

SecurityAgent and Thunder Security Integration in RPi

Refer [Thunder Security](#) page to understand the basics of ThunderSecurity module and SecurityAgent plugin and its purpose and functionality. This page is intended to cover integration and validation of these modules in RPi CMF stack.

Code change to enable SecurityAgent plugin.

meta-layer path:

meta-cmf-raspberrypi/recipes-extended/rdk-services/rdk-services_git.bbappend.

```
diff --git a/recipes-extended/rdk-services/rdk-services_git.bbappend b/recipes-extended/rdk-services/rdk-services_git.bbappend
index 1ff7634..33a8145 100644
--- a/recipes-extended/rdk-services/rdk-services_git.bbappend
+++ b/recipes-extended/rdk-services/rdk-services_git.bbappend
@@ -20,7 +20,7 @@ CXXFLAGS += "-DENABE_THERMAL_PROTECTION"
CXXFLAGS += "-DPLATFORM_BROADCOM_REF"

PACKAGECONFIG_remove = "controlservice hdmicec remoteactionmapping \
- securityagent opencdm datacapture"
+ opencdm datacapture"
# displayinfo is temporarily not supported for RPi until fixes are being in main branch
PACKAGECONFIG_remove = "displayinfo"
```

Code changes to enable thundersecurity.

Meta layer path:

meta-cmf-raspberrypi/conf/distro/include/rdk-rpi.inc

Corresponding patch file.

Patch :

```
diff --git a/conf/distro/include/rdk-rpi.inc b/conf/distro/include/rdk-rpi.inc
index ba9aeda..024c3a5 100644
--- a/conf/distro/include/rdk-rpi.inc
+++ b/conf/distro/include/rdk-rpi.inc
@@ -23,6 +23,8 @@ DISTRO_FEATURES_append = "ctrlm_voice_sdk"

# Disable Thunder Security
DISTRO_FEATURES_append = "thunder_security_disable"
+# Enables Thunder Security
+DISTRO_FEATURES_remove = "thunder_security_disable"

DISTRO_FEATURES_append = "enable_icrypto_openssl"
DISTRO_FEATURES_remove = "netflix_cryptanium"
```

RFC Support.

Thunder Security can be enabled/disabled using RFC Device.DeviceInfo.X_RDKCENTRAL-COM_RFC.Feature.ThunderSecurity.Enable.

Set ThunderSecurity to true with below command.

tr181 -s -t boolean -v true Device.DeviceInfo.X_RDKCENTRAL-COM_RFC.Feature.ThunderSecurity.Enable

Get the setted value with below command.

tr181 Device.DeviceInfo.X_RDKCENTRAL-COM_RFC.Feature.ThunderSecurity.Enable

Note: RPi needs to be rebooted after changing the RFC value.

Ex:

```
login as: root
root@raspberrypi-rdk-mc:~#
root@raspberrypi-rdk-mc:~#
root@raspberrypi-rdk-mc:~#
root@raspberrypi-rdk-mc:~#
root@raspberrypi-rdk-mc:~#
root@raspberrypi-rdk-mc:~# tr181 -s -t boolean -v true Device.DeviceInfo.X_RDKCENTRAL-COM_RFC.Feature.ThunderSecurity.Enable
root@raspberrypi-rdk-mc:~# tr181 Device.DeviceInfo.X_RDKCENTRAL-COM_RFC.Feature.ThunderSecurity.Enable
true
root@raspberrypi-rdk-mc:~#
```

