

System Engineering

System Acceptance Test

EMC

***Phase III PPV/IPPV/IRD
Command***

Oct 2005

Document Change History

Date	Version	Author	Modification
05-07-2005	Draft	Sarah Chang	First Document
05-15-2005	1.0	Sarah Chang	Version 1.0
09-27-2005	1.1	Alex Qian	Update document
10-23-2005	1.2	Alex Qian Sarah Chang	Removed the ambiguity in the master/slave section. Added sign-off page & reservation list at the end. Corrected the document formatting of the IRD command section to match the rest of the document. Corrected OPPV & memory full callback test cases.

Table of Contents

1 INTRODUCTION	4
1.1 SCOPE OF THE DOCUMENT	4
1.2 RELATED DOCUMENTS	4
2 SAT OVERVIEW	5
2.1 ACCEPTANCE TEST OBJECTIVES	5
2.2 TESTING ORGANIZATION	5
2.3 PROBLEM REPORTING	5
2.4 OUTSTANDING ISSUES MANAGEMENT	5
3 PPV/IPPV/CALLBACK	6
3.1 TESTING APPROACH	6
3.2 TESTING ENVIRONMENT	6
3.2.1 FEEDBACK COMMANDS:	6
3.2.2 REGULAR CALLBACK	6
3.2.3 IMMEDIATE CALLBACK	7
3.2.4 MEMORY FULL CALLBACK	7
3.2.5 SPECIAL EVENT CALLBACK	8
3.2.6 NUMBER OF CALL LIMITATION	8
3.2.7 IPPV PRODUCT EXPIRY AND PURGE DATE	8
3.2.8 EXPIRED AND CLEANUP	8
3.3 ACCEPTANCE TEST REQUIREMENTS	9
3.4 TEST CASES	9
3.4.1 ORDER AHEAD PAY PER VIEW OR OPPV	9
3.4.2 PREPAID IMPULSIVE PAY PER VIEW (IPPV) WITHOUT RETURN PATH	12
3.4.3 PREPAID IMPULSIVE PAY PER VIEW (IPPV) WITH RETURN PATH	16
3.4.4 ALL TYPES OF CALLBACK	20
3.4.5 CLEANUP PPV AND IPPV RECORDS	24
4 GENERIC IRD COMMANDS	30
4.1 TEST CASES	30
4.1.1 MAIL	30
4.1.2 FORCE TUNE	31
4.1.3 SET NETWORK ID	32
4.1.4 SET PIN CODE	33
4.1.5 MASTER AND SLAVE	35
5 CONCLUSION	39

1 Introduction

1.1 Scope of the Document

The purpose of the System Acceptance Test is to specifically define all aspects of the Acceptance Tests. The document includes the testing approach, methodology, resources and environmental requirements, the test schedule, and the methods for documenting and evaluating the test results. Detailed test scenarios, to be executed during the Acceptance Test, are also included as part of the SAT. The SAT should also address the traceability of test cases to system requirements.

1.2 Related Documents

#	Title	Revision
[1]	phase3_EMC_SMSgw_matrix_ver3.8-d2_20050510.xls	
[2]	Hyundai Digital Technology StbCakIrdSpe010306.pdf	1.3.6
[3]	EasternMultimediaCompany StbIrdMSOvw010000	1.0.0
[4]	EasternMultimediaCompany StbIrdMSTed00003	0.0.3

2 SAT Overview

2.1 Acceptance Test Objectives

The objective of these tests is to ensure that the installed CAS system adequately meets the functional and operational requirements as stated in the Statement of Work.

The following items will be evaluated:

PPV/IPPV/Callback Features:

- Order Ahead Pay Per View
- Prepaid Impulsive Pay Per View (IPPV) without return path
- Prepaid Impulsive Pay Per View (IPPV) with return path
- All types of Callback
- Clean-up of PPV and IPPV records

Generic IRD Commands:

- Mail
- Force Tune
- Set Network ID
- Set PIN Code
- Master/Slave

2.2 Testing Organization

Role	Name	In Charge of
Program Manager	Alex Qian	Technical coordination
System Engineer	Sarah Chang	Performing SAT

2.3 Problem Reporting

All problems or bugs will be reported to Nagravision R&D through service office.

2.4 Outstanding Issues Management

All outstanding issues will be recorded and traced in the SAT.

3 PPV/IPPV/Callback

3.1 Testing Approach

This is functional testing of PPV and IPPV related for EMC. To demonstrate the PPV/IPPV function works properly and is ready for the implementation. Based on EMC's business model, the test will be performed with PPV, IPPV with and without return path.

3.2 Testing Environment

The tests will be done based on the CAS configuration and EMC environment.

CAS configuration:

3.2.1 Feedback Commands:

Feedback commands are the commands sent by the CAS to the SMS. They hold information about the impulsive purchases that have been made by the subscribers.

The routing of a feedback command depends on the SMS source_id associated for a given ICC. When the call collector prepares a feedback command, the SMS_id is set using that source_id.

