NISTIR 4668

OSINET
TEST & REGISTRATION SERVICE
FUNCTIONAL SPECIFICATION

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U.S. DEPARTMENT OF COMMERCE
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Table of Contents

DISCLAIMER iii

1. The Testing & Registration (T&R) Service 1

2. The T&R Service Environment and Equipment 1
   2.1 The T&R Service Network Topology 1
   2.2 The T&R Service Hardware 1
   2.3 The T&R Service Database Management System 2

3. The T&R Service Functions, Operations, and Database . . . 2
   3.1 The T&R Service Audience 2
   3.2 The Forms Used by the T&R Service 3
   3.3 The T&R Service Access Methods 3
   3.4 The T&R Service Entries 4
   3.5 The T&R Service Declaration of Interoperation (DI) Database Design 4
   3.6 Additional T&R Service Databases 5
   3.7 The T&R Service Paper Response Process 5
   3.8 The T&R Service Directory Information Function . . 6
   3.9 The T&R Service Backup Process 6
   3.10 The T&R Service Database Tables 7

4. The T&R Service Asynchronous Access Method 11
   4.1 The T&R Service Menus 12
   4.2 Using the T&R Service DI Forms Application 14
      4.2.1 A Typical T&R Service User Scenario 23
      4.2.2 A Typical T&R Service Registrant Scenario . 23
   4.3 The T&R Service Terminal Types Supported 24
   4.4 The T&R Service Keypad Layouts 25

5. The T&R Service Message Handling System Access Method . . 27
   5.1 The T&R Service MHS Access Method Error Messages . 27

6. The T&R Service Packet Assembler/Disassembler (PAD) Access Method 27

7. The T&R Service Protective Mechanisms 28
   7.1 The DEC VMS Captive Account Feature 28
   7.2 The Protective Features of Application Menus . . . 28
   7.3 The Protective Features of Application Forms . . . 28

8. The T&R Service Project Schedule & Deliverables 30

9. The T&R Service Project Contacts 30

10. References 31

List of Figures

Figure 1. The T&R Service Communication Architecture 3
Figure 2. The T&R Servic Login Menu 11
Figure 3. The T&R User Menu 12
Figure 4. The T&R Registrant Menu 13
Figure 5. The Registrations and Updates Submenu 14
Figure 6. Page 1 of the T&R Service User DI 15
Figure 7. Page 2 of the T&R Service User DI 16
Figure 8. Page 3 of the T&R Service User DI 16
Figure 9. Page 4 of the T&R Service User DI 17
Figure 10. Page 5 of the T&R Service User DI 17
Figure 11. Page 6 of the T&R Service User DI 18
Figure 12. Page 1 of the T&R Service Registrant DI 19
Figure 13. Page 2 of the T&R Service Registrant DI 19
Figure 14. Page 3 of the T&R Service Registrant DI 20
Figure 15. Page 4 of the T&R Service Registrant DI 20
Figure 16. Page 5 of the T&R Service Registrant DI 21
Figure 17. Page 6 of the T&R Service Registrant DI 21
Figure 18. Page 7 of the T&R Service Registrant DI 22
Figure 19. Page 8 of the T&R Service Registrant DI 22
Figure 20. The T&R Service Keypad Layout for the VT100 . . . 25
Figure 21. The T&R Service Keypad Layout for the VT220 . . . 26

List of Tables

Table 1. The DI Table Definition 8
Table 2. The Registrant Information Table Definition 9
Table 3. The Test Requirements Specification Table Definition 9
Table 4. The Profiles Referenced Table Definition 10
Table 5. The Detailed Test Results Table Definition 10
Table 6. The Derived Systems Table Definition 10
Table 7. The T&R Service Project Schedule & Deliverables . . 30
Table 8. The T&R Service Project Contacts 30

1. The Testing & Registration (T&R) Service

The Testing & Registration (T&R) service is an online database service developed by NIST and owned by OSINET Corporation. It provides an up-to-date reference for announced Open System Interconnection (OSI) products in order to help users select interoperable implementations. Products that have been successfully tested for interoperability using approved OSINET tests and test procedures are listed. These products are protocol suites headed by layer 7 protocols. Currently, Message Handling System (MHS) and File Transfer, Access, and Management (FTAM) protocol suites may be registered.

2. The T&R Service Environment and Equipment

The T&R service is implemented on a Digital Equipment Corporation (DEC) MicroVAX II operating under version 5.1 of the VAX/VMS operating system. This computer is an end system containing the MHS application with the supporting lower layer software.

2.1 The T&R Service Network Topology

OSINET X.25 networking services are provided by AT&T and U.S. Sprint. End systems on the AT&T network can interoperate with end systems on the U.S. Sprint network. End systems can be directly attached to one of these two networks or they can be attached to a local area network which connects to the X.25 network through an intermediate system.

The Corporation for Open Systems (COS) is the new secretariat for the OSINET Corporation. During the period of August - September 1991, the T&R service computer system will be physically moved from NIST to COS headquarters, where COS will be responsible for the day-to-day operation. COS plans to connect the T&R service end system directly to the AT&T network.

2.2 The T&R Service Hardware

The T&R service computer system has two fixed disks for data storage. The data backup capability of this system is supported with two tape units. The T&R service system has modem connections with at least two phone lines supported simultaneously for asynchronous access. The modems operate in asynchronous, full-duplex mode at speeds of 2400/1200 bits/second with no parity, 8 bits, and 1 stop bit.

The T&R service system uses a laser printer for T&R service correspondence and for hard copy distributions of the information contained in the T&R service database.

2.3 The T&R Service Database Management System

The T&R service database uses Version 6 of ORACLE Corporation's Relational Database Management System (RDBMS). ORACLE uses Structured Query Language (SQL), the ANSI and IBM standard language for database management. ORACLE provides application development tools to assist developers in building applications. The application development tools used by the T&R service are listed below, along with a brief description of each tool:

* SQL*ReportWriter - allows users to create formatted multi-part reports.

* SQL*Forms - is a 4th generation tool that allows users to develop forms-based applications.

* SQL*Plus - is a 4th generation, interactive interface. The user enters SQL statements as interactive commands and SQL*Plus runs them against the user's ORACLE database.

* SQL*Menu - allows users to develop custom menu-driven interfaces to their ORACLE applications and other products.

ORACLE also provides programmatic interfaces which allow programmers to access ORACLE data from within standard programming languages. The T&R service uses ORACLE's Pro*C programmatic interface. This programmatic interface supports the C programming language.

3. The T&R Service Functions, Operations, and Database

The OSINET Testing & Registration project operates in the following manner. Testing parties privately, voluntarily, and bilaterally agree to perform certain interoperation tests. The successful results of these tests are registered with the T&R service. The following sections describe the design and operation of the T&R service. The sections discuss items such as the electronic forms used, the structure of the database, and the access methods provided.

3.1 The T&R Service Audience

The T&R service serves the needs of two different groups, T&R registrants and T&R users. A T&R registrant is an organization that is permitted, under the rules established by OSINET, to register interoperability test results. The T&R users are individuals who query the database to view its contents. T&R users may be anyone; to access the T&R service for queries users do not

have to be OSINET members. For further definition of who is eligible to register information with the T&R service, please refer to OSINET Corporation General Agreements and Information Document, section 4.2.

3.2 The Forms Used by the T&R Service

The results of successful interoperability testing are registered by T&R registrants using an electronic version of the Declaration of Interoperation (DI). The results are stored in pairs with a matching unique identifier in the T&R service's relational database. Users are able to retrieve information on the testing results of products that is contained in the DI using the asynchronous access method.

3.3 The T&R Service Access Methods

The T&R service allows users to make basic queries to its relational database. The T&R service also allows T&R registrants to register testing results in the database. These two services are available thru the T&R service communication architecture, which is based on three different access methods. The access methods are asynchronous terminal access via phone line modem, Packet Assembler/Disassembler (PAD) access via OSINET, and MHS via OSINET. Figure 1 shows the T&R service communication architecture.

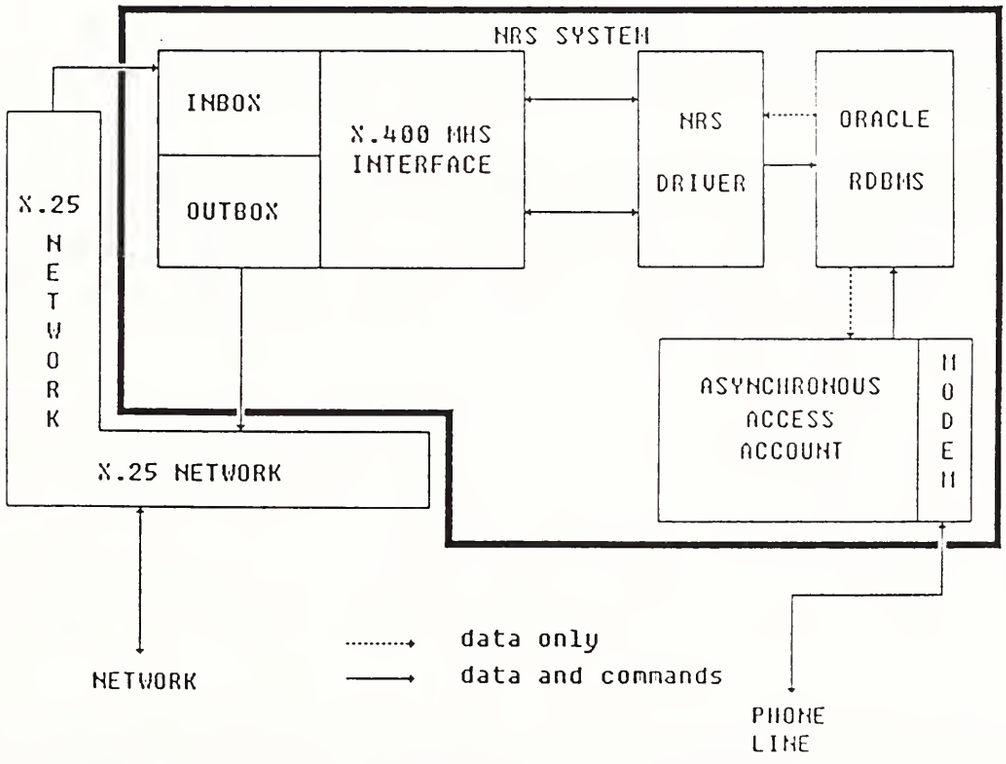


Figure 1. The T&R Service Communication Architecture

3.4 The T&R Service Entries

The T&R service data may be used to assist users in their procurement efforts. It provides up-to-date information on announced OSI products that interoperate. Only implementations that have met the OSINET testing criteria are listed.