From Wpeframework logs we could see **Security ENABLED, incoming requests need to be authorized!!!** And ThunderSecurity value = true.

```
Nov 25 08:28:56.567919 /usr/bin/WPEFramework[935]: [Thu, 25 Nov 2021 08:28:56 ]:[PluginServer.h:1628]: Startup: name = Device.DeviceInfo.X_RDKCENTRAL-COM_RFC.Feature.ThunderSecurity.Enable, type = 3, value = true
Nov 25 08:28:56.596726 /usr/bin/WPEFramework[935]: [Thu, 25 Nov 2021 08:28:56 ]:[PluginHost.cpp:559]: Startup: WPEFramework actively listening.
Nov 25 08:28:56.602215 /usr/bin/WPEFramework[935]: [Thu, 25 Nov 2021 08:28:56 ]:[SystemInfo.h:280]: Startup: EVENT: Platform
Nov 25 08:28:56.605227 /usr/bin/WPEFramework[935]: [Thu, 25 Nov 2021 08:28:56 ]:[SystemInfo.h:289]: Startup: EVENT: Network
Nov 25 08:28:56.605585 /usr/bin/WPEFramework[935]: [Thu, 25 Nov 2021 08:28:56 ]:[Config.h:781]: Startup: Accessor: http://192.168.43.11:9998/Service
Nov 25 08:28:56.605661 /usr/bin/WPEFramework[935]: [Thu, 25 Nov 2021 08:28:56 ]:[Config.h:782]: Startup: Interface IP: 192.168.43.11
Nov 25 08:28:56.607863 /usr/bin/WPEFramework[935]: [Thu, 25 Nov 2021 08:28:56 ]:[SystemInfo.h:329]: Startup: EVENT: Identifier: OEuCfrUta8
Nov 25 08:28:56.610205 /usr/bin/WPEFramework[935]: [Thu, 25 Nov 2021 08:28:56 ]:[SystemInfo.h:491]: Startup: EVENT: Graphics
Nov 25 08:28:56.612628 /usr/bin/WPEFramework[935]: [Thu, 25 Nov 2021 08:28:56 ]:[SystemInfo.h:501]: Startup: EVENT: WebSource
Nov 25 08:28:56.614636 /usr/bin/WPEFramework[935]: [Thu, 25 Nov 2021 08:28:56 ]:[SystemInfo.h:511]: Startup: EVENT: Streaming
Nov 25 08:28:56.617995 /usr/bin/WPEFramework[935]: [Thu, 25 Nov 2021 08:28:56 ]:[SystemInfo.h:521]: Startup: EVENT: Bluetooth
Nov 25 08:28:56.619212 /usr/bin/WPEFramework[935]: [Thu, 25 Nov 2021 08:28:56 ]:[PluginServer.cpp:393]: Startup: Activated plugin [Controller]:[Controller]
Nov 25 08:28:56.619606 /usr/bin/WPEFramework[935]: [Thu, 25 Nov 2021 08:28:56 ]:[PluginServer.cpp:727]: Startup: Security ENABLED, incoming requests need to be authorized!!!
Nov 25 08:28:56.659924 /usr/bin/WPEFramework[935]: [Thu, 25 Nov 2021 08:28:56 ]:[SecurityAgent.cpp:105]: Startup: SecurityAgent: Reading acl file /etc/thunde
```

We can get Security token with running of **WPEFrameworkSecurityUtility** binary.

```
root@raspberrypi-rdk-mc:/usr/bin# ./WPEFrameworkSecurityUtility
{"token":"eyJhbGciOiJIUzI1NiIsInR5cCI6IkpXVCJ9.aHR0cDovL2xvY2FsaG9zdA.aFpBz8A603aUJsQmITpNY64eqCcFZu08Sk0GUqz5voo","success":true}
```

Ex:

192.168.43.11 - PuTTY

```
root@raspberrypi-rdk-mc:~# cd /usr/bin/
root@raspberrypi-rdk-mc:/usr/bin# ./WPEFrameworkSecurityUtility
{"token":"eyJhbGciOiJIUzI1NiIsInR5cCI6IkpXVCJ9.aHR0cDovL2xvY2FsaG9zdA.aFpBz8A603aUJsQmITpNY64eqCcFZu08Sk0GUqz5voo","success":true}
root@raspberrypi-rdk-mc:/usr/bin#
```

