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| Videocon  Full CWE Compliance |
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# Preface

This document describes the steps to enable and test control word encryption (CWE) at Videocon.

## Applicability

ECMS\_SC 4.3.11

## Terminology

Table  2 provides a short glossary of any terms crucial to the understanding of this document, and lists the acronyms and abbreviations used in the document.

Table 1 Terminology

|  |  |
| --- | --- |
| Term | Definition |
| CWE | Control word encryption |
| ECM | Entitlement control message |
| STB | Set top box |

# Changes To The Headend

## Alter ECMS\_SC configuration

The file skeleton\_groups.cfg must be altered to allow for the CWE flag to be generated in the ECM.

* + 1. Note From the comments in the skeleton\_groups.cfg file:
    2. ;c2\_signal\_additional\_flag. bitmask: supported values are 0x00-0x03
    3. ;used for setting bits in C2
    4. ;0 - do not set any bits for signalling presence of additional flags
    5. ;0x01 - set bit in flags2 to signal presence of flag3
    6. ;0x02 - set bit in flags3 to signal presence of flag4
    7. ;0x03 - both 0x01&0x02.

To make the changes follow the steps below on each installation where ecms\_sc is running:

# cd /opt/nds/ecms\_sc/etc

# vi skeleton\_groups.cfg

;Change the value of c2\_signal\_additional\_flag=0x03

## Setting CWE level

The CWE level can be set per channel by putting a 0, 1 or 2 in the cell of the SSR database cell CAP.CA\_SCHED\_CONTROL.CWE\_LEVEL. If this cell is left with NULL (no value) then the CWE level is set by the value in the ecm\_builder.cfg file. The current relevant values are:

NBOOL CWE\_SUPPORTED = TRUE

USHORT CWE\_LEVEL = 1

NBOOL CWE\_OVERRIDE = FALSE

USHORT CWE\_OVERRIDE\_LEVEL = 0

If the CWE\_LEVEL cell is going to be left blank then make sure that the level is properly set in the ecm\_builder.cfg before it is restarted. Please set CWE\_LEVEL=0 in the ecm\_builder.cfg to begin which will make sure that all services begin with a known value and are viewable without CWE.

**REMEMBER:** Restart the ecms\_sc after making changes to the configuration files:

# nds\_service nds\_ecms\_sc restart

* + 1. Note Changing the CWE\_LEVEL cell in the SSR database does not require a restart of the ecms\_sc.

# Testing CWE

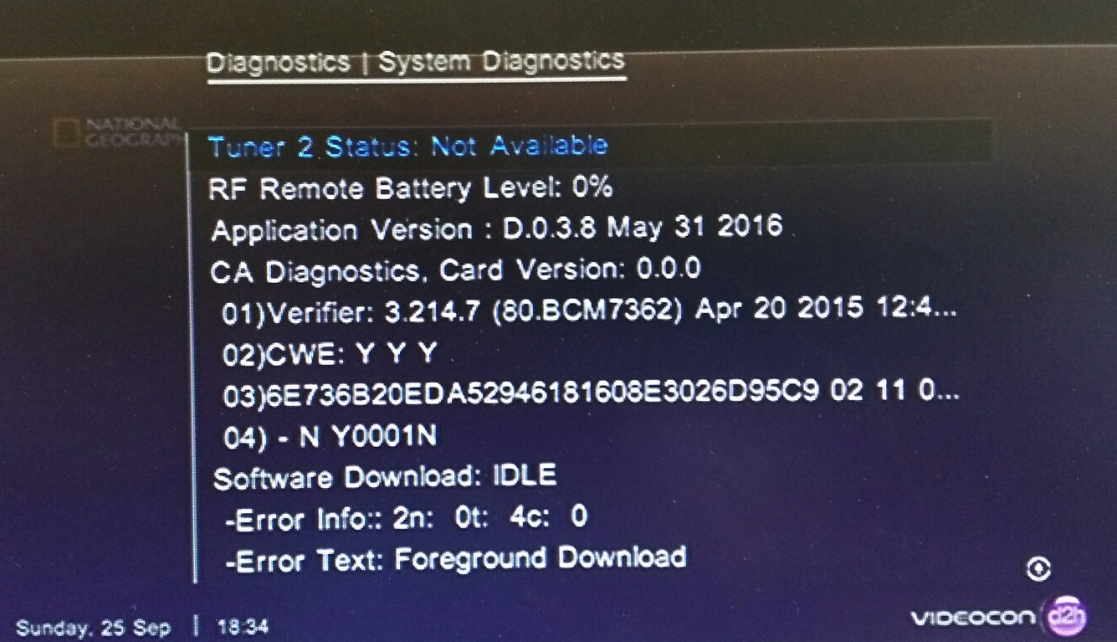
There are a number of indicators that will show that CWE is currently working and they should all be tested.