T&R entries do not contain any confidential information. T&R entries may be accessed online by OSINET members and potential customers, at no charge. The information may also be published periodically with the cost of the hard copy version of the T&R information being paid by the user.

T&R entries become publically available and may not be deleted. Correct entries applicable to announced products are known as "CURRENT" entries. Entries found to be in error are marked as "INVALID". Entries that are retired, for example because of new releases of products, are marked "OBSOLETE". New entries, known as "DRAFT" entries, may be edited by the submitter to correct typographical or other errors.

"DRAFT" and "INVALID" entries are not accessible to users. Entries which have been marked "OBSOLETE" are available for up to two years.

The organization submitting an entry to the database retains all patents and copyrights. No patent or copyright licenses, expressed or implied, are granted by these submissions.

3.5 The T&R Service Declaration of Interoperation (DI) Database Design

The T&R service utilizes three databases for DI data: a WORKING database, a PERMANENT database, and an EXAMPLE database. This design was chosen to increase the protection, simplify the operation, and improve the integrity of the T&R service. The following paragraphs describe each of the databases and how they are used by the T&R service.

The WORKING database is used by T&R registrants when they are registering test results. The T&R registrants register the test results as "DRAFT" entries in the WORKING database. The T&R registrants may make changes to their entries in this database while the status of the entry is "DRAFT". Once T&R registrants change the status of an entry from "DRAFT" to "CURRENT" they are unable to make further changes to their entry in the WORKING database.

The PERMANENT database is used by T&R users when they are querying the database. The PERMANENT database may also be accessed by T&R registrants to change the status of an entry from "CURRENT" to

"INVALID" or "OBSOLETE". T&R registrants may also make changes to derived systems and marketing contact information on a "CURRENT" entry.

Once the status of the matching entries in the WORKING database is "CURRENT", an automated T&R service routine moves the matching entries from the WORKING database to the PERMANENT database to be available for viewing by T&R users. The T&R service database design thus allows only T&R registrants to have access to the WORKING database. It does not allow users to access entries in the WORKING database.

The EXAMPLE database is a sample database provided as a means for registrants and users to familiarize themselves with the T&R service operation. Inexperienced users and registrants are encouraged to "play" with the EXAMPLE database before using the "real" database.

3.6 Additional T&R Service Databases

There are several other databases used by the T&R service in addition to the DI databases. The first database is known as the "Test Requirements Specification" database. This database contains an entry for each profile which may appear in the profiles referenced section of the DI (please see Figure 10 or 17). Each profile developer may, for each OSI application, specify the subset of interoperability tests which must be successfully completed to satisfy the requirements of the profile developer. An entry in the Test Requirements Specification database consists of the name of the profile (e.g. US GOSIP Ver. 1 MHS) and the list of OSINET test cases associated with that profile.

Another database used by the T&R service is the "Detailed Test Results" database. Each registered DI makes reference to this database. Each detailed test results entry lists only those test cases successfully executed between the test partners.

3.7 The T&R Service Paper Response Process

The T&R service provides a positive acknowledgement for every transaction which modifies either the PERMANENT or WORKING database. This positive acknowledgement is in the form of a letter. The letter contains information on the change made, who (as far as the database is concerned) executed the change, and the current view of the data as it appears in the database.

The letter is generated by ORACLE's SQL*ReportWriter. Upon logging in to the electronic DI form, the username/password used by the T&R registrant is recorded. By use of the username/password the database identifies who made the change. This username/ password

is also used by the SQL*ReportWriter to retrieve from the Registrant Information table the name and address of the person to receive the letter detailing the change accepted to the database.

In this way, a paper trail exists for every entry in the database. This paper trail adds to the overall T&R service protection. For example, consider what happens if another T&R registrant masquerades as ABC Company and makes a change to one of ABC Company's entries. When the database generates the letter noting the change made, it designates ABC Company as the recipient, because as far as the database is concerned, ABC Company made the change. As soon as ABC Company receives the letter, it knows that its entries have been tampered with.

In cases where a change made to an entry may affect the matching entry, both testing partners receive notice of the change. For example when ABC Company changes the status of its X.400 entry from "CURRENT" to "INVALID" or "OBSOLETE", ABC Company's testing partner, XYZ Inc., is also sent a letter noting the change.

3.8 The T&R Service Directory Information Function

The T&R service offers the option of directory information. The directory information provides a brief overview of the data stored in the database. The directory information consists of a list of registrants who have products registered and a list of the products registered with the database. Registration of test results is open to OSINET Corporation Senior Members.

3.9 The T&R Service Backup Process

Once every two weeks, the automated backup process makes a backup copy of the database. During this process entries which have had a status of "OBSOLETE" for two years or more are extracted from the database and archived on a tape. Entries which have a status of "INVALID" are also extracted and archived. T&R registrants or users who wish to view archived entries must make a special request to the T&R service.

Special requests may be made by sending an electronic mail message, sending a letter, or telephoning the T&R service support staff. The T&R service support staff will manually extract the requested entries and send them back to the requesting party.

The T&R service support staff provides classifications for special requests. If a special request is "CRITICAL", the T&R service support staff will respond within 48 hours. If the request is "IMPORTANT" the T&R service staff will respond within 1 week. All other requests, known as "NORMAL" requests will be answered within 2 weeks.

3.10 The T&R Service Database Tables

The T&R service makes use of eleven major tables. Three of the tables are similar in content. The three main tables, referred to as "DI" tables, correspond with the WORKING, PERMANENT, and EXAMPLE databases. The fourth table is the username/password table, referred to as the "Registrant Information" table. The Registrant Information table contains the T&R registrant usernames and passwords associated with registering or changing data in the above mentioned databases. The Registrant Information table also contains the names, addresses, and telephone numbers of the main contacts for each T&R registrant.

The fifth table is known as the "Test Requirements Specification" table. This table contains an entry for each of the profiles which may be specified in the profiles referenced of the DI (please see Figure 10 or 17). Each entry contains the profile name and the list of test cases associated with that profile. The T&R service support staff is responisible for updating this table, using information supplied by responsible organizations. NIST for example will specify the tests that apply to the GOSIP profile.

The sixth and seventh tables, known as "Profiles Referenced" and "Example Profiles Referenced", are similar in nature. The table, "Profiles Referenced", corresponds to the PERMANENT and WORKING databases. The table, "Example Profiles Referenced", corresponds to the EXAMPLE database. Each of these tables contain the list of profiles associated with each DI entry. This data is kept in separate tables from the other DI data in order to allow for an unbounded number of entries per DI. These tables are linked to the DI tables through the unique ID assigned to each DI entry.

The eighth and ninth tables contain lists of test cases. These tables are known as the "Detailed Test Results" table and the "Example Detailed Test Results" table. Once again, one table, "Detailed Test Results", corresponds to the PERMANENT and WORKING databases, while the other, "Example Detailed Test Results", corresponds to the EXAMPLE database. These tables contain one entry per DI and each entry lists all test cases successfully executed between the partners; including tests that are in addition to those required by the listed profiles. These tables are linked to the DI tables through the unique ID assigned to each DI entry.

The last two tables, referred to as "Derived Systems" and "Example Derived Systems", contain the derived systems data associated with each DI entry. Derived systems data is stored in separate tables to allow multiple entries for any one DI entry. These tables are updated by the registrants. When a registrant makes a change to the "Derived Systems" table, the test partner is notified that additional changes have been made to the derived systems data.

These tables are linked to the DI tables through the unique ID assigned to each DI entry. And once again, one table, "Derived Systems", corresponds to the PERMANENT and WORKING databases, while the other table, "Example Derived Systems", corresponds to the EXAMPLE database.

The DI tables contain the information on the Declaration of Interoperation. The DI fields, their type, and length are listed in Table 1.