To validate of **SecurityAgent** plugin need to use **Security** token with curl command as below.

curl command :

```
curl -H "Content-Type: application/json" -H "Authorization: Bearer eyJhbGciOiJIUzI1NiIsInR5cCI6IkpXVCJ9.aHR0cDovL2xvY2FsaG9zdA.aFpBz8A603aUJsQmITpNY64eqCcFZu08Sk0GUqz5voo" -X POST -d '{"jsonrpc": "2.0", "id": 1234567890, "method": "SecurityAgent.1.validate", "params": {"token": "eyJhbGciOiJIUzI1NiIsInR5cCI6IkpXVCJ9.aHR0cDovL2xvY2FsaG9zdA.aFpBz8A603aUJsQmITpNY64eqCcFZu08Sk0GUqz5voo"}}' http://127.0.0.1:9998/jsonrpc
```

Response :

```
{ "jsonrpc": "2.0", "id": 1234567890, "result": { "valid": true } }
```

Ex:

```
root@raspberrypi-rdk-mc:~# curl -H "Content-Type: application/json" -H "Authorization: Bearer eyJhbGciOiJIUzI1NiIsInR5cCI6IkpXVCJ9.aHR0cDovL2xvY2FsaG9zdA.aFpBz8A603aUJsQmITpNY64eqCcFZu08Sk0GUqz5voo" -X POST -d '{"jsonrpc": "2.0", "id": 1234567890, "method": "SecurityAgent.1.validate", "params": {"token": "eyJhbGciOiJIUzI1NiIsInR5cCI6IkpXVCJ9.aHR0cDovL2xvY2FsaG9zdA.aFpBz8A603aUJsQmITpNY64eqCcFZu08Sk0GUqz5voo"}}' http://127.0.0.1:9998/jsonrpc
{"jsonrpc": "2.0", "id": 1234567890, "result": { "valid": true }}root@raspberrypi-rdk-mc:~#
```

Here Manually changed the security token to wrong and expected result should be false.

Curl command :

```
root@raspberrypi-rdk-mc:~# curl -H "Content-Type: application/json" -H "Authorization: Bearer eyJhbGciOiJIUzI1NiIsInR5cCI6IkpXVCJ9.aHR0cDovL2xvY2FsaG9zdA.aFpBz8A603aUJsQmITpNY64eqCcFZu08Sk0GUqz5voo" -X POST -d '{"jsonrpc": "2.0", "id": 1234567890, "method": "SecurityAgent.1.validate", "params": {"token": "eyJhbGciOiJIUzI1NiIsInR5cCI6IkpXVCJ9.aHR0cDovL2xvY2FsaG9zdA.aFpBz8A603aUJsQmITpNY64eqCcFZu08Sk0GUqz5voK"}}' http://127.0.0.1:9998/jsonrpc
```

Response :

```
{ "jsonrpc": "2.0", "id": 1234567890, "result": { "valid": false } }
```

setCurrentResolution with Security token.

Curl command:

```
curl -H "Content-Type: application/json" -H "Authorization: Bearer eyJhbGciOiJIUzI1NiIsInR5cCI6IkpXVCJ9.aHR0cDovL2xvY2FsaG9zdA.aFpBz8A603aUJsQmITpNY64eqCcFZu08Sk0GUqz5voo" -X POST -d '{"jsonrpc": "2.0", "id": 42, "method": "org.rdk.DisplaySettings.1.setCurrentResolution", "params": {"videoDisplay": "HDMI0", "resolution": "1080p", "persist": true}}' http://127.0.0.1:9998/jsonrpc
```

Response:

```
{ "jsonrpc": "2.0", "id": 42, "result": { "success": true } }
```

Ex:

192.168.43.11 - PuTTY

```
root@raspberrypi-rdk-mc:~# curl -H "Content-Type: application/json" -H "Authorization: Bearer eyJhbGciOiJIUzI1NiIsInR5cCI6IkpXVCJ9.aHR0cDovL2xvY2FsaG9zdA.aFpBz8A603aUJsQmITpNY64eqCcFZu08Sk0GUqz5voo" -X POST -d '{"jsonrpc": "2.0", "id": 42, "method": "org.rdk.DisplaySettings.1.setCurrentResolution", "params": {"videoDisplay": "HDMI0", "resolution": "1080p", "persist": true}}' http://127.0.0.1:9998/jsonrpc
{"jsonrpc": "2.0", "id": 42, "result": { "success": true }}root@raspberrypi-rdk-mc:~#
```

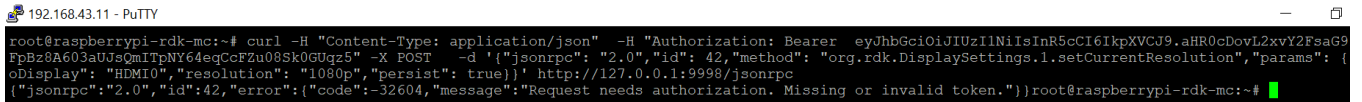
Here Manually changed the security token to wrong and expected result should be **Request needs authorization. Missing or invalid token.**

Curl command:

```
curl -H "Content-Type: application/json" -H "Authorization: Bearer eyJhbGciOiJIUzI1NiIsInR5cCI6IkpXVCJ9.aHR0cDovL2xvY2FsaG9zdA.  
aFpBz8A603aUJsQmITpNY64eqCcFZu08Sk0GUqz5" -X POST -d '{"jsonrpc": "2.0", "id": 42, "method": "org.rdk.DisplaySettings.1.setCurrentResolution", "  
params": {"videoDisplay": "HDMI0", "resolution": "1080p", "persist": true}}' http://127.0.0.1:9998/jsonrpc
```

Response:

```
{"jsonrpc": "2.0", "id": 42, "error": {"code": -32604, "message": "Request needs authorization. Missing or invalid token."}}root@raspberrypi-rdk-mc:/usr/bin#
```

A screenshot of a terminal window titled "192.168.43.11 - PuTTY". The terminal shows a curl command being executed on a Raspberry Pi. The command is: curl -H "Content-Type: application/json" -H "Authorization: Bearer eyJhbGciOiJIUzI1NiIsInR5cCI6IkpXVCJ9.aHR0cDovL2xvY2FsaG9zFpBz8A603aUJsQmITpNY64eqCcFZu08Sk0GUqz5" -X POST -d '{"jsonrpc": "2.0", "id": 42, "method": "org.rdk.DisplaySettings.1.setCurrentResolution", "params": {"videoDisplay": "HDMI0", "resolution": "1080p", "persist": true}}' http://127.0.0.1:9998/jsonrpc. The response is: {"jsonrpc": "2.0", "id": 42, "error": {"code": -32604, "message": "Request needs authorization. Missing or invalid token."}}. The terminal prompt is root@raspberrypi-rdk-mc:~#. There is a green cursor at the end of the prompt.

```
192.168.43.11 - PuTTY  
root@raspberrypi-rdk-mc:~# curl -H "Content-Type: application/json" -H "Authorization: Bearer eyJhbGciOiJIUzI1NiIsInR5cCI6IkpXVCJ9.aHR0cDovL2xvY2FsaG9zFpBz8A603aUJsQmITpNY64eqCcFZu08Sk0GUqz5" -X POST -d '{"jsonrpc": "2.0", "id": 42, "method": "org.rdk.DisplaySettings.1.setCurrentResolution", "params": {"videoDisplay": "HDMI0", "resolution": "1080p", "persist": true}}' http://127.0.0.1:9998/jsonrpc  
{"jsonrpc": "2.0", "id": 42, "error": {"code": -32604, "message": "Request needs authorization. Missing or invalid token."}}root@raspberrypi-rdk-mc:~#
```

Ex: