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Literature Review For Networking And Communication Technology

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NETWORKING AND COMMUNICATION
TECHNOLOGY LABORATORY

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FOR
NETWORKING AND COMMUNICATION TECHNOLOGY

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UNIVERSITY OF CENTRAL FLORIDA
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NETWORKING AND COMMUNICATION TECHNOLOGY LABORATORY LITERATURE REVIEW

1.0 INTRODUCTION

1.1 Purpose

The purpose of this report is to document the results of a literature search performed in the area of networking and communication technology. This information search was undertaken to assess the effectiveness and resource requirements of current networking and communication technology, and to provide guidance for future enhancements.

1.2 Statement of the Problem

There is a need for networked systems for use in multi-service, multi-organizational team training. A literature search was performed to identify new networking and communication technologies, determine the state-of-the-art in this arena, and provide guidance for the future maximization of operational assets.

2.0 INVESTIGATION METHODOLOGY

2.1 Procedures

Relevant information was located through the search of various indices and computerized data bases.

2.1.1 Indices

2.1.1.1 Papers and Articles

Approximately 200 abstracts or bibliographies of relevance were located through the use of indices. Indices queried include the Applied Science and Technology Index, Computer Abstracts, Government Documents, Computing Review, and Computer and Control Abstracts. After careful review, copies of 30 of these articles were obtained, either through the UCF library, or with the use of inter-library loan, and retained for reference in the IST library.

All material contained in the IST library is available for review upon request. Additionally, IST library information has been shared with the PM TRADE data base on a

limited basis. A copy of the titles and IST library file numbers of the papers and articles of relevance to the networking and communication technology effort is contained in Appendix A.

2.1.1.2 Books

Nearly 50 books of interest were also discovered by quizzing indices. Directories utilized include the Applied Science and Technology Index, Computer Abstracts, Government Documents, Computing Review, and Computer and Control Abstracts. Three books and the abstracts of five others were added to the IST library. The three books were purchased directly from the publisher, Howard & Sams Publishing. The book titles and abstracts are included in the information found in Appendix A.

2.1.2 On-line Data File Search

The NTIS data file was queried. The key terms "parallel programming" and "distributed processing" were entered on-line. More than 300 titles resulted. A copy of the output is included in Appendix B. The listing was evaluated and pared to 68 titles considered of sufficient interest to qualify for further investigation.

Abstracts were requested for the 68 titles. A copy of the abstracts is located in Appendix C. Upon review of the abstracts, copies of 38 articles were requested. 25 of the articles were ordered through NTIS; the UCF inter-library loan service procured the remaining 13 from NASA's library. The article copies were placed in the IST library, and are included in Appendix A.

2.1.3 Other

The implementation of medium-access protocol of local area networks was also investigated as part of this effort. Both Carrier Sense Multiple Access with Collision Detection Protocols and Token Ring Protocols were examined and evaluated. The literature reviewed during this investigation is included in the latter portion of Appendix A. Copies of this information is not currently available in house, but may be obtained upon request.

Additionally, languages for specifying the process switch level of interprocessor communications were also investigated. Carnegie Mellon University has offered DURRA, an SEI developed language, to IST. A listing of all DURRA documentation currently available at IST is located in Appendix D.

3.0

SUMMARY

This Networking and Communication Technology literature search was undertaken to evaluate current networking and communication technology efforts, and ascertain possible future trends and areas of augmentation. The effort included locating and acquiring the data, and entering it into the IST library. Access to all literature located in the IST library is available upon request.

APPENDIX A

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A DECENTRALIZED CONFLICT FREE PROTOCOL, GBRAM FOR LARGE SCALE LOCAL NETWORKS	can be	_____
ANSI/IEEE - INTERNATIONAL STANDARD 8802/5 "Token Ring Access"	can be	_____
"Measured Performance of the Ethernet" ADVANCES IN LOCAL AREA NETWORKS	can be	_____
"Local Area Networks - Major Technologies and Trends" in LOCAL AREA NETWORKS	can be	_____
"Architecture and design of a reliable token ring network" in LOCAL AREA NETWORKS	can be	_____
"Description of FASNET - a Unidirectional Local Area Communications Network" in LOCAL AREA NETWORKS	can be	_____
"Optic Fibers in Local Area Networks" in LOCAL AREA NETWORKS	can be	_____
"A Distributed Experimental Communication System" in LOCAL AREA NETWORKS	can be	_____
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<u>TITLE</u>	<u>FILE #</u>	<u>NAME</u>
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"Long Haul Networking of Simulators" PROCEEDINGS 10th INTERSERVICE/INDUSTRY TRAINING SYSTEMS	can be	_____
"ISDN 83" special issue on ISDNs	can be	_____
"Transition to ISDN - an Overview" special issue on ISDNs	can be	_____
ISDN PROTOCOL ARCHITECTURE	can be	_____
DESIGN APPROACHES AND PERFORMANCE CRITERIA FOR INTERGRATED VOICE/DATA SWITCHING	can be	_____
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"Token Ring Access" ANSI/IEEE - INTERNATIONAL STANDARD 8802/5	can be	_____
"Performance Models of Token Ring Local Area Networks" PROCEEDINGS OF ACM SIGMETRICS	can be	_____
SIMSCRIPT II.5 PROGRAMING LANGUAGE	can be	_____
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"SIMNET ETHERNET Performance" BBN TECHNICAL REPORT No 6711	can be	_____
DATA COLLECTION AND ANALYSIS: THE KEYS FOR INTERACTIVE TRAINING FOR COMBAT READINESS	can be	_____
"Concurrent C" TECHNICAL REPORT	can be	_____
"Benchmarking LAN Protocol Analyzers" PROCEEDINGS OF 13th IEEE CONFERENCE ON LOCAL COMPUTER	can be	_____
HP 4792A LAN PROTOCOL ANALYZER: VOL I: GETTING STARTED, VOL II: OPERATING MANUAL	can be	_____
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"ISDN 83" special issue on ISDNs	can be
"Transition to ISDN - an Overview" special issue on ISDNs	can be
ISDN PROTOCOL ARCHITECTURE	can be
DESIGN APPROACHES AND PERFORMANCE CRITERIA FOR INTERGRATED VOICE/DATA SWITCHING	can be
TELECOMMUNICATION NETWORKS	can be
DATA NETWORKS	can be
SIMULATION MODELING AND SIMNET	can be
"Carrier Sense Multiple Access with Collision Detection (CSMA/CD) Access Method and Physical Layer Specification"	can be
"Token-Passing Bus Access Method" ANSI/IEE - DRAFT INTERNATIONAL STANDARD ISO/DIS 8802/4	can be
"Token Ring Access" ANSI/IEEE - INTERNATIONAL STANDARD 8802/5	can be
"Performance Models of Token Ring Local Area Networks" PROCEEDINGS OF ACM SIGMETRICS CONFERENCE ON	can be
SIMSCRIPT II.5 PROGRAMMING LANGUAGE	can be
A TOKEN RING NETWORK FOR LOCAL DATA COMMUNICATION	can be

<u>TITLE</u>	<u>FILE #</u>
"SIMNET ETHERNET Performance" BBN TECHNICAL REPORT No 6711	can be
DATA COLLECTION AND ANALYSIS: THE KEYS FOR INTERACTIVE TRAINING FOR COMBAT READINESS	can be
"Concurrent C" TECHNICAL REPORT	can be
"Benchmarking LAN Protocol Analyzers" PROCEEDINGS OF 13th IEEE CONFERENCE ON LOCAL COMPUTER NETWORKS	can be
HP 4792A LAN PROTOCOL ANALYZER: VOL I: GETTING STARTED, VOL II: OPERATING MANUAL	can be
CONCURRENT EUCLID, THE UNIX SYSTEM AND TUNIS	can be
STRUCTURED CONCURRENT PROGRAMMING WITH OPERATING SYSTEM APPLICATIONS	can be
THE C PROGRAMMING LANGUAGE	can be
"First FDDI Local Area Network" PROCEEDINGS OF 12th IEEE CONFERENCE ON LOCAL COMPUTER NETWORKS	can be
COMPUTER PERFORMANCE MODELING HANDBOOK	can be
EMMERGING STANDARDS, HARDWARE, AND SOFTWARE LIGHT THE WAY TO FDDI	can be
"ETHERNET: DISTRIBUTED PACKET SWITCHING FOR LOCAL COMPUTER NETWORKS	can be
"The SIMNET Network and Protocols" BBN Report No. 7102	can be

<u>TITLE</u>	<u>FILE #</u>
"The SIMNET Network and Protocols" BBN Report No. 6369	can be
INTRODUCTION TO SIMULATION AND SLAM II (2nd edition)	can be
"SHIPNET: A Real-Time Local Area Network For Ships" PROCEEDINGS OF 13th IEEE CONFERENCE ON LOCAL COMPUTER	can be
"Performance Analysis of the FDDI Token-Ring" TECHNICAL REPORT TR-8802	can be
LOCAL NETWORKS	can be
"Evaluation of Real-Time Transport Protocols" TECHNICAL REPORT TR-88-21	can be
A LOCAL COMMUNICATION NETWORK BASED ON INTERCONNECTED TOKEN RINGS: A TUTORIAL	can be
CALCULATING THE MAXIMUM MEAN DATA RATE IN LOCAL AREA NETWORKS	can be
NETWORK PROTOCOLS	can be
LOCAL COMPUTER NETWORK TECHNOLOGIES	can be
"A Real-Time Message System for Token Ring Networks" TECHNICAL REPORT TR-88-08	can be
"Simulation of Local Computer Networks" PROCEEDINGS OF 4th IEEE CONFERENCE ON LOCAL COMPUTER NETWORKS	can be

SUBJECT MODELING OF COMPUTER
COMMUNICATION SYSTEMS
TITLE PERFORMANCE EVALUATION OF THE
COMPUTER NETWORK DYNAMIC TABLE
ALGORITHM

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PUBLISHER IEEE TRANSACTIONS ON COMPUTERS
DATE OF PUBLICATION FEB. 1988
PAGE NUMBER 150 - 159
FILE # B - 01

SUBJECT MODELING OF COMPUTER
COMMUNICATION SYSTEMS
TITLE INTEGRATED SERVICE DIGITAL
NETWORKS: MARKET ASPECTS JANUARY
1983 - AUGUST 1988

AUTHOR(S) VARIOUS

PUBLISHER CITATIONS FROM THE COMP. DATA BASE
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SUBJECT MODELING OF COMPUTER
COMMUNICATION SYSTEMS
TITLE COMPUTING ON AN ANONYMOUS RING

AUTHOR(S) H. ATTIYA
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PUBLISHER JOURNAL OF ASSN. COMPUT. MACHINERY
DATE OF PUBLICATION OCT. 1988
PAGE NUMBER 845 - 875
FILE # B - 03

SUBJECT MODELING OF COMPUTER
COMMUNICATION SYSTEMS
TITLE A GRAPH MATCHING APPROACH TO
OPTIMAL TASK ASSIGNMENT IN
DISTRIBUTED COMPUTING SYSTEMS
USING A MINIMAX CRITERION

AUTHOR(S) WEN-HSIANG TSAI
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PUBLISHER IEEE TRANSACTIONS ON COMPUTERS
DATE OF PUBLICATION MAR. 1985
PAGE NUMBER 197 - 203
FILE # B - 04

SUBJECT MODELING OF COMPUTER
COMMUNICATION SYSTEMS
TITLE NETWORKS AND DISTRIBUTED
COMPUTATION: CONCEPTS, TOOLS, AND
ALGORITHMS

AUTHOR(S) MICHEL RAYNAL

PUBLISHER MIT PRESS, CAMBRIDGE, MASS.
DATE OF PUBLICATION 1988
PAGE NUMBER 166
FILE # B - 05

SUBJECT MODELING OF COMPUTER
COMMUNICATION SYSTEMS
TITLE EFFICIENT COMPUTATION OF OPTIMAL
ASSIGNMENTS FOR DISTRIBUTED TASKS

