

REAL-TIME IDENTIFICATION USING MOBILE HAND-HELD DEVICE : PROOF OF CONCEPT SYSTEM TEST REPORT

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IMPORTANT INFORMATIVE STATEMENTS

This project, *PSTP-03-427BIOM Real-time Identification Systems Using Mobile Hand-held Devices*, was supported by the Canadian Safety and Security Program (CSSP) which is led by Defence Research and Development Canada's Centre for Security Science, in partnership with Public Safety Canada. Led by Royal Canadian Mounted Police, partners in the project include International Biometric Group-Canada, 3M Cogent, DFAIT, OPC, IPC Ontario, DRDC-Toronto, DRDC-Ottawa, Transport Canada, and Reboot Communications.

The CSSP is a federally-funded program to strengthen Canada's ability to anticipate, prevent/mitigate, prepare for, respond to, and recover from natural disasters, serious accidents, crime and terrorism through the convergence of science and technology with policy, operations and intelligence

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Three reports are published on this study:

REAL-TIME IDENTIFICATION SYSTEM USING MOBILE HAND-HELD DEVICES: FINAL REPORT

REAL-TIME IDENTIFICATION SYSTEM USING MOBILE HAND-HELD DEVICES: MOBILE BIOMETRICS EVALUATION FRAMEWORK

REAL-TIME IDENTIFICATION USING MOBILE HAND-HELD DEVICE: PROOF OF CONCEPT SYSTEM TEST REPORT



ROYAL CANADIAN MOUNTED POLICE

PSTP 03-427BIOM

REAL-TIME IDENTIFICATION USING MOBILE HAND-HELD DEVICE

PROOF OF CONCEPT SYSTEM TEST REPORT

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1 INTRODUCTION:

The purpose of the Real-time Identification System (RTID) using Mobile Hand-held Devices (HHD) study is to address the Science and Technology-level interest in biometric performance measurement through field trials, development, evaluation, and transition recommendations, providing an enduring mobile biometric evaluation capability and direction.

The objectives of the study is to identify Privacy, Policy issues and use cases for HHD identification, to evaluate the technology baseline and pilot a representative device with an operational RTID system.

The project is to develop a pilot system by integrating a representative multi-modal device, the 3M Cogent Fusion Hand-held Mobile device with the existing RCMP RTID TEST Environment and Automated Fingerprint Identification System (AFIS) to explore real-time, hand-held identification

As part of the study team, 3M Cogent is RCMP validated to send CAR-N transactions to the RCMP's RTID and AFIS in accordance with the adoption of NIST compliant ICD. The multi-modal HHD can wirelessly transmit biometric data in EBTS format, using WiFi 802.11b/g, GSM, GPRS, or EDGE. 3M-Cogent will modify and integrate the HHD to communicate, IP through the existing bridge server, with the RCMP NNS Test Environment for the RTID and AFIS in accordance with the partial RCMP-NPS NIST ICD v 1.7.7 E2 standard.

The RCMP will identify operationally relevant scenarios enabled by the device's Finger, (Photo and Iris not being used in this study) collection capabilities and ability to perform on-board matching and submissions against the AFIS. Because the handheld system will only support searches without retention, the RCMP will ensure that test data exists within the RTID test deployment to support the evaluation and the proper handling of the specified transactions by the RTID test system. The RCMP will validate the electronic submissions and its correct handling by the RCMP NNS - Test environment.

IBG will utilize the evaluation framework to scientifically evaluate the Proof-of-Concept system, with inputs from the RCMP, DRDC-Toronto, DRDC-Ottawa, Transport Canada and DFAIT on relevance and performance with respect to their needs, providing the foundation for the Strategic Advisory Note.

2 CAR-N TEST CASES:

2.1 BACKGROUND

The intent of executing the selected CAR-N test cases is to connect to the RCMP NPS-NIST TEST SERVER environment and execute a number of formal criminal ten print transactions using the HHD.

The purpose of this process is to;

- Establish network connectivity to the RCMP NPS-NIST Server test environment;
- Validate that the HHD NIST Server application software and hardware can successfully process PARTIALLY a select number of NPS-NIST-ICD v1.7.7 Rev. E2 dated July 30, 2010 transactions, namely;
 - HHD generated CARN transactions
- Complete NPS-NIST-compliant transactions for transmission to the RCMP and receive various electronic results.

