為帶有警報和效能資料監控的Cisco NCS 1002(Rosco)配置軟體

目錄

簡介

本檔案介紹思科網路聚合系統(NCS)1002(Rosco)的基本軟體組態步驟以及警報和效能資料監控。

必要條件

需求

思科建議您瞭解以下主題：

- NCS1002
- 具有光纖產品知識的Cisco IOS®-XR平台特定系統

採用元件

本文中的資訊係根據以下軟體和硬體版本：

- NCS1002
- Cisco IOS®-XR VM控制檯登入

本文中的資訊是根據特定實驗室環境內的裝置所建立。文中使用到的所有裝置皆從已清除（預設）的組態來啟動。如果您的網路運作中，請確保您瞭解任何指令可能造成的影響。

背景資訊

NCS1002是一種2彙總(RU)系統，使用當前光纖，可在超過3000千米的距離內提供完全可程式設計的高頻寬容量（高達250 Gbps）。Cisco NCS 1002採用業界領先的Cisco IOS® XR作業系統，提供強大的功能，例如第三方應用程式託管、機器對機器(M2M)介面、遙測和靈活的包交付。

NCS 1002具有以下優點：

- 支援高達2 Tbps的容量
- 通過軟體調配在同一平台上傳輸100、200或250 Gbps每波長
- 通過軟體調配在同一平台上傳輸10 GE和100 GE
- 支援用於靈活網格密集分波多工(DWDM)的無網格調整
- 支援不同的調制格式（PM-QPSK或PM-16QAM）
- 支援7%或20%的軟決策(SD)FEC，以實現最大的光纖效能
- 允許自動安裝、配置和監控
- 支援基於另一新一代(YANG)模型的M2M API，以便於配置
- 支援用於裝置監控的發佈子模型的遙測代理

設定

設定和驗證管理IP

開始之前：

- 請諮詢網路管理員或系統規劃員，獲取管理埠的IP地址和子網掩碼
- 確保管理埠已連線到管理網路

```
RP/0/RP0/CPU0:DBX2#conf t

Thu Feb 11 07:45:28.810 UTC

RP/0/RP0/CPU0:DBX2(config)#interface mgmtEth 0/RP0/CPU0/0

RP/0/RP0/CPU0:DBX2(config-if)#ipv4 address 172.20.165.151/24

RP/0/RP0/CPU0:DBX2(config-if)#no shutdown

RP/0/RP0/CPU0:DBX2(config-if)#commit

RP/0/RP0/CPU0:DBX2#sh ipv4 interface brief

Thu Feb 11 07:44:21.811 UTC

          Interface                  IP-Address      Status      Protocol Vrf-Name

MgmtEth0/RP0/CPU0/0          172.20.165.151 Up            Up        default

RP/0/RP0/CPU0:DBX2#
```

驗證軟體版本

```
RP/0/RP0/CPU0:DBX2#show version

Thu Feb 11 07:52:26.846 UTC


Cisco IOS XR Software, Version 6.0.0

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Build Information:

Built By      : alnguyen

Built On      : Thu Dec 24 01:05:17 PST 2015

Build Host    : iox-lnx-005

Workspace     : /auto/srcarchive16/production/6.0.0/ncs1k/workspace

Version       : 6.0.0

Location      : /opt/cisco/XR/packages/

cisco NCS1002 () processor

System uptime is 21 hours, 2 minutes

RP/0/RP0/CPU0:DBX2#
```

驗證硬體的狀態

```
RP/0/RP0/CPU0:DBX2#show platform

Thu Feb 11 10:06:43.448 UTC

Node name        Node type         Node state      Admin state   Config state

--------------------------------------------------------------------------------

0/RP0            NCS1K-CNTLR       OPERATIONAL     UP            NSHUT

RP/0/RP0/CPU0:DBX2#
```
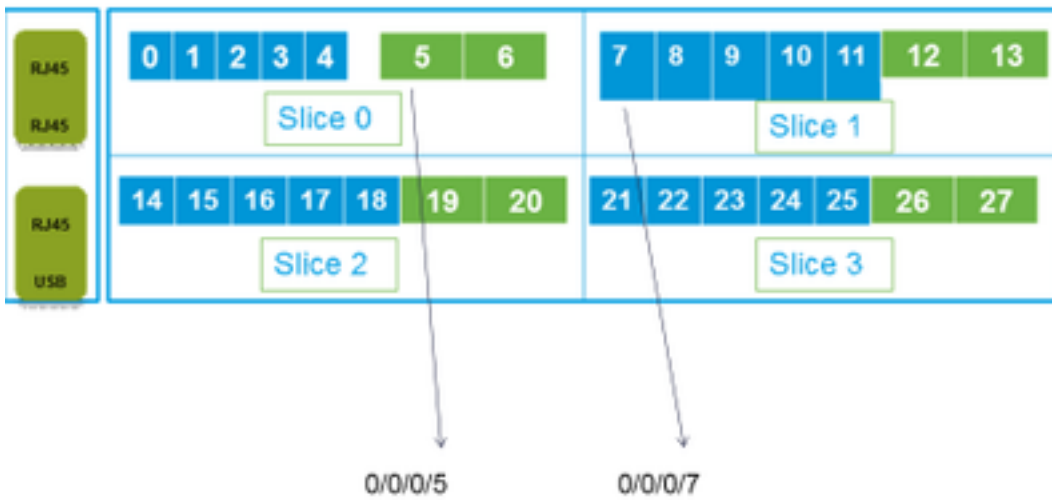
配置和驗證切片

NCS1002中的埠表示如下圖所示。

Port addressing on NCS1K


```
RP/0/RP0/CPU0:DBX2#conf t

Thu Feb 11 08:53:44.390 UTC

RP/0/RP0/CPU0:DBX2(config)#hw-module location 0/RP0/CPU0 slice 3 client bitrate 100 trunk
bitrate 200$

RP/0/RP0/CPU0:DBX2(config)#commit

Thu Feb 11 08:54:16.383 UTC

RP/0/RP0/CPU0:DBX2(config)#end

RP/0/RP0/CPU0:DBX2#show hw-module slice 3

Thu Feb 11 08:55:05.100 UTC

Slice ID:               3

Status:                 Provisioning In Progress

Client Bitrate:         100

Trunk Bitrate:           200

DP FPGA Version:         H14 (CURRENT)


Client Port -   Trunk Port       CoherentDSP0/0/0/26 CoherentDSP0/0/0/27

Traffic Split Percentage

HundredGigECtrlr0/0/0/21                         100                   0

HundredGigECtrlr0/0/0/22                         100                   0

HundredGigECtrlr0/0/0/24                           0                 100

HundredGigECtrlr0/0/0/25                           0                 100
```

```
RP/0/RP0/CPU0:DBX2#
```

NCS1k支援的流量組合：

```
5 x 40G à 2 x 100G
5 x 40G à 1 x 200G
5 x 40G à 1 x 250G
20 x 10G à 2 x 100G
20 x 10G à 1 x 200G
20 x 10G à 1 x 250G
2 x 100G à 2 x 100G
4 x 100G à 2 x 200G
5 x 100G à 2 x 250G
```

