Project: H2020-ICT-688712

Project Name:

5G Applications and Devices Benchmarking (TRIANGLE)

D2.2 Appendix 7

Test Specification

Apps Energy consumption (AEC)

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Contents

List of Figures

List of Tables

1 Introduction

1.1 Purpose

The test cases defined in this Test Specification measure the power consumption of an App running on a reference Host Device.

This test specification describes basic measurements that are representative of the main uses of an application to determine the power consumption performance of the application.

1.2 Scope of testing

This Test Specification is applicable to applications.

The test cases included in this test specification are designed to obtain Key Performance Indicators (KPIs) to determine Apps performance in the Applications Energy Consumption TRIANGLE domain.

The KPIs obtained are used by the Applications Energy Consumption metric to obtain the App TRIANGLE mark.

The test cases in this Test Specification are initially defined to be implemented in TRIANGLE testbed.

1.3 Definitions and Acronyms

Table 1 – Definitions

State	Description
Application User Flow	The sequence of actions which the user's AUT is expected to perform on the AUT user interface objects in order to execute a test step of this test specification.
AUT Backend Service	Remote endpoint of the AUT service layer
Dummy Battery Fixture	Device designed to replace the usual Host Device battery to facilitate powering the Host device from an external DC source and simulating normal behavior of the replaced battery
Host Device	Android or iOS device where the AUT is installed in order to test the AUT
Network Scenario	usage scenario as described in Deliverable D2.2 [1] which is defined by a parameterization of the air interface and the core network
Test System	Integrated system used to measure the AUT's performance against this test specification.
TRIANGLE Testbed	TRIANGLE testing framework. It covers all the software, and the coordination/sequencing that control & connects to the test infrastructure. It is in charge of handling and transforming the end user test requests into actionable steps for the software and hardware components of the testbed.

Table 2 – Acronyms

State	Description
AR	Augmented Reality
AUT	Application Under Test
CPU	Central Processing Unit
CS	Content Distribution Streaming Services
CV	Connected Vehicles
DUT	Device Under Test
EM	Emergency Services
GA	Gaming
GPU	Graphics Processing Unit
HS	High Speed Internet
ICS	Implementation Conformance Statement
IXIT	Implementation eXtra Information for Testing
ksps	KiloSamples per second (thousands of samples per second)
LS	Live Streaming services
PM	Patient Monitoring
SG	Smart Grids
SM	Smart Metering
SN	Social Networking
VR	Virtual Reality

1.4 References

[1] D2.2 Formalization of the certification process, requirements and use. Appendix 2: Product characterization.

2 General Test conditions

Unless otherwise specified in a particular test case, the conditions defined in this section will apply for all test cases.

2.1 Test System configuration

The figure below shows a simplified overview of the testing architecture.

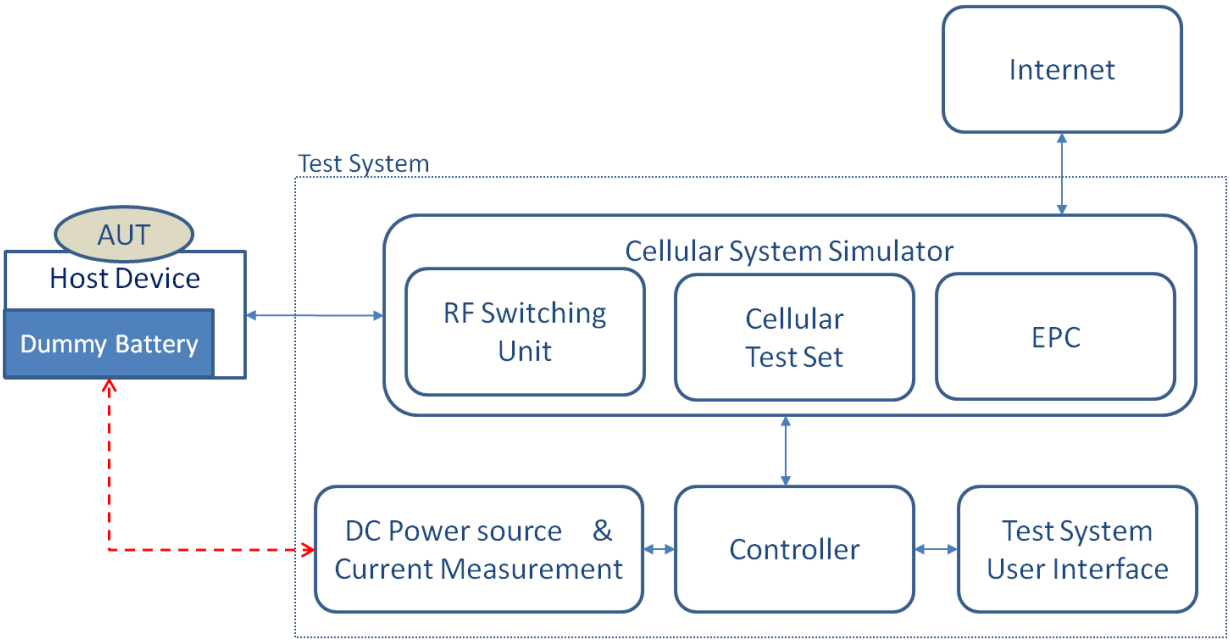

Figure 1 – Test System architecture overview

The App under test (AUT) is installed in the Host Device. The Host Device is connected to the Test System though a conducted RF connection.

The DC Power Source and Current Measurement device provides DC power source to the Host Device and measures the Host Device current consumption.

The DC Power Source will have the following functionalities:

- Configurable output voltage.
- Output Resolution at least 0.01 volt.
- Output voltage range including the nominal voltage of the Host device (+- 5%)
- Remote sensing recommended; for the maintenance of the nominal voltage of the Host Device.
- Enough continuous and peak output current capability to cover Host Device requirements during the measurements.

The Current measurement device will have the following functionalities:

- Measurement resolution: At least 0.1 mA.
- Sampling frequency: No less than 50 ksps

The Host Device battery is replaced by a dummy battery fixture.

The dummy battery shall provide a connection between the Host Device battery terminals and the DC power source.

The dummy battery will provide means to minimize, as far as possible, the resistance, inductance and length of cables required to connect the fixture to the DC power supply.

The dummy battery may provide source and sense conductors to keep the nominal battery voltage as stable as possible.

The Test System is configured to perform the test cases will be one of the bands supported by the Host Device. In case any of the bands listed next is supported by the device it will be selected and in the order defined: 1. FDD4; 2.FDD17; 3. FDD14; 4. FDD25; 5. FDD2; 6. FDD5; 7. FDD7; 8. FDD12; 9. FDD12; 10. FDD30.

Note: It is recommended that the Host Devices always use the same frequency band, as it may affect the results obtained.

The Test System network is initially configured as specified by the latest release of 3GPP TS 36.508.