Feedback commands settings in CAS:

Command 211 – Start of Report

Command 202 – PPV Purchase List

Command 201 – Current Debit and Credit

Command 207 – ICC Memory Full Alarm

Command 212 – End of Report

3.2.2 Regular Callback

Regular calls are triggered when the RCDate field of an operator class (OPC) is in the past, provided that this OPC is related to a valid phone number. Upon completion of a regular call, RCDate is updated so that the next regular call occurs one period later (e.g one month, daily, etc).

The date_first_call field is the first date in UTC on which the ICC should call back. The callback_time provided by the SMS is ignored and the CAS will manage a random callback time.

Regular Callback commands:

Command 211 – Start of Report

Command 202 – PPV Purchase List

Command 201 – Current Debit and Credit

Command 212 – End of Report

3.2.3 Immediate callback

Immediate callback calls are triggered when the ICDate field of an operator class (OPC) is in the past, provided that this OPC is related to a valid phone number. Upon completion of an immediate call, immediate callbacks are disabled by setting ICDate far in the future.

An immediate call means that the CAS system expects to receive a callback from a given ICC/STB in a time frame from 10 min to several hours. When a STB perform a callback and if the call fails for any reason (e.g the line is busy), the STB retries in a period in the range of a couple of minutes to several hours.

In order to prevent STB to call the head-end too many times, the number of call attempts is limited to 8 every 24 hours, starting from the first call attempt following the smart card insertion. This limitation includes failed calls as well as successful calls.

Immediate Callback commands:

Command 211 – Start of Report

Command 202 – PPV Purchase List

Command 201 – Current Debit and Credit

Command 212 – End of Report

3.2.4 Memory Full Callback

Low memory calls are triggered when the smartcard is unable to create a new entitlement due to lack of available memory and that at least one entitlement has expired (end date is the past).

Low memory calls are performed to make room in the smartcard. Inserting a smartcard with no memory left without attempting to purchase a right will not trigger any connection. The call is only triggered when the smartcard is full and an impulse purchase is performed.

After a successful call collection the Interactive Transaction Manager (ITM) sends a clean-up command back to the smartcard. The purpose of the clean-up command is to purge expired IPPV records in order to make room for new ones.

Memory Full commands:

Command 211 – Start of Report

Command 207 – ICC Memory Full Alarm

Command 202 – PPV Purchase List

Command 201 – Current Debit and Credit

Command 212 – End of Report

3.2.5 Special Event Callback

The head-end has the capability to flag an event so that a callback is triggered in case the subscriber watched it. An event is considered as watched when the smartcard has decrypted an ECM, n being defined as the watch criterion. These events are called "special events" since they are assigned the "special" or high priority flag.

In order to prevent STB of subscribers watching the same special event to call the call collector exactly at the same time, special event calls are uniformly distributed on a period defined as follows:

Period = OPC.CRPeriod (h)

The special event period is a linear function of CRPeriod from 10 to 255 hours. By default, CRPeriod is equal to 180, which corresponds to a 7.5-day special event period. This is rather huge but was dimensioned for the entire network to balance the load.

Special Event Callback commands:

Command 211 – Start of Report

Command 202 – PPV Purchase List

Command 201 – Current Debit and Credit

Command 212 – End of Report

3.2.6 Number of Call Limitation

In order to prevent STB to call the head-end too many times, the number of call attempts is limited to 8 every 24 hours, starting from the first call attempt following the smart card insertion. This limitation includes failed calls as well as successful calls.

3.2.7 IPPV Product Expiry and Purge Date

The expiry of a record on the smartcard corresponds to the end_value of the corresponding product in the CAS database. The end_date of a single event product is 1 day after the end of the event. The product validity end_date is inclusive. The product is expired the day after that.

This can be shown in the example below:

Event Start Time	: 04/19/2005 18:00 Local Time
Event End Time	: 04/19/2005 19:44 Local Time
Product Validity Begin	: 04/18/2005 08:00 Local Time
Product Validity End	: 04/20/2005 08:00 Local Time

Product will be expired and can be purged on 04/21/2005 UTC. In Local time (GMT+8), the product will be considered as expired and therefore can be purged at 8AM on 04/21/2005.

3.2.8 Expired and Cleanup

OPPV are automatically marked as reported when they are sent to the smartcard. Therefore these OPPV records will be purged by the automatic global cleanup process after they expired. SMS can also manually purge the expired records by sending Command 96 (Purge PPV and IPPV records)

In IPPV without return path, the SMS needs to send manually Command 97 (Set IPPV records as reported) to each smartcard. The IPPV records will be purged automatically by the global cleanup after they expired. SMS can also manually purge the expired records by sending Command 96 (Purge PPV and IPPV records)

In IPPV with return path, the IPPV records will be flagged as reported after a successful callback and then purged (for expired records). For call collected and non expired records, they will be purged by the global cleanup process.

