FAA-STD-047 -DCN 1
December 29, 1993

U.S. Department
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**Standard**

# NATIONAL AIRSPACE SYSTEM (NAS)
# OPEN SYSTEMS INTERCONNECTION (OSI) CONFORMANCE TESTING

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# DOCUMENT CHANGE NOTICE

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| 1. Originator Name and Address<br>SEIC<br>Washington, DC | 2. [ ] Proposed<br>[X] Approved | 3. Code Identification<br>N/A<br>5. Code Identification<br>N/A | 4. Standard No.<br>FAA-STD-047<br>6. DCN No.<br>1 |
| 7. System Designation<br>NAS | 8. Related ECR/NCP No.<br>see #14 | 9. Contract No.<br>DTFA01-84-C-00017 | 10. Contractual Activity<br>N/A |
| 11. Configuration Item Nomenclature<br>NAS Open Systems Interconnection (OSI) Conformance Testing, FAA-STD-047 | | 12. Effectivity<br>N/A | |

This notice informs recipients that the standard identified by the number (and revision letter) shown in block 4 has been changed. The pages changed by this DCN (being those furnished herewithin) carry the same date as the DCN. The page numbers and dates listed below in the summary of changed pages, combined with nonlisted pages of the original issue of the revision shown in block 4, constitute the current version of this specification.

| 13. DCN No. | 14. Pages changed | S* | A/D* | 15. Date |
|---|---|---|---|---|
| 1 | NCP 16173 baselines this standard.. | | A | 12/29/93 |

*S = Indicates Supercedes Earlier Pages *A = Indicates Added Page * D = Indicates Deleted Page

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# FOREWORD

This standard establishes requirements necessary for ensuring the compliance of National Airspace Systems (NAS) open systems to Open Systems Interconnection (OSI) requirements specified in FAA-STD-039a (or latest revision). Open system Interfaces employed within the NAS must be certified implementations of communication protocols that comply with the International Organization for Standardization (ISO) OSI standards, as well as the Government Open Systems Interconnection Profile (GOSIP), FIPS PUB 146-1.

This standard includes definitions in section 6.1 and is written in accordance with FAA-STD-005.

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# 1. SCOPE

1.1 Scope. This standard provides the requirements for ensuring that vendor–supplied Open Systems Interconnection (OSI) products conform to the NAS OSI requirements specified in FAA–STD–039a (or latest revision).

Conformance testing requirements for NAS open systems which communicate via the Aeronautical Telecommunication Network (ATN) are contained in the ATN manual.

1.2 Purpose. The purpose of this standard is to establish conformance testing requirements and to ensure OSI compliance for NAS open systems. Conformance testing does not guarantee interoperability, but is designed to increase the probability that different vendor implementations of OSI products are interoperable. Successful communications among NAS open systems is more likely if all systems conform to the same standards.

1.3 Relationship to Other Documents. This document provides requirements for testing the conformance of the protocols specified in FAA–STD–039a (or latest revision).

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## 2. APPLICABLE DOCUMENTS

2.1 Government Documents. The following documents form a part of this standard to the extent specified herein. In the event of conflict between the documents referenced herein and the contents of this standard, the contents of this standard shall be considered the superseding requirement.

FAA Standards

| | |
|---|---|
| FAA-STD-039 | National Airspace System (NAS) Open Systems Architecture and Protocols |

Federal Standards

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| FIPS PUB 146-1 | Government Open Systems Interconnection Profile (GOSIP), Version 2.0 |
| GOSIP PICS Proforma 6 | US GOSIP Protocol Implementation Conformance Statement Proforma for Transport Class 0 and 4 Protocols (ISO 8073), March 1992 |
| GOSIP PICS Proforma 1 | US GOSIP Protocol Implementation Conformance Statement Proforma for Packet Layer (ISO 8208), March 1992 |
| GOSIP PICS Proforma 3 | US GOSIP Protocol Implementation Conformance Statement Proforma for Connectionless Network Layer Protocol (ISO 8473), March 1992 |
| NISTIR 4594 | GOSIP Conformance and Interoperation Testing and Registration, version 1, March 1991 |

2.2 Non-Government Documents. The following documents form a part of this standard to the extent specified herein. In the event of conflict between the documents referenced herein and the contents of this standard, the contents of this standard shall be considered the superseding requirement.

Electronic Industries Association (EIA)

| | |
|---|---|
| EIA-232D | Interface Between Data Terminal Equipment and Data Circuit Terminating Equipment Employing Serial Binary Data Interchange |
| EIA-232E | Interface Between Data Terminal Equipment and Data Circuit Terminating Equipment Employing Serial Binary Data Interchange |
| EIA-530 | High-Speed 25-position Interface for Data Terminal Equipment and Data Circuit and Data Circuit Terminating Equipment |

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| RS-232C | Interface Between Data Terminal Equipment and Data Circuit Terminating Equipment Employing Serial Binary Data Interchange |

International Telegraph and Telephone Consultative Committee (CCITT)

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| CCITT V.32 | A family of 2-wire, Duplex Modems Operating at Data Signaling Rates of up to 9600 Bit/s for Use on the General Switched Telephone Network and on Leased Telephone-Type Circuits |
| CCITT V.35 | Data Transmission at 48 Kilobits per Second Using 60-108 kHz Group Band Circuits |
| CCITT X.25 | Interface Between Data Terminal Equipment (DTE) and Data Circuit Terminating Equipment (DCE) for Terminals operating in the Packet Mode on Public Data Networks, 1984 |
| CCITT X.32 | Interface Between Data Terminal Equipment (DTE) and Data Circuit Terminating Equipment (DCE) for Terminals Operating in the Packet Mode and Accessing a Packet Switched Public Data Network through a Public Switched Telephone Network or a Circuit Switched Public Data Network, 1984 |

International Organization for Standardization (ISO)

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|---|---|
| ISO 4335:1987 | Information Processing Systems - Data Communication - High-Level Data link Control (HDLC) Elements of Procedures, 3rd Edition |
| ISO 7478:1987 | Information Processing Systems - Data Communication - Multi-link Procedures, 1st Edition |
| ISO 7776:1986 | Information Processing Systems - Data Communication - High-Level Data Link Control Procedures - Description of the X.25 LAPB- Compatible DTE Data Link Procedures, 1st Edition |
| ISO 7776:1986/ AM1:1992 | Information Processing Systems - Data Communication - High-Level Data Link Control Procedures - Description of the X.25 LAPB -Compatible DTE Data Link Procedures - Amendment 1: PICS Proforma |
| ISO/IEC 8073:1988 | Information Processing Systems - Open Systems Interconnection - Connection-Oriented Transport Protocol Specification, 2nd Edition |

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| ISO/IEC 8073:1988/ AD2:1989 | Information Processing Systems – Open Systems Interconnection – Connection–Oriented Transport Protocol Specification – Addendum 2: Class Four Operation over Connectionless Network Service |
| ISO/IEC 8208:1990 | Information Technology – Data Communications – X.25 Packet Layer Protocol for Data Terminal Equipment, Version 2 |
| ISO 8327:1987 | Information Processing Systems – Open Systems Interconnection – Basic Connection–Oriented Session Protocol Specification, 1st Edition |
| ISO 8327/DAD2 | Information Processing Systems – Open Systems Interconnection – Basic Connection–Oriented Session Protocol Specification – Addendum 2: Incorporation of Unlimited User Data, June 1988 |
| CD 8327–2.2 | Information Technology – Open Systems Interconnection – Basic Connection–Oriented Session Protocol Specification – Part 2: Protocol Implementation Conformance Statement (PICS) Proforma, September 1991 |
| ISO 8473:1988 | Information Processing Systems – Data Communications – Protocol for Providing the Connectionless–Mode Network Service (CLNS), 1st Edition |
| ISO 8473:1988/ AD3:1989 | Information Processing Systems – Data Communications – Protocol for Providing the Connectionless–Mode Network Service – Addendum 3: Provision of the Underlying Service Assumed by ISO 8473 over Subnetworks Which Provide the OSI Data Link Service, 1st Edition |
| ISO/IEC 8571–4:1988 | Information Processing Systems – Open Systems Interconnection – File Transfer, Access, and Management – Part 4: File Protocol Specification, 1st Edition |
| ISO/IEC 8571–5:1990 | Information Technology – Open Systems Interconnection – File Transfer, Access, and Management – Part 5: Protocol Implementation Conformance Statement (PICS) Proforma |
| ISO 8650:1988 | Information Processing Systems – Open Systems Interconnection – Protocol Specification for the Association Control Service Element, 1st Edition |
| DIS 8650–2 | Information technology – Open Systems Interconnection – Protocol Specification for the Association Control Service Element – Part 2: Protocol Implementation Conformance Statement Proforma (PICS), June 1990 |

