Revision Information

This document (version #6.18) and its companion volumes are believed to accurately reflect release v 7.0 of July 18, 1991.

Release Information

If you would like a copy of the release described in this document, there are several avenues available:

- NORTH AMERICA
  For mailings in NORTH AMERICA, send a check for 375 U.S. Dollars to:

  Postal address: University of Pennsylvania
  Department of Computer and Information Science
  Moore School
  Attn: David J. Farber (ISODE Distribution)
  200 South 33rd Street
  Philadelphia, PA 19104-6314
  U.S.A.

  Telephone: +1 215 898 8560

  Specify one:

  1. 1600bpi 1/2–inch tape, or
  2. Sun 1/4–inch cartridge tape.

  The tape will be written in *tar* format and returned with a documentation set. Do not send tapes or envelopes. Documentation only is the same price.

- EUROPE
  For mailings in EUROPE, send a cheque or bankers draft and a purchase order for 200 Pounds Sterling to:

  Postal address: Department of Computer Science
  Attn: Natalie May/Dawn Bailey
  University College London
  Gower Street
  London, WC1E 6BT
  UK

For information only:

Telephone:	+44 71 380 7214
Fax:	+44 71 387 1397
Telex:	28722
Internet:	`natalie@cs.ucl.ac.uk`
	`dawn@cs.ucl.ac.uk`

Specify one:

1. 1600bpi 1/2–inch tape, or
2. Sun 1/4–inch cartridge tape.

The tape will be written in *tar* format and returned with a documentation set. Do not send tapes or envelopes. Documentation only is the same price.

- EUROPE (tape only)
  Tapes without hardcopy documentation can be obtained via the European Forum for Open Systems (EurOpen, formerly known as EUUG). The ISODE 7.0 distribution is called EurOpenD14.

  Postal address:
  EurOpen Software Distributions
  c/o Frank Kuiper
  Centrum voor Wiskunde en Informatica
  Kruislann 413
  1098 SJ Amsterdam
  The Netherlands

  For information only:

Telephone:	+31 20 5924056
	(or +31 20 5929333)
Telex:	12571 mactr nl
Telefax:	+31 20 5924199
Internet:	`euug-tapes@cwi.nl`

  Specify one:

  1. 1600bpi 1/2–inch tape: 140 Dutch Guilders.

2. Sun 1/4–inch cartridge tape (QIC-24 format): 200 Dutch Guilders.

If you require DHL this is possible and will be billed through. Note that if you are not a member of EurOpen then there is an additional handling fee of 300 Dutch Guilders (please enclose a copy of your membership or contribution payment form when ordering). Do not send money, cheques, tapes or envelopes, you will be invoiced.

- PACIFIC RIM
  For mailings in the Pacific Rim, send a cheque for 300 dollars Australian to:

  Postal address: Isode Distribution
  (Attn: Andrew Waugh)
  723 Swanston St
  Carlton, VIC 3053
  Australia

  For information only:

  Telephone: +61 3 282 2615
  Fax: +61 3 282 2600
  Internet: `ajw@mel.dit.csiro.au`

  Specify one:

  1. 1600/3200/6250bpi 1/2-inch tape, or
  2. Sun 1/4-inch cartridge tape in either QIC-11, QIC-24 or QIC-150 format.
  3. Exabyte 2.3 Gigabyte or 5 Gigabyte format

  The tape will be written in *tar* format and returned with a documentation set. Do not send tapes or envelopes. Documentation only is the same price.

- Internet
  If you can FTP to the Internet, you can use anonymous FTP to the host `uu.psi.com [136.161.128.3]` to retrieve `isode-7.tar.Z` in BINARY mode from the `isode/` directory. This file is the *tar* image after being run through the compress program and is approximately 4.7MB in size.

- NIFTP
  If you run NIFTP over the public X.25 or over JANET, and are registered in the NRS at Salford, you can use NIFTP with username "guest" and your own name as password, to access `UK.AC.UCL.CS` to retrieve the file `<SRC>isode-7.tar.Z`. This file is the *tar* image after being run through the compress program and is approximately 4.7MB in size.

- FTAM on the JANET, IXI or PSS
  The source code is available by FTAM at the University College London over X.25 using

  JANET (DTE `00000511160013`)

  IXI (DTE `20433450420113`)

  PSS (DTE `23421920030013`)

  Use TSEL `259` (ASCII encoding). Use the "anon" user-identity and retrieve the file `isode-7.tar.Z` from the `src/` directory. This file is the *tar* image after being run through the compress program and is approximately 4.7MB in size.

