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。

常规

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) ：

- Cisco 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，根据是否分集被使用
- HE双工机-一个每个ODU的**注意：** 安装的双工机的方向确定transmit (TX)高或接受(在配置的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多点订户网络模块**注意：** 必须安装NMs，当路由器被断电时，除了在Cisco 3660路由器上。
- DC电源注射器(大功率ODU或+24VDC的-48VDC标准的功率ODU的)与电源
- SU转换器(ODU) -需要的两，如果曾经分集;可用集成用天线或非完整和任一提供高或标准的功率**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英里半径)的20英里单个HE
- 微细胞：直径的四到10英里(两到五英里半径)能使用频率复用
- Microcell ：直径(一条英里半径)的两英里SU能使用更低的TX功率允许SU的最大数量在特定区域内的允许频率复用

Q. 什么是用于此系统的频率范围？

- MMDS ：2.500 - 2.690千兆赫
- MD ：2.150 - 2.162千兆赫(使用上行只)
- ETSI ：3.400 - 3.600千兆赫(ODU将是2001可用的下半年)
- U-NII ：5.725 - 5.825千兆赫(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–到真实生活配置优点。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. 最大覆盖范围是多少？

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. 非视线传输的覆盖范围取决于这些参数：

- 路经损耗假定—多少信号沿传输路径丢失。
- 链路可靠性和可用性需求—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发射电源的标准的功率ODU或大功率ODU在CPE端。
- 天线增益—天线的种类使用在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了。
- 接收天线的编号—一两.

使用一个标准功率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，当满足99.9%链路可用性需求时，并且使用6兆赫信道下行和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当前发布技术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2月/2001 3月)
- 相关的微码

Q. 什么下行频率带宽允许？能否更改此？

A. 6兆赫带宽， 3兆赫， 1.5兆赫允许。配置HE线卡使用宽的单个信道6兆赫，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6兆赫、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3兆赫的一上行集，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6兆赫总数。

Q. 什么是此系统的数据吞吐率？

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	媒体
1.5	3.2	标准	媒体
1.5	1.6	标准	媒体
3.0	10.0	标准	媒体
3.0	7.6	标准	媒体
3.0	5.1	标准	媒体
3.0	8.6	高	媒体
3.0	6.6	高	媒体
3.0	4.4	高	媒体
6.0	22.0	标准	媒体
6.0	17.0	标准	媒体
6.0	12.0	标准	媒体
6.0	19.0	高	媒体
6.0	14.0	高	媒体
6.0	11.0	高	媒体

上行

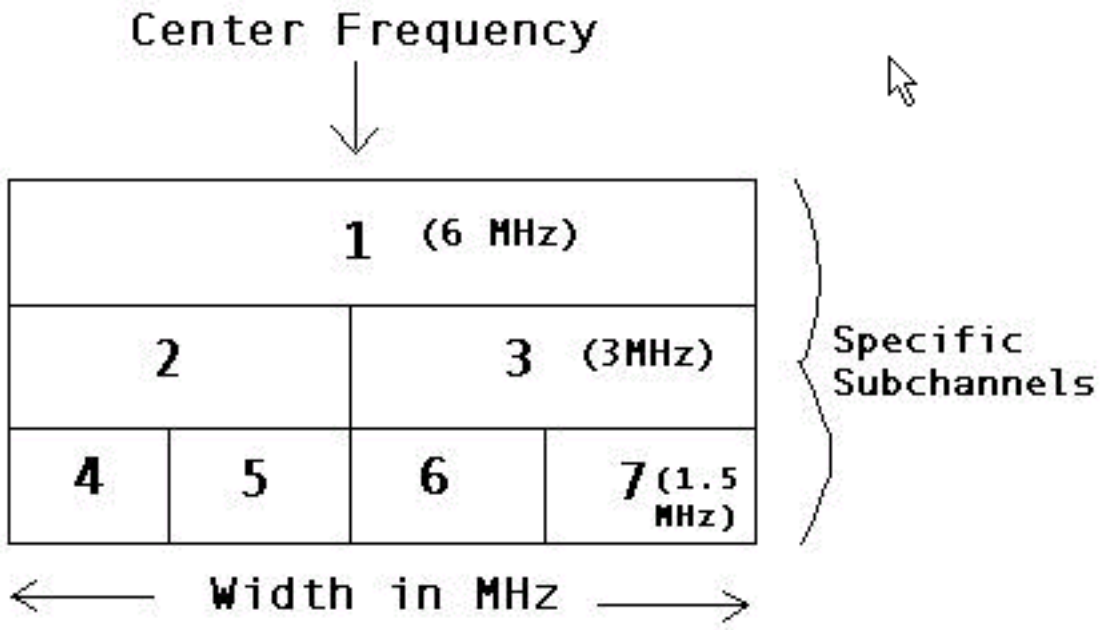
带宽(兆赫)	吞吐量(Mbps)	多路径抗错性	突发传输长度
1.5	4.2	标准	媒体
1.5	3.2	标准	媒体