2.2 Host Device configuration

The Host Device will be configured as defined below:

- The Host Device is ON and there are no Apps running other than required system apps.
- No antivirus and/or anti-malware App is running.
- Maximum brightness available.
- Maximum screen resolution available.
- No Energy saving or screen saving option is enabled.
- Vibration is enabled if available.
- The Host Device is allowed to use mobile data.
- There is no restriction configuration for data use.
- The Host Device Audio Volume is configured at the middle of the available range.
- The Host Device has been ON for at least three minutes to allow all boot processes to be completed.
- The Host Device screen is configured with screen always ON.

2.3 Network Scenarios Applicability

The test cases will be executed for each of the Network Scenarios applicable for each Use Case as shown in Table 3.

Table 3 – Use Case / Network Scenarios Applicability

Network Scenario	Use Cases								
	CS	**LS**	**SN**	**HS**	**VR**	**AR**	**PM**	**ES**	**GA**
Urban-Office	Y		Y	Y	Y	Y		Y	Y
Urban-Pedestrian	Y	Y	Y	Y		Y			Y
Urban-Driving-Normal	Y	Y	Y	Y		Y	Y		Y
Urban-Driving-Traffic jam	Y		Y	Y		Y	Y		Y
Urban-Driving-Emergency driving		Y	Y	Y		Y	Y	Y	
Urban-Internet Café, Busy Hours	Y		Y	Y	Y	Y			Y
Urban-Internet Cafe, Off-Peak	Y		Y	Y	Y	Y			Y
Suburban-Festival	Y	Y	Y	Y		Y		Y	Y
Suburban-Stadium	Y	Y	Y	Y		Y		Y	Y
Suburban-Shopping Mall, Busy Hours	Y		Y	Y		Y		Y	Y
Suburban-Shopping Mall, Off-Peak	Y		Y	Y		Y		Y	Y
High Speed-Relay	Y		Y	Y					Y
High Speed-Direct Passenger Connection	Y		Y	Y					Y

2.4 Number of Test Iterations

In order to obtain statistically relevant measurements out of which the KPIs will be derived, the test cases will be iterated 100 times, except for the following tests that will be iterated as shown in Table 4.

Table 4 – Test case Iterations

Test Case	# of Iterations
TBD	tad

2.5 Test Case Initial Conditions (Preamble)

Following initial conditions modes are defined:

AUT-NOT RUNNING

- The AUT is not installed on the Host Device.
- The Host Device is configured as specified in section 2.2.
- The Test System and the Host Device are connected as shown in figure 1.
- The AUT Backend Service is accessible from the Test System.

- Test Environment Lightning: Office conditions with no direct sun light on the Host Device.
- The Test System is configured according to the target Network Scenario (refer to section 2.3.
- The Test System is configured according to the target Network Scenario as defined in D2.2 Appendix 8 (Network scenarios parameterization).
- The Test System has established a data path with the Host Device.

AUT-STARTED

- The AUT is installed on the Host Device.
- The Host Device is configured as specified in section 2.2.
- The Test System and the Host Device are connected as shown in figure 1.
- The AUT Backend Service is accessible from the Test System.
- Test Environment Lightning: Office conditions with no direct sun light on the Host Device.
- The Test System is configured according to the target Network Scenario as defined in D2.2 Appendix 8 (Network scenarios parameterization).
- The Test System has established a data path with the Host Device.
- The Test System has cleared the AUT stored data and cache.
- The Test System has opened the AUT.

2.6 Test Case Final Condition (Postamble)

Unless stated otherwise in the test case description, the following steps will be executed after the test case steps:

- The System closes the AUT.
- The Test System shuts down the data path with the Host Device.

2.7 Application User Flows

Following Application User Flows are used by the test cases of this test specification.

The table below contains a list of the common Application User Flows to be used in the Test Specifications. Additional Application User Flows may be defined in each Test Specification.

Table 5 –Application User Flows

Identifier	Use Case	Application User Flow
1.1	All	Reopen the App 1. Open the App. 2. Perform login step and wait for 5 seconds. 3. Close App and wait for 5 seconds 4. Open the App (no login required).
1.2	All	Navigate menu 1. Open the App. 2. Perform login step and wait for 5 seconds. 3. Enter all available menu options and views. 4. Close the App.
1.3	All	Login 1. Perform login step and wait for 5 seconds.
2.1	CS	Play three reference videos: 1. Perform login step and wait for 10 seconds. 2. Play sequentially the three reference videos: RV1, RV2 and RV3.
2.2	CS	Play and pause 1. Perform login step and wait for 10 seconds. 2. Start playing RV3 during 10 seconds. 3. Pause the reproduction. 4. Resume the reproduction after 2 minutes
2.3	CS	Rewind and Fast Forward 1. Perform login step and wait for 10 seconds. 2. Start playing RV3 for 10 seconds. 3. Perform fast forward during 2 minutes (select X8 speed if supported by the App (ICSA_CSFastForwardX8), else select the highest speed supported). 4. Change to normal play and keep this mode for 10 seconds. 5. Perform rewind for 2 minutes (select X8 speed if supported by the App (ICSA_CSRewindX8), else select the highest rewind speed supported), 6. Stop the playback.
2.4	CS	Download a media file 1. Perform login step and wait for 10 seconds. 2. Download RV3. 3. Wait until the download is complete.

2.5	CS	Set background state. 1. Perform login step and wait for 10 seconds. 2. Set the App in background state. 3. Wait for 20 minutes 4. Set the App in active state
2.6	CS	Play and Stop 1. Perform login step and wait for 10 seconds. 2. Start playing RV3. 3. Stop the reproduction after 1 minute. 4. Resume the reproduction after 1 minutes
2.7	CS	Search and Seek 1. Perform login step and wait for 10 seconds. 2. Search reference file RV3. 3. Start playing RV3. 4. Seek the player at 15 minutes position.
2.8	CS	Skip forward and backward 1. Perform login step and wait for 10 seconds. 2. Start playing RV2. 3. After 1 minute, skip backward to the beginning of the media file. 4. After 20 seconds, skip forward to the next media file (RV3). 5. After 5 seconds, skip backward to the previous media file (RV2).
3.1	LS	Play an live video from a know user 1. Perform login step and wait for 10 seconds. 2. Select to play the live video set up in the test case initial conditions.
3.2	LS	Broadcast live video 1. Perform login step and wait for 10 seconds. 2. Broadcast live video
4.1	SN	Post comments 1. Perform login step and wait for 10 seconds. 2. Post reference comment: RC1. 3. Post reference comment: RC2. 4. Post reference comment: RC3.
4.2	SN	Post pictures 1. Perform login step and wait for 10 seconds. 2. Post sequentially the pictures: RP1, RP2 and RP3 and without

		any delay between the pictures. 3. Wait until the last picture is completely uploaded.
4.3	SN	Post videos 1. Perform login step and wait for 10 seconds. 2. Post sequentially the pictures: RV1, RV2 and RV3 and without any delay between videos. 3. Wait until the last video is completely uploaded.
4.4	SN	Post live video 1. Perform login step and wait for 10 seconds. 2. Post sequentially the pictures: RV1, RV2 and RV3 and without any delay between videos. 3. Wait until the last video is completely uploaded.
4.5	SN	Post location 1. Perform login step and wait for 10 seconds. 2. Post sequentially the reference location: RL1.
4.6	SN	Post files 1. Perform login step and wait for 10 seconds. 2. Post sequentially the reference files: RF1, RF2 and RF3. 3. Wait until all the files are completely uploaded.
4.7	SN	Get comment 1. Perform login step and wait for 10 seconds. 2. Get the first available comment.
4.8	SN	Show picture 1. Perform login step and wait for 10 seconds. 2. Get the first available picture.
4.9	SN	Play video 1. Perform login step and wait for 10 seconds. 2. Get the first available video.
4.10	SN	Play live video 1. Perform login step and wait for 10 seconds. 2. Get reference live video
4.11	SN	Get location 1. Perform login step and wait for 10 seconds. 2. Post sequentially the reference location: RL1.
4.12	SN	Get file 1. Perform login step and wait for 10 seconds.