SNMP

- 在Cisco IOS®-XR上配置SNMP V2C

啟用SNMP V2c獲取/設定請求所需的配置：

```
RP/0/0/CPU0:smart-prp16#conf t

RP/0/0/CPU0:smart-prp16(config)#

RP/0/0/CPU0:smart-prp16(config)#snmp-server community public RW SystemOwner

RP/0/0/CPU0:smart-prp16(config)#commit

RP/0/0/CPU0:smart-prp16#

RP/0/0/CPU0:smart-prp16#show running-config snmp-server

snmp-server community public RW SystemOwner



Explanation of Configuration:

In configuration "public" is the community string and it be any text.

The Options RW and SystemOwner provides Read/Write to the entire system, including admin plane.
If you need access to just the SDR (secure Domain Router),

then you can choose option "SDROwner"

You can also apply an Access list to the SNMP server. You can use command.

#snmp-server community public RW SDROwner my_acl_ravi

Where my_acl_ravi is an ACL.



Use command to verify the SNMP configuration.

RP/0/RP0/CPU0:DBX2#show snmp group

Thu Feb 11 09:09:48.303 UTC

groupname: public                          security model:snmpv1

readview : v1default                         writeview:
```

```
notifyview: v1default

row status: active

groupname: public                          security model:snmpv2c

readview : v1default                        writeview:

notifyview: v1default

row status: active
```
- 在Cisco IOS®-XR上配置SNMP V3:

請遵循以下步驟：

```
SNMPV3

Configure an SNMP View
---------------------

Command Syntax:

snmp-server view view-name oid-tree included

Where

view-name: is the name of the View
oid-tree: Object identifier (OID) of the ASN.1 subtree to be included or excluded from the view.
To identify the subtree, specify a text string consisting of numbers, such as 1.3.6.2.4, or a
word,
such as system. Replace a single sub-identifier with the asterisk wildcard to specify a subtree
family; for example 1.3.*.4.

RP/0/RP1/CPU0:akki(config)#snmp-server view view1 1.3 included
RP/0/RP1/CPU0:akki(config)#commit

RP/0/RP1/CPU0:akki#show snmp view
view1 org - included nonVolatile active
v1default iso - included nonVolatile active
RP/0/RP1/CPU0:akki#
```
- 配置SNMP組：

```
RP/0/RP1/CPU0:akki(config)#snmp-server group group1 v3 priv write view1 read view1
RP/0/RP1/CPU0:akki(config)#commit
RP/0/RP1/CPU0:akki#show running-config snmp-server group snmp-server group group1 v3 priv read
view1 write view1

RP/0/RP1/CPU0:akki#show snmp group groupname: group1 security model:usm readview : view1
writeview: view1 notifyview: v1default row status: nonVolatile

RP/0/RP1/CPU0:akki#
```
- 配置SNMP使用者：

```
RP/0/RP1/CPU0:akki(config)#snmp-server user user1 group1 v3 auth md5 clear lab priv des56 clear
lab SystemOwner
RP/0/RP1/CPU0:akki(config)#commit
RP/0/RP1/CPU0:akki(config)#
RP/0/RP1/CPU0:akki#
```

```
RP/0/RP1/CPU0:akki#show snmp users
User name: user1
Engine ID: localSnmpID
storage-type: nonvolatile active

RP/0/RP1/CPU0:akki#show running-config snmp-server user
snmp-server user user1 group1 v3 auth md5 encrypted 13091610 priv des56 encrypted 09404F0B
SystemOwner

RP/0/RP1/CPU0:akki#

So far we need lines for V3 SNMP

RP/0/RP1/CPU0:akki#show running-config snmp-server
snmp-server user user1 group1 v3 auth md5 encrypted 13091610 priv des56 encrypted 09404F0B
SystemOwner
snmp-server view view1 1.3 included
snmp-server group group1 v3 priv read view1 write view1
```
這樣,您就可以在路由器上為V3請求設定配置。

請參閱<u>為V3 SNMP請求設定主機</u>。

遙測

流遙測允許使用者將資料直接傳送到已配置的接收器進行分析和故障排除,以保持網路的正常運行。這是通過利用M2M通訊功能實現的。

傳統上,組織使用拉取模型來收集資料,即客戶端從網路元素拉取資料。但是,當網路中有多個網路管理站時,此拉取模式無法擴展。這些傳統技術並不滿足路由器的所有底層資訊,並且需要手動干預。