Name	Null ?	Type
UNIQUE_RECORD_ID	NOT NULL	NUMBER(9)
REGISTRANT_IDENTIFICATION	NOT NULL	NUMBER(7)
IDENTIFICATION_NUMBER	NOT NULL	CHAR(18)
ENTRY_DATE		DATE
STATUS		CHAR(10)
TEST_PARTY_A		CHAR(50)
A_SUBMITTED_BY		CHAR(50)
TEST_PARTY_B		CHAR(50)
B_SUBMITTED_BY		CHAR(50)
PRODUCT_SPECIFICATION		CHAR(100)
HARDWARE_PLATFORM		CHAR(30)
OPERATING_SYSTEM		CHAR(30)
APPLICATION_PROFILE		CHAR(7)
APPLICATION_PROFILE_2		CHAR(7)
APPLICATION_PROFILE_3		CHAR(7)
TRANSPORT_PROFILE		CHAR(7)
RELAY_PROFILE		CHAR(11)
INTERCHANGE_P ILE		CHAR(7)
CONTACT_NAME		CHAR(40)
CONTACT_ADDR		CHAR(40)
CONTACT_ADDRESS2		CHAR(40)
CONTACT_CITY		CHAR(30)
CONTACT_STATE		CHAR(2)
CONTACT_ZIP_CODE		CHAR(10)
CONTACT_TELEPHONE		CHAR(20)
CONTACT_FAX		CHAR(20)
PICS_NUMBER		CHAR(20)
TSES_NUMBER		CHAR(20)
PITR_NUMBER		CHAR(20)
TEST_SUITE_IDENTIFICATION		CHAR(100)

Table 1. The DI Table Definition

Table 2 shows the structure of the Registrant Information table. This table is only viewable by persons with Database Administrator (DBA) privilege. Entries are put into the Registrant Information table when the DBA grants an T&R registrant access to the T&R service databases.

Name	Null ?	Type
COMPANY_NAME		CHAR(50)
USERNAME		CHAR(20)
PASSWORD		CHAR(20)
CONTACT_NAME		CHAR(35)
CONTACT_ADDRESS1		CHAR(40)
CONTACT_ADDRESS2		CHAR(40)
CONTACT_CITY		CHAR(30)
CONTACT_STATE		CHAR(2)
CONTACT_COUNTRY		CHAR(25)
CONTACT_ZIP_CODE		CHAR(10)
CONTACT_TELEPHONE		CHAR(20)
CONTACT_FAX		CHAR(20)
IDENTIFICATION_NUMBER	NOT NULL	NUMBER(7)

Table 2. The Registrant Information Table Definition

Table 3 shows the structure of the Test Requirements Specification table.

Name	Null?	Type
PROFILE_NAME		CHAR(100)
TEST_SUITE_IDENTIFICATION		CHAR(100)
TEXT_AREA_1		CHAR(60)
TEXT_AREA_2		CHAR(60)
TEXT_AREA_3		CHAR(60)
TEXT_AREA_4		CHAR(60)
TEXT_AREA_5		CHAR(60)
TEXT_AREA_6		CHAR(60)
TEXT_AREA_7		CHAR(60)
TEXT_AREA_8		CHAR(60)
TEXT_AREA_9		CHAR(60)
TEXT_AREA_10		CHAR(60)
TEXT_AREA_11		CHAR(60)
TEXT_AREA_12		CHAR(60)

Table 3. The Test Requirements Specification Table Definition

Table 4 shows the format of the Profiles Referenced tables.

Name	Null?	Type
SDI_UNIQUE_RECORD_ID	NOT NULL	NUMBER(9)
PROFILE_REFERENCED		CHAR(100)
COMPANY_IDENTIFICATION_NUMBER	NOT NULL	NUMBER(7)

Table 4. The Profiles Referenced Table Definition

Table 5 shows the structure of the Detailed Test Results tables.

Name	Null?	Type
SDI_UNIQUE_RECORD_ID		NUMBER(9)
TEXT_AREA_1		CHAR(75)
TEXT_AREA_2		CHAR(75)
TEXT_AREA_3		CHAR(75)
TEXT_AREA_4		CHAR(75)
TEXT_AREA_5		CHAR(75)
TEXT_AREA_6		CHAR(75)
TEXT_AREA_7		CHAR(75)
TEXT_AREA_8		CHAR(75)
TEXT_AREA_9		CHAR(75)
TEXT_AREA_10		CHAR(75)
TEXT_AREA_11		CHAR(75)
TEXT_AREA_12		CHAR(75)
TEXT_AREA_13		CHAR(75)
COMPANY_IDENTIFICATION_NUMBER	NOT NULL	NUMBER(7)

Table 5. The Detailed Test Results Table Definition

Table 6 shows the structure of the Derived Systems tables.

Name	Null?	Type
SDI_UNIQUE_RECORD_ID	NOT NULL	NUMBER(9)
PRODUCT_SPECIFICATION		CHAR(50)
HARDWARE_PLATFORM		CHAR(30)
OPERATING_SYSTEM		CHAR(30)
APPLICATION_PROFILE		CHAR(7)
APPLICATION_PROFILE_2		CHAR(7)
APPLICATION_PROFILE_3		CHAR(7)
TRANSPORT_PROFILE		CHAR(7)
RELAY_PROFILE		CHAR(11)
INTERCHANGE_PROFILE		CHAR(7)
COMPANY_IDENTIFICATION_NUMBER	NOT NULL	NUMBER(7)

Table 6. The Derived Systems Table Definition

New fields may be added or the size of a field may be increased at a future time. Changing the tables in this manner can be made without affecting the resident data.

4. The T&R Service Asynchronous Access Method

All users wanting to communicate with T&R service using the asynchronous access method must have a computer with dial-out capabilities, a modem that enables a 2400/1200 bits/second full-duplex mode data transfer, and a software package that establishes the link, synchronizes the communication between the two hosts, and provides emulation of a Digital VT100/VT220/VT330/VT340 teminal type. The login process consists of the following steps.

The first step is to establish a communication link between the T&R service computer and the user's computer. The user's computer initiates the connection by dialing the phone number of the T&R service computer. The T&R service computer responds by accepting the connection. The user's computer announces the establishment of a successful communication link with a prompt (examples: "CONNECT", two bells, or both). At this point, pressing the RETURN key several times causes the user's computer to display the login information screen.

The next step is to enter the login information. The username "NRS_MODEM" must be entered followed by a carriage return. The T&R service computer remote host responds by transmiting the "TESTING & REGISTRATION (T&R) SERVICE LOGIN MENU" screen shown in Figure 2.

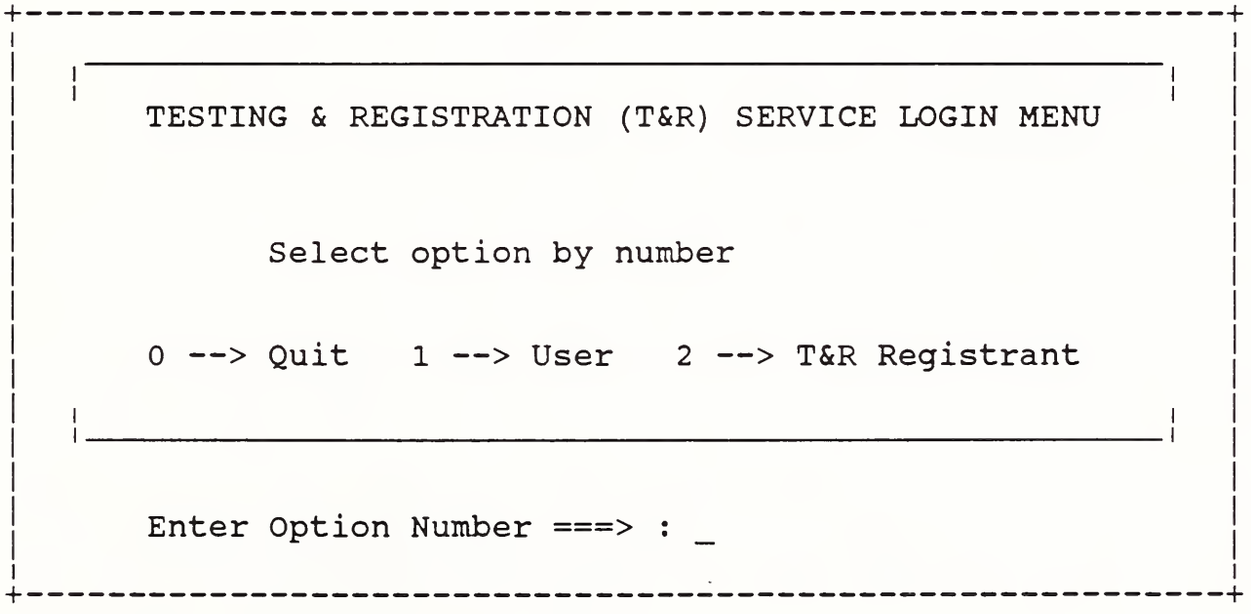


Figure 2. The T&R Servic Login Menu

Users select option 1 to access test results. T&R service registrants select option 2 to access or update test results. Users select option 0 to terminate T&R service access. After selecting option 1, the menu shown in Figure 3 is displayed; after selecting option 2, the menu shown in Figure 4 is displayed.