  The file service is provided by the FTAM implementation in ISODE 6.0 or later (IS FTAM) and is registered in the pilot OSI Directory below

  ```
  bells, Computer Science, University College London, GB
  ```

For distributions via either FTAM or FTP, there are two additional files available for retrieval:

- `isode-7-doc.tar.Z`
  This is the LaTeXsource for the entire documentation set. It is a compressed *tar* image (3.5MB).

- `isode-7-ps.tar.Z`
  This contains the five volume manual in PostScript format. It is a compressed *tar* image (4.3MB).

Discussion Groups

The Internet discussion group `ISODE@NIC.DDN.MIL` is used as a forum to discuss ISODE. Contact the Internet mailbox `ISODE-Request@NIC.DDN.MIL` to be asked to be added to this list.

Support

Although the ISODE is not "supported" per se, it does have a problem reporting address, `Bug-ISODE@XTEL.CO.UK`. Bug reports (and fixes) are welcome by the way.

Commercial Support

A UK company has been set up to provide commercial support for the ISODE and associated packages — X-Tel Services Ltd. This company provides an update service, general assistance and site specific support. Although inclusion of this information should not be considered an endorsement, it should be noted that two of the primary ISODE developers now work at X-Tel Services Ltd.

Postal address:	X-Tel Services Ltd. University Park, Nottingham, NG7 2RD UK
Telephone	+44 602 412648
Fax	+44 602 790278
Internet	support@xtel.co.uk

If other organisations offering formal support for the ISODE wish to be included in future announcements, a suitable index will be organized.

Acknowledgements

Many people have made comments about and contributions to the ISODE which have been most helpful. The following list is by no means complete:

The first three releases of the ISODE were developed at the Northrop Research and Technology Center, and the first version of this manual is referenced as NRTC Technical Paper #702. The initial work was supported in part by Northrop's Independent Research and Development program.

The Wollongong Group supported ISODE for its 4.0 and 5.0 release. They deserve much credit for that. Furthermore, they contributed an implementation of RFC1085, a lightweight presentation protocol for TCP/IP-based internets.

The ISODE development up until version 7.0 was supported by Performance Systems International, Inc. and NYSERNet, Inc. This was a substantial commitment to which the project in indebted. Before their support, ISODE was always an after-hours activity. The NYSERNet effort was partially supported by the U.S. Defense Advanced Research Projects Agency and the Rome Air Development Center of the U.S. Air Force Systems Command under contract number F30602–88–C–0016 to NYSERNet Inc.

Christopher W. Moore of the Wollongong Group has provided much help with ISODE in terms of both policy and implementational matters. He also performed Directory interoperability testing against a different implementation of the OSI Directory.

Dwight E. Cass of the Northrop Research and Technology Center was one of the original architects of *The ISO Development Environment*. His work was critical for the original proof of concept and should not be forgotten. John L. Romine also of the Northrop Research and Technology Center provided many fine comments concerning the presentation of the material herein. This resulted in a much more readable manuscript. Stephen H. Willson, also of the Northrop Research and Technology Center, provided some help in verifying the operation of the software on a system running the AT&T variant of UNIX[1].

The *librosap*(3n) library was heavily influenced by an earlier native-TCP version written by George Michaelson, formerly of University College London, in the United Kingdom. Stephen E. Kille, of University College London,

[1] UNIX is a trademark of AT&T Bell Laboratories.

provided valuable feedback on the *pepy*(1) utility. In addition, both Steve and George provided us with some good comments concerning the *libpsap*(3) library. Steve is also the conceptual architect for the addressing scheme used in the software, and he modified the *librosap*(3n) library to support half-duplex mode when providing ECMA ROS service. George contributed the CAMTEC and ULTRIX[2] X.25 interfaces. Simon Walton, also of University College London, has been very helpful in providing constant feedback on the ISODE during beta-testing.

The INCA project donated the QUIPU Directory implementation to the ISODE. Stephen E. Kille, Colin J. Robbins, and Alan Turland, at the time all of University College London, are the three principals who developed the 6.0 version of the directory software. In addition, Steve Titcombe, also of UCL spent considerable time on the DIrectory SHell (DISH), and Mike Roe formerly of UCL, put a large amount of effort into the security requirements of QUIPU. Development of the current version of QUIPU has been coordinated by Colin J. Robbins now of X-Tel Services Ltd, and designed by Stephen E. Kille.

The UCL work has been partially supported by the commission of the EEC under its ESPRIT program, as a stage in the promotion of OSI standards. Their support has been vital to the UCL activity. In addition, QUIPU is also funded by the UK Joint Network Team (JNT).

