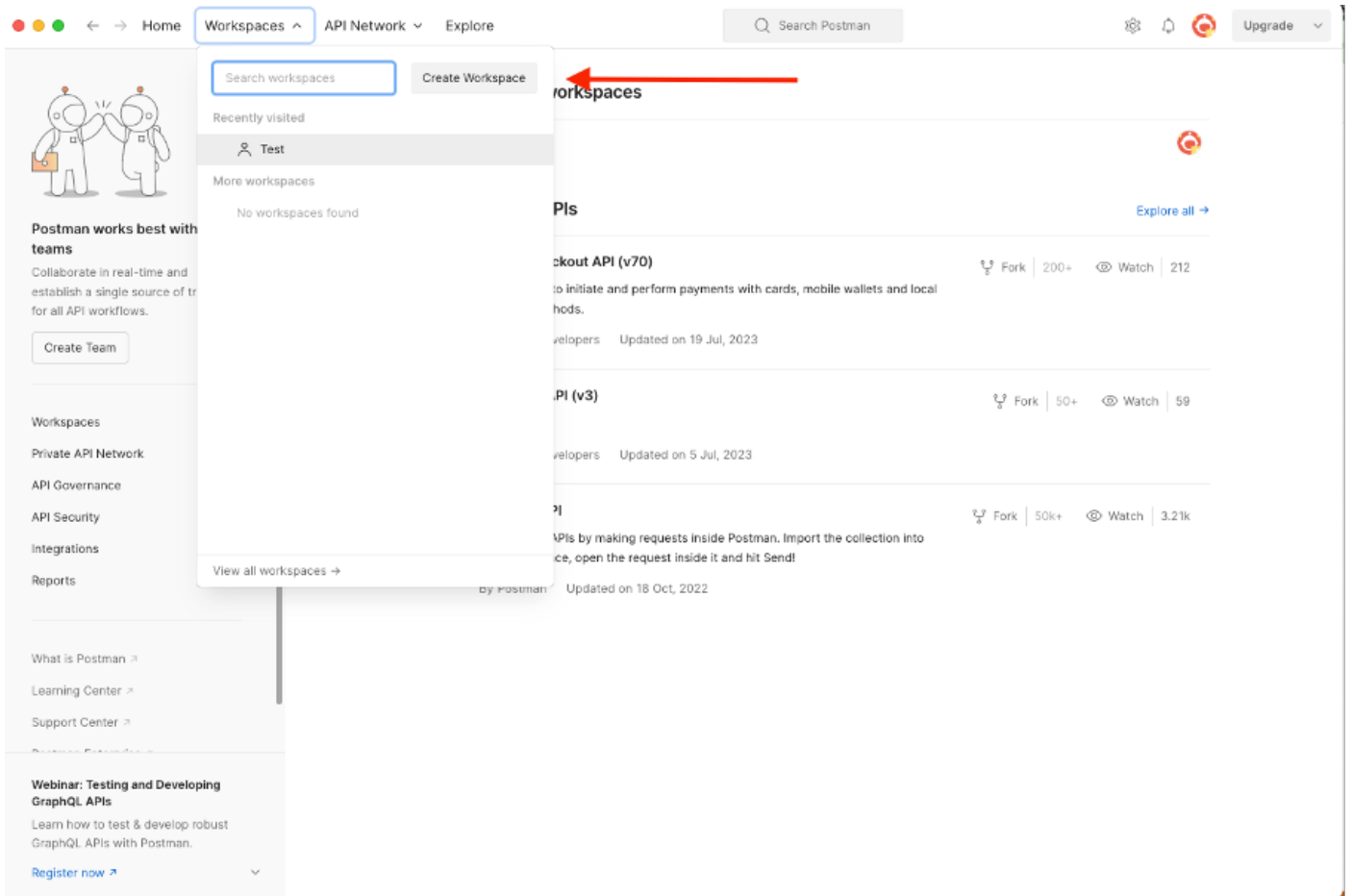
- Admin User:** Name (ERS-USER), Status (Enabled), Email, Domain, Reset Date, and Inactive account reset enabled.
- Password:** Password and Re-Enter Password fields, with a Generate Password button.
- User Information:** First Name and Last Name fields.
- Account Options:** Description and Change password on next login checkbox.
- Admin Groups:** A list of groups with 'ERS Admin' selected.

Red arrows in the image point to the 'Name' field, the 'Password' field, and the 'ERS Admin' group selection.