4.1 The T&R Service Menus

Figure 3 shows the menu presented when option 1 is selected. This is the T&R user menu and it contains 5 options. Selecting the first option brings up the EXAMPLE database menu which will give registrants and users a tool to learn how to update and access test result information in the PERMANENT database. Selecting the second option enables the user to view the information in the PERMANENT database. The HELP option causes "help" text to be displayed. The fourth option provides the Directory Information. Selecting the last option causes the termination of the T&R service work session.

```
+-------------------------------------------------------------+
|                                                             |
|    THE TESTING & REGISTRATION (T&R) SERVICE                 |
|                                                             |
|         ====> USER MENU <====                               |
|                                                             |
|                                                             |
|         --> 1 EXAMPLE Database                              |
|             2 Query Test Results                            |
|             3 HELP                                          |
|             4 Directory Information                         |
|             5 EXIT                                          |
|                                                             |
|                                                             |
|         Make your choice: _                                 |
|                                                             |
|    For Quick Help Press ================> Esc - K          |
|_____________________________________________________________|
```

Figure 3. The T&R User Menu

Figure 4 shows the menu presented when option 2 in Figure 2 is selected. This is the main menu for T&R registrants and it contains an additional option to register or update test results.

There is also a quick help screen available at each menu level (pressing Escape k displays a help menu). The quick help menu reminds users of the keystrokes necessary to negotiate through the menu driven application, such as moving the cursor up, down, left and right, returning to the previous menu and returning to the main menu.

The second option brings up the submenu for registrations and updates shown in Figure 5. This submenu contains 6 options that the T&R registrant can select by simply moving the cursor up or down. Once the selection is made, the registrant presses the RETURN key to execute the transaction corresponding to that option.

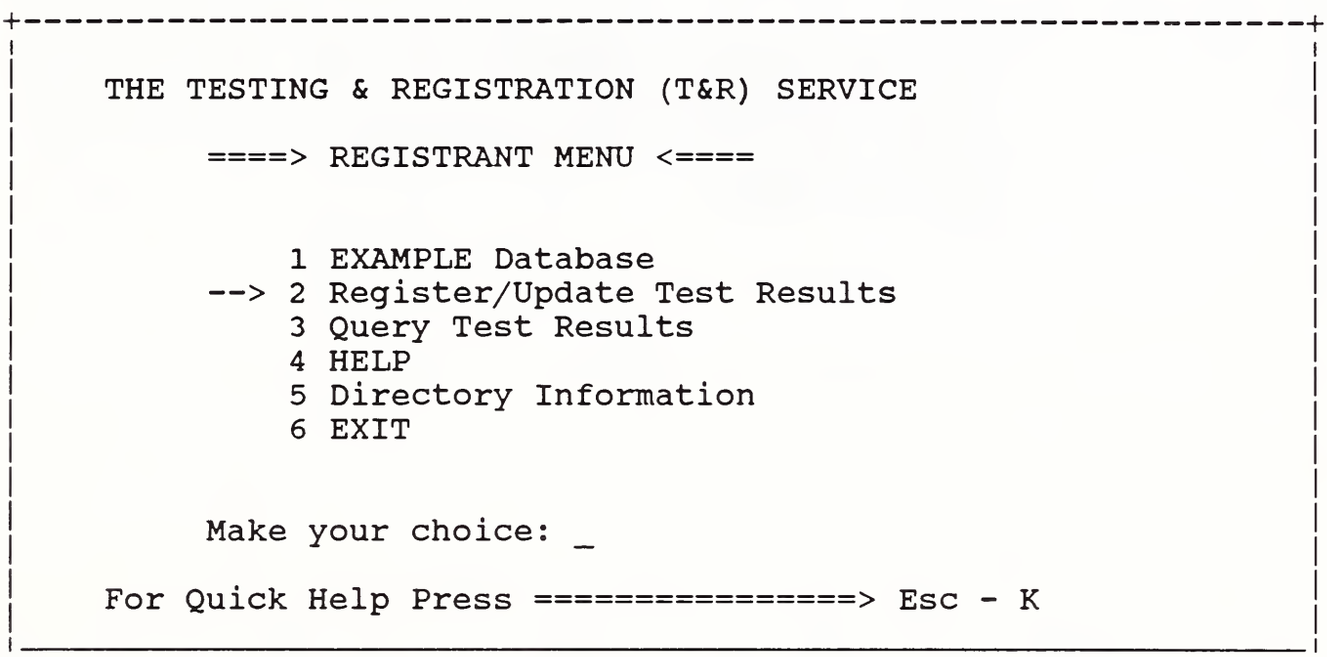


Figure 4. The T&R Registrant Menu

Any one of the first four options brings up the username/password screen which is the first page of the registrants DI form. T&R registrants must have their usernames and passwords validated before registering test result information in the WORKING database. After this information is validated, page 2 of the T&R registrant DI form is displayed for registration.

The first option allows T&R registrants to register successful test results or to update an entry that is currently in "DRAFT" status. Updates are not permitted in the WORKING database after the entry is changed to "CURRENT" status. The second option enables T&R registrants to change the status, marketing contact or derived systems information of "CURRENT" entries in the T&R service PERMANENT database. The third option, allows T&R registrants to register detailed test results data. The fourth option enables T&R registrants to change their passwords. Option five returns the T&R registrant to the previous menu and option six terminates the T&R service menu-driven work session.

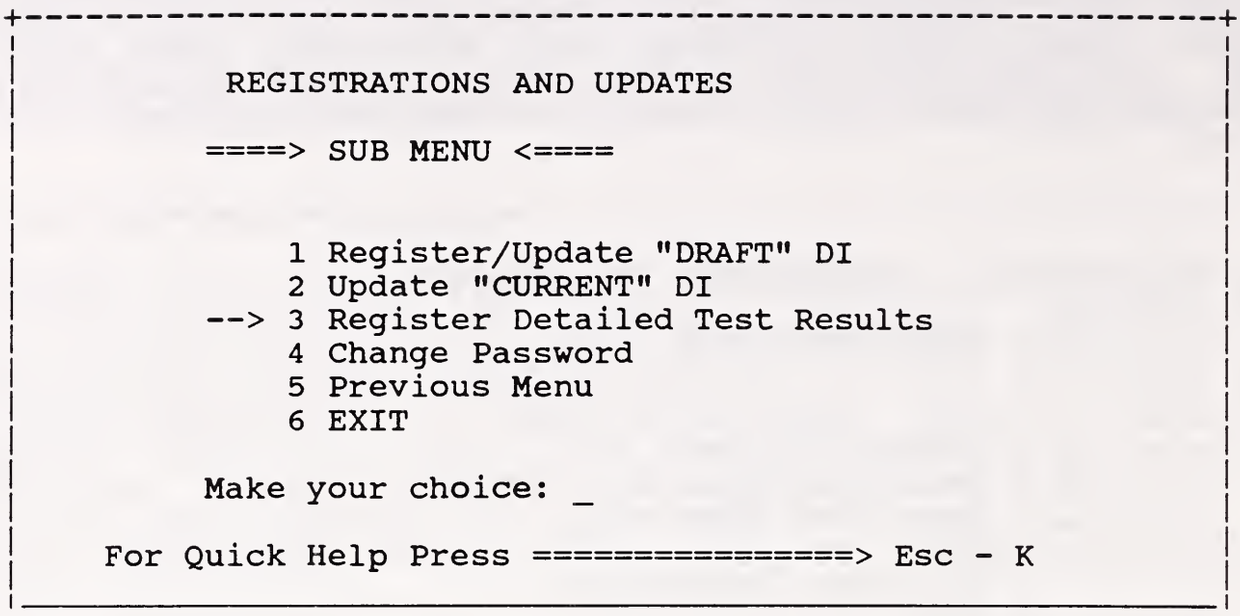


Figure 5. The Registrations and Updates Submenu

4.2 Using the T&R Service DI Forms Application

The T&R registrants and users access the database through an electronic version of the DI. An expanded version of the DI form is provided for T&R registrants to protect against unauthorized access to their entries.

Access to the electronic form is provided by an DI application. The DI application controls the actions allowed on the database and the types of data stored in any given field.

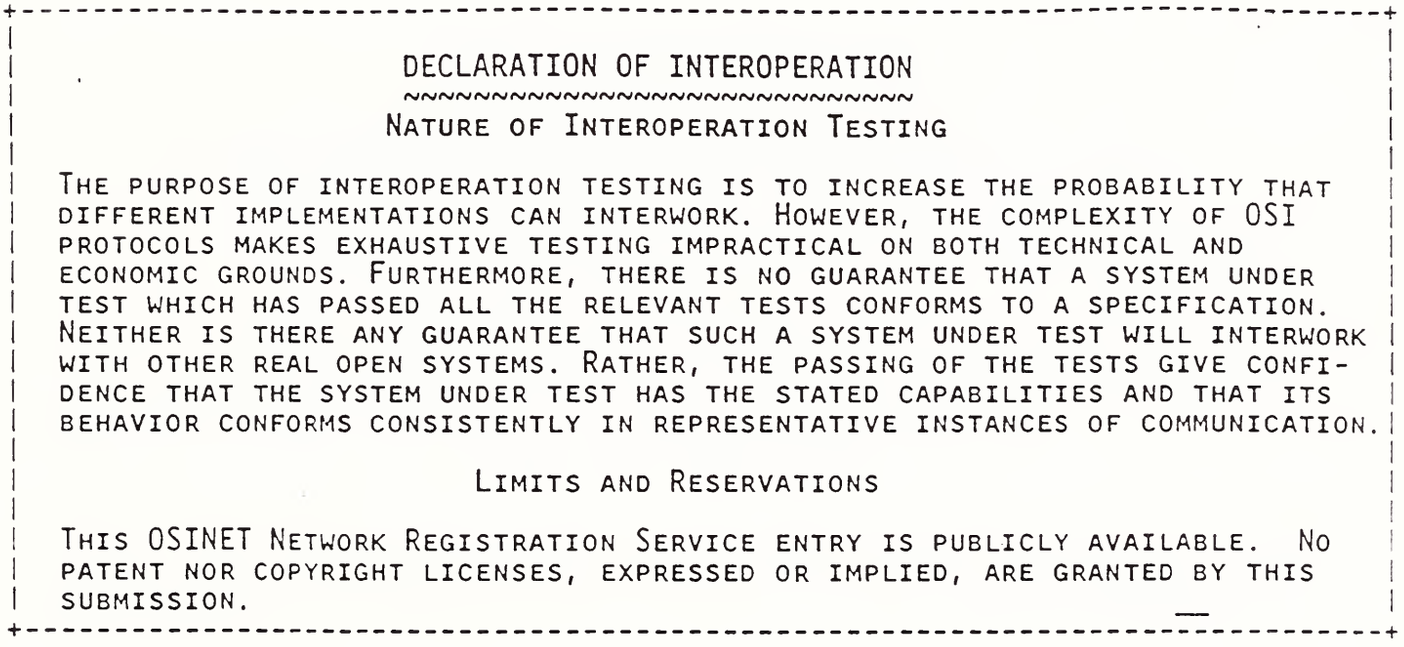
T&R registrants and users use either function keys or alternate keypads to enter data on the form. For more information on the terminal types supported and their keypad layouts, please refer to sections 4.3 and 4.4.