AUTHOR(S) J. B. SINCLAIR

PUBLISHER JOURNAL OF PARALLEL AND
DATE OF PUBLICATION 1987 VOL 4
PAGE NUMBER 342 - 362
FILE # B - 06

SUBJECT MODELING OF COMPUTER
COMMUNICATION SYSTEMS
TITLE MODELING OF COMPUTER
COMMUNICATION SYSTEMS

AUTHOR(S) ISRAEL MITRANI

PUBLISHER CAMBRIDGE UNIV. PRESS, NY
DATE OF PUBLICATION 1987
PAGE NUMBER 192
FILE # B - 07

SUBJECT MODELING OF COMPUTER
COMMUNICATION SYSTEMS
TITLE HANDBOOK OF COMPUTER
COMMUNICATION STANDARDS THE OPEN
SYSTEMS INTERCONNECTION (OSI)
MODEL AND OSI RELATED STANDARDS
VOLUME 1

AUTHOR(S) WILLIAM STALLINGS

PUBLISHER HOWARD & SAMS PUBLISHING
DATE OF PUBLICATION 1988 VOL 3
PAGE NUMBER 206
FILE # B - 08

SUBJECT MODELING OF COMPUTER
COMMUNICATION SYSTEMS
TITLE DATA AND COMPUTER COMMUNICATIONS

AUTHOR(S) WILLIAM STALLINGS

PUBLISHER MACMILLAN PUBLISHING COMPANY
DATE OF PUBLICATION 1988 VOL 2
PAGE NUMBER
FILE # B - 09

SUBJECT MODELING OF COMPUTER
COMMUNICATION SYSTEMS
TITLE GATEWAYS COMBINE WITH STANDARDS
TO BROADEN INTERCONNECTIVITY
OPTIONS FOR DISSIMILIAR DEVICES

AUTHOR(S) M. EDWARDS

PUBLISHER COMMUNICATION NEWS
DATE OF PUBLICATION 1988 VOL 25
PAGE NUMBER 44 - 49
FILE # B - 10

SUBJECT MODELING OF COMPUTER
COMMUNICATION SYSTEMS
TITLE SUPPORTING EXISTING TOOLS IN
DISTRIBUTED PROCESSING SYSTEMS:
THE CONVERSION PROBLEM

AUTHOR(S) SANDRA A. MARMAK
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PUBLISHER DISTRIBUTED COMPUTING SYSTEMS
DATE OF PUBLICATION 1982
PAGE NUMBER 847 - 853
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SUBJECT MODELING OF COMPUTER COMMUNICATIN
SYSTEMS
TITLE A NEW GATEWAY

AUTHOR(S) CARL GEIGER

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SUBJECT MODELING OF COMPUTER
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TITLE THE EVOLUTION OF ARPANET

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PUBLISHER DATAMATION
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SUBJECT MODELING OF COMPUTER
COMMUNICATION SYSTEMS
TITLE COMMUNICATION ASPECTS OF ANSA

AUTHOR(S) A. HERBERT

PUBLISHER COMPUTER STANDARDS AND INTERFACE
DATE OF PUBLICATION 1988 VOL 8 # 1
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SUBJECT MODELING OF COMPUTER
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TITLE PERFORMANCE MODELS OF TOKEN RING
LOCAL AREA NETWORKS

AUTHOR(S) ROBERT BERRY
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PUBLISHER ACM
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PAGE NUMBER 266 - 274
FILE # B - 15

SUBJECT MODELING OF COMPUTER
COMMUNICATION SYSTEMS
TITLE ETHERNET: DISTRIBUTED PACKET
SWITCHING FOR LOCAL COMPUTER
NETWORKS

AUTHOR(S) ROBERT M. METCALFE
DAVID R. BOGGS

PUBLISHER ASSOCIATION FOR COMPUTING
DATE OF PUBLICATION 1976
PAGE NUMBER 395 - 403
FILE # B - 16

SUBJECT MODELING OF COMPUTER
COMMUNICATION SYSTEMS
TITLE COMPUTER NETWORKS "A CARRIER
SENSE MULTIPLE ACCESS PROTOCOL FOR
LOCAL NETWORKS"

AUTHOR(S) SIMON S. LAM

PUBLISHER NORTH-HOLLAND PUBLISHING CO.
DATE OF PUBLICATION 1980 VOL 4 # 1
PAGE NUMBER 21 - 32
FILE # B - 17

SUBJECT MODELING OF COMPUTER
COMMUNICATION SYSTEMS
TITLE COMPUTER NETWORKS "PERFORMANCE
ANALYSIS OF CARRIER SENSE MULTIPLE
ACCESS WITH COLLISION DETECTION

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PUBLISHER NORTH-HOLLAND PUBLISHING CO.
DATE OF PUBLICATION 1980 VOL 4
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FILE # B - 18

SUBJECT MODELING OF COMPUTER
COMMUNICATION SYSTEMS
TITLE SIMULATION OF ETHERNET
PERFORMANCE BASED ON SINGLE
SERVER AND SINGLE QUEUE MODEL

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PUBLISHER IEEE SIMULATION CONFERENCE ON
DATE OF PUBLICATION 1987
PAGE NUMBER 74 - 85
FILE # B - 19

SUBJECT MODELING OF COMPUTER
COMMUNICATION NETWORKS
TITLE PROGRAMMING CONNECTIONIST
ARCHITECTURES

AUTHOR(S) MARK A. JONES

PUBLISHER AT&T TECHINICAL JOURNAL
DATE OF PUBLICATION JAN/FEB 1988 VOL 67 #1
PAGE NUMBER 65-68
FILE # B - 20

SUBJECT MODELING OF COMPUTER
COMMUNICATION SYSTEMS
TITLE ROUTING WITH PACKET DUPLICATION
AND ELIMINATION IN COMPUTER
NETWORKS

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PUBLISHER IEEE TRANSACTIONS ON
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SUBJECT MODELING OF COMPUTER
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TITLE NETWORK ACCESS PROTOCOLS FOR
REAL-TIME DISTRIBUTED SYSTEMS

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FILE # B - 22

SUBJECT MODELING OF COMPUTER
COMMUNICATION SYSTEMS
TITLE MEASURED PERFORMANCE OF AN
ETHERNET LOCAL NETWORK

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PUBLISHER COMMUNICATIONS OF THE ACM
DATE OF PUBLICATION DEC 1980 VOL 23 #12
PAGE NUMBER 711 - 720
FILE # B - 23

SUBJECT MODELING OF COMPUTER
COMMUNICATION SYSTEMS
TITLE PERFORMANCE CHARACTERISTICS OF 2
ETHERNETS: AN EXPERIMENTAL STUDY

AUTHOR(S) TIMOTHY A. GONSALVES

PUBLISHER ACM
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PAGE NUMBER 78 - 86
FILE # B - 24

SUBJECT MODELING OF COMPUTER
COMMUNICATION SYSTEMS
TITLE A TASK ALLOCATION MODEL FOR
DISTRIBUTED COMPUTING SYSTEMS

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PUBLISHER IEEE TRANSACTIONS ON COMPUTERS
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PAGE NUMBER 41 - 46
FILE # B - 25

SUBJECT MODELING OF COMPUTER
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TITLE PEER-TO-PEER PROTOCOL FACILITIES
REAL-TIME COMMUNICATION

AUTHOR(S) DEIF N. ATALLAH

PUBLISHER EDN
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SUBJECT MODELING OF COMPUTER
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FILE # B - 27

SUBJECT MODELING OF COMPUTER
COMMUNICATION SYSTEMS
TITLE NETWORKED SIMULATORS: USING
MODELS AND EXPERIENCED FOR DESIGN

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PUBLISHER PROCEEDINGS INTERACTIVE NETWORKED
DATE OF PUBLICATION APRIL 26&27, 1989
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SUBJECT MODELING OF COMPUTER
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TITLE PLANNING THE DESIGN OF TRAINING FOR
A STATE-WIDE DATA COMMUNICATIONS
NETWORK

AUTHOR(S) CANDACE M. ZACHER

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PAGE NUMBER 1 - 9
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SUBJECT MODELING OF COMPUTER
COMMUNICATIONS SYSTEMS
TITLE RECENT DEVELOPMENTS IN
INTERNATIONAL STANDARDS FOR
INFORMATION TECHNOLOGY

AUTHOR(S) BRYAN WOOD

PUBLISHER NETWORKING TECHNOLOGY AND
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FILE # B - 30

SUBJECT MODELING OF COMPUTER
COMMUNICATIONS SYSTEMS
TITLE PROGRESS AND PRACTICE IN
CONFORMANCE TESTING AND
CERTIFICATION

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PUBLISHER NETWORKING TECHNOLOGY AND
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PAGE NUMBER 31-37
FILE # B - 31

SUBJECT MODELING OF COMPUTER
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TITLE RECENT PROGRESS IN PROFILES FOR OSI

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PUBLISHER NETWORKING TECHNOLOGY AND
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FILE # B - 32

SUBJECT MODELING OF COMPUTER
COMMUNICATIONS SYSTEMS
TITLE BOUNDING THE MAXIMUM SIZE OF A
PACKET RADIO NETWORK

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PUBLISHER IEEE TRANSACTIONS ON COMPUTERS
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PAGE NUMBER 1184-1190
FILE # B - 33

SUBJECT MODELING OF COMPUTER
COMMUNICATION SYSTEMS
TITLE A MONITORING SYSTEM FOR AN
ETHERNET INSTALLATION

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SUBJECT MODELING OF COMPUTER
COMMUNICATIONS SYSTEMS
TITLE AN EFFICIENT METHOD FOR SIMULATING
TOKEN RING BUS ACCESS PROTOCOLS

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PUBLISHER PROCEEDINGS: SOUTHEASTERN
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SUBJECT MODELING OF COMPUTER
COMMUNICATIONS SYSTEMS
TITLE SHIPNET: A REAL-TIME LOCAL AREA
NETWORK FOR SHIPS

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PUBLISHER UNIVERSITY OF VIRGINIA
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SUBJECT MODELING OF COMPUTER
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TITLE XTP/PE OVERVIEW

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SUBJECT MODELING OF COMPUTER
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TITLE INTEGRATION VOICE/DATA SWITCHING

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PUBLISHER IEEE COMMUNICATIONS MAGAZINE
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FILE # B - 38

SUBJECT MODELING OF COMPUTER
COMMUNICATION SYSTEMS
TITLE MILITARY STANDARD
COMMON LONG HAUL AND TACTICAL
COMMUNICATION SYSTEM TECHNICAL
STANDARDS

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PUBLISHER DEPARTMENT OF DEFENSE
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SUBJECT MODELING OF COMPUTER
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TITLE VERY LARGE AREA NETWORKS (VLAN)
KNOWLEDGE-BASE APPLIED TO SPACE
COMMUNICATION PROBLEMS

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PUBLISHER DEPT. COMPUTER SCIENCE COLORADO
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SUBJECT MODELING OF COMPUTER
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TITLE EUROPEAN SEMINAR ON NEURAL
COMPUTING

AUTHOR(S) CLAIRE ZOMZELY-NEURATH

PUBLISHER US OFFICE OF NAVAL RESEARCH,
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SUBJECT MODELING OF COMPUTER
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TITLE THE FORCE

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PUBLISHER NTIS - COMPUTER SYSTEMS DESIGN
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SUBJECT MODELING OF COMPUTER
COMMUNICATION SYSTEMS
TITLE POKER ON THE COSMIC CUBE: THE FIRST
RETARGETABLE PARALLEL
PROGRAMMING LANGUAGE AND
ENVIRONMENT