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| ISO/IEC 8802-2:1989 | Information Processing Systems – Local Area Networks – Part 2: Logical Link Control, 1st Edition |
| ISO/IEC 8802-2/PDAM3.3 | Information processing Systems – Local Area Networks – Part 2: Logical Link Control – Amendment 3: Conformance Requirements, August 1992 |
| ISO/IEC 8802-3:1992 | Information Processing Systems – Local Area Networks – Part 3: Carrier Sense Multiple Access with Collision Detection (CSMA/CD) Access Method and Physical Layer Specifications, 2nd Edition |
| ISO/IEC 8802-4:1990 | Information Processing Systems – Local Area Networks – Part 4: Token-Passing Bus Access Method and Physical Layer Specifications, 1st Edition |
| ISO/IEC 8802-5:1992 | Information Processing Systems – Local Area Networks – Part 5: Token Ring Access Method and Physical Layer Specification, 1st Edition |
| ISO/IEC 8823:1988 | Information Processing Systems – Open Systems Interconnection – Connection-Oriented Presentation Protocol Specification, 1st Edition |
| DIS 8823-2 | Information Technology – Open Systems Interconnection – Connection-Oriented Presentation Protocol Specification – Part 2: Protocol Implementation Conformance Statement (PICS) Proforma, June 1990 |
| ISO/IEC 8878:1987 | Information Processing Systems – Data Communications – Use of X.25 to Provide the OSI Connection-mode Network Service (CONS), 1st Edition |
| DIS 8878-2 | Information Technology– Telecommunications and Information Exchange Between Systems – Use of X.25 to Provide the OSI Connection- mode Network Service – Part 2: Protocol Implementation Conformance Statement (PICS), October 1991 |
| ISO/IEC 8880-2:1988 | Information Processing Systems – Protocol Combinations to Provide and Support the OSI Network Service – Part 2: Provision and Support of the Connection-Mode Network Service, 1st Edition |
| ISO/IEC 9041-1:1990 | Information technology– Open Systems Interconnection – Virtual Terminal Basic Class Protocol – Part 1: Specification, 1st Edition |

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| DIS 9041–2 | Information technology – Open Systems Interconnection – Basic Class Virtual Terminal Protocol – Part 2: Protocol Implementation Conformance Statement (PICS) Proforma, April 1991 |
| ISO/IEC 9072–2:1989 | Information Processing Systems – Text Communication – Remote Operations – Part 2: Protocol Specification, 1st Edition |
| ISO 9314–1:1989 | Information Processing Systems – Fibre–Distributed Data Interface (FDDI) – Part 1: Physical Layer Protocol (PHY), 1st Edition |
| WD 9314–13 | Information Technology– Fibre–Distributed Data Interface (FDDI) – Part 13: FDDI Conformance Testing, Protocol Implementation Conformance Statement (PICS) |
| ISO/IEC 9542:1988 | Information Processing Systems – Telecommunications and Information Exchange Between Systems– End System to intermediate System Routeing Exchange Protocol for Use in Conjunction with the Protocol for Providing the Connectionless–mode Network Service |
| ISO/IEC 9646–1:1991 | Information Technology – Open Systems Interconnection – Conformance Testing Methodology and Framework – Part 1: General Concepts |
| ISO/IEC 9646–1 DAM 1 | Information Technology – Open Systems Interconnection – Conformance Testing Methodology and Framework – Part 1: General Concepts – Draft Amendment 1: Protocol Profile Testing Methodology, November 1992 |
| ISO/IEC 9646–1 DAM 2 | Information Technology – Open Systems Interconnection – Conformance Testing Methodology and Framework – Part 1: General Concepts – Draft Amendment 2: Multi–Party Testing Methodology, November 1992 |
| ISO/IEC 9646–2:1991 | Information Technology – OSI Conformance Testing Methodology and Framework – Part 2: Abstract Test Suite Specification |
| ISO/IEC 9646–2 DAM 1 | Information Technology – Open Systems Interconnection – Conformance Testing Methodology and Framework – Part 2: Abstract Test Suite Specification – Draft Amendment 1: Protocol Profile Testing Methodology, November 1992 |

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| ISO/IEC 9646-2 DAM 2 | Information Technology – Open Systems Interconnection – Conformance Testing Methodology and Framework – Part 2: Abstract Test Suite Specification – Draft Amendment 2: Multi-party Conformance Testing Methodology, November 1992 |
| DIS 9646-3 | Information Technology – OSI Conformance Testing Methodology and Framework – Part 3: The Tree And Tabular Combined Notation (TTCN), March 1990 |
| DIS 9646-3 PDAM 1 | Information Technology – OSI Conformance Testing Methodology and Framework – Part 3: TTCN – Proposed Draft Amendment 1: TTCN Extensions, January 1992 |
| ISO/IEC 9646-4:1991 | Information Technology – OSI Conformance Testing Methodology and Framework – Part 4: Test Realization |
| ISO/IEC 9646-4:DAM 1 | Information Technology – OSI Conformance Testing Methodology and Framework – Part 4: Test Realization – Draft Amendment 1: Protocol Profile Testing Methodology, November 1992 |
| ISO/IEC 9646-4:PDAM 2 | Information Technology – OSI Conformance Testing Methodology and Framework – Part 4: Test Realization – Draft Amendment 2: Multi- Party Conformance Testing Methodology, November 1992 |
| ISO/IEC 9646-5:1991 | Information Technology – Open Systems Interconnection – Conformance Testing Methodology and Framework – Part 5: Requirements on Test Laboratories and Clients for the Conformance Assessment Process |
| ISO/IEC 9646-5 DAM 1 | Information Technology – Open Systems Interconnection – Conformance Testing Methodology and Framework – Part 5: Requirements on Test Laboratories and Clients for the Conformance Assessment Process – Draft Amendment 1: Protocol profile Testing Methodology and Multi-Protocol Testing, November 1992 |
| ISO/IEC 9646-5 DAM 2 | Information Technology – Open Systems Interconnection – Conformance Testing Methodology and Framework – Part 5: Requirements on Test Laboratories and Clients for the Conformance Assessment Process – Draft Amendment 2: Multi-Party Testing Methodology, November 1992 |
| DIS 9646-6 | Information Technology – Open Systems Interconnection – Conformance Testing Methodology and Framework – Part 6: Protocol Profile Test Specification, October 1992 |

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| CD 9646–7 | Information Technology – Open Systems Interconnection – Conformance Testing Methodology and Framework – Part 7: Implementation Conformance Statements – Requirements and guidance on ICS and ICS proformas, November 1992 |
| ISO/IEC 10021–6:1990 | Information Technology – Text Communication – Message–Oriented Text Interchange System – Part 6: Protocol Specifications, 1st Edition |
| DIS 10026–3.2 | Information Technology – Open Systems Interconnection – Distributed Transaction Processing – Part 3: Protocol Specification, November 1991 |
| CD 10026–4.2 | Information Technology – Open Systems Interconnection – Distributed transaction Processing – Part 4: Protocol Implementation Conformance Statement (PICS) Proforma, October 1991 |
| WD 10169–2 | Information Technology – Open Systems Interconnection – Conformance Test Suite for the Protocol Specification of ACSE – Part 2: Common ACSE Abstract Test Suite |
| ISO/IEC 10589:1991 | Information Technology – Telecommunication and Information Exchange Between Systems – Intermediate System (IS) to IS Intra–Domain Routeing Information Exchange Protocol for Use in Conjunction With the Protocol for Providing the Connectionless–Mode Network Service (ISO 8473) |
| DIS 10747 | Information Technology – Telecommunications and Information Exchange Between Systems – Protocol for Exchange of Inter–Domain Routeing Information among Intermediate Systems to Support Forwarding of ISO 8473 PDUs, August 1992 |

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# 3. REQUIREMENTS

3.1 General Requirements. NAS open systems shall conform to International Organization for Standardization (ISO) standards, as well as FIPS PUB 146-1, Government Open Systems Interconnection Profile (GOSIP) as specified in FAA-STD-039.

