

Как декодировать сертификат DOCSIS для модема прикрепленный государственный диагноз

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Введение

Этот документ описывает шаги для декодирования сертификата DOCSIS для диагностирования, почему кабельные модемы всунули отклонение (pk) или w-отклонение (pk) состояние на Системе терминирования кабельных модемов (CMTS).

Общие сведения

В нескольких случаях модемы заканчиваются в отклонении (pk) состояние. Это может быть вызвано особыми условиями, например в сертификате CM, отправитель CM не совпадает CA с именем субъекта.

Пример:

```
SLOT 5/0: May 10 10:13:48.272 CET: Got Issuer 0^A^A1^K0 ^F^CU^D^F^S^BTW1^\0^Z^F^CU^D
^S^SHitron Technologies1^00
^F^CU^D^K^S^FDOCSIS1C0A^F^CU^D^C^S:Hitron Technologies Cable Modem Root Certificate Authority
from Certificate.
SLOT 5/0: May 10 10:13:48.272 CET: Got a new Invalid CM cert from a84e.3fdd.84c4
SLOT 5/0: May 10 10:13:48.272 CET: CA Cert Subject does not match CM Cert Issuer
SLOT 5/0: May 10 10:13:48.272 CET: BPI+ CM Cert Dump:

SLOT 5/0: May 10 10:13:48.272 CET: Failed CM Issuer not found. CMTS sent AUTH reject.
SLOT 5/0: May 10 10:13:48.272 CET: Sending KEK REJECT. Reason Code:6 Reason:16
SLOT 5/0: May 10 10:13:48.272 CET: BPI Authorization Reject Packet: a84e.3fdd.84c4
```

Эти выходные данные ясно не показывают основную причину проблемы.

Эта статья может использоваться для создания читаемого сертификата (который может

быть открыт openssl или KeyChain на Mac) для определения несоответствия.

Требования

Компания Cisco рекомендует предварительно ознакомиться со следующими предметами:

- Конфиденциальность базовой линии (BPI) в DOCSIS
- Система терминирования кабельных модемов (CMTS)

Совет: Для получения лучше понимания конфиденциальности базовой линии в DOCSIS рекомендуется пройти [Базовую конфиденциальность DOCSIS 1.0 на статье Cisco CMTS](#).

Используемые компоненты

Настоящий документ не имеет жесткой привязки к каким-либо конкретным версиям программного обеспечения и оборудования.

Сведения, представленные в этом документе, были получены от устройств, работающих в специальной лабораторной среде. Все устройства, описанные в данном документе, были запущены с конфигурацией по умолчанию. Если ваша сеть является оперативной, гарантируйте понимание потенциального воздействия любой команды.

Декодируйте процедуру

Задача 1. Соберите журналы

На CMTS, для получения шестнадцатеричного дампа сертификата, необходимо включить журналы. Введите эти команды.

```
debug cable mac-address <cm mac> ver
debug cable privacy
debug cable privacy tlvs
debug cable privacy auth-req
debug cable privacy auth-rep
debug cable privacy auth-rej
debug cable privacy auth-info
debug cable privacy ca-cert
debug cable bpi
```

Telnet к линейной карте и собирает журналы от **ЛИНЕЙНОЙ ПЛАТЫ** на CMTS.

```
CMTS#telnet 127.0.0.XY
Trying 127.0.0.XY ... Open
```

```
clc_X_Y>en
clc_X_Y#
clc_X_Y#show log
```

Можно получить подобные выходные данные этому.

```
SLOT 5/0: May 10 10:13:48.260 CET: BPI+ Manufacturer Cert Dump: a84e.3fdd.84c4
SLOT 5/0: May 10 10:13:48.260 CET: CA Certificate Dump:
SLOT 5/0: May 10 10:13:48.260 CET: 0x0000: 30 82 03 22 30 82 02 0A A0 03 02 01 02 02 10 43
```

SLOT 5/0: May 10 10:13:48.260 CET: 0x0010: 64 B5 50 E8 ED 7E E5 57 14 5A C0 A2 67 52 EC 30
SLOT 5/0: May 10 10:13:48.260 CET: 0x0020: 0D 06 09 2A 86 48 86 F7 0D 01 01 05 05 00 30 6F
SLOT 5/0: May 10 10:13:48.260 CET: 0x0030: 31 0B 30 09 06 03 55 04 06 13 02 42 45 31 1F 30
SLOT 5/0: May 10 10:13:48.260 CET: 0x0040: 1D 06 03 55 04 0A 13 16 74 43 6F 6D 4C 61 62 73
SLOT 5/0: May 10 10:13:48.260 CET: 0x0050: 20 2D 20 45 75 72 6F 2D 44 4F 43 53 49 53 31 15
SLOT 5/0: May 10 10:13:48.260 CET: 0x0060: 30 13 06 03 55 04 0B 13 0C 43 61 62 6C 65 20 4D
SLOT 5/0: May 10 10:13:48.260 CET: 0x0070: 6F 64 65 6D 73 31 28 30 26 06 03 55 04 03 13 1F
SLOT 5/0: May 10 10:13:48.260 CET: 0x0080: 45 75 72 6F 2D 44 4F 43 53 49 53 20 43 61 62 6C
SLOT 5/0: May 10 10:13:48.260 CET: 0x0090: 65 20 4D 6F 64 65 6D 20 52 6F 6F 74 20 43 41 30
SLOT 5/0: May 10 10:13:48.260 CET: 0x00A0: 1E 17 0D 30 34 30 38 31 33 30 30 30 30 30 5A
SLOT 5/0: May 10 10:13:48.260 CET: 0x00B0: 17 0D 32 34 30 38 31 32 32 33 35 39 35 39 5A 30
SLOT 5/0: May 10 10:13:48.260 CET: 0x00C0: 81 86 31 0B 30 09 06 03 55 04 06 13 02 54 57 31
SLOT 5/0: May 10 10:13:48.260 CET: 0x00D0: 1C 30 1A 06 03 55 04 0A 13 13 48 69 74 72 6F 6E
SLOT 5/0: May 10 10:13:48.260 CET: 0x00E0: 20 54 65 63 68 6E 6F 6C 6F 67 69 65 73 31 14 30
SLOT 5/0: May 10 10:13:48.260 CET: 0x00F0: 12 06 03 55 04 0B 13 0B 45 75 72 6F 2D 44 4F 43
SLOT 5/0: May 10 10:13:48.260 CET: 0x0100: 53 49 53 31 43 30 41 06 03 55 04 03 13 3A 48 69
SLOT 5/0: May 10 10:13:48.260 CET: 0x0110: 74 72 6F 6E 20 54 65 63 68 6E 6F 6C 6F 67 69 65
SLOT 5/0: May 10 10:13:48.260 CET: 0x0120: 73 20 43 61 62 6C 65 20 4D 6F 64 65 6D 20 52 6F
SLOT 5/0: May 10 10:13:48.260 CET: 0x0130: 6F 74 20 43 65 72 74 69 66 69 63 61 74 65 20 41
SLOT 5/0: May 10 10:13:48.260 CET: 0x0140: 75 74 68 6F 72 69 74 79 30 81 9F 30 0D 06 09 2A
SLOT 5/0: May 10 10:13:48.260 CET: 0x0150: 86 48 86 F7 0D 01 01 01 05 00 03 81 8D 00 30 81
SLOT 5/0: May 10 10:13:48.260 CET: 0x0160: 89 02 81 81 00 B8 47 DA 9D F1 F6 30 1B 8E 79 BE
SLOT 5/0: May 10 10:13:48.260 CET: 0x0170: BE 10 C3 2D 9F 7D D6 C7 B2 50 16 AB 85 5C 1C 8C
SLOT 5/0: May 10 10:13:48.260 CET: 0x0180: 9E 6B F7 15 60 B2 53 F4 2F 6D 49 0C 2C 3E 76 88
SLOT 5/0: May 10 10:13:48.260 CET: 0x0190: 8A 8A 23 6B 25 47 61 AE B9 DF A8 A7 8C 4D 51 FB
SLOT 5/0: May 10 10:13:48.260 CET: 0x01A0: E6 C2 0F D9 C7 27 DD F7 D8 CC F0 D8 70 F8 75 75
SLOT 5/0: May 10 10:13:48.260 CET: 0x01B0: F3 D8 B7 80 C2 36 B0 53 02 A4 E9 84 02 5F 66 AE
SLOT 5/0: May 10 10:13:48.260 CET: 0x01C0: E7 59 9A 17 4A A0 B1 B4 BA F3 3B 63 C4 75 05 11
SLOT 5/0: May 10 10:13:48.260 CET: 0x01D0: 40 F1 EB B3 C8 A0 E8 AD 6E 1B 59 CC 41 20 F8 94
SLOT 5/0: May 10 10:13:48.260 CET: 0x01E0: B3 94 23 A2 99 02 03 01 00 01 A3 26 30 24 30 12
SLOT 5/0: May 10 10:13:48.260 CET: 0x01F0: 06 03 55 1D 13 01 01 FF 04 08 30 06 01 01 FF 02
SLOT 5/0: May 10 10:13:48.264 CET: 0x0200: 01 00 30 0E 06 03 55 1D 0F 01 01 FF 04 04 03 02
SLOT 5/0: May 10 10:13:48.264 CET: 0x0210: 01 06 30 0D 06 09 2A 86 48 86 F7 0D 01 01 05 05
SLOT 5/0: May 10 10:13:48.264 CET: 0x0220: 00 03 82 01 01 00 09 DB 24 B9 46 76 D7 D0 9F 70
SLOT 5/0: May 10 10:13:48.264 CET: 0x0230: 86 59 ED 7F 9B AC 96 FD AE 19 DD B3 51 3B A5 C0
SLOT 5/0: May 10 10:13:48.264 CET: 0x0240: 98 DA 80 2B 53 26 42 FA 6A 11 9F 6D 16 6F 76 F8
SLOT 5/0: May 10 10:13:48.264 CET: 0x0250: 9A F3 81 53 E8 DB EF 22 DF AC 3F 57 78 0E 70 78
SLOT 5/0: May 10 10:13:48.264 CET: 0x0260: 07 30 1D FF 19 70 34 E5 7A 52 47 99 B0 EE 7F EA
SLOT 5/0: May 10 10:13:48.264 CET: 0x0270: 23 99 DF CB 72 FF 0D BE AB 68 20 9F 16 C0 7C 69
SLOT 5/0: May 10 10:13:48.264 CET: 0x0280: 88 2D 00 6A AF 4B FF 93 A5 07 D3 F2 A8 F9 5B C4
SLOT 5/0: May 10 10:13:48.264 CET: 0x0290: DD 9F BF 49 36 C4 12 8A 64 C8 35 41 BB E2 B9 9B
SLOT 5/0: May 10 10:13:48.264 CET: 0x02A0: 52 45 67 38 DC 92 55 E3 33 A4 70 68 FC E7 6E 54
SLOT 5/0: May 10 10:13:48.264 CET: 0x02B0: 96 CA 89 B4 65 8B 2C AA 58 24 FC 4D 68 D7 84 4E
SLOT 5/0: May 10 10:13:48.264 CET: 0x02C0: 36 3B B3 CA 9A 42 13 B1 FF 8C 66 D8 52 10 56 74
SLOT 5/0: May 10 10:13:48.264 CET: 0x02D0: C7 DD 58 C3 EE 9D E3 65 E6 C1 5D B9 75 C2 A8 C9
SLOT 5/0: May 10 10:13:48.264 CET: 0x02E0: 54 5B A1 85 38 3B E1 E1 DC 55 5D 3E DD 90 ED F8
SLOT 5/0: May 10 10:13:48.264 CET: 0x02F0: 3A B0 68 93 E9 4A C2 D4 7F DC 90 E3 86 E2 CF C3
SLOT 5/0: May 10 10:13:48.264 CET: 0x0300: F2 A3 92 84 B3 A3 9A F8 71 30 F8 24 71 C2 07 BD
SLOT 5/0: May 10 10:13:48.264 CET: 0x0310: E8 6C 3C F7 FC 82 08 86 84 84 1B C4 D8 97 D3 50
SLOT 5/0: May 10 10:13:48.264 CET: 0x0320: 59 72 2D D5 4C 0B
SLOT 5/0: May 10 10:13:48.264 CET: Found existing manufacturer certificate for a84e.3fdd.84c4
with subject cn=Hitron Technologies Cable Modem Root Certificate Authority,ou=Euro-
DOCSIS,o=Hitron Technologies,c=TW
SLOT 5/0: May 10 10:13:48.264 CET: BPI: setting a84e.3fdd.84c4 caidx:3

