Cisco WT-2750 多点宽带无线系统常见问题

目录

简介

本文包含常见问题(常见问题) Cisco WT-2750多点宽带无线系统。关于多点宽带无线网络的组件图表，请参阅[什么是子信道？](#)在本文的问题。

有关文档规则的详细信息，请参阅 [Cisco 技术提示规则](#)。

一般问题

Q. 什么是多点宽带无线系统的必要的组件？

A. 数据转发器(HE) ：

- 思科uBR7223/7246/7246VXR通用宽带路由器
- WT-2751 Multipoint数据转发器线卡-四每个HE的;支持1024个同步用户
- WT-2781 Multipoint quad power feed panel -一个两线卡的
- 电源(-48VDC)
- HE换流器(室外单元(ODU))-一两每线卡的，根据是否差异被使用
- HE双工机-一个每个ODU的**注意：** 已安装双工机的方向在配置方面确定transmit (TX)高或接收(RX)高频。
- 天线-全向或sectorized
- 避雷器

用户单元(SU) ：

- Cisco 2600/3600系列路由器(2610， 2611， 2612， 2613， 2620， 2621， 3620， 3640， 3661， 3662)
- WT-2755多点用户网络模块**注意：** 必须安装NMs，当路由器被断电时，除了在Cisco 3660路由器。
- DC电源注射器(大功率ODU或+24VDC的-48VDC标准的电源ODU的)用电源
- SU转换器(ODU) -需要的两，如果曾经差异;非完整的联机集成用天线或，和提供高或标准的电源**注意：** 分集式天线是仅RX。
- SU定向天线(使用集成ODU，如果不)
- 避雷器

Q. 点到多点网络如何典型地设计？

- 超级单体：直径(10英里radius)的20英里单个HE
- 微细胞：直径的四到10英里(两到五英里radius)能使用频率复用
- Microcell ：直径(一英里radius)的两英里SU能使用更低发射功率允许SU最大在给的区域内的允许频率复用

Q. 什么是用于此系统的频率波段？

- MMDS ：2.500 - 2.690 GHz
- MD ：2.150 - 2.162 GHz (用于仅上行)
- ETSI ：3.400 - 3.600 GHz (ODU将是2001可用的下半年)
- U-NII ：5.725 - 5.825 GHz (ODU将是可用的第一季度2001)

Q. 什么是Cisco WT-2750多点宽带无线系统使用的调制机制？

A. 在载体正交频分复用(VOFDM)的64QAM

Q. 什么为什么是载体正交频分复用(VOFDM)和是VOFDM很强制的？

A. VOFDM活用多重通道的现象–在微波传输的关键威慑–到真实生活部署优点。VOFDM技术通过多个信号的组合增加发射信号强度在接收端。VOFDM增加整体无线系统性能、链路质量和可用性。VOFDM通过非视线传输巨大也增加服务提供商市场述评。

Q. 什么是最大覆盖范围？

A. 您能根据不同的现货天线设计有3， 4和6部门设计。

Q. 什么是非视线传输？

A. 覆盖范围非视线传输取决于这些参数：

- 路经损耗假定—多少信号沿传输路径丢失。
- 林克信度和可用性要求—多少个9s服务提供商必须在无线链路保证。
- 客户端前置设备(CPE) ODU发射电源的标准的电源ODU或大功率ODU在CPE端。
- 天线增益—天线种类使用在CPE端。
- 管道化和性能要求—什么类型的管道化和性能为每个部门要求。
- 接收天线编号—一两.

使用一个标准的电源ODU用高赢利天线， WT-2750多点宽带无线系统能达到在信号(LOS)发射非LOS的六英里用两个天线/每个CPE的ODUs和与单个antenna/ODU的三英里，当符合99.9%链路可用性要求时，并且使用6MHz信道下行和3兆赫信道上行每个部门在正常路经损耗。

Q. 什么是中频(Ifs)数据转发器(HE)的和用户单元(SU) ？

- HE ：324兆赫TX， 420个兆赫RX
- CPE ：330兆赫TX， 426个兆赫RX

Q. 什么Cisco IOS当前发布支持多点宽带无线系统？

- 12.1(3)XQ1
- 12.1(3)XQ2
- 12.1(5)XM
- 12.2(1)T (可用的二月/三月2001)
- 相关的微码

Q. 什么下行频率带宽允许？能否更改此？

A. 带宽6MHz， 3兆赫， 1.5兆赫允许。HE线卡配置广泛使用单个信道6MHz，除非有不允许此配置的无线电频率(RF)变量。

Q. 什么是我能配置的不同的上行频率带宽？

A. 带宽是6MHz、3兆赫和1.5兆赫。由于subchannelization是可能的，您能使用这些管道化机制中的每一个的组合。例如，如果使用三个上行端口，您能有为3兆赫设置的一上行，并且另外两个为1.5兆赫设置。您不可以超出与这些组合的6MHz总计。

Q. 什么是此系统的数据吞吐量？

下行

带宽(兆赫)	吞吐量(Mbps)	多路径抗错性	突发传输长度
1.5	4.2	标准	介质
1.5	3.2	标准	介质
1.5	1.6	标准	介质
3.0	10.0	标准	介质
3.0	7.6	标准	介质
3.0	5.1	标准	介质
3.0	8.6	高	介质
3.0	6.6	高	介质
3.0	4.4	高	介质
6.0	22.0	标准	介质
6.0	17.0	标准	介质
6.0	12.0	标准	介质
6.0	19.0	高	介质
6.0	14.0	高	介质
6.0	11.0	高	介质

上行

带宽(兆赫)	吞吐量(Mbps)	多路径抗错性	突发传输长度
1.5	4.2	标准	介质
1.5	3.2	标准	介质

1.5	1.4	标准	介质
3.0	8.1	高	介质
3.0	6.3	高	介质
3.0	4.4	高	介质
6.0	19.0	高	介质
6.0	15.0	高	介质
6.0	11.0	高	介质

Q. 什么是子信道？

A. 子信道是6MHz， 6兆赫宽信道的3兆赫或者1.5兆赫块。子信道允许您使用无线调制解调器卡的多个上行端口。一条特定的子信道在6MHz波段内被安置允许为使用。所有子信道使用不可以超出该信道的6MHz的总带宽。例如，如果使用仅子信道1，是6MHz，您能只使用一个上行端口。如果要使用多个上行端口，子信道2至7允许3兆赫或1.5兆赫带宽分配。使用子信道2至7.，配置调制配置文件。

图1 –子信道地图图表

配置—头端

Q. 什么HE路由器看上去的配置示例象？

A. 配置示例如下所示:

```
radio modulation-profile 1 bandwidth 6.0 throughput 22.0
 multipath-robustness standard burst-length medium
radio modulation-profile 2 bandwidth 6.0 throughput 19.0
 multipath-robustness high burst-length medium
! !--- To view acceptable inputs for these modulation profiles, use the !--- show radio
capability modulation-profile command. !--- Change the throughput setting from high to medium to
employ more !--- multipath-robustness, and change the throughput setting from medium ! --- to
low to employ more forward error correction (FEC) coding. interface Radio4/0 point-to-multipoint
ip address 191.20.1.1 255.255.255.0 secondary !--- IP address network used for hosts behind SUs.
ip address 10.1.1.1 255.255.255.0 !--- IP address network used for the SUs. no keepalive radio
alc interval 96 !--- Airline Control (ALC) ensures the TRP at the HE is maintained !--- over
time, through power measurements of all subscribers !--- several times each second. radio cable-
loss auto !--- Usually set to "auto." radio transmit-power 20 !--- Acceptable range for
Multichannel Multipoint Distribution Service (MMDS) !--- is 15 to 38 dBm. For Unlicensed
National Information Infrastructure !--- (UNII), it is -5 to 15 dBm. radio upstream frequency
2677000 width 6.0 radio upstream 0 subchannel 1 modulation-profile 2 !--- Refer to modulation-
profile and sub-channel chart above. radio upstream 0 target-receive-power -65 no radio upstream
0 shutdown no radio upstream 1 target-receive-power radio upstream 1 shutdown no radio upstream
2 target-receive-power radio upstream 2 shutdown no radio upstream 3 target-receive-power radio
upstream 3 shutdown radio downstream frequency 2521000 width 6.0 !--- Default width is 6 MHz.
radio downstream subchannel 1 modulation-profile 1 !--- Refer to the modulation-profile and sub-
channel chart. radio dhcp-giaddr policy radio helper-address 10.1.1.5 !--- IP address of the
DHCP server, if you do not use DHCP on HE router !--- (see the next question). radio su-onoff-
trap interval 600
```