Conformance testing of vendor-developed Open Systems Interconnection (OSI) products shall be accomplished by the methodology specified in ISO/IEC 9646, (Parts 1 to 7). Conformance testing shall be performed by accredited testing agencies in accordance with the policies specified in the GOSIP Conformance and Interoperation Testing and Registration document, NISTIR 4594. The means of testing (MOT) used to determine the compliance of the system under test (SUT), shall be accredited by the National Institute of Standards and Technology (NIST) Computer Systems Laboratory (NCSL) or its agent. The MOT shall be based on an abstract test suite (ATS) approved by NCSL (i.e., GOSIP ATS). If such an ATS is not available, then an approved ISO ATS shall be used. If neither a GOSIP or ISO ATS exist, then the vendor-provided MOT shall be approved by the FAA.

Conformance testing of vendor-provided commercial off-the-shelf (COTS) OSI products shall be verified through GOSIP registration.

3.2 Protocol Specific Requirements. This section contains specific requirements for ensuring the compliance of vendor-provided OSI protocols to NAS OSI requirements.

3.2.1 Upper Layers.

3.2.1.1 Application Layer. NAS open end systems use common application service elements (ASE) to provide application layer services common to user applications. These ASEs include association control service element (ACSE) and remote operations service element (ROSE). NAS open end systems may select from several specific ASEs to satisfy particular open end systems requirements. These ASEs include file transfer, access and management (FTAM), message handling system (MHS), transaction processing, (TP), and virtual terminal (VT).

3.2.1.1.1 Association Control Service Element (ACSE). NAS open end systems implement the ACSE protocol as specified in ISO 8650. The MOT used for testing the conformance of ACSE shall be based on the generic ATS for ACSE as specified by WD 10169-2, Common ACSE Abstract Test Suite. Implementors claiming ACSE conformance shall complete DIS 8650-2, Annex A, Protocol implementation Conformance Statement (PICS) Proforma.

3.2.1.1.2 Remote Operations Service Element (ROSE). NAS open end systems implement the ROSE protocol as specified in ISO 9072-2. Currently, neither a registered generic abstract test suite or PICS Proforma exists for ROSE. Therefore, the vendor-provided MOT and PICS Proforma for ROSE shall be approved by the FAA.

3.2.1.1.3 File Transfer Access and Management (FTAM). NAS open end systems implement the FTAM protocol as specified in ISO 8571-4. The MOT used for testing the conformance of FTAM shall be based on GOSIP FTAM abstract test suite, ATS 2-16. Implementors claiming FTAM conformance shall complete ISO 8571-5, PICS Proforma.

3.2.1.1.4 Message Handling System (MHS). NAS open end systems implement the MHS protocol as specified in ISO 10021-6. Currently, neither a registered abstract test suite or PICS Proforma exists for MHS (1988). Therefore, the vendor-provided MOT and PICS Proforma for MHS (1988) shall be approved by the FAA.

3.2.1.1.5 Transaction Processing (TP). NAS open end systems implement the TP protocol as specified in DIS 10026-3.2. Currently, a registered abstract test suite for testing TP does not exist. Therefore, the vendor-provided MOT for testing TP shall be approved by the FAA. Implementors claiming TP conformance shall complete CD 10026-4.2, PICS Proforma.

3.2.1.1.6 Virtual Terminal (VT). NAS open end systems implement the VT protocol as specified in ISO 9041-1. Currently, a registered abstract test suite for testing VT does not exist. Therefore, the vendor-provided MOT for testing VT shall be approved by the FAA. Implementors claiming VT conformance shall complete DIS 9041-2, PICS Proforma.

3.2.1.2 Presentation Layer. NAS open end systems implement the connection-oriented presentation protocol as specified in ISO 8823. Currently, a registered generic abstract test suite for testing the presentation protocol does not exist. Therefore, the vendor-provided MOT for testing the presentation protocol shall be approved by the FAA. Implementors claiming presentation protocol conformance shall complete DIS 8823-2, PICS Proforma.

3.2.1.3 Session Layer. NAS open end systems implement the connection-oriented session protocol specification as specified in ISO 8327 and ISO 8327/DAD2. The MOT used for testing the conformance of the session protocol shall be based on the generic GOSIP session abstract test suite, ATS 2-10. Implementors claiming session protocol conformance shall complete CD 8327-2.2, PICS Proforma.

3.2.2 Lower Layers.

3.2.2.1 Transport Layer. NAS open end systems implement the connection-oriented transport protocol as specified in ISO 8073 and ISO 8073/AD2. The MOT used for testing the conformance of the transport class 0 protocol shall be based on GOSIP transport abstract test suite, ATS 2-8. The MOT used for testing the conformance of the transport class 4 protocol shall be based on GOSIP transport abstract test suite, ATS 2-9. Implementors claiming transport protocol conformance shall complete GOSIP Version 2 PICS Proforma for Transport Class 0 and 4 Protocols (ISO 8073).

3.2.2.2 Network Layer.

3.2.2.2.1 Network Layer Protocol.

3.2.2.2.1.1 Connectionless Network Protocol. NAS open end systems implement the protocols for connectionless-mode network protocol (CLNP) as specified in ISO 8473 and ISO 8473/AD3. The MOT used for testing the conformance of CLNP shall be based on GOSIP CLNP abstract test suite, ATS 2-7. Implementors claiming connectionless network protocol conformance shall complete GOSIP version 2 PICS Proforma for connectionless network layer protocol (ISO 8473).

3.2.2.2.1.1.1 End System to Intermediate System Routing Protocol. NAS open systems (e.g., end systems and routers) use the end system to intermediate system (ES-IS) protocol as specified in ISO 9542. Currently, a registered abstract test suite for testing ES-IS does not exist. Therefore, the vendor-provided MOT for testing ES-IS shall be approved by the FAA. Implementors claiming ES-IS protocol conformance shall complete ISO 9542, Annex A, PICS Proforma.

3.2.2.2.1.1.2 Intermediate System to Intermediate System Intra-Domain Routing Protocol. NAS open intermediate systems (e.g., routers), which provide routing within the NAS, use the intermediate system to intermediate system (IS-IS) protocol as specified in ISO 10589. Currently, a registered abstract test suite for testing IS-IS does not exist. Therefore, the vendor-provided MOT for testing IS-IS shall be approved by the FAA. Implementors claiming IS-IS protocol conformance shall complete ISO 10589, Annex A, PICS Proforma.

3.2.2.2.1.1.3 Boundary Intermediate System to Boundary Intermediate System Inter-Domain Routing Protocol. NAS open boundary intermediate systems (e.g., routers), use the boundary intermediate system to boundary intermediate system (BIS-BIS) protocol as specified in DIS 10747. Currently, a registered abstract test suite for testing BIS-BIS does not exist. Therefore, the vendor-provided MOT for testing BIS-BIS shall be approved by the FAA. Implementors claiming BIS-BIS protocol conformance shall complete DIS 10747, Annex A, PICS Proforma.

3.2.2.2.1.2 Connection-oriented Network Protocol. NAS open end systems which require a network connection when communicating over intermediary networks and not directly connected to a X.25 packet switching network, implement the connection-oriented network service (CONS) in conjunction with ISO 8473, as specified in ISO 8880-2. Currently, neither a registered ATS or PICS Proforma exists for ISO 8880-2. Therefore, the vendor provided MOT and PICS Proforma for ISO 8880-2 shall be approved by the FAA.

NAS open end systems communicating only over a single X.25 network (i.e., no intermediary networks) implement CONS in conjunction with ISO 8208, as specified in ISO 8878. Currently, a registered abstract test suite does not exist for testing ISO 8878. Therefore, the vendor-provided MOT for testing ISO 8878 shall be approved by the FAA. Implementors claiming conformance shall complete DIS 8878-2, PICS Proforma.

3.2.2.2.2 Subnetwork Access Protocol. NAS open end systems communicating over wide area networks (WAN) implement the subnetwork access protocol for data terminal equipment (DTE) interfaces as specified in FAA-STD-039a and defined in ISO 8208.

Intermediate systems (e.g., routers) providing DTE internetwork access for open end systems implement the subnetwork access protocol as defined in ISO 8208. The MOT for testing ISO 8208 shall be based on GOSIP abstract test suite, ATS 2-2. Implementors claiming conformance shall complete GOSIP Version 2 PICS Proforma for Packet Layer (ISO 8208).