The DI forms provided for the T&R registrants and users consist of several pages. Whenever a T&R registrant or user is presented with an DI form, initially page 1 is visible. At the very bottom of each screen, a T&R registrant or user sees a "help" line. In this "help" line, informational messages and error messages are displayed. Additional "help" information can be displayed by pressing the "HELP" key.

Since the DI forms consist of several pages the T&R registrants and users must use the "NEXT BLOCK" key to page down, and the "PREVIOUS BLOCK" key to page up. The T&R users' DI form consists of 6 pages, while the T&R registrants' DI form is 8 pages in length. Figures 6 - 11 show the exact format of the T&R users' DI form. Figures

12 - 19 show the exact format of the T&R registrants' DI form. In both sets of figures the EXAMPLE database version of the forms is used. The forms look the same for both the WORKING and PERMANENT databases except for the text headers which identify the database being accessed.

In some fields, the data entered may be restricted to a predefined list of values. In this case, the T&R registrant or user is notified when the data entered is not a valid response. The T&R registrant or user is then instructed to check the list of legal field values by pressing "ESCAPE V". The T&R registrant or user then presses the TAB key to cycle through the list of available responses till he/she finds the desired choice. When the T&R registrant or user has found the desired data, pressing the PF4 or "CANCEL/EXIT" key deactivates the list of field values.



DECLARATION OF INTEROPERATION

Nature of Interoperation Testing

The purpose of interoperation testing is to increase the probability that different implementations can interwork. However, the complexity of OSI protocols makes exhaustive testing impractical on both technical and economic grounds. Furthermore, there is no guarantee that a system under test which has passed all the relevant tests conforms to a specification. Neither is there any guarantee that such a system under test will interwork with other real open systems. Rather, the passing of the tests give confidence that the system under test has the stated capabilities and that its behavior conforms consistently in representative instances of communication.

Limits and Reservations

This OSINET Network Registration Service entry is publicly available. No patent nor copyright licenses, expressed or implied, are granted by this submission.

Figure 6. Page 1 of the T&R Service User DI

DECLARATION OF INTEROPERATION

THE INFORMATION BELOW DETAILS THE STATUS OF THIS ENTRY, THE DATE IT WAS ENTERED, THE PARTIES INVOLVED IN THE TESTING, AND TEST PARTY A'S PRODUCT TESTED. THE FIELDS ON THE REMAINING PAGES REFER TO TEST PARTY A'S PRODUCT.

IDENTIFICATION # _____ _____

STATUS _____ ENTRY DATE _____

TEST PARTY A _____
SUBMITTED BY _____

TEST PARTY B _____
SUBMITTED BY _____

PRODUCT SPECIFICATION _____

Figure 7. Page 2 of the T&R Service User DI

PRODUCT INFORMATION

THE INFORMATION BELOW DESCRIBES THE ENVIRONMENT IN WHICH THE TESTING WAS CONDUCTED, I.E. THE HARDWARE PLATFORM, OPERATING SYSTEM AND ASSOCIATED OSI PROFILES USED BY TEST PARTY A.