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

Q. 什么是子信道？

A. 子信道是6兆赫宽信道的6兆赫、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6兆赫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6兆赫的总带宽。例如，如果使用仅子信道1，是6兆赫，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 –子信道映射图表



配置—数据转发器

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. 切记您有最新的“T”代码，当您使用此配置。在HE不enable (event) **radio helper address命令**在您的配置，因为DISCOVER信息包不需要“被帮助”到另一台机器，信息包驻留。

```
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."
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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
```

完成这些步骤放置**.cm**文件在闪存：

1. Copy tftp **slot:0**，和按Enter。
2. 当一台远端主机的名字的分析程序查询，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Enter。

您能也配置在HE驻留而不是TFTP server的DOCSIS配置文件：

```
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."
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(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
```

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. 如何配置基本保密性？

A. 完成这些步骤配置基本保密性：

1. 装载K1镜像在HE和SU。
2. 请使用一个配置文件编辑器打开DOCSIS配置文件。
3. 点击**扩展**在**业务类别组**选项。
4. Enable (event)一1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驻留被连接到HE的快速以太网(FE)端口。在重新启动， SU用上述参数后装载您新的DOCSIS配置文件。
6. SU与HE协商保密性基准接口(BPI)。请使用**show radio subscriber命令**发现SU注册作为“online(pt)”而不是作为“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，如果允许“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，并且有无线电的SU参数来联机在符合到什么ISP设置，例如，最大数量下行和上行速率、最大上行突发传输费率、业务类别或者基本保密性、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数据转发器故障？

- **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标志列表。
- **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周期。
- **show controllers radio slot number/port number [{如果|rf}]** —显示所有或一个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下行端口信息。
- **show controllers radio slot/upstream-port upstream** —显示无线调制解调器卡上行端口信息。
- **radio loopback local main if** —显示线卡是否是有故障的。
- **radio loopback local main rf** —显示是否有在卡和ODU之间的一个电缆问题。

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 AddressUpstreamInsHitMissCRCP-AdjFlapTime
    0003.6b4f.bf90Radio4/0/U002118014810090ct 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
- 小姐

注意： 忽视功率调整(p adj)列在此输出中。P-Adj列仅适用于**show cable flap-list命令的**有线网络

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列可以是低的。当两个初始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”，并且飘荡探测器计数它。如果希望，您能更改此DEFAULT值180秒：

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

命中/错过

其次，飘荡探测器计数飘荡，当您看到“命中时跟随的" miss ""。事件检测在仅飘荡列计数。这些轮询是发送每30秒的hello信息包。如果获得" miss "跟随由“错过”，然后轮询被发送每秒钟16秒。如果在16秒前获得" hit "是UP，您获得飘荡，但是，如果没获得16次轮询的一" hit "，调制解调器脱机为了再开始最初的维护。如果SU终于返回线上，您将获得“插入”，因为SU插入了自己回到激活状态。如果有六连续缺失，飘荡计数增加。可以更改如果需要此DEFAULT值：

```
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频率被配置？其他重要信息此命令提供什么？

A. **show controller r4/0 rf命令**显示配置什么TX和RX频率。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. 直方图在无线接口被配置。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功率。一些可用的直方图如下是列出的：