請點選連結:

<u>https://www.cisco.com/c/en/us/td/docs/iosxr/Telemetry/Telemetry-Config-Guide/Telemetry-Config-Guide_chapter_011.html</u>

Netconf和SSH

Netconf提供安裝、操縱和刪除網路裝置配置的機制。

Netconf協定提供一組操作來管理裝置配置和檢索裝置狀態資訊。

- 驗證k9sec軟體包的安裝
- 使用crypto key generate dsa命令為安全外殼(SSH)生成加密密鑰
- 配置SSH

```
RP/0/RP0/CPU0:ios# configure

RP/0/RP0/CPU0(config)# ssh server v2

RP/0/RP0/CPU0(config)# ssh server netconf port 830

RP/0/RP0/CPU0(config)# ssh server netconf vrf default
```

> 附註:埠830是預設的Netconf埠。

- 配置Netconf:

```
RP/0/RP0/CPU0:ios# configure

RP/0/RP0/CPU0(config)# netconf-yang agent ssh
```

- 顯示netconf-yang的客戶端詳細資訊，在執行模式下運行**show netconf-yang clients**命令。

```
RP/0/RP0/CPU0:ios# show netconf-yang clients

Tue Dec 8 07:49:14.846 UTC

Netconf clients

client session ID| NC version| client connect time| last OP time| last OP type|

<lock>|

1188487019| 1.1| 0d 16h 56m 50s| 01:17:13| get|

No|
```

- 顯示netconf-yang的統計詳細資訊，在執行模式下運行**show netconf-yang statistics**命令。

```
RP/0/RP0/CPU0:ios# show netconf-yang statistics

Tue Dec 8 07:49:45.506 UTC

Summary statistics

# requests| total time| min time per request| max time per request| avg time per request|other
0| 0h 0m 0s 0ms| 0h 0m 0s 0ms| 0h 0m

0s 0ms| 0h 0m 0s 0ms|

0s 0ms| 0h 0m 0s 0ms|

Statistics for session with ID: 1188487019

<snip>
```

- 調試並驗證Netconf，在執行模式下運行**show netconf-yang trace**命令。

```
RP/0/RP0/CPU0:ios# show netconf-yang trace

Tue Dec 8 07:50:54.590 UTC

[12/08/15 07:30:37.851 UTC 1046d3 4942] TRC: nc_sm_session_find_session_id:1386 Found session

3027026318 0x1852f68

[12/08/15 07:30:37.851 UTC 1046d4 4942] DBG: nc_sm_yfw_response_cb:2816 Received OK response for

session-id '3027026318', for message-id '856615', which has 'NO ERROR' and 'DATA'

[12/08/15 07:30:37.851 UTC 1046d5 4942] TRC: nc_sm_yfw_response_complete:2700 DATA element in
chunk

state: CONTINUE

<snip>
```

檢驗光纖PM（客戶端QSFP和中繼CFP）

- 客戶端埠的PM:

```
For current PM data

RP/0/RP0/CPU0:DBX2#show controllers optics 0/0/0/0 pm current 15-min/24-hour optics 1

RP/0/RP0/CPU0:DBX2#show controllers optics 0/0/0/0 pm current 15-min/24-hour optics 2

RP/0/RP0/CPU0:DBX2#show controllers optics 0/0/0/0 pm current 15-min/24-hour optics 3

RP/0/RP0/CPU0:DBX2#show controllers optics 0/0/0/0 pm current 15-min/24-hour optics 4

For History PM data

RP/0/RP0/CPU0:DBX2#show controllers optics 0/0/0/0 pm history 15-min/24-hour optics 1 bucket <1-
32/1-12>

RP/0/RP0/CPU0:DBX2#show controllers optics 0/0/0/0 pm history 15-min/24-hour optics 2 bucket <1-
32/1-12>

RP/0/RP0/CPU0:DBX2#show controllers optics 0/0/0/0 pm history 15-min/24-hour optics 3 bucket <1-
32/1-12>

RP/0/RP0/CPU0:DBX2#show controllers optics 0/0/0/0 pm history 15-min/24-hour optics 4 bucket <1-
32/1-12>
```