		2. Get the first available file.
4.13	SN	Search objects 1. Perform login step and wait for 10 seconds. 2. Search the most relevant item for which the App has been mainly designed (e.g., contacts, flights, hotels, etc.).
5.1	HS	Download three files sequentially 1. Perform login step and wait for 10 seconds. 2. Download sequentially the reference files: RF1, RF2 and RF3 and without any delay between them. 3. Wait until the last file is completely downloaded.
5.2	HS	Upload three files sequentially 1. Perform login step and wait for 10 seconds. 2. Upload sequentially the reference files: RF1, RF2 and RF3 and without any delay between them. 3. Wait until the last file is completely uploaded.
5.3	HS	Download several files simultaneously 1. Perform login step and wait for 10 seconds. 2. Download simultaneously the reference files: RF1, RF2, RF3, RF4, RF5 and RF6. 3. Wait until the last file is completely downloaded.
5.4	HS	Upload several files sequentially 1. Perform login step and wait for 10 seconds. 2. Upload simultaneously the reference files: RF1, RF2, RF3, RF4, RF5 and RF6. 3. Wait until the last file is completely uploaded.
5.5	HS	Download a huge file 1. Perform login step and wait for 5 seconds. 2. Download the reference file RF7. 3. Wait until the file is completely downloaded.
5.6	HS	Upload a huge file 1. Perform login step and wait for 5 seconds. 2. Upload the reference file RF7. 3. Wait until the last file is completely uploaded.
5.7	HS	Pause and Resume Download 1. Perform login step and wait for 10 seconds. 2. Start downloading the reference file RF7. 3. After 30 seconds, pause the file transfer.

		4. Wait for 15 seconds and resume the transfer
5.8	HS	Pause and Resume Upload 1. Perform login step and wait for 10 seconds. 2. Start uploading the reference file RF7. 3. After 30 seconds, pause the file transfer. 4. Wait for 15 seconds and resume the file upload.
6.1	VR	Load Virtual Experience 1. Perform login step and wait for 10 seconds. 2. Load reference virtual experience RVE1. 3. Load until the virtual experience is completely loaded
7.1	AR	Load Augmentation layer on physical marker 1. Perform login step and wait for 10 seconds. 2. Start an augmented reality session. 3. Aim at a physical marker.
7.2	AR	Load Augmentation layer at a location 1. Perform login step and wait for 10 seconds. 2. Start an augmented reality session. 3. Aim at a specific location.
8.x	PM	TBD
9.x	ES	TBD
10.1	GA	Start session game 1. Perform login step and wait for 10 seconds. 2. Set most common configuration (as required) 3. Start session game
10.2	GA	Short Session game 1. Perform login step and wait for 10 seconds. 2. Set game most common configuration. 3. Start game. 4. Perform standard game session for 2 minutes
10.3	GA	Large Session game 1. Perform login step and wait for 10 seconds. 2. Set game most common configuration. 3. Start game. 4. Perform standard game session for 15 minutes
10.4	GA	Pause and resume game

		1. Perform login step and wait for 5 seconds. 2. Set game most common configuration. 3. Start game session. 4. After 2 minutes set the session in pause mode. 5. After 30 seconds resume the game session.
10.5	GA	Start saved session game 1. Perform login step and wait for 5 seconds. 2. Set game most common configuration. 3. Start game session. 4. After 2 minutes save game session data. Note: Some Apps may need a longer time to allow saving game session. 5. Exit the game session. 6. After 10 seconds restart the saved game session. 7. After 20 seconds, exit the game session.
10.6	GA	Start two game sessions 1. Perform login step and wait for 10 seconds. 2. Set most common configuration (as required). 3. Start a new session game. 4. After 1 minute, exit the game session. 5. Exit the game session and wait for 15 seconds. 6. Start a new session game. 7. After 15 seconds, exit the game session.

2.8 Additional configuration requirements

2.8.1 Live Streaming transmission configuration

Some test cases need that a live streaming is generated during test case execution.

If possible, the Test System will avoid the need of using an external camera by replacing the default camera app with a video/image file streamer. This way, a more accurate control over the conditions of what is streamed will be obtained.

If the option of replacing the camera app is not available (e.g. due to limitation of the specific OS), the live streaming will be generated as defined in the figure below:

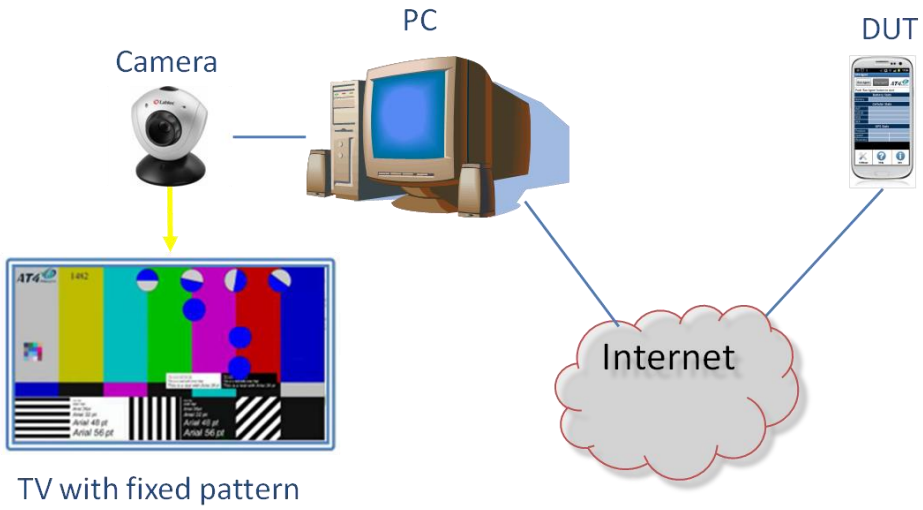

Figure 2 – Live streaming transmission configuration

Personal Computer (or equivalent hardware) connected to an Internet wide band connection.

Camera with video resolution no less than 1080p@30fps that can be connected to the PC.

Live Streaming Services Reference App to stream live videos with operative account valid for live streaming transmission.

The camera will be recording a fixed TV pattern (TBD) in a properly illuminated room.

