ISITEP

D5.8.1 - OPEN PUBLIC PROCEDURES OF MULTI VENDOR INTEROPERABILITY OF ENHANCED TERMINALS

Document Manager:	Franco Pangallo	ISCOM	Editor

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Prepared by:	Franco Pangallo (ISCOM)
Approved by (WP Leader):	Franco Pangallo (ISCOM)
Approved by (SP Leader):	Federica Battisti (RM3)
Approved by (Coordinator)	Paolo Di Michele (FNM)
Security Approval (Advisory Board Coordinator)	Etienne Lezaack (BFP)

CONTRIBUTING PARTNERS

Name	Company / Organization	Role / Title
Franco Pangallo, Proietti Modi Debora	ISCOM	Editor/Contributor
Christophe Madelenat	ADS FR	Contributor
Giuseppe Nasta, Giovanni Greco	EXP	Contributor
George Mitsopoulos	NETFI	Contributor

DISTRIBUTION LIST

Name	Company / Organization	Role / Title
All Company Project Managers	All involved companies	Members of the Steering Committee
Elina MANOVA	EC DG REA	EC Programme Officer
General Public	NA	NA

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Publishable extended abstract

Please write here a short abstract of the deliverable that can be published and that gives an overview of the deliverable content. This content will be published in the website.

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1. INTRODUCTION

The main objective of ISITEP project is the interoperability of terminals across vendors: to guarantee this objective, the terminals have to perform test session to verify interoperability.

The aim of the deliverable is the definition of the procedures for bi-technology terminals interoperability, **at functional and application level**. This document is focused on: evaluation of bi-technology aspect and of the added value functions embedded in the enhanced terminal; analysis of multivendor interoperability procedures and definition of open public procedures for multivendor interoperability testing.

The final document of this deliverable will be the input document of D58.2, in order to use this document as guide to perform the IOP test functionality for enhanced terminals.

2 EVALUATION OF BI-TECHNOLOGY ASPECT

The main objective of ISITEP project is the implementation of a terminal capable to connect with both TETRA and TETRAPOL networks. Considering that the aim of project is to use the existent technology, such as TETRA and TETRAPOL terminals, has been developed an unique device, made by two terminal: an android TETRA smartphone connected via USB with TETRAPOL standard terminal.

Considering that the TETRA and TETRAPOL modems are, in theory, working within the proprietary networks, it needs to evaluate only the aspects not strictly connected to specific modems. Moreover the following procedures are based on the functionality aspects, as results of the unique device under test.

For such reason, it has been analyzed every single request from end-user in order to produce tests at applicative and functional aspects, evaluating the effective working of bi-technology terminal.

3 EVALUATION OF ADDED VALUE

ISITEP project's scope is to realize a unique European digital professional network, to improve cooperation, so ISITEP project provides the following added value functions and applications:

- Location Assisted Numbering

- Dynamic Functional Numbering

- Enhanced Message Exchange Application [1]

The Location Assisted Numbering allows terminal to call the nearest control room, based on his own geographical position, without any modification of special number and without the knowledge of end user.

The Dynamic Functional Numbering allows terminal to call the nearest international coordination group without any manually modification on his phonebook.

The Enhanced Message Exchange (EME) shall be used to provide written orders to the PPDR resources. Written orders shall be translated into the proper language of the end-user.

To evaluate the added value, it is necessary to have testing procedures at application level, in order to verify usability and features required by end user. Further on, the following testing procedures are focused also on the functionality aspect, in order to evaluate the effective working of added value.

4 ANALYSIS AND DEFINITION OF PUBLIC PROCEDURES FOR MULTIVENDOR INTEROPERABILITY TESTING

In this chapter, considering the end-user requirements in deliverable D51.1, the following functional procedures needs to be performed to verify the bi-technology and the added value, accordingly the aim of this deliverable.

As precondition, the Network and the Enhanced Terminal shall be configured properly following the requirements of each tests.

