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MILITARY HANDBOOK

GUIDELINES FOR DEVELOPING DATA COMMUNICATIONS PROTOCOL STANDARDS

(MIL-STD-2045 SERIES DOCUMENTATION)

AMSC N/A

AREA DCPS

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FOREWORD

1. This military handbook (MIL-HDBK) is approved for use by all Departments and Agencies of the Department of Defense.

2. Beneficial comments (recommendations, additions, deletions) and any pertinent data that may be of use in improving this MIL-HDBK should be addressed to the

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by using the self-addressed Standardization Document Improvement Proposal (DD Form 1426) appearing at the end of this MIL-HDBK or by letter.

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1. SCOPE

1.1 Purpose. The purpose of this military handbook (MIL-HDBK) is to describe the development process of the MIL-STD-2045 series of standards. This document shall:

a. Convey general policy and procedures for DOD Standardized Profile (DSP) development

b. Establish the framework and taxonomy for DSP development in accordance with the International Organization for Standardization/International Electrotechnical Commission Technical Report (ISO/IEC/TR) 10000.

c. Establish the numbering schema for the series and provide guidance for developing, testing, coordinating, and publishing the MIL-STD-2045 series of Military Standards.

1.2 Background. The use of the commercial DCPS implementation specified in the U.S. Government Open Systems Interconnection Profile (GOSIP) is mandatory for all federal agencies, including the DOD. However, unique factors inherent in military communications may lead to additional requirements in the DOD DCPS area. Therefore, the MIL-STD-2045 series of documents has been established pursuant to Department of Defense (DOD) 4120.3-M for DOD Data Communications Protocol Standards (DCPS). MIL-STD-2045 Standards will include enhancements to commercial standards or new protocol standards that are entirely unique to DOD. The 2045 series also allows for a category of interim DOD standards. Interim standards are needed because of the usual disparity between immediate DOD needs and the amount of time required in the commercial world to adopt new standards.

1.2.1 MIL-STD-2045 documents. A MIL-STD-2045 document may either be a base standard or a functional profile. The primary focus for DOD DCPS development is normally on functional profiles. Profile development is encouraged, because the use of profiles ensures interoperability, while base standards may not. Functional profiles specify which options and parameters of component base standards should be used to ensure that a particular function is achieved. In some cases, base standards may have to be developed before profiles can be established. Further information about the relationship between profiles and base standards is found in International Organization for Standardization (ISO)/International Electrotechnical Commission (IEC)/Technical Report (TR) 10000, Parts 1, 2, and 3.

1.2.1.1 Base standards ISO/IEC/TR 10000-1 (see 2.2) defines a base standard as an "approved International Standard, Technical Report, or ITU Recommendation which is used in the definition of a profile." It further states that base standards " . . . define

fundamentals and basic procedures . . . and . . . provide an infrastructure that can be used by a variety of applications . . ."

ISO has established numerous base standards for OSI, including the Basic Reference Model (RM) (ISO 7498) and various service definitions and protocol specifications for each layer. NATO also has established a series of layer standardization agreements (STANAGs) that adopt applicable ISO layer standards and identify deficiencies in terms of the eight military features and enhancements.

DOD Standardized Profile development does not limit base standards to ISO/ITU standards. The DTMP working groups initiating the specific profile development select and approve the base standards that will be used for each profile.

1.2.1.2 Profiles. Profiles ensure interoperability and form a "vertical slice" of the ISO RM protocol layers, as contained in a base standard, to support a specific application or functional requirement. TR 10000-1 defines a profile as a ". . . set of one or more base standards, and . . . the identification of chosen classes, subsets, options and parameters . . . necessary for accomplishing a particular function." TR 10000-1 states that profiles:

a. ". . . define subsets or combinations of base standards used to provide specific functions . . .,"

b. ". . . identify the use of particular options available in the base standards . . .," and

c. ". . . provide a basis for the development of . . . uniform conformance tests."

There are currently two types of profiles that are internationally recognized: International Standardized Profiles (ISPs) and North Atlantic Treaty Organization (NATO) Standardized Profiles (NSPs).

1.2.1.3 DOD standardized profiles (DSPs). DSPs shall be used to document DOD data communications standards to include the Internet Protocol Suite (IPS) and, where appropriate, proprietary protocols. DSPs were found to be necessary by the Data Communications Protocol Standards (DCPS) Technical Management Panel (DTMP) to address DOD requirements for data communications services not being addressed in other base standards and subsequent ISPs and NSPs. DSPs will allow the DOD to control and document all DOD data communications requirements in a harmonized and contextual manner.

GOSIP, ISPs, and NSPs, although more specific than base standards, may lack the necessary specificity or services required by DOD. DSPs will be developed only

when DOD needs to further tailor GOSIP, ISPs, NSPs, IPS or when applicable commercial proprietary protocols to provide specific services not included in those profiles to improve interoperability or reduce ambiguity. A MIL-STD-2045 document will not be developed if a higher precedence functional profile (for example, ISP, NSP, or GOSIP) sufficiently meets DOD requirements and ensures the necessary degree of interoperability. If required, a DSP should address only those options associated with the applicable base standard(s) that affect DOD-wide interoperability or reduce ambiguities for acquisition purposes. The MIL-STD-2045-10000 series profiles may also include recommendations or implementor hints for those options not made mandatory within the DSP. DSPs will specify or invoke:

a. enhancements or modifications to existing profiles,

b. new profiles not otherwise under development,

c. enhancements to existing base standards,

d. new base standards.

The intent of DSP development is not to eliminate all options within a profile, but to address those that may create interoperability risks within DOD. When a DSP exists and supports a particular data communications functionality, acquisition personnel should use the DSP as the primary means for specifying the requirements for the data communications functionality in the system specification. If GOSIP, ISPs, or NSPs are sufficient, then no DSP will be developed. DSPs will be amended or canceled when DOD requirements are satisfied in GOSIP, or in approved ISPs or NSPs.

1.2.2 Standards development process overview. Profiles and base standards documented by the MIL-STD-2045 series are developed by working groups of the DCPS Technical Management Panel (DTMP) based on operational needs and technical requirements identified by DOD's CINCs, Services, and Agencies (C/S/A). The working groups use these needs and requirements to identify the necessary areas for a base standard or profile development in terms of an area of interest, functionality required, and specific taxonomy to be used. Next the working group defines the standard/profile's scope and compares it with any existing standards/profiles. Existing profiles include DSPs, GOSIP, International Standardized Profiles (ISPs), and NATO Stansardized Profiles (NSPs).

The working group assesses the amount of effort needed to develop the MIL-STD-2045 series document. Based on this assessment, the working group (after not finding a suitable and available commercial, national or international, military, or other standards profile) develops the necessary enhancements, base standards, and profiles. The group then documents them in the appropriate MIL-STD-2045 series standard(s). The draft MIL-STDs are validated, coordinated, and approved according to the Defense Standardization Manual, DOD 4120.3-M, and the DCPS Management

Plan. The Defense Information Systems Agency (DISA)/Joint Interoperability and Engineering Organization (JIEO), as Lead Standardization Activity (LSA) for the DCPS Standardization Area, then issues the appropriate MIL-STD-2045 series number and arranges for publication and distribution. Detailed development procedures are in Appendix D of this MIL-HDBK.

1.3 Appendixes. This MIL-HDBK is supplemented by four appendixes which will provide additional guidance and information:

a. Hierarchy of Standards Use, contained in Appendix A, mandates the order of preference for selecting standards and specifications.

b. Format of MIL-STD-2045 Documents, contained in Appendix B, describes in detail the format of a DSP, comparing it to equivalent sections of ISPs developed using the TR-10000 format.

c. Taxonomy of DCPS Profiles for DSP, contained in Appendix C, describes the methodology and format for determining the taxonomy of OSI based profiles

d. Template For Developing DOD Standardized Profiles is contained in Appendix D. This section provides a detailed template of a typical DSP. The template shows the profile format and describes the content of each section.

2. APPLICABLE DOCUMENTS

2.1 Government documents.

2.1.1 Specifications, standards, and handbooks. The following specifications, standards, and handbooks form a part of this MIL-HDBK to the extent specified herein:

STANDARDS

FEDERAL

FIPS 146-1 Federal Information Processing Standard Publication 146-1 *U.S. Government Open Systems Interconnection Profile (GOSIP)*, Version 2.0, 3 April 1991

MILITARY

MIL-STD-962B *Preparation of Military Standards, Handbooks, and Bulletins* 20 May 1988

[Copies of Federal Information Processing Standards (FIPS) are available to DOD activities from the Commanding Officer, Naval Publications and Forms Center, 5801 Tabor Avenue, Philadelphia, PA19120-5099. Others must request copies of FIPS from the National Technical Information Service, 5285 Port Royal Road, Springfield, VA 22161-2171.]

2.1.2 Other government documents, drawings, and publications. The following other Government documents, drawings, and publications form a part of this MIL-HDBK to the extent specified herein. Unless otherwise specified, the issues are those cited in the solicitation.

DOD 4120.3-M *Defense Standardization Manual: Defense Standardization Program Policies and Procedures*, July 1993

DISA *Management Plan for DOD Data Communications Protocols Standards (DCPS)*, July 1993

NIST NIST Special Publication 500-192, *Government Open Systems Interconnection Profile User's Guide*, Version 2, October 1991

FIPS 179 *Government Network Management Profile (GNMP)*, 1992

(DOD activities may obtain copies of DOD 4120.3-M through their own publication channels or from the DOD Single Stock Point, Standardization Document Order Desk, 700 Robbins Avenue, Building 4D, Philadelphia, PA 19111-5094. Other federal agencies and the public may purchase copies from the U.S. Department of Commerce, National Technical Information Service, 5285 Port Royal Road, Springfield, VA 22161.)

[Copies of the DCPS Management Plan may be obtained from the Defense Information Systems Agency (DISA)/Joint Interoperability and Engineering Organization (JIEO), ATTN: TBBD, Fort Monmouth, NJ 07703-5513.]

2.2 Non-Government documents. The following non-Government documents form a part of this MIL-HDBK to the extent specified herein:

International Organization for Standardization (ISO) documents:

ISO/IEC/TR 10000-1 *Information Technology - Framework and Taxonomy of International Standardized Profiles - Part 1: Framework,* 1990

ISO/IEC/TR 10000-2 *Information Technology - Framework and Taxonomy of International Standardized Profiles - Part 2: Taxonomy*, 1992

ISO/IEC/TR 10000-3 Information Technology - Framework and Taxonomy of International Standardized Profiles - Part 3: Principles and Taxonomy for Open System Environment Profiles 1993 (DRAFT)

(Application for copies of these documents should be addressed to ISO, Van Demonstrate 94, 1013 CN Amsterdam, Netherlands.)

2.3 Order of precedence. In the event of a conflict between the text of this MIL-HDBK and the references cited herein, the text of this MIL-HDBK takes precedence. Nothing in this MIL-HDBK, however, supersedes applicable laws and regulations unless a specific exemption has been obtained.

3. DEFINITIONS

3.1 Terms used in this MIL-HDBK. The following terms are defined in the previously referenced ISO/IEC/TR 10000-1,-2 and -3 These terms have the same meanings when used in this MIL-HDBK, to the extent indicated.

3.1.1 Base standard. TR 10000 defines a base standard as an "approved International Standard, Technical Report or CCITT Recommendation which is used in the definition of a Profile." As used in this MIL-HDBK-829 the term *base standard* may also include other types of standards, such as the Requests for Comments (RFC) series used in the Internet, or NATO layer Standardization Agreements (STANAGs). In addition, for the purposes of this MIL-HDBK, a base standard includes those standards that the Lead Standardization Activity (LSA) for the DCPS Standardization Area approves as DCPS. DOD-unique standards may include protocols and services that either span multiple layers of the (OSI) Reference Model or are considered outside the scope of the OSI Reference Model. (Note: "De facto" standards should be used only as a last resort when there are no commercial [IEEE, ISO, IEC, CCITT (now ITU-T)], military, or federal standards available that address or provide the mission-essential service or requirement.)

3.1.2 Functional profile. A profile is defined in TR 10000-1 as a "set of one or more base standards, and, where applicable, the identification of chosen classes, subsets, options and parameters of those base standards, necessary for accomplishing a particular function." The term *profile*, as used in MIL-HDBK-829 has the same meaning, as does the term *functional profile*. The terms "Profile" and "functional profile" are used interchangeably throughout this MIL-HDBK.

3.1.3 International Standardized Profile. An International Standardized Profile (ISP) is defined in TR 10000 as an "internationally-agreed-to, harmonized document which identifies a standard or group of standards, together with options and parameters, necessary to accomplish a function or set of functions."

Three regional profile development bodies work on the development of ISPs:

a. North American Open Systems Environment (OSE) Implementors Workshop (OIW)

b. European Workshop for Open Systems (EWOS)

c. Asian-Oceanic OSI Workshop (AOW)

3.1.4 NATO standardized profiles (NSPs). NATO has established the use of NSPs, with the layer STANAGs serving as base standards, in a manner analogous to the establishment of ISPs in ISO. NSP guidelines are established in the NATO Open

Systems Interoperability Profile (NOSIP) Strategy, First Draft, which adopts TR 10000-1 and 10000-2 as the framework and taxonomy, respectively, for NSP development and states that NSPs will be promulgated as STANAGs.

3.1.5 GOSIP. The U.S. Government Open Systems Interconnection Profile (GOSIP), promulgated as a Federal Information Processing Standard (FIPS) 146 (see 2.1.1), is similar in concept to ISPs and NSPs, but different in form. It is akin to, but not necessarily consistent with, other national profiles such as the U.K. GOSIP. The GOSIP establishes a minimum interoperability suite of protocols. It is based on the OIW Stable Implementation Agreements. The three regional profile development bodies (that is, OIW, EWOS, and AOW) are increasing the emphasis on the development of ISPs. They will also work to harmonize the regional profiles into ISPs. As ISPs are approved, it is likely that the regional profiles will either be replaced by the ISPs or point to the ISPs. As GOSIP is based on North American regional profiles (that is, the OIW stable agreements), GOSIP may either directly or indirectly point to approved ISPs. Compliance with GOSIP is mandatory for all applicable Federal procurements, including those within DOD. GOSIP is also undergoing intensive review with respect to the inclusion of the TCP/IP suite of protocols. If this occurs, the name of GOSIP will most likely change to "POSIT," which means 'Profiles for Open Systems Internetworking Technologies,' to better reflect the new, more inclusive suite of protocols.

3.2 List of acronyms.

ACP	Allied Communications Publication
AOW	Asian-Oceanic OSI Workshop
AQAP	Allied Quality Assurance Provision
CBD	Commerce Business Daily
CCITT	Consultative Committee for International Telegraph and Telephone
CI	Configuration Item
CID	Commercial Item Descriptions
CINC	Commander in Chief
CLNS	Connectionless-Mode Network Service
CLTS	Connectionless-Mode Transport Service
CM	Configuration Management
CNR	Combat Net Radio
CONS	Connection-Oriented Network Service
COTS	Connection-Oriented Transport Service
CP	Change Proposal
C/S/A	CINCs, Services, and Agencies
CSDN	Circuit-Switched Data Network
CSMA/CD	Carrier Sense Multiple Access/Collision Detection
CTO	Cognizant Technical Official
DAP	Directory Access Protocol
DCPS	Data Communications Protocol Standards

DISA	Defense Information Systems Agency
DLA	Defense Logistics Agency
DOD	Department of Defense
DODISS	Department of Defense Index of Specifications and Standards
DPICS	DOD Protocol Implementation Conformance Statement
DPRL	DSPICS Requirements List Protocol Implementation Conformance Statement
DSP	DOD Standardized Profile
DSPICS	DSP Protocol Implementation Conformance Statement
DTMP	DCPS Technical Management Panel
ES	End System
EWOS	European Workshop for Open Systems
FDDI	Fiber Distributed Data Interface
FED-STD	Federal Standard
FIPS	Federal Information Processing Standard
FSC	Federal Supply Classification
FTAM	File Transfer, Access, and Management
GNMP	Government Network Management Profile
GOSIP	Government Open Systems Interconnection Profile
IAB	Internet Activities Board
IEC	International Electrotechnical Commission
IEEE	Institute of Electrical and Electronic Engineers
IPM	Interpersonal Message
IPMS	Interpersonal Message System
IPRL	ISPICS Requirements List
IPSC	Information Processing Standards For Computers
ISDN	Integrated Services Digital Network
ISO	International Organization for Standardization
ISP	International Standardized Profile
ISPICS	ISP Protocol Implementation Conformance Statement
ITU	International Telecommunications Union
ITU-TS	International Telecommunications Union - Telecommunication Standardization Sector
JIEO	Joint Interoperability and Engineering Organization
JITC	Joint Interoperability Test Center
JTC	Joint Technical Committee
LAN	Local Area Network
LSA	Lead Standardization Activity
MAC	Media Access Control
MHS	Message Handling System
MIB	Management Information Base
MPDT	Multipeer Data Transmission
MS	Message Store
MTA	Message Transfer Agent

MTS	Message Transfer System
MIL-HDBK	military handbook
MIL-STD	Military Standard
NATO	North Atlantic Treaty Organization
NGS	Non-Government Standards
NGSB	Non-Government Standards Bodies
NIST	National Institute of Standards and Technology
NOSIP	NATO Open Systems Interoperability Profile
NSP	NATO Standardized Profile
OIW	OSE Implementor's Workshop
OSE	Open Systems Environment
OSI	Open Systems Interconnection
PICS	Protocol Implementation Conformance Statement
PIF	Project Initiation Form
PSDN	Packet-Switched Data Network
PSTN	Public-Switched Telephonic Network
QOS	Quality of Service
QSTAG	Quadripartite Standardization Agreement
RDA	Remote Data Access
RFC	Request for Comment
RM	Reference Model
S/A	Service/Agency
SGFS	Special Group on Functional Standardization
SMD	Standardized Military Drawings
SNA	System Network Architecture
STANAG	Standardization Agreement
TCP	Transmission Control Protocol
TCP/IP	Transmission Control Protocol/Internet Protocol
TP	Translation Processing
TR	Technical Report
TRM	Technical Reference Model
UA	User Agent
U.K.	United Kingdom
VT	Virtual Terminal

3.3 ISP-DSP mapping. The following mappings are to be used to replace ISO terms and references with DOD terms and references when reading ISO documents referenced herein.

a. The following mapping applies between ISO and DOD terms:

ISO	DOD
Protocol Implementation Conformance Statement (PICS)	DOD Protocol Implementation Conformance Statement (DPICS)
International Standardized Profile (ISP)	DOD Standardized Profile (DSP)
ISP Implementation Conformance Statement (ISPICS)	DSP Implementation Conformance Statement (DSPICS)
ISPICS Requirements List (IPRL)	DSPICS Requirements List (DPRL)

b. The following mapping applies between ISO and DOD references.

ISO	DOD
TR 10000-1:1990 (Framework)	Appendix B to MIL-HDBK-829,
TR 10000-2:1990 (framework)	Appendix C to MIL-HDBK-829,
TR 10000-3:1993 - Draft (Principles and Taxonomy for OSE Profiles)	Appendix C to MIL-HDBK-829,

c. Where ISO/IEC JTC1 is mentioned as an authority for profiles, read DTMP. The role of ISO/IEC members in approving ISPs corresponds to the role of DTMP members in approving DSPs.

d. Where ISO/IEC JTC1/SFGS is mentioned, read DTMP.

4. GENERAL REQUIREMENTS

4.1 Objectives of DCPS functional profile use. Commercial standards bodies have developed a wide range of standards and protocols for users and implementors of communications services. The possibility that different users may implement different options creates the potential for internetworking and interoperability problems. Non-DOD standards bodies are developing standardized functional profiles that limit the choice of options. The limiting factors are:

a. Provide a common format for specifying data communications standards that promote interoperability in a particular functional area.

b. Avoid voluminous duplication of base standards in standardization documents developed to provide interoperability.

c. Identify appropriate base standards and specify the classes, subsets, options, parameter values, and other details of the base standard necessary to achieve interoperability among different implementations that support a given functional requirement.

d. Allow the cost-effective acquisition of systems with consistent functional implementations.

e. Provide a framework for conformance testing of functional implementations.

4.2 Profile concepts. Profiles identify a combination of base standards, along with the appropriate classes, subsets, options, and parameters of these base standards necessary to ensure a required functionality. Different standards bodies worldwide have developed profiles; therefore, out of necessity, a common international framework and taxonomy for profiles has been established [for example, International Standardized Profiles (ISPs) and NATO Standardized Profiles (NSPs)]. For the reasons stated in 4.1 and because the DCPS Management Plan instructs the DCPS Standardization Area to follow the lead of commercial standards bodies as much as possible, the concepts set forth in ISO\IEC\TR 10000, Parts 1 and 2, which establish profile concepts, are relevant to DCPS work.

The DSP taxonomy classifies a profile as either transport (T), application (A), relay (R), or interchange format and representation (F). The taxonomy does not address the base standards required to construct the profile. Generally, the (F) profiles are outside the scope of the MIL-STD-2045 series of documents. These (F) profiles fall into the area of responsibility of the Information Processing Standards for Computers (IPSC). All of these profiles are described in ISO TR 10000-3. MIL-STD-2045 series standards are used to document DSPs, extensions to base standards, DOD-unique

standards, and DOD interim standards. The MIL-STD-2045 numbering schema allows for the differentiation between layer standards and profiles, as necessary.

4.2.1 Relationship to base standards. As described in ISO/IEC/TR 10000-1, base standards specify procedures and formats that facilitate the exchange of information between systems. They provide different options in anticipation of different applications, and take into account different capabilities of real systems and networks.

Profiles promote interoperability by defining the use of base standard combinations for a given function and environment. In addition to allowing a selection of base standards, a profile specifies choices of permitted options for each base standard and of suitable values for parameters left unspecified in the base standard. A profile can be used to identify the specific base standard(s) needed to implement each required parameter or element of service included within the scope of the profile, as well as the specification of required options and parameters, of each specific base standard. For example, a transport profile (such as a T Profile) will identify the appropriate physical, data link, network, and transport layer standards and the required options and parameters, of each specified base standard needed for a particular function and environment.

Profiles should be written so that they do not contradict base standards, but permit specific choices where options and ranges of values are available. The choice of base standard options should be restricted so that it maximizes the probability of networking between systems implementing different selections of the profile options. This is consistent with achieving interoperability, which is the objective of the profile.

Although the emphasis is on using OSI-based standards, working groups may elect to use de facto standards such as the Internet Request for Comments (RFCs) in the development of profiles. RFCs may be used when the functionality they provide is not available in a commercial, international, national, or military standard. Working groups using RFCs must be aware that they do not contain the Protocol Implementation Conformance Statements (PICS) that MIL-HDBK-829 requires for constructing DSPs. Section 5 in this part of the MIL-HDBK describes in more detail the scope of each type of MIL-STD-2045 document and the source of information that may be used in developing the standard. Section 5 also contains configuration control process information for a MIL-STD-2045 document.

4.3 MIL-STD-2045 series document development. Development of a MIL-STD-2045 document takes place in one or more of the DTMP working groups as part of an approved DCPS project. A lead working group is responsible for coordinating a project. The working group must ensure that the standard achieves the desired functionality and meets MIL-STD-2045 criteria. DCPS profiles and base standards shall be classified under the MIL-STD-2045 numbering scheme.

An approved DCPS project may consist of preparing and validating of a MIL-STD-2045 document, or that may be part of a larger project. Note that not all DCPS projects are intended to result in a MIL-STD-2045 document.

4.3.1 MIL-STD-2045 format requirements. MIL-STD-2045-10000 series documents are designated as DOD Standardized Profiles (DSP) and must be prepared according to the TR 10000 profile format, as modified by MIL-HDBK-829. MIL-STD-2045-20000, -30000, -40000 and -50000 series documents must be prepared in accordance with MIL-STD-962B. MIL-STD-962B establishes the formats, contents, and procedures for preparing military standards and bulletins. Appendix B to this MIL-HDBK-829 contains an overview of the TR 10000 and MIL-STD-962B document formats and provides additional guidance and requirements for MIL-STD-2045 documents. Additionally, as indicated in Appendix B, all MIL-STD-2045 documents must include a Protocol Implementation Conformance Statement (PICS) or a PICS Equivalent. The PICS format is depicted in Appendix D.

4.3.2 Composition of a profile. A profile must consist of six components:

a. A concise definition of the scope of the function and its purpose.

b. An illustration of the scenario within which the function applies.

c. A normative reference to a set of base standards, including precise identification of the texts of the base standards being used and any approved amendments and technical errata, conformance to which is identified as potentially having an impact on achieving interoperability when using the profile.

d. Informative references to any other relevant source documents.

e. Specifications of the application of each referenced base standard, covering recommendations on the choice of classes or subsets, and on the selection of options and ranges of parameter values, as well as reference to registered objects.

f. A statement defining the requirements to be observed by systems claiming conformance to the profile, including any remaining permitted options of the referenced base standards, which thus become options of the profile.

4.4 MIL-STD-2045 document development stages. The following stages of development are for MIL-STD-2045 documents. The description of the actual MIL-STD-2045 numbering scheme is found in Section 5., Specific Requirements. The basic algorithm for determining which type of MIL-STD-2045 document is needed is shown in Figure 1.

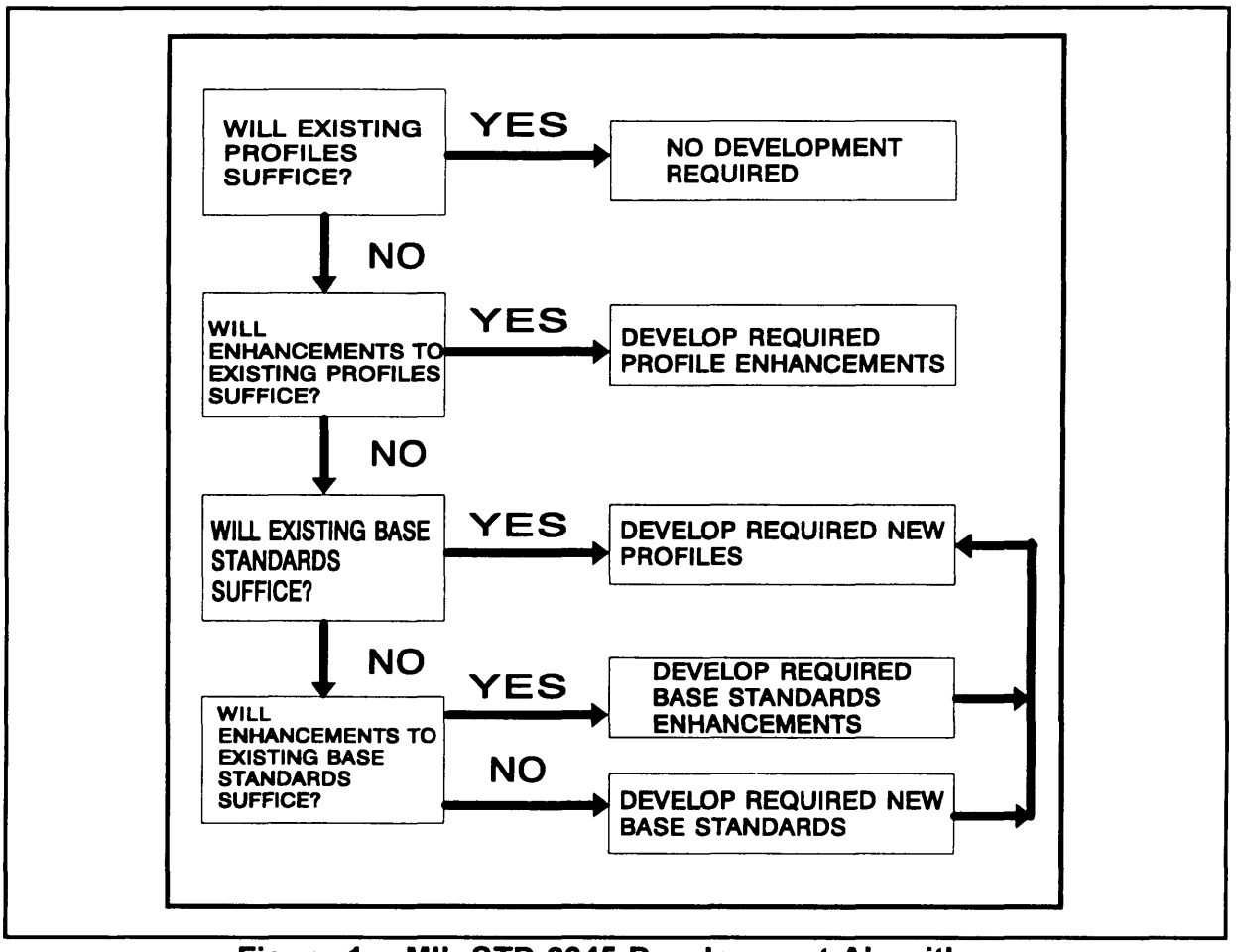


Figure 1. MIL-STD-2045 Development Algorithm

4.4.1 Identify Area Of Interest (Step 1:). The first step in developing a MIL-STD-2045 series document is to identify the appropriate area of interest based on stable service descriptions or functional requirements. These descriptions or functional requirements are developed at the beginning of the project. C/S/A needs and technical requirements provide the basis for developing the service descriptions or functional requirements. The area of interest should be identified in terms of a desired user requirements such as a tactical transport profile, an imagery profile, etc.

4.4.2 Define the profile requirements (Step 2). The second stage in developing a MIL-STD-2045 document is to define the profile requirements in terms which answer the following six questions:

a. What type of profile or combination of profiles is/are required?

b. What applications or transport/network services are required or need to be supported?

c. What internetworking or subnetwork access is required?

d. Do any existing profiles satisfy the Service description or functional requirement?

e. What extensions or modifications must be made to existing profiles or base standards to allow the DSP to be developed?

f. What specific military features are required (such as security features at different layers, preemption, network management features)?

4.4.3 Assess existing standards (Step 3). In conducting an assessment of existing standards, the working group should follow the hierarchy described in Appendix A to this MIL-HDBK and look for the simplest, most effective solution that provides the required functionality.

4.4.4 Determine availability of base standards (Step 4). Suitable base standards must be identified prior to profile development. If suitable base standards do not exist then they must be developed. The working group should analyze base standards to determine if requirements and parameters are explained in sufficient detail to provide vendors precise guidance without having to interpret what must be implemented.

Mandatory requirements,options commands and ranges of values should be clear and concise. If the base standards are lacking this detail then the responsible working group must either modify existing standards or develop new standards. If the base standard adequately explains the function or requirement then the profile may be used to specify specifics such as mandatory or optional implementation of a feature, or the desired response to a specific scenario.

A profile should not be used to explain or specify new services, commands or procedures that are not addressed in the base standards. In this case the working group should either develop a MIL-STD-2045 document that modifies the existing standard or develop a new base standard. Examining the suitability of the base standards is the most critical part of profile development. Profiles are meaningless without suitable base standards.

4.4.5 Assess the required level of effort (Step 5). The next step for the working group assigned to a MIL-STD-2045 project is to assess the amount of effort needed to develop the standard. The guiding philosophy is that existing profiles and base standards should be used wherever possible. If a profile does not exist, established

base layer standards should be investigated to determine if a new profile can be constructed. Enhancements to existing base standards or new base layer standards can be developed and used if necessary.

When a framework for the effort is established, the working group must develop a work plan for the project pursuant to the requirements of Section 3.6.2.3 of the DCPS Management Plan.

4.4.6 Development of draft standard (Step 6). After a DTMP working group develops a project work plan, the DTMP must approve that plan. Then the development of the necessary profile, enhancements, base standards (or both) begins. These protocols are documented in an appropriate MIL-STD-2045 document. The details and plans for identifying, developing, and testing the protocols, then documenting them in the appropriate MIL-STD-2045 series format, are found in the project work plan. Working and coordination drafts of MIL-STD-2045 documents will be given a DCPS document number. The lead working group is responsible for maintaining the correct version. MIL-STD-2045 numbers will be assigned only to the final, approved document. Progress reports on the document development effort are submitted quarterly to the DTMP as part of the parent DCPS Project Report.

During this stage, the lead working group is responsible for control of the work. Coordination of proposed protocols and profiles are accomplished within the working group and with liaisons to other DOD and non-DOD activities with the same interest. Issue resolution problems should be addressed according to the procedures described in the DCPS Management Plan.

4.4.7 Coordination and approval (Step 7) After completion within the working group, the standard is submitted to the DTMP for informal DOD coordination. This is accomplished according to the procedures described in the DCPS Management Plan.

Following the informal DOD coordination process, the standard must be validated to ensure the protocols, services, or both are implementable in a manner acceptable to DOD, that the objectives of the standards have been met, and that the protocols specified in the profile or base standard are sufficient in meeting the technical objectives of the standard. Validation testing is done according to the Validation Plan for Military Features in GOSIP Protocols and Architectures, developed under Standardization Project DCPS-0005.

The next step is formal SD-1 coordination. As with informal DOD coordination, DTMP approval of the standard is required before SD-1 coordination can occur. After DTMP approval, the DTMP Secretariat distributes the final draft document to each Service and Agency and solicits industry comments through an announcement in *Commerce Business Daily* (CBD). When all significant comments have been resolved, the standard is forwarded to the DTMP for approval. After DTMP approval, the DTMP Secretariat assigns the appropriate MIL-STD-2045 standard number

according to the numbering schema described in Section 5. The standard is printed and distributed according to the procedures described in DOD 4120.3-M. Upon approval, configuration control of the MIL-STD-2045 standard is the DTMP's responsibility.

5. SPECIFIC REQUIREMENTS

5.1 MIL-STD-2045 numbering schema. The MIL-STD-2045 numbering schema was established to identify the MIL-STD-2045 series as DOD DCPS within the general DOD standards numbering scheme and to provide the user with a logical means to identify the subject and use of a given standards document within the series. A given number identifies the type of standard, the functional area of interest, and a consecutive number within the functional area.

MIL-STD-2045-AYWWW

A=1: DoD Profiles (Implementations of Base Standards)
A=2: DoD Enhancements to Existing Base Standards
A=3: DoD-Unique DCPS Base Standards
A=4: Interim Base Standards
A=5: Interim Profiles

MIL-STD-2045-AYWWW (A=1,2,3,4 or 5; Y=1 to 9)

A1000 - A1999	Physical Layer Standards
A2000 - A2999	Data-Link Layer Standards
A3000 - A3499	Network Layer Standards
A3500 - A3999	Network/Relay Profiles/Multi-Layer
A4000 - A4499	Transport Layer Standards
A4500 - A4999	Transport Profiles/Multi-Layer
A5000 - A5999	Session Layer Standards
A6000 - A6999	Presentation Layer Standards
A7000 - A7499	Application Layer Standards
A7500 - A7999	Application Profiles/Multi-Layer
A8000 - A8499	Network Management
A8500 - A8999	Security
A9000 - A9999	Unassigned
A0000 - A0999	Unassigned

Note: Network profiles include standards in layers 1 through 3; transport profiles include standards in layers 1 through 4; and application profiles may include standards in either layers 5 through 7 or in layers 1 through 7.

Figure 2. MIL-STD-2045 Framework

5.2 Application guidance. A MIL-STD-2045 number is of the form MIL-STD-2045-AYWWW, where the first digit, "**A**," represents one of the five types of standards as illustrated in Figure 2. The second digit, "**Y**," represents the functional area covered by a particular standard. The last three digits, "**WWW**," represent a sequential number within a functional area.

Within these sequences, the numbering scheme is broken down further according to the functional area covered by a particular standard. Figure 2 also identifies the secondary numbering sequences for these functional areas.

Within the DCPS area, there may be a need to procure either full stack, application-only, transport-only, or relay-only products, which are defined by profiles. Because of these procurement benefits, and due to the wide acceptance and use of the profile concept in the commercial standards world, 10000 series profiles are the preferred type of MIL-STD-2045 document. If profiles are not available, however, base standards under either the 20000, 30000, 40000, or 50000 series may be developed. Multi-layer base standards will be assigned numbers that correspond as closely as possible to the numbering scheme shown in Figure 2.

For the purposes of this MIL-HDBK, network profile numbers (A3500 - A3999) address layers 1-3 of the OSI Reference Model (RM), and transport profile numbers (A4500 - A4999) address layers 1-4 of the OSI RM. The application profile numbers (A7500 - A7999) can be used for either layers 5-7 of the OSI RM or for a full 7-layer profile.

5.2.1 MIL-STD-2045-10000 series. The first type of MIL-STD-2045 standard is the MIL-STD-2045-10000 series, which includes MIL-STD-2045-10000 to MIL-STD-2045-19999. This series is used to describe how DOD should implement existing commercial, international, national, federal, or other military standards to provide the required network services.

The scope of the 10000 series documents is limited to referencing existing standards and profiles (including ISPs, NSPs, GOSIP, and MIL-STD-2045-20000, -30000, -40000 and -50000 series) and addressing ambiguities and options within these standards that pose interoperability risks within DOD. If an existing functional profile fulfills DOD functional and interoperability requirements, a MIL-STD-2045-10000 series DSP is neither needed nor desired. Otherwise, the series is used to document the DSP developed from existing functional profiles, existing commercial standards, DOD enhancements (e.g., MIL-STD-2045-20000 documents), DOD unique standards (such as MIL-STD-2045-30000 and MIL-STD-1777), interim DOD standards (such as MIL-STD-2045-40000 documents), interim profiles (such as MIL-STD-2045-50000 documents or de facto standards (such as RFCs). Figure 3 illustrates how a MIL-STD-2045-10000 series document relates to existing standards, functional profiles, and RFCs. The Internet set of Requests for Comments (RFCs) may be used in the

development of a 10000 series document when the desired functionality or service does not exist elsewhere. When an RFC is used, a reasonable effort should be made to construct a PICS-like table for inclusion into the DSP.

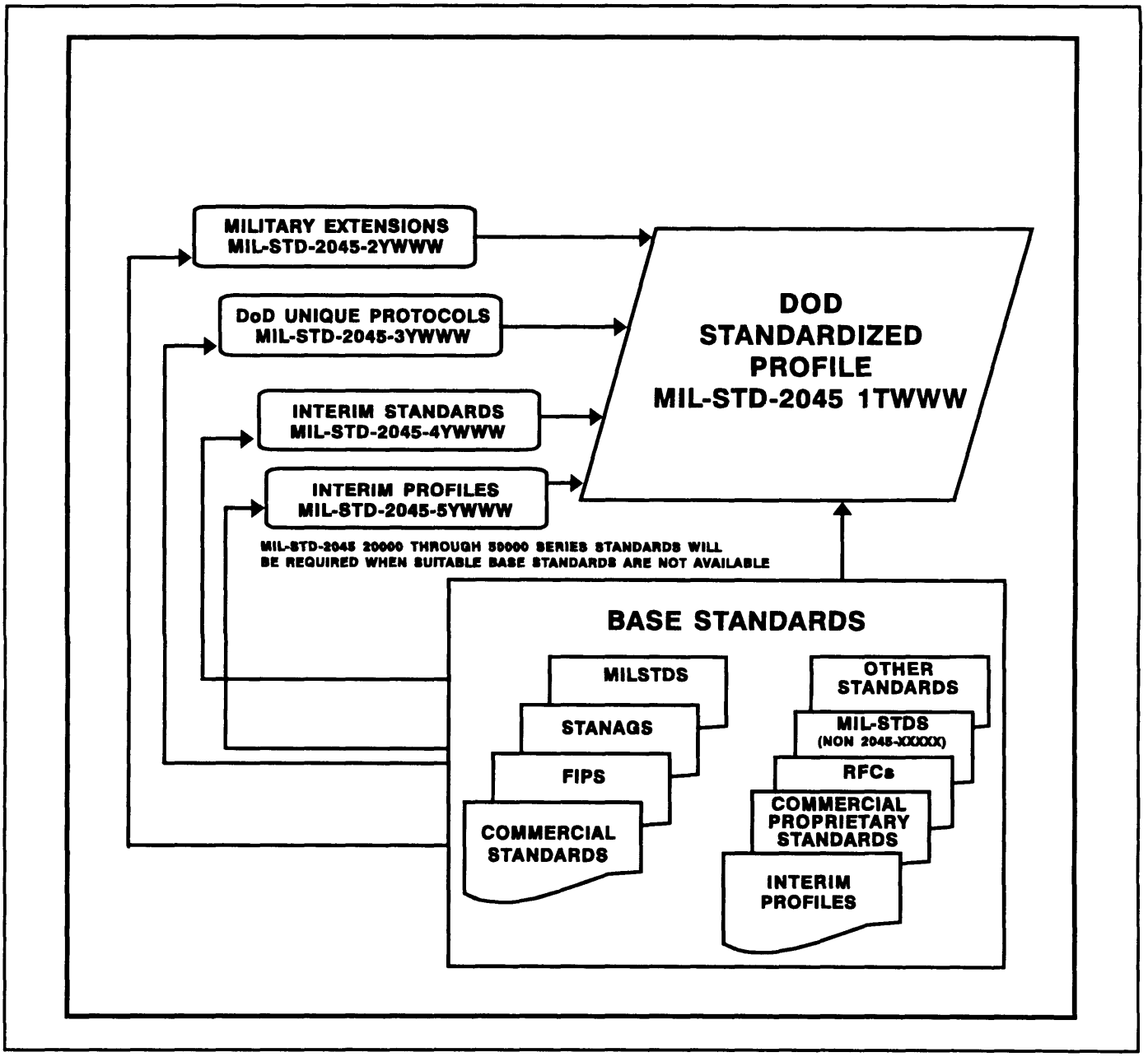


Figure 3. Relationship among MIL-STD 2045-10000 Series Documents, Existing Standards, Functional Profiles, and DSPs

The 10000 series is intended to describe DOD implementations of existing standards only when ambiguities or interoperability risks with these standards exist as promulgated. Therefore, only those MIL-STD-2045 numbers that relate to profiles will be used for 10000 series documents (for example, MIL-STDs-2045-13500 to -13999, MIL-STDs-2045-14500 to 14999, and MIL-STDs-2045-17500 to 17999).