2.8.2 Reference elements

The following reference elements are used in this Test Specification:

- RV1: Reference video 1 (Short duration video): TBD
- RV2: Reference video 2 (Medium duration video): TBD
- RV3: Reference video 3 (Long duration video (at least 30 minutes)): TBD
- RP1: Reference picture 1 (Small size picture): TBD
- RP2: Reference picture 2 (Medium size picture): TBD
- RP3: Reference picture 3 (Large size picture): TBD
- RC1: Reference comment 1: “The rain in Spain stays mainly in the plain.”
- RL1: Reference location 1: TBD
- RF1: Reference file 1 (Small size file): TBD
- RF2: Reference file 2 (Medium size file): TBD
- RF3: Reference file 3 (Large size file): TBD
- RF4: Reference file 4 (Large size file): TBD
- RF5: Reference file 5 (Large size file): TBD
- RF6: Reference file 6 (Large size file): TBD

- RVE1: Reference Virtual Experience 1: TBD
- RTVP1: Reference Fixed TV Pattern 1: TBD
- RTVP2: Reference TV Pattern 2 (High definition): TBD

3 Test cases

3.1 Common

The tests cases in this section apply to all Use Cases.

3.1.1 AUT not running

Identifier: AEC*/CO/001*

Title: AUT not running

Objective: Measure the energy that is consumed by the Host Device when the AUT is not running.

Applicability:

(ICSG_ProductType = Application)

Initial Conditions:

AUT is in [AUT NOT RUNNING] mode.

Steps:

1. The Test System measures the current consumption during 20 minutes with the AUT not running.

Postamble:

- Execute the Postamble sequence (see section 2.6).

Measurements:

- Current consumption: Record current samples during the measurement time and calculate the following values:
    - Average current consumption.
    - Standard deviation

3.1.2 Open the app

Identifier: AEC*/CO/002*

Title: Login and log out

Objective: Measure the energy that is consumed by the Host Device when the AUT is started, and logged in, and then closed and started again.

Applicability:

(ICSG_ProductType = Application) AND ICSA_Login

Initial Conditions:

AUT is in [AUT NOT RUNNING] mode.

Steps:

1. The Test System commands the AUT to replay the Application User Flow 1.1: Login and Logout.
2. The Test System measures the current consumption from initiating the App to closing it and reopening again.

Postamble:

- Execute the Postamble sequence (see section 2.6).

Measurements:

- Current consumption: Record current samples during the measurement time and calculate the following values:
    - Average current consumption.
    - Standard deviation

3.1.3 Background state

Identifier: AEC*/CO/003*

Title: Background state

Objective: Measure the energy that is consumed by the AUT when it is in background state.

Applicability:

(ICSG_ProductType = Application)

Initial Conditions:

AUT is in [AUT STARTED] mode.

Steps:

1. The Test System commands the AUT to replay the Application User Flow 1.3: Login.
2. The Test Systems sets the AUT in background state.
3. The Test System performs the measurements defined below during 20 minutes with the AUT in background state.
4. The Test Systems sets the AUT back in active state.

Postamble:

- Refer to section 2.6.

Measurements:

- Current consumption: Record current samples during the measurement time and calculate the following values:
  - Average current consumption.
  - Standard deviation

3.2 CS Content Distribution Streaming Services

Note: The following test cases are defined to prevent any device-side content caching which the AUT could implement. However, if the AUT Backend Service also implements a server-side caching (e.g., storing the current playback time for an user), preventing that effect is left to the implementation of the test case.

3.2.1 Non Interactive Playback

Identifier: *AEC/CS/001*

Title: Non Interactive Playback

Objective: Measure the energy that is consumed by an AUT while executing the feature media file playing from the Content Distribution Streaming Services use case.

Applicability:

(ICSG_ProductType = Application) AND (ICSG_UseCases includes CS)

Initial Conditions:

AUT is in [AUT STARTED] mode.

Steps:

1. The Test System commands the AUT to replay the Application User Flow 2.1: Play three reference media files.
2. The Test System measures the current consumed during the reproduction of the three reference videos.

Postamble:

- Execute the Postamble sequence (see section 2.6).

Measurements:

- Current consumption: Record current samples during the measurement time and calculate the following values:
    - Average current consumption.
    - Standard deviation

3.2.2 Pause

Identifier: *AEC/CS/002*

Title: Pause

Objective: Measure the energy that is consumed by an AUT when a media file is in pause mode.

Applicability:

(ICSG_ProductType = Application) AND (ICSG_UseCases includes CS) AND ICSA_CSPause

Initial Conditions:

AUT is in [AUT STARTED] mode.

Steps:

1. The Test System commands the AUT to replay the Application User Flow 2.2: Play and pause.
2. The Test System measures the current consumed during the period the reference video is in Pause mode.

Postamble:

- Execute the Postamble sequence (see section 2.6).

Measurements:

- Current consumption: Record current samples during the measurement time and calculate the following values:
    - Average current consumption.
    - Standard deviation

3.2.3 Rewind and Fast Forward

Identifier: *AEC/CS/003*

Title: Rewind and Fast Forward

Objective: Measure the energy that is consumed by an AUT when performing rewind and fast forward operations while playing a media file.

Applicability:

(ICSG_ProductType = Application) AND (ICSG_UseCases includes CS) AND ICSA_CSRewind AND ICSA_CSFastForward

Initial Conditions:

AUT is in [AUT STARTED] mode.

Steps:

1. The Test System commands the AUT to replay the Application User Flow 2.3: Rewind and Fast Forward.
2. The Test System measures the current consumed while the reproduction of the reference video is in Fast Forward mode and while it is in rewind mode.

Postamble:

- Execute the Postamble sequence (see section 2.6).

Measurements:

- Current consumption: Record current samples during the measurement time and calculate the following values:
    - Average current consumption.
    - Standard deviation

3.2.4 Download content for offline playing

Identifier: *AEC/CS/004*

Title: Download content for offline playing

Objective: Measure the energy that is consumed by an AUT when downloading a media file for offline playing.

Applicability:

(ICSG_ProductType = Application) AND (ICSG_UseCases includes CS) AND ICSA_CSDownloadMedia

Initial Conditions:

AUT is in [AUT STARTED] mode.

Steps:

1. The Test System commands the AUT to replay the Application User Flow 2.4: Download a media file.
2. The Test System measures the current consumed while the media file is being downloaded.

Postamble:

- Execute the Postamble sequence (see section 2.6).

Measurements:

- Current consumption: Record current samples during the measurement time and calculate the following values:
    - Average current consumption.
    - Standard deviation

3.2.5 Non Interactive Playback with screen off

Identifier: *AEC/CS/005*

Title: Non Interactive Playback with screen off

Objective: Measure the usage of device resources of the AUT while executing the feature media file playing from the Content Distribution Streaming Services use case and the screen is turned off.

Applicability:

(ICSG_ProductType = Application) AND (ICSG_UseCases includes CS)

Initial Conditions:

AUT is in [AUT STARTED] mode.

Host Device and/or AUT may need to be configured so it can replay videos with screen off (e.g. Host device configured to send the video reproduction to an external screen)

Steps:

1. The Test System commands the AUT to replay the Application User Flow 2.1: Play three reference media files.
2. Five seconds after the start of step 1, the Test Systems turns the Host Device screen off and waits for 5 seconds.
3. The Test System measures the current consumed while the Host Device is with the screen off and the video is being played.