EMC Environment:

- STB Model: HDT
- STB Software: 1.06
- CAK Version: V6_1.1.14
- OPPV
- Prepaid IPPV with return path
- Prepaid IPPV without return path
- Credit=2000
- Threshold=0
- Callback phone number=81777032

3.3 Acceptance Test Requirements

The PSTN is ready for the test.

The STB is fully integrated with the callback module. The application of STB should fully understand the IPPV descriptor in the SI stream and be able to purchase the IPPV event by remote control.

IPPV products are able to be imported from the scheduling system and created by the IMS.

2 Empty smart cards (smart card with return path, and smart card without return path)

3.4 Test Cases

3.4.1 Order Ahead Pay Per View or OPPV

Here, the subscribers call the Customer Service Centre and order a specific product. The CAS makes sure the corresponding rights are sent to the smart card while the billing is being done by the Subscriber Management System (SMS).

3.4.1.1 Test Summary

Test #	Test Title
--------	------------

1	Order Ahead Pay Per View
2	Cancel OPPV

Test #1

<Test #1><Order Ahead Pay per View>	
Test Objective:	To simulate PPV purchase successful.
Test Conditions:	<ul style="list-style-type: none"> PPV product ready
Test Description:	<ul style="list-style-type: none"> Select PPV product number xxx Send command#10, "Add event product".
Expected Results:	<ul style="list-style-type: none"> Command should be ack and broadcast. Be able to watch the programs after receive the right. In EMGRDBA, Add Event Product with Product ID is recorded In SMS_IO log, Add Event Product with Product ID is recorded
Test:	<input type="checkbox"/> Test Accepted <input type="checkbox"/> Test Not Accepted
Comments:	

Test #2

<Test #2><Cancel OPPV>

Test Objective: To simulate PPV cancellation.
Test Conditions: <ul style="list-style-type: none">• PPV product exists in smart card
Test Description: <ul style="list-style-type: none">• Select PPV product number xxx• Send command#6, "Product Cancellation".
Expected Results: <ul style="list-style-type: none">• Command should be ack and broadcast.• Not able to watch the programs after the right is cancelled.
Test: <input type="checkbox"/> Test Accepted <input type="checkbox"/> Test Not Accepted
Comments:

3.4.2 Prepaid Impulsive Pay Per View (IPPV) without return path

3.4.2.1 Test Summary

Test #	Test Title
1	Create credit info in the ICC
2	Purchase three movies with remote control
3	Add credit to subscriber's Smart Card
4	Suspend Impulse Purchase
5	Reactivate Impulse Purchase

Test #1

<Test #1> <Create credit info in the ICC>	
Test Objective:	To test the credit value is able to be stored correctly in the smart card.
Test Conditions:	<ul style="list-style-type: none"> Credit = 200 Threshold = 0
Test Description:	<ul style="list-style-type: none"> Send cmd#13 "Create Credit", set credit = 200 and threshold = 0 Send cmd#8 "Credit Management", set credit = 200. Send cmd#15 "Reactivate Impulsive Purchase"
Expected Results:	<ul style="list-style-type: none"> On STB, able to see the current cash is 200. From STB, Credit = 200 In EMGRDBA, Credit of 200 is recorded In SMS_IO log, Credit of 200 is recorded
Test:	<input type="checkbox"/> Test Accepted <input type="checkbox"/> Test Not Accepted

Comments:

Test #2

<Test #2> <Purchase three movies with remote control >

Test Objective:

To test with the credited amount in the smart card, the subscriber is able to purchase the movie simply by using the remote control unit.

Test Conditions:

- Movie 1 = \$50
- Movie 2 = \$50
- Movie 3 = \$50

Test Description:

- Purchase movie 1, 2 and 3 with remote control.

Expected Results:

- Be able to purchase 3 movies.
- 3 movies has been purchased with total debit = 150.
- On STB, able to see movie 1, 2 and 3 on the purchase list
- Be able to watch movie 1, 2 and 3.
- On STB, able to see the current cash is 50.

Test:

- ☐ Test Accepted
- ☐ Test Not Accepted

Comments:

Test #3

<Test #3> <Add credit to subscriber's Smart Card >

Test Objective:

To test the smart card is able to store the credit value when the subscriber calls and order additional credit.