Intermediate systems (i.e., packet switching nodes) providing WAN subnetwork access to open end systems implement the subnetwork access protocol for data circuit-terminating equipment (DCE) defined in CCITT X.25 (1984). Currently, neither a registered abstract test suite or PICS Proforma exists for CCITT X.25 (1984) for DCE interfaces. Therefore, the vendor-provided MOT and PICS Proforma for DCE CCITT X.25 (1984) interfaces shall be approved by the FAA.

3.2.2.3 Data Link Layer.

3.2.2.3.1 ISO 4335. NAS open systems implement high-level data link control (HDLC) protocol as specified in ISO 4335. Currently, neither a registered abstract test suite or PICS Proforma exists for ISO 4335. Therefore, the vendor-provided MOT and PICS Proforma shall be approved by the FAA.

3.2.2.3.2 CCITT X.25 LAPB. NAS open systems which provide subnetwork access implement DCE Link Access Procedure for Balance (LAPB) system as specified in CCITT X.25 (1984). Currently, neither a registered abstract test suite or PICS Proforma exists for CCITT X.25 LAPB. Therefore, the vendor-provided MOT and PICS Proforma for testing CCITT X.25 LAPB shall be approved by the FAA.

3.2.2.3.3 ISO 7776. NAS open systems provide a compatible LAPB interface as specified in ISO 7776. The MOT used for testing the conformance to ISO 7776 protocol shall be based on GOSIP abstract test suite, ATS 2-1. Implementors claiming protocol conformance shall complete ISO 7776/AM1, PICS Proforma.

3.2.2.3.4 ISO 7478 (Multilink Procedure). NAS open end systems implement the multi-link procedure (MLP) as specified in ISO 7478. Currently, neither a registered abstract test suite or PICS Proforma exists for ISO 7478. Therefore, the vendor-provided MOT and PICS Proforma for ISO 7478 shall be approved by the FAA.

Intermediate systems which provide subnetwork access implement multi-link procedures as specified in CCITT X.25 (1984). Currently, neither a registered abstract test suite or PICS Proforma exists for CCITT X.25 (1984) Multi-link Procedure. Therefore, the vendor-provided MOT and PICS Proforma for CCITT X.25 (1984) Multi-link Procedure shall be approved by the FAA.

3.2.2.3.5 CCITT X.32. NAS open systems implement dial-in/dial-out services and procedures as specified in CCITT X.32. Currently, neither a registered abstract test suite or PICS Proforma exists for CCITT X.32. Therefore, the vendor-provided MOT and PICS Proforma for CCITT X.32 shall be approved by the FAA.

3.2.2.3.6 ISO 8802-2. NAS open systems implement logical link control (LLC) as specified in ISO 8802-2. The MOT used for testing the conformance to ISO 8802-2 protocol shall be based on GOSIP abstract test suite, ATS 2-6. Implementors claiming LLC protocol conformance shall complete ISO 8802-2/PDAM3.3, PICS Proforma.

3.2.2.4 Physical Layer. NAS open systems implement EIA-530, EIA-232D, EIA-232E, RS-232C, V.35, V.32, ISO 8802-3, ISO 8802-4, and ISO 8802-5, and ISO 9314-1 (FDDI) as specified in FAA-STD-039a.

EIA-530, EIA-232D, EIA-232E, RS-232C, V.35, and V.32 functions and options shall be tested with standard data communication test equipment.

3.2.2.4.1 ISO 8802-3. NAS open end systems use a collision detection access protocol as specified in ISO 8802-3. The MOT used for testing the conformance to ISO 8802-3 protocol shall be based on GOSIP abstract test suite, ATS 2-3. Currently, a PICS Proforma does not exist for this protocol. Therefore, the vendor-provided protocol for ISO 8802-3 shall be approved by the FAA.

3.2.2.4.2 ISO 8802-4. NAS open end systems use a token passing protocol suitable for broadband bus architectures as specified in ISO 8802-4. The MOT used for testing the conformance to ISO 8802-4 protocol shall be based on GOSIP abstract test suite, ATS 2-4. Currently, a PICS Proforma does not exist for this protocol. Therefore, the vendor-provided protocol for ISO 8802-4 shall be approved by the FAA.

3.2.2.4.3 ISO 8802-5. NAS open end systems use a token passing protocol suitable for ring architectures as specified in ISO 8802-5. Currently, a registered abstract test suite for testing the conformance of ISO 8802-5 protocol does not exist. Therefore, the vendor-provided MOT for testing ISO 8802-5 protocol shall be approved by the FAA. Implementors claiming protocol conformance shall complete ISO 8802-5, PICS Proforma.

3.2.2.4.4 ISO 9314-1 (FDDI). NAS open end systems will use a connectionless token passing protocol as specified in ISO 9314-1. Currently, a registered abstract test suite for testing the conformance of ISO 9314-1 protocol does not exist. Therefore, the vendor-provided MOT for testing ISO 9314-1 protocol shall be approved by the FAA. Implementors claiming protocol conformance shall complete WD 9314-13, PICS Proforma.

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## 4. QUALITY ASSURANCE PROVISIONS

This section is not applicable to this standard.

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## 5. PREPARATION FOR DELIVERY

This section is not applicable to this standard.

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# 6. NOTES

## 6.1 Definitions.

Abstract Test Case – A complete and independent specification of the actions required to achieve a specific test purpose (or a specified combination of test purposes), defined at the level of abstraction of a particular abstract test method, starting in a stable testing state and ending in a stable testing state. This specification may involve one or more consecutive or concurrent connections.

Abstract Test Method – The description of how an IUT is to be tested, given at an appropriate level of abstraction to make the description independent of any particular realization of a means of testing, but with enough detail to enable tests to be specified for this method.

Abstract Test Suite – The complete set of abstract test cases needed to perform dynamic conformance testing for a given OSI protocol.

Conformance – Fulfillment by a product of all specified requirements.

Conformance Testing – Testing the extent to which an IUT is a conforming implementation.

End System – An end system contains the application processes that are the ultimate sources and destinations of user–oriented message flows. The functions of an end system can be distributed among more than one processor/computer.

Executable Test Case – A realization of an abstract test case.

Executable Test Suite – A suite composed of executable test cases.

GOSIP Product – A product which implements one or more of the data communications protocols identified in GOSIP and meets the

requirements specified herein.

Implementation Under Test (IUT) – An implementation of one or more OSI protocols in an adjacent user/provider relationship, being that part of a real open system which is to be studied by testing.

Intermediate System – A system providing an Open Systems Interconnection – Reference Model Network Layer relay function (that is, a system that receives data from one correspondent Network entity and forwards it to another corresponding Network entity).

Means of Testing – The realization of an abstract test method as defined in the OSI conformance testing methodology and framework. This realization includes the test system, executable test suite, testing support tools (hardware and software) and documentation (including technical test procedures).

Open System – An open system is a system capable of communicating with other open systems by virtue of implementing OSI protocols and services. End systems and intermediate systems are open systems. However, an open system may not be accessible by all other open systems. This isolation may be provided by physical separation or by technical capabilities based upon computer and communications security.

Protocol Implementation Conformance Statement (PICS) – A statement made by the supplier of an OSI implementation, or system, stating which capabilities and options have been implemented for a given OSI protocol.

Protocol Implementation Conformance Statement (PICS) Proforma – A document, in the form of a questionnaire, designed by the protocol specifier or conformance test suite specifier which, when completed for an OSI implementation or system, becomes the PICS.

System Under Test (SUT) – The real open system in which the IUT resides.