A MIL-STD-2045-10000 series document also may describe how multiple DSPs can be used together for a particular functionality. For example, a MIL-STD-2045-10000 document may describe how several application profiles may be used over a single transport profile, or vice versa. A MIL-STD-2045-10000 document also may describe how a particular security profile should be combined with a message-handling profile. Although DSPs and MIL-STD-2045 series documents are coupled closely, the MIL-STD-2045 series' purpose may expand beyond that of simply documenting a DSP.

5.2.2 MIL-STD-2045-20000 series. The second portion of the MIL-STD-2045 series is the MIL-STD-2045-20000 series, which is numbered MIL-STD-2045-20000 to MIL-STD-2045-29999 inclusive. This series is used to describe DOD enhancements and extensions to existing commercial, international, national, or federal standards.

A MIL-STD-2045-20000 standard should be developed only when no existing standard completely satisfies the functional requirements determined necessary by the lead working group for the project. A standard adopted under this series must relate to an existing non-DOD standard, and the document must describe the use of the extension in conjunction with the non-DOD standard. MIL-STD-2045-20000 series standards complement an existing standard. They specify only the modifications to the existing standard. All MIL-STD-2045-2000 series standards are considered base standards.

5.2.3 MIL-STD-2045-30000 series. The MIL-STD-2045-30000 series, MIL-STD-2045-30000 to MIL-STD-2045-39999 inclusive, is used to describe protocol specifications and service definitions that are unique to DOD and will not be supported by commercial, international, national, or federal standards.

A MIL-STD-2045-30000 document can be developed only when no existing standard is available that can be used, in whole or in part, to satisfy the DOD requirements set for the project by the lead working group. All MIL-STD-2045-30000 series standards are considered base standards.

5.2.4 MIL-STD-2045-40000 series. The MIL-STD-2045-40000 series, MIL-STD-2045-40000 to MIL-STD-2045-49999 inclusive, is used for interim base standards Interim standards document protocols and services needed by DOD until adequate protocols and services are either (1) developed by a non-DOD standards organization and are incorporated through GOSIP for DOD use, (2) a MIL-STD-2045-20000 or 30000 series standard, or an interim profile (MIL-STD-2045-50000 is adopted. All MIL-STD-2045-40000 series standards are considered base standards and are developed in the MIL-STD 962B format .

The establishment of a MIL-STD-2045-40000 series for interim standards is consistent with DOD's goal of maximizing the use of non-DOD standards and commercially available products to fulfill DOD data communications requirements. Interim standards are necessary because international standards development is a lengthy process. Commercial standards and commercially available products based on these standards may not be readily available in a manner early enough to meet DOD acquisition requirements.

MIL-STD-2045-40000 documents provide a buffering solution between the acquisition community's need for a reliable standard and the time required to develop an international standard and adapt it into GOSIP profiles. A MIL-STD-2045-40000 document should be viewed as a product in the overall DOD standards identification and development process. As such, the development of a MIL-STD-2045-40000 document is controlled by the procedures described in DOD 4120.3-M, and is identical to that of other military standards in terms of coordinating development of the standard within DOD. The major difference between a MIL-STD-2045-40000 document and MIL-STD-2045-20000 and MIL-STD-2045-30000 series documents is the probability of change.

Changes to a MIL-STD-2045-40000 document are based on the activities of non-DOD standards bodies and will be controlled through the configuration management (CM) process referenced in section 5.3. Users of the MIL-STD-2045-40000 document must consider the possibility of change. Users should develop a plan to migrate from the MIL-STD-2045-40000 document to another series MIL-STD-2045 document as circumstances dictate.

5.2.4.1 Non-OSI profiles. A MIL-STD-2045-10000 document shall be used to document non OSI based Profiles such as the Internet Protocol Suite (IPS) or options selected when using commercial proprietary protocols. To maintain document consistency the TR-10000 format will also be used for non OSI profiles.

5.2.5 MIL-STD-2045-50000 series. The MIL-STD-2045-50000 series, MIL-STD-2045-50000 to MIL-STD-2045-59999 inclusive, will be used to describe how DOD will implement commercial, international, national, federal, or military standards within the functional profile concept to provide required network services. The Government Open Systems Interconnection Profiles (GOSIP) will serve as the base for developing the 50000 series with DOD enhancements, unique military standards, and interim standards being used only when necessary. The difference between MIL-STD-2045-10000 series and the MIL-STD-2045-50000 series is that the 50000 series are interim profiles.

Specific details and instructions for establishing a MIL-STD-2045 document, as well as profile development guidelines, are documented in MIL-HDBK-829. DTMP Working Groups shall be responsible for DSP development and informal Service or Agency coordination; the DTMP Plenary shall be responsible for final review and approval.

5.2.6 Relationship between MIL-STD-2045-40000 documents and MIL-STD-2045-30000 documents. A subtle but distinct difference exists in the concept of MIL-STD-2045-40000

documents and MIL-STD-2045-30000 documents. A MIL-STD-2045-30000 document is used to describe protocols that provide a required DOD networking service that will not be provided by a commercial or federal standard within the foreseeable future. Essentially, a MIL-STD-2045-30000 document is considered permanent, although it is subject to review periodically, which is normally every five years. A MIL-STD-2045-30000 document also is subject to change resulting from technical improvements or changes in the service description.

MIL-STD-2045-40000 documents describe protocols needed to fulfill a DOD networking service requirement not addressed by GOSIP, an international standard, or another MIL-STD-2045 series document. MIL-STD-2045-40000 documents are intended to be short-termed and are canceled once applicable DOD requirements are incorporated in either GOSIP or another military standard. The protocols described by a MIL-STD-2045-40000 series standards and the service it provides are intended to be introduced into non-DOD standards activities to influence international standards development, although MIL-STD-2045-40000 standards initially should be developed to meet near-term acquisition needs. The Services and Agencies should make every effort to identify required data communications services early enough so that commercial standards and commercial product development can be influenced.

5.2.7 Documentation example. As an example of a MIL-STD-2045 document, consider the following case. Suppose a standard were required that would specify a strategic military organizational messaging system using message security protocols and incorporating multicasting features. This is an example of a more complicated situation that easily could arise, that is, one DCPS project is established to accomplish a given functionality, but more than one standard must be developed to satisfy the project requirements. In that case, the following fictional solution might be adopted:

a. For example, FIPS 146-1 briefly describes X.400 facilities with Interpersonal Message (IPM) services. A new MIL-STD-2045-175xx could be established to describe how FIPS 146-1 is implemented for this DOD application. MIL-STD-2045-175xx would point to the extensions shown below, since additional standards are needed to achieve the required function.

b. A new MIL-STD-2045-27xxx (application layer standard) could be established as an extension to FIPS 146-1 for organizational messaging.

c. MIL-STD-2045-33xxx could be established as a new, DOD-unique standard to accommodate multicasting.

d. MIL-STD-2045-48xxx could be established as an interim message security protocol while changes to the commercial standard are being effected.

e. MIL-STD-2045-54xxx could be established as an interim profile while changes to the commercial standard are being effected.

These MIL-STD-2045 documents are needed to satisfy the requirements for the DCPS project, although a related DSP would not have to be as complex. The DSP format could combine all features into one protocol. This illustrates the benefits of the profile concept. However, the MIL-STD format also is needed, as explained above, because DCPS documents are DOD standards, and they must fit within the DOD standards numbering scheme.

5.3 Configuration management. See DCPS Management Plan/Procedure for details of the configuration management (CM) process.

5.4 Testing Requirements. For purposes of this MIL-HDBK, testing is divided into two broad categories, conformance and interoperability testing. Conformance testing will verify that a particular implementation or system conforms to the stated standard in terms of functionality. Interoperability testing will verify that a particular implementation or system will successfully operate with a peer entity. Conformance testing is essentially the same whether it is applied to a base standard or to a functional profile. The same is true for interoperability testing. The process of validating requirements for data communications protocols and testing implementations for conformance to those requirements (verification) is found in the *Validation Plan for Military Features* in GOSIP Protocols and Architectures (Standardization Project DCPS-0005). The proper application of interoperability testing to verify peer-to-peer interoperability (base standards or functional profiles) is also contained in that document.

The policy and procedures for the formal program of conformance and interoperability testing is contained in the DOD *Conformance/Interoperability Test Plan for Military Features* in GOSIP Protocols and Architectures (Standardization Project DCPS-0006).

6. NOTES

6.1 Subject term (key word) listing.

Allied Communications Publication
Communication Protocol Standards
Data Communication Protocol Standard
Data Communications
Functional Profiles
DOD 4120.3-M
DOD Standard Profile
DSPICS Proforma
FIPS 146-1
International Standard Profile
Interoperability
MIL-STD-962B
Network
PICS Proforma
Profiles
Relay
Standards
Taxonomy
Transport

6.2 Identification of changes. Marginal notations are not used in this revision to identify changes with respect to the previous issue due to the extensiveness of the changes.

Appendix A

Hierarchy of Standards Use

10 GENERAL

10.1 Scope Appendix A is a mandatory part of this MIL-HDBK. The information contained herein is intended for compliance.

20 APPLICABLE DOCUMENTS

20.1 Government Documents. The following documents form a part of this appendix to the extent specified herein:

MILITARY STANDARDS

MIL-STD-970	Order of Preference for the Selection of Standards and Specifications, October 1987

20.2 Other Government Documents, Drawings, and Publications

Defense Information Systems Agency, Center for Information Management, Reference Model and Standards Profile, 31 December 1992

30 DEFINITIONS.

30.1 Applicability. For the purposes of this appendix, DCPS Management Plan definitions shall apply.

40 GENERAL REQUIREMENTS

40.1 Hierarchy of Standards Use Within DOD In October 1987, DOD changed the desired order of preference for selecting standards and specifications significantly, once technical design and economic factors have been considered. This hierarchy should be followed when considering the use of existing standards as the basis for a MIL-STD-2045 document. Below is an excerpt from MIL-STD-970, showing a partial listing:

a. Group I Group I includes those standards and specifications that are mandatory for use by law or regulation pursuant to law. These include, but are not limited to, mandatory Federal Information Processing Standards (FIPS) such as that for GOSIP,

Federal Telecommunications Standards, and multinational treaty organization agreements such as NATO STANAGs, AQAPs, and QSTAGs.

b. Group II These are standards, specifications, handbooks, and related documents promulgated by national and international non-government standard bodies (NGSBs) and referred to as non-government standards (NGS). These are divided into two subgroups:

(1) Subgroup IIA This subgroup includes those NGS formally adopted by DOD.

(2) Subgroup IIB This subgroup includes all other NGS that have not been formally adopted by DOD and are not listed in the DODISS.

c. Group III These are federal series standards and specifications with registered DOD interest. They are divided into two subgroups:

(1) Subgroup IIIA Commercial Item Descriptions (CIDs).

(2) Subgroup IIIB Coordinated federal standards and specifications.

d. Group IV These are military standards and specifications, and standardized military drawings (SMDs). There are two subgroups:

(1) Subgroup IVA This subgroup includes military standards and specifications (including JANs, ANs, and ANDs) in accordance with MIL-STD-962 and MIL-STD-961, respectively.

(2) Subgroup IVB This subgroup includes coordination copies of military standards and specifications issued by the requiring DOD Service, Agency, or Activity, and SMDs.

e. Group V This group includes two subgroups:

(1) Subgroup VA This subgroup includes interim federal standards and specifications developed by the DOD Service, Agency, or Activity concerned.

(2) Subgroup VB This subgroup includes limited coordination or "used-in-lieu of" military standards and specifications issued by a DOD Service, Agency, or Activity other than the preparing activity of the basic document.

f. Group VI This group includes CIDs and federal standards and specifications for which the DOD has not registered interest.

g. Group VII This group includes standards and specifications issued by the Government that are outside the military or federal series, and therefore are not listed in the DODISS. There are two subgroups:

(1) Subgroup VIIA This subgroup consists of Group VII documents issued by Government agencies other than DOD (for example, FAA and NASA specifications).

(2) Subgroup VIIB This subgroup consists of purchase specifications, purchase descriptions, product descriptions, and program-peculiar specifications prepared in accordance with MIL-STD-490 for the non-repetitive acquisition of development items and other supply items.

h. Group VIII This group includes standards and specifications not covered by Groups I through VII.

The priority of other documentation and details of the order of preference are in MIL-STD-970 (October 1987). The above DOD hierarchy emphasizes the use of international and other non-Government standardization documents in DCPS activities.

Appendix B

Format for MIL-STD-2045 Documents

10 GENERAL

10.1 Scope This appendix provides a general description of the required structure for a MIL-STD-2045 document. ISO/IEC/TR 10000, and MIL-STD-962B, as appropriate, serve as the basis for preparing a MIL-STD-2045 series document. This appendix explains the use of these documents. It also sets forth certain content requirements unique to MIL-STD-2045 documents. Appendix D contains a DSP template that shows MIL-STD-2045 format and content requirement.

This appendix is a mandatory part of this MIL-HDBK. The information contained herein is intended for compliance.