The CAR-N Vendor Certification test suite was used to select a subset of test cases for this evaluation (Note: the same five test cases were used for the WIFI and 3G testing).

The five test cases selected consisted of a CAR-N; Basic test, Notification of the Death of a Known Offender, Missing Fingerprint, Authorization to search a Young Offender taken with informed consent creating an ERRT and a Positive Hit to a Criminal.

During the testing process if inconsistencies to the ICD were found these errors were corrected.

This testing was not for the purpose of certifying the HHD.

2.2 TEST CASE DETAILS FOR CAR-N BASIC (WIFI):

The following details the CAR-N Basic Test Case using WIFI including screen prints of the test results.

Test Case Name	CERT#1-CAR-N-BASIC (WIFI)
Test Scenario	Submission used to request, under the appropriate authority, a search of a person's fingerprints against the RCMP National AFIS database. This is a basic transaction.
Test Overview	<p>Authority for Canadian Search Reason = IDENTIFICATION OF CRIMINALS ACT – FOR IDENTIFICATION PURPOSES</p> <p>PRIORITY = 1</p> <p>If at any time during the submission of test cases the fingerprints being used invoke a quality assessment and require a Quality Override Reason to be generated, enter a reason even if not specified in the test case description.</p> <p>FINGERPRINTS: The tester will create Type-4 records by enrolling a full set of 10 fingerprints.</p> <p>MISSING FINGERPRINTS: The following fingerprints will be missing and reasons;</p> <ul style="list-style-type: none">➤ Finger 11 (Plain Right thumb) = physical limitation➤ Finger 12 (Plain Left thumb) = physical limitation➤ Finger 13 (Plain Right 4 fingers) = physical limitation➤ Finger 14 (Plain Left 4 fingers) = physical limitation <p>PALMS: No Palms (Type-15 records) are required.</p>
Test Instructions	<ol style="list-style-type: none">1. Enter the data at the Mobile Id Hand Held Fusion device exactly as identified in the attached Data Input table.2. Should the input data trigger subsequent mandatory tags, it is the responsibility of the tester to populate these fields.3. Complete the fingerprint enrollment (Type-4 records fingers 1-10). For plains (Type-4 records fingers 11-14) enter the missing fingerprint reason of physical limitation.4. Submit the transaction.
Expected Result	<ol style="list-style-type: none">1. Transaction is received, validated and accepted by the NPS NIST Server.2. Transaction contains record types 1, 2, 4(10).3. ACKT and Negative SRE are returned to the contributor
Additional Requirements	<ol style="list-style-type: none">1. C-216 Fingerprint Form is printed and evaluated.2. Screen shot of the Negative SRE.

Type-2: DATA INPUT
CERT#1-CAR-N-BASIC

Tag Name	Tag Content
Fingerprint Section Number	
Address	
Apt/Unit# - Street#/Name	
City	
Province/State	
Postal Code/Zip Code	
Country	
Occupation & Employer Name	
Contributor Individual Reference Number	
Primary Name	
Surname	SMITH-JONES
Given Name 1	CERT #1
Given Name 2	
Given Name 3	
Given Name 4	
Sex	<MALE>
Hair Colour	
Eye Colour	
Height	
Weight	
Race Descent	
Place of Birth	
Response to Agency Identifier	
Complexion	
Marks, Scars, Tattoos	
Mark/Scar/Tattoo	
Body Location	
Description	
Other Names/Alias	
Surname	
Given Name 1	
Given Name 2	
Given Name 3	
Given Name 4	
Narrative Message	
FBI Search Request	
US States to Search	
State	
State File Number	
City of Birth	
Port of Entry	
Date of Entry	
Refugee File Number	
CBSA/CIC Office Number	
Field Operational Support System Number	
International Search Request	
International Countries to Search	
Country	
File Number	
Fingerprint Quality Override	
Finger Number	
Reason	
Description	
Foreign Search Reason	
Authority for Canadian Search Reason	< IDENTIFICATION OF CRIMINALS ACT – FOR IDENTIFICATION PURPOSES>
FBI File Number	
Date of Birth	19600823
Missing Fingerprint Reason	

Type-2: DATA INPUT CERT#1-CAR-N-BASIC	
Tag Name	Tag Content
Finger Position	11 <plain right thumb> 12 <plain left thumb> 13 <plain right 4 fingers> 14 <plain left 4 fingers>
Missing Fingerprint Reason	<Physical Limitation> for all
Investigator Contact Information	
Investigator Name	
Investigating Agency Name	
Investigating Section Name	
Contact Telephone Number	
Contact Fax Number	
Contact Mailing Address	
Contact Email Address	
Contributor Case/File number	
Name of Person Responsible for Transaction	MINI MIZER
Country of Birth	
Race Description	
Name of official taking fingerprints	PAUL DUPONT
Fingerprints Capture Location	OTTAWA

Summary of Results:

This was a basic CAR-N test using minimal mandatory data transmitted via WIFI.