SLOT 5/0: May 10 10:13:48.264 CET: Mfg serial no. from a84e.3fdd.84c4 certificate:
4364B550E8ED7EE557145AC0A26752EC
SLOT 5/0: May 10 10:13:48.264 CET: Finger print of a84e.3fdd.84c4 manufacturer certificate
matched.
SLOT 5/0: May 10 10:13:48.264 CET: crl0k_clc_snmp_bpplus_broadcast_cert() CA idx:3
state:Chained rowStatus:Active prov:0 len:1078 idx:3 state:Chained rowState:Active prov:0
learn:1 idx:3
SLOT 5/0: May 10 10:13:48.268 CET: BPI: Sent CA Cert to RP successfully.
SLOT 5/0: May 10 10:13:48.268 CET: Success in validating AUTH Info message from a84e.3fdd.84c4.

SLOT 5/0: May 10 10:13:48.268 CET: CMTS Received AUTH REQ from a84e.3fdd.84c4.
SLOT 5/0: May 10 10:13:48.268 CET: BPI Authorization Request Packet: a84e.3fdd.84c4
SLOT 5/0: May 10 10:13:48.268 CET: BPKM Attributes: a84e.3fdd.84c4
SLOT 5/0: May 10 10:13:48.268 CET: Found COMPOUND CM Identification (length = 173):
SLOT 5/0: May 10 10:13:48.268 CET: Found Serial Number (length = 12):
SLOT 5/0: May 10 10:13:48.268 CET: 32353331 36433030 38303433
SLOT 5/0: May 10 10:13:48.268 CET: Found Manufacturer ID (length = 3):
SLOT 5/0: May 10 10:13:48.268 CET: 0050F1
SLOT 5/0: May 10 10:13:48.268 CET: Found MAC Address (length = 6):
SLOT 5/0: May 10 10:13:48.268 CET: A84E3FDD 84C4
SLOT 5/0: May 10 10:13:48.268 CET: Found RSA Public Key (length = 140):
SLOT 5/0: May 10 10:13:48.268 CET: 30818902 818100B0 D4F2B649 87FCE340
SLOT 5/0: May 10 10:13:48.268 CET: B21FB1E0 8CFE04DD DB3D05D5 34170886
SLOT 5/0: May 10 10:13:48.268 CET: 7623EE25 4E4A61FC 6D134830 55F402CF
SLOT 5/0: May 10 10:13:48.268 CET: 89B11B34 867B3EF7 D9FE6CBE 8B4C251F
SLOT 5/0: May 10 10:13:48.268 CET: DA5A2E47 D65C2120 8EFC72E2 238D5443
SLOT 5/0: May 10 10:13:48.268 CET: 786F151A A7FE6C21 371957DD 3FEB8435
SLOT 5/0: May 10 10:13:48.268 CET: 8AA1B7A2 181DAF7A 4F7DD4E9 128D953C
SLOT 5/0: May 10 10:13:48.268 CET: 146B77F4 51A9F868 5D1A253F A9590AC0
SLOT 5/0: May 10 10:13:48.268 CET: F69D24DF 2B84C102 03010001
SLOT 5/0: May 10 10:13:48.268 CET: Found CM Certificate (length = 652):
SLOT 5/0: May 10 10:13:48.268 CET: 30820288 308201F1 A0030201 02020C41
SLOT 5/0: May 10 10:13:48.268 CET: 38344533 46444438 34433430 0D06092A
SLOT 5/0: May 10 10:13:48.268 CET: 864886F7 0D010105 05003081 81310B30
SLOT 5/0: May 10 10:13:48.268 CET: 09060355 04061302 5457311C 301A0603
SLOT 5/0: May 10 10:13:48.268 CET: 55040A13 13486974 726F6E20 54656368
SLOT 5/0: May 10 10:13:48.268 CET: 6E6F6C6F 67696573 310F300D 06035504
SLOT 5/0: May 10 10:13:48.268 CET: 0B130644 4F435349 53314330 41060355
SLOT 5/0: May 10 10:13:48.268 CET: 0403133A 48697472 6F6E2054 6563686E
SLOT 5/0: May 10 10:13:48.268 CET: 6F6C6F67 69657320 4361626C 65204D6F
SLOT 5/0: May 10 10:13:48.268 CET: 64656D20 526F6F74 20436572 74696669
SLOT 5/0: May 10 10:13:48.268 CET: 63617465 20417574 686F7269 7479301E
SLOT 5/0: May 10 10:13:48.268 CET: 170D3137 30313031 30303030 30305A17
SLOT 5/0: May 10 10:13:48.268 CET: 0D333631 32323832 33353935 395A3081
SLOT 5/0: May 10 10:13:48.268 CET: 86310B30 09060355 04061302 5457311C
SLOT 5/0: May 10 10:13:48.268 CET: 301A0603 55040A13 13486974 726F6E20
SLOT 5/0: May 10 10:13:48.268 CET: 54656368 6E6F6C6F 67696573 313D303B
SLOT 5/0: May 10 10:13:48.268 CET: 06035504 0B13344E 6F2E2034 302C2057
SLOT 5/0: May 10 10:13:48.268 CET: 752D6B75 6E672035 74682052 642E2C20
SLOT 5/0: May 10 10:13:48.268 CET: 57752D6B 752C2054 61697065 69204873
SLOT 5/0: May 10 10:13:48.268 CET: 69656E2C 20546169 77616E31 1A301806
SLOT 5/0: May 10 10:13:48.268 CET: 03550403 13114138 3A34453A 33463A44
SLOT 5/0: May 10 10:13:48.268 CET: 443A3834 3A433430 819F300D 06092A86
SLOT 5/0: May 10 10:13:48.268 CET: 4886F70D 01010105 0003818D 00308189
SLOT 5/0: May 10 10:13:48.268 CET: 02818100 B0D4F2B6 4987FCE3 40B21FB1
SLOT 5/0: May 10 10:13:48.268 CET: E08CFE04 DDBB3D05 D5341708 867623EE
SLOT 5/0: May 10 10:13:48.268 CET: 254E4A61 FC6D1348 3055F402 CF89B11B
SLOT 5/0: May 10 10:13:48.268 CET: 34867B3E F7D9FE6C BE8B4C25 1FDA5A2E
SLOT 5/0: May 10 10:13:48.268 CET: 47D65C21 208EFC72 E2238D54 43786F15
SLOT 5/0: May 10 10:13:48.268 CET: 1AA7FE6C 21371957 DD3FEB84 358AA1B7
SLOT 5/0: May 10 10:13:48.268 CET: A2181DAF 7A4F7DD4 E9128D95 3C146B77
SLOT 5/0: May 10 10:13:48.268 CET: F451A9F8 685D1A25 3FA9590A C0F69D24
SLOT 5/0: May 10 10:13:48.268 CET: DF2B84C1 02030100 01300D06 092A8648
SLOT 5/0: May 10 10:13:48.268 CET: 86F70D01 01050500 03818100 08DFC2DA
SLOT 5/0: May 10 10:13:48.268 CET: 8C3ECCDA 98289410 E1B8657A 9A3F220D
SLOT 5/0: May 10 10:13:48.268 CET: AE368029 0E89923F 0DF09E06 8142BAB7
SLOT 5/0: May 10 10:13:48.268 CET: E8A6D5B3 6D7604FF 6A07A8B8 409D0B0B
SLOT 5/0: May 10 10:13:48.268 CET: 6D568AF4 F9395199 AB54126C E9C22F1B
SLOT 5/0: May 10 10:13:48.268 CET: 6390543A 3B67EFB8 FCF0E755 F642E1E0
SLOT 5/0: May 10 10:13:48.268 CET: 273A3853 F4DDBFF1 391E63CE 8BB7BBC0
SLOT 5/0: May 10 10:13:48.268 CET: 8AFC59FC 767C3FA5 A5EB255C 8878F4AB
SLOT 5/0: May 10 10:13:48.272 CET: 63665AA9 CDCF779A 3DFE0C4C
SLOT 5/0: May 10 10:13:48.272 CET: Found COMPOUND SA Capabilities (length = 13):
SLOT 5/0: May 10 10:13:48.272 CET: Found Crypto Suite List (length = 6):

```

SLOT 5/0: May 10 10:13:48.272 CET: 01000200 0300
SLOT 5/0: May 10 10:13:48.272 CET: Found BPI Version (length = 1):
SLOT 5/0: May 10 10:13:48.272 CET: 01
SLOT 5/0: May 10 10:13:48.272 CET: Found SAID (length = 2):
SLOT 5/0: May 10 10:13:48.272 CET: 0000
SLOT 5/0: May 10 10:13:48.272 CET: END BPKM Attributes: a84e.3fdd.84c4
SLOT 5/0: May 10 10:13:48.272 CET: Get a CM Certificate.
SLOT 5/0: May 10 10:13:48.272 CET: Cable5/0/12: Auth-Req contains 1 SID(s).
SLOT 5/0: May 10 10:13:48.272 CET: Cable5/0/12: AuthReq with NULL SAID - D3.0 modem.
SLOT 5/0: May 10 10:13:48.272 CET: EAE_BPI_REQ: DISABLE a84e.3fdd.84c4 - OK
SLOT 5/0: May 10 10:13:48.272 CET: BPI_AES: Encryption priority is: aes128-des56-des40.
SLOT 5/0: May 10 10:13:48.272 CET: BPI_AES: AES is a candidate.
SLOT 5/0: May 10 10:13:48.272 CET: BPI Crypto Algorithm: sid:0 cfg_mod:1, cm_cap:0x7, assigned:3
aes_support:1
SLOT 5/0: May 10 10:13:48.272 CET: CMTS generated AUTH_KEY.
SLOT 5/0: May 10 10:13:48.272 CET: CMTS received 0 as primary SAID - D3.0
SLOT 5/0: May 10 10:13:48.272 CET: CM state:2050 MAC:a84e.3fdd.84c4
SLOT 5/0: May 10 10:13:48.272 CET: Parsed/Matched MAC Address:a84e.3fdd.84c4
SLOT 5/0: May 10 10:13:48.272 CET: Got Issuer 0^A^A1^K0 ^F^CU^D^F^S^BTW1^\0^Z^F^CU^D
^S^SHitron Technologies1^00
^F^CU^D^K^S^FDOCSIS1C0A^F^CU^D^C^S:Hitron Technologies Cable Modem Root Certificate Authority
from Certificate.
SLOT 5/0: May 10 10:13:48.272 CET: Got a new Invalid CM cert from a84e.3fdd.84c4
SLOT 5/0: May 10 10:13:48.272 CET: CA Cert Subject does not match CM Cert Issuer

```

Вы видите в тех журналах, что существует два отдельных шестнадцатеричных дампа.