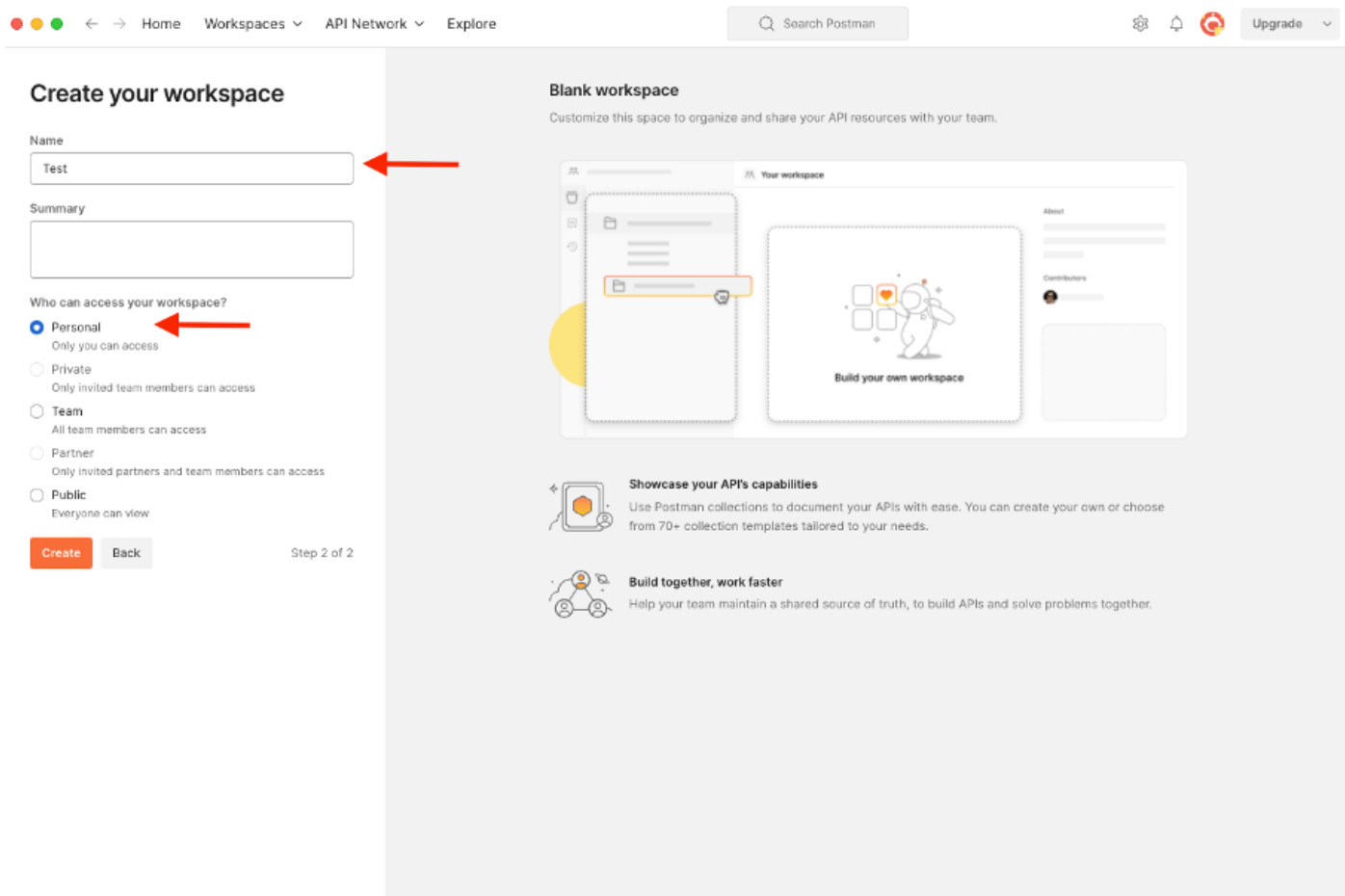
## 设置Postman

下载或使用在线版Postman。

1. 通过点击“工作区”选项卡下的“创建工作区”创建用户和工作区。



2. 选择空白工作区并为工作区指定名称。您可以添加说明并将其公开。在本示例中，Personalis selected。



创建工作空间后，现在即可配置API调用。

## ISE SDK和基本Postman授权

要配置任何呼叫，请首先访问ISE ERS SDK（软件开发套件）。此工具编译ISE可以执行的API调用的完整列表：

1. 导航到<https://{ise-ip}/ers/sdk>。
2. 使用您的ISE管理员凭证登录。
3. 展开API文档。
4. 向下滚动直至找到Network Device，然后单击。
5. 在此选项下，您现在可找到可以对ISE上的网络设备执行的所有可用操作。选择创建。

External RESTful Services (ERS) Online SDK

Quick Reference

API Documentation

- Filter Policy
- Guest Location
- Guest Sntp Notification Configur
- Guest Ssid
- Guest Type
- Guest User
- Hotspot Portal
- IP To SCT Mapping
- IP To SCT Mapping Group
- ISE Service Information
- Identity Group
- Identity Sequence
- Internal User
- My Device Portal
- Native Supplicant Profile
- Network Device
- Network Device Group
- Node Details
- PSN Node Details with Radius Set
- Portal
- Portal Theme
- Profiler Profile
- Pull Deployment Info
- Pxgrid Node
- Pxgrid Settings
- Radius Server Sequence
- RestID Store
- SMS Server
- SXP Connections
- SXP Local Bindings
- SXP Vpns
- Security Groups
- Security Groups ACLs
- Security Groups to Virtual Netwo
- Self Registered Portal
- Sponsor Group
- Sponsor Group Member
- Sponsor Portal
- Sponsored Guest Portal
- Support Bundle Download

Network Device

- Overview
- Resource definition
- Revision History
- Update-By-Name
- Delete-By-Name
- Get-By-Name
- Get-By-Id
- Update
- Get-All
- Delete
- Create
- Get Version
- Bulk Request
- Monitor Bulk Status

Overview

Network Device API allows the client to add, delete, update, and search Network Devices. In this documentation, for each available API you will find the request syntax including the required headers and a response example of a successful flow. Please note that each API description shows weather the API is supported in bulk operation. The Bulk section is showing only 'create' bulk operation however, all other operation which are bulk supported can be used in same way.

Please note that these examples are not meant to be used as is because they have references to DB data. You should treat it as a basic template and edit it before sending to server.

Back to top

Resource definition

Attribute	Type	Required	Default value	Description
name	String	Yes		Resource name
id	String	No		Resource UUID, mandatory for update

Developer Resources

6. 现在，您可以看到在任何Rest客户端上使用XML或JSON执行API调用所需的配置以及预期的响应示例。

Quick Reference

API Documentation

- Filter Policy
- Guest Location
- Guest Sntp Notification Configur
- Guest Ssid
- Guest Type
- Guest User
- Hotspot Portal
- IP To SCT Mapping
- IP To SCT Mapping Group
- ISE Service Information
- Identity Group
- Identity Sequence
- Internal User
- My Device Portal
- Native Supplicant Profile
- Network Device
- Network Device Group
- Node Details
- PSN Node Details with Radius Set
- Portal
- Portal Theme
- Profiler Profile
- Pull Deployment Info
- Pxgrid Node
- Pxgrid Settings
- Radius Server Sequence
- RestID Store
- SMS Server
- SXP Connections
- SXP Local Bindings
- SXP Vpns
- Security Groups
- Security Groups ACLs
- Security Groups to Virtual Netwo
- Self Registered Portal
- Sponsor Group
- Sponsor Group Member
- Sponsor Portal
- Sponsored Guest Portal
- Support Bundle Download

Network Device

Create

Request:

Method: POST

URI: https://10.201.230.99/ers/config/networkdevice

HTTP 'Content-Type' Header: application/xml | application/json

HTTP 'Accept' Header: application/xml | application/json

HTTP 'ERS-Media-Type' Header (Not Mandatory): network.networkdevice.1.1

HTTP 'X-CSRF-TOKEN' Header (Required Only if Enabled from GUI): The Token value from the GET X-CSRF-TOKEN fetch request