Postamble:

- The Test System turns the Host Device screen ON.
- Execute the Postamble sequence (see section 2.6).

Measurements:

- Current consumption: Record current samples during the measurement time and calculate the following values:
    - Average current consumption.
    - Standard deviation

3.3 Live Streaming Services

3.3.1 Play Live Video from User

Identifier: *AEC/LS/001*

Title: Play Live Video from User

Objective: Measure the energy that is consumed by an AUT while executing the feature live video playing from the Live Streaming Services use case.

Applicability:

(ICSG_ProductType = Application) AND (ICSG_UseCases includes LS)

Initial Conditions:

- AUT is in [AUT STARTED] mode.
- A live video is generated as defined in section 2.8.1.

Steps:

1. The Test System commands the AUT to replay the Application User Flow 3.1: Play a live video.
2. The Test System measures the current consumed during the reproduction of the live video streaming.

Postamble:

- Execute the Postamble sequence (see section 2.6).

Measurements:

- Current consumption: Record current samples during the measurement time and calculate the following values:
    - Average current consumption.
    - Standard deviation.

3.3.2 Broadcast Live Video

Identifier: *AEC/LS/002*

Title: Broadcast Live Video to User

Objective: Measure the energy that is consumed by an AUT when broadcasting live content.

Applicability:

(ICSG_ProductType = Application) AND (ICSG_UseCases includes LS)

Initial Conditions:

- AUT is in [AUT STARTED] mode.
- The Host Device camera is focused on the fixed TV pattern RTVP1.

Steps:

1. The Test System commands the AUT to replay the Application User Flow 3.2: Broadcast live video.
2. The Test System measures the current consumed during the reproduction of the live video streaming.

Postamble:

- Execute the Postamble sequence (see section 2.6).

Measurements:

- Current consumption: Record current samples during the measurement time and calculate the following values:
    - Average current consumption.
    - Standard deviation.

3.3.3 Broadcast live video with screen off

Identifier: *AEC/LS/003*

Title: Broadcast live video with screen off

Objective: Measure the energy that is consumed by an AUT while executing the feature broadcast a live video from the Live Streaming Services use case when the screen is turned off.

Applicability:

(ICSG_ProductType = Application) AND (ICSG_UseCases includes LS) AND ICSA_LSBroadcastScreenOff

Initial Conditions:

- AUT is in [AUT STARTED] mode.
- The Host Device camera is focused on the fixed TV pattern RTVP1.

Steps:

1. The Test System commands the AUT to replay the Application User Flow 3.2: Broadcast live video.
2. Wait for 10 seconds.
3. The Test Systems turns the Host Device screen off and waits for 5 seconds.
4. The Test System measures the current consumed after completion of step 3 during 10 minutes.

Postamble:

- The Test System turns the Host Device screen ON.
- Execute the Postamble sequence (see section 2.6).

Measurements:

- Current consumption: Record current samples during the measurement time and calculate the following values:
    - Average current consumption.
    - Standard deviation

3.4 Social Networking

3.4.1 Picture Posting

Identifier: *AEC/SN/001*

Title: Picture Posting

Objective: Measure the energy that is consumed by an AUT while executing the feature picture posting in the Social Networking use case.

Applicability:

(ICSG_ProductType = Application) AND (ICSG_UseCases includes SN) AND ICSA_SNPostImage

Initial Conditions:

AUT is in [AUT STARTED] mode.

Steps:

1. The Test System commands the AUT to replay the Application User Flow 4.2: Post pictures.
2. The Test System measures the current consumed while the pictures are being posted.

Postamble:

- Execute the Postamble sequence (see section 2.6).

Measurements:

- Current consumption: Record current samples during the measurement time and calculate the following values:
  - Average current consumption.
  - Standard deviation.

3.4.2 Video Posting

Identifier: *AEC/SN/002*

Title: Video Uploading

Objective: Measure the energy that is consumed by an AUT while executing the feature vdeo posting in the Social Networking use case.

Applicability:

(ICSG_ProductType = Application) AND (ICSG_UseCases includes SN) AND ICSA_SNPostVideo

Initial Conditions:

AUT is in [AUT STARTED] mode.

Steps:

1. The Test System commands the AUT to replay the Application User Flow 4.3: Post videos sequentially.
2. The Test System measures the current consumed while the videos are being posted.

Postamble:

- Execute the Postamble sequence (see section 2.6).

Measurements:

- Current consumption: Record current samples during the measurement time and calculate the following values:
    - Average current consumption.
    - Standard deviation.

3.4.3 File Posting

Identifier: *AEC/SN/003*

Title: File Posting

Objective: Measure the energy that is consumed by an AUT while executing the feature file posting in the Social Networking use case.

Applicability:

(ICSG_ProductType = Application) AND (ICSG_UseCases includes SN) AND ICSA_SNPostFile.

Initial Conditions:

AUT is in [AUT STARTED] mode.

Steps:

1. The Test System commands the AUT to replay the Application User Flow 4.6: Post three reference files separately.
2. The Test System measures the current consumed while the files are being posted.

Postamble:

- Execute the Postamble sequence (see section 2.6).

Measurements:

- Current consumption: Record current samples during the measurement time and calculate the following values:
    - Average current consumption.
    - Standard deviation.

3.4.4 Show Picture

Identifier: *AEC/SN/004*

Title: Picture Downloading

Objective: Measure the energy that is consumed by an AUT while executing the feature picture downloading in the Social Networking use case.

Applicability:

(ICSG_ProductType = Application) AND (ICSG_UseCases includes SN) AND ICSA_SNGetImage

Initial Conditions:

AUT is in [AUT STARTED] mode.

Steps:

1. The Test System commands the AUT to replay the Application User Flow 4.8: Get three reference pictures.
2. The Test System measures the current consumed while the pictures are being downloaded and until the pictures are completely displayed at their final resolution.

Postamble:

- Execute the Postamble sequence (see section 2.6).

Measurements:

- Current consumption: Record current samples during the measurement time and calculate the following values:
  - Average current consumption.
  - Standard deviation.

3.4.5 Play Video

Identifier: *AEC/SN/005*

Title: Play Video

Objective: Measure the energy that is consumed by an AUT while executing the feature play video in the Social Networking use case.

Applicability:

(ICSG_ProductType = Application) AND (ICSG_UseCases includes SN) AND ICSA_SNGetVideo

Initial Conditions:

AUT is in [AUT STARTED] mode.

Steps:

1. The Test System commands the AUT to replay the Application User Flow 4.9 Play three reference videos.
2. The Test System measures the current consumed while the videos are being played.

Postamble:

- Execute the Postamble sequence (see section 2.6).

Measurements:

- Current consumption: Record current samples during the measurement time and calculate the following values:
    - Average current consumption.
    - Standard deviation.

3.4.6 File Downloading

Identifier: *AEC/SN/006*

Title: File Downloading

Objective: Measure the energy that is consumed by an AUT while executing the feature file downloading in the Social Networking use case.