10.2 Providing Tailoring Guidance This appendix is not intended to replace TR 10000 or MIL-STD-962B, as those documents contain extensive information about the required structure and format of profiles and military standards, respectively. This appendix is intended to provide an overview of the two formats as a tool for creating a MIL-STD-2045 document. This appendix should be used in structuring the basic components of the standard, but TR 10000, and MIL-STD-962B, as appropriate, must be consulted before drafting a MIL-STD-2045 document.

20 APPLICABLE DOCUMENTS

This section is not applicable to this appendix.

30 DEFINITIONS

30.1 For the purposes of this appendix, the definitions of MIL-STD-962B and ISO/IEC/TR 10000, as modified by this MIL-HDBK-829 apply.

40 GENERAL REQUIREMENTS

A MIL-STD-2045-10000 series document should be drafted in the format specified by ISO/IEC/TR 10000 for ISPs. However, this appendix which describes the process for DSP development, contains some modifications to that format. These modifications must be considered when drafting a MIL-STD-2045-10000 or 40000 series profile. A MIL-STD-2045-20000, -30000, or -40000 series base standard must be drafted using the MIL-STD-962B format, with the modifications described below. An overview of both formats follows.

40.1 Framework for DSPs The framework for ISPs specified in ISO/IEC TR 10000-1 shall also apply to DSPs, with the exceptions and modifications specified herein. The framework specified for DSPs is also analogous to that specified for NSPs in the NOSIP Strategy, 1994. The DSP documentation outline and content, both consistent with TR 10000-1 and NOSIP Strategy, 1994, are shown in Figure B-1.

40.1.1 Non-OSI Based DSPs DSPs may be developed that profile standards that are not based on the ISO seven layer model. For example the Internet Protocol Suite (IPS), or proprietary System Network Architecture (SNA) protocols such as Apple Talk or). Non OSI based profiles will use the basic framework established by TR-10000 and this document. However, the taxonomy specified herein will not apply to these profiles

40.2 Use of DSPs The intent of DSPs is to specify the use of base standards so that various implementations of the DSP will be interoperable for a particular functional requirement. The following paragraphs discuss how alternate implementations are documented by a DSPICS and how efficiency is achieved through use of multi-part DSPs.

40.3 DSPICS A PICS Proforma is a tabulation of all the mandatory requirements and options offered by a layer standard. It is provided by the developer of the layer standard as an addendum to the standard. An implementor shows the extent of compliance to a base standard by completing the PICS Proforma; that is, compliance to all mandatory requirements and the options that are and are not supported are shown. The completed PICS Proforma is called simply a "PICS." There can be as many PICS for a given base standard as there are implementations of that standard.

A similar relationship exists for functional profiles. Within a DSP, a group of layer standards is selected to support a given function. The PICS Proforma from each of the selected layer standards is gathered into a combined tabular listing of the mandatory requirements and options. Those options that will guarantee functional interoperability are then selected within this combined listing, leaving any unselected options open. The resulting combined tabular listing is called a DPRL and is documented as Annex A to a DSP. A DSP implementor shows the extent of compliance to a DSP by completing the DPRL (see ISO 9646); that is, compliance to all mandatory requirements and the options that are and are not supported are shown. The resulting completed DPRL is called a DSPICS.

Between the selections made within the DPRL and those added in developing the DSPICS, a profile implementor has in essence prepared a PICS for each layer in the profile. The difference between completing individual PICS and a DSPICS is that interoperability with implementations of other vendors is ensured in the DSPICS. However, nothing but rigorous testing can ensure vendor interoperability. Reference Section 5.4 for additional information. There can be as many DSPICS for a given

profile as there are implementations of that profile. Because of the selections made within the DPRL, all implementations based on the DPRL should be functionally interoperable. The relationships among layer standards, PICS Proforma, PICS, DSPs, DPRLs, and DSPICS described above are represented graphically in Figure B-1.

40.4 Individual and Multipart DSPs An individual DSP defines a single functional area (e.g., TB1231). There can be a great deal of commonality associated with one or more layers within a group of profiles. In such cases it is more efficient to use multi-part DSPs in which common requirements are placed in a single part and related profiles are gathered into a single document. For example, one part of a multi-part transport profile could be TBnnnn, addressing TP 0, 2, and 4 transport layer class services operating over Connection-Oriented Network Service (CONS). A second part of the multi-part profile might be a TCnnnn profile, addressing TP 0 and 2; and a third part of this profile could be a TX1111 profile. The TBnnnn and TCnnnn parts of the multi-part DSP refers to the third part for subnetwork-type dependent requirements and avoids repeating the subnetwork dependent requirements in each of the TB1111 and TC1111 profiles that would otherwise have been produced.

40.5 DSP Structure The required structure of DSPs, specified in TR 10000, is shown in Figure B-1. The intended content of the sections of a DSP, identified by the bold type headings in Figure B-1, is self-explanatory. It is important to note that DSPs are meant to be concise documents. They should not repeat the text of the base standards to which they are related. The Scope, Requirements Section, Annex A and the Concluding Material Annex (which contains a descriptive area for elaboration on changes, implementation issues, etc.) are key parts of a DSP.

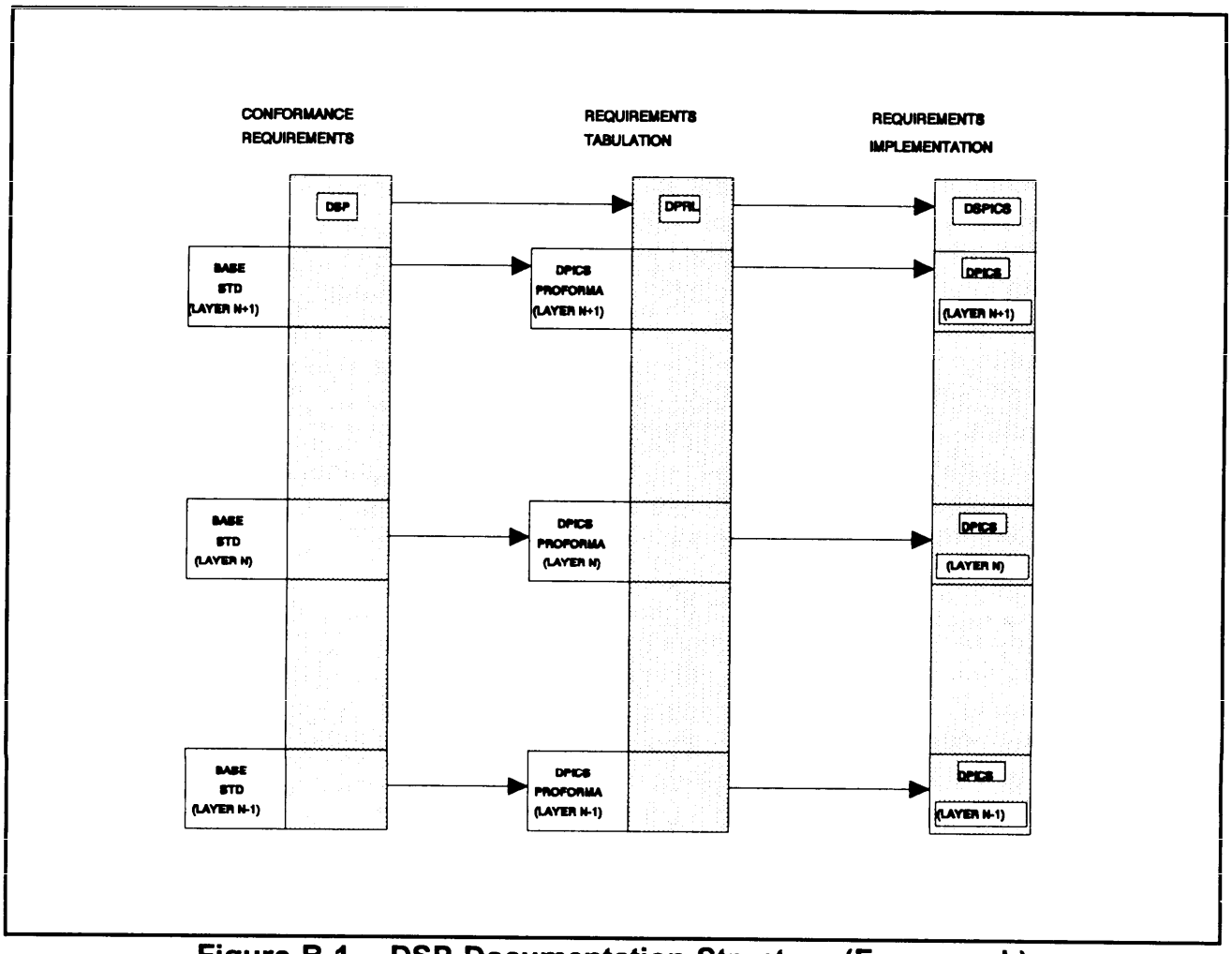


Figure B-1. DSP Documentation Structure (Framework)

40.6 Overview of MIL-STD-962B Format Below are the major sections required by MIL-STD-962B:

a. Self Cover This is the cover page for a MIL-STD document. It must be in proper MIL-STD-962B format and contain the required information.

b. Foreword A foreword must be included. This section consists of specific statements, as applicable, set forth in MIL-STD-962B.

c. Contents This is the table of contents for the document. The format is specified in MIL-STD-962B.

d. Section 1: Scope MIL-STD-962B provides that the Scope section should include a clear, concise delineation of the function or purpose of

the document, and the extent or range of its technical content. This section also should contain general information about applicability and application guidance, as well as tailoring options. The requirements of MIL-STD-962B for this section should be followed, as appropriate.

e. Section 2: Applicable Documents This section should list the documents referenced in sections 4 and 5 of the MIL-STD. There is a prescribed format and priority for the listing of these documents, which is detailed in MIL-STD-962B. Information on obtaining the referenced documents also must be included in this section.

f. Section 3: Definitions Definitions of all key terms and acronyms must be included in this section.

g. Section 4: General Requirements This section should contain information common to the area covered. It should describe those requirements that would not vary when the standard is used and could be expected to apply in almost all cases. This section should include all general requirements that are imposed automatically whenever the document is invoked in a solicitation or contract.

h. Section 5: Detailed Requirements This section contains the essential requirements for applying the standard in individual cases. Requirements under this section should be presented either individually or as coherent groups to enable selective application and identification by reference. Each individual requirement or group of requirements should be structured as follows.

(1) Purpose This section serves as a statement of intent that defines the objective of a particular requirement. It may include the anticipated results and benefits.

(2) Application Guidance Guidance for use of the particular requirement or requirements should be presented here. Information in this section may include the range of application and should define such features as program phase and system application. The functionality to be provided to the user and an explanation of how the standard can be used to satisfy particular operational requirements should be included here.

(3) Tasking Requirements A self-contained tasking statement should be included in this section. It should be written to enable independent application to a specific acquisition. This section identifies such items as methods, processes, procedures, techniques, and equipment.

(4) Support Information This section should contain statements that provide associated or related information considered necessary during the requirements selection process or in performing the requirement.

Note: More specific information on the use of these sections, with examples, can be found in MIL-STD-962B. In addition, the Detailed Requirements section should include information on how to describe testing requirements and test methods, if applicable. MIL-STD-962B also requires that each requirement or group of requirements and each test method be identified by number. The numbering scheme should be described in this section, and should be formulated according to MIL-STD-962B.

i. Section 6: Notes Information in this section is not contractually binding. It is used for general or explanatory information, including information designed to assist in determining applicability of the document. If a Notes section is included in a MIL-STD-2045 document, MIL-STD-962B must be consulted for format.

j. Appendixes Appendixes should be attached to a MIL-STD-2045 document as required for general information, illustration, or application purposes. MIL-STD-962B contains detailed information on the format and content of appendixes. In addition, section 80.3 sets forth the requirements in connection with PICS for MIL-STD-2045-20000, -30000, and -40000 series documents. The PICS should be included as a separate appendix to documents in these series.

k. Index An alphabetical index may be placed at the end of a MIL-STD to permit ready reference to contents. However, MIL-STD-962B mentions that this index should be used only in lengthy documents. MIL-STD-962B contains some format requirements in the event that an index is used.

l. Concluding Material This is a mandatory section that can include clarification or informational statements that may be helpful in implementating the DSP in question.

m. DD Form 1426, Standardization Document Improvement Proposal This form must be included as the last sheet of a MIL-STD-2045 document. MIL-STD-962B contains additional information about its use.

50. Protocol Implementation Conformance Statement (PICS) Proforma. In addition to any other appendixes deemed necessary for a particular MIL-STD-2045 document, a Protocol Implementation Conformance Statement (PICS) proforma must be included as an appendix to a MIL-STD-2045-20000 series document, a MIL-STD-2045-30000 series document, or a MIL-STD-2045-40000 series document.

A PICS proforma normally will be available for a MIL-STD-2045-10000 series document because each base standard used in the profile should have a PICS proforma. However, if a PICS is not available for a particular profile, then a PICS Equivalent should be developed.

Appendix C

Taxonomy of DCPS Profiles for DSPs

10 GENERAL

10.1 Scope

The Taxonomy of Profiles specified for ISPs in ISO/IEC TR 10000-2 (see 2.2) shall also apply to DOD profiles documented in DSPs, with the exceptions and modifications specified herein. The Taxonomy of Profiles specified for DSPs is analogous to that specified for NSPs in the NOSIP Strategy, 1994. The Taxonomy of Profiles specified in TR 10000-2 is summarized in Figure C-1(a) through C-1(d). (NOTE: This taxonomy of profiles is subject to change as requirements for specific ISPs develop.) This taxonomy only applies to OSI based profiles. This taxonomy may not be applicable to non OSI based profiles.