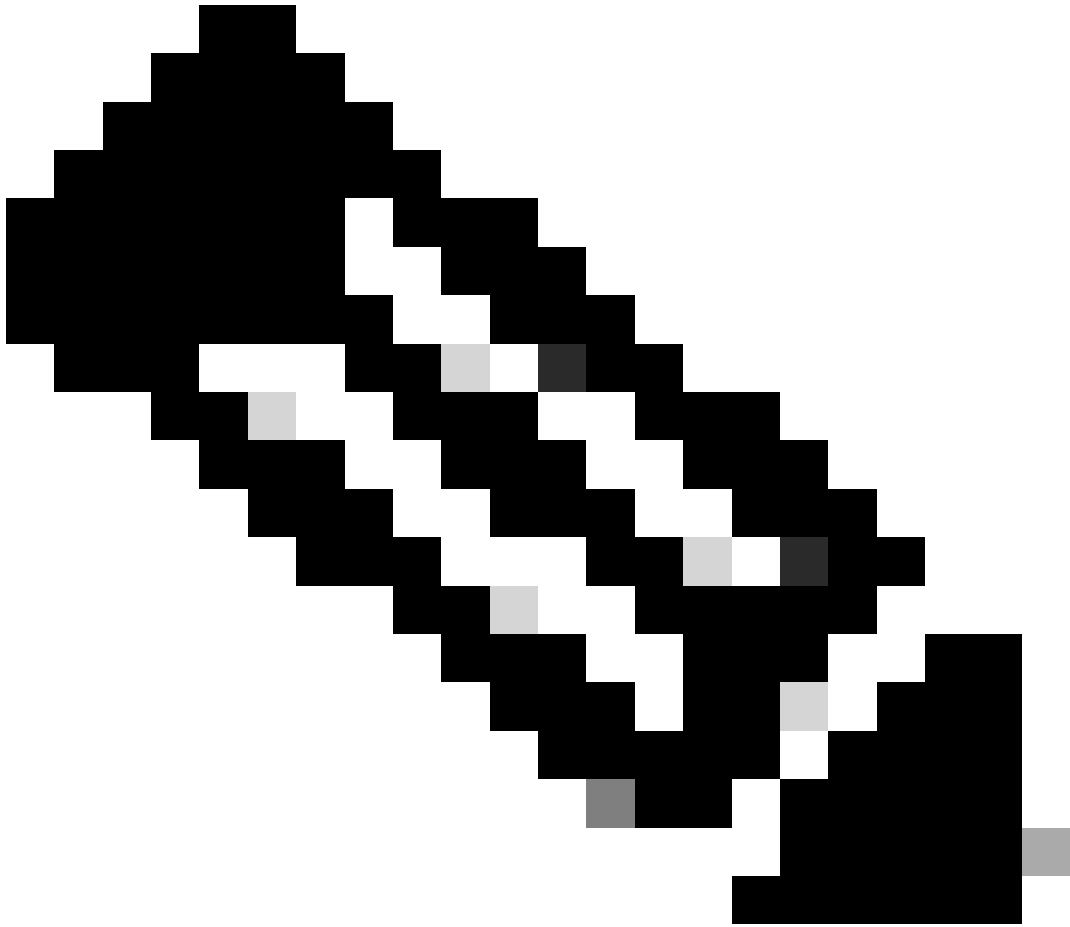
Request Content:

```

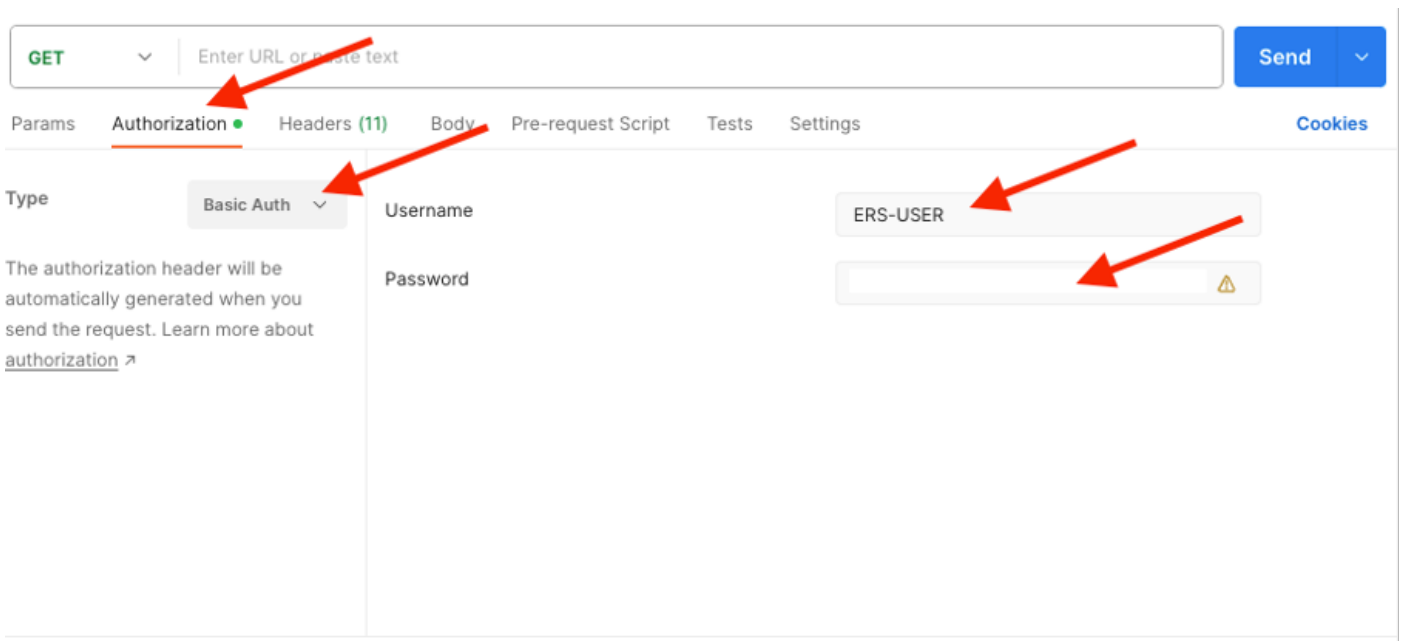
XML
<?xml version="1.0" encoding="UTF-8">
<ns0:networkdevice xmlns:ns0="network.ers.ise.cisco.com" xmlns:xs="http://www.w3.org/2001/XMLSchema" xmlns:ns1="ers.ise.cisco.com" xmlns:ers="ers.ise.cisco.com" description="example nd" ns="">
  <authenticationSettings>
    <dtlsRequired>true</dtlsRequired>
    <enableKeyWrap>true</enableKeyWrap>
    <keyEncryptionKey>1234567890123456</keyEncryptionKey>
    <keyInputFormat>ASCII</keyInputFormat>
    <messageAuthenticatorCodeKey>12345678901234567890</messageAuthenticatorCodeKey>
    <radiusSharedSecret>aaaaa</radiusSharedSecret>
  </authenticationSettings>
  <coaPort>1700</coaPort>
  <dtlsDnsName>ISE111.il.com</dtlsDnsName>
  <NetworkDeviceIPList>
    <NetworkDeviceIP>
      <ipaddress>1.1.1.1</ipaddress>
      <mask>32</mask>
    </NetworkDeviceIP>
  </NetworkDeviceIPList>
  <NetworkDeviceGroupList>
    <NetworkDeviceGroupLocation#All Locations</NetworkDeviceGroup>
    <NetworkDeviceGroupDevice Type#All Device Types</NetworkDeviceGroup>
  </NetworkDeviceGroupList>
  <profileName>Cisco</profileName>
  <smppSettings>
    <linkTrapQuery>true</linkTrapQuery>
    <macTrapQuery>true</macTrapQuery>
    <originatingPolicyServicesNode>autor</originatingPolicyServicesNode>
    <pollingInterval>300</pollingInterval>
    <cronCommint@v0aaa</cronCommint@v>
  </smppSettings>
</ns0:networkdevice>