Test Conditions: <ul style="list-style-type: none"> Credit = 100
Test Description: <ul style="list-style-type: none"> Send cmd#8 "Create Management", set credit = 300 and threshold = 0
Expected Results: <ul style="list-style-type: none"> Smart card receives the new credit value = 100. On STB, able to see the new balance = 150. In EMGRDBA, Credit of 200 is recorded In SMS_IO log, Credit of 200 is recorded
Test: <ul style="list-style-type: none"> <input type="checkbox"/> Test Accepted <input type="checkbox"/> Test Not Accepted
Comments:

Test #4

<p align="center"><Test #4> <Suspend Impulse Purchase ></p>
Test Objective: <p>To test that after the impulse purchased is suspended, the subscriber is not able to purchase the IPPV.</p>
Test Conditions: <ul style="list-style-type: none"> Credit = 100
Test Description: <ul style="list-style-type: none"> Send cmd#14 "Suspend Impulse Purchase"
Expected Results: <ul style="list-style-type: none"> Subscriber cannot purchase IPPV. The credit is suspended.
Test: <ul style="list-style-type: none"> <input type="checkbox"/> Test Accepted <input type="checkbox"/> Test Not Accepted

Comments:

Test #5

<Test #5> <Reactivate Impulse Purchase >	
Test Objective:	To test that after reactivate impulse purchase, the subscriber is able to purchase the IPPV again.
Test Conditions:	<ul style="list-style-type: none"> Credit = 100
Test Description:	<ul style="list-style-type: none"> Send cmd#15 "Reactivate Impulse Purchase"
Expected Results:	<ul style="list-style-type: none"> Subscriber is able to purchase IPPV again.
Test:	<input type="checkbox"/> Test Accepted <input type="checkbox"/> Test Not Accepted
Comments:	

3.4.3 Prepaid Impulsive Pay Per View (IPPV) with return path

3.4.3.1 Test Summary

Test #	Test Title
1	Create credit info in the ICC
2	Purchase three movies with remote control
3	Add credit to subscriber's Smart Card
4	Suspend Impulse Purchase
5	Reactivate Impulse Purchase

Test #1

<Test #1> <Create credit, Callback Phone Number in the ICC>	
Test Objective:	To test the credit value is able to be stored correctly in the smart card.
Test Conditions:	<ul style="list-style-type: none"> • Credit = 200 • Threshold = 0 • Phone Number = 81777032
Test Description:	<ul style="list-style-type: none"> • Send cmd#104 "Create ICC on Call Collector" • Send cmd#101 "Set Authorized Phone Number", set authorized phone number = 81777032 • Send cmd#49, "Set Callback Phone Number", set callback phone number = 81777032 • Send cmd#13 "Create Credit", set credit = 200 and threshold = 0 • Send cmd#8 "Credit Management", set credit = 200 • Send cmd#15 "Reactivate Impulse Purchase"

Expected Results: <ul style="list-style-type: none"> • On STB, able to see the current cash is 200. • From EMGRDBA, phone number = 81783071, Credit = 200 is recorded • In SMS_IO log, Credit of 200 is recorded
Test: <div style="margin-left: 100px;"> <input type="checkbox"/> Test Accepted <input type="checkbox"/> Test Not Accepted </div>
Comments:

Test #2

<Test #2> <Purchase three movies with remote control >
Test Objective: <p>To test with the credited amount in the smart card, the subscriber is able to purchase the movie simply by using the remote control unit.</p>
Test Conditions: <ul style="list-style-type: none"> • Movie 1 = \$50 • Movie 2 = \$50 • Movie 3 = \$50
Test Description: <ul style="list-style-type: none"> • Purchase movie 1, 2 and 3 with remote control.
Expected Results: <ul style="list-style-type: none"> • Be able to purchase 3 movies. • 3 movies has been purchased with total debit = 150. • On STB, able to see movie 1, 2 and 3 on the purchase list • Be able to watch movie 1, 2 and 3. • On STB, able to see the current cash is 50.
Test: <div style="margin-left: 100px;"> <input type="checkbox"/> Test Accepted <input type="checkbox"/> Test Not Accepted </div>

Comments:

Test #3

<Test #3> <Add credit to subscriber's Smart Card >
Test Objective: <p>To test the smart card is able to store the credit value when the subscriber calls and order additional credit.</p>
Test Conditions: <ul style="list-style-type: none"> Credit = 100
Test Description: <ul style="list-style-type: none"> Send cmd#8 "Create Management", set credit = 300
Expected Results: <ul style="list-style-type: none"> Smart card receives the new credit value = 100. On STB, able to see the new balance = 150. In EMGRDBA, Credit of 300 is recorded In SMS_IO log, Credit of 300 is recorded
Test: <ul style="list-style-type: none"> <input type="checkbox"/> Test Accepted <input type="checkbox"/> Test Not Accepted
Comments:

Test #4

<Test #4> <Suspend Impulse Purchase >
Test Objective: <p>To test that after the impulse purchased is suspended, the subscriber is not able to purchase the IPPV.</p>

Test Conditions: <ul style="list-style-type: none"> Credit = 100
Test Description: <ul style="list-style-type: none"> Send cmd#14 "Suspend Impulse Purchase"
Expected Results: <ul style="list-style-type: none"> Subscriber cannot purchase IPPV. The credit is suspended.
Test: <ul style="list-style-type: none"> <input type="checkbox"/> Test Accepted <input type="checkbox"/> Test Not Accepted
Comments:

Test #5

<Test #5> <Reactivate Impulse Purchase >
Test Objective: To test that after reactivate impulse purchase, the subscriber is able to purchase the IPPV again.
Test Conditions: <ul style="list-style-type: none"> Credit = 100
Test Description: <ul style="list-style-type: none"> Send cmd#15 "Reactivate Impulse Purchase"
Expected Results: <ul style="list-style-type: none"> Subscriber is able to purchase IPPV again.
Test: <ul style="list-style-type: none"> <input type="checkbox"/> Test Accepted <input type="checkbox"/> Test Not Accepted
Comments:

3.4.4 All Types of Callback

3.4.4.1 Test Summary

Test #	Test Title
1	Regular callback
2	Immediate callback
3	Memory Full callback
4	Special Event callback

Test #1

<Test #1> <Regular callback >	
Test Objective: To test that the regular callback can be triggered and the callback information is correct.	
Test Conditions: <ul style="list-style-type: none"> callback frequency = "every day" date first call = "today" 	
Test Description: <ul style="list-style-type: none"> Send cmd#61 "Enable Automatic Callback", set callback frequency = "every day" and date first call = "today" 	
Expected Results: <ul style="list-style-type: none"> With Jsim, be able to see the feedback command on "today", "today" + 1 days and "today" + 2 days. From Jsim, be able to see the callback information <ul style="list-style-type: none"> ➤ Cmd 211 – Start of Report ➤ Cmd 202 – PPV Purchase List (if there is any) ➤ Cmd 201 – Current Debit and Credit ➤ Cmd 212 – End of Report In SSM log, callback information is recorded 	
Test: <div style="display: flex; justify-content: flex-end;"> <input type="checkbox"/> Test Accepted <input type="checkbox"/> Test Not Accepted </div>	

Comments:

Test #2

<Test #2> < Immediate callback >	
Test Objective:	To test that the immediate callback can be triggered and the callback information is correct.
Test Conditions:	<ul style="list-style-type: none"> • Immediate callback
Test Description:	<ul style="list-style-type: none"> • Send cmd#60 "Immediate Callback"
Expected Results:	<ul style="list-style-type: none"> • With Jsim, be able to see the feedback command in ~10 minutes. <ul style="list-style-type: none"> ➤ Cmd 211 – Start of Report ➤ Cmd 202 – PPV Purchase List (if there is any) ➤ Cmd 201 – Current Debit and Credit ➤ Cmd 212 – End of Report • In SSM log, callback information is recorded
Test:	<input type="checkbox"/> Test Accepted <input type="checkbox"/> Test Not Accepted
Comments:	

Test #3

<Test #3> <Memory Full callback>

Test Objective: To test that the STB is able to trigger a callback when the smartcard is unable to create a new entitlement due to lack of available memory and that at least one entitlement has expired (end date is the past).	
Test Conditions: <ul style="list-style-type: none"> • Subscription 10 • IPPV record 60 10 reported/expired 50 reported/not expired • Credit = 1000, Threshold = 0 	
Test Description: <ul style="list-style-type: none"> • Send cmd#13 "Create Credit", set credit = 1000, threshold =0 • Purchase 60 movies as the price <1000 • After 10 movies expired, purchase one more movie then low memory callback will be triggered. • Send cmd#96 "Purge PPV and IPPV records" (Note: This command is only necessary when the subscriber's telephone line is not working, and the command must be sent with the condition date = 19920101, indicating a smartcard with return path) 	
Expected Results: <ul style="list-style-type: none"> • Be able to buy 60 movies with enough credit. • When you try to buy one more movie, be able to see the low memory callback with JSIM. <ul style="list-style-type: none"> ➢ Cmd 211 – Start of Report ➢ Cmd 207 – Memory Full Alarm ➢ Cmd 202 – PPV Purchase List (if there is any) ➢ Cmd 201 – Current Debit and Credit ➢ Cmd 212 – End of Report • After low memory callback, 10 movies expired will be purged and be able to buy a new movie. • In SSM log, callback information is recorded 	
Test: <div> <input type="checkbox"/> Test Accepted <input type="checkbox"/> Test Not Accepted </div>	
Comments:	

Test #4

<Test #4> <Special Event callback >	
Test Objective:	To test if the event the subscriber is watching is marked as a special event (high priority), the STB will trigger a special event callback when the event is flagged as "watched".
Test Conditions:	<ul style="list-style-type: none"> A single event IPPV product and marked as "special event"
Test Description:	<ul style="list-style-type: none"> Purchase the product with the remote control. Watch the movie for at least 5 minutes. Monitor the callback. By default, it will callback in 7.5 days.
Expected Results:	<ul style="list-style-type: none"> In 7.5 days, be able to see the feedback commands. <ul style="list-style-type: none"> ➤ Cmd 211 – Start of Report ➤ Cmd 202 – PPV Purchase List (if there is any) ➤ Cmd 201 – Current Debit and Credit ➤ Cmd 212 – End of Report In SSM log, callback information is recorded
Test:	<input type="checkbox"/> Test Accepted <input type="checkbox"/> Test Not Accepted
Comments:	