10.2 Applicability This appendix applies to DOD services and agencies that are developing OSI based DSPs.

20 APPLICABLE DOCUMENTS

20.1 See section 2

30 DEFINITIONS

30.1 See section 3.

40 GENERAL

40.1 DSP taxonomy (Classification) The system of classification for DSPs is given by TR 10000-2 which, at the top level, separates profiles into broad classes based on boundaries within systems and areas of system expertise. This yields profile classes that differentiate among representation of information or objects, communications protocol support, application-related protocols, and subnetwork types. These classes are then functionally subdivided on the basis of system implementor choice selections such as the application service offered or the subnetwork type used. The following classes of ISPs have been identified in TR 10000:

- Interchange format and representation profiles
- Application profiles
- Transport profiles

- Relay profiles

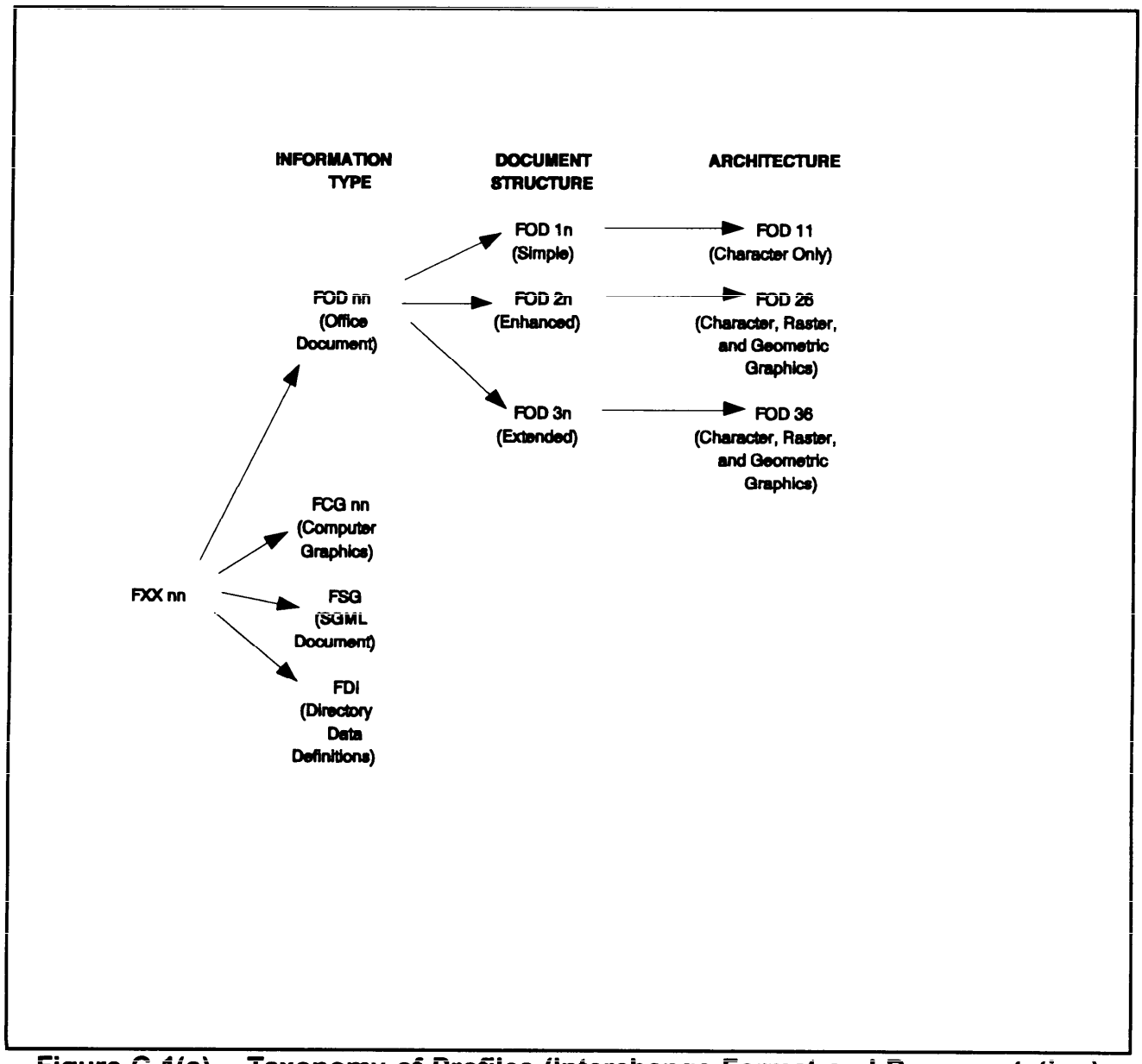
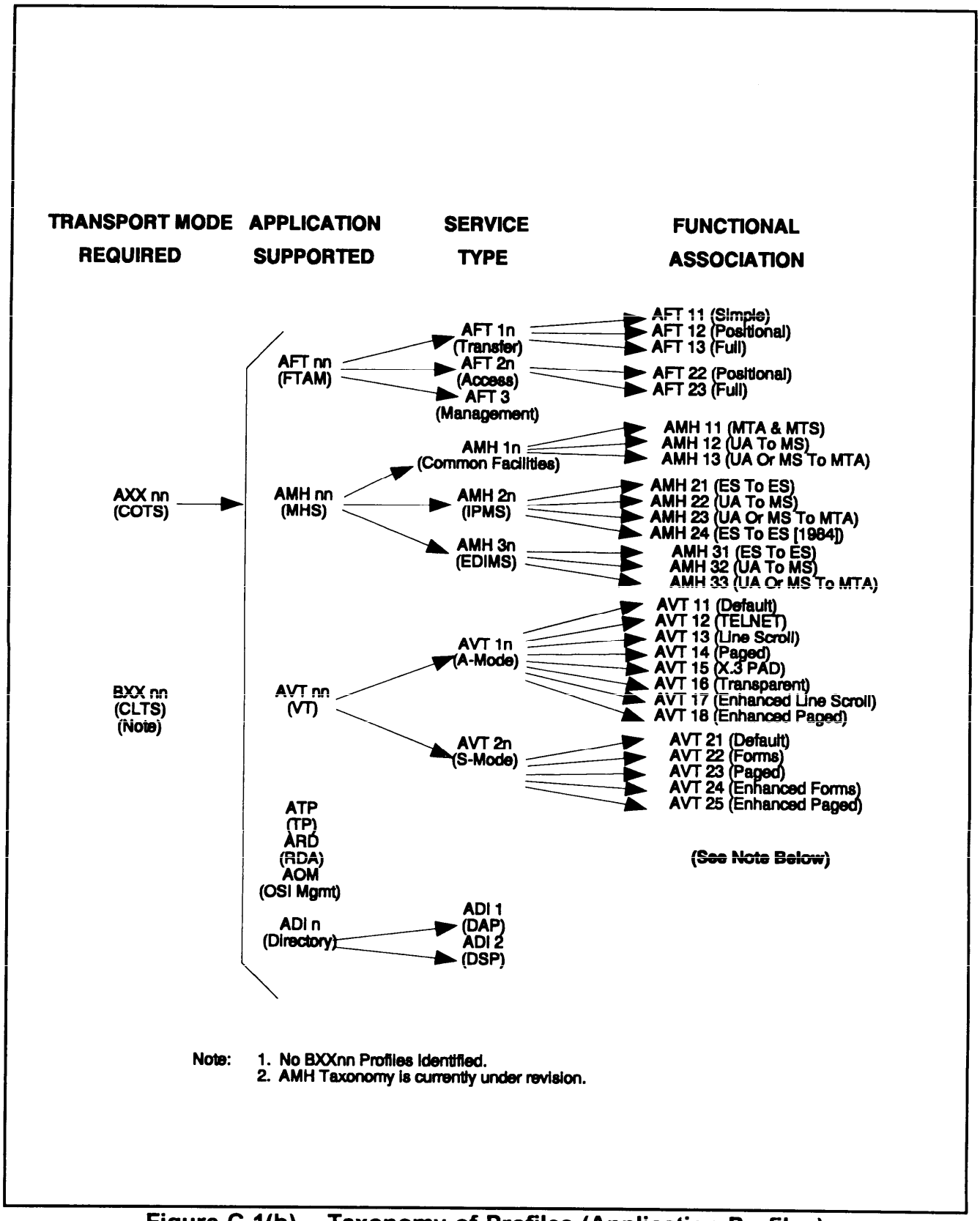


Figure C-1(a). Taxonomy of Profiles (Interchange Format and Representation)



Note: 1. No BXXnn Profiles identified.
2. AMH Taxonomy is currently under revision.

Figure C-1(b). Taxonomy of Profiles (Application Profiles)

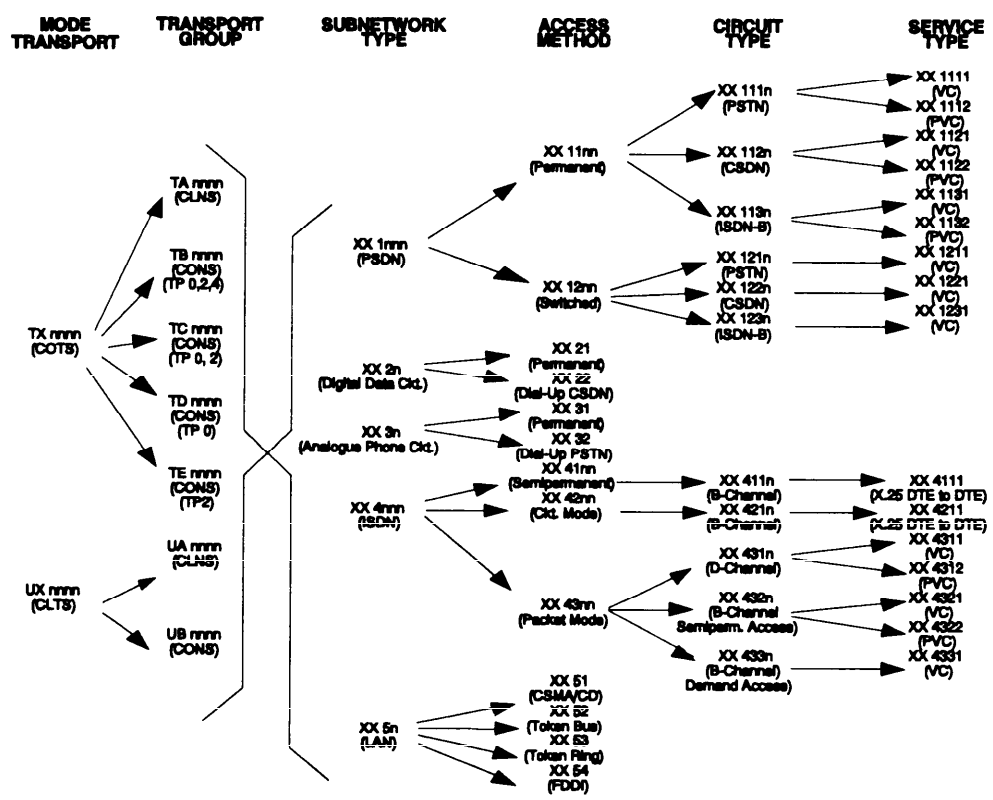
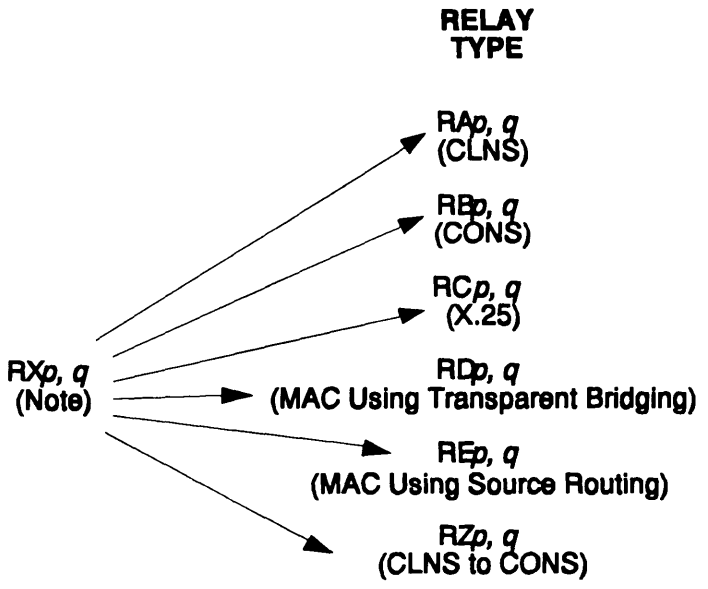


Figure C-1(c). Taxonomy of Profiles (Transport Profiles)



Note: *p* and *q* each use the four-digit numerical classifications of the Transport Profiles and thus identify the subnetwork types between which the relay occurs.

Figure C-1(d). Taxonomy of Profiles (Relay Profiles)

probe are shown on Figure

Exceptions and modifications to TR 10000-2 are as specified in the following paragraphs.

40.2 Substitution of DOD Terms and References for ISO Substitute DOD terms and references for ISO terms and references in accordance with the mapping defined in Section 3 of the main document.

40.3 Profile Identifiers Profile Identifiers for DSPs shall have the suffix "(D)" indicating a DOD Profile.

40.4 Replacement for Paragraph 5, Clause 1 Replace the last sentence paragraph 5 in clause 1, Scope, with the following paragraph:

"Proposed DOD extensions will generally arise only from work on a particular DSP, resulting in a specific need to extend the Taxonomy. No separate activity devoted specifically to extending the Taxonomy is envisioned."

40.5 Approval of DOD Extensions to Taxonomy All approved DOD extensions to the Taxonomy shall be documented in Appendix E to this appendix. If and when these extensions are adopted in TR 10000-2, or TR 10000-3 they shall be deleted from this MIL-HDBK.

40.6 Replacement for Paragraph 6 Replace the last sentence of paragraph 6 and the first sentence of paragraph 7 in clause 1, Scope, with the following paragraph:

"The Taxonomy is concerned only with OSI Profiles based upon the seven layer model. Further information is provided in the DOD TRM (see Foreword for mailing address) as to which DSP contains the documentation of which Profiles.

This DOD TRM is maintained as a DTMP document and will be updated as required."

