DATA ITEM DESCRIPTION

Title: SOFTWARE TEST DESCRIPTION (STD)

Number: DI-IPSC-81439A
AMSC Number: N7364
DTIC Applicable:
Office of Primary Responsibility: N/SPAWAR
Applicable Forms:
Use, Relationships:

Approval Date: 19991215
Limitation:
GIDEP Applicable:

The Software Test Description (STD) describes the test preparations, test cases, and test procedures to be used to perform qualification testing of a Computer Software Configuration Item (CSCI) or a software system or subsystem.

The STD enables the acquirer to assess the adequacy of the qualification testing to be performed.

This Data Item Description (DID) contains the format and content preparation instructions for the data product generated by specific and discrete task requirements as delineated in the contract.

This DID is used when the developer is tasked to define and record the test preparations, test cases, and test procedures to be used for CSCI qualification testing or for system qualification testing of a software system.

This DID supersedes DI-IPSC-81439.

Requirements:

1. Reference documents. None.

2. General instructions.

a. Automated techniques. Use of automated techniques is encouraged. The term "document" in this DID means a collection of data regardless of its medium.

b. Alternate presentation styles. Diagrams, tables, matrices, and other presentation styles are acceptable substitutes for text when data required by this DID can be made more readable using these styles.

3. Format. Following are the format requirements.

The description shall be in contractor format unless otherwise specified on the Contract Data Requirements List (CDRL)(DD 1423). The CDRL should specify whether deliverable data are to be delivered on paper or electronic media; are to be in a given electronic form (such as ASCII, CALS, or compatible with a specified word processor or other support software); may be

delivered in developer format rather than in the format specified herein; and may reside in a computer-aided software engineering (CASE) or other automated tool rather than in the form of a traditional document.

4. Content. The description shall contain the following:

a. Title page or identifier. The document shall include a title page containing, as applicable: document number; volume number; version/revision indicator; security markings or other restrictions on the handling of the document; date; document title; name, abbreviation, and any other identifier for the system, subsystem, or item to which the document applies; contract number; CDRL item number; organization for which the document has been prepared; name and address of the preparing organization; and distribution statement. For data in a database or other alternative form, this information shall be included on external and internal labels or by equivalent identification methods.

b. Table of contents. The document shall contain a table of contents providing the number, title, and page number of each titled paragraph, figure, table, and appendix. For data in a database or other alternative form, this information shall consist of an internal or external table of contents containing pointers to, or instructions for accessing, each paragraph, figure, table, and appendix or their equivalents.

c. Page numbering/labeling. Each page shall contain a unique page number and display the document number, including version, volume, and date, as applicable. For data in a database or other alternative form, files, screens, or other entities shall be assigned names or numbers in such a way that desired data can be indexed and accessed.

d. Response to tailoring instructions. If a paragraph is tailored out of this DID, the resulting document shall contain the corresponding paragraph number and title, followed by "This paragraph has been tailored out." For data in a database or other alternative form, this representation need occur only in the table of contents or equivalent.

e. Multiple paragraphs and subparagraphs. Any section, paragraph, or subparagraph in this DID may be written as multiple paragraphs or subparagraphs to enhance readability.

f. Standard data descriptions. If a data description required by this DID has been published in a standard data element dictionary specified in the contract, reference to an entry in that dictionary is preferred over including the description itself.

g. Substitution of existing documents. Commercial or other existing documents may be substituted for all or part of the document if they contain the required data.

The numbers shown designate the paragraph numbers to be used in the document.

1. Scope. This section shall be divided into the following paragraphs.

1.1 Identification. This paragraph shall contain a full identification of the system and the software to which this document applies, including, as applicable, identification number(s), title(s), abbreviation(s), version number(s), and release number(s).

1.2 System overview. This paragraph shall briefly state the purpose of the system and the software to which this document applies. It shall describe the general nature of the system and software; summarize the history of system development, operation, and maintenance; identify the project sponsor, acquirer, user, developer, and support agencies; identify current and planned operating sites; and list other relevant documents.