1. Шестнадцатеричный дамп для Сертификата CA. Это запускает с линии полужирным **Дамп Сертификата CA:**
2. Шестнадцатеричный дамп для Сертификата CM. Это запускает с линии полужирным **Найденный Сертификат CM (длина = 652):**

Задача 2. Санируйте сертификаты

Для дампа сертификата, который будет обработан должным образом, необходимо удалить все дополнительные сведения и поддержать только значения шестнадцатеричного дампа.

Примечание: (Верхний/ниже) случай и пробелы в дампе сертификата не важен для этого процесса.

Совет: Быстрое и простой способ для удаления всех заголовков линии (номер слота, метка времени, и т.д.) должны держать клавишу ALT в текстовом редакторе, как Сублимат или Блокнот ++.

Пример дампа сертификата CA.

```

SLOT 5/0: May 10 10:13:48.260 CET: BPI+ Manufacturer Cert Dump: a84e.3fdd.84c4
SLOT 5/0: May 10 10:13:48.260 CET: CA Certificate Dump:
SLOT 5/0: May 10 10:13:48.260 CET: 0x0000: 30 82 03 22 30 82 02 0A A0 03 02 01 02 02 10 43
SLOT 5/0: May 10 10:13:48.260 CET: 0x0010: 64 B5 50 E8 ED 7E E5 57 14 5A C0 A2 67 52 EC 30
SLOT 5/0: May 10 10:13:48.260 CET: 0x0020: 0D 06 09 2A 86 48 86 F7 0D 01 01 05 05 00 30 6F
SLOT 5/0: May 10 10:13:48.260 CET: 0x0030: 31 0B 30 09 06 03 55 04 06 13 02 42 45 31 1F 30
SLOT 5/0: May 10 10:13:48.260 CET: 0x0040: 1D 06 03 55 04 0A 13 16 74 43 6F 6D 4C 61 62 73
SLOT 5/0: May 10 10:13:48.260 CET: 0x0050: 20 2D 20 45 75 72 6F 2D 44 4F 43 53 49 53 31 15
SLOT 5/0: May 10 10:13:48.260 CET: 0x0060: 30 13 06 03 55 04 0B 13 0C 43 61 62 6C 65 20 4D
SLOT 5/0: May 10 10:13:48.260 CET: 0x0070: 6F 64 65 6D 73 31 28 30 26 06 03 55 04 03 13 1F
SLOT 5/0: May 10 10:13:48.260 CET: 0x0080: 45 75 72 6F 2D 44 4F 43 53 49 53 20 43 61 62 6C

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SLOT 5/0: May 10 10:13:48.260 CET: 0x0090: 65 20 4D 6F 64 65 6D 20 52 6F 6F 74 20 43 41 30

SLOT 5/0: May 10 10:13:48.260 CET: 0x00A0: 1E 17 0D 30 34 30 38 31 33 30 30 30 30 30 30 5A

SLOT 5/0: May 10 10:13:48.260 CET: 0x00B0: 17 0D 32 34 30 38 31 32 32 33 35 39 35 39 5A 30

SLOT 5/0: May 10 10:13:48.260 CET: 0x00C0: 81 86 31 0B 30 09 06 03 55 04 06 13 02 54 57 31

SLOT 5/0: May 10 10:13:48.260 CET: 0x00D0: 1C 30 1A 06 03 55 04 0A 13 13 48 69 74 72 6F 6E

SLOT 5/0: May 10 10:13:48.260 CET: 0x00E0: 20 54 65 63 68 6E 6F 6C 6F 67 69 65 73 31 14 30

SLOT 5/0: May 10 10:13:48.260 CET: 0x00F0: 12 06 03 55 04 0B 13 0B 45 75 72 6F 2D 44 4F 43

SLOT 5/0: May 10 10:13:48.260 CET: 0x0100: 53 49 53 31 43 30 41 06 03 55 04 03 13 3A 48 69

SLOT 5/0: May 10 10:13:48.260 CET: 0x0110: 74 72 6F 6E 20 54 65 63 68 6E 6F 6C 6F 67 69 65

SLOT 5/0: May 10 10:13:48.260 CET: 0x0120: 73 20 43 61 62 6C 65 20 4D 6F 64 65 6D 20 52 6F

SLOT 5/0: May 10 10:13:48.260 CET: 0x0130: 6F 74 20 43 65 72 74 69 66 69 63 61 74 65 20 41

SLOT 5/0: May 10 10:13:48.260 CET: 0x0140: 75 74 68 6F 72 69 74 79 30 81 9F 30 0D 06 09 2A

SLOT 5/0: May 10 10:13:48.260 CET: 0x0150: 86 48 86 F7 0D 01 01 01 05 00 03 81 8D 00 30 81

SLOT 5/0: May 10 10:13:48.260 CET: 0x0160: 89 02 81 81 00 B8 47 DA 9D F1 F6 30 1B 8E 79 BE

SLOT 5/0: May 10 10:13:48.260 CET: 0x0170: BE 10 C3 2D 9F 7D D6 C7 B2 50 16 AB 85 5C 1C 8C

SLOT 5/0: May 10 10:13:48.260 CET: 0x0180: 9E 6B F7 15 60 B2 53 F4 2F 6D 49 0C 2C 3E 76 88

SLOT 5/0: May 10 10:13:48.260 CET: 0x0190: 8A 8A 23 6B 25 47 61 AE B9 DF A8 A7 8C 4D 51 FB

SLOT 5/0: May 10 10:13:48.260 CET: 0x01A0: E6 C2 0F D9 C7 27 DD F7 D8 CC F0 D8 70 F8 75 75

SLOT 5/0: May 10 10:13:48.260 CET: 0x01B0: F3 D8 B7 80 C2 36 B0 53 02 A4 E9 84 02 5F 66 AE

SLOT 5/0: May 10 10:13:48.260 CET: 0x01C0: E7 59 9A 17 4A A0 B1 B4 BA F3 3B 63 C4 75 05 11

SLOT 5/0: May 10 10:13:48.260 CET: 0x01D0: 40 F1 EB B3 C8 A0 E8 AD 6E 1B 59 CC 41 20 F8 94

SLOT 5/0: May 10 10:13:48.260 CET: 0x01E0: B3 94 23 A2 99 02 03 01 00 01 A3 26 30 24 30 12

SLOT 5/0: May 10 10:13:48.260 CET: 0x01F0: 06 03 55 1D 13 01 01 FF 04 08 30 06 01 01 FF 02

SLOT 5/0: May 10 10:13:48.264 CET: 0x0200: 01 00 30 0E 06 03 55 1D 0F 01 01 FF 04 04 03 02

SLOT 5/0: May 10 10:13:48.264 CET: 0x0210: 01 06 30 0D 06 09 2A 86 48 86 F7 0D 01 01 05 05

SLOT 5/0: May 10 10:13:48.264 CET: 0x0220: 00 03 82 01 01 00 09 DB 24 B9 46 76 D7 D0 9F 70

SLOT 5/0: May 10 10:13:48.264 CET: 0x0230: 86 59 ED 7F 9B AC 96 FD AE 19 DD B3 51 3B A5 C0

SLOT 5/0: May 10 10:13:48.264 CET: 0x0240: 98 DA 80 2B 53 26 42 FA 6A 11 9F 6D 16 6F 76 F8

SLOT 5/0: May 10 10:13:48.264 CET: 0x0250: 9A F3 81 53 E8 DB EF 22 DF AC 3F 57 78 0E 70 78

SLOT 5/0: May 10 10:13:48.264 CET: 0x0260: 07 30 1D FF 19 70 34 E5 7A 52 47 99 B0 EE 7F EA

SLOT 5/0: May 10 10:13:48.264 CET: 0x0270: 23 99 DF CB 72 FF 0D BE AB 68 20 9F 16 C0 7C 69

SLOT 5/0: May 10 10:13:48.264 CET: 0x0280: 88 2D 00 6A AF 4B FF 93 A5 07 D3 F2 A8 F9 5B C4

SLOT 5/0: May 10 10:13:48.264 CET: 0x0290: DD 9F BF 49 36 C4 12 8A 64 C8 35 41 BB E2 B9 9B

SLOT 5/0: May 10 10:13:48.264 CET: 0x02A0: 52 45 67 38 DC 92 55 E3 33 A4 70 68 FC E7 6E 54

SLOT 5/0: May 10 10:13:48.264 CET: 0x02B0: 96 CA 89 B4 65 8B 2C AA 58 24 FC 4D 68 D7 84 4E

SLOT 5/0: May 10 10:13:48.264 CET: 0x02C0: 36 3B B3 CA 9A 42 13 B1 FF 8C 66 D8 52 10 56 74

SLOT 5/0: May 10 10:13:48.264 CET: 0x02D0: C7 DD 58 C3 EE 9D E3 65 E6 C1 5D B9 75 C2 A8 C9

SLOT 5/0: May 10 10:13:48.264 CET: 0x02E0: 54 5B A1 85 38 3B E1 E1 DC 55 5D 3E DD 90 ED F8

SLOT 5/0: May 10 10:13:48.264 CET: 0x02F0: 3A B0 68 93 E9 4A C2 D4 7F DC 90 E3 86 E2 CF C3

SLOT 5/0: May 10 10:13:48.264 CET: 0x0300: F2 A3 92 84 B3 A3 9A F8 71 30 F8 24 71 C2 07 BD

SLOT 5/0: May 10 10:13:48.264 CET: 0x0310: E8 6C 3C F7 FC 82 08 86 84 84 1B C4 D8 97 D3 50

SLOT 5/0: May 10 10:13:48.264 CET: 0x0320: 59 72 2D D5 4C 0B

SLOT 5/0: May 10 10:13:48.264 CET: Found existing manufacturer certificate for a84e.3fdd.84c4 with subject cn=Hitron Technologies Cable Modem Root Certificate Authority,ou=Euro-DOCSIS,o=Hitron Technologies,c=TW

SLOT 5/0: May 10 10:13:48.264 CET: BPI: setting a84e.3fdd.84c4 caidx:3

SLOT 5/0: May 10 10:13:48.264 CET: Mfg serial no. from a84e.3fdd.84c4 certificate: 4364B550E8ED7EE557145AC0A26752EC

SLOT 5/0: May 10 10:13:48.264 CET: Finger print of a84e.3fdd.84c4 manufacturer certificate matched.

SLOT 5/0: May 10 10:13:48.264 CET: cr10k_clc_snmp_bpplus_broadcast_cert() CA idx:3 state:Chained rowStatus:Active prov:0 len:1078 idx:3 state:Chained rowState:Active prov:0 learn:1 idx:3

SLOT 5/0: May 10 10:13:48.268 CET: BPI: Sent CA Cert to RP successfully.

SLOT 5/0: May 10 10:13:48.268 CET: Success in validating AUTH Info message from a84e.3fdd.84c4.

SLOT 5/0: May 10 10:13:48.268 CET: CMTS Received AUTH REQ from a84e.3fdd.84c4.

SLOT 5/0: May 10 10:13:48.268 CET: BPI Authorization Request Packet: a84e.3fdd.84c4

SLOT 5/0: May 10 10:13:48.268 CET: BPKM Attributes: a84e.3fdd.84c4

SLOT 5/0: May 10 10:13:48.268 CET: Found COMPOUND CM Identification (length = 173):

SLOT 5/0: May 10 10:13:48.268 CET: Found Serial Number (length = 12):

SLOT 5/0: May 10 10:13:48.268 CET: 32353331 36433030 38303433

SLOT 5/0: May 10 10:13:48.268 CET: Found Manufacturer ID (length = 3):

SLOT 5/0: May 10 10:13:48.268 CET: 0050F1

SLOT 5/0: May 10 10:13:48.268 CET: Found MAC Address (length = 6):
SLOT 5/0: May 10 10:13:48.268 CET: A84E3FDD 84C4
SLOT 5/0: May 10 10:13:48.268 CET: Found RSA Public Key (length = 140):
SLOT 5/0: May 10 10:13:48.268 CET: 30818902 818100B0 D4F2B649 87FCE340
SLOT 5/0: May 10 10:13:48.268 CET: B21FB1E0 8CFE04DD DB3D05D5 34170886
SLOT 5/0: May 10 10:13:48.268 CET: 7623EE25 4E4A61FC 6D134830 55F402CF
SLOT 5/0: May 10 10:13:48.268 CET: 89B11B34 867B3EF7 D9FE6CBE 8B4C251F
SLOT 5/0: May 10 10:13:48.268 CET: DA5A2E47 D65C2120 8EFC72E2 238D5443
SLOT 5/0: May 10 10:13:48.268 CET: 786F151A A7FE6C21 371957DD 3FEB8435
SLOT 5/0: May 10 10:13:48.268 CET: 8AA1B7A2 181DAF7A 4F7DD4E9 128D953C
SLOT 5/0: May 10 10:13:48.268 CET: 146B77F4 51A9F868 5D1A253F A9590AC0
SLOT 5/0: May 10 10:13:48.268 CET: F69D24DF 2B84C102 03010001
SLOT 5/0: May 10 10:13:48.268 CET: Found CM Certificate (length = 652):
SLOT 5/0: May 10 10:13:48.268 CET: 30820288 308201F1 A0030201 02020C41
SLOT 5/0: May 10 10:13:48.268 CET: 38344533 46444438 34433430 0D06092A
SLOT 5/0: May 10 10:13:48.268 CET: 864886F7 0D010105 05003081 81310B30
SLOT 5/0: May 10 10:13:48.268 CET: 09060355 04061302 5457311C 301A0603
SLOT 5/0: May 10 10:13:48.268 CET: 55040A13 13486974 726F6E20 54656368
SLOT 5/0: May 10 10:13:48.268 CET: 6E6F6C6F 67696573 310F300D 06035504
SLOT 5/0: May 10 10:13:48.268 CET: 0B130644 4F435349 53314330 41060355
SLOT 5/0: May 10 10:13:48.268 CET: 0403133A 48697472 6F6E2054 6563686E
SLOT 5/0: May 10 10:13:48.268 CET: 6F6C6F67 69657320 4361626C 65204D6F
SLOT 5/0: May 10 10:13:48.268 CET: 64656D20 526F6F74 20436572 74696669
SLOT 5/0: May 10 10:13:48.268 CET: 63617465 20417574 686F7269 7479301E
SLOT 5/0: May 10 10:13:48.268 CET: 170D3137 30313031 30303030 30305A17
SLOT 5/0: May 10 10:13:48.268 CET: 0D333631 32323832 33353935 395A3081
SLOT 5/0: May 10 10:13:48.268 CET: 86310B30 09060355 04061302 5457311C
SLOT 5/0: May 10 10:13:48.268 CET: 301A0603 55040A13 13486974 726F6E20
SLOT 5/0: May 10 10:13:48.268 CET: 54656368 6E6F6C6F 67696573 313D303B
SLOT 5/0: May 10 10:13:48.268 CET: 06035504 0B13344E 6F2E2034 302C2057
SLOT 5/0: May 10 10:13:48.268 CET: 752D6B75 6E672035 74682052 642E2C20
SLOT 5/0: May 10 10:13:48.268 CET: 57752D6B 752C2054 61697065 69204873
SLOT 5/0: May 10 10:13:48.268 CET: 69656E2C 20546169 77616E31 1A301806
SLOT 5/0: May 10 10:13:48.268 CET: 03550403 13114138 3A34453A 33463A44
SLOT 5/0: May 10 10:13:48.268 CET: 443A3834 3A433430 819F300D 06092A86
SLOT 5/0: May 10 10:13:48.268 CET: 4886F70D 01010105 0003818D 00308189
SLOT 5/0: May 10 10:13:48.268 CET: 02818100 B0D4F2B6 4987FCE3 40B21FB1
SLOT 5/0: May 10 10:13:48.268 CET: E08CFE04 DDBB3D05 D5341708 867623EE
SLOT 5/0: May 10 10:13:48.268 CET: 254E4A61 FC6D1348 3055F402 CF89B11B
SLOT 5/0: May 10 10:13:48.268 CET: 34867B3E F7D9FE6C BE8B4C25 1FDA5A2E
SLOT 5/0: May 10 10:13:48.268 CET: 47D65C21 208EFC72 E2238D54 43786F15
SLOT 5/0: May 10 10:13:48.268 CET: 1AA7FE6C 21371957 DD3FEB84 358AA1B7
SLOT 5/0: May 10 10:13:48.268 CET: A2181DAF 7A4F7DD4 E9128D95 3C146B77
SLOT 5/0: May 10 10:13:48.268 CET: F451A9F8 685D1A25 3FA9590A C0F69D24
SLOT 5/0: May 10 10:13:48.268 CET: DF2B84C1 02030100 01300D06 092A8648
SLOT 5/0: May 10 10:13:48.268 CET: 86F70D01 01050500 03818100 08DFC2DA
SLOT 5/0: May 10 10:13:48.268 CET: 8C3ECCDA 98289410 E1B8657A 9A3F220D
SLOT 5/0: May 10 10:13:48.268 CET: AE368029 0E89923F 0DF09E06 8142BAB7
SLOT 5/0: May 10 10:13:48.268 CET: E8A6D5B3 6D7604FF 6A07A8B8 409D0B0B
SLOT 5/0: May 10 10:13:48.268 CET: 6D568AF4 F9395199 AB54126C E9C22F1B
SLOT 5/0: May 10 10:13:48.268 CET: 6390543A 3B67EFB8 FCF0E755 F642E1E0
SLOT 5/0: May 10 10:13:48.268 CET: 273A3853 F4DDBFF1 391E63CE 8BB7BBC0
SLOT 5/0: May 10 10:13:48.268 CET: 8AFC59FC 767C3FA5 A5EB255C 8878F4AB
SLOT 5/0: May 10 10:13:48.272 CET: 63665AA9 CDCF779A 3DFE0C4C
SLOT 5/0: May 10 10:13:48.272 CET: Found COMPOUND SA Capabilities (length = 13):
SLOT 5/0: May 10 10:13:48.272 CET: Found Crypto Suite List (length = 6):
SLOT 5/0: May 10 10:13:48.272 CET: 01000200 0300
SLOT 5/0: May 10 10:13:48.272 CET: Found BPI Version (length = 1):
SLOT 5/0: May 10 10:13:48.272 CET: 01
SLOT 5/0: May 10 10:13:48.272 CET: Found SAID (length = 2):
SLOT 5/0: May 10 10:13:48.272 CET: 0000
SLOT 5/0: May 10 10:13:48.272 CET: END BPKM Attributes: a84e.3fdd.84c4
SLOT 5/0: May 10 10:13:48.272 CET: Get a CM Certificate.
SLOT 5/0: May 10 10:13:48.272 CET: Cable5/0/12: Auth-Req contains 1 SID(s).