6.2 Acronyms and abbreviations.

| | |
|---|---|
| ACSE | Association Control Service Element |
| AD | Addendum |
| AM | Amendment |
| ASN.1 | Abstract Syntax Notation One |
| ASE | Application Service Element |
| ATS | Abstract Test Suite |
| BIS | Boundary Intermediate System |
| CCITT | International Telegraph and Telephone Consultative Committee |
| CD | Collision Detection |
| CD | Committee Draft |
| CLNP | Connectionless Network Protocol |
| CLNS | Connectionless Network Service |
| CONS | Connection Oriented Network Service |
| COTS | Commercial–off–the–shelf |
| CSMA | Carrier Sense Multiple Access |
| DAD | Draft Addendum |
| DAM | Draft Amendment |
| DCE | Data Circuit–terminating Equipment |
| DIS | Draft International Standard |
| DTE | Data Terminal Equipment |
| EIA | Electronic Industries Association |
| ES | End System |
| ETS | Executable Test Suite |
| FDDI | Fibre–Distributed Data Interface |
| FIPS | Federal Information Processing Standard |
| FTAM | File Transfer, Access and Management |
| GOSIP | Government Open Systems Interconnection Profile |
| HDLC | High–level Data Link Control |
| IS | Intermediate System |
| IS | International Standard |
| ISO | International Organization for Standardization |
| IUT | Implementation Under Test |
| LAPB | Link Access Procedure Balanced |

| | |
|---|---|
| LLC | Logical Link Control |
| MHS | Message Handling System |
| MLP | Multilink Procedure |
| MOT | Means of Testing |
| NA | National Airspace System |
| NCSL | NIST Computer Systems Laboratory |
| NIST | National Institute of Standards and Technology |
| NVLAP | National Voluntary Laboratory Accreditation Program |
| OSI | Open Systems Interconnection |
| PDAD | Proposed Draft Addendum |
| PDAM | Proposed Draft Amendment |
| PDTR | Proposed Draft Technical Report |
| PHY | Physical |
| PICS | Protocol Implementation Conformance Statement |
| PLP | Packet Layer Protocol |
| ROSE | Remote Operations Service Element |
| SUT | System Under Test |
| TP | Transaction Processing |
| TTCN | Tree and Tabular Combined Notation |
| VT | Virtual Terminal |
| WAN | Wide Area Network |
| WD | Working Draft |

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# APPENDIX I

## 10. GOSIP CONFORMANCE TESTING LABORATORY REGISTER

| LAB CODE | LAB NAME | CONTACT |
|---|---|---|
| 354 | Control Data Corp., OSI Accredited Test Center<br>Arden Hills, MN | Ronald Swan,<br>612-482-6257 |
| 355 | Bull Conformance Test Center<br>Phoenix, AZ | Oscar Hefner,<br>602-862-6001 |
| 361 | IBM Corporation -<br>Networking Systems Protocol Ctr.<br>Research Triangle Park, NC | Robert Amy<br>919-254-4141 |
| 362 | Digital Equipment Corporation<br>Littleton, MA | Richard Duharmel<br>508-486-5021 |
| 363 | Corporation for Open Systems<br>International Test Ctr.<br>Fairfax, VA | Andrea Reitzel,<br>703-205-2809 |
| 364 | CDA, Inc., Open Systems Development Group<br>McLean, VA | Kevin Murry,<br>703-821-1858 |
| 365 | Hewlett-Packard Co.,<br>OSI Conformance Test Center<br>Cupertino, CA | Murali Subbarao,<br>408-447-2822 |
| 367 | UNISYS - Open Systems Interconnection<br>Laboratory<br>Paoli, PA | Andrew Kalish,<br>215-993-7044 |
| 371 | Alcatel TITN Inc.,<br>Conformance Accreditation and Test Ctr.<br>Pleasanton, CA | Sanjay Lokare,<br>510-484-5764 |
| 385 | Dept. of Defense, Joint Interoperability Test Ctr. | Kenneth Thomas,<br>602-538-5170 |
| 391 | Data General Corp.,<br>OSI Conformance Test Center<br>Westborough, MA | Charles Stakus,<br>508-870-6392 |

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# APPENDIX II

## 20. GOSIP VERSION 2 MEANS OF TESTING REGISTER

### 20.1 MOT 2-1 WIDE AREA NETWORK TEST SYSTEMS

| SUPPLIER | CONTACT |
|---|---|
| International Business Machines<br>Research Triangle, NC | John Conner,<br>919-254-2679 |
| Hewlett-Packard Company<br>Edmonton, Alberta, Canada | Bill Mortimer,<br>403-462-4545 |
| TEKELEC<br>Calabasas, CA | Siamak Pousabahian,<br>818-880-7952 |
| Alcatel, TITN Incorporated<br>Pleasanton, CA | Scott Schmitz,<br>703-715-0800 |
| The National Computing Centre Limited<br>Manchester, United Kingdom | Peter Bird,<br>011-44-612-286-333<br>Robert Clark, US,<br>510-687-3002 |

### 20.2 MOT 2-4 TRANSPORT TEST SYSTEMS

| SUPPLIER | CONTACT |
|---|---|
| Alcatel TITN Incorporated<br>Pleasanton, CA | Scott Schmitz,<br>703-715-0800 |
| The National Computing Centre Limited<br>Manchester, United Kingdom | Peter Bird,<br>011-44-612-333<br>Robert Clark, US,<br>510-687-3002 |

### 20.3 MOT 2-5 SESSION TEST SYSTEMS

| SUPPLIER | CONTACT |
|---|---|
| Alcatel TITN Incorporated<br>Pleasanton, CA | Scott Schmitz,<br>703-715-0800 |

### 20.4 MOT 2-7 FTAM TEST SYSTEMS

| SUPPLIER | CONTACT |
|---|---|
| Alcatel TITN Incorporated<br>Pleasanton, CA | Scott Schmitz,<br>703-715-0800 |
| GSI-Danet, Incorporated<br>Pittsburg, PA | Hans-Ludwig Heil,<br>412,967-0834 |
| The National Computing Centre, Limited<br>Manchester, United Kingdom | Robert Clark, US,<br>510-687-3002 |

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# APPENDIX III

## 30. GOSIP VERSION 2 PICS PROFORMA REGISTER

| PICS PROFORMA ID | PICS PROFORMA TITLE |
|---|---|
| 1 | US GOSIP PICS Proforma for Packet Layer (ISO 8208) |
| 2 | US GOSIP PICS Proforma for Data Link (ISO 7776) |
| 3 | US GOSIP PICS Proforma for Connectionless Network Layer Protocol (ISO 8473) |
| 4 | ISO/IEC 9542:1988(E),ES–IS Protocol, Annex A, PICS Proforma |
| 5 | US GOSIP PICS Proforma for Transport Class 0, 2, and 4 Protocols (ISO 8073:1988) |
| 6 | US GOSIP PICS Proforma for Transport Class 0 and 4 Protocols (ISO 8073:1988) |
| 10 | ISO/IEC 8328–2 (E), Session |
| 12 | ISO/IEC 8650–2: 1992(E), ACSE |
| 13 | ISO/IEC 8571–5:1990(E), FTAM |
| 14 | ISO/IEC 8823–2:1992(E), FTAM Presentation |
| 15 | ISO/IEC 8327:1992(E), FTAM Session |

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APPENDIX IV

## 40. GOSIP VERSION 2 ABSTRACT TEST SUITE REGISTER

| CODE | ATS DOCUMENT | PROTOCOL |
|---|---|---|
| ATS 2–1 | ISO/IEC 8882–2: 1992(E) | ISO 7776 |
| ATS 2–2 | ISO/IEC 8882–3: 1991(E) | ISO 8208 |
| ATS 2–3 | 802.3 Draft Abstract Test Suite for GOSIP Version 2 | ISO 8802–3 |
| ATS 2–4 | 802.4 MAC Sublayer Conformance Test System Test | ISO 8802–4 |
| ATS 2–6 | 802.2 LLC (Type 1) Abstract Test Suite Submission | ISO 8802–2 |
| ATS 2–7 | Internet Protocol Tests and Testing Guide for ISO–8473, End System | ISO 8473 |
| ATS 2–7.1 | Interim Abstract Test Suite for CLNP Intermediate Systems Testing | ISO 8473 |
| ATS 2–8 | OSTC Abstract Test Suite, Transport Class 0 | ISO 8073 |
| ATS 2–9.1 | Transport Class 4 over CLNS Abstract Test Suite | ISO 8073 |
| ATS 2–9.3 | Transport Class 4 over CONS Abstract Test Suite | ISO 8073 |
| ATS 2–10.1 | Session Abstract Test Suite, Volumes 1, 2, and 3 | ISO 8823 |
| ATS 2–10.2 | Session Abstract Test Suite | ISO 8823 |
| ATS 2–16.2 | FTAM T1 Responder ATS and FTAM T1 Initiator | ISO 8571–4 |
| ATS 2–16.4 | FTAM T1 Restart and Recovery Abstract Test Suite | ISO 8571–4 |
| ATS 2–16.6 | FTAM M1 ATS, Version 2 | ISO 8571–4 |
| ATS 2–16.7 | FTAM T2 ATS, Volume 1 (Responder) and Volume 2 (Initiator) | ISO 8571–4 |
| ATS 2–16.8 | FTAM A1 ATS, Volume 1 (Responder) and Volume 2 (Initiator) | ISO 8571–4 |
| ATS 2–16.9 | FTAM ACSE Abstract Test Suite | ISO 8650 |
| ATS 2–16.10 | FTAM Presentation Abstract Test Suite | ISO 8823 |
| ATS 2–16.11 | FTAM Presentation ASN.1 Abstract Test Suite | ISO 8824 |
| ATS 2–16.12 | FTAM Session Abstract Test Suite | ISO 8327 |
| ATS 2–16.13 | FTAM Session Restart and Recovery Abstract Test Suite | ISO 8327 |
| ATS 2–20 | OSTC Abstract Test Suite, Transport Class 2 | ISO 8073 |