The RTID activity list shows that the transaction was successfully processed through RTID to normal completion.

The NIST packet view shows that the fingerprints were captured and the Type-1, 2 and 4 records were created correctly.

The Type-1, Type-2 and Type -4 screen prints show the detailed data elements and values captured for this test.

The C-216 printed correctly.

RTID Activity list:


Submission 6113 - CAR - N

DCN 11201106106190015104 / TCN 0610619005015
Logout
Match Reports
Print
Help
Close

Main Status: Completed
 Submission Search

FBI Status:
Refresh

RNSC Status:

Priority: 1
 External ICD Version: 177 **System Table Version:** 001

Details
Int'l Search
Activities
Status History
Errors
Tasks

[View Process](#)

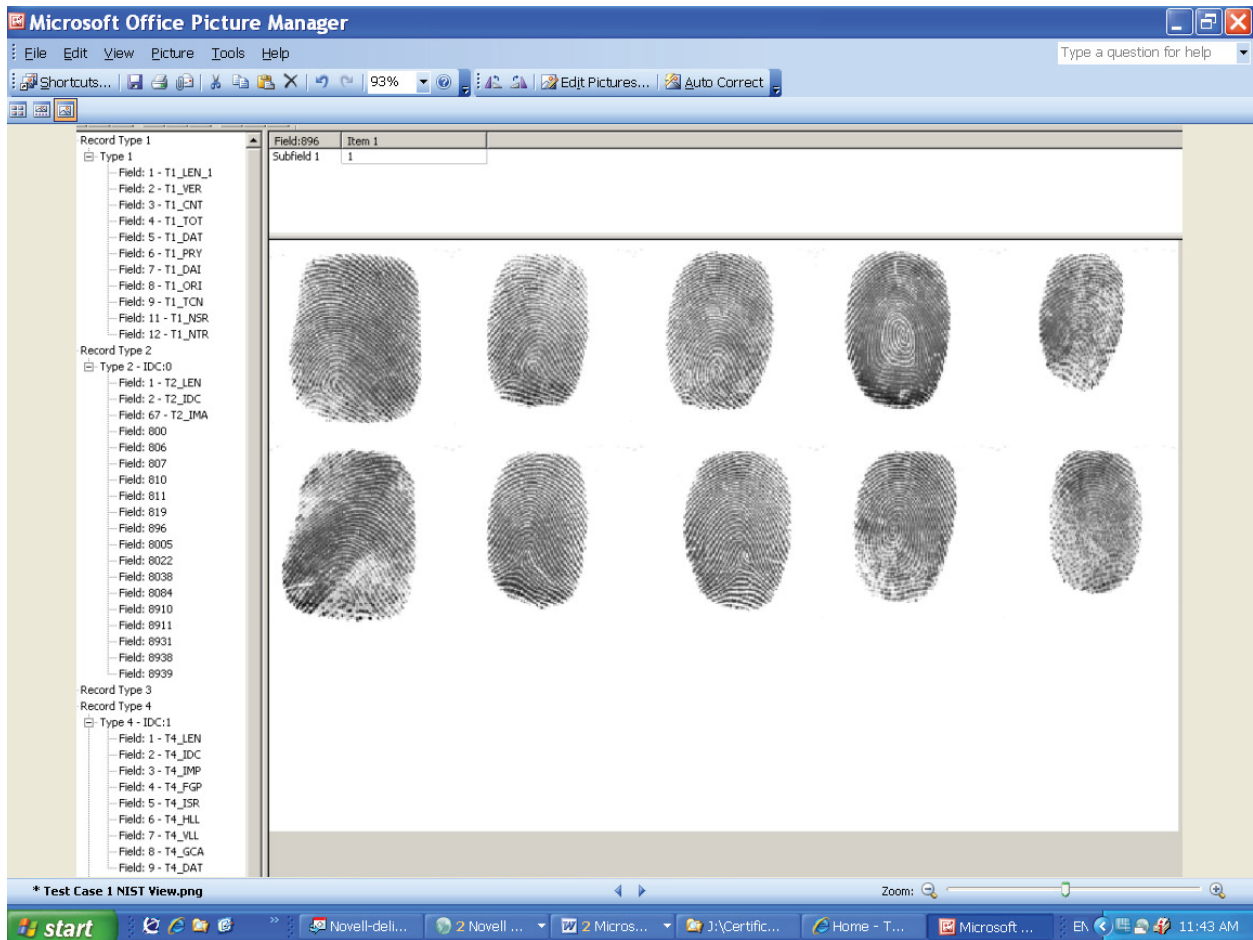
Activities

Filter
Clear

Activity	Transaction	Foreign	System	Date/Time Start ▲	Date/Time End	Action	Operator ID	Outcome
Automated Ten Print QC	TPREI		AFIS	2012-01-11 10:40:28	2012-01-11 10:40:38			
Ten Print Search	TPREI		AFIS	2012-01-11 10:40:38	2012-01-11 10:40:55			1 System declared hit(s) 200000090253
Automated Certification	TPREI		AFIS	2012-01-11 10:40:55	2012-01-11 10:41:00		999999999	Ident to: Criminal 200000090253
Received	CAR		NNS	2012-01-11 10:40:57	2012-01-11 10:40:57			Passed
High Level Validation	CAR		NNS	2012-01-11 10:40:58	2012-01-11 10:40:58			Passed
ICD Validation	CAR		NNS	2012-01-11 10:40:58	2012-01-11 10:40:58			Passed
Image Validation	CAR		NNS	2012-01-11 10:40:59	2012-01-11 10:40:59			Passed
Business Exception Processing	CAR		NNS	2012-01-11 10:40:59	2012-01-11 10:40:59			No Exception
Transformation	CARI		NNS	2012-01-11 10:41:00	2012-01-11 10:41:00			From: CAR To: CARI
Reverse Search	TPULI		AFIS, NNS	2012-01-11 10:41:01	2012-01-11 10:41:14			Result: Non-Ident
Querying QCNI	Name Search		NNS, CPIC	2012-01-11 10:41:05	2012-01-11 10:41:05			Respondents
Querying Refugee Name Search	Name Search		NCNI	2012-01-11 10:41:19	2012-01-11 10:41:19			Respondents
Send to AFIS	TPRI		AFIS, NNS	2012-01-11 10:41:30	2012-01-11 10:41:30			
Ten Print QC Received	TPQCI		AFIS	2012-01-11 10:41:49	2012-01-11 10:41:49			Passed
Created and Archived	ACKT		NNS	2012-01-11 10:41:49	2012-01-11 10:41:49	Resend		
Sent	ACKT		NNS	2012-01-11 10:41:49	2012-01-11 10:41:49			