Q. 如何配置HE运行TOD、TFTP和DHCP全部在一个？

A. 确保您有最新的“T”代码，当您使用此配置。请勿启用**radio helper address命令**在您的配置方面，因为DISCOVER数据包不需要“帮助”到另一计算机，数据包驻留在HE。

```
service udp-small-servers max-servers no-limit
```

```
!
radio time-server
!
ip dhcp pool modems-c3
!--- Modems-c3 is just a string. ! network 10.30.128.0 255.255.240.0 bootfile p2mp.cm next-
server 10.30.128.1 !--- Radio interface. ! default-router 10.30.128.1 option 7 ip 10.30.128.1
option 4 ip 10.30.128.1 option 2 hex 0000.0000 ! interface Radio3/0 point-to-multipoint ip
address 10.30.128.1 255.255.240.0 ! tftp server slot0:p2mp.cm alias p2mp.cm !--- Use this
statement when .cm file is stored in "flash," !--- not in the TFTP server.
```

完成这些步骤放置**.cm**文件在flash:

1. Copy tftp **slot:0**，和按回车。
2. 当远程主机的名称的分析程序查询，键入TFTP server的地址。
3. 当源文件名的分析程序查询，键入.cm文件名，并且按回车。

您能也配置在HE驻留而不是TFTP server的**DOCSIS配置文件**：

```
radio config-file
p2mp.cm
cpe max
4
service-class
1 priority 2
service-class
1 max-upstream 128
service-class
1 max-downstream 1000
timestamp
```

注意： 因为没有.cm文件，您不需要语句“TFTP server slot0:p2mp.cm别名p2mp.cm”。它在配置内驻留。

Q. 如何配置基本保密功能？

A. 完成这些步骤配置基本保密功能：

1. 装载K1在HE和SU的镜像。
2. 请使用一个配置文件编辑器打开**DOCSIS配置文件**。
3. 单击**展开**在**服务等级(COS)组**选项卡。
4. 启用1在**服务等级保密性Enable (event) (0/1)下：1个**字段。默认情况下这是0，因此请更改值到1。
5. 保存**DOCSIS配置文件**TFTP启动文件，在TFTP server驻留连接对HE的快速以太网(FE)端口。在重新启动， SU装载您有上述参数的后新的DOCSIS配置文件。
6. SU协商与HE的保密性基准接口(BPI)。请使用**show radio subscriber命令**发现SU注册作为“online(pt)”而不是如“联机”。如果看不到“(PT)”检查发现是否有K1在SU和HE的镜像，并且检查发现是否启用“服务等级保密性”等于1在.cm文件。

Q. DOCSIS配置文件和IOS配置文件有何区别？

A. DOCSIS配置文件是二进制文件，并且有来的无线电的SU参数联机在符合对什么ISP设置，例如，下行与上行速率、最大上行突发速率、服务等级(COS)或者基本保密功能、MIB和许多其他参数。

Cisco IOS配置文件是能包含特定配置，例如访问列表，密码的文本文件和NAT配置，您能在DOCSIS配置文件内下载。

Q. 什么是一些有用的命令监控和排除故障头端？

- **show radio interface***插槽编号/端口编号***[{如果|rf}]**
- **show radio subscribers** —显示所有无线用户和当前状态。
- **show radio flap-list** —显示无线调制解调器卡的无线电摆动列表。
- **show interfaces radio slot number/port number hist-data** —显示信噪比(SNR)。您必须有在无线接口配置的直方图发现所有输出。这是显示SNR的唯一的命令。
- **show interfaces radio slot number/port number link-metrics** —显示在一条链路的所有代码字错误在一个特定期限。
- **show controllers radio slot number/port number [{如果|rf}]** —显示所有或特定调制解调器卡的一个子集属性。
- **show controllers radio slot/downstream-port downstream** —显示无线调制解调器卡的下行端口信息。
- **show controllers radio slot/upstream-port upstream** —显示无线调制解调器卡的上行端口信息。
- **radio loopback local main if** —，如果线卡有故障，显示。
- **radio loopback local main rf** —，如果有在卡和ODU之间的一个电缆问题显示。

Q. show radio subscriber命令输出看上去什么象，并且每行是什么意思？

```
Headend# show radio flap-list MAC Address Upstream Ins Hit Miss CRC P-Adj Flap Time
0003.6b4f.bf90 Radio4/0/U0 0 21180 148 10 0 9 Oct 3 17:34:23
```

A. 这是在HE的**show radio flap-list命令**输出。Flap List是事件探测器和这是造成一个事件计数的三个情况：

- 插入
- 命中数
- 错过

注意： 忽视电源调节.(P ADJ)列在此输出中。P-Adj列仅适用于有线网络为**show cable flap-list命令**

插入

首先，如果SU有一个注册问题和重复设法迅速再注册，您能与插入一起看到飘荡。P-Adj列可以低。当两次最初的维护再登记之间的时间由SU少于180秒时是，您取得进展“飘荡”在“插入上”，并且摆动探测器计数它。如果希望，您能更改此默认值180秒：

```
Headend(config)# radio flap-list insertion-time ? <60-86400> Insertion time interval in seconds
```

命中/错过

其次，摆动探测器计数一摆动，当您看到“命中数时跟随的" miss ""。事件检测在仅摆动列计数。这些轮询是每30秒发送一次的Hello数据包。如果获得" miss "跟随由“错过”，然后投票发送每秒钟16秒。如果在16秒前获得" hit "是UP，您获得摆动，但是，如果没获得16投票的一" hit "，调制解调器脱机为了再开始最初的维护。如果SU终于回来联机，您将获得“插入”，因为SU插入回到活动状态。如果有六连续缺失，飘荡计数增加。如果需要此默认值可以更改：

```
Headend(config)# radio flap miss-threshold ? <1-12> missing consecutive polling messages
```

注意： 目前P-Adj列没有使用点对多点系统。

Q. 什么命令显示除show run命令之外，什么TX和RX频率配置？其他重要信息此命令提供什么？

A. **show controller r4/0 rf命令**显示什么TX和RX频率配置。下列是查看在此输出中的输出示例:和某些重要事情：

```
Headend# show controller r4/0 rf RF ODU# 1 Hardware Identification Info: PIC code version: 0.15
!--- This shows the point in call (PIC) code version that is !--- currently on the ODU. !---
This is important if you encounter problems with the ODU. NVS checksum 0x69 NVS version: 0.0
Card type: 0x10 Vendor name: cisco Part number: 800-05805-03 Board number: 73-4352-03 HW rev
code: 03 Serial number: JAB041904BZ Date code: 05112000 RF ODU# 1 Hardware Capability Info:
Capability flag1: 0x9F Capability flag2: 0x2C RF Diversity Head: Tx/Rx Tx Blanking Capable: Yes
RF Power Level Mode Capable: Yes RF Power Gain Mode Capable: Yes RF Loopback Capable: Yes Tx
Predistortor Capable: No Antenna Alignment Capable: No PA Temp Sensor Capable: Yes Tx Spectral
Inversion: No Rx Spectral Inversion: No Rx Blanking Capable: Yes Rx Gain Cal. Capable: Yes
Variable Gain Info Available: No Duplexor Field Replaceble: Yes Max chan. BW: 6 Mhz Tx frequency
bands: 1, step: 600 Khz min: 2500000 Khz, max: 2686000 Khz !--- These TX and RX values show the
ODU bandpass. !--- With this information, you will know what center !--- frequencies are
available for use. Rx frequency bands: 2, step: 600 Khz min1: 2150000 Khz, max1: 2162000 Khz
min2: 2500000 Khz, max2: 2686000 Khz IF Tx freq: 330000 Khz !--- These are the IF, TX, and RX
frequencies that you can measure !--- for verification purposes from the front of the board out
of !--- the monitor port. IF Rx freq: 426000 Khz Freq reference: 24 Mhz Tx power range min: 15
dbm, max: 41 dbm, step: 1 dbm Tx fixed gain min: 0 db, max: 0 db, step: 0 db Rx fixed gain min:
0 db, max: 0 db, step: 0 db Tx var gain min: 48 db, max: 56 db, step: 1 * 0.125 db Rx var gain
min: 30 db, max: 36 db, step: 1 * 0.125 db Temp. threshold low: 95 deg. C, high: 98 deg. C BW
adjusted max tx pwr: full:0 dbm half:0 dbm quarter:0 dbm RF ODU# 1 Status: TX Frequency: 2521000
Khz !--- These are the TX and RX frequencies that are actually !--- configured on the HE. RX
Frequency: 2677000 Khz TX Output Power: 20 dbm !--- As well as the output power that is
configured on the HE. TX Cable Loss: 15 db
```

Q. 如何配置直方图并且从他们得到数据输出？

A. 直方图在无线接口配置。有配置的几不同种类的直方图;最常用部分是那个为signal-to-interference plus noise ratio (SINR)和RF RX电源。一些可用的直方图如下是列出的：

```
radio histogram sinr-ant1 0 bin-range 10 50 duration 5 tone average
 update 5 sum false width coarse
    radio histogram timing-offset 0 bin-range -10 10 duration 5
 update 5 sum false width coarse
    radio histogram rf-rx-power-ant1 0 bin-range -100 0 duration
 5 update 5 sum false width coarse
    radio histogram chan-delay-spread-ant1 0 bin-range 0 22 duration
 5 update 5 sum false width coarse
    radio histogram power-amb 0 bin-range -101 -21 duration
 5 update 5 sum false width coarse
```