40.7 Profile class relationships System implementations require, as a minimum, use of an application profile (A or B) and a transport profile (T or U). Application profiles provide services associated with users while transport profiles provide a transition to the supporting communications network. The classification system requires that A Profiles be used over T Profiles and that B Profiles be used over U Profiles, with no mixing (e.g., A Profiles do not operate with U Profiles and B Profiles do not operate with T Profiles). The degree of interoperability provided within ISO standards is such that any given A Profile may use a variety of T Profiles, and any given T Profile could support a

variety of A-Profiles. The same relationships exist between B and U Profiles. When the Application Layer base standards, and thus the A or B Profiles themselves, do not specify necessary information structure, F Profiles are used above A or B Profiles to provide this structure. Information transfer functionality is not provided in an F Profile; therefore, an A or B Profile is always required in a complete system.

Appendix D

Template For Developing DOD Standardized Profiles

10. GENERAL

10.1 Scope. This Appendix contains a template that is to be used when developing DOD Standardized Profiles. This appendix is a mandatory part of this MIL-HDBK. The information contained herein is intended for compliance.

10.2 Applicability. This appendix applies to DOD services and agencies that are developing MIL-STD-2045-1XXXX & 5XXXX Series DSPs.

20 APPLICABLE DOCUMENTS

20.1 See section 2

30 DEFINITIONS

30.1 See section 3.

40 GENERAL

The purpose of this appendix is to standardize the preparation of MIL-STD-2045-1XXXX and MIL-STD-2045-5XXXX Series Profiles.

Each section provides an example and a brief description of the required content. Appendix A of this template provides a representative example of both an upper and lower layer PICS Proforma.

The mandatory sections are listed in italic print. Font types and sizes are listed as recommendations, but for ease of transitioning into and out of ASCII, and because of its widespread availability, Universal font (you are reading Universal) is preferred, with Helvetica and Arial (you are reading Arial) as excellent substitutes. These three fonts are very similar, and will help to attain a uniform appearance for these documents.

NOT MEASUREMENT SENSITIVE

MIL-STD-2045-xxxxx
21 July 1994

(Universal, Arial, or Helvetica, using 12 point as base, Extra Large)

MILITARY STANDARD

Information Technology
DOD Standardized Profiles XXXXX(D)

TITLE

Part X: Title

AMSC N/A

AREA DCPS

DISTRIBUTION STATEMENT A. Approved for public release; distribution is unlimited

Foreword *(Bold, Universal, Arial, or Helvetica 12pt)*

Note: The following nine paragraphs are required text (additional text is permitted) :

(Universal, Arial, or Helvetica 9pt)

This military standard is approved for use by all Departments and Agencies of the Department of Defense (DOD).

Beneficial comments (recommendations, additions, deletions) and any pertinent data that may be of use in improving this MIL-STD should be addressed to the:

Joint Interoperability and Engineering Organization (JIEO)
ATTN: TBBF
Fort Monmouth, New Jersey 07703-5613

by using the Standardization Document Improvement Proposal (DD Form 1426) appearing at the end of this MIL-STD or by memorandum.

This MIL-STD-2045-xxxxx series DOD Standardized Profile (DSP) is a functional standard produced by the Data Communications Protocol Standards (DCPS) Technical Management Panel (DTM P). DTMP functional standards are functional groupings of base standards. Referenced base standards may be commercial, DOD or de facto standards, although International Standards (produced by ISO, CCITT, and other bodies) are preferred when possible. The MIL-STD-2045 document series was established within the DCPS Standardization Area to allow for the enhancement of commercial standards or the development of standards that are unique to DOD.

The MIL-STD-2045-10000 series, MIL-STD-2045-10000 to MIL-STD-2045-19999 inclusive, will be used to describe how DOD will implement commercial, international, national, federal, or military standards within the functional profile concept to provide required network services. The Government Open Systems Interconnection Profiles (GOSIP) will serve as the base for developing the 10000 series with DOD enhancements, unique military standards, and interim standards being used only when necessary.

The MIL-STD-2045-20000 series, MIL-STD-2045-20000 to MIL-STD-2045-29999 inclusive, will be used to describe DOD enhancements and extensions to existing commercial, international, national, or federal standards.

The MIL-STD-2045-30000 series, MIL-STD-2045-30000 to MIL-STD-2045-39999 inclusive, will be used to describe protocols and services unique to DOD that will not be supported by commercial, international, national, or federal standards.

The MIL-STD-2045-40000 series, MIL-STD-2045-40000 to MIL-STD-2045-49999 inclusive, will be used to document interim standards. Interim standards document protocols and services needed by DOD until these protocols and services are described in either a GOSIP or a MIL-STD-2045-20000 or -30000 series standard.

The MIL-STD-2045-50000 series, MIL-STD-2045-50000 to MIL-STD-2045-59999 inclusive, will be used to describe how DOD will implement commercial, international, national, federal, or military standards within the functional profile concept to provide required network services. The Government Open Systems Interconnection Profiles (GOSIP) will serve as the base for developing the 50000 series with DOD enhancements, unique military standards, and interim standards being used only when necessary. The difference between MIL-STD-2045-10000 series and the MIL-STD-2045-50000 series is that the 50000 series are interim profiles.

Specific details and instructions for establishing a MIL-STD-2045 document, as well as profile development guidelines, are documented in MIL-HDBK-829. DTMP Working Groups shall be responsible for DSP development and informal Service or Agency coordination; the DTMP Plenary shall be responsible for final review and approval.

(Describe the purpose and structure of the specific profile i.e.)

(State which annexes are normative and which are informative)

Example for annex statement:

This Part of MIL-STD-2045-XXXXX contains one normative and one informative annex:

Annex A (normative) DSPICS REQUIREMENTS LIST (DPRL).
..
..
Annex (n) (informative) CONCLUDING MATERIAL

Note: The following two paragraphs are required text:

For DOD acquisition purposes, where such differences exist, this DSP shall be the controlling document.

The Preparing Activity for this standard is the Data Communication Protocol Standards Technical Management Panel (DTMP). The custodians for the document are identified in the Defense Standardization Program, "Standardization Directory (SD-1)" and are classified in the Federal Supply Classification (FSC) system under Data Communication Protocol Standards (DCPS). Additional information can be obtained from:

Joint Interoperability and Engineering Organization
ATTN: DTMP Chairman
Ft. Monmouth, New Jersey 07703-5613

Page headers shall contain the month and year of the document, and will be centered. *(Universal, Arial, or Helvetica, 12 point)*
Example:

MIL-STD-2045-xxxxx: July 94

Contents *(Bold, Universal, Arial, or Helvetica 12pt,centered)*

(Bold, Universal, Arial, or Helvetica 12pt, full justification)

Paragraph **Page**

(Universal, Arial, or Helvetica 9pt)

Annexes

Figures

Tables

Introduction *(Bold, Universal, Arial, or Helvetica 12pt)*

text ... *(Universal, Arial, or Helvetica 9pt)*

Note: The following two paragraphs are required text (additional text is permitted):

This DOD Standardized Profile (DSP) is defined within the context of functional standardization, in accordance with the principles specified by ISO/IEC TR 10000, "Framework and Taxonomy of International Standardized Profiles" and MIL-HDBK-829. The context of functional standardization is one part of the overall field of Information Technology (IT) standardization activities - covering base standards, profiles, and registration mechanisms. A profile defines a combination of base standards that collectively perform a specific well-defined IT function. Profiles standardize the use of options and other variations in the base standards to promote system interoperability and to provide a basis for the development of uniform, internationally recognized system tests.

One of the most important roles for a DSP is to serve as the basis for the development of recognized tests. DSPs also guide implementors in developing systems that fit the needs of the US Department of Defense (DoD). DSPs are produced not simply to 'legitimize' a particular choice of base standards and options, but to promote real system interoperability. The development and widespread acceptance of tests based on this and other DSPs is crucial to the successful realization of this goal.

(Describe the purpose and structure of the specific profile)

Example:

This DSP is to provide connectionless networking services with a military security option. The DSP changes the Base Standards in the areas of Quality of Service and ER PDUs. The DSP is GOSIP compliant, however..... (provide additional text as needed).

Information Technology - DOD Standardized Profile (DSP) - TITLE, Part # *(Bold, Universal, Arial, or Helvetica 20pt)*

1 Scope *(Bold, Universal, Arial, or Helvetica 12pt)*

1.1 General *(Bold, Universal, Arial, or Helvetica 12pt)*

text... *(Universal, Arial, or Helvetica 9pt)*

1.2 Position within the taxonomy *(Bold, Universal, Arial, or Helvetica 12pt)*

text... *(Universal, Arial, or Helvetica 9pt)*

1.3 Scenario *(Bold, Universal, Arial, or Helvetica 12pt)*

text with optional figure... *(Universal, Arial, or Helvetica 9pt)*

2 References *(Bold, Universal, Arial, or Helvetica 12pt)*

(text, Universal, Arial, or Helvetica 9pt)

2.1 Government documents:

2.1.1 Specifications, standards, and handbooks.

The following specifications, standards, and handbooks form a part of this document to the extent specified herein. Unless otherwise specified, the issues of these documents are those listed in the issue of the Department of Defense Index of Specifications and Standards (DODISS) and supplement thereto, cited in the solicitation.

(The following types of publications shall be listed (as applicable) in the following order under the appropriate heading:

Federal Specifications
Military Specifications
Federal Standards
Federal Information Processing Standards
Military Standards
Military Handbooks

Example:
Military Standards

MIL-STD-2045-17501-1: *October 1993, Information technology - DOD Standardized Profiles - Message Handling Systems - Common DOD Messaging - Part 1: MHS Service Support.*

DOD activities may obtain copies of DOD directives through their own publication channels or from the DOD Single Stock Point, Standardization Document Order Desk, 700 Robbins Avenue, Building 4D, Philadelphia, PA 19111-5094. Other federal agencies and the public may purchase copies from the U.S. Department of Commerce, National Technical Information Service, 5285 Port Royal Road, Springfield, VA 22161.

Copies of Federal Information Processing Standards (FIPS) are available to Department of Defense activities from the Commanding Officer, Naval Publications and Forms Center, 5801 Tabor Avenue, Philadelphia, PA 19120-5099. Others must request copies of FIPS from the National Technical Information Services, 5285 Port Royal, Springfield, VA 22161-2171.

2.1.2 Other Government documents, drawings, and publications.

The following other Government documents, drawings, and publications form a part of this document to the extent specified herein. Unless otherwise specified, the issues are those cited in the solicitation.

Example:
ACP 123: *Common Messaging Strategy and Procedures, June 1993.*

(list the source of the documents)

2.2 Non-Government publications.

The following documents form a part of this document to the extent specified herein. Unless otherwise specified, the issues of the documents which are DOD adopted are those listed in the issue of the DODISS cited in the solication.

2.2.1 Profiles.

(list the source of the documents, for example:

Application for copies of these documents should be addressed to the American National Standards Institute, 11 West 42nd Street, NY, NY 10036 or to ISO, Van Demonstrate 94, 1013 CN Amsterdam, Netherlands.)

2.2.2 Base standards.

Example:

ISO 7498-2: 1990, *Information processing systems - Open Systems Interconnection - Basic Reference Model - Part 2: Security Architecture.*

(list the source of the documents for example:

Application for copies of these documents should be addressed to the American National Standards Institute, 11 West 42nd Street, NY, NY 10036 or to ISO, Van Demonstrate 94, 1013 CN Amsterdam, Netherlands.)

2.2.3 Other non-Government documents, drawings, and publications.

The following documents form a part of this document to the extent specified herein. Unless otherwise specified, the issues of the documents which are DOD adopted are those listed in the issue of the DODISS cited in the solication.

2.3 Order of precedence

In the event of a conflict between the text of this document and the references cited herein, the text of this document takes precedence. Nothing in this document, however, supersedes applicable laws and regulations unless a specific exemption has been obtained.

3 Definitions *(Bold, Universal, Arial, or Helvetica 12pt)*

Text ... *(Universal, Arial, or Helvetica 9pt)*

Examples:

Internet Activities Board (IAB) Standards (STD): The IAB has established this as an official standard protocol for the Internet. These protocols are assigned STD numbers.

Request For Comments (RFCs): RFC are the working notes of the "Network Working Group", that is the Internet research and development community.

4 Abbreviations and acronyms *(Bold, Universal, Arial, or Helvetica 12pt)*

Text ... *(Universal, Arial, or Helvetica 9pt)*

Examples:

IAB	Internet Architecture Board
MIB	Management Information Base
RFC	Request For Comments
STD	Standard
TCP	Transmission Control Protocol
UDP	User Datagram Protocol

5 Requirements *(Bold, Universal, Arial, or Helvetica 12pt)*

5.1 General requirements *(Bold, Universal, Arial, or Helvetica 12pt)*

Text... *(Universal, Arial, or Helvetica 9pt)*

5.2 Conformance requirements *(Bold, Universal, Arial, or Helvetica 12pt)*

Text... *(Universal, Arial, or Helvetica 9pt)*

ANNEX A (normative)

DSPICS REQUIREMENTS LIST (DPRL)

(Bold, Universal, Arial, or Helvetica 14pt)

A.1 Introduction *(Bold, Universal, Arial, or Helvetica 12pt)*

(Generic text, Universal, Arial, or Helvetica 9pt) This document provides the DOD Standardized Profile Implementation Conformance Statements (DSPICS) Requirements List (DPRL) for implementations of the DOD Standardized Profile (DSP) 2045-17503. The DSPICS for an implementation is generated by completing the DPRL in accordance with the following instructions.

An implementation shall satisfy the mandatory conformance requirements of the base standards referenced in this profile.

An implementation's completed DPRL is called the DSPICS. The DSPICS states which capabilities and options of the protocol have been implemented. The following can use the DSPICS:

(a) the protocol implementor, as a checklist to reduce the risk of failure to conform to the standard through oversight.

