



Live TV for Mobile Applications Acceptance Test Plan

Version 1.0

Doc. No.:

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Revision History

Date	Version	Description	Author
12/10/2009	0.01	Initial Draft	Nima
12/11/2009	0.02	Testing method, approach and test cases	Amer

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1. Introduction

1.1 Purpose of this document

Purpose of this document is to verify and validate the product and show that it meets all requirements and also test cases and results are presented. Goal of some test cases is to test environment and configuration and the rest test cases are for testing developed software codes.

1.2 Intended Audience

The intended audience is:

- Live TV team members
- Steering group
- Customer

1.3 Scope

This document covers test cases for validating Live TV project. In this document some integrated test cases are presented as well as some unite test cases.

1.4 Definitions and acronyms

1.4.1 Definitions

Keyword	Definitions

1.4.2 Acronyms and abbreviations

Acronym or abbreviation	Definitions
RTSP	Real Time Streaming Protocol
API	Application Programming Interface
S60	Symbian S60 operating system
VLC	VideoLAN server used for streaming
DSS	Darwin Streaming Server

1.5 References

- Design description.
- Requirement description.
- Project description.

2. Test-plan introduction

As it has been described in design documentation this project is consist of three different boxes, recorder, studio and player. We have provided unit test cases for each part as well as end to end solution test case.

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3. Test items

According to different system parts we are presenting standalone test items for each part and one test case for end to end solution (recorder→studio→player).

3.1 RECORDER

In this part our application should record video using internal API and then encode the input video and send it over RTP protocol to PC studio application. So, one test item would be devised to test all these steps. VLC would be used to test this functionality instead of PC studio application to make testing independent for this component.

3.2 STUDIO

In this application we use libVLC in order to listen to one special port to receive stream from recorder. It should support up to 6 streams in same time. Then operator can choose one of these input streams to send it to client mobile phones. Operator can also put some commercial between output streams. The output stream is then relayed to the DSS server. So we can have one standalone test item for studio using some online streaming servers.

3.3 Player

The mobile player is using internal API to receive stream from DSS and decode audio and video. Then it should play video in screen. For sending feedback socket connection is used. Client can choose one of feedback items and then studio should receive this item. We also can have independent case item for testing player using online streaming server.

3.4 END TO END SOLUTION

Finally we should start recording using our recorder application, then studio should be able to receive video and play it. Different streams should be able to be sent (both from recorder or offline advertisement files) in output and client player should be able to play the output stream. Our main requirement is that there should be delay no more than five seconds so in this test item in addition to test all parts to work correctly we should test delay time.

4. Features to be tested

All aforementioned test items are going to be tested except some functionality which is pointed out in next section.

5. Features not to be tested

Feedback functionality is not going to be tested in this version. We are not able to test exactly 6 input streams at same time from recorder due to lack of devices.

6. Approach

The following approaches would be used in the testing of the project:

1. **Normal Usage** – testing based on features in order to cover all of the specified requirements
2. **Component Testing** – testing individual components (or “boxes”) of the system focusing on their features and requirements
3. **Integration Testing** – this would test the entire system as a serial combination of its components, i.e. the stream chain (Recorder → PC Studio → Client Player)
4. **Faulty Testing** – The components of the system would be given invalid input data (e.g. invalid stream files) and this approach would be combined with component and integration testing to test the system against abrupt inputs and/or unexpected situations.

6.1 Approach to configuration and installation

The development teams would craft installation packages for mobile recorder and PC Studio applications along with their installation manuals. The project uses Apple’s open-source Darwin Streaming Server which the administrator of the system would be required to install and configure. The system administrator would be provided installation and configuration manuals as well, so the development teams would be isolated from the

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responsibility of configuration and installation of the system. Furthermore, the developers of the system would in no way be held liable for any failures in configuration or installation of the system if the user or system administrator do not follow the instructions properly as stated in the given guidelines.

7. Item pass/fail criteria

Test	Verdict	Remarks
Normal Usage		
Component Testing		
Integration Testing		
Faulty Testing		

7.1 Installation and Configuration

The system involves setting up of Darwin Streaming Server which would be preferably on a dedicated server, but bandwidth of the internet connection, system resources of this server might affect reception of live streams from the mobile recorders and subsequent broadcasting to mobile client viewers.

7.2 Documentation problems

Testing is relatively unaffected by the documentation and no problems (that may arise from incomplete or non-existing documentation) are apparent or expected at this time.

8. Suspension criteria and resumption requirements

Most of the testing of the system is based on external inputs for which there are alternatives available in case of any intermediate issues that may arise. For instance, if the recorder fails to send live stream to the PC Studio application, RTSP video streams from various internet streaming sites could be fed to the PC Studio application instead.

9. Environmental needs

9.1 Hardware

- Mobile phone(s) for recording
- Dedicated server machine (for Darwin Streaming Server)
- Mobile phone(s) for client playback

9.2 Software

- Windows Server or Desktop edition hosting the PC Studio application and Darwin Streaming Server

9.3 Other

- Wireless internet connectivity for mobile phones (recorders)
 - WiFi
 - 3G or GPRS for mobile phone connectivity

10. Test procedure

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10.1 Test case specifications

10.1.1 Mobile Recorder

10.1.1.1 Live Streaming – MREC-001

Description:

Start recording live stream in the recorder application and transmit over RTP to the server

Test type:

Component test - Positive

Preconditions:

The mobile phone is connected to the internet and the server is running an instance of VLC to receive the incoming stream.