当直方图在无线接口时配置，您能查看从它的数据用**show interface** *slot number/port number hist-data <particular histogram>* global命令。请参阅下一个问题关于示例。

Q. show interface radio **slot number/port number hist-data**命令输出典型地看似什么类似在HE ？

注意： 当您查看柱状图输出时，请注意密切注意最低、平均值和最大值。

```
Headend# show interface r4/0 hist-data sinr-ant1 0 % Radio4/0 Histogram captured at 17:42:58 UTC
Mon Jan 3 2000 % radio histogram sinr-ant1 0 % bin 10 50 dur 5 tone ave up 5 sum f width c %
min=29.250 avg=30.000 max=30.500 !--- This is the SNR value for the wireless modem card. %
[1*=100 events] captured 0 seconds remain % 0 MININT<=x<10 | % 0 10<=x<14 | % 0 14<=x<18 | % 0
18<=x<22 | % 0 22<=x<26 | % 2 26<=x<30 |* % 3 30<=x<34 |* % 0 34<=x<38 | % 0 38<=x<42 | % 0
42<=x<46 | % 0 46<=x<50 | % 0 50<=x<MAXINT | Headend# show interface r4/0 hist-data chan 0 %
```

```
Radio4/0 Histogram captured at 17:58:21 UTC Mon Jan 3 2000 % radio histogram chan-delay-spread-ant1 0 % bin 0 22 dur 5 up 5 sum f width c % min=2.500 avg=2.500 max=2.500 !--- You want channel delay spread to be minimal. % [1*=100 events] captured 0 seconds remain % 0 MININT<=x<0 | % 5 0<=x<4 |* % 0 4<=x<8 | % 0 8<=x<12 | % 0 12<=x<16 | % 0 16<=x<20 | % 0 20<=x<24 | % 0 24<=x<28 | % 0 28<=x<32 | % 0 32<=x<36 | % 0 36<=x<40 | % 0 40<=x<MAXINT | Headend# show interface r4/0 hist-data power-amb 0 % Radio4/0 Histogram captured at 17:59:16 UTC Mon Jan 3 2000 % radio histogram power-amb 0 % bin -101 -21 dur 5 up 5 sum f width c % min=-96.000 avg=-96.000 max=-96.000 % [1*=100 events] captured 0 seconds remain % 0 MININT<=x<-101 | % 1 -101<=x<-93 |* % 0 -93<=x<-85 | % 0 -85<=x<-77 | % 0 -77<=x<-69 | % 0 -69<=x<-61 | % 0 -61<=x<-53 | % 0 -53<=x<-45 | % 0 -45<=x<-37 | % 0 -37<=x<-29 | % 0 -29<=x<-21 | % 0 -21<=x<MAXINT | Headend# show interface r4/0 hist-data rf-rx-power-ant1 0 % Radio4/0 Histogram captured at 17:58:37 UTC Mon Jan 3 2000 % radio histogram rf-rx-power-ant1 0 % bin -100 0 dur 5 up 5 sum f width c % min=-65.000 avg=-65.000 max=-65.000 !--- These are good values. % [1*=100 events] captured 0 seconds remain % 0 MININT<=x<-100 | % 0 -100<=x<-84 | % 0 -84<=x<-68 | % 5 -68<=x<-52 |* % 0 -52<=x<-36 | % 0 -36<=x<-20 | % 0 -20<=x<-4 | % 0 -4<=x<12 | % 0 12<=x<28 | % 0 28<=x<44 | % 0 44<=x<60 | % 0 60<=x<MAXINT | Headend# show interfaces r4/0 hist-data timing-offset 0 % Radio4/0 Histogram captured at 17:58:48 UTC Mon Jan 3 2000 % radio histogram timing-offset 0 % bin -10 10 dur 5 up 5 sum f width c % min=-1 avg=0 max=0 % [1*=100 events] captured 0 seconds remain % 0 MININT<=x<-10 | % 0 -10<=x<-8 | % 0 -8<=x<-6 | % 0 -6<=x<-4 | % 0 -4<=x<-2 | % 4 -2<=x<0 |* % 1 0<=x<2 |* % 0 2<=x<4 | % 0 4<=x<6 | % 0 6<=x<8 | % 0 8<=x<10 | % 0 10<=x<MAXINT |
```

Q. 什么调试是可用在HE排除故障链路的无线部分？

A. **debug radio p2mp phy cwrlog radio** —请使用此命令查看用户单元调制解调器卡的数字信号处理(DSP)同步。

用户单元 (SU)

Q. 什么SU路由器看上去的配置示例象？

```
interface Radio1/0 point-to-multipoint
ip address docsis
docsis boot admin 2
docsis boot oper 5
docsis mac-timer t2 40000
radio cable-loss 1 2 1
radio downstream saved channel 2521000 subchannel 0
!--- This is an optional parameter that can be added to save !--- the SU time from scanning the digital signal DS upon initialization.
```

Q. 什么是一些有用的命令监控和排除故障用户单元？

- **show interfaces radio slot number/port number link-metrics** —显示在链路的所有代码字错误在一个特定时期。
- **show interfaces radio slot number/port number hist-data** —您必须有在接口配置的直方图发现输出。
- **show controllers radio slot number/port number** —显示所有或特定调制解调器卡的一个子集属性。
- **show controllers radio slot number/port number if** —显示指定的无线接口的IF硬件信息。
- **radio loopback local main if** —，如果NM有故障，显示。
- **radio loopback local main rf** —，如果有在卡和ODU之间的一个电缆问题显示。**注意：** 要运行此命令，有子板是必要的。

Q. 什么**show interfaces radio slot number/port number link-metrics**输出看上去象？

```
------------------ show interface radio 1/0 link-metrics ------------------
```

```
Radio link metrics.Collected from: 00:12:00 - Fri Dec 1 2000
  to: 00:12:00 - Fri Dec 1 2000
Availability of the physical link:
Available seconds(EFS+ES-SES):00:00:00:0.000999%
Unavailable seconds (SES+SLS):   00:00:00: 99.99900%
Total               :            00:00:00: 100.0000%
Error characteristics of the physical link:
Error free seconds(EFS):       00:00:00:0.00000%
Errored seconds(CWerr>=1)    (ES):     00:00:00:0.00000%
Degraded seconds  (5.00000>CWerr>=  1.00000%)(DS): 00:00:00:   0.00000%
Severely errored seconds (CWerr>=  5.00000%)(SES):  00:00:00:  0.00000%
    Sync Loss secondsSLS):      00:00:00:0.00000%

Synchronization event counters:
Initial Synchronization seconds:    00:00:19
Time since last successful synchronization :00:00:00
Time since last synchronization failure:    00:00:00
Synchronization attempts - Successful: 1 : Unsuccessful : 0
Recovery attempts- Medium effort   : 0 :  High effort : 0

Physical link data rates:
Effective data rate (PHY payload bits/sec) :0
Efficiency (PHY payload bits/total bits):   0.00000%
```

Q. **show interfaces radio slot number/port number hist-data**输出典型地看似什么类似在SU ？

注意： 当您查看柱状图输出时，请注意密切注意最低、平均值和最大值。

```
Subscriber# show interfaces r1/0 hist-spec data sinr-ant1 % Radio1/0 Histogram captured at
02:01:59 UTC Mon Mar 1 1993 % radio histogram sinr-ant1 % bin 10 50 dur 5 tone ave up 5 sum f
width c % min=28.750 avg=29.875 max=30.875 % [1*=1100events] captured 0 seconds remain % 0
MININT<=x<10 | % 0 10<=x<14 | % 0 14<=x<18 | % 0 18<=x<22 | % 0 22<=x<26 | % 22632 26<=x<30
|********************* % 31717 30<=x<34 |**************************** % 0 34<=x<38 | % 0
38<=x<42 | % 0 42<=x<46 | % 0 46<=x<50 | % 0 50<=x<MAXINT | Subscriber# sh int r1/0 hist-data
timing-offset % Radio1/0 Histogram captured at 02:01:59 UTC Mon Mar 1 1993 % radio histogram
timing-offset % bin -10 10 dur 5 up 5 sum f width c % min=-1 avg=0 max=1 % [1*=100 events]
captured 0 seconds remain % 0 MININT<=x<-10 | % 0 -10<=x<-8 | % 0 -8<=x<-6 | % 0 -6<=x<-4 | % 0
-4<=x<-2 | % 287 -2<=x<0 |*** % 1223 0<=x<2 |************* % 0 2<=x<4 | % 0 4<=x<6 | % 0 6<=x<8
| % 0 8<=x<10 | % 0 10<=x<MAXINT | Subscriber# sh int r1/0 hist-data rf-rx-power-ant1 % Radio1/0
Histogram captured at 02:01:59 UTC Mon Mar 1 1993 % radio histogram rf-rx-power-ant1 % bin -100
0 dur 5 up 5 sum f width c % min=-44.625 avg=-42.000 max=-39.125 % [1*=100 events] captured 0
seconds remain % 0 MININT<=x<-100 | % 0 -100<=x<-84 | % 0 -84<=x<-68 | % 0 -68<=x<-52 | % 4529 -
52<=x<-36 |****************************************** % 0 -36<=x<-20 | % 0 -20<=x<-4 | % 0 -
4<=x<12 | % 0 12<=x<28 | % 0 28<=x<44 | % 0 44<=x<60 | % 0 60<=x<MAXINT | Subscriber# sh int
r1/0 hist-data chan-delay-spread-ant1 % Radio1/0 Histogram captured at 02:01:59 UTC Mon Mar 1
1993 % radio histogram chan-delay-spread-ant1 % bin 0 22 dur 5 up 5 sum f width c % min=2.500
avg=2.500 max=2.500 % [1*=100 events] captured 0 seconds remain % 0 MININT<=x<0 | % 4529 0<=x<4
|****************************************** % 0 4<=x<8 | % 0 8<=x<12 | % 0 12<=x<16 | % 0
16<=x<20 | % 0 20<=x<24 | % 0 24<=x<28 | % 0 28<=x<32 | % 0 32<=x<36 | % 0 36<=x<40 | % 0
40<=x<MAXINT |
```