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PUBLISHER NTIS - UNIVERSITY OF WASHINGTON
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SUBJECT MODELING OF COMPUTER
COMMUNICATION SYSTEMS
TITLE EXPERIENCES WITH POKER

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PUBLISHER NTIS - UNIVERSITY OF WASHINGTON
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SUBJECT MODELING OF COMPUTER
COMMUNICATION SYSTEMS
TITLE CRONUS, A DISTRIBUTED OPERATING
SYSTEM: CRONUS DOS IMPLEMENTATIONS

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SUBJECT MODELING OF COMPUTER
COMMUNICATION SYSTEMS
TITLE NUMERICAL COMPUTATIONS ON
MASSIVELY PARRALLEL HYPERCUBES

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PUBLISHER NTIS - LOS ALAMOS NATIONAL
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SUBJECT MODELING OF COMPUTER
COMMUNICATION SYSTEMS
TITLE CACHE BASED ERROR RECOVERY FOR
SHARED MEMORY MULTIPROCESSOR
SYSTEMS

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PUBLISHER NTIS - COMPUTER SYSTEMS GROUP
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FILE # B - 47

SUBJECT MODELING OF COMPUTER
COMMUNICATION SYSTEMS
TITLE POKER 4.1: A PROGRAMMER'S REFERENCE
GUIDE

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PUBLISHER NTIS - UNIVERSITY OF WASHINGTON
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FILE # B - 48

SUBJECT MODELING OF COMPUTER
COMMUNICATION SYSTEMS
TITLE NETWORK PROTOCOLS: PROCEEDINGS OF
THE JOINT IBM/UNIVERSITY OF
NEWCASTLE UPON TYNE SEMINAR HELD
IN THE UNIVERSITY COMPUTER
LABATORY

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SUBJECT MODELING OF COMPUTER
COMMUNICATION SYSTEMS
TITLE TAC - 1: KNOWLEDGE BASED AIRFORCE
TACTICAL BATTLE MANAGEMENT
TESTBED

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SUBJECT MODELING OF COMPUTER
COMMUNICATION SYSTEMS
TITLE PARALLEL PROGRAMMING PARADIGMS

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SUBJECT MODELING OF COMPUTER
COMMUNICATION SYSTEMS
TITLE APPROXIMATE ALGORITHMS FOR
PARTITIONING AND ASSIGNMENT
PROBLEMS

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PUBLISHER NASA LANGLEY RESEARCH CENTER
DATE OF PUBLICATION JUNE 1986
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FILE # B - 52

SUBJECT MODELING OF COMPUTER
COMMUNICATION SYSTEMS
TITLE CITATIONS FROM THE INFORMATION
SERVICES FOR THE PHYSICS AND
ENGINEERING COMMUNITIES INSPEC
DATABASE
COMPUTER NETWORKS: DATA
COMMUNICATION ARCHITECTURE AND
AUTHOR(S)

PUBLISHER NTIS
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SUBJECT MODELING OF COMPUTER
COMMUNICATION SYSTEMS
TITLE CITATIONS FROM THE INFORMATION
SERVICES FOR THE PHYSICS AND
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DECNET: DIGITAL EQUIPMENT
CORPORATION NETWORK ARCHITECTURE
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SUBJECT MODELING OF COMPUTER
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TITLE EUROPEAN SEMINAR ON ~~NE~~URAL
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SUBJECT MODELING OF COMPUTER
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TITLE OPTIMAL PARTITIONING OF RANDOM
PROGRAMS ACROSS TWO PROCESSORS

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PUBLISHER LANGLEY RESEARCH CENTER
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SUBJECT MODELING OF COMPUTER
COMMUNICATION SYSTEMS
TITLE AN EXPERT SYSTEM FOR THE
CONFIGURATION OF LOCAL AREA
NETWORKS APPLICATIONS

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PUBLISHER POLYTECHNICAL OF MILANO
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SUBJECT MODELING OF COMPUTER
COMMUNICATION SYSTEMS
TITLE MAPPING A BATTLEFIELD SIMULATION
ONTO MESSAGE-PASSING PARALLEL
ARCHITECTURES

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PUBLISHER NASA LANGLEY RESEARCH CENTER
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SUBJECT MODELING OF COMPUTER
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TITLE ANALYSIS OF FDDI SYNCHRONOUS
TRAFFIC DELAYS

AUTHOR(S) MARJORY J. JOHNSON

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SUBJECT MODELING OF COMPUTER
COMMUNICATION SYSTEMS
TITLE THE EFFECT OF DISTRIBUTED
COMPUTING TECHNOLOGY ON WIDE AREA
NETWORK CAPACITY REQUIREMENTS

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PUBLISHER NTIS - LAWRENCE BERKELEY LABATORY
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FILE # B - 60

SUBJECT MODELING OF COMPUTER
COMMUNICATION SYSTEMS

TITLE THE BLAZE FAMILY OF LANGUAGES:
PROGRAMMING ENVIRONMENTS FOR
SHARED AND DISTRIBUTED MEMORY
ARCHITECTURES

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PUBLISHER NTIS - ARGONNE NATIONAL LABATORY
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SUBJECT MODELING OF COMPUTER
COMMUNICATION SYSTEMS
TITLE EFFICIENT PARALLEL ARCHITECTURE
FOR HIGHLY COUPLED REAL-TIME
LINEAR SYSTEM APPLICATIONS

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PUBLISHER BUREAU OF ENGINEERING RESEARCH THE
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FILE # B - 62

SUBJECT MODELING OF COMPUTER
COMMUNICATION SYSTEMS
TITLE ESTIMATION AND IDENTIFICATION OF
NONLINEAR DYNAMIC SYSTEMS

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PUBLISHER AIAA JOURNAL
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FILE # B - 63

SUBJECT MODELING OF COMPUTER
COMMUNICATION SYSTEMS
TITLE SIMULATION NETWORKING PROTOCOL
ALTERNATIVES

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SUBJECT MODELING OF COMPUTER
COMMUNICATION SYSTEMS
TITLE PROGRAMMING LANGUAGES FOR
DISTRIBUTED SYSTEMS

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PUBLISHER NTIS - VRIJE UNIVERSITY, AMSTERDAM
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FILE # B - 65

SUBJECT MODELING OF COMPUTER
COMMUNICATION SYSTEMS
TITLE WHY WE CAN'T PROGRAM
MULTIPROCESSORS THE WAY WE'RE
TRYING TO DO IT NOW

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FILE # B - 66

SUBJECT MODELING OF COMPUTER
COMMUNICATION SYSTEMS
TITLE IMPLEMENTING DYNAMIC ARRAYS: A
CHALLENGE FOR HIGH-PERFORMANCE
MACHINES

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FILE # B - 67

SUBJECT MODELING OF COMPUTER
COMMUNICATION SYSTEMS
TITLE UNIX BASED PROGRAMMING TOOLS FOR
LOCALLY DISTRIBUTED NETWORK
APPLICATIONS

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FILE # B - 68

SUBJECT MODELING OF COMPUTER
COMMUNICATION SYSTEMS
TITLE HANDBOOK OF COMPUTER
COMMUNICATIONS STANDARDS LOCAL
NETWORK STANDARDS VOLUME 2

AUTHOR(S) WILLIAM STALLINGS

PUBLISHER HOWARD W. SAMS & COMPANY
DATE OF PUBLICATION 1988 BOOK
PAGE NUMBER 244
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SUBJECT MODELING OF COMPUTER
COMMUNICATION SYSTEMS
TITLE HANDBOOK OF COMPUTER
COMMUNICATIONS STANDARDS
DEPARTMENT OF DEFENSE (DOD)
PROTOCOL STANDARDS VOLUME 3

AUTHOR(S) WILLIAM STALLINGS

PUBLISHER MACMILLAN PUBLISHING
DATE OF PUBLICATION 1988
PAGE NUMBER 240
FILE # B - 70

SUBJECT MODELING OF COMPUTER
COMMUNICATION SYSTEMS
TITLE HIGH SPEED FIBER OPTICS LOCAL AREA
NETWORKS: DESIGN AND
IMPLEMENTATION

AUTHOR(S) F. A. TOBAQI

PUBLISHER STANFORD UNIVERSITY
DATE OF PUBLICATION SEPTEMBER 29, 1988
PAGE NUMBER 9 (presently on microfiche)
FILE # B - 71

SUBJECT MODELING OF COMPUTER
COMMUNICATION SYSTEMS
TITLE AN INTERFACE BETWEEN OBJECT
ORIENTED SYSTEMS

AUTHOR(S) LAWRENCE A. CROWL

PUBLISHER UNIVERSITY OF ROCHESTER COMPUTER
DATE OF PUBLICATION APRIL 1987
PAGE NUMBER 20
FILE # B - 72

SUBJECT MODELING OF COMPUTER
COMMUNICATION SYSTEMS
TITLE DISTRIBUTED OPERATING SYSTEMS: AN
OVERVIEW

AUTHOR(S) MEHMET AKSIT

PUBLISHER TECHNICAL UNIVERSITY OF TWENTE
DATE OF PUBLICATION OCTOBER 1987
PAGE NUMBER 23
FILE # B - 73

SUBJECT MODELING OF COMPUTER
COMMUNICATION SYSTEMS
TITLE DISTRIBUTED COMPUTATION OF
GRAPHICS PRIMATIVES ON A
TRANSPUTER NETWORK

AUTHOR(S) G. K. ELLIS

PUBLISHER NASA
DATE OF PUBLICATION 1988
PAGE NUMBER 7
FILE # B - 74

SUBJECT MODELING OF COMPUTER
COMMUNICATION SYSTEMS
TITLE PERFORMANCE ANALYSIS OF FDDI

AUTHOR(S) M. J. JOHNSON

PUBLISHER NASA
DATE OF PUBLICATION APRIL 1988
PAGE NUMBER 18
FILE # B - 75

SUBJECT MODELING OF COMPUTER
COMMUNICATION SYSTEMS
TITLE NETWORK PROTOCOLS FOR REAL TIME
APPLICATIONS

AUTHOR(S) M. J. JOHNSON

PUBLISHER NASA, AMES RESEARCH CENTER
DATE OF PUBLICATION MAY 1987
PAGE NUMBER 17 (presently on microfiche)
FILE # B - 76

SUBJECT MODELING OF COMPUTER
COMMUNICATION SYSTEMS
TITLE TEST AND EVALUATION OF THE
TRANSPUTER IN A MULTI-TRANSPUTER
SYSTEM

AUTHOR(S) JOSE VANNI FILHO

PUBLISHER NAVAL POSTGRADUATE SCHOOL
DATE OF PUBLICATION JUNE 1987
PAGE NUMBER 201
FILE # B - 77

SUBJECT MODELING OF COMPUTER
COMMUNICATION SYSTEMS
TITLE ANSI/IEEE INTERNATIONAL STANDARD
8802/3 "Carrier Sense Multiple Access
with Collision Detection (CSMA/CD)
Access Method and Physical Layer
Specification"

AUTHOR(S)

PUBLISHER IEEE Computer society press
DATE OF PUBLICATION 1985
PAGE NUMBER
FILE # can be accessed upon request

SUBJECT MODELING OF COMPUTER
COMMUNICATION SYSTEMS
TITLE ETHERNET DISTRIBUTED PACKET
SWITCHING FOR LOCAL COMPUTER
NETWORKS

AUTHOR(S) R.M. METETCALFE
D.R. BOGGS

PUBLISHER COMMUNICATION ASS. COMPUT. MACH.
DATE OF PUBLICATION 1976 VOL. 19 # 7
PAGE NUMBER 395 - 403
FILE # can be accessed upon request

SUBJECT MODELING OF COMPUTER
COMMUNICATION SYSTEMS
TITLE A DECENTRALIZED CONFLICT FREE
PROTOCOL, GBRAM FOR LARGE SCALE
LOCAL NETWORKS