HARDWARE PLATFORM _____

OPERATING SYSTEM _____

APPLICATION PROFILE 1 _____ _____
2 _____ _____
3 _____ _____

TRANSPORT PROFILE _____ _____

RELAY PROFILE _____ _____

INTERCHANGE PROFILE _____ _____

Figure 8. Page 3 of the T&R Service User DI

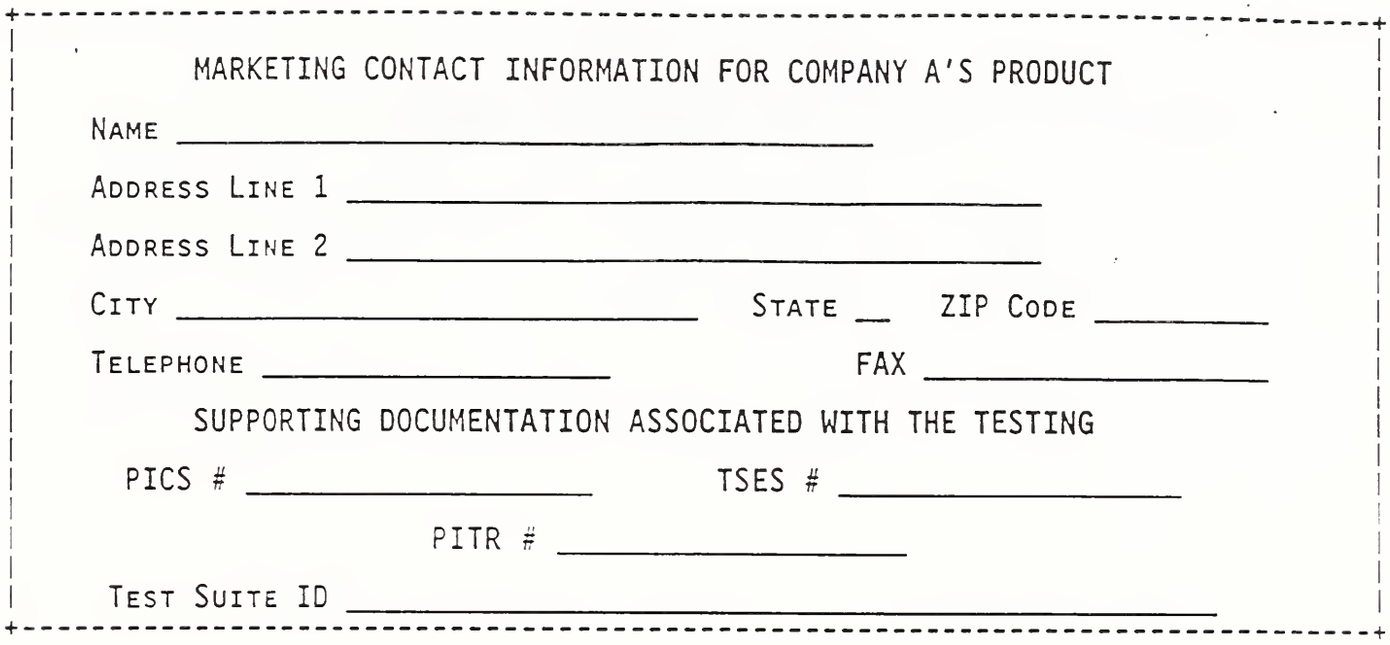


Figure 9. Page 4 of the T&R Service User DI

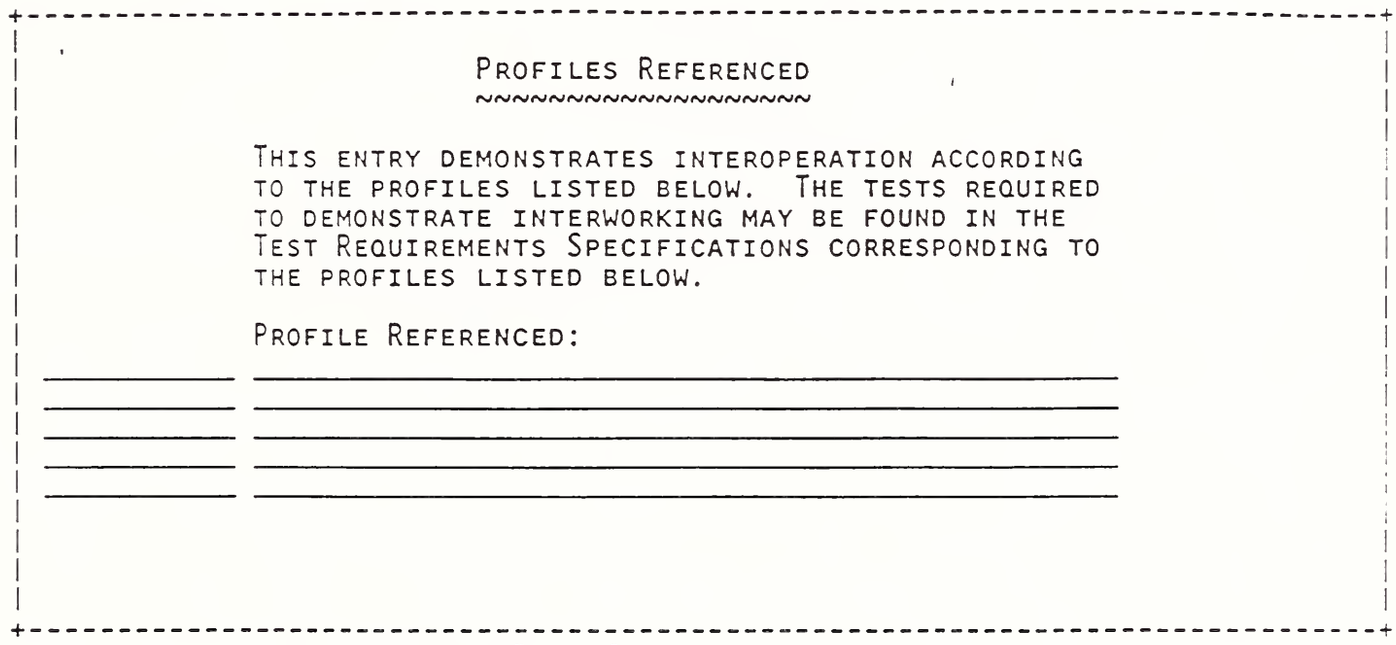


Figure 10. Page 5 of the T&R Service User DI

DERIVED SYSTEMS

THE INFORMATION LISTED BELOW DESCRIBES A PRODUCT/SYSTEM WHICH COMPANY A HAS IDENTIFIED AS A DERIVATIVE OF THE TESTING PERFORMED.

PRODUCT SPECIFICATION _____

HARDWARE PLATFORM _____

OPERATING SYSTEM _____

APPLICATION PROFILE 1 _____ _____
2 _____ _____
3 _____ _____

TRANSPORT PROFILE _____ _____

RELAY PROFILE _____ _____

INTERCHANGE PROFILE _____ _____

Figure 11. Page 6 of the T&R Service User DI

DECLARATION OF INTEROPERATION

NATURE OF INTEROPERATION TESTING

THE PURPOSE OF INTEROPERATION TESTING IS TO INCREASE THE PROBABILITY THAT DIFFERENT IMPLEMENTATIONS CAN INTERWORK. HOWEVER, THE COMPLEXITY OF OSI PROTOCOLS MAKES EXHAUSTIVE TESTING IMPRACTICAL ON BOTH TECHNICAL AND ECONOMIC GROUNDS. FURTHERMORE, THERE IS NO GUARANTEE THAT A SYSTEM UNDER TEST WHICH HAS PASSED ALL THE RELEVANT TESTS CONFORMS TO A SPECIFICATION. NEITHER IS THERE ANY GUARANTEE THAT SUCH A SYSTEM UNDER TEST WILL INTERWORK WITH OTHER REAL OPEN SYSTEMS. RATHER, THE PASSING OF THE TESTS GIVE CONFIDENCE THAT THE SYSTEM UNDER TEST HAS THE STATED CAPABILITIES AND THAT ITS BEHAVIOR CONFORMS CONSISTENTLY IN REPRESENTATIVE INSTANCES OF COMMUNICATION.

LIMITS AND RESERVATIONS

THIS OSINET NETWORK REGISTRATION SERVICE ENTRY IS PUBLICLY AVAILABLE. NO PATENT NOR COPYRIGHT LICENSES, EXPRESSED OR IMPLIED, ARE GRANTED BY THIS SUBMISSION.

Figure 12. Page 1 of the T&R Service Registrant DI

REGISTRANT'S LOGIN INFORMATION

COMPANY NAME _____

USERNAME _____

PASSWORD _____

Figure 13. Page 2 of the T&R Service Registrant DI

DECLARATION OF INTEROPERATION

THE INFORMATION BELOW DETAILS THE STATUS OF THIS ENTRY, THE DATE IT WAS ENTERED, THE PARTIES INVOLVED IN THE TESTING, AND TEST PARTY A'S PRODUCT TESTED. THE FIELDS ON THE REMAINING PAGES REFER TO TEST PARTY A'S PRODUCT.

IDENTIFICATION # _____ _____

STATUS _____ ENTRY DATE _____

TEST PARTY A _____
SUBMITTED BY _____

TEST PARTY B _____
SUBMITTED BY _____

PRODUCT SPECIFICATION _____

Figure 14. Page 3 of the T&R Service Registrant DI

PRODUCT INFORMATION

THE INFORMATION BELOW DESCRIBES THE ENVIRONMENT IN WHICH THE TESTING WAS CONDUCTED, I.E. THE HARDWARE PLATFORM, OPERATING SYSTEM AND ASSOCIATED OSI PROFILES USED BY TEST PARTY A.