3.4.5 Cleanup PPV and IPPV records

3.4.5.1 Test Summary

Test #	Test Title
1	Cleanup OPPV - manual purge (command 96)
2	Cleanup OPPV - auto purge (global cleanup)
3	Cleanup IPPV (w return path) - auto purge (callback)
4	Cleanup IPPV (w return path) - auto purge (global cleanup)
5	Cleanup IPPV (w/o return path) - manual purge (command 96)
6	Cleanup IPPV (w/o return path) - auto purge (global cleanup)

Test #1

<Test #1> < Cleanup OPPV - manual purge (command 96) >	
Test Objective:	To test that the command 96 is able to purge PPV marked as reported and older or equal to cleanup_date .
Test Conditions:	<ul style="list-style-type: none"> • OPPV records are automatically marked as reported when they are sent to the smart card • Stop global cleanup process from CAS
Test Description:	<ul style="list-style-type: none"> • Send cmd#10 "Add Event Product" to add 3 PPV product to a smart card • Wait for the PPV records to be expired • Send cmd#96 "Purge PPV and IPPV records", set cleanup date = today's date, (with return path->condition date = 19920101, without return path->condition date = cleanup_date)

Expected Results: <ul style="list-style-type: none"> Any PPV / IPPV records that are older than or equal to Cleanup Date will be purged. On STB, expired PPV are purged
Test: <ul style="list-style-type: none"> <input type="checkbox"/> Test Accepted <input type="checkbox"/> Test Not Accepted
Comments:

Test #2

<Test #2> < Cleanup - auto purge (global cleanup) >
Test Objective: <p>To test that the Automatic global cleanup process running on the CAS will periodically sending a global EMM to all smartcards. This EMM is able to purge any PPV marked as reported and expired for more than x days.</p>
Test Conditions: <ul style="list-style-type: none"> OPPV records are automatically marked as reported when they are sent to the smart card Start global cleanup process from CAS
Test Description: <ul style="list-style-type: none"> Send cmd#10 "Add Event Product" to add 3 PPV product to a smart card Wait for the PPV records to be expired
Expected Results: <ul style="list-style-type: none"> Expired PPV are purged automatically On the STB, expired PPV are purged
Test: <ul style="list-style-type: none"> <input type="checkbox"/> Test Accepted <input type="checkbox"/> Test Not Accepted

Comments:

Test #3

<Test #3> < Cleanup IPPV (w rp) - auto purge (callback) >	
Test Objective:	To test that at the end of any successful callback, the call collector will issue a purge command to the smartcard. This will purge IPPV that is marked as reported and expired for more than x days .
Test Conditions:	<ul style="list-style-type: none"> Default configuration
Test Description:	<ul style="list-style-type: none"> Before IPPV expired, make immediate callback to ensure the IPPV has been collected. After IPPV expired, trigger another immediate callback.
Expected Results:	<ul style="list-style-type: none"> Check the purchase list on the STB, the IPPV records are purged.
Test:	<input type="checkbox"/> Test Accepted <input type="checkbox"/> Test Not Accepted
Comments:	

Test #4

<Test #4> < Cleanup IPPV (w rp) - auto purge (global cleanup) >
--

Test Objective: To test that the Automatic global cleanup process running on the CAS will periodically sending a global EMM to all smartcards. This EMM is able to purge any PPV marked as reported and expired for more than x days .
Test Conditions: <ul style="list-style-type: none"> Start global cleanup process from CAS
Test Description: <ul style="list-style-type: none"> Before IPPV expired, make immediate callback to ensure the IPPV has been collected.
Expected Results: <ul style="list-style-type: none"> Expired PPV are purged automatically On the STB, expired PPV are purged
Test: <ul style="list-style-type: none"> <input type="checkbox"/> Test Accepted <input type="checkbox"/> Test Not Accepted
Comments:

Test #5

<Test #5> < Cleanup IPPV (w/o rp) - manual purge (command 96) >
Test Objective: To test that the command 96 is able to purge IPPV without return path that are marked as reported and older or equal to cleanup_date .
Test Conditions: <ul style="list-style-type: none"> Set IPPV events as collected

Test Description: <ul style="list-style-type: none"> Send cmd#97 "Set IPPV records as reported", set collect_date=today's date Send cmd#96 "Purge PPV and IPPV records", set cleanup_date=today's date, condition_date=cleanup_date
Expected Results: <ul style="list-style-type: none"> Any IPPV records that are older than or equal to Cleanup Date will be purged. On the STB, expired PPV are purged
Test: <div> <input type="checkbox"/> Test Accepted <input type="checkbox"/> Test Not Accepted </div>
Comments:

Test #6

<Test #6> < Cleanup IPPV (w/o rp) - auto purge (global cleanup) >
Test Objective: <p>To test that the Automatic global cleanup process running on the CAS will periodically sending a global EMM to all smartcards. This EMM is able to purge any PPV marked as reported and expired for more than x days.</p>
Test Conditions: <ul style="list-style-type: none"> Start global cleanup process from CAS
Test Description: <ul style="list-style-type: none"> Send cmd#97 "Set IPPV Records as Reported", set collect date = today's date
Expected Results: <ul style="list-style-type: none"> Expired PPV are purged On the STB, expired PPV are purged

Test: <input type="checkbox"/> Test Accepted <input type="checkbox"/> Test Not Accepted
Comments:

4 Generic IRD Commands

4.1 Test Cases

4.1.1 Mail

4.1.1.1 Test Summary

Test #	Test Title
1	Mail Message

Test #1

<Test #1> < Mail Message >
<p>Test Objective:</p> <p>To test the correct processing, encryption and broadcast of the generic IRD commands (EMM). The resulting action of the STB is not the responsibility of CAS.</p> <p>Note: If the total length of a mail is larger than 45 bytes, then the message is split in several segments, each having the same mail id and consecutive segment numbers. As there is at the most 63 segments of 45 bytes per messages, the maximum length of a message is equal to 2835 bytes.</p> <p>Note: Supported mailing is based on Nagravision IRD Specification</p>
<p>Test Conditions:</p> <ul style="list-style-type: none"> The smart card is initialised and paired

Test Description: <ul style="list-style-type: none"> • Send cmd#=69 "Send Generic IRD command", Command ID = 192, Operation ID= 001 • Send with 1 segment. • Send with multiple segment.
Expected Results: <ul style="list-style-type: none"> • The STB receives the EMM. The STB displays the message "Saving Mail" according to its priority.
Test: <div style="margin-left: 100px;"> <input type="checkbox"/> Test Accepted <input type="checkbox"/> Test Not Accepted </div>
Comments:

4.1.2 Force Tune

4.1.2.1 Test Summary

Test #	Test Title
1	Force Tune

Test #1

<Test #1> < Force Tune >
Test Objective: <p>To test the correct processing, encryption and broadcast of the generic IRD commands (EMM). The resulting action of the STB is not the responsibility of CAS.</p> <p>This command forces the STB to tune to a service defined by the (network id, transport id, service id). If the STB is able to query the access right needed for the service, then the tuning should occur only if the subscriber has access to the service.</p>

Test Conditions: <ul style="list-style-type: none"> The smart card is initialised and paired
Test Description: <ul style="list-style-type: none"> Send cmd#=69 "Send Generic IRD command", Command ID = 193, Operation ID= 001
Expected Results: <ul style="list-style-type: none"> The STB receives the EMM. The STB force tune on the chosen service.
Test: <ul style="list-style-type: none"> <input type="checkbox"/> Test Accepted <input type="checkbox"/> Test Not Accepted
Comments:

4.1.3 Set Network ID

4.1.3.1 Test Summary

Test #	Test Title
1	Set Network ID

Test #1

<Test #1> < Set Network ID >

Test Objective: To test the correct processing, encryption and broadcast of the generic IRD commands (EMM). The resulting action of the STB is not the responsibility of CAS. This command sets the Set-top box network ID to a specific value. This allows the set-top box to retrieve the Network Information Table (NIT) defining the topology of a particular local area. This command can also be used to assign testing network ID to specific set-top boxes.	
Test Conditions: <ul style="list-style-type: none"> The smart card is initialised and paired 	
Test Description: <ul style="list-style-type: none"> Send cmd#=69 "Send Generic IRD command", Command ID = 198, Operation ID= 001 	
Expected Results: <ul style="list-style-type: none"> The STB receives the EMM. The network ID of a set-top box is set to another value. 	
Test: <input type="checkbox"/> Test Accepted <input type="checkbox"/> Test Not Accepted	
Comments:	

4.1.4 Set PIN Code

4.1.4.1 Test Summary

Test #	Test Title
1	Set PIN Code – Parental PIN
2	Set PIN Code – Purchase PIN

Test #1

<Test #1> < Set PIN Code – Parental PIN >	
Test Objective:	<p>To test the correct processing, encryption and broadcast of the generic IRD commands (EMM). The resulting action of the STB is not the responsibility of CAS.</p> <p>This command allows the head-end to change the set-top box Parental PIN code</p>
Test Conditions:	<ul style="list-style-type: none"> The smart card is initialised and paired
Test Description:	<ul style="list-style-type: none"> Send cmd#=69 "Send Generic IRD command", Command ID = 200, Operation ID= 001 Note: The parameter "character" in the IRD command must be ASCII code of each character composing the PIN code.
Expected Results:	<ul style="list-style-type: none"> The STB receives the EMM. The STB change the Parental PIN code based on the "character" of IRD command
Test:	<p><input type="checkbox"/> Test Accepted</p> <p><input type="checkbox"/> Test Not Accepted</p>
Comments:	