AUTHOR(S) T.T. LIU
L. LI
W.R. FRANTA

PUBLISHER COMPUTER NETWORK SYMPOSIUM
DATE OF PUBLICATION DEC. 1981
PAGE NUMBER 39 - 54
FILE # can be accessed upon request

SUBJECT MODELING OF COMPUTER
COMMUNICATION SYSTEMS
TITLE ANSI/IEEE - INTERNATIONAL STANDARD
8802/5 "Token Ring Access"

AUTHOR(S)

PUBLISHER IEEE COMPUTER SOCIETY PRESS
DATE OF PUBLICATION 1985
PAGE NUMBER
FILE # can be accessed upon request

SUBJECT MODELING OF COMPUTER
COMMUNICATION SYSTEMS
TITLE "Measured Performance of the Ethernet"
ADVANCES IN LOCAL AREA NETWORKS

AUTHOR(S) T.A. GONSALVES
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K. KUMMERLE
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PUBLISHER IEEE PRESS
DATE OF PUBLICATION 1987
PAGE NUMBER 383 - 410
FILE # can be accessed upon request

SUBJECT MODELING OF COMPUTER
COMMUNICATION SYSTEMS
TITLE "Local Area Networks - Major
Technologies and Trends" in LOCAL
AREA NETWORKS

AUTHOR(S) K. KUMMERLE
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PUBLISHER IEEE PRESS
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PAGE NUMBER 2 - 27
FILE # can be accessed upon request

SUBJECT MODELING OF COMPUTER
COMMUNICATION SYSTEMS
TITLE "Architecture and design of a reliable
token ring network" in LOCAL AREA
NETWORKS

AUTHOR(S) W. BUX F.H. CLOSS
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PUBLISHER IEEE PRESS
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PAGE NUMBER 67 - 80
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SUBJECT MODELING OF COMPUTER
COMMUNICATION SYSTEMS
TITLE "Description of FASNET - a
Unidirectional Local Area
Communications Network" in LOCAL
AREA NETWORKS

AUTHOR(S) J.O. LIMB
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PUBLISHER IEEE PRESS
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PAGE NUMBER 190 - 205
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SUBJECT MODELING OF COMPUTER
COMMUNICATION SYSTEMS
TITLE "Optic Fibers in Local Area Networks"
in LOCAL AREA NETWORKS

AUTHOR(S) M.R. FINLEY JR.
EDITORS:
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PUBLISHER IEEE PRESS
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PAGE NUMBER 224 - 243
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SUBJECT MODELING OF COMPUTER
COMMUNICATION SYSTEMS
TITLE "A Distributed Experimental
Communication System" in LOCAL AREA
NETWORKS

AUTHOR(S) J.D. DETREVILLE
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PUBLISHER IEEE PRESS
DATE OF PUBLICATION 1987
PAGE NUMBER 533 - 542
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SUBJECT MODELING OF COMPUTER
COMMUNICATION SYSTEMS
TITLE SIMNET NETWORK PERFORMANCE
BBN REPORT 6711

AUTHOR(S) D. FRIEDMAN
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PUBLISHER BBN COMMUNICATIONS CORP.,
DATE OF PUBLICATION JAN. 1988
PAGE NUMBER
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SUBJECT MODELING OF COMPUTER
COMMUNICATION SYSTEMS
TITLE THE SIMNET NETWORK AND PROTOCOLS
BBN REPORT NUMBER 6787

AUTHOR(S) A. POPE

PUBLISHER BBN LABORATORIES, INC., CAMBRIDGE,
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SUBJECT MODELING OF COMPUTER
COMMUNICATION SYSTEMS
TITLE BRAM THE BROADCAST RECOGNITION
ACCESS METHOD

AUTHOR(S) I. CHLAMTAC
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PUBLISHER IEEE TRANSACTIONS ON
DATE OF PUBLICATION AUGUST 1989 VOL COM-27 # 8

PAGE NUMBER 1183 - 1189

FILE # can be accessed upon request

SUBJECT MODELING OF COMPUTER
COMMUNICATION SYSTEMS
TITLE "Long Haul Networking of Simulators"
PROCEEDINGS 10th
INTERSERVICE/INDUSTRY TRAINING
SYSTEMS CONFERENCE

AUTHOR(S) D.C. MILLER
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DATE OF PUBLICATION NOV 29 - DEC 1, 1988
PAGE NUMBER 577 - 582
FILE # can be accessed upon request

SUBJECT MODELING OF COMPUTER
COMMUNICATION SYSTEMS
TITLE "ISDN 83" special issue on ISDNs

AUTHOR(S) F.T. ANDREWS JR.

PUBLISHER IEEE COMMUNICATIONS MAGAZINE
DATE OF PUBLICATION JAN 1984 VOL 22 #1
PAGE NUMBER 6 - 10
FILE # can be accessed upon request

SUBJECT MODELING OF COMPUTER
COMMUNICATION SYSTEMS
TITLE "Transition to ISDN - an Overview"
special issue on ISDNs

AUTHOR(S) D.J. KOSTAS

PUBLISHER IEEE COMMUNICATIONS MAGAZINE
DATE OF PUBLICATION JAN 1984 VOL 22 #1
PAGE NUMBER 11 - 17
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SUBJECT MODELING OF COMPUTER
COMMUNICATION SYSTEMS
TITLE ISDN PROTOCOL ARCHITECTURE

AUTHOR(S) N.Q. DUC
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PUBLISHER IEEE COMM. MAG
DATE OF PUBLICATION MARCH 1985 VOL 23 #3
PAGE NUMBER 15 - 22
FILE # can be accessed upon request

SUBJECT MODELING OF COMPUTER
COMMUNICATION SYSTEMS
TITLE DESIGN APPROACHES AND
PERFORMANCE CRITERIA FOR
INTERGRATED VOICE/DATA SWITCHING

AUTHOR(S) M. ROSS

PUBLISHER PROC. IEEE
DATE OF PUBLICATION SEPT 1977 VOL 65 #9
PAGE NUMBER 1283 - 1295
FILE # can be accessed upon request

SUBJECT MODELING OF COMPUTER
COMMUNICATION SYSTEMS
TITLE TELECOMMUNICATION NETWORKS

AUTHOR(S) M. SCHWARTZ

PUBLISHER ADDISON AND WESLEY
DATE OF PUBLICATION 1987
PAGE NUMBER
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SUBJECT MODELING OF COMPUTER
COMMUNICATION SYSTEMS
TITLE DATA NETWORKS

AUTHOR(S) D. BERTSEKAS
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PUBLISHER PRENTICE HALL
DATE OF PUBLICATION 1987
PAGE NUMBER
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SUBJECT MODELING OF COMPUTER
COMMUNICATION SYSTEMS
TITLE SIMULATION MODELING AND SIMNET

AUTHOR(S) H.A. TAHA

PUBLISHER PRENTICE HALL
DATE OF PUBLICATION 1988
PAGE NUMBER
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SUBJECT MODELING OF COMPUTER
COMMUNICATION SYSTEMS

TITLE "Carrier Sense Multiple Access with
Collision Detection (CSMA/CD) Access
Method and Physical Layer
Specification" ANSI/IEEE -
INTERNATIONAL STANDARD 8802/3

AUTHOR(S)

PUBLISHER IEEE COMPUTER SOCIETY PRESS
DATE OF PUBLICATION 1985
PAGE NUMBER
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SUBJECT MODELING OF COMPUTER
COMMUNICATION SYSTEMS
TITLE "Token-Passing Bus Access Method"
ANSI/IEEE - DRAFT INTERNATIONAL
STANDARD ISO/DIS 8802/4

AUTHOR(S)

PUBLISHER IEEE COMPUTER SOCIETY PRESS
DATE OF PUBLICATION 1985
PAGE NUMBER
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SUBJECT MODELING OF COMPUTER
COMMUNICATION SYSTEMS
TITLE "Token Ring Access" ANSI/IEEE -
INTERNATIONAL STANDARD 8802/5

AUTHOR(S)

PUBLISHER IEEE COMPUTER SOCIETY PRESS
DATE OF PUBLICATION 1985
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SUBJECT MODELING OF COMPUTER
COMMUNICATION SYSTEMS
TITLE "Performance Models of Token Ring
Local Area Networks" PROCEEDINGS OF
ACM SIGMETRICS CONFERENCE ON
MEASUREMENT AND MODELING OF
COMPUTER SYSTEMS

AUTHOR(S) R. BERRY
K. CHANDY

PUBLISHER
DATE OF PUBLICATION 1983
PAGE NUMBER 29 - 31
FILE # can be accessed upon request

SUBJECT MODELING OF COMPUTER
COMMUNICATION SYSTEMS
TITLE SIMSCRIPT II.5 PROGRAMMING
LANGUAGE

AUTHOR(S) CACI INC.

PUBLISHER CACI, INC. FEDERAL LOS ANGELES, CA
DATE OF PUBLICATION 1987
PAGE NUMBER
FILE # can be accessed upon request

SUBJECT MODELING OF COMPUTER
COMMUNICATION SYSTEMS
TITLE A TOKEN RING NETWORK FOR LOCAL
DATA COMMUNICATION

AUTHOR(S) R. DIXON
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J. MARKOV

PUBLISHER IBM SYSTEM JOURNAL
DATE OF PUBLICATION 1983 VOL 22
PAGE NUMBER 62-74
FILE # can be accessed upon request

SUBJECT MODELING OF COMPUTER
COMMUNICATION SYSTEMS
TITLE "SIMNET ETHERNET Performance" BBN
TECHNICAL REPORT No 6711

AUTHOR(S) D. FRIEDMAN
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PUBLISHER BBN COMMUNICATIONS CORP. MA
DATE OF PUBLICATION 1988

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SUBJECT MODELING OF COMPUTER
COMMUNICATION SYSTEMS
TITLE DATA COLLECTION AND ANALYSIS: THE
KEYS FOR INTERACTIVE TRAINING FOR
COMBAT READINESS

AUTHOR(S) R. GARVEY
T. RADGOWSKI

PUBLISHER PROCEEDINGS OF IITSC CONFERENCE
DATE OF PUBLICATION 1988

PAGE NUMBER 572 - 576

FILE # can be accessed upon request

SUBJECT MODELING OF COMPUTER
COMMUNICATION SYSTEMS
TITLE "Concurrent C" TECHNICAL REPORT

AUTHOR(S) N. GEHANI
W. ROOME

PUBLISHER AT & T BELL LABORATORIES
DATE OF PUBLICATION 1986
PAGE NUMBER
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SUBJECT MODELING OF COMPUTER
COMMUNICATION SYSTEMS
TITLE "Benchmarking LAN Protocol
Analyzers" PROCEEDINGS OF 13th IEEE
CONFERENCE ON LOCAL COMPUTER
NETWORKS

AUTHOR(S) J. HAUGDAHL

PUBLISHER
DATE OF PUBLICATION 1988
PAGE NUMBER 375 - 384
FILE # can be accessed upon request

SUBJECT MODELING OF COMPUTER
COMMUNICATION SYSTEMS
TITLE HP 4792A LAN PROTOCOL ANALYZER:
VOL I: GETTING STARTED, VOL II:
OPERATING MANUAL

AUTHOR(S) HEWLETT-PACKARD

PUBLISHER HP TELECOMMUNICATIONS DIVISION
DATE OF PUBLICATION 1987
PAGE NUMBER
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SUBJECT MODELING OF COMPUTER
COMMUNICATION SYSTEMS
TITLE CONCURRENT EUCLID, THE UNIX SYSTEM
AND TUNIS

AUTHOR(S) R. HOLT

PUBLISHER ADDISON-WESLEY, READING MA
DATE OF PUBLICATION 1983
PAGE NUMBER
FILE # can be accessed upon request