Applicability:

(ICSG_ProductType = Application) AND (ICSG_UseCases includes SN) AND ICSA_SNGetFile

Initial Conditions:

AUT is in [AUT STARTED] mode.

Steps:

1. The Test System commands the AUT to replay the Application User Flow 4.12: Downloading three reference flies.
2. The Test System measures the current consumed while the files are being downloaded.

Postamble:

- Execute the Postamble sequence (see section 2.6).

Measurements:

- Current consumption: Record current samples during the measurement time and calculate the following values:
    - Average current consumption.
    - Standard deviation.

3.5 High Speed Internet

3.5.1 Downloading files sequentially

Identifier: *AEC/ HS/001*

Title: Downloading files sequentially

Objective: Measure the energy that is consumed by an AUT while executing the feature downloading files sequentially in the High Speed Internet use case.

Applicability:

(ICSG_ProductType = Application) AND (ICSG_UseCases includes HS)

Initial Conditions:

AUT is in [AUT STARTED] mode.

Steps:

1. The Test System commands the AUT to replay the Application User Flow 5.1: Download three reference flies.
2. The Test System measures the current consumed while the files are being downloaded.

Postamble:

- Execute the Postamble sequence (see section 2.6).

Measurements:

- Current consumption: Record current samples during the measurement time and calculate the following values:
    - Average current consumption.
    - Standard deviation.

3.5.2 Uploading files sequentially

Identifier: *AEC/ HS/002*

Title: Uploading files sequentially

Objective: Measure the energy that is consumed by an AUT while executing the feature uploading files sequentially in the High Speed Internet use case.

Applicability:

(ICSG_ProductType = Application) AND (ICSG_UseCases includes HS)

Initial Conditions:

AUT is in [AUT STARTED] mode.

Steps:

1. The Test System commands the AUT to replay the Application User Flow 5.2: Upload three reference flies.
2. The Test System measures the current consumed while the files are being uploaded.

Postamble:

- Execute the Postamble sequence (see section 2.6).

Measurements:

- Current consumption: Record current samples during the measurement time and calculate the following values:
  - Average current consumption.
  - Standard deviation.

3.5.3 Downloading several files simultaneously

Identifier: *AEC/ HS/003*

Title: Downloading several files simultaneously

Objective: Measure the energy that is consumed by an AUT while executing the feature downloading several files simultaneously in the High Speed Internet use case.

Applicability:

(ICSG_ProductType = Application) AND (ICSG_UseCases includes HS)

Initial Conditions:

AUT is in [AUT STARTED] mode.

Steps:

1. The Test System commands the AUT to replay the Application User Flow 5.3: Download several reference flies simultaneously.
2. The Test System measures the current consumed while the files are being downloaded.

Postamble:

- Execute the Postamble sequence (see section 2.6).

Measurements:

- Current consumption: Record current samples during the measurement time and calculate the following values:
    - Average current consumption.
    - Standard deviation.

3.5.4 Uploading Several Files simultaneously

Identifier: *AEC/ HS/004*

Title: Uploading several files simultaneously

Objective: Measure the energy that is consumed by an AUT while executing the feature uploading several files simultaneously in the High Speed Internet use case.

Applicability:

(ICSG_ProductType = Application) AND (ICSG_UseCases includes HS)

Initial Conditions:

AUT is in [AUT STARTED] mode.

Steps:

1. The Test System commands the AUT to replay the Application User Flow 5.4: Upload several reference flies simultaneously.
2. The Test System measures the current consumed while the files are being uploaded.

Postamble:

- Execute the Postamble sequence (see section 2.6).

Measurements:

- Current consumption: Record current samples during the measurement time and calculate the following values:
    - Average current consumption.
    - Standard deviation.

3.5.5 Downloading a file with screen off

Identifier: *AEC/ HS/005*

Title: Downloading a file with screen off

Objective: Measure the energy that is consumed by an AUT while executing the feature downloading a file in the High Speed Internet use case with the screen off.

Applicability:

(ICSG_ProductType = Application) AND (ICSG_UseCases includes HS)

Initial Conditions:

AUT is in [AUT STARTED] mode.

Steps:

1. The Test System commands the AUT to replay the Application User Flow 5.5: Download a huge file.
2. Five seconds after the start of step 1, The Test System starts measuring the current consumed while the file is being downloaded.

Postamble:

- Execute the Postamble sequence (see section 2.6).

Measurements:

- Current consumption: Record current samples during the measurement time and calculate the following values:
    - Average current consumption.
    - Standard deviation.

3.5.6 Uploading a file with screen off

Identifier: *AEC/ HS/006*

Title: Uploading a file with screen off

Objective: Measure the energy that is consumed by an AUT while executing the feature uploading a file in the High Speed Internet use case with the screen off.

Applicability:

(ICSG_ProductType = Application) AND (ICSG_UseCases includes HS)

Initial Conditions:

AUT is in [AUT STARTED] mode.

Steps:

1. The Test System commands the AUT to replay the Application User Flow 5.6: Download a huge file.
2. Five seconds after the start of step 1, The Test System start measuring the current consumed while the file is being uploaded.

Postamble:

- Execute the Postamble sequence (see section 2.6).

Measurements:

- Current consumption: Record current samples during the measurement time and calculate the following values:
    - Average current consumption.
    - Standard deviation.

3.6 Virtual Reality

3.6.1 Virtual Experience Loading

Identifier: *AEC/VR/001*

Title: Virtual Experience Loading

Objective: Measure the energy that is consumed by an AUT while loading a Virtual experience from a single point.

Applicability:

(ICSG_ProductType = Mobile device) AND (ICSG_UseCases includes VR)

Initial Conditions:

- AUT is in [AUT STARTED] mode.

Steps:

1. The Test System commands the AUT to replay the Application User Flow 6.1 Select a virtual experience.
2. The Test System waits until the AUT recognizes the target object
3. The Test System spins up the Host Device 30 degrees, and waits until the AUT recognizes the target object.
4. The Test System spins down the Host Device 60 degrees and waits until the AUT recognizes the target object.
5. The Test System spins up the Host Device 30 degrees and spins left 60 degrees and waits until the AUT recognizes the target object.
6. The Test System spins right the Host Device 120 degrees and waits until the AUT recognizes the target object.
7. The Test System spins left 60 degrees and waits until the AUT recognizes the target object.
8. The Test System measures the current consumed from step 1 to step 7.
9. The Test System spins back the Host Device to the original position.

Postamble:

- Execute the Postamble sequence (see section 2.6).

Measurements:

- Current consumption: Record current samples during the measurement time and calculate the following values:
  - Average current consumption.
  - Standard deviation.
- Time to load the virtual experience.

3.6.2 Virtual Scene Loading

Identifier: *AEC/VR/002*

Title: Virtual Scene Loading

Objective: Measure the energy that is consumed by an AUT while moving horizontally from the initial observation point under the user control.

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Applicability:

(ICSG_ProductType = Mobile device) AND (ICSG_UseCases includes VR)

Initial Conditions:

AUT is in [AUT STARTED] mode.