```

7. 返回Postman，为ISE配置基本身份验证。在授权选项卡下，选择基本身份验证作为身份验证类型，并添加之前在ISE中创建的ISE ERS用户凭证。



注意：除非在Postman上配置了变量，否则密码显示为明文。



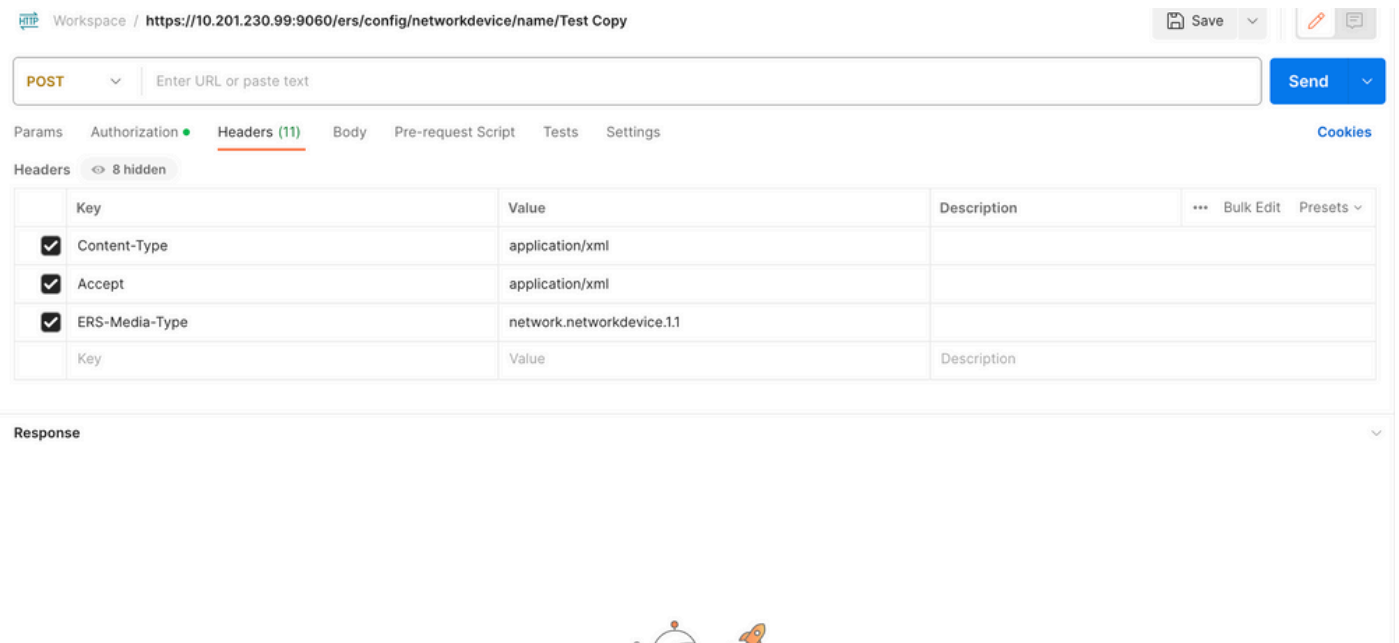


## 使用XML创建NAD

使用XML创建具有RADIUS TACACS、SNMP和TrustSec设置的TESTNAD1。

1. 在SDK中的创建下方，包含执行呼叫所需的报头和模板，以及预期响应。

2. 转到Headers选项卡并为API调用配置所需的报头，如SDK中所示。报头配置必须如下所示：



Workspace / <https://10.201.230.99:9060/ers/config/networkdevice/name/Test Copy>

POST Enter URL or paste text Send

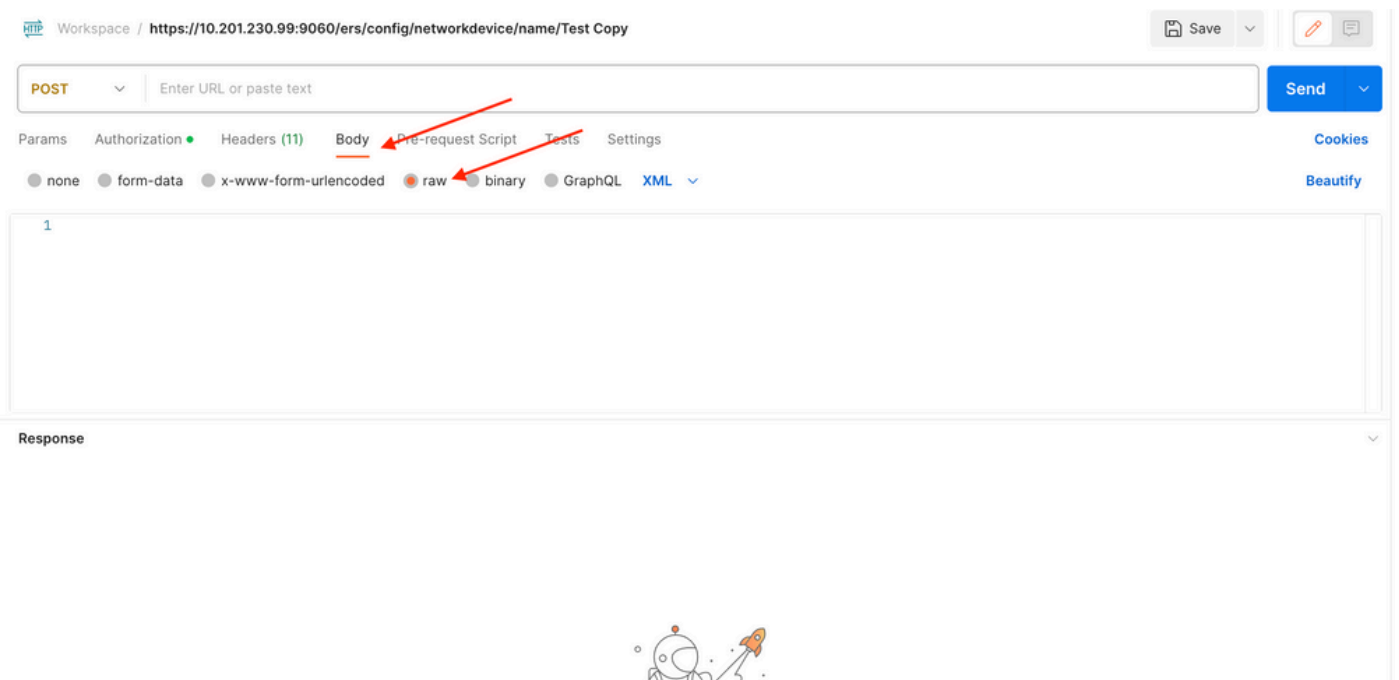
Params Authorization Headers (11) Body Pre-request Script Tests Settings Cookies

Headers 8 hidden

Key	Value	Description	Bulk Edit	Presets
<input checked="" type="checkbox"/>	Content-Type	application/xml		
<input checked="" type="checkbox"/>	Accept	application/xml		
<input checked="" type="checkbox"/>	ERS-Media-Type	network.networkdevice.1.1		
	Key	Value		Description

Response

3. 移至正文题头，然后选择原始。这允许您粘贴创建NAD所需的XML模板。



Workspace / <https://10.201.230.99:9060/ers/config/networkdevice/name/Test Copy>

POST Enter URL or paste text Send

Params Authorization Headers (11) Body Pre-request Script Tests Settings Cookies

none form-data x-www-form-urlencoded raw binary GraphQL XML

1

Response

4. XML模板如下所示（根据需要更改值）：

```
<?xml version="1.0" encoding="UTF-8"?> <ns0:networkdevice xmlns:ns0="network.ers.ise.cisco.com" xmlns:xs="Schema XML File"
xmlns:ns1="ers.ise.cisco.com" xmlns:ers="ers.ise.cisco.com" description="This NAD was added via ERS API" name="TESTNAD1">
<authenticationSettings> <dtlsRequired>true</dtlsRequired> <enableKeyWrap>true</enableKeyWrap>
```

```
<keyEncryptionKey>1234567890123456</keyEncryptionKey> <keyInputFormat>ASCII</keyInputFormat>
<messageAuthenticatorCodeKey>12345678901234567890</messageAuthenticatorCodeKey>
<radiusSharedSecret>cisco123</radiusSharedSecret> </authenticationSettings> <coaPort>1700</coaPort>
<dtlsDnsName>Domain</dtlsDnsName> <NetworkDeviceIPList> <NetworkDeviceIP> <ipaddress>NAD IP Address</ipaddress>