4.1 General Requirements

TETRA modems have to be in compliance IOP V+D, TETRA ISI IOP and TETRAPOL modems have to be in compliance with PAS TETRAPOL standards. The TETRA terminal requirements needed for TETRA functionality over the air interface and relevant for ISI migrating terminals are listed in TCCA TIP (TETRA IOP V+D and TETRA IOP ISI)

ETR: Enhanced Terminal Requirements

ID	Description
I-ETR-FUN-1.a	TETRA Modem shall be compliant with TETRA IOP V+D: Part 1: Core Part 2: Short data Service Part 4: Authentication Part 6: Air Interface migration Part 11: Air Interface Encryption
TCCA IOP V+D	

ID	Description
I-ETR-FUN-1.b	TETRA Modem shall be compliant with TETRA IOP ISI: Part 1: Mobility Management Part 2: Individual Call Part 3: Short Data Service Part 4: ISI Lower layers Part 5-1: Circuit mode voice transfer (*) Part 5-2: Packet mode speech format (*) Part 5-3: Generic speech format Part 6: ISI Group Call
TCCA ISI IOP	

ID	Description
I-ETR-FUN-1.c	TETRAPOL Modem shall be compliant with TETRAPOL PAS: PAS 0001 – Part 1General Network Design PAS 0001 – Part 2 Radio Air interface PAS 0001 – Part 3 Air Interface Protocol PAS 0001 – Part 7 Codec PAS 0001 – Part 8 Radio conformance tests PAS 0001 – Part 9 Air interface Protocol conformance tests PAS 0001 – Part 10 Inter System Interface PAS 0001 – Part 13 User Data Terminal to System Terminal interface PAS 0001 – Part 16 Security PAS 0001 - Part 19-2 System Terminal Control Protocol
PAS TEST	
PAS 0001-9-1: Part 9: Conformance tests; Part 1: Air Interface Protocol Conformance tests	

4.2 Interface Requirements

ID	Description
I-ETR-INT-1.a	The TETRA modem shall be integrated inside the smart phone of the hand-held ISITEP terminal solution.
TEST	
Verify TETRA modem is integrated inside smart phone. Moreover, verify the encrypted connection, if it is wireless, between smart phone and TETRA/TETRAPOL modems.	

4.3 Requirements for bi-technology terminals “application enabled”

ID	Description
I-ETR-FUN-2.a	Adaptation and Communication Manager shall translate instructions from user interface and business logic into commands toward TETRA App and TETRAPOL App and vice-versa. These commands shall be independently from the user language and the one configured on the terminal (the Adaptation and Communication Manager acts as an abstraction level related to the language in use). The following commands shall be supported at least: - Switch-on/off the TETRA/TETRAPOL Modem(s) - Individual call - …
TESTs	
These tests can be verify on Enhanced Terminal Display during tests of General Requirements.	

ID	Description
I-ETR-FUN-2.b	Adaptation and Communication Manager shall be able to check TETRA App and TETRAPOL App. At least the following information shall be provided: - MCC and MNC - Service List - … TETRA App and TETRAPOL App shall be able to provide information of Network Access RSSI, Security Class, Networked/Fallback.
TESTs	
In these tests will be verify the information of Network Access (RSSI, MCC, MNC, Security Class, Networked or FallBack …) on Enhanced Terminal Display, during tests of General Requirements.	

ID	Description
I-ETR-MIS-1.a	User Interface shall provide the radio user the possibility to select automatic or manual migration.
TESTs	
Selection Automatic/Manual Migration on application layer during IOP test session, with test plans: IOP001-06_v100_AIM and IOP003-01_v100_IMM	

ID	Description
I-ETR-MIS-1.b	In case migration is performed manually, the user interface shall provide the radio user the possibility to select the serving network.
TESTs	
During Manual Migration, the user shall be able, on application layer, to choose the serving network, during IOP test session, with test plans: IOP001-06_v100_AIM and IOP003-01_v100_IMM. (for tetrapol??)	

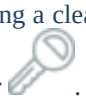
ID	Description
I-ETR-MIS-1.c	If migration is performed automatically, the ACM shall consider: - ProviderName - ServiceAvailability (true for active, false otherwise) - MCC - MNC - ServiceList
TESTs	
The enhanced terminal perform automatic migration, considering the service availability. TETRA network is assumed to be the preferred network. If TETRA network is not available, the enhanced terminal shall perform migration on TETRAPOL network, if it is available. The TETRA security class sent by the network shall be displayed on airtracer in order to perform the tests. The enhanced terminal stay on the home network until the radio link is available, in the case of the ET migrate from TETRA to TETRAPOL, and viceversa.	

These tests shall be performed only if I-ETR-FUN-2.b is verified.

ID	Description
I-ETR-FUN-3.a	User Interface shall display on the screen the network name/code with which the terminal is currently attached.
TEST	
Verify on enhanced terminal display shall show the name or the code of Network attached to.	

ID	Description
I-ETR-FUN-4.a	User Interface should display only the available talkgroups, or at least it shall display the available talk groups differently from the not available ones.
TEST	
Verify on enhanced terminal display, if the application show differently available list groups from the others not available.	