1.3 Document overview. This paragraph shall summarize the purpose and contents of this document and shall describe any security or privacy considerations associated with its use.

2. Referenced documents. This section shall list the number, title, revision, and date of all documents referenced in this document. This section shall also identify the source for all documents not available through normal Government stocking activities.

3. Test preparations. This section shall be divided into the following paragraphs. Safety precautions, marked by WARNING or CAUTION, and security and privacy considerations shall be included as applicable.

3.x (Project-unique identifier of a test). This paragraph shall identify a test by project-unique identifier, shall provide a brief description, and shall be divided into the following subparagraphs. When the information required duplicates information previously specified for another test, that information may be referenced rather than repeated.

3.x.1 Hardware preparation. This paragraph shall describe the procedures necessary to prepare the hardware for the test. Reference may be made to published operating manuals for these procedures. The following shall be provided, as applicable:

a. The specific hardware to be used, identified by name and, if applicable, number

b. Any switch settings and cabling necessary to connect the hardware

c. One or more diagrams to show hardware, interconnecting control, and data paths

d. Step-by-step instructions for placing the hardware in a state of readiness

3.x.2 Software preparation. This paragraph shall describe the procedures necessary to prepare the item(s) under test and any related software, including data, for the test. Reference may be made to published software manuals for these procedures. The following information shall be provided, as applicable:

a. The specific software to be used in the test

b. The storage medium of the item(s) under test (e.g., magnetic tape, diskette)

c. The storage medium of any related software (e.g., simulators, test drivers, databases)

d. Instructions for loading the software, including required sequence
e. Instructions for software initialization common to more than one test case

3.x.3 Other pre-test preparations. This paragraph shall describe any other pre-test personnel actions, preparations, or procedures necessary to perform the test.

4. Test descriptions. This section shall be divided into the following paragraphs. Safety precautions, marked by WARNING or CAUTION, and security and privacy considerations shall be included as applicable.

4.x (Project-unique identifier of a test). This paragraph shall identify a test by project-unique identifier and shall be divided into the following subparagraphs. When the required information duplicates information previously provided, that information may be referenced rather than repeated.

4.x.y (Project-unique identifier of a test case). This paragraph shall identify a test case by project-unique identifier, state its purpose, and provide a brief description. The following subparagraphs shall provide a detailed description of the test case.

4.x.y.1 Requirements addressed. This paragraph shall identify the CSCI or system requirements addressed by the test case. (Alternatively, this information may be provided in 5.a.)

4.x.y.2 Prerequisite conditions. This paragraph shall identify any prerequisite conditions that must be established prior to performing the test case. The following considerations shall be discussed, as applicable:

a. Hardware and software configuration

b. Flags, initial breakpoints, pointers, control parameters, or initial data to be set/reset prior to test commencement

c. Preset hardware conditions or electrical states necessary to run the test case

d. Initial conditions to be used in making timing measurements

e. Conditioning of the simulated environment

f. Other special conditions peculiar to the test case

4.x.y.3 Test inputs. This paragraph shall describe the test inputs necessary for the test case. The following shall be provided, as applicable:

a. Name, purpose, and description (e.g., range of values, accuracy) of each test input

b. Source of the test input and the method to be used for selecting the test input

c. Whether the test input is real or simulated

d. Time or event sequence of test input

e. The manner in which the input data will be controlled to:

1) Test the item(s) with a minimum/reasonable number of data types and values

2) Exercise the item(s) with a range of valid data types and values that test for overload, saturation, and other "worst case" effects

3) Exercise the item(s) with invalid data types and values to test for appropriate handling of irregular inputs

4) Permit retesting, if necessary

4.x.y.4 Expected test results. This paragraph shall identify all expected test results for the test case. Both intermediate and final test results shall be provided, as applicable.