```
SLOT 5/0: May 10 10:13:48.272 CET: Cable5/0/12: AuthReq with NULL SAID - D3.0 modem.
SLOT 5/0: May 10 10:13:48.272 CET: EAE_BPI_REQ: DISABLE a84e.3fdd.84c4 - OK
SLOT 5/0: May 10 10:13:48.272 CET: BPI_AES: Encryption priority is: aes128-des56-des40.
SLOT 5/0: May 10 10:13:48.272 CET: BPI_AES: AES is a candidate.
SLOT 5/0: May 10 10:13:48.272 CET: BPI Crypto Algorithm: sid:0 cfg_mod:1, cm_cap:0x7, assigned:3
aes_support:1
SLOT 5/0: May 10 10:13:48.272 CET: CMTS generated AUTH_KEY.
SLOT 5/0: May 10 10:13:48.272 CET: CMTS received 0 as primary SAID - D3.0
SLOT 5/0: May 10 10:13:48.272 CET: CM state:2050 MAC:a84e.3fdd.84c4
SLOT 5/0: May 10 10:13:48.272 CET: Parsed/Matched MAC Address:a84e.3fdd.84c4
SLOT 5/0: May 10 10:13:48.272 CET: Got Issuer 0^A^A1^K0 ^F^CU^D^F^S^BTW1^\0^Z^F^CU^D
^S^SHitron Technologies1^00
^F^CU^D^K^S^FDOCISIS1C0A^F^CU^D^C^S:Hitron Technologies Cable Modem Root Certificate Authority
from Certificate.
SLOT 5/0: May 10 10:13:48.272 CET: Got a new Invalid CM cert from a84e.3fdd.84c4
SLOT 5/0: May 10 10:13:48.272 CET: CA Cert Subject does not match CM Cert Issuer
```

Сохраните этот файл с названием **casert.txt**.

Пример дампа сертификата CM.