HARDWARE PLATFORM _____

OPERATING SYSTEM _____

APPLICATION PROFILE 1 _____ _____
2 _____ _____
3 _____ _____

TRANSPORT PROFILE _____ _____

RELAY PROFILE _____ _____

INTERCHANGE PROFILE _____ _____

Figure 15. Page 4 of the T&R Service Registrant DI

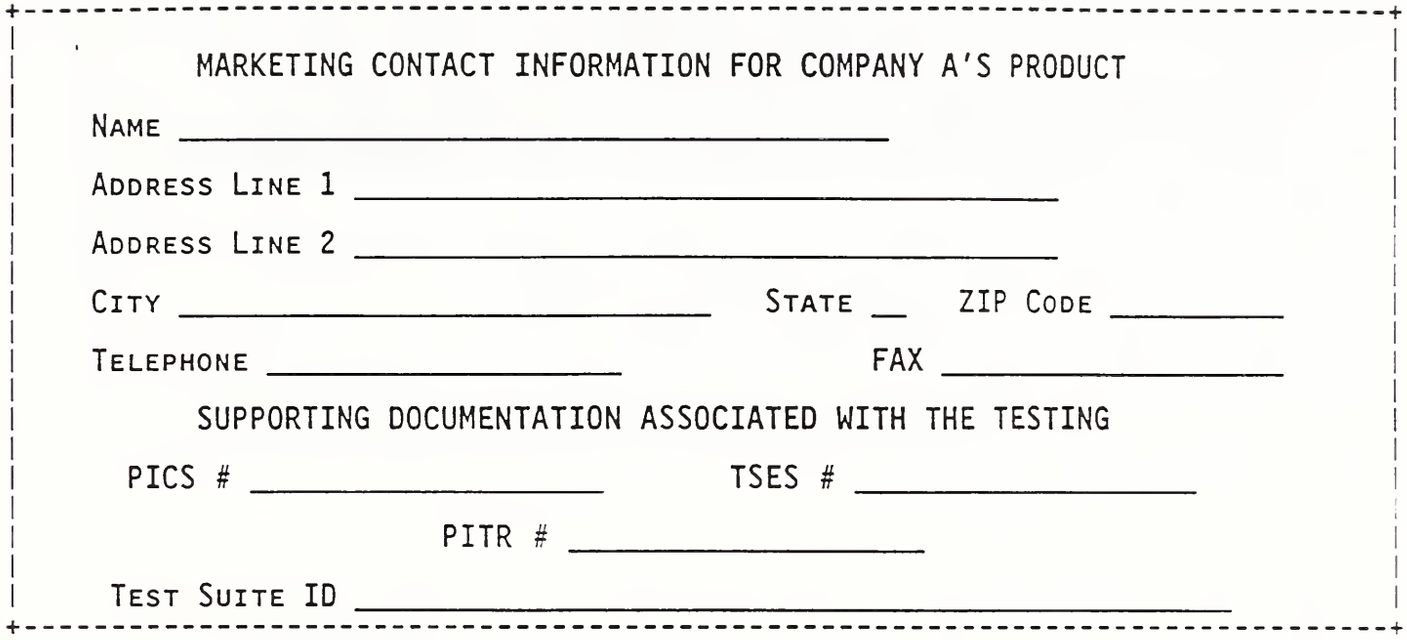


Figure 16. Page 5 of the T&R Service Registrant DI

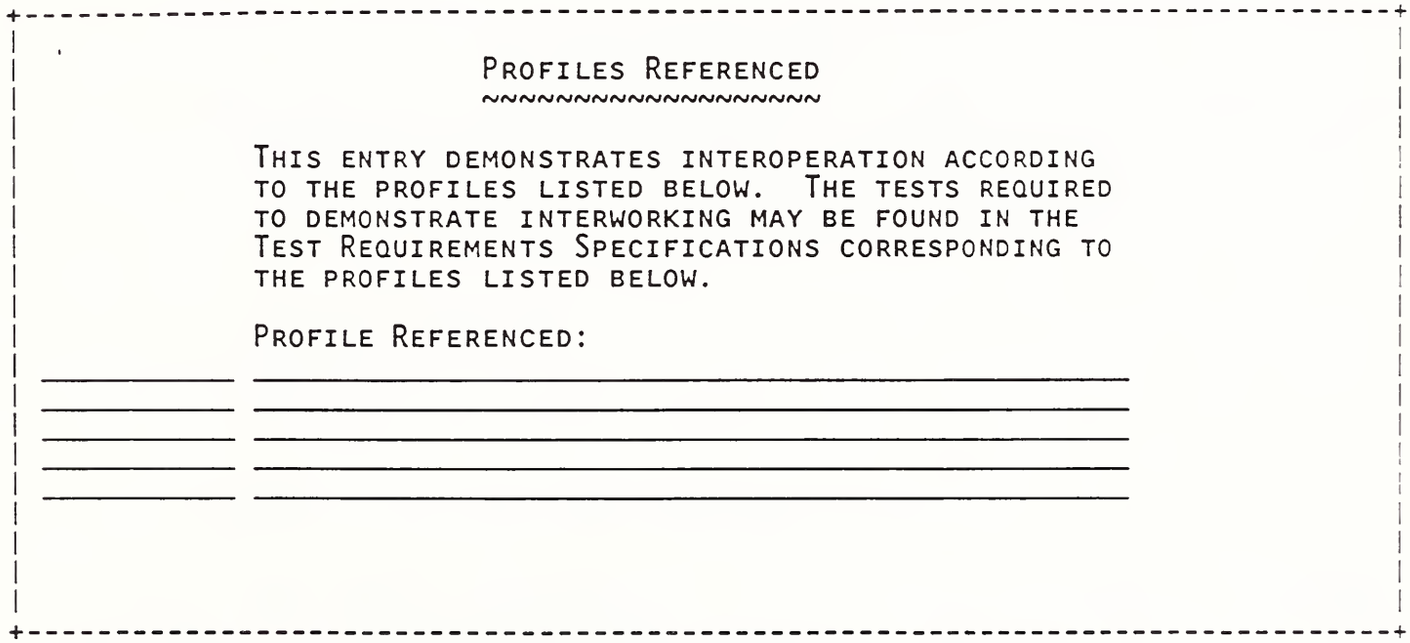


Figure 17. Page 6 of the T&R Service Registrant DI

DERIVED SYSTEMS

THE INFORMATION LISTED BELOW DESCRIBES A PRODUCT/SYSTEM WHICH COMPANY A HAS IDENTIFIED AS A DERIVATIVE OF THE TESTING PERFORMED.

PRODUCT SPECIFICATION _____

HARDWARE PLATFORM _____

OPERATING SYSTEM _____

APPLICATION PROFILE 1 _____ _____
2 _____ _____
3 _____ _____

TRANSPORT PROFILE _____ _____

RELAY PROFILE _____ _____

INTERCHANGE PROFILE _____ _____

Figure 18. Page 7 of the T&R Service Registrant DI

DETAILED TEST RESULTS

LISTED BELOW ARE THE TEST REFERENCE NUMBERS OF EVERY TEST SUCCESSFULLY COMPLETED BETWEEN COMPANY A AND B. TEST NUMBERS SELECTED FOR TESTING INCLUDE ALL THE MANDATORY TESTS AND THE OPTIONAL TESTS SELECTED BY COMPANY A AND B WHICH DEMONSTRATE THE FEATURES SUPPORTED BY BOTH PRODUCTS.

Figure 19. Page 8 of the T&R Service Registrant DI

4.2.1 A Typical T&R Service User Scenario

A T&R service user's typical scenario might proceed as follows. After logging into the system and selecting the appropriate menu selections, the user is presented with the blank DI electronic form. The user pushes the "ENTER QUERY" key and then proceeds to fill in whatever items on the form he/she wants used as query criteria. If the interest is for "all entries registered by IBM", the user would enter into the field labeled "Test Party A" the letters "IBM".

Then as instructed by the "help" line at the bottom of the screen, the user presses the "EXECUTE QUERY" key. The pressing of the "EXECUTE QUERY" key terminates the input of the query and initiates the retrieval of the test result information that meets the entered criteria. The T&R service presents to the user the first page of the first record from the entries it found satisfying the selection criteria. The user uses the arrow keys, the "NEXT RECORD" key, and the "PREVIOUS RECORD" key to cycle through the entries selected from the database in answer to the query.

In the above scenario, the user only filled in one field value; but any combination of fields could have contained values. Most field values entered act as query qualifiers. The T&R service restricts the the use of some fields as query qualifiers, since querying on these fields in not meaningful. If a particular combination of fields yields no records or entries the user is informed, "No records selected". The T&R User's Guide lists the fields most helpful for use as query selection criteria.

Two additional scenarios illustrate the construction of multiple field queries. In one scenario the user is interested in all Touch Communications and NCR products which have interoperated. Here the user again presses the "ENTER QUERY" key. The user then enters the letters "Touch Communications" into the field labeled "TEST PARTY A". And the user enters the letters "NCR" into the field labeled "TEST PARTY B". The user next presses the "EXECUTE QUERY" key. The database then notifies the user of the records which satisfy the query.

When a user has completed all query requests to the database, he/she exits the DI form by pressing the "EXIT/CANCEL" key. The user is then returned to the menu.

4.2.2 A Typical T&R Service Registrant Scenario

A T&R service registrant may perform several functions, but each function results in either a query or a store operation. In the case of a query operation, the above user scenario applies. The next several paragraphs will address a typical storing scenario.

After a T&R registrant has logged into the system and made the appropriate menu selections to register test results, he/she is presented with the T&R registrant blank DI form. The first page of this form requires the T&R registrant to "log in". This logging function is necessary to determine that the person wishing to register test results is indeed a registrant of the T&R.

The T&R registrant is required to enter a username/password. The database then checks to make sure that this username/password is in the Registrant Information table. If the username/password can not be found in the Registrant Information table, the database informs the T&R Registrant, "This username/password is not registered; please contact the Database Administrator (DBA)". If a T&R registrant receives this message, he/she is restricted from doing anything and must contact the T&R service DBA to be given access.

After the T&R registrant has successfully "logged" into the DI application, he/she may proceed to page 2 of the DI form by pressing the "NEXT BLOCK" key. In this scenario, the T&R registrant is interested in registering test results. The T&R registrant registers the results by first pressing the "CREATE RECORD" key. The T&R registrant then enters data into the appropriate fields of the DI form. Once all pages of the DI form have been filled out, the T&R registrant presses the "COMMIT" key. This alerts the database that data entry is complete and the database then inserts this row or record.

4.3 The T&R Service Terminal Types Supported

The VT100/VT220/VT330/VT340 terminal types are currently supported. Terminal support for IBM PC/compatibles and 3270 terminals will be provided in the near future.

4.4 The T&R Service Keypad Layouts

ORACLE

Function	Key	Function	Key
Clear Form/Rollback	Esc-C	Next Field	RETURN or TAB
Count Query Hits	Esc-4	Next Primary Key Field	Esc-TAB
Delete Backward	DELETE	Next Set of Records	Esc-S
Delete Record	Esc-D	Previous Field	BACKSPACE
Down	↓	Print	Esc-P
Duplicate Field	Esc-1	Redisplay Page	Esc-R
Duplicate Record	Esc-2	Scroll Left	Esc-←
Exit/Cancel	Control-Z	Scroll Right	Esc-→
List of Field Values	Esc-V	Scroll Up	Esc-↑
Menu	Esc-B	Scroll Down	Esc-↓
Left	←	Show Function Keys	Esc-K
Right	→	Up	↑