4.x.y.5 Criteria for evaluating results. This paragraph shall identify the criteria to be used for evaluating the intermediate and final results of the test case. For each test result, the following information shall be provided, as applicable:

a. The range or accuracy over which an output can vary and still be acceptable

b. Minimum number of combinations or alternatives of input and output conditions that constitute an acceptable test result

c. Maximum/minimum allowable test duration, in terms of time or number of events

d. Maximum number of interrupts, halts, or other system breaks that may occur

e. Allowable severity of processing errors

f. Conditions under which the result is inconclusive and re-testing is to be performed

g. Conditions under which the outputs are to be interpreted as indicating irregularities in input test data, in the test database/data files, or in test procedures

h. Allowable indications of the control, status, and results of the test and the readiness for the next text case (may be output of auxiliary test software)

i. Additional criteria not mentioned above.

4.x.y.6 Test procedure. This paragraph shall define the test procedure for the test case. The test procedure shall be defined as a series of individually numbered steps listed sequentially in the order in which the steps are to be performed. For convenience in document maintenance the test procedures may be included as an appendix and referenced in this paragraph. The appropriate level of detail in each test procedure depends on the type of software being tested. For some software, each keystroke may be a separate test procedure step; for most software, each step may include a logically related series of keystrokes or other actions. The appropriate level of detail is the level at which it is useful to specify expected results and compare them to actual results. The following shall be provided for each test procedure, as applicable:

a. Test operator actions and equipment operation required for each step, including commands, as applicable, to:

1) Initiate the test case and apply test inputs

2) Inspect test conditions

3) Perform interim evaluations of test results

4) Record data

5) Halt or interrupt the test case

6) Request data dumps or other aids, if needed

7) Modify the database/data files

8) Repeat the test case if unsuccessful

9) Apply alternate modes as required by the test case

10) Terminate the test case

b. Expected result and evaluation criteria for each step

c. If the test case addresses multiple requirements, identification of which test procedure step(s) address which requirements. (Alternatively, this information may be provided in 5.)

d. Actions to follow in the event of a program stop or indicated error, such as:

1) Recording of critical data from indicators for reference purposes
2) Halting or pausing time-sensitive test-support software and test apparatus
3) Collection of system and operator records of test results

e. Procedures to be used to reduce and analyze test results to accomplish the following, as applicable:

1) Detect whether an output has been produced
2) Identify media and location of data produced by the test case
3) Evaluate output as a basis for continuation of test sequence
4) Evaluate test output against required output

4.x.y.7 Assumption and constraints. This paragraph shall identify any assumptions made and constraints or limitations imposed in the description of the test case due to system or test conditions, such as limitations on timing, interfaces, equipment, personnel, and database/data files. If waivers or exceptions to specified limits and parameters are approved, they shall be identified and this paragraph shall address their effects and impacts upon the test case.

5. Requirements traceability. This paragraph shall contain:

a. Traceability from each test case in this STD to the system or CSCI requirements it addresses. If a test case addresses multiple requirements, traceability from each set of test procedure steps to the requirement(s) addressed. (Alternatively, this traceability may be provided in 4.x.y.1.)

b. Traceability from each system or CSCI requirement covered by this STD to the test case(s) that address it. For CSCI testing, traceability from each CSCI requirement in the CSCI's Software Requirements Specification (SRS) and associated Interface Requirements Specifications (IRSs). For system testing, traceability from each system requirement in the system's System/Subsystem Specification (SSS) and associated IRSs. If a test case addresses multiple requirements, the traceability shall indicate the particular test procedure steps that address each requirement.

6. Notes. This section shall contain any general information that aids in understanding this document (e.g., background information, glossary, rationale). This section shall include an alphabetical listing of all acronyms, abbreviations, and their meanings as used in this document and a list of any terms and definitions needed to understand this document.

A. Appendices. Appendices may be used to provide information published separately for convenience in document maintenance (e.g., charts classified data). As applicable, each appendix shall be referenced in the main body of the document where the data would normally have been provided. Appendixes may be bound as separate documents for ease in handling. Appendixes shall be lettered alphabetically (A, B, etc.).

END OF DI-IPSC-81439A