Input definition:

1. Live TV Recorder application is started and running on the mobile phone
2. Click “Set Server IP” button from the Menu
3. Enter the receiving server’s IP address and click OK
4. Click “Set Server Port” button from the Menu
5. Enter the receiving server’s port number where the VLC client would listen for incoming stream, then click OK.
6. VLC listener client is started and running on the receiving server.
7. Click Play button on VLC client.
8. Click “Record/Stream” button on the mobile recording application to start streaming.

Output definition:

Expected output is live video stream playing on the VLC client on the server.

Remarks:

Make sure that only one instance of VLC listener client is run on the server at one time. Otherwise received stream might not play. This is because only one instance of VLC can listen to one incoming RTP stream.

10.1.2 PC Studio

10.1.2.1 Add an input media to stream list – PCSTD-001

Description:

Add a media input (File/URL) to the list of available streams.

Test type:

Component test - Positive

Preconditions:

The PC Studio application has no input media in the available streams list and allows inserting either file location or URLs as input media. The computer where PC studio application is running is connected to internet. Furthermore, there are available media files that can be fed to the PC studio application.

Input definition:

1. PC Studio application is started and running on the server.
2. Click “Add Input Media” button on the main screen.
3. Enter “rtsp://stream.zoovision.com/zootoones/superman_electric_earthquake.3gp” in the textbox and click OK.

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Output definition:

The list of available input streams now contains the “rtsp://stream.zoovision.com/zootoones/superman_electric_earthquake.3gp” entry.

Remarks:

None

10.1.2.2 *Preview an input stream – PCSTD-002*

Description:

Preview an input stream in one of the six preview panes displayed on the PC Studio application. This allows viewing the input streams before transmitting them to the DSS server.

Test type:

Component test - Positive

Preconditions:

The PC Studio application is started and it contains a list of available input streams (file or internet streaming URLs). It is also connected to the internet in order to be able to play internet streams.

Input definition:

1. PC Studio application is started and it contains a list of available input streams in the stream list.
2. Select any one of the entries in the list of available input streams and drag-drop it to any of the six preview panes.

Output definition:

The selected input media starts playing on the selected preview pane (on which the stream was drag-dropped).

Remarks:

The stream selected for preview must be accessible by the PC studio application (i.e. if it is a file, it must be present on the computer; if it is a streaming URL it must be valid and accessible).

10.1.2.3 *Transmit an input stream – PCSTD-003*

Description:

Transmit an input stream to the DSS server so that it is broadcasted to client viewers.

Test type:

Component test - Positive

Preconditions:

The PC Studio application is started and there is one or more streams being previewed. It is also connected to the internet in order to be able to play internet streams.

Input definition:

1. PC Studio application is started and there is one or more input streams being previewed.
2. Click “Live” button below the preview pane of the stream which you want to transmit.

Output definition:

Selected input stream starts to play in the output stream pane.

Remarks:

None

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10.1.3 Mobile Player

10.1.3.1 Play a live stream – MPLY-001

Description:

Receive and play a live broadcast coming from the DSS server on the mobile phone (viewer).

Test type:

Component test - Positive

Preconditions:

The mobile phone is connected to the internet and the server is running DSS which is broadcasting video streams.

Input definition:

1. Mobile client player is started and running on the mobile phone
2. Click “Available Broadcasts” button from the Menu
3. Select a video stream to play
4. Click “Play” button

Output definition:

Live video stream buffers up and plays in the mobile client player.

Remarks:

At the time of testing, there would be some test video streams that would be set up on DSS server for streaming and they could either be file sources or internet-streaming sources.

10.1.4 END TO END SOLUTION

10.1.4.1 Live recording and broadcast viewing – LTV-001

Description:

Start recording live stream in the mobile recorder application, select and transmit it from PC Studio and then view it on mobile player client

Test type:

Integration test - Positive

Preconditions:

Both the recorder mobile phone and viewer mobile phone are connected to the internet. There is a configured server with PC studio application and DSS server running on it. The PC Studio application is configured to receive the input live stream coming from mobile recorder. The mobile client player is configured with the output stream URL coming from the PC Studio.

Input definition:

1. Live TV Recorder application is started and running on the mobile phone.
2. Click “Set Server IP” button from the Menu.
3. Enter the receiving server’s IP address and click OK.
4. Click “Set Server Port” button from the Menu.
5. Enter the receiving server’s port number where the PC Studio application is started and running.
6. PC Studio application is started and running on the receiving server.
7. Click “Record/Stream” button on the mobile recording application to start streaming.
8. On the PC Studio application, select and drag-drop the live input stream URL from the live input

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streams list to any of the preview panes.

9. Click “Live” button below the drag-dropped preview pane.
10. On the mobile client player, click “Available Broadcasts” button.
11. Select the live stream from the list.
12. Click the “Play” button.

Output definition:

The live video stream coming from the mobile recorder broadcasted by PC Studio is played on the mobile viewer phone.

Remarks:

A delay of less than or equal to five seconds is expected to arise due to real-time recording and transmission delays. The delays also depend on the internet bandwidth available to the mobile recorder, PC Studio server and the viewer mobile client.

10.2 Test plan

Specify main test threads and test case orders in which to perform overall testing process (in a form of a tree?)

11. Responsibilities

11.1 Developers

The developers (team at MDH & Zagreb) are responsible for fixing bugs that become apparent during both development and testing phases.

11.2 User representative

The user (customer) will not officially have any responsibilities during the testing phase.

12. Risks and contingencies

The client player has been tested on Symbian 5th edition phones (Nokia N97, Nokia ExpressMusic) and Android phone but other mobile platforms (Symbian 3rd edition and older, Blackberry, iPhone, etc.) have not been tested yet, but the design of the system follows standards by which we can predict a favorable success rate.

13. Approvals

Name	Title	Date yyyy-mm-dd	Signature