Process AFIS Response	TPREI		AFIS, NNS	2012-01-11 10:42:04	2012-01-11 10:42:04			Ident
Send M SC to CPIC	CRIFI Search		NNS	2012-01-11 10:42:07	2012-01-11 10:42:07			
Information Fetch CPIC Information	CRIFI Search		CPIC	2012-01-11 10:42:10	2012-01-11 10:42:10			File Number Fetched:200000090253
Information Fetch ADS Flags	CRIFI Search		NNS, ADS	2012-01-11 10:42:10	2012-01-11 10:42:10			File Number Fetched:200000090253
Send to Subsystem (240)	FOLI		NNS, CREMMS	2012-01-11 10:42:11	2012-01-11 10:42:11			
No Reverse Search Candidates (242)	STI		AFIS	2012-01-11 10:42:17	2012-01-11 10:42:17			
Received	FOLRI		NNS, CREMMS	2012-01-11 10:43:00	2012-01-11 10:43:00			
Information Fetch Folio Docket	CRIFI Search		NNS, CREMMS	2012-01-11 10:43:02	2012-01-11 10:43:02			File Number Fetched:200000090253
CRIFI Completed	CRIFI Search		NNS	2012-01-11 10:43:03	2012-01-11 10:43:03			
Created and Archived	LABI		NNS	2012-01-11 10:43:07	2012-01-11 10:43:07			
Log DOC ID event	LABI		NNS, CREMMS	2012-01-11 10:43:07	2012-01-11 10:43:07			DOC_ID: 11201100112101001308 Start Tracking: 200000090253 2
Received	ACKI		NCNI/CREMMS	2012-01-11 10:43:11	2012-01-11 10:43:11			In Response To: LABI
Generating/Populating Criminal Print Queue	CARI		NNS	2012-01-11 10:43:20	2012-01-11 10:43:38			C216 - CAR N, Urgent Add Sheet
Ready for Printing	CARI		NNS	2012-01-11 10:43:41	2012-01-11 10:43:41			
Created and Archived	SREI		NNS	2012-01-11 10:43:42	2012-01-11 10:43:42			
Prepare SREI (172)	SREI		NNS	2012-01-11 10:43:42	2012-01-11 10:43:42			Release Rule Type: 2 SRE Response Type: POSITIVE - CRIMINAL RECORD INQUIRY - HIT TO CRIMINAL ONLY
Transformation	SRE		NNS	2012-01-11 10:43:42	2012-01-11 10:43:42			From: SREI To: SRE
Created and Archived	SRE		NNS	2012-01-11 10:43:42	2012-01-11 10:43:42	Resend		
Sent	SRE		NNS	2012-01-11 10:43:46	2012-01-11 10:43:46			Destination Agency:ON10619
Criminal Forms Printed	CARI		NNS	2012-01-11 11:16:18	2012-01-11 11:16:18		T00000045	Product Type: C216 - CAR N, Urgent Add Sheet Batch ID: 2490
Completion Of Service	CARI		NNS	2012-01-11 11:16:19	2012-01-11 11:16:19			
Print Duplicate				2012-01-13 14:52:52	2012-01-13 14:52:53		T00000045	C216 - CAR N
Print Duplicate				2012-01-13 14:53:13	2012-01-13 14:53:13		T00000045	C216 - CAR N