(b) the supplier and acquirer or potential acquirer of the implementation, as a detailed indication of the capabilities of the implementation, stated relative to the common basis for understanding provided by the standard DSPICS proforma.

(c) the user or potential user of the implementation, as a basis for initially checking the possibility of inter-working with another implementation (note that, while inter-working can never be guaranteed, failure to internetwork can often be predicted from incompatible DSPICSs).

(d) a protocol tester, as the basis for selecting appropriate tests against which to assess the claim for conformance of the implementation.

A.1.1 Notation *(Bold, Universal, Arial, or Helvetica 12pt)*

(Generic text, Universal, Arial, or Helvetica 9pt) The following notations and symbols from MIL-HDBK 829, which references ISO/IEC TR 10000-1 and -2, are used in the DPRL to indicate the status of features:

<u>Status Symbols</u>

m	- mandatory
m.<n>	- support of every item of the group labeled by the same numeral <n> required, but only one is active at a time
o	- optional
o.<n>	- optional, but support of at least one of the group of options labeled by the same numeral <n> is required
c	- conditional
-	- non-applicable (i.e. logically impossible in the scope of the profile)
x	- excluded or prohibited
i	- out of scope of profile (left as an implementation choice)

In addition, the symbol "•" is used to indicate an option whose status is not constrained by the profile (status in the base standard). The o.<n> notation is used to show a set of selectable options (i.e., one or more of the set must be implemented) with the same identifier <n>.

Two character combinations may be used for dynamic conformance requirements. In this case, the first character refers to the static (implementation) status, and the second refers to the dynamic (use); thus "mo" means "mandatory to be implemented, optional to be used."

Notations for Conditional Status

The following predicate notations are used:

<predicate>:: This notation introduces a group of items, all of which are conditional on <predicate>.

<predicate>: This notation introduces a single item which is conditional on <predicate>.

In each case, the predicate may identify a profile feature, or a boolean combination of predicates. ("^" is the symbol for logical negation.)

<index>: This predicate symbol means that the status following it applies only when the DPICS states that the features identified by the index are supported. In the simplest case, <index> is the identifying tag of a single DPICS items. The symbol <index> also may be a Boolean expression composed of several indices.

<index>:: When this group predicate is true, the associated clause should be completed.

Notations used in the Protocol Feature Column

<r> Symbol used to denote the receiving system.
<t> Symbol used to denote the transmitting system.

Support Column Symbols

The support of every item as claimed by the implementor is stated by circling the appropriate answer (Yes, No, or N/A) in the support column:

Yes Supported by the implementation.
No Not supported by the implementation.
N/A Not applicable.

Base standard requirements are shown using the equivalent notations in upper case (e.g., M, O, X).

A.1.2 Footnotes *(Bold, Universal, Arial, or Helvetica 12pt)*

(Generic text, Universal, Arial, or Helvetica 9pt) Footnotes to the proforma are indicated by superscript numerals. The footnote appears on the page of the first occurrence of the numeral. Subsequent occurrences of a numeral refer to the footnote of the first occurrence.

A.1.3 Instructions for completing the DPRL *(Bold, Universal, Arial, or Helvetica 12pt)*

(Generic text, Universal, Arial, or Helvetica 9pt) A DSP implementor shows the extent of compliance to a DSP by completing the DPRL; that is, compliance to all mandatory requirements and the options that are not supported are shown. The resulting completed DPRL is called a DSPICS. Where this profile refines the features of the base standards, the requirements expressed in this DPRL shall be applied (as indicated in DPRL items with no "Profile Support" column) to constrain the allowable responses in the base standard DPICS proforma. When this profile makes additional requirements, the "Profile Support" column for such DPRLs shall be completed. In this column, each response shall be selected either from the indicated set of responses, or it shall comprise one or more parameter values as requested. If a conditional requirement is inapplicable, use the Not Applicable (NA) choice. If a mandatory requirement is not satisfied, exception information must be supplied by entering a reference Xi, where i is a unique identifier, to an accompanying rationale for the noncompliance. When the profile requirement is expressed as a two-character combination (as defined in A.1.1 above), the response shall address each element of the requirement; e.g., for the requirement "mo," the possible compliant responses are "yy" or "yn."

A.2 Standards referenced

(List standards as they pertain, in their normally used title/number)
Example: ISO 7709
CCITT Recommendation X.25(88)

A.3 DSPICS requirements list *(Bold, Universal, Arial, or Helvetica 12pt)*

The following describes the general case. (See the following pages for the case where a single base standard, such as an existing ISP, can be modified.)

The following tables give the DPRL for ....

A.3.1 General information *(Bold, Universal, Arial, or Helvetica 12pt)*

A.3.1.1 Implementation identification *(Bold, Universal, Arial, or Helvetica 12pt)*

Lower layer table format example:

The following table presents the suggested format for lower layer profile DSPICS proforma tables. Due to the difficulty in following different base standards that use different formats, this table format may be modified to reflect any specific protocol requirements. The Base Standard must be identified.

Example:
The following tables modify those contained in ISO 7609.

Table A.3.2 Procedure (X.x.x PICS) NOTE: Where appearing, the number in parentheses refers to the Base Standard equivalent PICS table. The table numbers in the DSP and the referenced PICS may be identical in many cases.

Tables ... *(Universal, Arial, or Helvetica 8pt, Header Line Bold)*

Item	Protocol Feature	Base Standard		Profile		Supported?
		Reference	Status	Clause	Status	
	Push Flag:					
pf1	Aggregate or queue un-pushed data	6.3	O		o	Yes No
pf2	Sender collapse successive PSH flags	etc	O		m	Yes
pf3	SEND call can specify PUSH	etc	O		o	Yes No
pf4	IF cannot: sender buffer indefinitely	..	O		x	Yes No
pf5	If cannot: PSH last segment		M		m	Yes
pf6	Notify receiving ALP of PSH		O		o	Yes No
pf7	Send max size segment when possible		O		m	Yes

Application layer table format example:

The following table presents the suggested format for the application layer profile DSPICS proforma tables. This table format may be modified as needed to reflect any specific protocol requirements. Table numbering will follow the format described above.

(Universal, Arial, or Helvetica 8pt, Header Line Bold)

Item	Protocol Features	Profile		Support		Reference
		Send	Reply	Send	Reply	
1	message	m	m	Yes	Yes	
1.1	fields	m	m	Yes	Yes	
1.1.1	dates	m	m	Yes	Yes	
1.1.1.1	orig-date	m	m	Yes	Yes	
1.1.1.2	resent-date	m	m	Yes	Yes	
1.1.2	source	m	m	Yes	Yes	

Single base standard with PICS:

MIL-STDs that only need to reference a single base standard that has a PICS Proforma will specify only the differences between the base standard and the MIL-STD. The section number and table numbers in the MIL-STD will match those in the base standard. When there are no additional DOD requirements, a statement to this effect will be placed under the corresponding section in the MIL-STD. The example below demonstrates that there are no additional requirements or changes needed between Table A.1 in the base standard and Table A.1 in the MIL-STD. The MIL-STD further defines only two additional requirements or changes needed between table A.2 in the base standard and table A.2 in the MIL-STD.

Example:

Annex (X) (Normative)

Elements of Service

(Bold Universal, Arial, or Helvetica 14pt)

(Generic Text, Universal, Arial, or Helvetica 9pt) In the event of a discrepancy becoming apparent in the body of this part of MIL-STD-2045-XXXXX and the tables in this annex, this annex is to take precedence. Only the EoS differences between the Base Standard (ISO/IEC 10611-1) and this MIL-STD are listed.

A.1 MT elements of service *(Bold Universal, Arial, or Helvetica 12pt)*

(Generic Text, Universal, Arial, or Helvetica 9pt) In the following tables, the "Basic" column reflects the basic requirements for conformance to this part of MIL-STD-2045-XXXXX i.e. the minimum level of support required by all MHS implementations (see clause 6). The "Functional Group" column specifies any additional support requirements if support of an optional functional group is claimed (see clause 7). Each column is then further subdivided into support for origination ("Orig"), processing ("Proc") and reception ("Rec") as defined in 3.2, together with the abbreviated name of the functional group ("FG") in the + case of the second column. The origination and reception columns are further subdivided to distinguish the support required for an MTA from that for an MTS-user (the latter refers only to the use of MT services, not whether such services are made available to the MHS user, and may be further qualified in a content type-dependent profile).

Table A.1- Elements of Service Belonging to The Basic MT Service *(Bold Universal, Arial, or Helvetica 12pt)*

(Generic Text, Universal, Arial, or Helvetica 9pt) No additional requirements

Table A.2 - MT Service Optional User Facilities *(Bold Universal, Arial, or Helvetica 12pt)*

(Table elements, Universal, Arial, or Helvetica 8pt)

Element of Service	Basic					Functional Group					
	Orig.		Proc.	Rec.		FG	Orig.		Proc.	Rec.	
	MTS -user	MTA		MTA	MTA -user		MTA	MTA -user		MTA	MTA - user
Probe	x	x	x1	-							
Return of content	x	x	x	-	-	RoC					

1 Note: Reception of Probe at the MTA will be logged as a security violation and no delivery or non-delivery report will be returned.

ANNEX N (informative)

Title: CONCLUDING MATERIAL

(Generic text, Universal, Arial, or Helvetica 9pt, paragraph titles, 12 pt bold)

B.1 Deviations from Base Standards/Referenced Profiles (if needed)

Note: This section must describe the areas that the DSP deviates from the Base Standards/Referenced Profile. It should be in both tabular format to provide a cross-index between all referenced documents as well as text that provides the rationale for the deviations.

B.2 Subject Term (Key word) Listing. (Can be up to 25 words)

Communication Protocol Standards
Data Communications
Functional Profiles
Interoperability
Network
Relay
Standards
Transport

B.3 Preparing Activity

DISA-JIEO (Project DTMP-0004)

B.4 Reviewing Activities

Army:	SC
Air Force:	90
DLA:	DH

B.5 Custodians

DISA:	DC
Army:	SC
Air Force:	90

STANDARDIZATION DOCUMENT IMPROVEMENT PROPOSAL

INSTRUCTIONS

1. The preparing activity must complete blocks 1,2, 3, and 8. In block 1, both the document number and revision letter should be given.
2. The submitter of this form must complete blocks 4, 5, 6, and 7.
3. The preparing activity must provide a reply within 30 days from receipt of the form.

NOTE: This form may not be used to request copies of documents, nor to request waivers, or clarification of requirements on current contracts. Comments submitted on this form do not constitute or imply authorization to waive any portion of the referenced document(s) or to amend contractual requirements.

I RECOMMEND A CHANGE:	1. DOCUMENT NUMBER MIL-STD-2045-14501-1	2. DOCUMENT DATE *(YYMMDD)* 940701

3. DOCUMENT TITLE Information Technology - DOD Standardized Profiles - CLTS OVER CLNS - Part 1: Simplex

4. NATURE OF CHANGE *(Identify paragraph number and include proposed rewrite, if possible. Attach extra sheets as needed.)*

5. REASON FOR RECOMMENDATION

6. SUBMITTER

a. NAME *(Last, First, Middle Initial)*	b. ORGANIZATION	
c. ADDRESS *(Include Zip Code)*	d. TELEPHONE *(Include Area Code)* (1) Commercial (2) DSN *(If applicable)*	7. DATE SUBMITTED *(YYMMDD)*

8. PREPARING ACTIVITY DEFENSE INFORMATION SYSTEMS AGENCY (DISA)

a. NAME	b. TELEPHONE *(Include Area Code)*
Rose D. Satz	(1) Commercial (908)532-7732 (2)992-7732
c. ADDRESS *(Include Zip Code)* Director JIEO Attn: TBBF Squier Hall Ft. Monmouth, NJ 07703-5613	**IF YOU DO NOT RECEIVE A REPLY WITHIN 45 DAYS, CONTACT:** Defense Quality and Standardization Office 5203 Leesburg Pike, Suite 1403, Falls Church, VA 22041-3466 Telephone (703) 756-2340 DSN289-2340

CONCLUDING MATERIAL

Custodians:

DISA:	DC
Army:	SC
Air Force:	90
Navy:	OM
DIA:	DI
NSA:	NS
USMC:	MC
DLA:	DH

Preparing Activity:

Defense Information Systems Agency (DISA) - DC

Review Activities

Army:	SC
Air Force:	02,13,17,29,90
DLA:	DH
OASD:	IQ,DO,MA,IR
NSA:	NS
USMC:	MC
DLA:	DH
ODISC4:	AC
NAVY:	EC,OM
USMC:	MC,CG

STANDARDIZATION DOCUMENT IMPROVEMENT PROPOSAL

INSTRUCTIONS

1. The preparing activity must complete blocks 1,2, 3, and 8. In block 1, both the document number and revision letter should be given.
2. The submitter of this form must complete blocks 4, 5, 6, and 7.
3. The preparing activity must provide a reply within 30 days from receipt of the form.

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I RECOMMEND A CHANGE:	1. DOCUMENT NUMBER MIL-HDBK-829A	2. DOCUMENT DATE *(YYMMDD)* 940901

3. DOCUMENT TITLE **Guidelines for Developing Data Communications Protocol Standards**

4. NATURE OF CHANGE *(Identify paragraph number and include proposed rewrite, if possible. Attach extra sheets as needed.)*

5. REASON FOR RECOMMENDATION

6. SUBMITTER

a. NAME *(Last, First, Middle Initial)*	b. ORGANIZATION	
c. ADDRESS *(Include Zip Code)*	d. TELEPHONE *(Include Area Code)* (1) Commercial (2) DSN *(If applicable)*	7. DATE SUBMITTED *(YYMMDD)*

8. PREPARING ACTIVITY **DEFENSE INFORMATION SYSTEMS AGENCY (DISA)**

a. NAME	b. TELEPHONE *(Include Area Code)*
Rose D. Satz	(1) Commercial (908)532-7732 (2) DSN 992-7732
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DD Form 1426, OCT 89 previous *editions are obsolete*.198-290