Q. 什么调试是可用在SU排除故障无线链路？

- debug radio p2mp phy cwrlog radio —请使用此命令查看用户单元调制解调器卡的数字信号处理(DSP)同步。
- debug docsis mac [log] —显示DOCSIS MAC实时日志生成的调试消息。

Q. 什么**debug radio p2mp phy cwrlog radio**看起来的输出下面正常初始化？

```
Subscriber Unit#
01:48:27: SU RFSM: STATE CHANGE standby_state
 ====> if_hw_reset_state
01:48:27: SU RFSM: Debug PIC Timeouts occurred=0
01:48:27: SU RFSM: Debug PIC NAKs occurred=0
01:48:28: SU RFSM: Resetting IF HW
01:48:28: SU RFSM: STATE CHANGE if_hw_reset_state
 ====> if_hw_read_version_state
01:48:28: SU RFSM: Default IF Unsolicited Msg Processing
01:48:28: IFHW: PIC unsolicited msg received - IDU PIC Reset Event
01:48:28: IFHW: PIC boot loader version=1, vendor ID=0
01:48:28: IFHW: IF PIC code version=0.10, eeprom version=0
01:48:28: IFHW: IF EEPROM Checksum=0x87
01:48:28 : SU RFSM: STATE CHANGE if_hw_read_version_state
 ====> if_hw_read_eeprom_state
01:48:28: SU RFSM: Reading IF HW EEPROM
01:48:28: SU RFSM: IF Hardware Cached EEPROM okay
01:48:28: SU RFSM: STATE CHANGE if_hw_read_eeprom_state
 ====> rf_hw_reset_state
01:48:28: SU RFSM: Default RF Resp. Processing
01:48:28: SU RFSM: Default DSP Resp Processing
01:48:28: SU RFSM: Default DSP Ind Processing
01:48:28: SU RFSM: Default DSP Ind Processing
01:48:28: SU RFSM: Resetting RF/ODU1
01:48:28: %LINK-3-UPDOWN: Interface Radio1/0, changed state to up
 !--- The line above is out of place. This line often appears here. !--- You can ignore this
line. You can get stuck in this state !--- if for some reason the SU cannot communicate with the
ODU. 01:48:29: SU RFSM: STATE CHANGE if_hw_reset_state ====> if_hw_read_version_state 01:48:29:
IFHW: IF PIC code version=0.11, NVS major version=0 01:48:29: IFHW: PIC boot loader version=1,
vendor ID=0 01:48:29: IFHW: IF NVS Checksum=0x9D 01:48:29: SU RFSM: STATE CHANGE
if_hw_read_version_state ====> if_hw_read_eeprom_state 01:48:29: SU RFSM: Re-using cached IF NVS
data 01:48:29: SU RFSM: STATE CHANGE if_hw_read_eeprom_state ====> rf_hw_reset_state 01:48:29:
RFHW: Unsolicited PIC msg - ODU PIC Reset Event (opcode=0x1A state=0x0) 01:48:29: SU RFSM: STATE
CHANGE rf_hw_reset_state ====> rf_hw_read_version_state 01:48:29: RFHW: RF/ODU1 PIC code
version=0.30, NVS major version=0 01:48:29: RFHW: RF/ODU1 PIC boot loader version=255, vendor
ID=0 01:48:29: RFHW: RF/ODU1 NVS Checksum=0x48 01:48:29: SU RFSM: STATE CHANGE
rf_hw_read_version_state ====> rf_hw_read_eeprom_state 01:48:30: SU RFSM: Re-using cached
RF/ODU1 NVS data 01:48:30: SU RFSM: STATE CHANGE rf_hw_read_eeprom_state ====> rf_hw_reset_state
01:48:35: SU RFSM: RF/ODU2 not detected/operational 01:48:35: SU RFSM: STATE CHANGE
rf_hw_reset_state ====> if_hw_cable_comp_state 01:48:35: IFHW: Rx1 cable loss=1 db
compensation=12 db 01:48:35: SU RFSM: STATE CHANGE if_hw_cable_comp_state ====>
rf_hw_cable_comp_state 01:48:35: RFHW: Tx cable loss=2 db compensation=11 db 01:48:35: SU RFSM:
STATE CHANGE rf_hw_cable_comp_state ====> if_hw_config_state 01:48:35: IFHW: IF Tx Gain=16 db
01:48:35: SU RFSM: STATE CHANGE if_hw_config_state ====> rf_hw_config_state 01:48:35: RFHW:
RF/ODU1 Rx Fixed Gain=0 db, Rx Var Gain=15 db 01:48:35: RFHW: RF/ODU1 Tx Fixed Gain=0 db, Tx Var
Gain=20 db 01:48:35: RFHW: RF/ODU1 Auto updating cached NVS (Max Tx Pwr) for Standard Power ODU
01:48:35: SU RFSM: STATE CHANGE rf_hw_config_state ====> loopback_state 01:48:35: SU RFSM: STATE
CHANGE loopback_state ====> ds_candidate_selection_state 01:48:35: SU RFSM: STATE CHANGE
ds_candidate_selection_state ====> ds_hardware_init_state 01:48:35: SU RFSM: STATE CHANGE
ds_hardware_init_state ====> dspinit_powerup_state 01:48:35: SU RFSM: STATE CHANGE
dspinit_powerup_state ====> dspinit_ping_state 01:48:35: SU RFSM: STATE CHANGE
dspinit_ping_state ====> dspinit_config_state 01:48:35: SU RFSM: STATE CHANGE
dspinit_config_state ====> dspinit_agc_config_state 01:48:35: SU RFSM: STATE CHANGE
dspinit_agc_config_state ====> dspinit_ifrf_config_state 01:48:35: SU RFSM: STATE CHANGE
dspinit_ifrf_config_state ====> dspinit_down_sync_config_state 01:48:35: SU RFSM: DS RF Freq =
2521000 Down sync carrier for DSP = 50420 01:48:35: SU RFSM: DS RF Freq = 2521000 Down sync
carrier for DSP = 50420 01:48:35: SU RFSM: STATE CHANGE dspinit_down_sync_config_state ====>
dspinit_down_sync_state_config_state 01:48:35: SU RFSM: STATE CHANGE
dspinit_down_sync_state_config_state ====> dsp_sync_state 01:48:36: SU RFSM: Received DSP SYNC
IND (0) 01:48:36: SU RFSM: Received DSP SYNC IND (2) 01:48:36: SU RFSM: Received DSP SYNC IND
(4) 01:48:36: SU RFSM: Received DSP SYNC IND (5) 01:48:36: SU RFSM: Received DSP SYNC IND (7)
01:48:37: SU RFSM: Received DSP SYNC IND (4) 01:48:37: SU RFSM: Received DSP SYNC IND (5)
01:48:37: SU RFSM: Received DSP SYNC IND (8) 01:48:37: SU RFSM: DSP SYNC PASSED 01:48:37: SU
RFSM: STATE CHANGE dsp_sync_state ====> fec_sync_state !--- You have found a valid downstream
```