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# APPENDIX V

## 50. GOSIP VERSION 2 CONFORMANCE TESTED PRODUCT REGISTER

PRODUCT CODE: P-001 PRODUCT TYPE: WAN

| PRODUCT NAME | PRODUCT ID | MANUFACTURER | CONTACT | GOSIP LAB |
|---|---|---|---|---|
| TP4900/LPM Network Release 6 | 174 | ALCATEL Data | K. Trumble, 703-389-6287 | CDA, Inc., McLean, VA, USA |
| TP4900/TCP/CF Network Release 6 | 175 | ALCATEL Data | K. Trumble, 703-389-6287 | CDA, Inc., McLean, VA, USA |
| TP8000 Network Release 6 | 173 | ALCATEL Data | K. Trumble, 703-389-6287 | CDA, Inc., McLean, VA, USA |
| AT&T X.25 Network Interface Product | 1 | AT&T | Reginald Lewis 201-898-6005 | COSI, McLean VA, USA |
| DPX/2 B.O.S. (stack B) w/MTB board | 91 | Bull HN | Bill George 602-862-6008 | BULL S.A. Cecob, France |
| DPX/2 B.O.S. (stack B) w/ECP board | 92 | Bull HN | Bill George 602-862-6008 | BULL S.A. Cecob, France |
| DATANET DCP 7500, DNS V.4 U1 | 93 | Bull HN | Bill George 602-862-6008 | BULL S.A. Cecob, France |
| AGS+/3 X.25 Version 2 | 176 | Cisco Systems | Wm. Miskovetz, 415-688-4682 | CDA, Inc., McLean, VA, USA |
| AGS+/4 X.25 Version 2 | 177 | Cisco Systems | Wm. Miskovetz, 415-688-4682 | CDA, Inc., McLean, VA, USA |
| CGS+/3 X.25 Version 2 | 178 | Cisco Systems | Wm. Miskovetz, 415-688-4682 | CDA, Inc., McLean, VA, USA |
| CGS+/4 X.25 Version 2 | 179 | Cisco Systems | Wm. Miskovetz, 415-688-4682 | CDA, Inc., McLean, VA, USA |
| IGS+/R X.25 Version 2 | 180 | Cisco Systems | Wm. Miskovetz, 415-688-4682 | CDA, Inc., McLean, VA, USA |
| MGS+/3 X.25 Version 2 | 181 | Cisco Systems | Wm. Miskovetz, 415-688-4682 | CDA, Inc., McLean, VA, USA |
| MGS+/4 X.25 Version 2 | 182 | Cisco Systems | Wm. Miskovetz, 415-688-4682 | CDA, Inc., McLean, VA, USA |
| CDCNET 1.6.1 L780AB | 31 | Control Data Corp | Ronald D. Swan, 612-482-6257 | Control Data Corp., MN, USA |
| X.25 for Aviion Systems Release 2.20 | 40 | Data General Corp. | AlfredRegina, 508-366-8911 | COSI, LcLean, VA, USA |
| VAX Packetnet SI V5.4 | 100 | DEC | Rich Duhamel, 508-486-5021 | DEC, Littleton, MA, USA |
| DEC X.25 for ULTRIX | 140 | DEC | Rich Duhamel, 508-486-5021 | DEC, Littleton, MA, USA |
| VAX WAN Device Driver V5.4 Extensions | 147 | DEC | Rich Duhamel, 508-486-5021 | DEC, Littleton, MA, USA |
| VAX WAN Device Drivers for ULTRIX V2.0 | 161 | DEC | Rich Duhamel, 508-486-5021 | DEC, Littleton, MA, USA |
| DEC Network Integration Server Software | 172 | DEC | Rich Duhamel, 508-486-5021 | DEC, Littleton, MA, USA |
| Encore Infinity 90 EnComm X.25 and PAD | 47 | DEC | Ken Chamberlain | DEC Littleton, MA, USA |
| Challenger ES/174-20 Extended Cntrir | 17 | Hassis Adacom | Gregory Prynn, 214-386-2000 | CDA, Inc., McLean, VA, USA |
| Challenger ES/174-10 Extended Cntrir | 18 | Hassis Adacom | Gregory Prynn, 214-386-2000 | CDA, Inc., McLean, VA, USA |
| Challenger ES/174-60 Extended Cntrir | 19 | Hassis Adacom | Gregory Prynn, 214-386-2000 | CDA, Inc., McLean, VA, USA |
| IBM X.25 NCP Packet Switching Interface | 2 | IBM | John P. Streck, 919-254-4360 | IBM, Research Tri. Pk., NC, USA |
| IBM X.25 NCP Packet Switching Interface | 5 | IBM | John P. Streck, 919-254-4360 | IBM, Research Tri. Pk., NC, USA |
| IBM X.25 NCP Packet Switching Interface | 6 | IBM | John P. Streck, 919-254-4360 | IBM, Research Tri. Pk., NC, USA |
| IBM X.25 NCP Packet Switching Interface | 7 | IBM | John P. Streck, 919-254-4360 | IBM, Research Tri. Pk., NC, USA |
| IBM X.25 NCP Packet Switching Interface | 8 | IBM | John P. Streck, 919-254-4360 | IBM, Research Tri. Pk., NC, USA |
| IBM X.25 NCP Packet Switching Interface | 9 | IBM | John P. Streck, 919-254-4360 | IBM, Research Tri. Pk., NC, USA |
| IBM X.25 NCP Packet Switching Interface | 11 | IBM | John P. Streck, 919-254-4360 | IBM, Research Tri. Pk., NC, USA |
| IBM X.25 NCP Packet Switching Interface | 10 | IBM | John P. Streck, 919-254-4360 | IBM, Research Tri. Pk., NC, USA |
| IBM X.25 NCP Packet Switching Interface | 12 | IBM | John P. Streck, 919-254-4360 | IBM, Research Tri. Pk., NC, USA |
| IBM X.25 NCP Packet Switching Interface | 14 | IBM | John P. Streck, 919-254-4360 | IBM, Research Tri. Pk., NC, USA |