## CWE Diagnostics

On an STB that is **not** an MStar HD 6666-RF STB you should be able to see video on a service that is encrypted and has CWE level set to 2. You can verify that the STB is using CWE by going to the diagnostic screen on the STB:

Menu 🡪 Info 🡪 Diagnostics

Go to the 2nd screen and look for line with CWE where it should show the values **Y Y Y**. For example:



On an MStar HD 6666-RF that is running the previous code you may see a black screen even if the diagnostics are correct. On an MStar HD 6666-RF STB with the new code then video should be viewable.

## Verify the ECM

It is important to verify that the ECM that is being created for the test service is using CWE level 2 and that the ECM is formed correctly:

* + - * 1. Extract the clear ECMs from the log file:

# cd /opt/nds/ecms\_sc/log

# grep ‘Clear ecm’ ecms\_sc.`date +"%Y%m%d"`.log

Find the ECM for the service that you are interested in:

* + - * 1. Look for the service in hexadecimal in position 17-20 of the ECM. For example, looking for service ID 0x0004:

0000010B681963E40004 . . .

Parse the ECM to verify that the service is using CWE level 2:

* + - * 1. Find the 0x90 action:

. . . 901BC001C20840681963E4404002 . . .

Inside the 0x90 action is the 0xC2 which describes program related activity:

. . . 901BC001C20840681963E4404002 . . .

Verify that the flag byte 2 and 3 have bit 6 set and that flag 4 is set for CWE level 2:

. . . C20840681963E4404002 . . .

Flag byte 2 = 40 (01000000)

Flag byte 3 = 40 (01000000)

Flag byte 4 = 02

# Deployment Plan

The following are steps that can be used to deploy CWE at the customer site.

Deploy the new image for the MStar STB which solves the driver issue for CWE.

On the test system, follow these steps:

* + - * 1. Edit the ecm\_builder.cfg and skeleton\_groups.cfg in the ecms\_sc/etc directory as described in section ‎2.1 “Alter ECMS\_SC configuration”. Specifically:

skeleton\_groups.cfg: c2\_signal\_additional\_flag=0x03

ecm\_builder.cfg: CWE\_LEVEL=0

Restart the ecms\_sc:

# nds\_service nds\_ecms\_sc restart

Perform a factory reset on the test STB(s) to clear the previous CWE details.

Define the CWE level directly in the SSR table CAP.CA\_SCHED\_CONTROL.CWE\_LEVEL as 0, then 1 and then 2. Re-instantiate the event on that test service in table CAP.CA\_INST\_RQST by changing the STATUS cell to 0, saving the change (redisplay of the table will show it returns to status 5) after each change of the CWE\_LEVEL field. Watch the ECM change the value in “flag byte 4” and note the behavior of CWE on the STBs:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| CWE level | Description | ECM flag byte 4 | CWE diagnostics | STB results |
| 0 | No CWE | 0x00 | N Y Y | Video |
| 1 | CWE “if you can” | 0x01 | Y Y Y | Video |
| 2 | Forced CWE | 0x02 | Y Y Y | Video |

On the live system, follow these steps:

* + - * 1. Edit the ecm\_builder.cfg and skeleton\_groups.cfg in the ecms\_sc/etc directory as described in section ‎2.1 “Alter ECMS\_SC configuration”. Specifically:

skeleton\_groups.cfg: c2\_signal\_additional\_flag=0x03

ecm\_builder.cfg: CWE\_LEVEL=0

Restart the ecms\_sc:

# nds\_service nds\_ecms\_sc restart

Set the CWE level in CAP.CA\_SCHED\_CONTROL.CWE\_LEVEL as 1 and then re-instantiate the event in CAP.CA\_INST\_RQST on that service.

Note the behavior on the STB

Move that service to CWE level 2 and re-instantiate the event.

Note the behavior on the STB

Continue these steps for each service.