signal at this state. 01:48:37: SU RFSM: SYNC Timer 01:48:37: SU RFSM: FEC Sync State, Viterbi Sync SUCCESS *!--- If you get stuck here, try a shut command and then a no shut command !--- on the SU first. Sometimes this state has intermittent failures. !--- Try again if you receive a failure response.* 01:48:37: SU RFSM: STATE CHANGE fec_sync_state ====> trc_sync_state 01:48:38: SU RFSM: TRC Sync State, Successful TRC LOCK 01:48:38: SU RFSM: STATE CHANGE trc_sync_state ====> maintenance_state *!--- This is where the SU MAC chip starts to communicate with the HE MAC chip.* 01:48:38: SU RFSM: Received Advance DS Channel Msg 01:48:43: SU RFSM: Default RF Resp. Processing 01:48:43: SU RFSM: UCD US bw is Full, adjusted max RF tx gain is 37 01:48:43: SU RFSM: Default RF Resp. Processing 01:48:43: SU RFSM: Default RF Resp. Processing 01:48:43: SU RFSM: DSPMSG_TX_POWER_ADJ [-128 db], IF[-4 db], RF[-13 db] 01:48:45: SU RFSM: DSPMSG_TX_POWER_ADJ [3 db], IF[-1 db], RF[-13 db] *!--- Lines like the one above appear often in the debug messages. !--- This line says that the transmit power is being adjusted up 3 dB, !--- and after the adjustment, the IF gain is -1 dB, and the RF gain !--- is -13 dB.* 01:48:48: SU RFSM: DSPMSG_TX_POWER_ADJ [3 db], IF[02 db], RF[-13 db] 01:48:49: SU RFSM: DSPMSG_TX_POWER_ADJ [3 db], IF[05 db], RF[-13 db] 01:48:50: SU RFSM: DSPMSG_TX_POWER_ADJ [3 db], IF[06 db], RF[-11 db] 01:48:51: SU RFSM: DSPMSG_TX_POWER_ADJ [3 db], IF[06 db], RF[-8 db] 01:48:52: SU RFSM: DSPMSG_TX_POWER_ADJ [3 db], IF[06 db], RF[-5 db] 01:48:53: SU RFSM: DSPMSG_TX_POWER_ADJ [3 db], IF[06 db], RF[-2 db] 01:48:54: SU RFSM: DSPMSG_TX_POWER_ADJ [3 db], IF[06 db], RF[01 db] 01:48:55: SU RFSM: DSPMSG_TX_POWER_ADJ [3 db], IF[06 db], RF[04 db] 01:48:56: SU RFSM: DSPMSG_TX_POWER_ADJ [3 db], IF[06 db], RF[07 db] 01:48:57: SU RFSM: DSPMSG_TX_POWER_ADJ [3 db], IF[06 db], RF[10 db] 01:48:58: SU RFSM: DSPMSG_TX_POWER_ADJ [3 db], IF[06 db], RF[13 db] 01:48:59: SU RFSM: DSPMSG_TX_POWER_ADJ [3 db], IF[06 db], RF[16 db] 01:49:00: SU RFSM: DSPMSG_TX_POWER_ADJ [3 db], IF[06 db], RF[19 db] 01:49:01: SU RFSM: DSPMSG_TX_POWER_ADJ [2 db], IF[06 db], RF[21 db] 01:49:02: SU RFSM: Set ALC State Resp: alcState 1, IFloopMode 0, RFloopMode 1, Tmin_IF 35 01:49:16: %LINEPROTO-5-UPDOWN: Line protocol on Interface Radio1/0, changed state to up

Q. 什么**debug docsis mac log**看起来的输出在正常情况下初始化？

Subscriber Unit#
01:24:34: 5074.432 CMAC_LOG_LINK_DOWN
01:24:34: 5074.432 CMAC_LOG_LINK_UP
01:24:34: 5074.432 CMAC_LOG_STATE_CHANGE
ds_channel_scanning_state 01:24:35: %LINEPROTO-5-UPDOWN: Line protocol on Interface Radio1/0, changed state to down 01:24:42: 5082.264 CMAC_LOG_DS_TUNER_KEEPALIVE 01:24:45: 5085.392 CMAC_LOG_UCD_MSG_RCVD 1 01:24:45: 5085.664 CMAC_LOG_DS_CHANNEL_SCAN_COMPLETED 01:24:45: 5085.664 CMAC_LOG_STATE_CHANGE **wait_ucd_state** *!--- This is where the SU mac chip starts to communicate with the HE MAC chip.* 01:24:47: 5087.392 CMAC_LOG_UCD_MSG_RCVD 1 01:24:49: 5089.392 CMAC_LOG_UCD_MSG_RCVD 1 01:24:49: 5089.392 CMAC_LOG_ALL_UCDS_FOUND 01:24:49: 5089.396 CMAC_LOG_STATE_CHANGE **wait_map_state** 01:24:49: 5089.396 CMAC_LOG_FOUND_US_CHANNEL 1 01:24:51: 5091.392 CMAC_LOG_UCD_MSG_RCVD 1 01:24:51: 5091.592 CMAC_LOG_UCD_NEW_US_FREQUENCY 2677000 01:24:51: 5091.592 CMAC_LOG_SLOT_SIZE_CHANGED 8 01:24:51: 5091.604 CMAC_LOG_UCD_UPDATED 01:24:51: 5091.632 CMAC_LOG_MAP_MSG_RCVD 01:24:51: 5091.632 CMAC_LOG_INITIAL_RANGING_MINISLOTS 18 01:24:51: 5091.636 CMAC_LOG_STATE_CHANGE **ranging_1_state** *!--- In ranging 1 state, the SU sends a message to the HE, and then waits !--- for a response. If it doesn't get a response, it tries again a little !--- louder (3 dB more transmit power each attempt). This continues until !--- there is a response, or until the SU has used up its tries.* 01:24:51: 5091.636 CMAC_LOG_RANGING_OFFSET_SET_TO 21368 01:24:52: 5092.836 CMAC_LOG_POWER_LEVEL_IS 0.0 dBmV(commanded) 01:24:52: 5092.836 CMAC_LOG_STARTING_RANGING 01:24:52: 5092.836 CMAC_LOG_RANGING_BACKOFF_SET 0 01:24:52: 5092.936 CMAC_LOG_RNG_REQ_QUEUED 0 01:24:52: 5092.956 CMAC_LOG_RNG_REQ_TRANSMITTED 01:24:53: 5093.156 CMAC_LOG_T3_TIMER *!--- The T3 timer sets how long the SU waits before it decides that the HE !--- didn't hear the last message. The line above indicates that this timer !--- has expired, and now the SU will try retransmitting. The T3 timer can be set to a !--- very large value, so if you want the SU to receive downstream but never transmit anything, !--- use the docsis mac-timer t3 3600000 command.* 01:24:53: 5093.156 CMAC_LOG_POWER_LEVEL_IS 0.25 dBmV(commanded) 01:24:53: 5093.156 CMAC_LOG_RANGING_BACKOFF_SET 0 01:24:53: 5093.256 CMAC_LOG_RNG_REQ_QUEUED 0 01:24:53: 5093.316 CMAC_LOG_RNG_REQ_TRANSMITTED 01:24:53: 5093.516 CMAC_LOG_T3_TIMER 01:24:53: 5093.516 CMAC_LOG_POWER_LEVEL_IS 0.50 dBmV(commanded) 01:24:53: 5093.516 CMAC_LOG_RANGING_BACKOFF_SET 2 01:24:53: 5093.616 CMAC_LOG_RNG_REQ_QUEUED 0 01:24:53: 5093.796 CMAC_LOG_RNG_REQ_TRANSMITTED 01:24:53: 5093.996 CMAC_LOG_T3_TIMER 01:24:53: 5093.996 CMAC_LOG_POWER_LEVEL_IS 0.75 dBmV(commanded) 01:24:53: 5093.996 CMAC_LOG_RANGING_BACKOFF_SET 0 01:24:54: 5094.096 CMAC_LOG_RNG_REQ_QUEUED 0 01:24:54: 5094.156 CMAC_LOG_RNG_REQ_TRANSMITTED 01:24:54: 5094.356 CMAC_LOG_T3_TIMER 01:24:54: 5094.356 CMAC_LOG_POWER_LEVEL_IS 1.0 dBmV(commanded) 01:24:54: 5094.356 CMAC_LOG_RANGING_BACKOFF_SET 0