```
SLOT 5/0: May 10 10:13:48.260 CET: BPI+ Manufacturer Cert Dump: a84e.3fdd.84c4
SLOT 5/0: May 10 10:13:48.260 CET: CA Certificate Dump:
SLOT 5/0: May 10 10:13:48.260 CET: 0x0000: 30 82 03 22 30 82 02 0A A0 03 02 01 02 02 10 43
SLOT 5/0: May 10 10:13:48.260 CET: 0x0010: 64 B5 50 E8 ED 7E E5 57 14 5A C0 A2 67 52 EC 30
SLOT 5/0: May 10 10:13:48.260 CET: 0x0020: 0D 06 09 2A 86 48 86 F7 0D 01 01 05 05 00 30 6F
SLOT 5/0: May 10 10:13:48.260 CET: 0x0030: 31 0B 30 09 06 03 55 04 06 13 02 42 45 31 1F 30
SLOT 5/0: May 10 10:13:48.260 CET: 0x0040: 1D 06 03 55 04 0A 13 16 74 43 6F 6D 4C 61 62 73
SLOT 5/0: May 10 10:13:48.260 CET: 0x0050: 20 2D 20 45 75 72 6F 2D 44 4F 43 53 49 53 31 15
SLOT 5/0: May 10 10:13:48.260 CET: 0x0060: 30 13 06 03 55 04 0B 13 0C 43 61 62 6C 65 20 4D
SLOT 5/0: May 10 10:13:48.260 CET: 0x0070: 6F 64 65 6D 73 31 28 30 26 06 03 55 04 03 13 1F
SLOT 5/0: May 10 10:13:48.260 CET: 0x0080: 45 75 72 6F 2D 44 4F 43 53 49 53 20 43 61 62 6C
SLOT 5/0: May 10 10:13:48.260 CET: 0x0090: 65 20 4D 6F 64 65 6D 20 52 6F 6F 74 20 43 41 30
SLOT 5/0: May 10 10:13:48.260 CET: 0x00A0: 1E 17 0D 30 34 30 38 31 33 30 30 30 30 30 5A
SLOT 5/0: May 10 10:13:48.260 CET: 0x00B0: 17 0D 32 34 30 38 31 32 32 33 35 39 35 39 5A 30
SLOT 5/0: May 10 10:13:48.260 CET: 0x00C0: 81 86 31 0B 30 09 06 03 55 04 06 13 02 54 57 31
SLOT 5/0: May 10 10:13:48.260 CET: 0x00D0: 1C 30 1A 06 03 55 04 0A 13 13 48 69 74 72 6F 6E
SLOT 5/0: May 10 10:13:48.260 CET: 0x00E0: 20 54 65 63 68 6E 6F 6C 6F 67 69 65 73 31 14 30
SLOT 5/0: May 10 10:13:48.260 CET: 0x00F0: 12 06 03 55 04 0B 13 0B 45 75 72 6F 2D 44 4F 43
SLOT 5/0: May 10 10:13:48.260 CET: 0x0100: 53 49 53 31 43 30 41 06 03 55 04 03 13 3A 48 69
SLOT 5/0: May 10 10:13:48.260 CET: 0x0110: 74 72 6F 6E 20 54 65 63 68 6E 6F 6C 6F 67 69 65
SLOT 5/0: May 10 10:13:48.260 CET: 0x0120: 73 20 43 61 62 6C 65 20 4D 6F 64 65 6D 20 52 6F
SLOT 5/0: May 10 10:13:48.260 CET: 0x0130: 6F 74 20 43 65 72 74 69 66 69 63 61 74 65 20 41
SLOT 5/0: May 10 10:13:48.260 CET: 0x0140: 75 74 68 6F 72 69 74 79 30 81 9F 30 0D 06 09 2A
SLOT 5/0: May 10 10:13:48.260 CET: 0x0150: 86 48 86 F7 0D 01 01 01 05 00 03 81 8D 00 30 81
SLOT 5/0: May 10 10:13:48.260 CET: 0x0160: 89 02 81 81 00 B8 47 DA 9D F1 F6 30 1B 8E 79 BE
SLOT 5/0: May 10 10:13:48.260 CET: 0x0170: BE 10 C3 2D 9F 7D D6 C7 B2 50 16 AB 85 5C 1C 8C
SLOT 5/0: May 10 10:13:48.260 CET: 0x0180: 9E 6B F7 15 60 B2 53 F4 2F 6D 49 0C 2C 3E 76 88
SLOT 5/0: May 10 10:13:48.260 CET: 0x0190: 8A 8A 23 6B 25 47 61 AE B9 DF A8 A7 8C 4D 51 FB
SLOT 5/0: May 10 10:13:48.260 CET: 0x01A0: E6 C2 0F D9 C7 27 DD F7 D8 CC F0 D8 70 F8 75 75
SLOT 5/0: May 10 10:13:48.260 CET: 0x01B0: F3 D8 B7 80 C2 36 B0 53 02 A4 E9 84 02 5F 66 AE
SLOT 5/0: May 10 10:13:48.260 CET: 0x01C0: E7 59 9A 17 4A A0 B1 B4 BA F3 3B 63 C4 75 05 11
SLOT 5/0: May 10 10:13:48.260 CET: 0x01D0: 40 F1 EB B3 C8 A0 E8 AD 6E 1B 59 CC 41 20 F8 94
SLOT 5/0: May 10 10:13:48.260 CET: 0x01E0: B3 94 23 A2 99 02 03 01 00 01 A3 26 30 24 30 12
SLOT 5/0: May 10 10:13:48.260 CET: 0x01F0: 06 03 55 1D 13 01 01 FF 04 08 30 06 01 01 FF 02
SLOT 5/0: May 10 10:13:48.264 CET: 0x0200: 01 00 30 0E 06 03 55 1D 0F 01 01 FF 04 04 03 02
SLOT 5/0: May 10 10:13:48.264 CET: 0x0210: 01 06 30 0D 06 09 2A 86 48 86 F7 0D 01 01 05 05
SLOT 5/0: May 10 10:13:48.264 CET: 0x0220: 00 03 82 01 01 00 09 DB 24 B9 46 76 D7 D0 9F 70
SLOT 5/0: May 10 10:13:48.264 CET: 0x0230: 86 59 ED 7F 9B AC 96 FD AE 19 DD B3 51 3B A5 C0
SLOT 5/0: May 10 10:13:48.264 CET: 0x0240: 98 DA 80 2B 53 26 42 FA 6A 11 9F 6D 16 6F 76 F8
SLOT 5/0: May 10 10:13:48.264 CET: 0x0250: 9A F3 81 53 E8 DB EF 22 DF AC 3F 57 78 0E 70 78
SLOT 5/0: May 10 10:13:48.264 CET: 0x0260: 07 30 1D FF 19 70 34 E5 7A 52 47 99 B0 EE 7F EA
SLOT 5/0: May 10 10:13:48.264 CET: 0x0270: 23 99 DF CB 72 FF 0D BE AB 68 20 9F 16 C0 7C 69
SLOT 5/0: May 10 10:13:48.264 CET: 0x0280: 88 2D 00 6A AF 4B FF 93 A5 07 D3 F2 A8 F9 5B C4
```


SLOT 5/0: May 10 10:13:48.264 CET: 0x0290: DD 9F BF 49 36 C4 12 8A 64 C8 35 41 BB E2 B9 9B
SLOT 5/0: May 10 10:13:48.264 CET: 0x02A0: 52 45 67 38 DC 92 55 E3 33 A4 70 68 FC E7 6E 54
SLOT 5/0: May 10 10:13:48.264 CET: 0x02B0: 96 CA 89 B4 65 8B 2C AA 58 24 FC 4D 68 D7 84 4E
SLOT 5/0: May 10 10:13:48.264 CET: 0x02C0: 36 3B B3 CA 9A 42 13 B1 FF 8C 66 D8 52 10 56 74
SLOT 5/0: May 10 10:13:48.264 CET: 0x02D0: C7 DD 58 C3 EE 9D E3 65 E6 C1 5D B9 75 C2 A8 C9
SLOT 5/0: May 10 10:13:48.264 CET: 0x02E0: 54 5B A1 85 38 3B E1 E1 DC 55 5D 3E DD 90 ED F8
SLOT 5/0: May 10 10:13:48.264 CET: 0x02F0: 3A B0 68 93 E9 4A C2 D4 7F DC 90 E3 86 E2 CF C3
SLOT 5/0: May 10 10:13:48.264 CET: 0x0300: F2 A3 92 84 B3 A3 9A F8 71 30 F8 24 71 C2 07 BD
SLOT 5/0: May 10 10:13:48.264 CET: 0x0310: E8 6C 3C F7 FC 82 08 86 84 84 1B C4 D8 97 D3 50
SLOT 5/0: May 10 10:13:48.264 CET: 0x0320: 59 72 2D D5 4C 0B
SLOT 5/0: May 10 10:13:48.264 CET: Found existing manufacturer certificate for a84e.3fdd.84c4
with subject cn=Hitron Technologies Cable Modem Root Certificate Authority,ou=Euro-
DOCSIS,o=Hitron Technologies,c=TW
SLOT 5/0: May 10 10:13:48.264 CET: BPI: setting a84e.3fdd.84c4 caidx:3

SLOT 5/0: May 10 10:13:48.264 CET: Mfg serial no. from a84e.3fdd.84c4 certificate:
4364B550E8ED7EE557145AC0A26752EC
SLOT 5/0: May 10 10:13:48.264 CET: Finger print of a84e.3fdd.84c4 manufacturer certificate
matched.
SLOT 5/0: May 10 10:13:48.264 CET: cr10k_clc_snmp_bpplus_broadcast_cert() CA idx:3
state:Chained rowStatus:Active prov:0 len:1078 idx:3 state:Chained rowState:Active prov:0
learn:1 idx:3
SLOT 5/0: May 10 10:13:48.268 CET: BPI: Sent CA Cert to RP successfully.
SLOT 5/0: May 10 10:13:48.268 CET: Success in validating AUTH Info message from a84e.3fdd.84c4.
SLOT 5/0: May 10 10:13:48.268 CET: CMTS Received AUTH REQ from a84e.3fdd.84c4.
SLOT 5/0: May 10 10:13:48.268 CET: BPI Authorization Request Packet: a84e.3fdd.84c4
SLOT 5/0: May 10 10:13:48.268 CET: BPKM Attributes: a84e.3fdd.84c4
SLOT 5/0: May 10 10:13:48.268 CET: Found COMPOUND CM Identification (length = 173):
SLOT 5/0: May 10 10:13:48.268 CET: Found Serial Number (length = 12):
32353331 36433030 38303433
SLOT 5/0: May 10 10:13:48.268 CET: Found Manufacturer ID (length = 3):
0050F1
SLOT 5/0: May 10 10:13:48.268 CET: Found MAC Address (length = 6):
A84E3FDD 84C4
SLOT 5/0: May 10 10:13:48.268 CET: Found RSA Public Key (length = 140):
SLOT 5/0: May 10 10:13:48.268 CET: 30818902 818100B0 D4F2B649 87FCE340
SLOT 5/0: May 10 10:13:48.268 CET: B21FB1E0 8CFE04DD DB3D05D5 34170886
SLOT 5/0: May 10 10:13:48.268 CET: 7623EE25 4E4A61FC 6D134830 55F402CF
SLOT 5/0: May 10 10:13:48.268 CET: 89B11B34 867B3EF7 D9FE6CBE 8B4C251F
SLOT 5/0: May 10 10:13:48.268 CET: DA5A2E47 D65C2120 8EFC72E2 238D5443
SLOT 5/0: May 10 10:13:48.268 CET: 786F151A A7FE6C21 371957DD 3FEB8435
SLOT 5/0: May 10 10:13:48.268 CET: 8AA1B7A2 181DAF7A 4F7DD4E9 128D953C
SLOT 5/0: May 10 10:13:48.268 CET: 146B77F4 51A9F868 5D1A253F A9590AC0
SLOT 5/0: May 10 10:13:48.268 CET: F69D24DF 2B84C102 03010001
SLOT 5/0: May 10 10:13:48.268 CET: Found CM Certificate (length = 652):
SLOT 5/0: May 10 10:13:48.268 CET: 30820288 308201F1 A0030201 02020C41
SLOT 5/0: May 10 10:13:48.268 CET: 38344533 46444438 34433430 0D06092A
SLOT 5/0: May 10 10:13:48.268 CET: 864886F7 0D010105 05003081 81310B30
SLOT 5/0: May 10 10:13:48.268 CET: 09060355 04061302 5457311C 301A0603
SLOT 5/0: May 10 10:13:48.268 CET: 55040A13 13486974 726F6E20 54656368
SLOT 5/0: May 10 10:13:48.268 CET: 6E6F6C6F 67696573 310F300D 06035504
SLOT 5/0: May 10 10:13:48.268 CET: 0B130644 4F435349 53314330 41060355
SLOT 5/0: May 10 10:13:48.268 CET: 0403133A 48697472 6F6E2054 6563686E
SLOT 5/0: May 10 10:13:48.268 CET: 6F6C6F67 69657320 4361626C 65204D6F
SLOT 5/0: May 10 10:13:48.268 CET: 64656D20 526F6F74 20436572 74696669
SLOT 5/0: May 10 10:13:48.268 CET: 63617465 20417574 686F7269 7479301E
SLOT 5/0: May 10 10:13:48.268 CET: 170D3137 30313031 30303030 30305A17
SLOT 5/0: May 10 10:13:48.268 CET: 0D333631 32323832 33353935 395A3081
SLOT 5/0: May 10 10:13:48.268 CET: 86310B30 09060355 04061302 5457311C
SLOT 5/0: May 10 10:13:48.268 CET: 301A0603 55040A13 13486974 726F6E20
SLOT 5/0: May 10 10:13:48.268 CET: 54656368 6E6F6C6F 67696573 313D303B
SLOT 5/0: May 10 10:13:48.268 CET: 06035504 0B13344E 6F2E2034 302C2057
SLOT 5/0: May 10 10:13:48.268 CET: 752D6B75 6E672035 74682052 642E2C20
SLOT 5/0: May 10 10:13:48.268 CET: 57752D6B 752C2054 61697065 69204873

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SLOT 5/0: May 10 10:13:48.268 CET: 69656E2C 20546169 77616E31 1A301806
SLOT 5/0: May 10 10:13:48.268 CET: 03550403 13114138 3A34453A 33463A44
SLOT 5/0: May 10 10:13:48.268 CET: 443A3834 3A433430 819F300D 06092A86
SLOT 5/0: May 10 10:13:48.268 CET: 4886F70D 01010105 0003818D 00308189
SLOT 5/0: May 10 10:13:48.268 CET: 02818100 B0D4F2B6 4987FCE3 40B21FB1
SLOT 5/0: May 10 10:13:48.268 CET: E08CFE04 DDD3D05 D5341708 867623EE
SLOT 5/0: May 10 10:13:48.268 CET: 254E4A61 FC6D1348 3055F402 CF89B11B
SLOT 5/0: May 10 10:13:48.268 CET: 34867B3E F7D9FE6C BE8B4C25 1FDA5A2E
SLOT 5/0: May 10 10:13:48.268 CET: 47D65C21 208EFC72 E2238D54 43786F15
SLOT 5/0: May 10 10:13:48.268 CET: 1AA7FE6C 21371957 DD3FEB84 358AA1B7
SLOT 5/0: May 10 10:13:48.268 CET: A2181DAF 7A4F7DD4 E9128D95 3C146B77
SLOT 5/0: May 10 10:13:48.268 CET: F451A9F8 685D1A25 3FA9590A C0F69D24
SLOT 5/0: May 10 10:13:48.268 CET: DF2B84C1 02030100 01300D06 092A8648
SLOT 5/0: May 10 10:13:48.268 CET: 86F70D01 01050500 03818100 08DFC2DA
SLOT 5/0: May 10 10:13:48.268 CET: 8C3ECCDA 98289410 E1B8657A 9A3F220D
SLOT 5/0: May 10 10:13:48.268 CET: AE368029 0E89923F 0DF09E06 8142BAB7
SLOT 5/0: May 10 10:13:48.268 CET: E8A6D5B3 6D7604FF 6A07A8B8 409D0B0B
SLOT 5/0: May 10 10:13:48.268 CET: 6D568AF4 F9395199 AB54126C E9C22F1B
SLOT 5/0: May 10 10:13:48.268 CET: 6390543A 3B67EFB8 FCF0E755 F642E1E0
SLOT 5/0: May 10 10:13:48.268 CET: 273A3853 F4DDBFF1 391E63CE 8BB7BBC0
SLOT 5/0: May 10 10:13:48.268 CET: 8AFC59FC 767C3FA5 A5EB255C 8878F4AB
SLOT 5/0: May 10 10:13:48.272 CET: 63665AA9 CDCF779A 3DFE0C4C
SLOT 5/0: May 10 10:13:48.272 CET: Found COMPOUND SA Capabilities (length = 13):
SLOT 5/0: May 10 10:13:48.272 CET: Found Crypto Suite List (length = 6):
SLOT 5/0: May 10 10:13:48.272 CET: 01000200 0300
SLOT 5/0: May 10 10:13:48.272 CET: Found BPI Version (length = 1):
SLOT 5/0: May 10 10:13:48.272 CET: 01
SLOT 5/0: May 10 10:13:48.272 CET: Found SAID (length = 2):
SLOT 5/0: May 10 10:13:48.272 CET: 0000
SLOT 5/0: May 10 10:13:48.272 CET: END BPKM Attributes: a84e.3fdd.84c4
SLOT 5/0: May 10 10:13:48.272 CET: Get a CM Certificate.
SLOT 5/0: May 10 10:13:48.272 CET: Cable5/0/12: Auth-Req contains 1 SID(s).
SLOT 5/0: May 10 10:13:48.272 CET: Cable5/0/12: AuthReq with NULL SAID - D3.0 modem.
SLOT 5/0: May 10 10:13:48.272 CET: EAE_BPI_REQ: DISABLE a84e.3fdd.84c4 - OK
SLOT 5/0: May 10 10:13:48.272 CET: BPI_AES: Encryption priority is: aes128-des56-des40.
SLOT 5/0: May 10 10:13:48.272 CET: BPI_AES: AES is a candidate.
SLOT 5/0: May 10 10:13:48.272 CET: BPI Crypto Algorithm: sid:0 cfg_mod:1, cm_cap:0x7, assigned:3
aes_support:1
SLOT 5/0: May 10 10:13:48.272 CET: CMTS generated AUTH_KEY.
SLOT 5/0: May 10 10:13:48.272 CET: CMTS received 0 as primary SAID - D3.0
SLOT 5/0: May 10 10:13:48.272 CET: CM state:2050 MAC:a84e.3fdd.84c4
SLOT 5/0: May 10 10:13:48.272 CET: Parsed/Matched MAC Address:a84e.3fdd.84c4
SLOT 5/0: May 10 10:13:48.272 CET: Got Issuer 0^A^A1^K0 ^F^CU^D^F^S^BTW1^\0^Z^F^CU^D
^S^SHitron Technologies1^00
^F^CU^D^K^S^FDOCISIS1C0A^F^CU^D^C^S:Hitron Technologies Cable Modem Root Certificate Authority
from Certificate.
SLOT 5/0: May 10 10:13:48.272 CET: Got a new Invalid CM cert from a84e.3fdd.84c4
SLOT 5/0: May 10 10:13:48.272 CET: CA Cert Subject does not match CM Cert Issuer