SUBJECT MODELING OF COMPUTER
COMMUNICATION SYSTEMS
TITLE STRUCTURED CONCURRENT
PROGRAMMING WITH OPERATING SYSTEM
APPLICATIONS

AUTHOR(S) R. HOLT ET.AL

PUBLISHER ADDISON-WESLEY, READING MA
DATE OF PUBLICATION 1978
PAGE NUMBER
FILE # can be accessed upon request

SUBJECT MODELING OF COMPUTER
COMMUNICATION SYSTEMS
TITLE THE C PROGRAMMING LANGUAGE

AUTHOR(S) B. KERNIGHAN
D. RITCHIE

PUBLISHER PRENTICE-HALL
DATE OF PUBLICATION 1978
PAGE NUMBER
FILE # can be accessed upon request

SUBJECT MODELING OF COMPUTER
COMMUNICATION SYSTEMS
TITLE "First FDDI Local Area Network"
PROCEEDINGS OF 12th IEEE CONFERENCE
ON LOCAL COMPUTER NETWORKS

AUTHOR(S) I. KOLNIK
J. GARODNICK

PUBLISHER
DATE OF PUBLICATION 1987
PAGE NUMBER 7 - 11
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SUBJECT MODELING OF COMPUTER
COMMUNICATION SYSTEMS
TITLE COMPUTER PERFORMANCE MODELING
HANDBOOK

AUTHOR(S) S. LAVENBERG

PUBLISHER ACADEMIC PRESS
DATE OF PUBLICATION 1983
PAGE NUMBER
FILE # can be accessed upon request

SUBJECT MODELING OF COMPUTER
COMMUNICATION SYSTEMS
TITLE EMERGING STANDARDS, HARDWARE,
AND SOFTWARE LIGHT THE WAY TO FDDI

AUTHOR(S) K. MARRIN

PUBLISHER COMPUTER DESIGN
DATE OF PUBLICATION APRIL 1989 VOL 28 # 7
PAGE NUMBER 51 - 57
FILE # can be accessed upon request

SUBJECT MODELING OF COMPUTER
COMMUNICATION SYSTEMS
TITLE "ETHERNET: DISTRIBUTED PACKET
SWITCHING FOR LOCAL COMPUTER
NETWORKS

AUTHOR(S) R. METCALF
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PUBLISHER COMMUNICATIONS OF ACM
DATE OF PUBLICATION 1976 VOL 19 # 7
PAGE NUMBER 395 - 403
FILE # can be accessed upon request

SUBJECT MODELING OF COMPUTER
COMMUNICATION SYSTEMS
TITLE "The SIMNET Network and Protocols"
BBN Report No. 7102

AUTHOR(S) ARTHUR POPE

PUBLISHER BBN COMMUNICATIONS CORP., MA
DATE OF PUBLICATION JULY 1989
PAGE NUMBER
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SUBJECT MODELING OF COMPUTER
COMMUNICATION SYSTEMS
TITLE "The SIMNET Network and Protocols"
BBN Report No. 6369

AUTHOR(S) ARTHUR POPE

PUBLISHER BBN COMMUNICATIONS CORP., MA
DATE OF PUBLICATION FEBRUARY 1987
PAGE NUMBER
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SUBJECT MODELING OF COMPUTER
COMMUNICATION SYSTEMS
TITLE INTRODUCTION TO SIMULATION AND
SLAM II (2nd edition)

AUTHOR(S) A. PRITSKER

PUBLISHER SYSTEMS PUBLISHING CORP., WEST
DATE OF PUBLICATION 1984
PAGE NUMBER
FILE # can be accessed upon request

SUBJECT MODELING OF COMPUTER
COMMUNICATION SYSTEMS
TITLE "SHIPNET: A Real-Time Local Area
Network For Ships" PROCEEDINGS OF
13th IEEE CONFERENCE ON LOCAL
COMPUTER NETWORKS

AUTHOR(S) R. SIMONSON et al

PUBLISHER
DATE OF PUBLICATION 1988
PAGE NUMBER 424 - 432
FILE # can be accessed upon request

SUBJECT MODELING OF COMPUTER
COMMUNICATION SYSTEMS
TITLE "Performance Analysis of the FDDI
Token-Ring" TECHNICAL REPORT
TR-8802

AUTHOR(S) R. SIMONSON

PUBLISHER DEPT. COMPUTER SCIENCE UVA
DATE OF PUBLICATION 1988
PAGE NUMBER
FILE # can be accessed upon request

SUBJECT MODELING OF COMPUTER
COMMUNICATION SYSTEMS
TITLE LOCAL NETWORKS

AUTHOR(S) W. STALLINGS

PUBLISHER ACM COMPUTING SURVEYS
DATE OF PUBLICATION MARCH 1984 VOL 16 # 1
PAGE NUMBER 3 - 42
FILE # can be accessed upon request

SUBJECT MODELING OF COMPUTER
COMMUNICATION SYSTEMS
TITLE "Evaluation of Real-Time Transport
Protocols" TECHNICAL REPORT
TR-88-21

AUTHOR(S) W. STRAYER
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PUBLISHER DEPT. OF COMPUTER SCIENCE UVA
DATE OF PUBLICATION 1988
PAGE NUMBER
FILE # can be accessed upon request

SUBJECT MODELING OF COMPUTER
COMMUNICATION SYSTEMS
TITLE A LOCAL COMMUNICATION NETWORK
BASED ON INTERCONNECTED TOKEN
RINGS: A TUTORIAL

AUTHOR(S) N STROLE

PUBLISHER IBM JOURNAL ON RESEARCH AND
DATE OF PUBLICATION 1983 VOL 27 #5
PAGE NUMBER 481 - 496
FILE # can be accessed upon request

SUBJECT MODELING OF COMPUTER
COMMUNICATION SYSTEMS
TITLE CALCULATING THE MAXIMUM MEAN DATA
RATE IN LOCAL AREA NETWORKS

AUTHOR(S) B. STUCK

PUBLISHER IEEE COMPUTER
DATE OF PUBLICATION MAY 1983
PAGE NUMBER 72 - 76
FILE # can be accessed upon request

SUBJECT MODELING OF COMPUTER
COMMUNICATION SYSTEMS
TITLE NETWORK PROTOCOLS

AUTHOR(S) A. TANENBAUM

PUBLISHER ACM COMPUTING SURVEYS
DATE OF PUBLICATION DEC. 1981 VOL 13 # 4
PAGE NUMBER 453 - 490
FILE # can be accessed upon request

SUBJECT MODELING OF COMPUTER
COMMUNICATION SYSTEMS
TITLE LOCAL COMPUTER NETWORK
TECHNOLOGIES

AUTHOR(S) C. TROOPER

PUBLISHER ACADEMIC PRESS
DATE OF PUBLICATION 1981
PAGE NUMBER
FILE # can be accessed upon request

SUBJECT MODELING OF COMPUTER
COMMUNICATION SYSTEMS
TITLE "A Real-Time Message System for
Token Ring Networks" TECHNICAL
REPORT TR-88-08

AUTHOR(S) A. WEAVER
M. COLVIN

PUBLISHER DEPT. OF COMPUTER SCIENCE UVA
DATE OF PUBLICATION 1988
PAGE NUMBER
FILE # can be accessed upon request

SUBJECT MODELING OF COMPUTER
COMMUNICATION SYSTEMS
TITLE "Simulation of Local Computer
Networks" PROCEEDINGS OF 4th IEEE
CONFERENCE ON LOCAL COMPUTER
NETWORKS

AUTHOR(S) J. YEH

PUBLISHER
DATE OF PUBLICATION OCTOBER 1979
PAGE NUMBER 1 - 4
FILE # can be accessed upon request

APPENDIX B

Welcome to DIALOG
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Last logoff 02oct89 14:27:51
Logon file001 04oct89 09:56:59
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\$0.30	0.010 Hrs	File1
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? s parallel(w)programming? or distributed(w)processing?

17357	PARALLEL
46534	PROGRAMMING?
174	PARALLEL(W) PROGRAMMING?
11575	DISTRIBUTED
109155	PROCESSING?
617	DISTRIBUTED(W) PROCESSING?

S1	787	PARALLEL(W) PROGRAMMING?	OR
DISTRIBUTED(W) PROCESSING?			

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787	S1
182147	PY=1986 : PY=1989
S2	337 S1 AND PY=1986:1989

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2/6/1

1407258 DE89012297/XAB

Structured Command History for UNIX Using a Parallel
Distributed Processing Model

(Thesis (M.S.))

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NTIS Prices: PC A05/MF A01

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1406419 AD-A209 401/9/XAB

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1406150 AD-A209 132/0/XAB

Parallel Vision Algorithms

(Annual technical rept. no. 2, 1 Oct 87-28 Dec 88)

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Computer Networks: Data Communication Architecture and
Development.

January 1975-July 1989 (Citations from the INSPEC: Information
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1405007 N89-23183/1/XAB

Specifying Real-Time Systems with Interval Logic

(Final Report)

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1405004 N89-23073/4/XAB

Implementing Nested Conditional Statements in SIMD
(Single Instruction Multiple Data) Machines

(Final Report)

NTIS Prices: PC A03/MF A01

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Parallel Vision Algorithms
(Annual technical rept. no. 1, 1 Oct 86-30 Sep 87)
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International Corporation), 3900 Wheeler Ave., Alexandria, VA
22304-5110.
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2/6/11
1400748 PB89-184360/XAB
Methodology for the Design of Continuous-Dataflow
Synchronous Systems (Technical rept.)
NTIS Prices: PC A03/MF A01

2/6/12
1400638 N89-21542/0/XAB
Parallel Solution of Sparse One-Dimensional Dynamic
Programming Problems (Final Report)
NTIS Prices: PC A03/MF A01

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Language Comparison for Scientific Computing on MIMD
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NTIS Prices: PC A03/MF A01

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Implementation Indices (1975-1979). Volume 1
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NTIS Prices: PC A08/MF A01

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1399489 AD-A207 567/9/XAB
Real-Time Signal Processing Data Acquisition Subsystem
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NTIS Prices: PC A03/MF A01

2/6/16
1398122 N89-20638/7/XAB
Run-Time Scheduling and Execution of Loops on Message
Passing Machines (Final Report)
NTIS Prices: PC A03/MF A01

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(Final Report)
NTIS Prices: PC A04/MF A01

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1396042 AD-A206 657/9/XAB
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(Technical rept.)
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1395831 TIB/B89-80939/XAB
Graphenalgorithmen fuer MIMD-Rechner. (Graph
algorithms for MIMD (Multiple-Instruction-Stream, Multiple
Data Stream) processors)
(Diploma Thesis)
NTIS Prices: PC E11

2/6/20
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Fairness in parallel programs: The transformational approach

NTIS Prices: PC E09

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1394837 N89-19830/3/XAB
Artificial Intelligent Decision Support for Low-Cost
Launch Vehicle Integrated Mission Operations
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CIRCA 2000 Operations Criteria
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 1321242 AD-A191 094/2/XAB
 Proceedings from the Workshop on Large-Grained Parallelism
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 1321106 AD-A190 956/3/XAB
 UNIX Based Programming Tools for Locally Distributed Network
 Applications (Master's thesis)
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 Proceedings of the National Conference on Ada (trade
 mark) Technology (6th) Held on 14-18 March 1988 in Arlington,
 VA
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 1318555 AD-A190 383/0/XAB
 MultiScheme: A Parallel Processing System Based on MIT
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1318554 AD-A190 382/2/XAB

Argus Reference Manual (Technical rept.)