Test #2

<Test #2> < Set PIN Code – Purchase PIN >	
Test Objective:	<p>To test the correct processing, encryption and broadcast of the generic IRD commands (EMM). The resulting action of the STB is not the responsibility of CAS.</p> <p>This command allows the head-end to change the set-top box Purchase PIN code</p>

Test Conditions: <ul style="list-style-type: none"> The smart card is initialised and paired
Test Description: <ul style="list-style-type: none"> Send cmd#=69 "Send Generic IRD command", Command ID = 200, Operation ID= 002 Note: The parameter "character" in the IRD command must be ASCII code of each character composing the PIN code.
Expected Results: <ul style="list-style-type: none"> The STB receives the EMM. The STB change the Purchase Pin code based on the "character" of IRD command
Test: <div> <input type="checkbox"/> Test Accepted <input type="checkbox"/> Test Not Accepted </div>
Comments:

4.1.5 Master and Slave

4.1.5.1 Test Summary

Test #	Test Title
1	Continuous Mode Initialization command
2	Cancellation command
3	Single Shot command

Test #1

<Test #1> < Continuous Mode Initialization command >

<p>Test Objective:</p> <p>To test the correct processing, encryption and broadcast of the generic IRD commands (EMM). The resulting action of the STB is not the responsibility of CAS.</p> <p>This command is used to set the parameters in order to initialize the Master/Slave continuous mode.</p>
<p>Test Conditions:</p> <ul style="list-style-type: none"> The smart card is initialised and paired
<p>Test Description:</p> <ul style="list-style-type: none"> Send cmd#=69 "Send Generic IRD command", Command ID = 199, Operation ID= 001 (continuous mode initialisation) In the continuous mode, an IRD command is sent to a slave STB which then automatically triggers revalidations from the Master Smart card at regular intervals.
<p>Expected Results:</p> <ul style="list-style-type: none"> The STB receives the EMM. The subscriber is prompted to insert the Master smart card during the amount of time until cut off. If the Subscriber inserts the Master smart card into the slave STB within the validation period then re-inserts his initial slave smart card, he is able to watch TV. If the subscriber does not insert the Master smart card into the slave STB within the validation period, he is not able to watch TV.
<p>Test:</p> <p><input type="checkbox"/> Test Accepted</p> <p><input type="checkbox"/> Test Not Accepted</p>
<p>Comments:</p>

Test #2

<p><Test #2> < Cancellation command ></p>

Test Objective: To test the correct processing, encryption and broadcast of the generic IRD commands (EMM). The resulting action of the STB is not the responsibility of CAS. This command is used to disable all the Master/Slave settings (continuous mode and single shot mode) on a STB.
Test Conditions: <ul style="list-style-type: none"> The smart card is initialised and paired
Test Description: <ul style="list-style-type: none"> Send cmd#=69 "Send Generic IRD command", Command ID = 199, Operation ID= 002 (cancellation)
Expected Results: <ul style="list-style-type: none"> The STB receives the EMM. The STB clears all of its Master/Slave settings and stops prompting subscriber to insert the Master Smart Card and the signal is playing normally.
Test: <ul style="list-style-type: none"> <input type="checkbox"/> Test Accepted <input type="checkbox"/> Test Not Accepted
Comments:

Test #3

<Test #3> < Single Shot command >
Test Objective: To test the correct processing, encryption and broadcast of the generic IRD commands (EMM). The resulting action of the STB is not the responsibility of CAS. This command is used to set the parameters in order to initialize the single shot Master/Slave command.
Test Conditions: <ul style="list-style-type: none"> The smart card is initialised and paired

Test Description:	<ul style="list-style-type: none">• Send cmd#=69 "Send Generic IRD command", Command ID = 199, Operation ID= 003 (single shot mode)• In the single shot mode, an IRD command is sent to a slave STB to trigger an immediate revalidation from the Master smart card.
Expected Results:	<ul style="list-style-type: none">• The STB receives the EMM. The subscriber is prompted to insert the Master smart card during the amount of time until cut off.• Note: The next revalidation of the slave STB will be triggered until the next command is received.• If the subscriber inserts the Master smart card into the slave STB within the validation period then re-inserts his initial slave smart card, he is able to watch TV.• If the subscriber does not insert the Master smart card into the slave STB within the validation period, he is not able to watch TV.
Test:	<input type="checkbox"/> Test Accepted <input type="checkbox"/> Test Not Accepted
Comments:	

5 Conclusion

With reference to the above test results, the whole system is:

<input type="checkbox"/>	ACCEPTED
<input type="checkbox"/>	NOT ACCEPTED

Reservation

By:
Eastern Multimedia Co., Ltd. (EMC)

At:
1 F, No. 108, RuiKuang Road, Taipei NeiHu, Taiwan

Duly represented hereunder.

Signature

	Name	Date	Signature
Nagravision representative			

IDT representative			
EMC representative			
EMC representative			
EMC representative			
Cablessoft representative			

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