```
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

当直方图在无线接口时被配置，您能查看从它的数据与global命令**show interface *slot number/port number hist-data <particular的histogram>***。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，请注意密切注意最小数量、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
% 0MININT<=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
% 0MININT<=x<-10|
% 0-10<=x<-8|
% 0-8<=x<-6|
% 0-6<=x<-4|
% 0-4<=x<-2|
% 4-2<=x<0|*
% 10<=x<2|*
% 02<=x<4|
% 04<=x<6|
% 06<=x<8|
% 08<=x<10|
% 010<=x<MAXINT|
```

Q. 什么调试是可用在HE排除链路的无线部分故障？

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式的信号处理(DSP)同步。

用户单元(SU)

Q. 什么SU路由器看上去的配置示例象？

```
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
% 0MININT<=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
% 0MININT<=x<-10|
% 0-10<=x<-8|
% 0-8<=x<-6|
% 0-6<=x<-4|
% 0-4<=x<-2|
% 4-2<=x<0|*
% 10<=x<2|*
% 02<=x<4|
% 04<=x<6|
% 06<=x<8|
% 08<=x<10|
% 010<=x<MAXINT|
```

Q. 什么是一些有用的命令监控和排除用户单元故障？

- **show interfaces radio slot number/port number link-metrics** —显示在链路的所有代码字错误在一段特定时期。
- **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** —显示所有或一个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IF硬件信息。
- **radio loopback local main if** —，如果NM是有故障的，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？

```
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
% 0MININT<=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
% 0MININT<=x<-10|
% 0-10<=x<-8|
% 0-8<=x<-6|
% 0-6<=x<-4|
% 0-4<=x<-2|
% 4-2<=x<0|*
% 10<=x<2|*
% 02<=x<4|
% 04<=x<6|
% 06<=x<8|
% 08<=x<10|
% 010<=x<MAXINT|
```

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，请注意密切注意最小数量、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
% 0MININT<=x<10|
```

```
% 010<=x<14|
% 014<=x<18|
% 018<=x<22|
% 022<=x<26|
% 2263226<=x<30|********************
% 3171730<=x<34|****************************
% 034<=x<38|
% 038<=x<42|
% 042<=x<46|
% 046<=x<50|
% 050<=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
% 0MININT<=x<-10|
% 0-10<=x<-8|
% 0-8<=x<-6|
% 0-6<=x<-4|
% 0-4<=x<-2|
% 287-2<=x<0|***
% 12230<=x<2|*************
% 02<=x<4|
% 04<=x<6|
% 06<=x<8|
% 08<=x<10|
% 010<=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
% 0MININT<=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|
% 012<=x<28|
% 028<=x<44|
% 044<=x<60|
% 060<=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
% 0MININT<=x<0|
% 45290<=x<4|*******************************************
% 04<=x<8|
% 08<=x<12|
% 012<=x<16|
% 016<=x<20|
% 020<=x<24|
% 024<=x<28|
```

```
% 028<=x<32|
% 032<=x<36|
% 036<=x<40|
% 040<=x<MAXINT|
```

Q. 什么调试是可用在SU排除无线链路故障？

- **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式的信号处理(DSP)同步。
- **调试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# 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
% 0MININT<=x<10|
% 010<=x<14|
% 014<=x<18|
% 018<=x<22|
% 022<=x<26|
% 2263226<=x<30|********************
% 3171730<=x<34|****************************
% 034<=x<38|
% 038<=x<42|
% 042<=x<46|
% 046<=x<50|
% 050<=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
% 0MININT<=x<-10|
% 0-10<=x<-8|
% 0-8<=x<-6|
% 0-6<=x<-4|
% 0-4<=x<-2|
% 287-2<=x<0|***
% 12230<=x<2|*************
% 02<=x<4|
% 04<=x<6|
% 06<=x<8|
% 08<=x<10|
% 010<=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
% 0MININT<=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|
% 012<=x<28|
% 028<=x<44|
% 044<=x<60|
% 060<=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
% 0MININT<=x<0|
% 45290<=x<4|*********************************************
% 04<=x<8|
% 08<=x<12|
% 012<=x<16|
% 016<=x<20|
% 020<=x<24|
% 024<=x<28|
% 028<=x<32|
% 032<=x<36|
% 036<=x<40|
% 040<=x<MAXINT|
```

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：

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.
```

此消息出现立候你启动程序，因此您能容易地错过此消息。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：

```
microcode cwrsu slot1:
```

如果这仍然不运作，检查确信，闪存卡适当地插入到slot 1。从exec提示(类型达到的末端exec提示)，您能查看什么的目录在卡在slot 0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，您必须分开打开与路由器。
- ODU没有正确地被连接到无线卡。切记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，查寻。为了调整此问题，请关闭ODU，等一些秒钟，并且翻回ODU。
- 路由器为两ODUs被配置，但是仅一个被连接。