```

Сохраните этот filewith название **cmcert.txt** .

Задача 3. Подготовьте Файл к ххд Утилите

XXD является утилитой Linux/Mac, которая позволяет преобразовывать шестнадцатеричный дамп в двоичный файл и наоборот. XXD нужны данные в шестнадцатеричном виде для имени определенного заголовка линии для работы. Используйте следующий сценарий питона, который добавляет необходимый заголовок:

```

SLOT 5/0: May 10 10:13:48.260 CET: BPI+ Manufacturer Cert Dump: a84e.3fdd.84c4
SLOT 5/0: May 10 10:13:48.260 CET: CA Certificate Dump:

```

SLOT 5/0: May 10 10:13:48.260 CET: 0x0000: 30 82 03 22 30 82 02 0A A0 03 02 01 02 02 10 43
SLOT 5/0: May 10 10:13:48.260 CET: 0x0010: 64 B5 50 E8 ED 7E E5 57 14 5A C0 A2 67 52 EC 30
SLOT 5/0: May 10 10:13:48.260 CET: 0x0020: 0D 06 09 2A 86 48 86 F7 0D 01 01 05 05 00 30 6F
SLOT 5/0: May 10 10:13:48.260 CET: 0x0030: 31 0B 30 09 06 03 55 04 06 13 02 42 45 31 1F 30
SLOT 5/0: May 10 10:13:48.260 CET: 0x0040: 1D 06 03 55 04 0A 13 16 74 43 6F 6D 4C 61 62 73
SLOT 5/0: May 10 10:13:48.260 CET: 0x0050: 20 2D 20 45 75 72 6F 2D 44 4F 43 53 49 53 31 15
SLOT 5/0: May 10 10:13:48.260 CET: 0x0060: 30 13 06 03 55 04 0B 13 0C 43 61 62 6C 65 20 4D
SLOT 5/0: May 10 10:13:48.260 CET: 0x0070: 6F 64 65 6D 73 31 28 30 26 06 03 55 04 03 13 1F
SLOT 5/0: May 10 10:13:48.260 CET: 0x0080: 45 75 72 6F 2D 44 4F 43 53 49 53 20 43 61 62 6C
SLOT 5/0: May 10 10:13:48.260 CET: 0x0090: 65 20 4D 6F 64 65 6D 20 52 6F 6F 74 20 43 41 30
SLOT 5/0: May 10 10:13:48.260 CET: 0x00A0: 1E 17 0D 30 34 30 38 31 33 30 30 30 30 30 5A
SLOT 5/0: May 10 10:13:48.260 CET: 0x00B0: 17 0D 32 34 30 38 31 32 32 33 35 39 35 39 5A 30
SLOT 5/0: May 10 10:13:48.260 CET: 0x00C0: 81 86 31 0B 30 09 06 03 55 04 06 13 02 54 57 31
SLOT 5/0: May 10 10:13:48.260 CET: 0x00D0: 1C 30 1A 06 03 55 04 0A 13 13 48 69 74 72 6F 6E
SLOT 5/0: May 10 10:13:48.260 CET: 0x00E0: 20 54 65 63 68 6E 6F 6C 6F 67 69 65 73 31 14 30
SLOT 5/0: May 10 10:13:48.260 CET: 0x00F0: 12 06 03 55 04 0B 13 0B 45 75 72 6F 2D 44 4F 43
SLOT 5/0: May 10 10:13:48.260 CET: 0x0100: 53 49 53 31 43 30 41 06 03 55 04 03 13 3A 48 69
SLOT 5/0: May 10 10:13:48.260 CET: 0x0110: 74 72 6F 6E 20 54 65 63 68 6E 6F 6C 6F 67 69 65
SLOT 5/0: May 10 10:13:48.260 CET: 0x0120: 73 20 43 61 62 6C 65 20 4D 6F 64 65 6D 20 52 6F
SLOT 5/0: May 10 10:13:48.260 CET: 0x0130: 6F 74 20 43 65 72 74 69 66 69 63 61 74 65 20 41
SLOT 5/0: May 10 10:13:48.260 CET: 0x0140: 75 74 68 6F 72 69 74 79 30 81 9F 30 0D 06 09 2A
SLOT 5/0: May 10 10:13:48.260 CET: 0x0150: 86 48 86 F7 0D 01 01 01 05 00 03 81 8D 00 30 81
SLOT 5/0: May 10 10:13:48.260 CET: 0x0160: 89 02 81 81 00 B8 47 DA 9D F1 F6 30 1B 8E 79 BE
SLOT 5/0: May 10 10:13:48.260 CET: 0x0170: BE 10 C3 2D 9F 7D D6 C7 B2 50 16 AB 85 5C 1C 8C
SLOT 5/0: May 10 10:13:48.260 CET: 0x0180: 9E 6B F7 15 60 B2 53 F4 2F 6D 49 0C 2C 3E 76 88
SLOT 5/0: May 10 10:13:48.260 CET: 0x0190: 8A 8A 23 6B 25 47 61 AE B9 DF A8 A7 8C 4D 51 FB
SLOT 5/0: May 10 10:13:48.260 CET: 0x01A0: E6 C2 0F D9 C7 27 DD F7 D8 CC F0 D8 70 F8 75 75
SLOT 5/0: May 10 10:13:48.260 CET: 0x01B0: F3 D8 B7 80 C2 36 B0 53 02 A4 E9 84 02 5F 66 AE
SLOT 5/0: May 10 10:13:48.260 CET: 0x01C0: E7 59 9A 17 4A A0 B1 B4 BA F3 3B 63 C4 75 05 11
SLOT 5/0: May 10 10:13:48.260 CET: 0x01D0: 40 F1 EB B3 C8 A0 E8 AD 6E 1B 59 CC 41 20 F8 94
SLOT 5/0: May 10 10:13:48.260 CET: 0x01E0: B3 94 23 A2 99 02 03 01 00 01 A3 26 30 24 30 12
SLOT 5/0: May 10 10:13:48.260 CET: 0x01F0: 06 03 55 1D 13 01 01 FF 04 08 30 06 01 01 FF 02
SLOT 5/0: May 10 10:13:48.264 CET: 0x0200: 01 00 30 0E 06 03 55 1D 0F 01 01 FF 04 04 03 02
SLOT 5/0: May 10 10:13:48.264 CET: 0x0210: 01 06 30 0D 06 09 2A 86 48 86 F7 0D 01 01 05 05
SLOT 5/0: May 10 10:13:48.264 CET: 0x0220: 00 03 82 01 01 00 09 DB 24 B9 46 76 D7 D0 9F 70
SLOT 5/0: May 10 10:13:48.264 CET: 0x0230: 86 59 ED 7F 9B AC 96 FD AE 19 DD B3 51 3B A5 C0
SLOT 5/0: May 10 10:13:48.264 CET: 0x0240: 98 DA 80 2B 53 26 42 FA 6A 11 9F 6D 16 6F 76 F8
SLOT 5/0: May 10 10:13:48.264 CET: 0x0250: 9A F3 81 53 E8 DB EF 22 DF AC 3F 57 78 0E 70 78
SLOT 5/0: May 10 10:13:48.264 CET: 0x0260: 07 30 1D FF 19 70 34 E5 7A 52 47 99 B0 EE 7F EA
SLOT 5/0: May 10 10:13:48.264 CET: 0x0270: 23 99 DF CB 72 FF 0D BE AB 68 20 9F 16 C0 7C 69
SLOT 5/0: May 10 10:13:48.264 CET: 0x0280: 88 2D 00 6A AF 4B FF 93 A5 07 D3 F2 A8 F9 5B C4
SLOT 5/0: May 10 10:13:48.264 CET: 0x0290: DD 9F BF 49 36 C4 12 8A 64 C8 35 41 BB E2 B9 9B
SLOT 5/0: May 10 10:13:48.264 CET: 0x02A0: 52 45 67 38 DC 92 55 E3 33 A4 70 68 FC E7 6E 54
SLOT 5/0: May 10 10:13:48.264 CET: 0x02B0: 96 CA 89 B4 65 8B 2C AA 58 24 FC 4D 68 D7 84 4E
SLOT 5/0: May 10 10:13:48.264 CET: 0x02C0: 36 3B B3 CA 9A 42 13 B1 FF 8C 66 D8 52 10 56 74
SLOT 5/0: May 10 10:13:48.264 CET: 0x02D0: C7 DD 58 C3 EE 9D E3 65 E6 C1 5D B9 75 C2 A8 C9
SLOT 5/0: May 10 10:13:48.264 CET: 0x02E0: 54 5B A1 85 38 3B E1 E1 DC 55 5D 3E DD 90 ED F8
SLOT 5/0: May 10 10:13:48.264 CET: 0x02F0: 3A B0 68 93 E9 4A C2 D4 7F DC 90 E3 86 E2 CF C3
SLOT 5/0: May 10 10:13:48.264 CET: 0x0300: F2 A3 92 84 B3 A3 9A F8 71 30 F8 24 71 C2 07 BD
SLOT 5/0: May 10 10:13:48.264 CET: 0x0310: E8 6C 3C F7 FC 82 08 86 84 84 1B C4 D8 97 D3 50
SLOT 5/0: May 10 10:13:48.264 CET: 0x0320: 59 72 2D D5 4C 0B

SLOT 5/0: May 10 10:13:48.264 CET: Found existing manufacturer certificate for a84e.3fdd.84c4 with subject cn=Hitron Technologies Cable Modem Root Certificate Authority,ou=Euro-DOCSIS,o=Hitron Technologies,c=TW

SLOT 5/0: May 10 10:13:48.264 CET: BPI: setting a84e.3fdd.84c4 caidx:3

SLOT 5/0: May 10 10:13:48.264 CET: Mfg serial no. from a84e.3fdd.84c4 certificate: 4364B550E8ED7EE557145AC0A26752EC

SLOT 5/0: May 10 10:13:48.264 CET: Finger print of a84e.3fdd.84c4 manufacturer certificate matched.

SLOT 5/0: May 10 10:13:48.264 CET: crl0k_clc_snmp_bpiplus_broadcast_cert() CA idx:3 state:Chained rowStatus:Active prov:0 len:1078 idx:3 state:Chained rowState:Active prov:0 learn:1 idx:3

SLOT 5/0: May 10 10:13:48.268 CET: BPI: Sent CA Cert to RP successfully.

SLOT 5/0: May 10 10:13:48.268 CET: Success in validating AUTH Info message from a84e.3fdd.84c4.