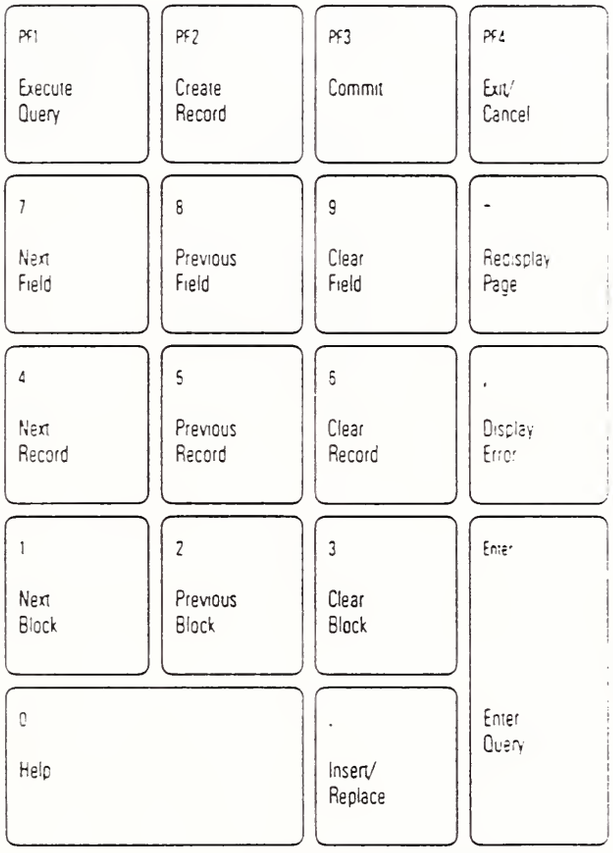


Figure 20. The T&R Service Keypad Layout for the VT100

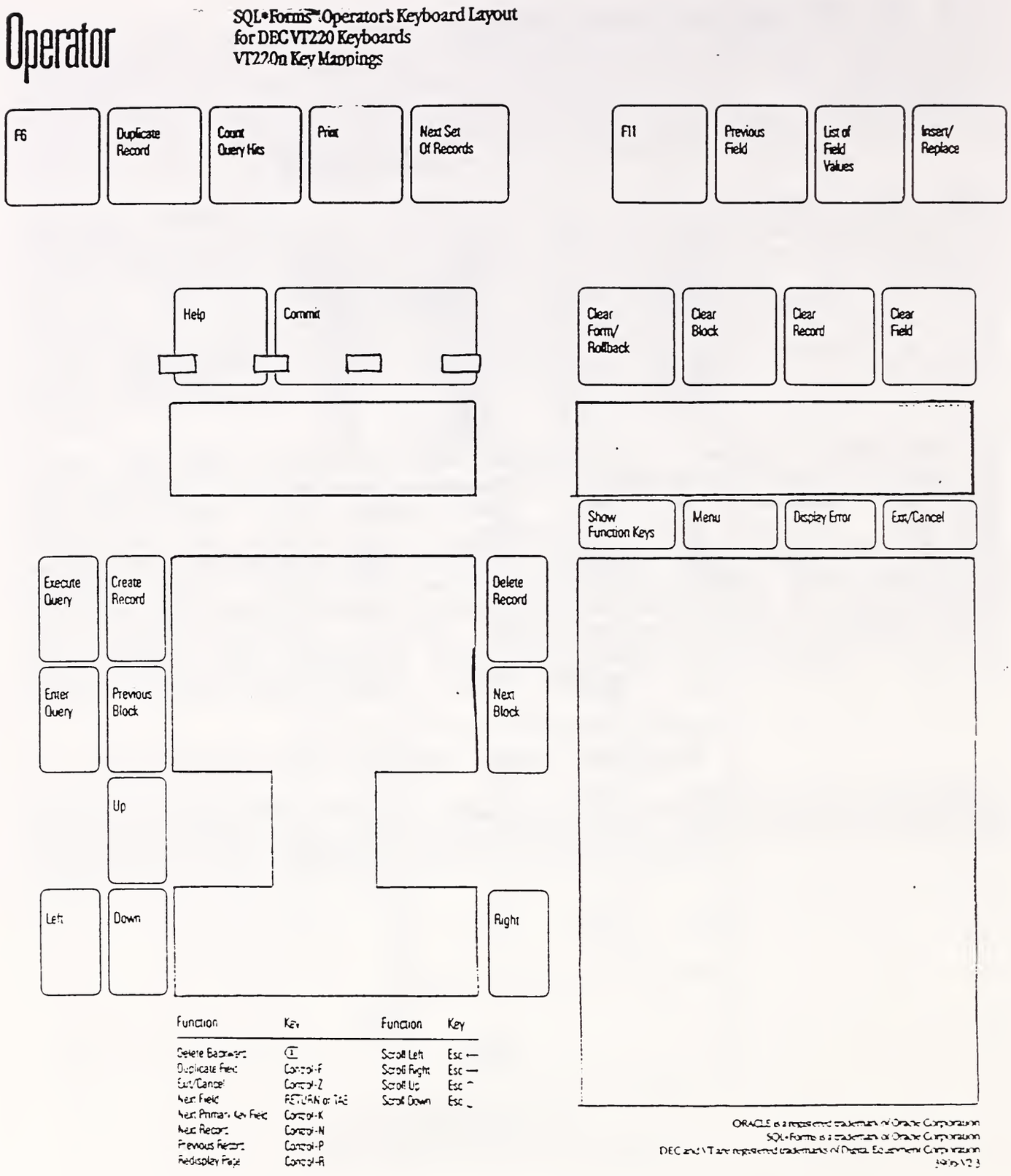


Figure 21. The T&R Service Keypad Layout for the VT220

5. The T&R Service Message Handling System Access Method

This access method is implemented by extending the capabilities of the Network Information Center (NIC). T&R registrants can indicate a request to register, or update test results in the Subject field of the message content. The body part of the message contains the test results to be registered or updated.

T&R registrants and users can query test results by requesting one of the query messages maintained by the T&R service. Each query message contains the actual SQL required to perform a specific query. The user or registrant, upon receiving the query message, fills in the blanks and sends it back to the T&R sercice. The query is submitted to the database, the results of the query are written to a file, which is then sent back to the user or registrant.

All retrieval capabilities using the asynchronous access method are available in the MHS access method. Other requests such as change T&R registrant password, retrieve directory information, and access EXAMPLE database will also be indicated in the Subject field. The T&R service provides a template file to T&R service registrants who wish to use the MHS access method to register or update test results.

5.1 The T&R Service MHS Access Method Error Messages

There are two kinds of errors that could result using the T&R service MHS access method of operation. The first, and probably most frequent is a typing error.

If there is an error in the request type, the parser will not be able to process the request. The automated T&R service function will build an X.400 message containing the error field and an explanation about the nature of the error, and return it back to the message originator.

The second type occurs if the message originator address on the message envelope is incorrect. When this results, the T&R service will not be able to send a message back to the message originator. In this case, the automated T&R service process will save the contents of this message in a file for later investigation. If the message originator has not received a response within a reasonable time, he/she should call the appropriate T&R service contact person at the NIST. This type of error should rarely occur.

6. The T&R Service Packet Assembler/Disassembler (PAD) Access Method

The T&R service offers PAD access via OSINET for users who do not

choose to register via asynchonous terminal or MHS. Access as this level is very similar to asynchonous terminal access. The major difference is the initial connection details. After the connection to the T&R service is made, everything, including login prompts and forms presented, is identical to asynchonous terminal access.

All users wanting to communicate with the T&R service using the PAD access method must have a computer with PAD support and a connection to OSINET or have PAD access via local telecommunications company support. The latter method requires a user to dial into the local service via a modem and then connect to the T&R service.

7. The T&R Service Protective Mechanisms

The T&R service has protective mechanisms incorporated at the system level, the database level and the application level. The following sections describe in detail the overall protection provided by the T&R service.

7.1 The DEC VMS Captive Account Feature

The DEC VMS captive account feature provides the capability of restricting user interrupts and allows the user to be kept under the control of the login command procedure. The user is not permitted to enter the system command level. Any attempts will result in termination from the account.

7.2 The Protective Features of Application Menus

The user is not allowed to access the system level from the menus. If any attempt is made, it will result in termination from the account.

The menu options only permit the T&R registrants providing a valid username and password to register or update test results. The users are only given the permission to VIEW the database tables thru the menu options.

7.3 The Protective Features of Application Forms

The use of application forms insures that the T&R service is protected. An application form limits access to the database through a variety of methods. The following paragraphs give the details of the protective features built into the T&R service via the DI application forms.

Users and T&R registrants do not see the same database form. Users

are presented with a form which only allows query operations. Users are restricted from making changes to the database. T&R registrants may perform several specialized functions in addition to the normal user's functions. T&R registrants may register entries, modify entries with "DRAFT" status, and change the status and update the derived systems and marketing contact information in "CURRENT" entries.

Regardless of the action being performed, T&R registrants receive a special database form which requires them to "log in" using a username/password which is stored in a password table in the database. If the username/password entered is not in the password table, access to the database is denied. Only persons with Database Adminstrator (DBA) privilege can view the password table.

Note that T&R registrants only receive this special form if they choose menu options which identify them as a T&R registrant. If a T&R registrant is only interested in querying the database, he/she may access the T&R as a user. A T&R registrant entering the system as a user never sees the special form and the activities are limited to those of a user.

Once the T&R registrant is logged in via the special form, he/she is able to perform any of the specialized functions reserved for T&R registrants. There is further protection provided here as well. T&R registrants, who are registering new entries, changing "DRAFT" entries or changing the status of an entry from "DRAFT" to "CURRENT", are accessing the WORKING database. If the T&R registrant is changing the status of an entry from "CURRENT" to "OBSOLETE" or "INVALID", then he/she is accessing the PERMANENT database.

At the form level there is even further protection. This level protects the integrity of the data in the database. At this level each data field on the form is checked to make sure that the response is on a list of valid responses, that the data is within an appropriate range, and that all fields which are mandatory have been entered. And it is at this level that the database checks for duplicate entries.

8. The T&R Service Project Schedule & Deliverables

Table 7 shows the list of deliverables for the T&R service project and the approximate date of delivery for each.

T&R SERVICE PROJECT DELIVERABLES	DELIVERY DATE
DRAFT Functional Specification	November 1989
Final DRAFT Functional Spec.	May 1990
Completed Database - Async Access DRAFT User's Guide	June, 1990
Final DRAFT User's Guide	Nov., 1990
X.400 Access to T&R service	Sept. 1991
NISTIR Versions of T&R User's Guide & T&R Functional Spec.	July 1991
Transition of T&R Service to COS	August - Sept. 1991

Table 7. The T&R Service Project Schedule & Deliverables

9. The T&R Service Project Contacts

Table 8 below lists the NIST contacts associated with the T&R service. Each person's functional role and telephone number are provided with their name.

FUNCTION	NAME	TELEPHONE
NIST T&R Project Approval	Kevin Mills	301-975-3618
NIST T&R Project Mgr.	Jerry Mulvenna	301-975-3631
NIST T&R Implementation Team:	Alper Kerman Carol Edgar	301-975-3387 301-975-3613
COS T&R Project Leader	Kathy Bruen	703-883-2700

Table 8. The T&R Service Project Contacts

10. References

OSINET Corporation General Agreements and Information Document, Jan. 1991, OSINET Corporation, 1750 Old Meadow Road, McLean, VA 22102.

ORACLE Authorized ADP Schedule Price List, Contract Number GS OOK 88 AGS 5937, Option year 1, October 1, 1988 - Sept. 30, 1989.

FTAM Interoperability Tests, NIST 4435, August 1990, National Institute of Standards and Technology, Bldg. 225, Room B-217, Gaithersburg, MD 20899.

Message Handling Systems Interoperability Tests, NIST 4452, October 1990, National Institute of Standards and Technology, Bldg. 225, Room B-217, Gaithersburg, MD 20899.