01:24:54: 5094.456 CMAC_LOG_RNG_REQ_QUEUED 0 01:24:54: 5094.516 CMAC_LOG_RNG_REQ_TRANSMITTED
01:24:54: 5094.716 CMAC_LOG_T3_TIMER 01:24:54: 5094.716 CMAC_LOG_POWER_LEVEL_IS 1.25
dBmV(commanded) 01:24:54: 5094.716 CMAC_LOG_RANGING_BACKOFF_SET 3 01:24:54: 5094.816
CMAC_LOG_RNG_REQ_QUEUED 0 01:24:55: 5095.056 CMAC_LOG_RNG_REQ_TRANSMITTED 01:24:55: 5095.260
CMAC_LOG_T3_TIMER 01:24:55: 5095.260 CMAC_LOG_POWER_LEVEL_IS 1.50 dBmV(commanded) 01:24:55:
5095.260 CMAC_LOG_RANGING_BACKOFF_SET 0 01:24:55: 5095.360 CMAC_LOG_RNG_REQ_QUEUED 0 01:24:55:
5095.416 CMAC_LOG_RNG_REQ_TRANSMITTED 01:24:55: 5095.620 CMAC_LOG_T3_TIMER 01:24:55: 5095.620
CMAC_LOG_POWER_LEVEL_IS 1.75 dBmV(commanded) 01:24:55: 5095.620 CMAC_LOG_RANGING_BACKOFF_SET 0
01:24:55: 5095.720 CMAC_LOG_RNG_REQ_QUEUED 0 01:24:55: 5095.776 CMAC_LOG_RNG_REQ_TRANSMITTED
01:24:55: 5095.980 CMAC_LOG_T3_TIMER 01:24:55: 5095.980 CMAC_LOG_POWER_LEVEL_IS 2.0
dBmV(commanded) 01:24:55: 5095.980 CMAC_LOG_RANGING_BACKOFF_SET 0 01:24:56: 5096.080
CMAC_LOG_RNG_REQ_QUEUED 0 01:24:56: 5096.136 CMAC_LOG_RNG_REQ_TRANSMITTED 01:24:56: 5096.340
CMAC_LOG_T3_TIMER 01:24:56: 5096.340 CMAC_LOG_POWER_LEVEL_IS 2.25 dBmV(commanded) 01:24:56:
5096.340 CMAC_LOG_RANGING_BACKOFF_SET 7 01:24:56: 5096.440 CMAC_LOG_RNG_REQ_QUEUED 0 01:24:56:
5096.916 CMAC_LOG_RNG_REQ_TRANSMITTED 01:24:57: 5097.116 CMAC_LOG_T3_TIMER 01:24:57: 5097.116
CMAC_LOG_POWER_LEVEL_IS 2.50 dBmV(commanded) 01:24:57: 5097.116 CMAC_LOG_RANGING_BACKOFF_SET 1
01:24:57: 5097.216 CMAC_LOG_RNG_REQ_QUEUED 0 01:24:57: 5097.336 CMAC_LOG_RNG_REQ_TRANSMITTED
01:24:57: 5097.340 CMAC_LOG_RNG_RSP_MSG_RCVD 01:24:57: 5097.344 CMAC_LOG_RNG_RSP_SID_ASSIGNED
138 01:24:57: 5097.344 CMAC_LOG_ADJUST_RANGING_OFFSET 61 01:24:57: 5097.344
CMAC_LOG_RANGING_OFFSET_SET_TO 21429 01:24:57: 5097.344 CMAC_LOG_ADJUST_TX_POWER 20 01:24:57:
5097.344 CMAC_LOG_STATE_CHANGE **ranging_2_state** *!--- The HE got the ranging message from the SU,
and sent a response. !--- Now the SU enters the ranging 2 state. In this state, it sends !---
messages to the HE, and the HE sends back messages !--- that instruct the SU on how to adjust
its transmit power. !--- The distance between the HE and SU is also measured, and the !--- SU is
given a ranging offset to account for propagation delay.* 01:24:57: 5097.448
CMAC_LOG_RNG_REQ_QUEUED 138 01:24:58: 5098.348 CMAC_LOG_RNG_REQ_TRANSMITTED 01:24:58: 5098.352
CMAC_LOG_RNG_RSP_MSG_RCVD 01:24:58: 5098.356 CMAC_LOG_ADJUST_TX_POWER 20 01:24:58: 5098.356
CMAC_LOG_RANGING_CONTINUE 01:24:59: 5099.364 CMAC_LOG_RNG_REQ_TRANSMITTED 01:24:59: 5099.368
CMAC_LOG_RNG_RSP_MSG_RCVD 01:24:59: 5099.368 CMAC_LOG_ADJUST_TX_POWER 20 01:24:59: 5099.368
CMAC_LOG_RANGING_CONTINUE 01:25:00: 5100.376 CMAC_LOG_RNG_REQ_TRANSMITTED 01:25:00: 5100.380
CMAC_LOG_RNG_RSP_MSG_RCVD 01:25:00: 5100.380 CMAC_LOG_ADJUST_TX_POWER 20 01:25:00: 5100.384
CMAC_LOG_RANGING_CONTINUE 01:25:01: 5101.388 CMAC_LOG_RNG_REQ_TRANSMITTED 01:25:01: 5101.396
CMAC_LOG_RNG_RSP_MSG_RCVD 01:25:01: 5101.396 CMAC_LOG_ADJUST_TX_POWER 16 01:25:01: 5101.396
CMAC_LOG_RANGING_CONTINUE 01:25:02: 5102.404 CMAC_LOG_RNG_REQ_TRANSMITTED 01:25:02: 5102.408
CMAC_LOG_RNG_RSP_MSG_RCVD 01:25:02: 5102.408 CMAC_LOG_RANGING_SUCCESS 01:25:02: 5102.408
CMAC_LOG_STATE_CHANGE dhcp_state *!--- In this example, the SU was told to increase its power in
the !--- ranging 2 state. In total, the SU increased its gain by 20 dB !--- during this state.
This is an indication that the channel is !--- very clean - the HE was able to demodulate the
signal from the SU, !--- even when it was 20 dB below the optimal signal level. If the !---
opposite occurs, and the SU is told to decrease the power in this !--- state, then that is an
indication that the upstream !--- channel is not very clean. At this point, the state machine
has !--- reached the dhcp_state. The SU sends an IP broadcast request !--- looking for a DHCP
server.* 01:25:02: 5102.420 CMAC_LOG_RNG_REQ_TRANSMITTED 01:25:02: 5102.428
CMAC_LOG_RNG_RSP_MSG_RCVD 01:25:03: 5103.424 CMAC_LOG_RNG_REQ_TRANSMITTED 01:25:03: 5103.428
CMAC_LOG_RNG_RSP_MSG_RCVD 01:25:04: 5104.424 CMAC_LOG_RNG_REQ_TRANSMITTED 01:25:04: 5104.428
CMAC_LOG_RNG_RSP_MSG_RCVD 01:25:05: 5105.420 CMAC_LOG_RNG_REQ_TRANSMITTED 01:25:05: 5105.428
CMAC_LOG_RNG_RSP_MSG_RCVD 01:25:06: 5106.420 CMAC_LOG_RNG_REQ_TRANSMITTED 01:25:06: 5106.424
CMAC_LOG_RNG_RSP_MSG_RCVD 01:25:07: 5107.424 CMAC_LOG_RNG_REQ_TRANSMITTED 01:25:07: 5107.428
CMAC_LOG_RNG_RSP_MSG_RCVD 01:25:08: 5108.420 CMAC_LOG_RNG_REQ_TRANSMITTED 01:25:08: 5108.428
CMAC_LOG_RNG_RSP_MSG_RCVD 01:25:09: 5109.420 CMAC_LOG_RNG_REQ_TRANSMITTED 01:25:09: 5109.428
CMAC_LOG_RNG_RSP_MSG_RCVD 01:25:10: 5110.420 CMAC_LOG_RNG_REQ_TRANSMITTED 01:25:10: 5110.424
CMAC_LOG_RNG_RSP_MSG_RCVD 01:25:11: 5111.424 CMAC_LOG_RNG_REQ_TRANSMITTED 01:25:11: 5111.428
CMAC_LOG_RNG_RSP_MSG_RCVD 01:25:12: 5112.420 CMAC_LOG_RNG_REQ_TRANSMITTED 01:25:12: 5112.428
CMAC_LOG_RNG_RSP_MSG_RCVD 01:25:13: 5113.420 CMAC_LOG_RNG_REQ_TRANSMITTED 01:25:13: 5113.424
CMAC_LOG_RNG_RSP_MSG_RCVD 01:25:14: 5114.420 CMAC_LOG_RNG_REQ_TRANSMITTED 01:25:14: 5114.424
CMAC_LOG_RNG_RSP_MSG_RCVD 01:25:15: 5115.292 CMAC_LOG_DHCP_ASSIGNED_IP_ADDRESS 10.1.1.3
01:25:15: 5115.292 CMAC_LOG_DHCP_TFTP_SERVER_ADDRESS 10.1.1.1 01:25:15: 5115.292
CMAC_LOG_DHCP_ERROR_ACQUIRING_TOD_ADDRESS 01:25:15: 5115.292 CMAC_LOG_DHCP_SET_GATEWAY_ADDRESS
01:25:15: 5115.292 CMAC_LOG_DHCP_TZ_OFFSET 0 01:25:15: 5115.296 CMAC_LOG_DHCP_CONFIG_FILE_NAME
p2mp.cm 01:25:15: 5115.296 CMAC_LOG_DHCP_ERROR_ACQUIRING_SEC_SVR_ADDR 01:25:15: 5115.296
CMAC_LOG_DHCP_ERROR_ACQUIRING_LOG_ADDRESS 01:25:15: 5115.300 CMAC_LOG_DHCP_COMPLETE *!--- Other
parameters that are required by the SU are the TFTP server !--- address, the Time of Day (TOD)
server address, the Time Zone (TX) !--- offset value and DHCP config file name (also known as
the DOCSIS !--- config file). These parameters must all be present !--- in the DHCP response*

```
from the DHCP server. 01:25:15: 5115.312 CMAC_LOG_STATE_CHANGE establish_tod_state 01:25:15:
5115.316 CMAC_LOG_TOD_NOT_REQUESTED_NO_TIME_ADDR 01:25:15: 5115.316 CMAC_LOG_STATE_CHANGE
security_association_state 01:25:15: 5115.316 CMAC_LOG_SECURITY_BYPASSED 01:25:15: 5115.316
CMAC_LOG_STATE_CHANGE configuration_file_state 01:25:15: 5115.316 CMAC_LOG_LOADING_CONFIG_FILE
p2mp.cm !--- The establish_tod_state is the point in which the SU tries to retrieve !--- the
time of day from the TOD server. This is used to synchronize clocks !--- for alarms and logs,
among other reasons. The security_association_state !--- is a placeholder for a state yet to be
defined. In the future, !--- a security association with a security server would provide !---
IPsec-like security for the SUs. This is NOT the baseline privacy state. !--- The
configuration_file_state is the main configuration and !--- administration interface to the SU
DOCSIS subsystem. !--- The name of this file and the TFTP server address in which !--- this
could be downloaded was originally provided in the DHCP state. !--- This configuration file
contains downstream channel and upstream !--- channel identification, characteristics, Class of
Service settings, !--- Baseline Privacy settings, and general operational settings. 01:25:15:
5115.424 CMAC_LOG_RNG_REQ_TRANSMITTED 01:25:15: 5115.428 CMAC_LOG_RNG_RSP_MSG_RCVD 01:25:16:
%LINEPROTO-5-UPDOWN: Line protocol on Interface Radio1/0, changed state to up 01:25:16: 5116.420
CMAC_LOG_RNG_REQ_TRANSMITTED 01:25:16: 5116.428 CMAC_LOG_RNG_RSP_MSG_RCVD 01:25:17: 5117.420
CMAC_LOG_RNG_REQ_TRANSMITTED 01:25:17: 5117.424 CMAC_LOG_RNG_RSP_MSG_RCVD 01:25:18: 5118.424
CMAC_LOG_RNG_REQ_TRANSMITTED 01:25:18: 5118.428 CMAC_LOG_RNG_RSP_MSG_RCVD 01:25:19: 5119.352
CMAC_LOG_CONFIG_FILE_PROCESS_COMPLETE 01:25:19: 5119.352 CMAC_LOG_STATE_CHANGE
registration_state 01:25:19: 5119.352 CMAC_LOG_REG_REQ_MSG_QUEUED 01:25:19: 5119.356
CMAC_LOG_REG_REQ_TRANSMITTED 01:25:19: 5119.368 CMAC_LOG_REG_RSP_MSG_RCVD !--- The link is now
up. !--- The link comes up and then the SU tries to register with the HE !--- through the
registration_state. After configuration, the modem sends !--- a registration request (REG-REQ)
with a required subset !--- of the configuration settings received in the DOCSIS config file.
01:25:19: 5119.368 CMAC_LOG_COS_ASSIGNED_SID 1/138 01:25:19: 5119.372 CMAC_LOG_COS_ASSIGNED_SID
2/139 01:25:19: 5119.472 CMAC_LOG_RNG_REQ_QUEUED 138 01:25:19: 5119.472 CMAC_LOG_REGISTRATION_OK
01:25:19: 5119.472 CMAC_LOG_STATE_CHANGE establish_privacy_state 01:25:19: 5119.472
CMAC_LOG_PRIVACY_NOT_CONFIGURED 01:25:19: 5119.476 CMAC_LOG_STATE_CHANGE maintenance_state !---
At this point, the service identifier (SID), which designates the !--- MAP grants on which the
SU is allowed to speak, !--- is assigned. The establish_privacy_state only comes into effect !--
- if baseline privacy is turned on. At the current time, !--- this is not supported, but it will
be in the future.
```