SLOT 5/0: May 10 10:13:48.268 CET: CMTS Received AUTH REQ from a84e.3fdd.84c4.
SLOT 5/0: May 10 10:13:48.268 CET: BPI Authorization Request Packet: a84e.3fdd.84c4
SLOT 5/0: May 10 10:13:48.268 CET: BPKM Attributes: a84e.3fdd.84c4
SLOT 5/0: May 10 10:13:48.268 CET: Found COMPOUND CM Identification (length = 173):
SLOT 5/0: May 10 10:13:48.268 CET: Found Serial Number (length = 12):
SLOT 5/0: May 10 10:13:48.268 CET: 32353331 36433030 38303433
SLOT 5/0: May 10 10:13:48.268 CET: Found Manufacturer ID (length = 3):
SLOT 5/0: May 10 10:13:48.268 CET: 0050F1
SLOT 5/0: May 10 10:13:48.268 CET: Found MAC Address (length = 6):
SLOT 5/0: May 10 10:13:48.268 CET: A84E3FDD 84C4
SLOT 5/0: May 10 10:13:48.268 CET: Found RSA Public Key (length = 140):
SLOT 5/0: May 10 10:13:48.268 CET: 30818902 818100B0 D4F2B649 87FCE340
SLOT 5/0: May 10 10:13:48.268 CET: B21FB1E0 8CFE04DD DB3D05D5 34170886
SLOT 5/0: May 10 10:13:48.268 CET: 7623EE25 4E4A61FC 6D134830 55F402CF
SLOT 5/0: May 10 10:13:48.268 CET: 89B11B34 867B3EF7 D9FE6CBE 8B4C251F
SLOT 5/0: May 10 10:13:48.268 CET: DA5A2E47 D65C2120 8EFC72E2 238D5443
SLOT 5/0: May 10 10:13:48.268 CET: 786F151A A7FE6C21 371957DD 3FEB8435
SLOT 5/0: May 10 10:13:48.268 CET: 8AA1B7A2 181DAF7A 4F7DD4E9 128D953C
SLOT 5/0: May 10 10:13:48.268 CET: 146B77F4 51A9F868 5D1A253F A9590AC0
SLOT 5/0: May 10 10:13:48.268 CET: F69D24DF 2B84C102 03010001
SLOT 5/0: May 10 10:13:48.268 CET: Found CM Certificate (length = 652):
SLOT 5/0: May 10 10:13:48.268 CET: 30820288 308201F1 A0030201 02020C41
SLOT 5/0: May 10 10:13:48.268 CET: 38344533 46444438 34433430 0D06092A
SLOT 5/0: May 10 10:13:48.268 CET: 864886F7 0D010105 05003081 81310B30
SLOT 5/0: May 10 10:13:48.268 CET: 09060355 04061302 5457311C 301A0603
SLOT 5/0: May 10 10:13:48.268 CET: 55040A13 13486974 726F6E20 54656368
SLOT 5/0: May 10 10:13:48.268 CET: 6E6F6C6F 67696573 310F300D 06035504
SLOT 5/0: May 10 10:13:48.268 CET: 0B130644 4F435349 53314330 41060355
SLOT 5/0: May 10 10:13:48.268 CET: 0403133A 48697472 6F6E2054 6563686E
SLOT 5/0: May 10 10:13:48.268 CET: 6F6C6F67 69657320 4361626C 65204D6F
SLOT 5/0: May 10 10:13:48.268 CET: 64656D20 526F6F74 20436572 74696669
SLOT 5/0: May 10 10:13:48.268 CET: 63617465 20417574 686F7269 7479301E
SLOT 5/0: May 10 10:13:48.268 CET: 170D3137 30313031 30303030 30305A17
SLOT 5/0: May 10 10:13:48.268 CET: 0D333631 32323832 33353935 395A3081
SLOT 5/0: May 10 10:13:48.268 CET: 86310B30 09060355 04061302 5457311C
SLOT 5/0: May 10 10:13:48.268 CET: 301A0603 55040A13 13486974 726F6E20
SLOT 5/0: May 10 10:13:48.268 CET: 54656368 6E6F6C6F 67696573 313D303B
SLOT 5/0: May 10 10:13:48.268 CET: 06035504 0B13344E 6F2E2034 302C2057
SLOT 5/0: May 10 10:13:48.268 CET: 752D6B75 6E672035 74682052 642E2C20
SLOT 5/0: May 10 10:13:48.268 CET: 57752D6B 752C2054 61697065 69204873
SLOT 5/0: May 10 10:13:48.268 CET: 69656E2C 20546169 77616E31 1A301806
SLOT 5/0: May 10 10:13:48.268 CET: 03550403 13114138 3A34453A 33463A44
SLOT 5/0: May 10 10:13:48.268 CET: 443A3834 3A433430 819F300D 06092A86
SLOT 5/0: May 10 10:13:48.268 CET: 4886F70D 01010105 0003818D 00308189
SLOT 5/0: May 10 10:13:48.268 CET: 02818100 B0D4F2B6 4987FCE3 40B21FB1
SLOT 5/0: May 10 10:13:48.268 CET: E08CFE04 DDBB3D05 D5341708 867623EE
SLOT 5/0: May 10 10:13:48.268 CET: 254E4A61 FC6D1348 3055F402 CF89B11B
SLOT 5/0: May 10 10:13:48.268 CET: 34867B3E F7D9FE6C BE8B4C25 1FDA5A2E
SLOT 5/0: May 10 10:13:48.268 CET: 47D65C21 208EFC72 E2238D54 43786F15
SLOT 5/0: May 10 10:13:48.268 CET: 1AA7FE6C 21371957 DD3FEB84 358AA1B7
SLOT 5/0: May 10 10:13:48.268 CET: A2181DAF 7A4F7DD4 E9128D95 3C146B77
SLOT 5/0: May 10 10:13:48.268 CET: F451A9F8 685D1A25 3FA9590A C0F69D24
SLOT 5/0: May 10 10:13:48.268 CET: DF2B84C1 02030100 01300D06 092A8648
SLOT 5/0: May 10 10:13:48.268 CET: 86F70D01 01050500 03818100 08DFC2DA
SLOT 5/0: May 10 10:13:48.268 CET: 8C3ECCDA 98289410 E1B8657A 9A3F220D
SLOT 5/0: May 10 10:13:48.268 CET: AE368029 0E89923F 0DF09E06 8142BAB7
SLOT 5/0: May 10 10:13:48.268 CET: E8A6D5B3 6D7604FF 6A07A8B8 409D0B0B
SLOT 5/0: May 10 10:13:48.268 CET: 6D568AF4 F9395199 AB54126C E9C22F1B
SLOT 5/0: May 10 10:13:48.268 CET: 6390543A 3B67EFB8 FCF0E755 F642E1E0
SLOT 5/0: May 10 10:13:48.268 CET: 273A3853 F4DDBFF1 391E63CE 8BB7BBC0
SLOT 5/0: May 10 10:13:48.268 CET: 8AFC59FC 767C3FA5 A5EB255C 8878F4AB
SLOT 5/0: May 10 10:13:48.272 CET: 63665AA9 CDCF779A 3DFE0C4C
SLOT 5/0: May 10 10:13:48.272 CET: Found COMPOUND SA Capabilities (length = 13):

```

SLOT 5/0: May 10 10:13:48.272 CET: Found Crypto Suite List (length = 6):
SLOT 5/0: May 10 10:13:48.272 CET: 01000200 0300
SLOT 5/0: May 10 10:13:48.272 CET: Found BPI Version (length = 1):
SLOT 5/0: May 10 10:13:48.272 CET: 01
SLOT 5/0: May 10 10:13:48.272 CET: Found SAID (length = 2):
SLOT 5/0: May 10 10:13:48.272 CET: 0000
SLOT 5/0: May 10 10:13:48.272 CET: END BPKM Attributes: a84e.3fdd.84c4
SLOT 5/0: May 10 10:13:48.272 CET: Get a CM Certificate.
SLOT 5/0: May 10 10:13:48.272 CET: Cable5/0/12: Auth-Req contains 1 SID(s).
SLOT 5/0: May 10 10:13:48.272 CET: Cable5/0/12: AuthReq with NULL SAID - D3.0 modem.
SLOT 5/0: May 10 10:13:48.272 CET: EAE_BPI_REQ: DISABLE a84e.3fdd.84c4 - OK
SLOT 5/0: May 10 10:13:48.272 CET: BPI_AES: Encryption priority is: aes128-des56-des40.
SLOT 5/0: May 10 10:13:48.272 CET: BPI_AES: AES is a candidate.
SLOT 5/0: May 10 10:13:48.272 CET: BPI Crypto Algorithm: sid:0 cfg_mod:1, cm_cap:0x7, assigned:3
aes_support:1
SLOT 5/0: May 10 10:13:48.272 CET: CMTS generated AUTH_KEY.
SLOT 5/0: May 10 10:13:48.272 CET: CMTS received 0 as primary SAID - D3.0
SLOT 5/0: May 10 10:13:48.272 CET: CM state:2050 MAC:a84e.3fdd.84c4
SLOT 5/0: May 10 10:13:48.272 CET: Parsed/Matched MAC Address:a84e.3fdd.84c4
SLOT 5/0: May 10 10:13:48.272 CET: Got Issuer 0^A^A1^K0 ^F^CU^D^F^S^BTW1^\0^Z^F^CU^D
^S^SHitron Technologies1^00
^F^CU^D^K^S^FDOCSIS1C0A^F^CU^D^C^S:Hitron Technologies Cable Modem Root Certificate Authority
from Certificate.
SLOT 5/0: May 10 10:13:48.272 CET: Got a new Invalid CM cert from a84e.3fdd.84c4
SLOT 5/0: May 10 10:13:48.272 CET: CA Cert Subject does not match CM Cert Issuer