ID	Description
I-ETR-FUN-5.a	The migrating radio shall be able to automatically select the group used in the visited network.
TEST	
When the radio migrates to a visited network, the enhanced terminal shall perform a group call to the statically group available in the home network in order to verify the correct automatic update of GSSI.	

ID	Description
I-ETR-FUN-6.a	User Interface shall display if the speech call is ciphered or clear.
TEST	
During a encrypted speech call, verify on display of ET, the presence of icon key predefined, in order to define if the call is ciphered  . During a clear speech call, verify on display of ET, the presence of icon key predefined, in order to define if the call is clear  .	

ID	Description
I-ETR-FUN-7.a	User Interface shall provide the capability to select if the communication is ciphered or not.
TEST	
Verify in the UI&BL the implementation of optionally selection of E2EE and AIE security level from end-user side. Verify in the display of ET, the presence of icon key predefined. Test the functionality transmitting/receiving an E2EE call to verify the correct behaviour	

4.4 Requirement for interoperability functions

ID	Description
I-ETR-FUN-8.a	Security Manager shall provide the smart device with authentication and authorization services. The radio user shall be allowed to use the smart device only after successful user authentication.
TESTs	
Test1: Turn on the enhanced terminal, verify the request of PIN. Put wrong PIN to verify the rejected access, then put right PIN to verify the access. **Test1.a**: Verify the request of username and password for chief officer/minister body guard/team officer leader, …	

ID	Description
I-ETR-INT-2.a	The Wireless connectivity between the smart device and the TETRA / TETRAPOL modems shall be encrypted.
TESTs	
Verify with an opportune air interface sniffer, the encrypted communications during a speech call between TETRAPOL modem and the Bluetooth headset.	

ID	Description
I-ETR-FUN-9.a	A secure fence for applications running on Android shall be realized on the smart device.
TEST	
The smart device shall be provided with a security mechanism that protect the device from viruses, malware, Trojans. After downloading a malicious software (tbd), verify the automatic block of malware application and verify the correct protection of the terminal operated by antivirus sw	

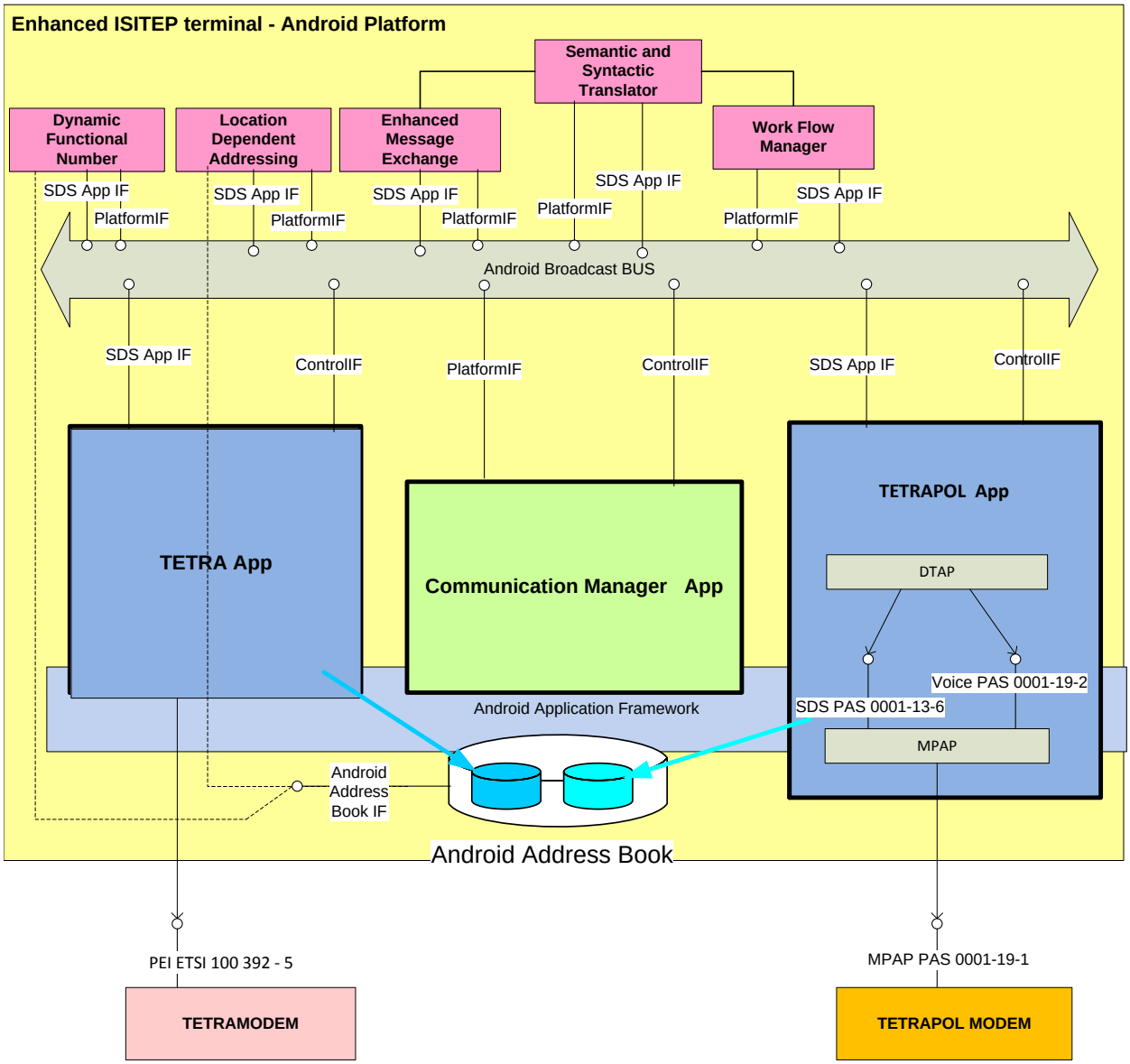
4.5 Requirements for PPDR cloud added value functions and applications