<mask>32</mask> </NetworkDeviceIP> </NetworkDeviceIPList> <NetworkDeviceGroupList> <NetworkDeviceGroup>Location#All
Locations#LAB</NetworkDeviceGroup> <NetworkDeviceGroup>Device Type#All Device Types#Access-Layer</NetworkDeviceGroup>
</NetworkDeviceGroupList> <profileName>Cisco</profileName> <snmpsettings> <linkTrapQuery>true</linkTrapQuery>
<macTrapQuery>true</macTrapQuery> <originatingPolicyServicesNode>Auto</originatingPolicyServicesNode>
<pollingInterval>3600</pollingInterval> <roCommunity>aaa</roCommunity> <version>ONE</version> </snmpsettings> <tacacsSettings>
<connectModeOptions>ON_LEGACY</connectModeOptions> <sharedSecret>cisco123</sharedSecret> </tacacsSettings> <trustsecsettings>
<deviceAuthenticationSettings> <sgaDeviceId>TESTNAD1</sgaDeviceId> <sgaDevicePassword>cisco123</sgaDevicePassword>
</deviceAuthenticationSettings> <deviceConfigurationDeployment> <enableModePassword>cisco123</enableModePassword>
<execModePassword>cisco123</execModePassword> <execModeUsername>Admin</execModeUsername>
<includeWhenDeployingSGTUpdates>true</includeWhenDeployingSGTUpdates> </deviceConfigurationDeployment>
<pushIdSupport>false</pushIdSupport> <sgaNotificationAndUpdates> <coaSourceHost>ise3-1test</coaSourceHost>
<downloadEnvironmentDataEveryXSeconds>86400</downloadEnvironmentDataEveryXSeconds>
<downloadPeerAuthorizationPolicyEveryXSeconds>86400</downloadPeerAuthorizationPolicyEveryXSeconds>
<downloadSGACLListsEveryXSeconds>86400</downloadSGACLListsEveryXSeconds>
<otherSGADevicesToTrustThisDevice>false</otherSGADevicesToTrustThisDevice>
<reAuthenticationEveryXSeconds>86400</reAuthenticationEveryXSeconds>
<sendConfigurationToDevice>false</sendConfigurationToDevice>
<sendConfigurationToDeviceUsing>ENABLE_USING_COA</sendConfigurationToDeviceUsing> </sgaNotificationAndUpdates>
</trustsecsettings> </ns0:networkdevice>
```