如果SU不能超过rf_hw_reset_state，日志表示，软件设法重置秒钟ODU ：

```
dir flash:
dir slot0:
dir slot1:
```

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。

Q. SU若不能超过dsp_sync_state ？

A. 在此状态下， DSP尝试查找一个有效下行信号，锁定对频率该信号，并且开始解调信号。如果错误有任何到达的下行信号，则问题可能出现这里。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，则传送这些信息：

```
dir flash:
dir slot0:
dir slot1:
```

或

```
dir flash:
dir slot0:
dir slot1:
```

可能的DSP同步指示器是：

- 0个AGC_PASS — DSP看到在收到的信号的若干功率。
- 1个AGC_FAIL — DSP看不到在收到的信号的功率。此指示器是难获得。确定正确地设置下行频率。
- 2个BURST_SIZE_PASS — DSP假设一个有效下行信号的出现。如果这是您接受的最后DSP指示器， DSP不能锁定到频率下行。功率循环一切和尝试再。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严格的信号。确定HE打开并且适当地传输，天线在正确的方向指向，并且正确地设置下行频率。的问题任何这些设置意味着没有信号或者一非常微弱的信号，接受。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。如果信号查找太严格，请检查饱和。考虑有更低的增益的一个天线。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 —此编号是未使用的。
- 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。键入这些命令：

```
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低SNR。DSP在一个更低的SNR信号比可以被解调能同步。为了解决此问题，您需要让一个更加干净的信号进入订户。切记正确地设置cable-comp值，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发生故障。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HE的一个问题，而不是有订户的。再供给循环动力订户和尝试，是肯定的。如果遇到同一个问题，请证实任何其他订户是否成功连接到此HE卡。否则，请尝试一**shut/no shut命令**在HE。如果那不工作，供给循环动力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，有传输的一个下行信号，但是没有关于信号的数据。

Q. SU若不能超过wait_ucd_state ？

A. 有两种可能性在这里。第一是initial-ranging-offset不正确设置DOCSIS。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。请参阅上述问与答。另一种可能性是某事在上行信号是错误的。检查正确地设置上行频率。切记ALC打开。这DEFAULT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。

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的太少功率，或者从订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设置传输增益。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个dB ：

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

为了看到传输增益设置的合法范围，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)可变的增益的范围。如果订户在范围的底部附近只使用收益， HE很可能接受许多个功率。换成一个低功率ODU，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设置为充分的增益，并且HE继续指示SU增加功率，这是HE不接受足够的功率的征兆。检查对RF接受HE的功率的什么值设置，并且检查天线的对准线。一个更加高赢利的天线可帮助。或者，请移动天线或者安放它更高。

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，如果运行外部DHCP服务器，验证正确**radio helper-address命令**被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(也称为DOCSIS配置文件)。这些参数一定全部是存在自DHCP服务器的DHCP响应。

注意： 您能配置HE起DHCP/TFTP服务器的作用。如果没有配置HE是DHCP/TFTP服务器，请切记**radio helper-address命令**被配置在HE无线接口下。这保证DHCP广播被转送到正确的服务器。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信息包回到SU网络的路由或默认网关。

这些错误信息指向缺乏在DHCP响应的可选参数：

```
show cont r1/0 rf

show cont r1/0 if
```

配置在DHCP服务器的附属服务器和日志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. 故障的一常见原因在此状态是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服务器能发送回应回到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对SU DOCSIS子系统。这可以下载此文件的名字和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

故障的常见原因在此状态是缺少文件，错误文件权限，一不可得到的TFTP server，格式错误的文件，与缺少所需的选项、不正确地被配置的所需的选项或者不正确选项(未知或无效类型长度值(TLVs)的)文件。

Q. SU若失效在registration_state呢？

A. 注册的问题几乎总是陈述点对file错误的配置。确定SU和HE两个支持在配置文件的设置。确定HE允许业务类别配置文件的创建或请使用HE创建的一个配置文件。检查认证字符串在HE无线接口配置和在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，请确定HE和SU使用K镜像。

Q. SU若达到maintenance_state，但是不连接？

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是太低的。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