Steps:

1. The Test System commands the AUT to replay the Application User Flow 6.1 Select a virtual experience.
2. The Test System waits until the target object is recognized.
3. The Test System spins up the Host Device a random number of degrees between 10 and 50.
4. The Test System waits until the target object is recognized.
5. The Test System commands the AUT to move horizontally (walking speed, 4 km/h) during 20 seconds in order to change the scene.
6. The Test System measures the current consumed during step 5 execution.
7. The Test System spins back the Host Device to the original position.

Postamble:

- Execute the Postamble sequence (see section 2.6).

Measurements:

- Current consumption: Record current samples during the measurement time and calculate the following values:
    - Average current consumption.
    - Standard deviation.

3.7 Augmented Reality

3.7.1 Load augmentation layer on a physical marker

Identifier: *AEC/AR/001*

Title: Load augmentation layer on a physical marker

Objective: Measure the energy that is consumed by an AUT to render a virtual layer on top of a moving physical marker.

Applicability:

(ICSG_ProductType = Mobile device) AND (ICSG_UseCases includes AR)

Initial Conditions:

AUT is in [AUT STARTED] mode.

Steps:

1. The Test System commands the AUT to replay the Application User Flow 7.1 Load augmentation layer on a physical marker.
2. The Test System measures the current consumed until the App displays a virtual layer on top of the physical marker.

Postamble:

- Execute the Postamble sequence (see section 2.6).

Measurements:

- Current consumption: Record current samples during the measurement time and calculate the following values:
    - Average current consumption.
    - Standard deviation.

3.7.2 Load Augmentation Layer at Location

Identifier: *AEC/AR/002*

Title: Load Augmentation Layer at location

Objective: Measure the energy that is consumed by an AUT to render a virtual layer at an specific location.

Applicability:

(ICSG_ProductType = Mobile device) AND (ICSG_UseCases includes AR)

Initial Conditions:

AUT is in [AUT STARTED] mode.

Steps:

1. The Test System commands the AUT to replay the Application User Flow 7.2 Load augmentation layer at an specific location.
2. The Test System measures the current consumed until the App displays a virtual layer at the location specified.

Postamble:

- Execute the Postamble sequence (see section 2.6).

Measurements:

- Current consumption: Record current samples during the measurement time and calculate the following values:
    - Average current consumption.
    - Standard deviation.

3.7.3 Augmented reality session

Identifier: *AEC/AR/003*

Title: Augmented reality session

Objective: Measure the energy that is consumed by an AUT during an augmented reality session.

Applicability:

(ICSG_ProductType = Mobile device) AND (ICSG_UseCases includes AR)

Initial Conditions:

AUT is in [AUT STARTED] mode.

Steps:

1. The Test System commands the AUT to replay the Application User Flow 7.1 Load augmentation layer on a physical marker.
2. The Test System spins (in one of the three axis) the Host Device 15 degrees, while the physical marker remains in the same position.
3. The Test Systems wait for 5 seconds
4. The Test System measures the current consumption in steps 2 and 3, and whether the AUT keeps showing the virtual layer on top of the physical marker.
5. The Test System spins in the same axis the Host Device 30 degrees in the opposite direction, while the physical marker remains in the same position.
6. The Test Systems wait for 5 seconds
7. The Test System measures the current consumption in steps 5 and 6 and whether the AUT keeps showing the virtual layer on top of the physical virtual.
8. The Test System spins the Host device back to the original position.
9. The Test System spins back to the original position.
10. The Test System repeat steps 2 to 9 in the other two axis.

Postamble:

- Execute the Postamble sequence (see section 2.6).

Measurements:

- Current consumption: Record current samples during the measurement time and calculate the following values:
    - Average current consumption.
    - Standard deviation.

3.8 Emergency Services

TBD

3.9 Patient Monitoring

TBD

3.10 Gaming

3.10.1 Start Game session

Identifier: *AEC/GA/001*

Title: Start game session

Objective: Measure the energy that is consumed by an AUT while starting a game session.

Applicability:

(ICSG_ProductType = Mobile device) AND (ICSG_UseCases includes GA)

Initial Conditions:

- AUT is in [AUT STARTED] mode.
- AUT options are configured to their default values.
- Any AUT screen saving option is disabled.
- AUT resolution is configured to maximum resolution available.
- AUT Music and sound effects are configured to be ON.
- No energy saving option is enabled in the AUT.

Steps:

1. The Test System commands the AUT to replay the Application User Flow 10.1: Start game session.
2. The Test System measures the current consumed while the game session is being started.

Postamble:

- Execute the Postamble sequence (see section 2.6).

Measurements:

- Current consumption: Record current samples during the measurement time and calculate the following values:
    - Average current consumption.
    - Standard deviation.

3.10.2 Short Game session

Identifier: *AEC/GA/002*

Title: Short Game session

Objective: Measure the energy that is consumed by an AUT while playing a short game session.

Applicability:

(ICSG_ProductType = Mobile device) AND (ICSG_UseCases includes LS)

Initial Conditions:

- AUT is in [AUT STARTED] mode.
- AUT options are configured to their default values.
- Any AUT screen saving option is disabled.
- AUT resolution is configured to maximum resolution available.
- AUT Music and sound effects are configured to be ON.
- No energy saving option is enabled in the AUT.

Steps:

1. The Test System commands the AUT to replay the Application User Flow 7.2: Short game session.
2. The Test System measures the current consumed while the game session is being played.

Postamble:

- Execute the Postamble sequence (see section 2.6).

Measurements:

- Current consumption: Record current samples during the measurement time and calculate the following values:
    - Average current consumption.
    - Standard deviation.

3.10.3 Long Game session

Identifier: *AEC/GA/003*

Title: Long Game session

Objective: Measure the energy that is consumed by an AUT while playing a long game session.

Applicability:

(ICSG_ProductType = Mobile device) AND (ICSG_UseCases includes LS)

Initial Conditions:

- AUT is in [AUT STARTED] mode.
- AUT options are configured to their default values.
- Any AUT screen saving option is disabled.
- AUT resolution is configured to maximum resolution available.
- AUT Music and sound effects are configured to be ON.
- No energy saving option is enabled in the AUT.

Steps:

1. The Test System commands the AUT to replay the Application User Flow 7.3: Long game session.
2. The Test System measures the current consumed while the game session is being played.

Postamble:

- Execute the Postamble sequence (see section 2.6).

Measurements:

- Current consumption: Record current samples during the measurement time and calculate the following values:
    - Average current consumption.
    - Standard deviation.

4 Test cases applicability

The applicability of each individual test is identified in Table C.1.

The applicability of every test is formally expressed by the use of Boolean expressions that are based on parameters (ICS) included in annex A of the present document.

The columns in Table C.1 have the following meaning:

Test case column

The Test case column indicates the test case number for each test case as described in the Control Panel Service Framework test case specification for which the applicability is identified.

Description column

The Title column indicates the title of each test case as described in the Control Panel Service Framework test case specification for which the applicability is identified.

Release column

The Release column indicates the earliest release from which each test case is applicable, except if otherwise stated of an individual test case.

