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1. INTRODUCTION

TR69C is a TR-069 implementation for the Broadcom STB platforms. It is also a Nexus multi-process application which uses NxClient and Nexus API's to query Nexus status. Please refer to NxClient.pdf for further details. Currently, TR-135 data model, SSL transport and ACS discovery are supported.

2. FEATURES SUPPORT

2.1 TR-135

The following TR-135 data objects and their attributes are currently supported.

STBService.{i}.Capabilities.AudioDecoder.

STBService.{i}.Capabilities.VideoDecoder.

STBService.{i}.Capabilities.VideoDecoder.MPEG2Part2.

STBService.{i}.Capabilities.VideoDecoder.MPEG2Part2.ProfileLevel.{i}.

STBService.{i}.Capabilities.VideoDecoder.MPEG4Part2.

STBService.{i}.Capabilities.VideoDecoder.MPEG4Part2.ProfileLevel.{i}.

STBService.{i}.Capabilities.VideoDecoder.MPEG4Part10.

STBService.{i}.Capabilities.VideoDecoder.MPEG4Part10.ProfileLevel.{i}.

STBService.{i}.Capabilities.VideoDecoder.SMPTEVC1.

STBService.{i}.Capabilities.VideoDecoder.SMPTEVC1.ProfileLevel.{i}.

STBService.{i}.Capabilities.HDMI.

STBService.{i}.Components.

STBService.{i}.Components.AudioDecoder.{i}.

STBService.{i}.Components.VideoDecoder.{i}.

STBService.{i}.Components.SCART.{i}.

STBService.{i}.Components.HDMI.{i}.

The rest of the data objects will be added in the future software release.

Notes:

- STBService.{i}.Capabilities.VideoDecoder.VideoStandards

BCM97425 and BCM97428/97429 do not support VP6 whereas BCM97435 does.

- STBService.{i}.Capabilities.VideooOutput.CompositeVideoStandards
  SECAM-K1 is not supported.

- STBService.{i}.Capabilities.VideooOutput.HDCP
  HDCP 1.3 and 1.4 implement optional features such Hot Plug, Enabling encryption, etc. which we do not support

- STBService.{i}.Components.AudioOutputNumberOfEntries
  It is not supported at the moment.

- STBService.{i}.Components.VideoOutputNumberOfEntries
  It is not supported at the moment.

- STBService.{i}.Components.AudioDecoder
  Only main audio decoder is supported.

- STBervice.{i}.Components.VideoDecoder
  Only main video decoder is supported.

- STBervice.{i}.Components.VideoDecoder.Enable
  Only allow enable at this moment.

- STBervice.{i}.Components.VideoDecoder.Status
  Only return enabled since we do not allow enable.

- STBService.{i}.Components.SCART.Enable
  Do not allow enable

- STBService.{i}.Components.SCART.Presence
  Take no action when set to true since it is not supported.

2.2 OPENSSL

TR69C supports the SSL based transport. This is supported by using OpenSSL libraries.

2.3 ACS DISCOVERY

TR69C supports the ACS discovery. By using DHCPv4 option 124, a DHCP server (ICS-DHCP dhcp-4.2.5-P1) sends an option 124 (octet string) which encapsulates the option values (such as the URL of the ACS and etc) to a DHCP client. When the client receives the option values, it saves the information to a file, /var/db/dhclient.leases. TR69C looks for this file and get the option values.

2.4 NOTES

In user mode, "get"/"set" functions related to NEXUS_VideoDecoderHandle such as: getCompVideoDecoderStatus, getCompVideoDecoderMPEG2Part2, ..., are not supported.

3. BUILDING TR69

TR69C can be built in either user mode or kernel mode application.

To build NxClient:

$ cd nexus/nxclient

$ make (user mode binaries)

or

$ make NEXUS_MODE=proxy (kernel mode binaries)

To build TR69C:

$ cd BSEAV/app/tr69c

$ make TR135_SUPPORT=y tr69c_stb (user mode)

or

$ make NEXUS_MODE=proxy TR135_SUPPORT=y tr69c_stb (kernel mode)

To build TR69C with OpenSSL support, add 'OPENSSL_SUPPORT=y' to the build command above.

The binaries are located under obj.$PLATFORM/nexus/bin.

4. TESTING USING CDROUTER

We are testing using CDRouter which provides comprehensive test coverage for TR069 protocol and TR135 data model. Following instruction are very basic, more detail information can be found here:

docs.qacafe.com/index.php/User_Guides

4.1 CONNECTIONS AND AND SETUP

There are several Ethernet ports on CDRouter.

First interface (assuming eth0) is connected to corporation network to access to internet.

Eth1 can be left unused.

Other interfaces (eth2 – eth6) should be connected directly to STB under test.

Note: even though CDRouter can connect to multiple STBs at the same time but only one test suite (one STB) can be run at a time.

4.2 CDROUTER CONFIGURATION AND TEST SUITE

Use this URL to connect to CDRouter http://localhost:8015. It will connect to CDRouter web interface called BuddyWeb.

There is an example of test package for TR69 testing. Make some changes in the pre-defined configuration file as follow:

- Change the “testvar lanInterface eth0” to the name of interface which is leaved unused (since we are setting up for WAN testing), “testvar lanInterface eth1”.
- Change the “testvar wanInterface” to the name of interface which is connected to STB, in this case it will be “testvar wanInterface eth2”.
- Set acsDefaultUser, acsDefaultPassword to “admin”

Edit the existing package to add any applicable test case for TR69 and TR135.

Click “Save” to save the package.

4.3 LAUNCH TEST

Once the package is created, you can go to the “Packages” tab and select the just created package and click “Launch…” then click “Watch Live”. Your will see a message saying “Please restart device under test”.

On STB, run TR69 agent with assumption that NXServer has been built in kernel mode.

export LD_LIBRARY_PATH= .

nexus nxserver &

tr69c_stb –dv

Running in user mode:

nexus nxserver &

nexus.client tr69c_stb –dv

This will start nxserver and tr69 agent in NxClient framework.

On the BuddyWeb page and click “Unpause..”. TR69 agent will connect to ACS automatically. Checked test cases will be running after it. Result (Passed/Failed) can be checked in BuddyWeb page.