---

注意：请注意，只有在`<enableKeyWrap>{false|true}</enableKeyWrap>`设置为`true`时，才需要后面几行。否则，可以从XML模板中删除相同内容：

---

```
<keyEncryptionKey>1234567890123456</keyEncryptionKey> <keyInputFormat>ASCII</keyInputFormat>
<messageAuthenticatorCodeKey>12345678901234567890</messageAuthenticatorCodeKey>
```

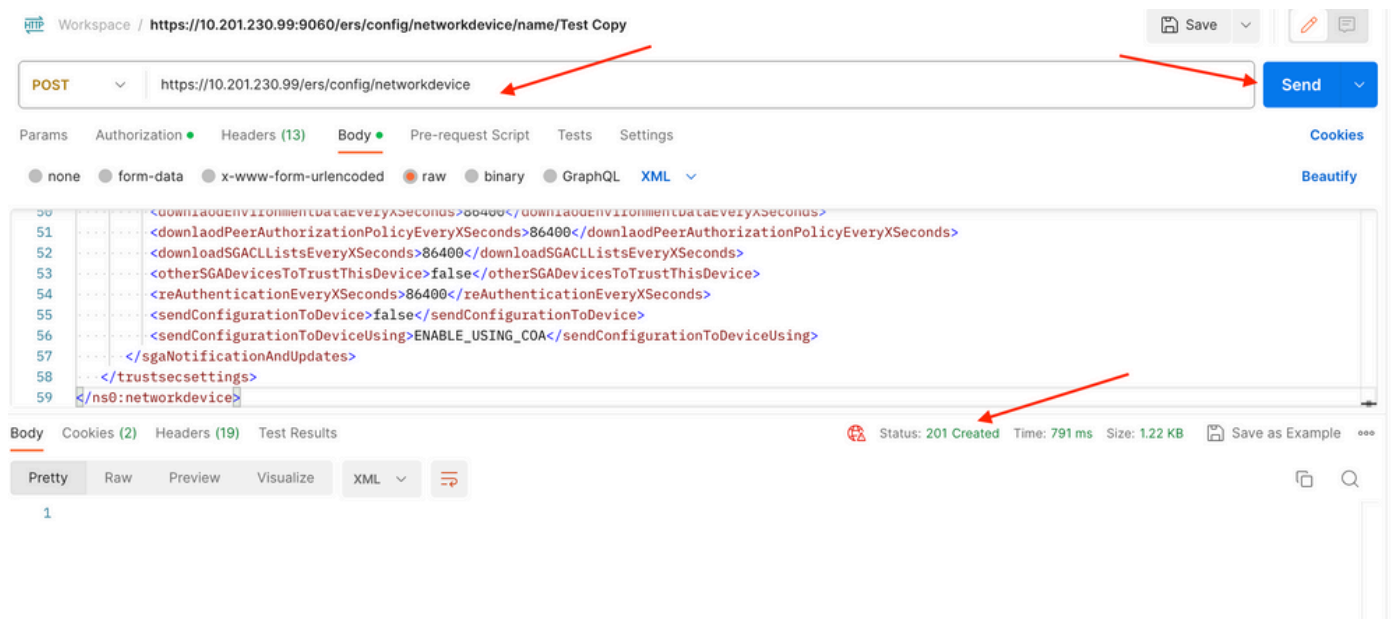
您可以从模板中删除不需要的配置，只需保留您在创建NAD期间实际需要添加的数据即可。例如，这是相同的模板，但仅与TACACS配置相同。无论所需的配置如何，确保模板以`</ns0 : networkdevice>`结尾。

```
<?xml version="1.0" encoding="UTF-8"?> <ns0:networkdevice xmlns:ns0="network.ers.ise.cisco.com" xmlns:xs="Schema XML File"
xmlns:ns1="ers.ise.cisco.com" xmlns:ers="ers.ise.cisco.com" description="This NAD was added via ERS API" name="TESTNAD1">
<NetworkDeviceIPList> <NetworkDeviceIP> <ipaddress>NAD IP Address</ipaddress> <mask>32</mask> </NetworkDeviceIP>
```

```
</NetworkDeviceIPList> </NetworkDeviceGroupList> </NetworkDeviceGroup>Location#All Locations#LAB</NetworkDeviceGroup>
</NetworkDeviceGroup>Device Type#All Device Types#Access-Layer</NetworkDeviceGroup> </NetworkDeviceGroupList>
<profileName>Cisco</profileName> <tacacsSettings> <connectModeOptions>ON_LEGACY</connectModeOptions>
<sharedSecret>cisco123</sharedSecret> </tacacsSettings> </ns0:networkdevice>
```

5. 将raw的XML模板粘贴到Body标题下。

6. 选择POST作为方法，粘贴https://{ISE-ip}/ers/config/networkdevice，然后单击Send。如果一切配置正确，您应该看到201 Created消息并且结果为空。



7. 通过执行NAD的GET调用或检查ISE NAD列表确认NAD是否已创建。



Workspace / <https://10.201.230.99:9060/ers/config/networkdevice/name/Test> Save Send

POST  Send

Params Authorization Headers (12) Body Pre-request Script Tests Settings Cookies

Headers 9 hidden

Key	Value	Description	Bulk Edit	Presets
<input checked="" type="checkbox"/> Content-Type	application/json			
<input checked="" type="checkbox"/> Accept	application/json			
<input checked="" type="checkbox"/> ERS-Media-Type	network.networkdevice.1.1			
Key	Value	Description		

3. 移至正文题头，然后选择原始。这允许您粘贴创建NAD所需的JSON模板。

Workspace / <https://10.201.230.99:9060/ers/config/networkdevice/name/Test Copy> Save Send