Status column

The following notations are used for the Status column:

A	applicable - the test is applicable.
O	optional – the capability may be supported or not.
N/A	not applicable – in the given context, the test case is not applicable.
Ci	conditional – the test is applicable ("A") or not ("N/A") depending on the support of other optional or conditional items. "i" is an integer identifying an unique conditional status expression which is defined immediately following the table. For nested conditional expressions, the syntax "IF ... THEN (IF ... THEN ... ELSE...) ELSE ..." is used to avoid ambiguities.

The conditional expressions are added in the last row of the table. These expressions may use ICS as defined in D2.2 Appendix 2. ICS/IXIT. The ICS items will be referred as A.n/m where A.n refers to the table in which the ICS is defined and m refers to the item of the table.

A practical example is detailed below Table 6.

Table 6 – Test cases applicability

Test case	Description	Status
AEC/CO/001	AUT not running	A
AEC/CO/002	Open the AUT	C08
AEC/CO/003	Background state	C08
AEC/CS/001	Non Interactive Playback	C01
AEC/CS/002	Pause	C20
AEC/CS/003	Rewind and Fast Forward	C21
AEC/CS/004	Download content for offline playing	C09
AEC/CS/005	Non interactive Playback with screen off	C25
AEC/LS/001	Play Live Video from User	C02
AEC/LS/002	Broadcast Live Video	C02
AEC/LS/003	Broadcast Live Video with screen off	C26
AEC/SN/001	Picture Posting	C10
AEC/SN/002	Video Posting	C11
AEC/SN/003	File Posting	C13
AEC/SN/004	Show Picture	C14
AEC/SN/005	Play Video	C15
AEC/SN/006	File Downloading	C16
AEC/HS/001	Downloading files sequentially	C04
AEC/HS/002	Uploading files sequentially	C04
AEC/HS/003	Downloading several files simultaneously	C04
AEC/HS/004	Uploading several files simultaneously	C04
AEC/HS/005	Downloading a file with screen off	C04
AEC/HS/006	Uploading a file with screen off	C04
AEC/VR/001	Virtual Experience Loading	C05
AEC/VR/002	Virtual Scene Loading	C05
AEC/AR/001	Load Augmentation Layer on Physical Marker	C06
AEC/AR/002	Load Augmentation Layer at Location	C06
AEC/AR/003	Augmented reality Session	C06
AEC/GA/001	Start game session	C07
AEC/GA/002	Short game session	C07
AEC/GA/003	Long game session	C07

Test case	Description	Status
C01	IF (A.1/1= Application) AND (A.1/3 includes CS) THEN **A** ELSE **N/A**	
C02	IF (A.1/1= Application) AND (A.1/3 includes LS) THEN **A** ELSE **N/A**	
C03	IF (A.1/1= Application) AND (A.1/3 includes SN) THEN **A** ELSE **N/A**	
C04	IF (A.1/1= Application) AND (A.1/3 includes HS) THEN **A** ELSE **N/A**	
C05	IF (A.1/1= Application) AND (A.1/3 includes VR) THEN **A** ELSE **N/A**	
C06	IF (A.1/1= Application) AND (A.1/3 includes AR) THEN **A** ELSE **N/A**	
C07	IF (A.1/1= Application) AND (A.1/3 includes GA) THEN **A** ELSE **N/A**	
C08	IF (A.1/1= Application) AND A.2/1 THEN A ELSE **N/A**	
C09	IF (A.1/1= Application) AND (A.1/3 includes CS) AND A.2/14 THEN **A** ELSE **N/A**	
C10	IF (A.1/1= Application) AND (A.1/3 includes SN) AND A.2/17 THEN **A** ELSE **N/A**	
C11	IF (A.1/1= Application) AND (A.1/3 includes SN) AND A.2/16 THEN **A** ELSE **N/A**	
C12	IF (A.1/1= Application) AND (A.1/3 includes SN) AND A.2/15 THEN **A** ELSE **N/A**	
C13	IF (A.1/1= Application) AND (A.1/3 includes SN) AND A.2/19 THEN **A** ELSE **N/A**	
C14	IF (A.1/1= Application) AND (A.1/3 includes SN) AND A.2/20 THEN **A** ELSE **N/A**	
C15	IF (A.1/1= Application) AND (A.1/3 includes SN) AND A.2/21 THEN **A** ELSE **N/A**	
C16	IF (A.1/1= Application) AND (A.1/3 includes SN) AND A.2/17 THEN **A** ELSE **N/A**	
C17	IF (A.1/1= Application) AND (A.1/3 includes SN) AND A.2/24 THEN **A** ELSE **N/A**	
C18	IF (A.1/1= Application) AND (A.1/3 includes GA) AND A.2/26 THEN **A** ELSE **N/A**	
C19	IF (A.1/1= Application) AND (A.1/3 includes GA) AND A.2/25 THEN **A** ELSE **N/A**	
C20	IF (A.1/1= Application) AND (A.1/3 includes CS) AND A.2/11 THEN **A** ELSE **N/A**	
C21	IF (A.1/1= Application) AND (A.1/3 includes CS) AND A.2/8 AND A.2/10 THEN **A** ELSE **N/A**	
C22	IF (A.1/1= Application) AND (A.1/3 includes CS) AND A.2/27 THEN **A** ELSE **N/A**	
C23	IF (A.1/1= Application) AND (A.1/3 includes CS) AND A.2/7 AND A.2/9 THEN **A** ELSE **N/A**	
C24	IF (A.1/1= Application) AND (A.1/3 includes CS) AND A.2/4 THEN **A** ELSE **N/A**	
C25	IF (A.1/1= Application) AND (A.1/3 includes CS) AND A.2/28 THEN **A** ELSE **N/A**	
C26	IF (A.1/1= Application) AND (A.1/3 includes LS) AND A.2/29 THEN **A** ELSE **N/A**	

Example of expression interpretation in the table above.

Test case	Test case title	Status
AEC/CS/001	Non Interactive Playback	C01

The status (applicability) of test case ‘AEC/CS/001’ is defined by condition’ C01’

C01 IF (A.1/1= Application) AND (A.1/3 includes CS) THEN A ELSE N/A

Where:

C01: Condition to be used in the test cases to define applicability

A.1/1 Value of Item 1 of table A.1 defined in D2.2 Appendix 2. ICS/IXIT In this case, value of ICS 'ICSG_ProductType' (Table A.1, item 1)

A.1/3 includes CSCS is one of the values of ICS 'ICSG_UseCases' (table A.1, item 3). (ICSG_UseCases ICS status is Mn, meaning that several options may be supported.

If the value of the sub-expresion *(A.1/1= Application)* is TRUE AND the value of the sub-expression *(A.1/3 includes CS) is TRUE, the test case status is Applicable (A); In any other case, the status is Not-applicable (N/A).*

5 Annex 1: Key Performance Indicators

The following table summarizes the Key Performance Indicators that will be obtained based on the measurements obtained by the execution of the test cases and each test case repetition.

Table 7 – Application User Experience Key Performance Indicators

Measurements	**Use Cases**	**Type**	**Unit**	**Summarization**	**KPI**
Current consumption	All	Unsigned Integer	mA	Average, Deviation, Skewness, Kurtosis	App Consumption