v1.2.1.515

NIST Packet View:



Type-1: Screen 2

NIST Packet Viewer

Type: Criminal Record Inquiry Submission
TCN: 0610619005015
NIST Packet File: .../INT-MAINT/InService/D_0/6113/192.168.18.209--3bbcc561.134c9a9d254.-7ff6.nist

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Records

<<

Identifier	Field Number	Occurrence	Field Name	Value	Condition	Character Type
		7	Information Item 1	4	C	N
		7	Information Item 2	05	M	N
		8	Information Item 1	4	C	N
		8	Information Item 2	06	M	N
		9	Information Item 1	4	C	N
		9	Information Item 2	07	M	N
		10	Information Item 1	4	C	N
		10	Information Item 2	08	M	N
		11	Information Item 1	4	C	N
		11	Information Item 2	09	M	N
		12	Information Item 1	4	C	N
		12	Information Item 2	10	M	N
@TOT	1.004		Type of Transaction	CAR	M	A
@DAT	1.005		Transaction Date	20120111	M	D
@PRY	1.006		Transaction Priority	Priority 1 (1)	M	N
@DAI	1.007		Destination Agency Identifier	IC10850	M	AN
@OAI	1.008		Originating Agency Identifier	ON10819	M	AN
@TCN	1.009		Transaction Control Number	0610619005015	M	N
@NSR	1.011		Native Scanning Resolution	19.89	M	N
@NTR	1.012		Nominal Transmitting Resolution	19.89	M	N

Image Preview

>>

Validation Messages / Image Carousel

Type-2: Screen 1

RCMP NIST Packet Viewer - RCMP-GRC

Type: Criminal Record Inquiry Submission
TCN: 0610619005015
NIST Packet File: .../INT-MAINT/InService/D_0/6113/192.168.18.209--3bbcc561.134c9a9d254.-7ff6.nist

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Records

<<

Identifier	Field Number	Occurrence	Field Name	Value	Condition	Character Type
@LENT2	2.001		Logical Record Length	290	M	N
@DC	2.002		Image Designation Character	00	M	N
@BIA	2.067		Image Capture Equipment		O	
		1	Originating Fingerprint Reading System	3MCOGENT	M	ANS
		1	Originating Fingerprint Reading System	FUSIOND3	M	ANS
		1	Originating Fingerprint Reading System	L01	M	ANS
@DCN	2.800		Document Control Number	1120110610619005104	M	N
@NAME	2.806		Primary Name		M	
		1	Surname	SMITH-JONES	M	A
		1	Given Name 1	CERT NO. ONE	M	A
@SEX	2.807		Sex	Male (M)	M	A
@HGT	2.810		Height	0	C	N
@WGT	2.811		Weight	0	C	N
@LGF	2.819		Language Flag	English (E)	M	A
@ACS	2.896		Authority for Canadian Search	Identification Of Criminals Act - For Identification Purposes (1)	M	N
@RET	2.8005		Retention Code	No (N)	M	A
@DOB	2.8022		Date of Birth	19600823	M	d
@DPR	2.8038		Date Fingerprinted	20120111	M	D
@MFR	2.8004		Missing Fingerprint Reason		O	
		1	Finger Position Code	Plain right thumb (11)	M	N