The global software architecture of the ISITEP enhanced terminal, which is applicable to both hand-held and vehicular options, has been analysed and defined within WP5.1. This software architecture is illustrated in figure below

The TETRA App and the TETRAPOL App both export on the Android Broadcast BUS a common intent interface (SDS App IF) to send message across the TETRA or the TETRAPOL air interface

Using this interface the cloud added value applications (Dynamic Functional Number, Location Dependent Addressing and Enhanced Message Exchange) are able to exchange data using Short Data Services (SDS) with the remote servers. [2]

The following figure, explained in the D56.2, show the Enhanced ISITEP terminal Android Platform:



ID	Description
I-ETR-FUN-10.a	For each kind of service **Location Assisted Numbering**, the radio user shall be able to always select the same name in its address book independently of its location, and the call shall be automatically routed.
TESTs	
Verify that selecting the same service number in address book, the call shall be automatically routed to nearest control room related with that special number. The test can be done or changing LA or changing GPS coordinates.	

.ID	Description
I-ETR-FUN-11.a	**Dynamic Functional Numbering** application (on the network-side) shall associate, for each country, the agencies defined in the workflow to some special numbers. Every time a subscriber belonging to the home network migrates to a foreign network, the DFN

	terminal-side application shall ask to the DFN network-side application to provide the list of special numbers available in the foreign country. The DFN network-side application should send the list of special numbers available in the foreign country to the DFN terminal-side application. The DFN terminal-side application shall then update the terminal address book and the emergency button with the special numbers received by the DFN network-side application, linking each special number to the proper agency name.
TESTs	
During a migration, verify that address book of enhanced terminal shall be automatically updated by the PPDR Network depending on its location, and the terminal shall update its address book following the DFN network-side application criteria.	

ID	**Description**
I-ETR-FUN-12.a	The sending **Enhanced Message Exchange** terminal-side application shall provide the end-user with the list of available pre-defined orders, and shall allow the user to define new orders. The list of pre-defined orders shall be presented in the user native language. Only the functional leader shall be enabled to provide orders to the PPDR resources assigned to its functional group.
TESTs	
Verify on display ET, the availability of the list of pre-defined orders. Verify the pre-defined orders are available in the native language. Verify the user is able to add new orders, and verify that the list shall be update on others ET. Verify that the leader user shall provide orders to the user assigned to his group.	

ID	**Description**
I-ETR-FUN-13.a	Short data messages containing pre-defined orders shall be translated at terminal side and kept translated in the history.
TEST	
Verify that receiving SDS, with pre-defined orders, shall be translated automatically and correctly. Verify that the pre-defined orders shall be added in the history.	

ID	**Description**
I-ETR-FUN-14.a	Short data messages containing new orders, not present in the pre-defined order list, shall be translated at network-side. The EME network-side application shall provide real-time translation between the language used by the sender and the receiver. The receiving EME terminal-side application is in charge to ask for real time translation service to the EME network-side application.
TEST	
Sent an order not in pre-defined order list in language1 towards a receiver with different native language. Verify by the receiver's display that the EME network-side application translate correctly the order in real-time.	

REFERENCES

[1] ISITEP_D511_20140515_V1.1 Draft Enhanced Terminal Requirements

[2] ISITEP_D562_v04 User interface and business logic manager Design description