POST  Send

Params Authorization Headers (11) Body Pre-request Script Tests Settings Cookies

none
  form-data
  x-www-form-urlencoded
  raw
  binary
  GraphQL
  XML

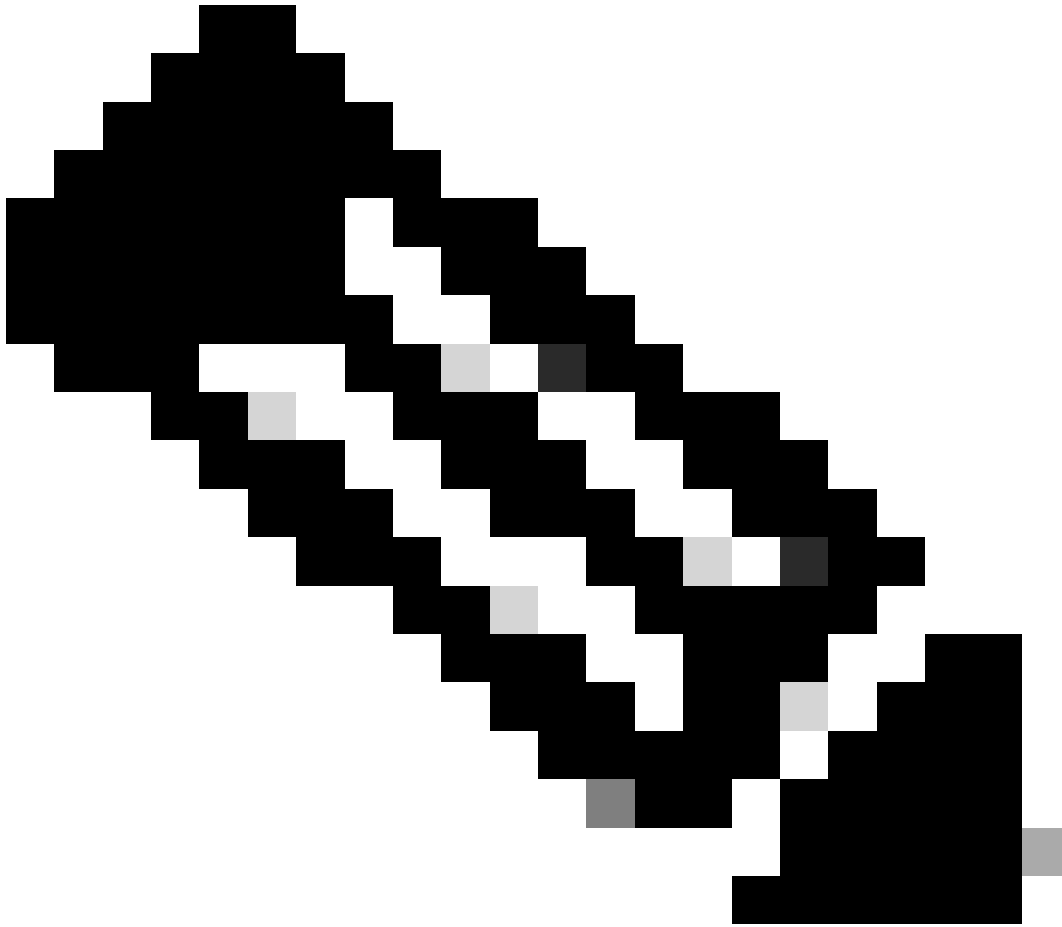
1

Response



4. JSON模板必须如下所示（根据需要更改值）：

```
{ "NetworkDevice": { "name": "TESTNAD2", "description": "This NAD was added via ERS API", "authenticationSettings": {
"radiusSharedSecret": "cisco123", "enableKeyWrap": true, "dtlsRequired": true, "keyEncryptionKey": "1234567890123456",
"messageAuthenticatorCodeKey": "12345678901234567890", "keyInputFormat": "ASCII" }, "snmpsettings": { "version": "ONE",
"roCommunity": "aaa", "pollingInterval": 3600, "linkTrapQuery": true, "macTrapQuery": true, "originatingPolicyServicesNode": "Auto" },
"trustsecsettings": { "deviceAuthenticationSettings": { "sgaDeviceId": "TESTNAD2", "sgaDevicePassword": "cisco123" },
"sgaNotificationAndUpdates": { "downloadEnvironmentDataEveryXSeconds": 86400, "downloadPeerAuthorizationPolicyEveryXSeconds":
86400, "reAuthenticationEveryXSeconds": 86400, "downloadSGACLListsEveryXSeconds": 86400, "otherSGADevicesToTrustThisDevice":
false, "sendConfigurationToDevice": false, "sendConfigurationToDeviceUsing": "ENABLE_USING_COA", "coaSourceHost": "ise3-1test" },
"deviceConfigurationDeployment": { "includeWhenDeployingSGTUpdates": true, "enableModePassword": "cisco123", "execModePassword":
"cisco123", "execModeUsername": "Admin" }, "pushIdSupport": "false" }, "tacacsSettings": { "sharedSecret": "cisco123",
"connectModeOptions": "ON_LEGACY" }, "profileName": "Cisco", "coaPort": 1700, "dtlsDnsName": "Domain", "NetworkDeviceIPList": [ {
"ipaddress": "NAD IP Adress", "mask": 32 } ], "NetworkDeviceGroupList": [ "Location#All Locations", "Device Type#All Device Types" ] }
```



**注意：**请务必注意，只有在enableKeyWrap“：**{false|true}**”，设置为**true**时，才需要下一行。否则，也可以从JSON模板中删除相同的内容：

---

"keyEncryptionKey": "**1234567890123456**", "messageAuthenticatorCodeKey": "**12345678901234567890**", "keyInputFormat": "ASCII" 您还可以从模板中删除不需要的配置，并保留您在创建NAD期间实际需要添加的数据。

5. 将**raw**的JSON模板粘贴到**Body**标头下。

6. 选择**POST**作为方法，粘贴<https://{ISE-ip}/ers/config/networkdevice>，然后单击Send。如果一切配置正确，您应该看到**201 Created**消息并且结果为空。

Workspace / <https://10.201.230.99:9060/ers/config/networkdevice/name/Test Copy> Save