- 中繼CFP埠的PM:

對於當前PM資料：

```
RP/0/RP0/CPU0:DBX2#show controllers optics 0/0/0/5 pm current 15-min/24-hour optics 1
```

對於歷史PM資料：

```
RP/0/RP0/CPU0:DBX2#show controllers optics 0/0/0/5 pm history 15-min/24-hour optics 1 bucket 1
```

驗證客戶端埠上的乙太網PM

- 客戶端QSFP埠：

```
RP/0/RP0/CPU0:DBX2#show controllers hundredGigECtrlr 0/0/0/0 pm current 15-min/24-hour ether

RP/0/RP0/CPU0:DBX2#show controllers hundredGigECtrlr 0/0/0/0 pm history 15-min ether <1-32>

RP/0/RP0/CPU0:DBX2#show controllers hundredGigECtrlr 0/0/0/0 pm history 24-hour ether
```

- 中繼CFP埠：

```
RP/0/RP0/CPU0:DBX2#show controllers coherentDSP 0/0/0/5 pm current 15-min otn

RP/0/RP0/CPU0:DBX2#show controllers coherentDSP 0/0/0/5 pm current 15-min fec

RP/0/RP0/CPU0:DBX2#show controllers coherentDSP 0/0/0/5 pm history 15-min fec <1-32>

RP/0/RP0/CPU0:DBX2#show controllers coherentDSP 0/0/0/5 pm history 24-hour fec
```

驗證埠和系統上的警報（當前和歷史記錄）

- 對於當前警報，運行命令：

```
RP/0/RP0/CPU0:DBX2#show alarms brief card location 0/RP0/CPU0 active

Thu Feb 11 10:12:21.886 UTC

-------------------------------------------------------------------------------

Active Alarms

-------------------------------------------------------------------------------

Location        Severity    Group        Set Time            Description

-------------------------------------------------------------------------------

0/0             Critical    Controller   02/10/2016 10:51:33   Optics0/0/0/10 - Improper
Removal

0/0             Critical    Controller   02/10/2016 10:51:33   Optics0/0/0/11 - Improper
Removal

[snippet]
```

- 對於歷史警報，請運行命令：

```
RP/0/RP0/CPU0:DBX2#show alarms brief card location 0/RP0/CPU0 history

Thu Feb 11 10:14:13.070 UTC

-------------------------------------------------------------------------------

History Alarms

-------------------------------------------------------------------------------

Location        Severity    Group        Set Time            Description

                                         Clear Time

-------------------------------------------------------------------------------

0/0             Minor       Controller   02/10/2016 10:51:33   Optics0/0/0/5 - Optics High
Differential Group Delay

                                         02/10/2016 10:52:01

0/0             Minor       Controller   02/10/2016 10:51:33   Optics0/0/0/5 - Optics Out of
Range Chromatic Dispersion

                                         02/10/2016 10:52:01

[snippet]
```

附註：NSC1002的6.0.0版已捕獲輸出。

驗證

使用本節內容，確認您的組態是否正常運作。

本文「配置」部分單獨介紹了驗證過程。

疑難排解

目前尚無適用於此組態的具體疑難排解資訊。

相關資訊

- http://www.cisco.com/c/en/us/td/docs/optical/ncs1000/dwdm-system-setup-guide/b-system-setup-ncs1002_chapter_010.html#task_37FE9449C1004631B8CEB859BB191F9E
- http://www.cisco.com/c/en/us/td/docs/optical/ncs1000/dwdm-cli-reference/ncs1002commandreference_chapter_00.html
- 技術支援與文件 - Cisco Systems