Image Preview

>>

Validation Messages / Image Carousel

Local Intranet 100%

Type-2: Screen 2

RCMP Nist Packet Viewer - RCMP-GRC

File Edit View Favorites Tools Help

http://acpic-s937.rcmp-grc.gc.ca:5851/RTID_NPS_NetServerWeb/SubmissionConsole/displayNistPacketViewer.do?id=56295

RCMP Nist Packet Viewer

NIST Packet Viewer

Type: Criminal Record Inquiry Submission
TCN: 0610619005015
NIST Packet File: .../INT-MAINT/InService/D_0/6113/192.168.18.209--3bbcc561.134c9a9d254.-7ff6.nist

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Records

Identifier	Field Number	Occurrence	Field Name	Value	Condition	Character Type
@WGT	2.811		Weight	0	C	N
@LGF	2.819		Language Flag	English (E)	M	A
@ACS	2.896		Authority for Canadian Search	Identification Of Criminals Act - For Identification Purposes (1)	M	N
@RET	2.8005		Retention Code	No (N)	M	A
@DOB	2.8022		Date of Birth	19600823	M	d
@DPR	2.8038		Date Fingerprinted	20120111	M	D
@MFR	2.8084		Missing Fingerprint Reason		O	
		1	Finger Position Code	Plain right thumb (11)	M	N
		1	Missing Fingerprint Reason Code	Physical Limitations (PL)	M	A
		2	Finger Position Code	Plain left thumb (12)	M	N
		2	Missing Fingerprint Reason Code	Physical Limitations (PL)	M	A
		3	Finger Position Code	Plain right four fingers (13)	M	N
		3	Missing Fingerprint Reason Code	Physical Limitations (PL)	M	A
		4	Finger Position Code	Plain left four fingers (14)	M	N
		4	Missing Fingerprint Reason Code	Physical Limitations (PL)	M	A
@NVN	2.8910		External ICD Version Number	177	M	N
@STV	2.8911		System Table Version Number	001	M	N
@NFT	2.8931		Name of Person Responsible for Tran...	MINI MIZER	M	ANS
@NOTF	2.8938		Name of Official Taking Fingerprints	PAUL DUPONT	M	ANS
@FPCL	2.8939		Fingerprints Capture Location	OTTAWA	M	ANS

Image Preview

Validation Messages / Image Carousel

Local intranet 100%

Type-4: Right Thumb

RCMP Nist Packet Viewer - RCMP-GRC

File Edit View Favorites Tools Help

http://acpic-s937.rcmp-grc.gc.ca:5851/RTID_NPS_NetServerWeb/SubmissionConsole/displayNistPacketViewer.do?id=56295

RCMP Nist Packet Viewer

NIST Packet Viewer


Type: Criminal Record Inquiry Submission
TCN: 0610619005015
NIST Packet File: .../INT-MAINT/InService/D_0/6113/192.168.18.209--3bbcc561.134c9a9d254.-7ff6.nist

Download

Records

Identifier	Field Number	Occurrence	Field Name	Value	Condition	Character Type
@LENT4	4.001		Logical Record Length	31364	M	B
@ICT4	4.002		Image Designation Character	1	M	B
@MPT4	4.003		Impression Type	Livescan Plain (0)	M	B
@FPT4	4.004		Finger Number	Right thumb (1)	M	B
@SRT4	4.005		Image Scanning Resolution	Minimum Scanning Resolution (0)	M	B
@VLLT4	4.006		Horizontal Line Length	500	M	B
@VLLT4	4.007		Vertical Line Length	500	M	B
@GAT4	4.008		Grayscale Compression Algorithm	WVSQ (1)	M	B
@DAT4	4.009		Image Data	31346	M	B