NTIS Prices: PC A08/MF A01

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Automated Interactive Simulation Model (AISIM) VAX
Version 5.0 User's Manual (Final rept. 14 May 86-15 May 87)

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Experiences with Serial and Parallel Algorithms for Channel
Routing Using Simulated Annealing

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1315702 AD-A189 856/8/XAB

Mobile Remote Manipulator System Simulator

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1315695 AD-A189 849/3/XAB

Implementation of a Distributed Adaptive Routing Algorithm
on the Intel iPSC (Intel Personal Super-Computer) (Master's
thesis)

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Architecture of MRMS Simulation: Distributing Processes

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Duality of Fault Tolerant System Structures

NTIS Prices: PC E03/MF E03

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Implementation and Use of Ada on Distributed
Systems with High Reliability Requirements. Annual Progress
Report, January 1, 1987-February 14, 1988

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Systeme de Programmation Parallele Occam/Ada
(Occam/Ada Parallel Programming System) (Doctoral thesis)

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Why We Can't Program Multiprocessors the Way We're Trying
to Do It Now (Technical rept.)
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Interface between Object-Oriented Systems (Technical
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Mitsubishi Denki Giho, Vol. 61, No. 10, 1987

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Interface between Astrophysical Datasets and Distributed Database Management Systems (DAVID) (Progress rept.)

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Strategies
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Shared Memory Algorithm and Proof for the Alternative
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1305006 N88-14641/0/XAB
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MPP:3. Final Report, May 1984-July 1987
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Introduction to Local Area Network Design on Ariane
5 and Future Launchers
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Theory and Practice of Fault Tolerance in Distributed
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Projects Agency (Technical rept. (Final) 1 Oct 81-30 Sep 87)

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Environments: 1, A Uniform Decomposition and Performance
Analysis for the NCUBE and JPL Mark IIIfp Hypercubes
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(Final rept. 15 Jun 85-14 Oct 86)
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1293195 AD-A185 579/0/XAB
Communications for the DTroll Distributed Database System
(Master's thesis)
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Multi-Processor Architectures for Artificial Intelligence
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Methodologie d'Evaluation des Performances des Systemes
Repartis en Temps Reel (Methodology of Performance
Evaluation of Real Time Distributed Systems)

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1291911 N88-11402/0/XAB

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1291899 N88-11379/0/XAB

Systeme Memoire pour Architecture Multiprocesseur sur Bus Unique. Application au Systeme SCQM (Memory Systems for Single Bus Multiprocessor Architecture. Application to the SCQM System)

(Doctoral thesis)

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Programming: Progress Report, September 1, 1986-August 31, 1987

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Test and Evaluation of the Transputer in a Multi-Transputer System (Master's thesis)

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1284195 N87-29173/8/XAB

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1280235 N87-28294/3/XAB

Ada Pilot Project (Final rept.)

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Sistema de Comunicacao Para Ambiente de Multiprocessamento (Communication System for a Multiprocessing Environment)

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Synchronization Delay Effects (Final rept.)

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1276515 N87-27433/8/XAB

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Placement on a Hypercube Computer

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1273956 PB87-219937/XAB

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 1265909 AD-A182 176/8/XAB
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NTIS Prices: PC A02/MF A01

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1242319 N87-17441/3/XAB

Comparison of Five Benchmarks

NTIS Prices: PC A02/MF A01

2/6/291

1241827 N87-16851/4/XAB

Distributed Data Acquisition System for Aeronautics Test
Facilities

NTIS Prices: PC A02/MF A01

2/6/292

1239787 AD-A176 907/4/XAB

Naval C(3) Distributed Tactical Decision Making
(Quarterly rept. 1 Oct-31 Dec 86)

NTIS Prices: PC A03/MF A01

2/6/293

1239707 AD-A176 827/4/XAB

Survey of Fault Tolerant Computer Security and Computer
Safety (Final technical rept. Apr 85-Apr 86)

NTIS Prices: PC A10/MF A01

2/6/294

1239234 N87-16656/7/XAB

Database Interfaces on NASA's (National
Aeronautics and Space Administration's) Heterogeneous
Distributed Database System (Semiannual rept)

NTIS Prices: PC A03/MF A01

2/6/295

1239221 N87-16528/8/XAB

Overview of Database Projects
(Semiannual status rept)

NTIS Prices: PC A10/MF A01

2/6/296

1235417 AD-A176 258/2/XAB

Development of Real-Time Speech Recognition
(Final technical rept. 3 Jun 85-2 Dec 86)

NTIS Prices: PC A02/MF A01

2/6/297

1234157 N87-14914/2/XAB

Placement d'UN Reseau de Processus Communicants Decrit
en FP2 sur Une Structure de Grille en Vue d'Une
Implantation Parallele de Ce Langage (Location of the
Communication Process Network Described in FP2 on a Graph
Structure in Order to Implement the Parallel Processing of
That Language)

NTIS Prices: PC A05/MF A01

2/6/298

1234151 N87-14907/6/XAB

Aspecten van Het Amsterdams Multiprocessor Prolog Systeem
(Aspects of the Amsterdam Multiprocessor Prolog System)

NTIS Prices: PC A02/MF A01

2/6/299

1229732 DE86015570/XAB

Portable Environment for Developing Parallel Fortran
Programs

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NTIS Prices: PC A02/MF A01

2/6/300

1227996 N87-12270/1/XAB

ELAND: An Expert System for the Configuration of Local
Area Networks Applications

NTIS Prices: PC A03/MF A01

2/6/301

1227995 N87-12265/1/XAB

Implementation and Use of Ada on Distributed
Systems with High Reliability Requirements
(Progress rept. 5 Mar 82-31 Dec 86)

NTIS Prices: PC A04/MF A01

2/6/302

1227984 N87-12247/9/XAB

Parallel Scheduling of Recursively Defined Arrays (Final
rept)

NTIS Prices: PC A03/MF A01

2/6/303

1227974 N87-12169/5/XAB

Application of a Sparse, Distributed Memory to

the Detection, Identification and Manipulation of Physical Objects. Semiannual Status Report October 1985-March 1986

NTIS Prices: PC A02/MF A01

2/6/304

1227329 DE86014770/XAB

Data Management of a Multilaboratory Field Program Using Distributed Processing Portions of this document are illegible in microfiche products.

NTIS Prices: PC A02/MF A01

2/6/305

1227052 AD-A174 506/6/XAB

Cooperative Intelligence for Remotely Piloted Vehicle Fleet Control. Analysis and Simulation (Interim rept.)

NTIS Prices: PC A04/MF A01

2/6/306

1227032 AD-A174 486/1/XAB

Assessment of the Computer Science Activities of the Office of Naval Research

NTIS Prices: PC A03/MF A01

2/6/307

1226827 AD-A174 276/6/XAB

Processor Renaming in Asynchronous Environments (Technical rept.)

NTIS Prices: PC A02/MF A01

2/6/308

1225747 N87-11510/1/XAB

EOS (Embedded Operating Systems): A Project to Investigate the Design and Construction of Real-Time Distributed Embedded Operating Systems

NTIS Prices: PC A10/MF A01

2/6/309

1225308 AD-A173 989/5/XAB

Serial Order: A Parallel Distributed Processing Approach (Technical rept. Jun 85-Mar 86)

NTIS Prices: PC A04/MF A01

2/6/310

1223941 DE86014683/XAB

Unified Approach to Parallel Computation: Performance Evaluation and Architecturally Independent Parallel Programming. Progress Report, September 1, 1985-August 31, 1986

NTIS Prices: PC A02/MF A01

2/6/311

1223263 AD-A173 283/3/XAB

Applying Activation Theory for Modeling Task Interference

in Dual-Task Situations (Final rept. Mar 85-Jun 86)
NTIS Prices: PC A02/MF A01

2/6/312
1223009 AD-A173 028/2/XAB
Information Processing Research (Final rept. Jan 81-Dec 84)
NTIS Prices: PC A07/MF A01

2/6/313
1222214 N86-33032/1/XAB
First 3 Years of Operation of RIACS (Research Institute for Advanced Computer Science) (1983-1985) (Final rept)
NTIS Prices: PC A02/MF A01

2/6/314
1220744 N86-32112/2/XAB
Multiple Grid Problems on Concurrent-Processing Computers
NTIS Prices: PC A06/MF A01

2/6/315
1219350 AD-A172 224/8/XAB
Distributed Control in Computer Networks and Cross-Sections of Colored Multidimensional Bodies (Interim research rept.)
NTIS Prices: PC A02/MF A01

2/6/316
1219323 AD-A172 196/8/XAB
RAMBOT (Restructuring Associative Memory Based on Training): A Connectionist Expert System That Learns by Example
(Technical rept. Oct 85-Apr 86)
NTIS Prices: PC A03/MF A01

2/6/317
1219099 PB86-877123/XAB
DECNET: Digital Equipment Corporation Network Architecture. 1976-October 1986 (Citations from the INSPEC: Information Services for the Physics and Engineering Communities Database)
(Rept. for 1976-Oct 86)
NTIS Prices: PC N01/MF N01

2/6/318
1219057 PB86-876687/XAB
IBM System 370. 1975-October 1986 (Citations from the INSPEC: Information Services for the Physics and Engineering Communities Database) (Rept. for 1975-Oct 86)
NTIS Prices: PC N01/MF N01

2/6/319
1218318 N86-31261/8/XAB
Optimal Partitioning of Random Programs Across Two

Processors
(Final rept)
NTIS Prices: PC A03/MF A01

2/6/320
1217862 DE86013517/XAB
Denelcor HEP Multiprocessor Simulator
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NTIS Prices: PC A02/MF A01

2/6/321
1216029 N86-30380/7/XAB
Force on the Flex: Global Parallelism and Portability
(Final rept)
NTIS Prices: PC A02/MF A01

2/6/322
1216028 N86-30379/9/XAB
Dynamic Remapping of Parallel Computations with Varying Resource Demands (Final rept)
NTIS Prices: PC A04/MF A01

2/6/323
1215030 PB86-875507/XAB
Distributed Data Base Management Systems. October 1984-September 1986 (Citations from the INSPEC: Information Services for the Physics and Engineering Communities Database)
(Rept. for Oct 84-Sep 86)
NTIS Prices: PC N01/MF N01

2/6/324
1214437 N86-29562/3/XAB
UCLA Design Diversity Experiment (DEDIX) System: A Distributed Testbed for Multiple-Version Software
NTIS Prices: PC A02/MF A01

2/6/325
1214435 N86-29551/6/XAB
Statistical Methodologies for the Control of Dynamic Remapping (Final rept)
NTIS Prices: PC A03/MF A01

2/6/326
1214434 N86-29550/8/XAB
Approximate Algorithms for Partitioning and Assignment Problems NTIS Prices: PC A03/MF A01

2/6/327
1210685 AD-A169 981/8/XAB
High Performance Parallel Computing
(Final rept. 1 Feb 84-31 Jan 85)
NTIS Prices: PC A02/MF A01

2/6/328
1201386 N86-25142/8/XAB
Implementation and Use of Ada on Distributed
Systems with High Reliability Requirements (Annual rept)
NTIS Prices: PC A05/MF A01

2/6/329
1199173 PB86-870466/XAB
Micro-Mainframe Links: Forecasts and Markets. 1983-June
1986 (Citations from The Computer Database) (Rept. for
1983-Jun 86)
NTIS Prices: PC N01/MF N01

2/6/330
1198619 N86-24347/4/XAB
Performance Tradeoffs in Static and Dynamic Load Balancing
Strategies (Final rept)
NTIS Prices: PC A02/MF A01

2/6/331
1196115 N86-23319/4/XAB
Display System Software for the Integration of an Adage 3000
Programmable Display Generator into the Solid Modeling Package
C.a.D. Software (Contractor rept., 26 Sep 84-31 Mar 86)
NTIS Prices: PC A08/MF A01

2/6/332
1195222 DE86007645/XAB
Environments for Prototyping Parallel Algorithms
NTIS Prices: PC A02/MF A01