POST <https://10.201.230.99/ers/config/networkdevice> Send

Params Authorization Headers (13) Body Pre-request Script Tests Settings Cookies Beautify

none form-data x-www-form-urlencoded raw binary GraphQL JSON

```
1 {
2   "NetworkDevice": {
3     "name": "TESTNAD2",
4     "description": "This NAD was added via ERS API",
5     "authenticationSettings": {
6       "radiusSharedSecret": "cisco123",
7       "enableKeyWrap": true,
8       "dtlsRequired": true,
9       "keyEncryptionKey": "1234567890123456",
10      "messageAuthenticatorCodeKey": "12345678901234567890",
11      "keyFormat": "ASCII"
12    }
13  }
14 }
```

Body Cookies (2) Headers (17) Test Results Status: 201 Created Time: 678 ms Size: 1.03 KB Save as Example

Pretty Raw Preview Visualize JSON

1

7.通过执行NAD的GET调用或检查ISE NAD列表确认NAD是否已创建。

Workspace / <https://10.201.230.99:9060/ers/config/networkdevice/name/Test Copy> Save

GET <https://10.201.230.99/ers/config/networkdevice> Send

Params Authorization Headers (13) Body Pre-request Script Tests Settings Cookies Beautify

none form-data x-www-form-urlencoded raw binary GraphQL JSON

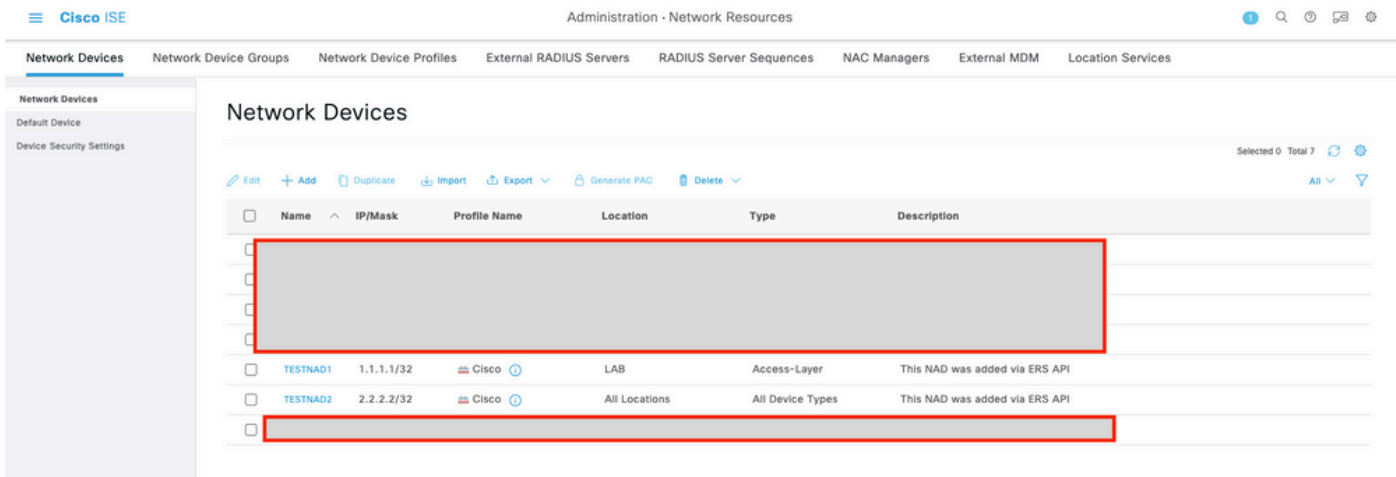
```
1 {
2   "NetworkDevice": {
3     "name": "TESTNAD2",
4     "description": "This NAD was added via ERS API",
5     "authenticationSettings": {
6       "radiusSharedSecret": "cisco123",
7       "enableKeyWrap": true,
8       "dtlsRequired": true,
9       "keyEncryptionKey": "1234567890123456",
10      "messageAuthenticatorCodeKey": "12345678901234567890",
11      "keyFormat": "ASCII"
12    }
13  }
14 }
```

Body Cookies (2) Headers (18) Test Results Status: 200 OK Time: 659 ms Size: 3.74 KB Save as Example

Pretty Raw Preview Visualize JSON

```
57 {
58   "name": "TESTNAD1",
59   "description": "This NAD was added via ERS API",
60   "link": {
61     "rel": "self",
62     "href": "https://10.201.230.99/ers/config/networkdevice/afe572d0-5bcc-11ee-9ab7-9a446445bd4f",
63     "type": "application/json"
64   }
65 },
66 {
67   "id": "9dd45a60-5bd7-11ee-9ab7-9a446445bd4f",
68   "name": "TESTNAD2",
69   "description": "This NAD was added via ERS API",
70   "link": {
71     "rel": "self",
72     "href": "https://10.201.230.99/ers/config/networkdevice/9dd45a60-5bd7-11ee-9ab7-9a446445bd4f",
73     "type": "application/json"
74   }
75 }
```





## 验证

如果能够访问API服务GUI页面(例如<https://{iseip} : {port}/api/swagger-ui/index.html>或<https://{iseip} : 9060/ers/sdk>)，则表示API服务按照预期工作。

## 故障排除

- 所有REST操作都经过审核，并且日志记录在系统日志中。
- 要排除与开放式API相关的问题，请在调试日志配置窗口中将apiservice组件的日志级别设置为调试。
- 要排除与ERS API相关的问题，请在调试日志配置窗口中将ers组件的日志级别设置为调试。要查看此窗口，请导航到Cisco ISE GUI，单击菜单图标并选择**Operations > Troubleshoot > Debug Wizard > Debug Log Configuration**。
- 您可以从下载日志窗口下载日志。要查看此窗口，请导航到Cisco ISE GUI，单击菜单图标并选择**操作 > 故障排除 > 下载日志**。
- 您可以选择从“支持捆绑包”选项卡中下载支持捆绑包(通过点击选项卡下的下载按钮)，也可以通过点击api服务调试日志的日志文件(Log File)值，从“调试日志”(Debug Logs)选项卡中下载api服务调试日志。

## 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。

请注意：即使是最好的机器翻译，其准确度也不及专业翻译人员的水平。

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