Q. SU若不能被通过downstram_channel_scanning_state ？

A. 这很可能意味着微码未曾装载。如果微码下载发生故障，此消息出现：

```
 00:00:38: %CWRMP-3-UCODEFAIL: Radio 1/0: Loading slot1:/cod.001 failed
```

此消息出现立候你启动程序，因此您能容易地未命中此消息。您能通过**no shut命令**也看到问题：

```
SU1(config-if)# no shut SU1(config-if)# 00:02:26: 146.628 CMAC_LOG_LINK_DOWN 00:02:26: 146.628
CMAC_LOG_LINK_UP 00:02:26: 146.628 CMAC_LOG_STATE_CHANGE ds_channel_scanning_state 00:02:27:
147.628 CMAC_LOG_RESET_CANT_START_DS_TUNER_PRCESS 00:02:27: 147.628 CMAC_LOG_STATE_CHANGE
reset_interface_state 00:02:27: SU RFSM: MAC FSM Stop Cmd 00:02:27: 147.628
CMAC_LOG_STATE_CHANGE reset_hardware_state 00:02:27: 147.628 CMAC_LOG_STATE_CHANGE
wait_for_link_up_state 00:02:27: 147.628 CMAC_LOG_LINK_DOWN
```

为了修理问题类型：

```
end conf t microcode cwrsu [path to microcode] microcode reload
```

微编码的路径典型地是slot1 ：如此命令如下所示:

```
microcode cwrsu slot1:
```

当代码成功负载时，您收到此消息：

```
00:06:06: %CWRMP-5-UCODE: Radio 1/0: Loaded slot1:
```

如果这仍然不运作，检查确保，闪存卡适当地插入到slot 1。从EXEC提示(达到的类型末端EXEC提示)，您能查看什么的目录在卡在slot0或1或者在闪存。类型：

dir flash: dir slot0: dir slot1:

Q. SU若不能超过rf_hw_reset_state ？

A. 这是此问题的可能的原因：

- ODU没有打开。这是容易俯视，因为ODU有其自己的电源，您必须分开启动与路由器。
- ODU没有正确地连接到无线卡。确保电缆全部连接并且紧密地被拧紧。请参阅安装指南关于布线图。
- PIC，一个处理器在ODU里面，锁定。为了调整此问题，关闭ODU，等一些秒钟和启动ODU上一步。
- 路由器为两ODUs配置，但是仅一个连接。

如果SU不能超过rf_hw_reset_state，日志显示软件设法重置秒钟ODU ：

```
10:26:43: SU RFSM: STATE CHANGE if_hw_read_eeprom_state
 ====> rf_hw_reset_state
10:26:43: SU RFSM: Resetting RF/ODU1
10:26:44: %LINK-3-UPDOWN: Interface Radio1/0, changed state to up
10:26:48: SU RFSM: STATE CHANGE rf_hw_reset_state
 ====> rf_hw_read_version_state
10:26:48: RFHW: RF/ODU1 PIC boot loader version=255, vendor ID=0
10:26:48: RFHW: RF/ODU1 PIC code version=0.5, eeprom version=0
10:26:48: RFHW: Error: RF/ODU1 EEPROM Checksum failed!
10:26:48: RFHW: RF/ODU1 EEPROM Checksum=0x61
10:26:48: SU RFSM: STATE CHANGE rf_hw_read_version_state
 ====> rf_hw_read_eeprom_state
10:26:48: SU RFSM: Reading RF HW EEPROM
10:26:48: SU RFSM: Loading RF/ODU1 HW EEPROM data...
10:26:52: SU RFSM: Re-using RF/ODU1 HW EEPROM cached data
10:26:52: SU RFSM: RF/ODU1 HW EEPROM load complete
10:26:52: SU RFSM: STATE CHANGE rf_hw_read_eeprom_state
 ====> rf_hw_reset_state
10:26:52: SU RFSM: Resetting RF/ODU2
10:27:00: SU RFSM: PIC RESP Timeout
10:27:00: SU RFSM: Error: PIC msg timeout during SU RFSM rf_hw_reset_state
10:27:00: %CWRMP-4-RF_IF_COMM: Radio1/0, IF-to-RF/ODU2 comm error
 (ODU Controller Reset cmd)
10:27:00: SU RFSM: STATE CHANGE rf_hw_reset_state
 ====> standby_state
```

为了解决此问题，只连接秒钟ODU或者配置系统使用一。为了为一个ODU配置，请键入**radio receive-antennas 1命令**从无线接口提示符。

Q. SU若不能超过dsp_sync_state ？

A. 在此状态， DSP尝试查找一个有效下行信号，锁定到频率该信号和开始解调信号。如果错误有任何到达的下行信号，则问题可能出现此处。当通过同步进程，进步为了帮助您排除故障， DSP传送信息。如果一切工作，则这些信息传送：

```
09:55:54: SU RFSM: STATE CHANGE dspinit_down_sync_state_config_state
 ====> dsp_sync_state
09:55:54: SU RFSM: Received DSP SYNC IND (0)
09:55:54: SU RFSM: Received DSP SYNC IND (2)
09:55:54: SU RFSM: Received DSP SYNC IND (4)
09:55:54: SU RFSM: Received DSP SYNC IND (5)
09:55:54: SU RFSM: Received DSP SYNC IND (8)
09:55:54: SU RFSM: DSP SYNC PASSED
```