Julian P. Onions, of X-Tel Services Ltd is the current *pepy*(1) guru, having brainstormed and implemented the encoding functionality along with Stephen E. Easterbrook formerly of University College London. Julian also contributed the UBC X.25 interface along with the TCP/X.25 TP0 bridge, and has also contributed greatly to *posy*(1). Julian's latest contribution has been a *transport service bridge*. This is used to masterfully solve interworking problems between different OSI stacks (TP0/X.25, TP4/CLNP, RFC1006/TCP, and so on).

John Pavel and Godfrey Cowin of the Department of Trade and Industry/ National Physical Laboratory in the United Kingdom both contributed significant comments during beta-testing. In particular, John gave us a lot of feedback on *pepy*(1) and on the early FTAM DIS implementation. John also contributed the SunLink X.25 interface.

Keith Ruttle of CAMTEC Electronics Limited in the United Kingdom

[2] ULTRIX is a trademark of Digital Equipment Corporation.

contributed both the driver for the new CAMTEC X.25 interface and the CAMTEC CONS interface (X.25 over 802 networks). This latter driver was later removed from the distribution for lack of use.

In addition, Andrew Worsley of the Department of Computer Science at the University of Melbourne in Australia pointed out several problems with the FTAM DIS implementation. He also developed a replacement for *pepy* and *posy* called *pepsy*. After moving to University College London, he improved this system and integrated into the ISODE.

Olivier Dubous of BIM sa in Belgium contributed some fixes to concurrency control in the FTAM initiator to allow better interworking with the VMS[3] implementation of the filestore. He also suggested some changes to allow interworking with the FTAM T1 and A/111 profiles.

Olli Finni of Nokia Telecommunications provided several fixes found when testing interoperability with the TOSI implementation of FTAM.

Mark R. Horton of AT&T Bell Laboratories also provided some help in verifying the operation of the software on a 3B2 system running UNIX System V release 2. In addition, Greg Lavender of NetWorks One, under contract to the U.S. Navy Regional Data Automation Center (NARDAC), provided modifications to allow the software to run on a generic port of UNIX System V release 3.

Steve D. Miller of the University of Maryland provided several fixes to make the software run better on the ULTRIX variant of UNIX.

Jem Taylor of the Computer Science Department at the University of Glasgow provided some comments on the documentation.

Hans-Werner Braun of the University of Michigan provided the inspiration for the initial part of Section 1.2.

A previous release of the software contained an ISO TP4/CLNP package derived from a public-domain implementation developed by the National Institute of Standards and Technology (then called the National Bureau of Standards). The purpose of including the NIST package (and associated support) was to give an example of how one would interface the code to a "generic" TP4 implementation. As the software has now been interfaced to various native TP4 implementations, the NIST package is no longer present in the distribution.

John A. Scott of the MITRE Corporation contributed the SunLink OSI

[3]VMS is a trademark of Digital Equipment Corporation.

interface for TP4. He also wrote the FTAM/FTP gateway which the MITRE Corporation has generously donated to this package.

Philip B. Jelfs of the Wollongong Group upgraded the FTAM/FTP gateway to the "IS-level" (International Standard) FTAM.

Rick Wilder and Don Chirieleison of the MITRE Corporation contributed the VT implementation which the MITRE Corporation has generously donated to this package.

Jacob Rekhter of the T. J. Watson Research Center, IBM Corporation, provided some suggestions as to how the system should be ported to the IBM RT/PC running either AIX or 4.3BSD. He also fixed the incompatibilities of the FTAM/FTP gateway when running on 4.3BSD systems.

Ashar Aziz and Peter Vanderbilt, both of of Sun Microsystems Inc., provided some very useful information on modifying the SunLink OSI interface for TP4.

Later on, elements of the SunNet 7.0 Development Team (Hemma Prafullchandra, Raj Srinivasan, Daniel Weller, and Erik Nordmark) made numerous enhancements and fixes to the system.

John Brezak of Apollo Computer, Incorporated ported the ISODE to the Apollo workstation. Don Preuss, also of Apollo, contributed several enhancements and minor fixes.

Ole-Jorgen Jacobsen of Advanced Computing Environments provided some suggestions on the presentation of the material herein.

Nandor Horvath of the Computer and Automation Institute of the Hungarian Academy of Sciences while a guest researcher at the DFN/GMD in Darmstadt, FRG, provided several fixes to the FTAM implementation and documentation.

George Pavlou and Graham Knight of University College London contributed some management instrumentation to the *libtsap*(3n) library.

Juha Heinänen of Tampere University of Technology provided many valuable comments and fixes on the ISODE.

Paul Keogh of the Nixdorf Research and Development Center, in Dublin, Ireland, provided some fixes to the FTAM implementation.

Oliver Wenzel of GMD Berlin contributed the RFA system.

L. McLoughlin of Imperial College contributed Kerberos support for the FTAM responder.

Kevin E. Jordan of CDC provided many enhancements to the G3FAX library.