2/6/333
1193603 N86-21516/7/XAB
Three-Dimensional Boundary Layer Analysis Program
Blay and Its Application
NTIS Prices: PC A02/MF A01

2/6/334
1192839 DE86007309/XAB
Forward Spectrometers at the SSC
Portions of this document are illegible in microfiche
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NTIS Prices: PC A02/MF A01

2/6/335
1191949 PB86-866829/XAB
Distributed Information Systems. 1975-April 1986
(Citations from the INSPEC: Information Services for the
Physics and Engineering Communities Database) (Rept. for
1975-Apr 86)
NTIS Prices: PC N01/MF N01

2/6/336

1184451 AD-A164 897/1/XAB
Semi-Applicative Programming. Examples of Context Free
Recognizers (Technical rept.)
NTIS Prices: PC A03/MF A01

2/6/337
1183966 PB86-862703/XAB
Computer Networks: Data Communication Architecture and
Development. 1975-March 1986 (Citations from the INSPEC:
Information Services for the Physics and Engineering
Communities Database) (Rept. for 1975-Mar 86)
NTIS Prices: PC N01/MF N01
? t 1387880/7;t 1387870/7;t 1381250/7;t 1380043/7;t
1380010/7;t 1379988/7;t 1377085/7

APPENDIX C

1387880/7
1387880 N89-12255/0/XAB
Study of the Development of On-Board Distributed Software Systems Using Ada
Porcherlabreuille, B. ; Dellatorre, A.
CISI Ingenierie, Toulouse (France).
Corp. Source Codes: 093451000; CP773641
Sponsor: National Aeronautics and Space Administration, Washington, DC.
Report No.: ESA-CR(P)-2651; ETN-88-93247
May 88 71p
Languages: English
Journal Announcement: GRAI8906; STAR2703
Prepared in Cooperation with Carlo Gavazzi Controls S.p.a., Milan, Italy.
NTIS Prices: PC A04/MF A01
Country of Publication: France
Contract No.: ESA-6572/85-NL-PP
Use of Ada technology for the design and implementation of large distributed systems in the context of the Columbus space station program was assessed by developing in Ada a prototype of an on-board data management system (DMS). Results and lessons learned by applying a virtual node approach together with hierarchical object oriented design contribute to a better understanding and management of the use of Ada technology. This approach provides the definition of a development framework very well adapted to the Columbus DMS context. By defining applications and services software as Ada virtual nodes it is possible to design the whole system as a single Ada program, structured according to the architecture adopted for DMS. The applications could be developed in parallel on geographically distributed sites and be validated individually using this initial model and the corresponding interface specification. The final integration process could concentrate on the operational validation of the system in distributed configuration (the functional validation in centralized configuration being obtained at the end of the first phase). The efficient implementation of this method requires support tools for: checking the rules imposed by the virtual node approach; and scanning virtual node specifications (Ada packages) in order to generate a surrogate software layer to provide syntactically transparent communication between virtual nodes located on distinct physical processors.

1387870/7
1387870 N89-12222/0/XAB
Support Architecture for Reliable Distributed Computing Systems. Semiannual Status Report, June 9, 1987-June 8, 1988

Dasgupta, P. ; LeBlanc, R. J.
Georgia Inst. of Tech., Atlanta.
Corp. Source Codes: 010263000; GW167534
Sponsor: National Aeronautics and Space Administration,
Washington, DC.

Report No.: NAS 1.26:183235; NASA-CR-183235

30 Sep 88 36p

Languages: English

Journal Announcement: GRAI8906; STAR2703

NTIS Prices: PC A03/MF A01

Country of Publication: United States

Contract No.: NAG1-430

The Clouds project is well underway to its goal of building a unified distributed operating system supporting the object model. The operating system design uses the object concept of structuring software at all levels of the system. The basic operating system was developed and work is under progress to build a usable system.

1381250/7

1381250 AD-A204 126/7/XAB

QLISP for Parallel Processors

(Final rept. 15 Jul 86-31 Jul 88)

McCarthy, J.

Stanford Univ., CA. Dept. of Computer Science.

Corp. Source Codes: 009225004; 094120

Jan 89 4p

Languages: English

Journal Announcement: GRAI8912

NTIS Prices: PC A02/MF A01

Country of Publication: United States

Contract No.: N00039-84-C-0211; ARPA Order-5826

The goal of the Qlisp project at Stanford is to gain experience with the shared-memory, queue-based approach to parallel Lisp, by implementing the Qlisp language on an actual multiprocessor, and by developing a symbolic algebra system as a testbed application. The experiments performed on the simulator included: 1. Algorithms for sorting and basic data structure manipulation for polynomials. 2. Partitioning and scheduling methods for parallel programming. 3. Parallelizing the production rule system OPS5. Computer programs. (jes)

1380043/7

1380043 N89-16347/1/XAB

Comparing Host and Target Environments for Distributed Ada Programs

Paulk, M. C.

System Development Corp., Huntsville, AL.

Corp. Source Codes: 030459000; S8792091

Sponsor: National Aeronautics and Space Administration,
Washington, DC.

1986 10p

Languages: English

Journal Announcement: GRAI8911; STAR2708

In NASA, Lyndon B. Johnson Space Center, First International Conference on Ada (R) Programming Language Applications for the NASA Space Station, Volume 2 10 p.

NTIS Prices: (Order as N89-16326/5, PC A22/MF A01)

Country of Publication: United States

The Ada programming language provides a means of specifying logical concurrency by using multitasking. Extending the Ada multitasking concurrency mechanism into a physically concurrent distributed environment which imposes its own requirements can lead to incompatibilities. These problems are discussed. Using distributed Ada for a target system may be appropriate, but when using the Ada language in a host environment, a multiprocessing model may be more suitable than retargeting an Ada compiler for the distributed environment. The tradeoffs between multitasking on distributed targets and multiprocessing on distributed hosts are discussed. Comparisons of the multitasking and multiprocessing models indicate different areas of application.

1380010/7

1380010 N89-16314/1/XAB

Impact of Common APSE (Ada Program Support Environment) Interface Set Specifications on Space Station Information Systems

Diaz-Herrera, J. L. ; Sibley, E. H.

George Mason Univ., Fairfax, VA.

Corp. Source Codes: 063190000; GV714519

Sponsor: National Aeronautics and Space Administration, Washington, DC.

1986 11p

Languages: English

Journal Announcement: GRAI8911; STAR2708

In NASA, Lyndon B. Johnson Space Center, First International Conference on Ada (R) Programming Language Applications for the NASA Space Station, Volume 1 11 p.

NTIS Prices: (Order as N89-16279/6, PC A18/MF A01)

Country of Publication: United States

Certain types of software facilities are needed in a Space Station Information Systems Environment; the Common APSE (Ada Program Support Environment) Interface Set (CAIS) was proposed as a means of satisfying them. The reasonableness of this is discussed by examining the current CAIS, considering the changes due to the latest Requirements and Criteria (RAC) document, and postulating the effects on the CAIS 2.0. Finally, a few additional comments are made on the problems inherent in the Ada language itself, especially on its deficiencies when used for implementing large distributed processing and data base applications.

1379988/7

1379988 N89-16292/9/XAB

Distributed Programming Environment for Ada

Brennan, P. ; McDonnell, T. ; McFarland, G. ; Timmins, L.
J. ; Litke, J.
D.

Grumman Data Systems Corp., Woodbury, NY.
Corp. Source Codes: 093982000; G7180425
Sponsor: National Aeronautics and Space Administration,
Washington, DC.

1986 11p

Languages: English

Journal Announcement: GRAI8911; STAR2708

In NASA, Lyndon B. Johnson Space Center, First
International Conference on Ada (R) Programming Language
Applications for the NASA Space Station, Volume 1 11 p.

NTIS Prices: (Order as N89-16279/6, PC A18/MF A01)

Country of Publication: United States

Despite considerable commercial exploitation of fault
tolerance systems, significant and difficult research
problems remain in such areas as fault detection and
correction. A research project is described which constructs
a distributed computing test bed for loosely coupled
computers. The project is constructing a tool kit to
support research into distributed control algorithms,
including a distributed Ada compiler, distributed debugger,
test harnesses, and environment monitors. The Ada compiler is
being written in Ada and will implement distributed computing
at the subsystem level. The design goal is to provide a
variety of control mechanics for distributed programming while
retaining total transparency at the code level.

1377085/7

1377085 N89-15601/2/XAB

Very Large Area Network (VLAN) Knowledge-Base
Applied to Space Communication Problems

Zander, C. S.

Colorado State Univ., Fort Collins.

Corp. Source Codes: 006665000; CU102466

Sponsor: National Aeronautics and Space Administration,
Washington, DC.

Oct 88 9p

Languages: English

Journal Announcement: GRAI8910; STAR2707

In NASA, Marshall Space Flight Center, Fourth Conference
on Artificial Intelligence for Space Applications p 401-409.

NTIS Prices: (Order as N89-15549/3, PC A21/MF A01)

Country of Publication: United States

This paper first describes a hierarchical model for
very large area networks (VLAN). Space communication
problems whose solution could profit by the model are
discussed and then an enhanced version of this model
incorporating the knowledge needed for the missile
detection-destruction problem is presented. A satellite
network or VLAN is a network which includes at least one
satellite. Due to the complexity, a compromise between
fully centralized and fully distributed network management has

been adopted. Network nodes are assigned to a physically localized group, called a partition. Partitions consist of groups of cell nodes with one cell node acting as the organizer or master, called the Group Master (GM). Coordinating the group masters is a Partition Master (PM). Knowledge is also distributed hierarchically existing in at least two nodes. Each satellite node has a back-up earth node. Knowledge must be distributed in such a way so as to minimize information loss when a node fails. Thus the model is hierarchical both physically and informationally.

? t 1372001/7;t 1369604/7;t 1369112/7;t 1365721/7;t
1361012/7;t 1351011/7

1372001/7
1372001 N89-14695/5/XAB
Analysis of FDDI Synchronous Traffic Delays
Johnson, M. J.
National Aeronautics and Space Administration, Moffett
Field, CA. Ames Research Center.
Corp. Source Codes: 019045001; NC473657
Report No.: NAS 1.26:183223; RIACS-TR-88.3; NASA-CR-183223
Jan 88 21p
Languages: English
Journal Announcement: GRAI8909; STAR2706
NTIS Prices: PC A03/MF A01
Country of Publication: United States
Contract No.: NCC2-387
The Fiber Distributed Data Interface (FDDI)
high-speed token-ring protocol provides support for two
classes of service: synchronous, to support applications
which require deterministic access to the channel, and
asynchronous, to support applications which do not have
such stringent response-time requirements. The purpose of
this paper is to determine how
to set ring parameters to support synchronous traffic most
efficiently. Both theoretical results and results obtained
from a simulation study are presented.

1369604/7
1369604 PB89-150296/XAB
Distributed-Feedback Laser-Diode Module with an Optical
Isolator for Multigigabit Optical Transmission
Yamashita, J. ; Nakamura, T. ; Suganuma, R. ; Ito, S. ;
Kakimoto, S.
Mitsubishi Electric Corp., Tokyo (Japan).
Corp. Source Codes: 076350000
c1988 3p
Languages: Japanese
Journal Announcement: GRAI8908
Text in Japanese.
Included in Mitsubishi Denki Giho, v62 n10 p77-80 1988.
NTIS Prices: (Order as PB89-150221, PC E05/MF A01)
Country of Publication: Japan

The module, which has a thermoelectric cooler, has the following advantages: a smooth frequency response up to 5GHz, relative intensity noise less than -145dB/Hz, side-model suppression ratio better than 35dB during high-bit-rate modulation, high output-power stability ($< \text{or} = 0.2\text{dB}$) over a wide 0 approx. 60 degrees C operating-temperature range, and efficient cooling.