或

```
09:55:54: SU RFSM: STATE CHANGE dspinit_down_sync_state_config_state
 ====> dsp_sync_state
09:55:54: SU RFSM: Received DSP SYNC IND (0)
09:55:54: SU RFSM: Received DSP SYNC IND (2)
09:55:54: SU RFSM: Received DSP SYNC IND (4)
09:55:54: SU RFSM: Received DSP SYNC IND (5)
09:55:54: SU RFSM: Received DSP SYNC IND (7)
09:55:54: SU RFSM: Received DSP SYNC IND (4)
09:55:54: SU RFSM: Received DSP SYNC IND (5)
09:55:54: SU RFSM: Received DSP SYNC IND (8)
09:55:54: SU RFSM: DSP SYNC PASSED
```

可能的DSP同步指示器是：

- 0个AGC_PASS — DSP看到在收到的信号的一些电源。
- 1个AGC_FAIL — DSP看不到在收到的信号的电源。此指示器是难获得。确保下行频率正确地设置。
- 2个BURST_SIZE_PASS — DSP假设一个有效下行信号的出现。如果这是您接收的为时DSP指示器， DSP不能锁定到下行的频率。重新通电一切和再试一次。如果那不工作，请替换SU IF卡。
- 3个BURST_SIZE_FAIL — DSP无法查找一个有效下行信号。此问题能发生由于太弱或太强信号。确保HE打开并且适当地传送，天线在正确的方向指向，并且下行频率正确地设置。与的问题任何这些设置含义没有信号或者一非常微弱的信号，接收。另一种可能性是有许多个信号。如果这是实际情形，在ODU的放大器能饱和。请使用光谱分析程序和一台分离器查看在ODU和线卡之间的信号。下行信号必须在423和429兆赫之间，并且信号功率必须在64和15 dbm之间。如果信号查找太强，请检查饱和。考虑有更低增益的一个天线。另一种可能性是cable-comp不正确设置。
- 4个TIME_D_PASS — DSP同步对收到的信号的定时。
- 5个COARSE_FREQ_PASS —此指示器总是跟随指示器号4。这是完全无意义的。
- 6 —此编号未使用。
- 7个OSC_ADJ_PASS — DSP需要做一个大频率调整。在一个大频率调整以后， DSP回到TIME_D状态，如此能跟随这一个是指示器号4.的唯一的消息。如果看到此消息许多次，很可能IF模块miscalibrated。替换IF卡。
- 8个DEMOD_TT_PASS — DSP找到下行信号的所有调制参数，并且准备开始数据解调。

如果进入dsp_sync_state，但是看不到其中任一个从DSP的指示器消息，微码没有正确地很可能下载。键入这些指令：

```
shut end configure terminal microcode reload
```

Q. SU若不能超过fec_sync_state ？

A. 此问题通常发生由于一低SNR。DSP在一个更低SNR信号比可以解调能同步。为了解决此问题，您需要让一个更加干净的信号进入用户。确保cable-comp值正确地设置，并且所有电缆紧密地连接。重定向天线。

注意： 此状态没有明显的原因有时出故障。在您寻找错误前，请再试一次并且检查是否第二次运作。

Q. SU若不能超过trc_sync_state ？

A. 此问题经常指示与HE的一问题，而不是有用户的。重新通电用户并再次尝试，以确认。如果遇到同一问题，请证实任何其他用户是否顺利地连接对此HE卡。否则，请尝试一**shut/no shut命令**在HE。如果那不工作，请重新通电HE。问题是HE有时看上去有no shut，但是实际上从未开始的

MAC芯片。因此，有传送的下行信号，但是没有在信号的数据。

Q. SU若不能超过wait_ucd_state ？

A. 有两种可能性在这里。第一是DOCSIS initial-ranging-offset不正确设置。这是存在运行的配置，您能从EXEC提示查看用**show run命令**。为了调整此问题，请进入接口提示符并且键入**docsis initial-ranging-offset 27000**。第二种可能性是HE有问题。请参阅"SU若不能超过trc_sync_state ？"问题欲知更多信息。

Q. SU若不能超过ranging_1_state ？

A. initial-ranging-offset能不正确设置。请参阅上述问题和解答。另一种可能性是某事在上行信号是错误的。检查上行频率正确地设置。确保ALC打开。这是默认模式，但是您能手工也设置传输增益，禁用ALC。一般来说，您不能禁用ALC。为了确保ALC打开，请键入**no radio diag transmit-gain命令**从接口提示符。

Q. SU若不能超过ranging_2_state ？

A. 这很可能意味着HE看到太多或从SU的太少电源，或者从用户的信号太差以至于不能一致解调。有告诉您对的消息什么传输增益设置。这是命令，因此意味着SU由3个dB [-3 db告诉减少增益]，和，因此SU设置IF增益为-4 dB和RF增益为0 dB ：

```
10:54:26: SU RFSM: DSPMSG_TX_POWER_ADJ [-3 db], IF[-4 db], RF[00 db]
```

为了看到合法范围传输增益设置，请键入从EXEC提示的这些命令：

```
show cont r1/0 rf show cont r1/0 if
```

他们显示的这些show命令关于IF和RF卡的很多信息和其中一个字段是时间区域(TX)可变增益的范围。如果用户在范围的底部附近只使用收益，很可能HE接收许多个电源。对一个低功率ODU的交换机，不同地调整天线或者放置衰减器在ODU和天线之间。

另一方面，如果SU设置为全双工增益，并且HE继续指示SU增加电源，这是HE不接收足够的电源的征兆。检查对什么值HE的RF接收电源设置，并且检查天线的校准。一个更加高赢利的天线可帮助。或者，请移动天线或者装载它更加高。

Q. SU若达到dhcp_state，但是从未获得IP地址呢？

A. 如果看到dhcp_state消息和从未看到IP地址得到分配到SU，这通常指向DHCP服务器的不正确的配置或者缺乏IP路径DHCP服务器。请验证DHCP服务器的配置和，如果运行一个外部DHCP服务器，验证正确**radio helper-address命令**配置在无线接口下通过**show running命令**。

Q. SU若达到dhcp_state，收到IP地址，但是失效在其他参数呢？

A. SU要求的其他参数是TFTP服务器地址、每日定时(ToD)服务器地址、时间区域(TX)偏移值和DHCP设置文件名(也呼叫**DOCSIS配置文件**)。这些参数一定全部是存在从DHCP服务器的DHCP响应。

注意： 您能配置HE播放DHCP/TFTP服务器的零件。如果HE没有配置是DHCP/TFTP服务器，请确保一**radio helper-address命令**已配置的在HE无线接口下。这保证DHCP广播转发到正确服务器。如果使用一个外部DHCP/TFTP服务器，服务器必须也包含提示如何发送数据包回到SU网络的路由或

默认网关。

这些错误消息指向缺乏在DHCP响应的可选参数：

```
DHCP_ERROR_ACQUIRING_SEC_SVR_ADDR
DHCP_ERROR_ACQUIRING_LOG_ADDRESS
```

配置辅助服务器并且记录在DHCP服务器的服务器地址排除这些错误。

Q. SU若达到establish_tod_state，但是从未达到TOD REPLY RECEIVED呢？

A. 失败的一常见原因此状态的是TOD服务器不是存在外部或在HE。您能配置HE作为TOD服务器。发出**radio time-server命令**从全局配置模式。再次，使用外部TOD服务器，路由一定是存在为了TOD服务器能发送答复回到SU。

Q. SU若失效在configuration_file_state呢？

A. configuration_file_state是主要配置和管理界面到SU DOCSIS子系统。这可以下载此文件的名称和TFTP服务器地址在DHCP状态最初提供了。此配置文件包含：

- 下行信道和上行信道认证
- 特性
- 服务等级设置
- 基础线保密性设置
- 一般操作设置

失败的常见原因此状态的是缺少文件，错误文件权限，一不可得到的TFTP server，格式错误的文件，有缺少所需的选项、不正确地配置的所需的选项或者不正确选项的(未知或无效类型长度值(TLV))文件。

Q. SU若失效在registration_state呢？

A. 问题以注册状态几乎总是指向配置文件错误。确保SU，并且HE两个支持在配置文件的设置。确保HE允许服务等级(COS)配置文件的创建或使用HE创建的配置文件。检查认证字符串在HE无线接口配置里和在**DOCSIS配置文件**。

Q. SU若失效在establish_privacy_state呢？

A. 此情况很可能意味着HE或SU设法设立保密性基准(BPI)，并且人一个不是。验证**DOCSIS配置文件**是否有打开的BPI。在HE，请验证QoS配置文件是否也显示打开的BPI。请使用**show radio qos profile命令**。并且，请确保HE和SU使用K镜像。

Q. SU若达到maintenance_state，但是不ping ？

A. 检查SU无线电线卡有一个有效IP地址。如果必须尝试几次超过ranging_2_state，这是符号其他是错误的。这意味着莫名其妙地SNR太低。如果在SU的单播重试次数计数器设置对非零，这是低SNR的征兆。为了看到SNR值，请使用**show controller r1/0 mac命令**。

相关信息

- Cisco Aironet 无线局域网客户端适配器

- Cisco UBR7200系列通用宽带路由器的多点无线支持
- 技术支持和文档 - Cisco Systems