Image Preview



Validation Messages / Image Carousel

Done

Local intranet 100%

Type-4: Left index

The screenshot displays the RCMP NIST Packet Viewer interface. The browser address bar shows the URL: http://acpic-s937.rcmp-grc.gc.ca:5851/RTID_NFS_NistServerWeb/SubmissionConsole/displayNistPacketViewer.do?id=58295. The page title is "NIST Packet Viewer". Below the title, it indicates the submission type: "Type: Criminal Record Inquiry Submission" and the TCN: "0610619005015". The NIST Packet File path is shown as ".../INT-MAINT/InService/D_0/6113/192.168.18.209--3bbcc561.134c9a9d254-7ff6.nist". A "Download" button is present.

The "Records" section on the left lists various packet types, with "Type 4 [DC:7]" selected. The main table displays the following data:

Identifier	Field Number	Occurrence	Field Name	Value	Condition	Character Type	Val
@LENT4	4.001		Logical Record Length	24414	M	B	Y
@DCT4	4.002		Image Designation Character	7	M	B	Y
@IMPT4	4.003		Impression Type	Livescan Plain (0)	M	B	Y
@FGPT4	4.004		Finger Number	Left index (7)	M	B	Y
@SRT4	4.005		Image Scanning Resolution	Minimum Scanning Resolution (0)	M	B	Y
@HLLT4	4.006		Horizontal Line Length	500	M	B	Y
@VLLT4	4.007		Vertical Line Length	500	M	B	Y
@CGAT4	4.008		Grayscale Compression Algorithm	WSQ (1)	M	B	Y
@DAT4	4.009		Image Data	24396	M	B	Y

Below the table, there is an "Image Preview" section showing a grayscale fingerprint image of the left index finger. The bottom status bar indicates "Local intranet" and "100%" zoom.

2.3 SAMPLE HHD SCREEN SHOTS FROM TEST CASE # 10 CAR-N POSITIVE HIT TO A CRIMINAL USING 3G

The following screen shot from the HHD shows the Hit to a Criminal displaying the TCN and DCN.

Transactions

Total: 14 Queue: Running

HIT
2012-03-19 14:01:47 NO PHOTO NO PHOTO

Above is the
response for
CERT#10
TCN:061061908101
0
DCN:112079061061
98010105

15

The following screen shot from the HHD shows the Hit to a Criminal displaying the First and Last names and the TCN.

First: CERT TEN
Last: TWAIN

TCN
DCN
Priority
Surname

0610619081010

View Back

10:13

3 SUMMARY OF FINDINGS:

All of the objectives identified for the pilot of the HHD, interfacing with the RCMP RTID Test environment and AFIS systems, were successfully met. The results of running 5 CARN test cases using WIFI and 5 CARN test cases using 3G successfully demonstrated the ability of the HHD to; establish network connectivity, process selected CARN test transactions to the RCMP NPS-NIST Server test environment and complete NPS-NIST compliant transactions for transmission to the RCMP and to receive various electronic results.

There were a few startup problems which were resolved. One known issue was that the HHD could not capture plain right and left thumbs (record types 11 and 12) and plain right and left four fingers (record types 13 and 14). The current RTID system is expecting to process transactions created by a Cardscan or Livescan which capture and submit these record types (plains). A work around for this problem was that the HHD was hardcoded to create the required plains (record types 11, 12, 13 and 14) with a missing reason of physical limitation. This allowed the transaction to be processed correctly through the RTID system.

Due to the small screen on the HHD for capturing fingerprints the HLL and VLL were both 500. On the Livescan the HLL is 800 and the VLL is 750.

The electronic and printed C216 fingerprints were examined by a RCMP fingerprint analyst and were acceptable.

One problem identified during the WIFI testing was that the transaction priority field was a fixed field. A change was made so that the field defaulted to a value of 4 (same as the Livescan) and could also be changed to any valid numeric field value.

The 3G test cases identified that the transmission of transactions were slower when sent/received from the RCMP National Police Services building than when submitted from other locations. Degradation of the network coverage within the RCMP building may have been caused by the structure of the buildings (multiple floors, cement) therefore, interfering with the network transmissions from the HHD to the RCMP server and back.

It was observed during 3G testing that the SRE and ERRT messages sent to the HHD displayed as a numeric value. It was recommended, and a fix made, to display the actual SRE and ERRT messages sent to the HHD from RTID.