PRODUCT CODE: P-001 PRODUCT TYPE: WAN

| PRODUCT NAME | PRODUCT ID | MANUFACTURER | CONTACT | GOSIP LAB |
|---|---|---|---|---|
| IBM AS/400 X.25 Comm. Support Program | 15 | IBM | John P. Streck, 919-254-4360 | IBM, Research Tri. Pk., NC, USA |
| IBM AS/400 X.25 Comm. Support Program | 16 | IBM | John P. Streck, 919-254-4360 | IBM, Research Tri. Pk., NC, USA |
| IBM 6611 Network Processor Model 140 | 45 | IBM | John P. Streck, 919-254-4360 | IBM, Research Tri. Pk., NC, USA |
| IBM 6611 Network Processor Model 170 | 46 | IBM | John P. Streck, 919-254-4360 | IBM, Research Tri. Pk., NC, USA |
| IBM AIX RISC System/6000, for IBM 7011 | 39 | IBM | John P. Streck, 919-254-4360 | IBM, Research Tri. Pk., NC, USA |
| IBM AIX RISC System/6000, for IBM 7012 | 41 | IBM | John P. Streck, 919-254-4360 | IBM, Research Tri. Pk., NC, USA |
| IBM AIX RISC System/6000, for IBM 7013 | 42 | IBM | John P. Streck, 919-254-4360 | IBM, Research Tri. Pk., NC, USA |
| IBM AIX RISC System/6000, for IBM 7015 | 43 | IBM | John P. Streck, 919-254-4360 | IBM, Research Tri. Pk., NC, USA |
| IBM AIX RISC System/6000, for IBM 7016 | 44 | IBM | John P. Streck, 919-254-4360 | IBM, Research Tri. Pk., NC, USA |
| IBM AS/400 (9404) X.25 V.2, R.2 | 102 | IBM | John P. Streck, 919-254-4360 | IBM, Research Tri. Pk., NC, USA |
| IBM AS/400 (9402, 9406) X.25 V.2, R.2 | 103 | IBM | John P. Streck, 919-254-4360 | IBM, Research Tri. Pk., NC, USA |
| IBM NCP PSI V.3, R.5 | 104 | IBM | John P. Streck, 919-254-4360 | IBM, Research Tri. Pk., NC, USA |
| AS/400 X.25 Communication Support | 183 | IBM | John P. Streck, 919-254-4360 | IBM, Research Tri. Pk., NC, USA |
| IBM AS/400 X.25 Comm. Support Program | 125 | IBM | John P. Streck, 919-254-4360 | IBM, Research Tri. Pk., NC, USA |
| X.25 NCP Packet Switching Interface | 162 | IBM | John P. Streck, 919-254-4360 | IBM, Research Tri. Pk., NC, USA |
| 1174-60R Network Controller | 20 | Memorex Telex | Kevin Good, 703-318-5600 | CDA, Inc., McLean, VA, USA |
| 1174-10R Network Controller | 21 | Memorex Telex | Kevin Good, 703-318-5600 | CDA, Inc., McLean, VA, USA |
| 1174-90R Network Controller | 22 | Memorex Telex | Kevin Good, 703-318-5600 | CDA, Inc., McLean, VA, USA |
| LinkMaster 7100 Model 20R | 27 | McData | Steve Cartwright, 303-460-9200 | CDA, Inc., McLean, VA, USA |
| LinkMaster 7100 Model 90R | 28 | McData | Steve Cartwright, 303-460-9200 | CDA, Inc., McLean, VA, USA |
| LinkMaster 7100 Model 10R | 29 | McData | Steve Cartwright, 303-460-9200 | CDA, Inc., McLean, VA, USA |
| LinkMaster 7100 Model 60R | 30 | McData | Steve Cartwright, 303-460-9200 | CDA, Inc., McLean, VA, USA |
| NCR System 3000 X.25 Network Services | 62 | NCR | Wendy Morrision, 619-693-5665 | COSI, McLean, VA, USA |
| Netrix #1 ISS GOSIP X.25 I/F Module | 64 | Netrix Corp. | Ted Ritter, 703-742-6000 | CDA, Inc., McLean, VA, USA |
| Netrix #1 ISS GOSIP X.25 I/F Module | 143 | Netrix Corp. | Ted Ritter, 703-742-6000 | CDA, Inc., McLean, VA, USA |
| Netrix S100 GOSIP X.25 I/F Module | 164 | Netrix Corp. | Ted Ritter, 703-742-6000 | CDA, Inc., McLean, VA, USA |
| Netrix BRX GOSIP X.25 I/F Module | 165 | Netrix Corp. | Ted Ritter, 703-742-6000 | CDA, Inc., McLean, VA, USA |
| Magellan DPN-100 | 168 | Northern Telecom | Torre Albritton, 703-712-8764 | COSI, McLean, VA, USA |
| SUNNET X.25 7.0.1 | 65 | SUN Microsystems | Tom Hull, +33-76-41-42-18 | CDA, Inc., McLEan, VA, USA |
| SUNNET X.25 8.0 Rev B | 152 | SUN Microsystems | Tom Hull, +33-76-41-42-18 | CDA, Inc., McLEan, VA, USA |
| ACP50 X.25 Version 10.04 | 185 | Telematics Internat'l | Terry Rihel, 818-880-4900 | CDA, Inc., McLean, VA, USA |
| UNISYS X.25 PSCS SIRA & PCTs | 69 | Unisys | Keith Fretz, 703-556-5665 | Unisys, Paoli, PA, USA |
| CP2000 X.25 Protocol V 30.00.192 | 131 | Unisys | Dale Pluta, 703-556-5682 | Unisys, Paoli, PA, USA |

PRODUCT CODE: P-002 PRODUCT TYPE: LAN

| PRODUCT NAME | PRODUCT ID | MANUFACTURER | CONTACT | GOSIP LAB |
|---|---|---|---|---|
| Etherlink 16 Release 3C507, Rev. A | 37 | 3Com Corporation | Howard Chan, 408-764-5827 | COSI, McLean, VA, USA |
| Local Area Controller Subsystem (LACS) | 3 | Bull HN | K. Finkenauer, 508-294-2909 | COSI, McLean, VA, USA |
| CDCNET LLC/MAC 1.7.1, PLS 1.6.1 | 79 | CDC | Ronald Swan, 612-482-6257 | COSI McLean, VA, USA |

PRODUCT CODE: P-003 PRODUCT TYPE: INTERMEDIATE SYSTEM

| PRODUCT NAME | PRODUCT ID | MANUFACTURER | CONTACT | GOSIP LAB |
|---|---|---|---|---|
| CISCO Systems Router V9.1 | 148 | CISCO Systems | Susan Scheer, 415-688-8131 | ATI Pleasanton, CA, USA |
| NETBuilder II Extended WAS 3C6242A | 167 | 3Com Corporation | Cyndi Jung, 4080764-5173 | ATI Pleasanton, CA, USA |
| DEC Network Integration Server Software | 184 | DEC | Ken Chamberlain | DEC, Littleton, MA, USA |
| Wellfleet Comm Router Ver 5.81 | 186 | Wellfleet Comm. | Dan Mulvey, 703-739-6710 | ATI Pleasanton, CA, USA |
| CISCO Systems MGS/4 V2.0 | TBD | CISCO Systems | Alex Tweedley, 415-688-8114 | |

PRODUCT CODE: P-003 PRODUCT TYPE: TRANSPORT

| PRODUCT NAME | PRODUCT ID | MANUFACTURER | CONTACT | GOSIP LAB |
|---|---|---|---|---|
| DPX/2 B.O.S. (stack B), TP0 | 94 | Bull | Oscar Hefner, 602-862-6001 | Bull S.A., Ceocob, France |
| DATANET DCP 7500, TP0 | 95 | Bull | Oscar Hefner, 602-862-6001 | Bull S.A., Ceocob, France |
| DPX/2 B.O.S. (stack B), TP4 | 96 | Bull | Oscar Hefner, 602-862-6001 | Bull S.A., Ceocob, France |
| DATANET DCP 7500, TP4 | 97 | Bull | Oscar Hefner, 602-862-6001 | Bull S.A., Ceocob, France |
| DPX/2 B.O.S. (stack B), TP4 | 98 | Bull | Oscar Hefner, 602-862-6001 | Bull S.A., Ceocob, France |
| DPX/2 B.O.S. (stack B), TP4 | 99 | Bull | Oscar Hefner, 602-862-6001 | Bull S.A., Ceocob, France |
| DPX/2 B.O.S. (stack B), TP4 | 101 | Bull | Oscar Hefner, 602-862-6001 | Bull S.A., Ceocob, France |
| DPX/2 B.O.S. (stack B), TP4 | 169 | Bull | Oscar Hefner, 602-862-6001 | Bull S.A., Ceocob, France |
| CDCNET 1.6.1/B720, TP0 | 88 | CDC | J. F. Carey, 612-482-2567 | Control Data Corp., MN, USA |
| CDCNET 1.7.1 BCU #803AA, TP4 | 170 | CDC | R. D. Swann, 612-482-6257 | Control Data Corp., MN, USA |
| Control Data EP/IX Access & Dir 1.4.2, TP4 | 38 | CDC | J. F. Carey, 612-482-2567 | Control Data Corp., MN, USA |
| OSI Platform for Aviion Systems 3.0, TP4 | 76 | Data General | Charles Stakus, 508-870-6392 | ATI Pleasanton, CA, USA |
| OSI Platform for Aviion Systems 3.0, TP0 | 77 | Data General | Charles Stakus, 508-870-6392 | ATI Pleasanton, CA, USA |
| OSI Platform for Aviion Systems 3.0, TP4 | 89 | Data General | Charles Stakus, 508-870-6392 | ATI Pleasanton, CA, USA |