```

Задача 4. Преобразуйте сертификаты от Hexdump до двоичного формата

Выполните эту команду для преобразования сертификата CA.

```
python3.5 addoffset.py cacert.txt | xxd -r > cacert.crt
```

Выполните эту команду для преобразования сертификата CM.

```
python3.5 addoffset.py cmcert.txt | xxd -r > cmcert.crt
```

Эти генерируемые файлы CRT теперь могут быть проверены для любого несоответствия.

Задача 5. Сертификаты анализа

Для чтения, файлы используют или с Openssl или с Keychain utility.

Пример с openssl утилитой для сертификата CA.

```

TVANEGRO-M-N1QP:Desktop tvanegro$ openssl x509 -inform der -in cacert.crt -noout -text
Certificate:
Data:
Version: 3 (0x2)
Serial Number:
43:64:b5:50:e8:ed:7e:e5:57:14:5a:c0:a2:67:52:ec
Signature Algorithm: sha1WithRSAEncryption
Issuer: C=BE, O=tComLabs - Euro-DOCSIS, OU=Cable Modems, CN=Euro-DOCSIS Cable Modem Root CA
Validity
Not Before: Aug 13 00:00:00 2004 GMT
Not After : Aug 12 23:59:59 2024 GMT
Subject: C=TW, O=Hitron Technologies, OU=Euro-DOCSIS, CN=Hitron Technologies Cable Modem Root
Certificate Authority
Subject Public Key Info:
Public Key Algorithm: rsaEncryption
RSA Public Key: (1024 bit)
Modulus (1024 bit):
00:b8:47:da:9d:f1:f6:30:1b:8e:79:be:be:10:c3:

```

```
2d:9f:7d:d6:c7:b2:50:16:ab:85:5c:1c:8c:9e:6b:
f7:15:60:b2:53:f4:2f:6d:49:0c:2c:3e:76:88:8a:
8a:23:6b:25:47:61:ae:b9:df:a8:a7:8c:4d:51:fb:
e6:c2:0f:d9:c7:27:dd:f7:d8:cc:f0:d8:70:f8:75:
75:f3:d8:b7:80:c2:36:b0:53:02:a4:e9:84:02:5f:
66:ae:e7:59:9a:17:4a:a0:b1:b4:ba:f3:3b:63:c4:
75:05:11:40:f1:eb:b3:c8:a0:e8:ad:6e:1b:59:cc:
41:20:f8:94:b3:94:23:a2:99
Exponent: 65537 (0x10001)
X509v3 extensions:
X509v3 Basic Constraints: critical
CA:TRUE, pathlen:0
X509v3 Key Usage: critical
Certificate Sign, CRL Sign
Signature Algorithm: sha1WithRSAEncryption
09:db:24:b9:46:76:d7:d0:9f:70:86:59:ed:7f:9b:ac:96:fd:
ae:19:dd:b3:51:3b:a5:c0:98:da:80:2b:53:26:42:fa:6a:11:
9f:6d:16:6f:76:f8:9a:f3:81:53:e8:db:ef:22:df:ac:3f:57:
78:0e:70:78:07:30:1d:ff:19:70:34:e5:7a:52:47:99:b0:ee:
7f:ea:23:99:df:cb:72:ff:0d:be:ab:68:20:9f:16:c0:7c:69:
88:2d:00:6a:af:4b:ff:93:a5:07:d3:f2:a8:f9:5b:c4:dd:9f:
bf:49:36:c4:12:8a:64:c8:35:41:bb:e2:b9:9b:52:45:67:38:
dc:92:55:e3:33:a4:70:68:fc:e7:6e:54:96:ca:89:b4:65:8b:
2c:aa:58:24:fc:4d:68:d7:84:4e:36:3b:b3:ca:9a:42:13:b1:
ff:8c:66:d8:52:10:56:74:c7:dd:58:c3:ee:9d:e3:65:e6:c1:
5d:b9:75:c2:a8:c9:54:5b:a1:85:38:3b:e1:e1:dc:55:5d:3e:
dd:90:ed:f8:3a:b0:68:93:e9:4a:c2:d4:7f:dc:90:e3:86:e2:
cf:c3:f2:a3:92:84:b3:a3:9a:f8:71:30:f8:24:71:c2:07:bd:
e8:6c:3c:f7:fc:82:08:86:84:84:1b:c4:d8:97:d3:50:59:72:
2d:d5:4c:0b
```

Пример с openssl утилитой для сертификата CM.

```
TVANEGRO-M-N1QP:Desktop tvanegro$ openssl x509 -inform der -in cmcert.crt -noout -text
Certificate:
Data:
Version: 3 (0x2)
Serial Number:
41:38:34:45:33:46:44:44:38:34:43:34
Signature Algorithm: sha1WithRSAEncryption
Issuer: C=TW, O=Hitron Technologies, OU=DOCSIS, CN=Hitron Technologies Cable Modem Root
Certificate Authority
Validity
Not Before: Jan 1 00:00:00 2017 GMT
Not After : Dec 28 23:59:59 2036 GMT
Subject: C=TW, O=Hitron Technologies, OU=No. 40, Wu-kung 5th Rd., Wu-ku, Taipei Hsien, Taiwan,
CN=A8:4E:3F:DD:84:C4
Subject Public Key Info:
Public Key Algorithm: rsaEncryption
RSA Public Key: (1024 bit)
Modulus (1024 bit):
00:b0:d4:f2:b6:49:87:fc:e3:40:b2:1f:b1:e0:8c:
fe:04:dd:db:3d:05:d5:34:17:08:86:76:23:ee:25:
4e:4a:61:fc:6d:13:48:30:55:f4:02:cf:89:b1:1b:
34:86:7b:3e:f7:d9:fe:6c:be:8b:4c:25:1f:da:5a:
2e:47:d6:5c:21:20:8e:fc:72:e2:23:8d:54:43:78:
6f:15:1a:a7:fe:6c:21:37:19:57:dd:3f:eb:84:35:
8a:a1:b7:a2:18:1d:af:7a:4f:7d:d4:e9:12:8d:95:
3c:14:6b:77:f4:51:a9:f8:68:5d:1a:25:3f:a9:59:
0a:c0:f6:9d:24:df:2b:84:c1
Exponent: 65537 (0x10001)
Signature Algorithm: sha1WithRSAEncryption
08:df:c2:da:8c:3e:cc:da:98:28:94:10:e1:b8:65:7a:9a:3f:
22:0d:ae:36:80:29:0e:89:92:3f:0d:f0:9e:06:81:42:ba:b7:
```

e8:a6:d5:b3:6d:76:04:ff:6a:07:a8:b8:40:9d:0b:0b:6d:56:
8a:f4:f9:39:51:99:ab:54:12:6c:e9:c2:2f:1b:63:90:54:3a:
3b:67:ef:b8:fc:f0:e7:55:f6:42:e1:e0:27:3a:38:53:f4:dd:
bf:f1:39:1e:63:ce:8b:b7:bb:c0:8a:fc:59:fc:76:7c:3f:a5:
a5:eb:25:5c:88:78:f4:ab:63:66:5a:a9:cd:cf:77:9a:3d:fe:
0c:4c

Вы видите, что не совпадает OU = поле (**Organizational Unit**). В примере вы видите DOCSIS и EuroDOCSIS. Это - причина, почему CMTS отклоняет сертификат.

Можно использовать программное средство Цепочки для ключей в Mac OS для просмотра сертификатов.