PRODUCT CODE: P-003 PRODUCT TYPE: TRANSPORT

| PRODUCT NAME | PRODUCT ID | MANUFACTURER | CONTACT | GOSIP LAB |
|---|---|---|---|---|
| DECnet-VAX (TM) V5.4 Extensions, TP0 | 129 | DEC | R. Duhamel, 508-486-5021 | DEC, Littleton, MA, USA |
| DECnet/OSI for ULTRIX | 144 | DEC | R. Duhamel, 508-486-5021 | DEC, Littleton, MA, USA |
| DECnet-VAX (TM) VOTS V3.0A, TP4 | 54 | DEC | Bill Daley | DEC, Reading, U.K. |
| Encore Infinity 90 EnComm ISO, CLNP | 55 | Encore Computer | CDA, Inc., McLean, VA, USA | CDA, Inc., McLean, VA, USA |
| Encore Infinity 90 EnComm ISO, TP0 | 56 | Encore Computer | CDA, Inc., McLean, VA, USA | CDA, Inc., McLean, VA, USA |
| Encore Infinity 90 EnComm ISO, TP4 | 57 | Encore Computer | CDA, Inc., McLean, VA, USA | CDA, Inc., McLean, VA, USA |
| HP OSI Transport Serv/9000, TP4 | 4 | Hewlett Packard | M. Subbarao, 408-447-2822 | HP Cupertino, CA, USA |
| OSI Comm. Subsystem Rel. 1-1.1, TP0 | 112 | IBM | G. Bonnes, +33-92-11-41-22 | IBM, La Gaude, France |
| OSI Comm. Subsystem, TP0 | 23 | IBM | G. Bonnes, +33-92-11-41-22 | IBM, La Gaude, France |
| OSI Comm. Subsystem, TP0 | 24 | IBM | G. Bonnes, +33-92-11-41-22 | IBM, La Gaude, France |
| OSI Comm. Subsystem Rel. 1-1.1, TP0 | 25 | IBM | G. Bonnes, +33-92-11-41-22 | IBM, La Gaude, France |
| OSI Comm. Subsystem Rel. 1-1.1, TP0 | 26 | IBM | G. Bonnes, +33-92-11-41-22 | IBM, La Gaude, France |
| OSI Comm. Subsystem, TP4 | 33 | IBM | G. Bonnes, +33-92-11-41-22 | IBM, La Gaude, France |
| OSI Comm. Subsystem, TP4 | 34 | IBM | G. Bonnes, +33-92-11-41-22 | IBM, La Gaude, France |
| OSI Comm. Subsystem Rel. 1-1.1, TP4 | 35 | IBM | G. Bonnes, +33-92-11-41-22 | IBM, La Gaude, France |
| OSI Comm. Subsystem Rel. 1-1.1, TP4 | 36 | IBM | G. Bonnes, +33-92-11-41-22 | IBM, La Gaude, France |
| OSI Comm. Subsystem Rel. 1-1.1, TP4 | 116 | IBM | G. Bonnes, +33-92-11-41-22 | IBM, La Gaude, France |
| AIX OSI Messaging & Filing/6000, TP4 | 117 | IBM | G. Bonnes, +33-92-11-41-22 | IBM, La Gaude, France |
| NCR UNIX OSI Network Services, TP4 | 51 | NCR | W. Morrision, 619-693-5665 | COSI McLean, VA, USA |
| NCR UNIX OSI Network Services, v2.01, TP4 | 81 | NCR | W. Morrision, 619-693-5665 | COSI McLean, VA, USA |
| NCR OSI Network Services, TP0 | 82 | NCR | W. Morrision, 619-693-5665 | COSI McLean, VA, USA |
| Netware FTAM Transport Component, TP4 | 49 | Novell, Inc. | Jan Provan, 408-473-8422 | Nat. Computing Ctr., Ltd., U.K. |
| Netware FTAM Transport Component, TP4 | 50 | Novell, Inc. | Jan Provan, 408-473-8422 | Nat. Computing Ctr., Ltd., U.K. |
| Intel 486 w/Retix LT-610 V2.3.0, TP4 | 111 | Retix | J. Marchioni, 310-8283400 | Nat. Computing Ctr., Ltd., U.K. |
| Intel 386 w/Retix LT-610 V2.3.0, TP4 | 132 | Retix | J. Marchioni, 310-8283400 | Nat. Computing Ctr., Ltd., U.K. |
| SunNET OSI V.7.1, TP4 | 66 | SUN Microsystems | Tom Hull, +33-76-41-42-18 | Nat. Computing Ctr., Ltd., U.K. |
| SunNET OSI V.7.1, TP4 | 85 | SUN Microsystems | Tom Hull, +33-76-41-42-18 | Nat. Computing Ctr., Ltd., U.K. |
| SunNET OSI V.7.1, TP0 | 87 | SUN Microsystems | Tom Hull, +33-76-41-42-18 | Nat. Computing Ctr., Ltd., U.K. |
| SunNET OSI Version 8.0 | 187 | SUN Microsystems | Tom Hull, +33-76-41-42-18 | Nat. Computing Ctr., Ltd., U.K. |
| Sparc 10 M42 w/SUNLINK OSI 8.0, TP4 | 106 | SUN Microsystems | M. Barnes, 703-204-4100 | CDA, Inc., McLean, VA, USA |
| Sparc 4/30 w/SUNLINK OSI 8.0, TP4 | 107 | SUN Microsystems | M. Barnes, 703-204-4100 | CDA, Inc., McLean, VA, USA |
| Sparc 10 M30 w/SUNLINK OSI 8.0, TP4 | 108 | SUN Microsystems | M. Barnes, 703-204-4100 | CDA, Inc., McLean, VA, USA |
| RDI LAPTOP w/SUNLINK OSI 8.0, TP4 | 109 | SUN Microsystems | M. Barnes, 703-204-4100 | CDA, Inc., McLean, VA, USA |

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| PRODUCT NAME | PRODUCT ID | MANUFACTURER | CONTACT | GOSIP LAB |
|---|---|---|---|---|
| Sparc 10 M41 w/SUNLINK OSI 8.0, TP4 | 142 | SUN Microsystems | M. Barnes, 703-204-4100 | CDA, Inc., McLean, VA, USA |
| SynOptics LattisNet 3030, CLNP | 58 | SynOptics Comm | B. Sheffer, 703-684-2627 | CDA, Inc., McLean, VA, USA |
| SynOptics LattisNet 3030, CLNP | 78 | SynOptics Comm | B. Sheffer, 703-684-2627 | CDA, Inc., McLean, VA, USA |
| CMS 1100/OSITS R.7R2B, TP4 | 59 | Unisys Corporation | Keith Fretz, 703-556-5665 | UNISYS Paoli, PA, USA |
| DCP OSITS 15-55 FEPs, TP4 | 71 | Unisys Corporation | Keith Fretz, 703-556-5665 | UNISYS Paoli, PA, USA |
| DCP OSITS V.2R1A, TP0 | 72 | Unisys Corporation | Keith Fretz, 703-556-5665 | UNISYS Paoli, PA, USA |
| DCP OSITS V.2R1A, TP4 | 73 | Unisys Corporation | Keith Fretz, 703-556-5665 | UNISYS Paoli, PA, USA |
| CMS 1100/OSITS Release 7R2B, TP4 | 81 | Unisys Corporation | Keith Fretz, 703-556-5665 | UNISYS Paoli, PA, USA |
| A-Series/CP2000 OSI-IPC V30.00.199, TP4 | 133 | Unisys Corporation | Dale Pluta, 703-556-5682 | UNISYS Paoli, PA, USA |
| A-Series/CP2000 OSI-IPC V30.00.200, TP4 | 136 | Unisys Corporation | Dale Pluta, 703-556-5682 | UNISYS Paoli, PA, USA |
| A-Series/CP2000 OSI-IPC V30.00.200, TP0 | 137 | Unisys Corporation | Dale Pluta, 703-556-5682 | UNISYS Paoli, PA, USA |
| A-Series/CP2000 OSI-IPC V30.00.199, TP4 | 145 | Unisys Corporation | Dale Pluta, 703-556-5682 | UNISYS Paoli, PA, USA |
| DCP 15-55 FEPs, TP4 | 171 | Unisys Corporation | Keith Fretz, 703-556-5665 | UNISYS Paoli, PA, USA |