1369112/7

1369112 N89-13991/9/XAB

Strategy for Reducing Turnaround Time in Design Optimization Using a Distributed Computer System

Young, K. C. ; Padula, S. L. ; Rogers, J. L.

National Aeronautics and Space Administration, Hampton, VA. Langley Research Center.

Corp. Source Codes: 019041001; ND210491

Report No.: NAS 1.15:101519; NASA-TM-101519

Oct 88 10p

Languages: English

Journal Announcement: GRAI8908; STAR2705

Presented at the Asme Design Technology Conferences-the Design Automation Conference, Kissimmee, Fla., 25-28 Sep. 1988.

NTIS Prices: PC A02/MF A01

Country of Publication: United States

There is a need to explore methods for reducing lengthly computer turnaround or clock time associated with engineering design problems. Different strategies can be employed to reduce this turnaround time. One strategy is to run validated analysis software on a network of existing smaller computers so that portions of the computation can be done in parallel. This paper focuses on the implementation of this method using two types of problems. The first type is a traditional structural design optimization problem, which is characterized by a simple data flow and a complicated analysis. The second type of problem uses an existing computer program designed to study multilevel optimization techniques. This problem is characterized by complicated data flow and a simple analysis. The paper shows that distributed computing can be a viable means for reducing computational turnaround time for engineering design problems that lend themselves to decomposition. Parallel computing can be accomplished with a minimal cost in terms of hardware and software.

1365721/7

1365721 N89-13173/4/XAB

European Seminar on Neural Computing

Zomzely-Neurath, C.

Office of Naval Research, London (England).

Corp. Source Codes: 021603000; OH736806

Sponsor: National Aeronautics and Space Administration, Washington, DC.

Report No.: ONRL-8-010-C

31 Aug 88 38p

Languages: English Document Type: Conference proceeding

Journal Announcement: GRAI8907; STAR2704

Seminar Held in London, United Kingdom, Feb. 1988.

NTIS Prices: PC A03/MF A01

Country of Publication: Other

Topics range from neural systems and models through languages and architectures to the respective European and American perspectives on neurocomputing.

1361012/7

1361012 N89-11438/3/XAB

Sopmcr: An Operating System for the Multiprocessor for Communication Networks

Martins, E. ; Ambrosio, A. M. ; Oshiro, S. K.

Instituto de Pesquisas Espaciais, Sao Jose dos Campos (Brazil).

Corp. Source Codes: 058511000; IO601891

Sponsor: National Aeronautics and Space Administration, Washington, DC.

Report No.: INPE-4675-NTE/284

Aug 88 270p

Languages: Portuguese

Journal Announcement: GRAI8905; STAR2702

In Portuguese; English Summary.

NTIS Prices: PC A12/MF A01

Country of Publication: Brazil

This work presents a distributed system developed at INPE, designed for the Multiprocessor for Network Communications (MCR). The system supports execution of application processes by request from other processes or external events. These processes communicate with each other by asynchronously exchanging messages; the use of a logical entity called channel permits the interprocess communications, independently of where the processes are being executed. The MCR was designed to be part of a packet-switching communications subnetwork node, among other applications; therefore the system must support the implementation of the lower layers of a communications protocol (layers 2 and 3 in the ISO/OSI architecture).

1351011/7

1351011 TIB/B88-81947/XAB

Nichtnukleare Energieforschung in der Bundesrepublik Deutschland. Bilanz und Ausblick. (Non-nuclear energy research in the Federal Republic of Germany. Balance and outlook)

Nitsch, J.

Deutsche Forschungs- und Versuchsanstalt fuer Luft- und Raumfahrt e.V., Stuttgart (Germany, F.R.). Inst. fuer Technische Physik.

Corp. Source Codes: 062740003

Report No.: DFVLR-ITP/IB-441/463-83

Jun 83 83p

Languages: German
Journal Announcement: GRAI8901
In German,
NTIS Prices: PC E09

Country of Publication: Germany, Federal Republic of
After taking a look at the present situation of energy supply in the Federal Republic of Germany the book reports on the non-nuclear energy research of 1972-1982. The topic is divided into following main points: 1) Criteria of supporting technologies; 2) A comprehensive look at the support programs and the classification of the individual areas; 3) The program 'non-nuclear energy systems'; 4) The partial program 'rational utilization of energy in the spheres of application and secondary energy'; 5) The partial program 'new energy sources'; and 6) The partial program 'coal and other fossil energy sources'. (UA). (Copyright (c) 1988 by FIZ. Citation no. 88:081947.)

? t 1360264/7;t 1358316/7;t 1344931/7;t 1344375/7;t
1342170/7;t 1341664/7;t 1341275/7

1360264/7
1360264 DE88016468/XAB
BLAZE Family of Languages: Programming Environments for Shared and Distributed Memory Architectures
Mehrotra, P. ; Van Rosendale, J.
Argonne National Lab., IL. Mathematics and Computer Science Div. Corp. Source Codes: 001960004; 9502076
Sponsor: Department of Energy, Washington, DC.
Report No.: ANL/MCS-TM-108
Jun 88 15p
Languages: English
Journal Announcement: GRAI8905; NSA1300
Portions of this document are illegible in microfiche products. NTIS Prices: PC A03/MF A01
Country of Publication: United States
Contract No.: W-31109-ENG-38
Designing software environments for parallel computers is a central issue in parallel computing research. This paper discusses this issue and the alternate approaches to resolving it which are being studied. We also look at the way in which the type of parallel architecture constrains the design of the programming environments. Shared memory multiprocessors provide the most freedom in the design of effective programming environments, but are more costly than nonshared memory architectures of comparable power. After this general discussion, we describe two new parallel programming languages, BLAZE 2 and KALI. The first of these, BLAZE 2, is a high level language for shared memory multiprocessors. The second, KALI, is a moderately high-level language for distributed memory architectures. We conclude with a brief discussion of the differences between these two languages, which are a consequence of

the difference between shared and non-shared memory multiprocessors. 13 refs., 3 figs. (ERA citation 13:052904)

1358316/7

1358316 N89-10216/4/XAB

High Speed Fiber Optics Local Area Networks: Design and Implementation. Final Report, January 1, 1984-December 31, 1987

Tobagi, F. A.

Stanford Univ., CA.

Corp. Source Codes: 009225000; S0380476

Sponsor: National Aeronautics and Space Administration, Washington, DC.

Report No.: NAS 1.26:182432; NASA-CR-182432

29 Sep 88 9p

Languages: English

Journal Announcement: GRAI8904; STAR2701

NTIS Prices: PC A02/MF A01

Country of Publication: United States

Contract No.: NAG2-292

The design of high speed local area networks (HSLAN) for communication among distributed devices requires solving problems in three areas: (1) the network medium and its topology; (2) the medium access control; and (3) the network interface. Considerable progress has been made in all areas. Accomplishments are divided into two groups according to their theoretical or experimental nature. A brief summary is given in Section 2, including references to papers which appeared in the literature, as well as to Ph.D. dissertations and technical reports published at Stanford University.

1344931/7

1344931 AD-A197 101/9/XAB

Experiences with POKER

Notkin, D. ; Socha, D. ; Snyder, L. ; Bailey, M. L. ; Forstall, B.

Washington Univ., Seattle. Dept. of Computer Science.

Corp. Source Codes: 005042231; 395224

Apr 88 12p

Languages: English

Journal Announcement: GRAI8824

Sponsored in part by Grant AFOSR-88-0023.

NTIS Prices: PC A03/MF A01

Country of Publication: United States

Contract No.: N00014-86-K-0264; NSF-CCR84-16878

Experience from over five years of building nonshared memory parallel programs using the Poker Parallel Programming Environment has positioned us to evaluate our approach to defining and developing parallel programs. This paper presents the more significant results of our evaluation of Poker. The evaluation is driving our next effort in parallel programming environment; many of the results should be sufficiently

general to apply to other related efforts. Keywords:
Algorithms; Programming language. (kr)

1344375/7

1344375 PB88-242144/XAB

Programming Languages for Distributed Systems

Bal, H. E. ; Steiner, J. G. ; Tanenbaum, A. S.

Vrije Univ., Amsterdam (Netherlands). Subfaculteit
Wiskunde en Informatica.

Corp. Source Codes: 019507011;

Sponsor: Mathematisch Centrum, Amsterdam (Netherlands).

Report No.: IR-147

Feb 88 84p

Languages: English

Journal Announcement: GRAI8823

Prepared in cooperation with Mathematisch
Centrum, Amsterdam (Netherlands).

NTIS Prices: PC E04/MF A01

Country of Publication: Netherlands

The paper presents a survey of recent research in
programming distributed systems, with the emphasis on new
programming languages specifically designed for this purpose.
Short descriptions are given of 20 languages. In addition, a
comprehensive bibliography provides over 250 references to
more

than 100 languages for distributed programming.

1342170/7

1342170 AD-A196 931/0/XAB

Parallel Programming Paradigms (Doctoral thesis)

Nelson, P. A.

Washington Univ., Seattle. Dept. of Computer Science.

Corp. Source Codes: 005042231; 395224

Report No.: TR-87-07-02

Jul 87 142p

Languages: English Document Type: Thesis

Journal Announcement: GRAI8823

Sponsored in part by Grant NSF-DCR84-16878.

NTIS Prices: PC A07/MF A01

Country of Publication: United States

Contract No.: N00014-86-K-0264; N00014-85-K-0328

Paradigms for the development of sequential
algorithms, such as divide-and-conquer and the greedy
method, are well known. Paradigms for the development of
parallel algorithms, especially algorithms for non-shared
memory MIMD machines, are not well known. These paradigms
are important, not only as tools for the development of new
algorithms, but also because algorithms using the same
paradigm often have common properties that can be
exploited by operations such as contraction. This
dissertation identifies four primary paradigms used by
non-shared memory MIMD algorithms. They are
compute-aggregate-broadcast, divide-and-conquer, pipelining,
and reduction. Compute-aggregate-broadcast is used, for

example, in numerical approximation algorithms like the conjugate gradient iterations. Three variations of the compute-aggregate-broadcast paradigm are studied. Divide-and-conquer is shown to be applicable to parallel algorithms. The relationship between divide-and-conquer algorithms and the n-cube is studied. Systolic techniques are known to be broadly applicable for the development of MIMD algorithms. Systolic algorithms are shown to be members of the more general pipelining paradigm. Finally, the reduction paradigm is briefly studied. The contraction problem, the problem arising when an algorithm requires more processors than are available on the execution machine, is studied. Special attention is given to common solutions to the contraction problem in each paradigm. (KR)

1341664/7

1341664 AD-A196 419/6/XAB

Poker (4.1): A Programmer's Reference Guide (Technical rept.)

Snyder, L.

Washington Univ., Seattle. Dept. of Computer Science.

Corp. Source Codes: 005042231; 395224

Report No.: TR-83-03-03

Apr 88 97p

Languages: English

Journal Announcement: GRAI8823

NTIS Prices: PC A05/MF A01

Country of Publication: United States

Contract No.: N00014-86-K-0264; NSF-CCR84-16878

This document gives a succinct description of the facilities available with the Poker Parallel Programming Environment. The emphasis is on what is available rather than how to achieve particular results. Although the sections are self-contained, so that they may be referred to independently, there are a few things you should know: 1) Poker uses interactive graphics. The graphics are described in Section 2; the interaction is described in Section 3; 2) The usual programming language notion of a 'source program' as a monolithic piece of symbolic text has been replaced in Poker by a database. The way to create, view, and change the database is described in Section 4; 3) Object programs (the 'compiled database') are executed or emulated by Poker and snapshots of the execution can be continuously displayed; 4) Poker supports a variety of CHiP architectures; the current one can be displayed or changed using the CHiP Parameters facility; Section 7; 5) The back page of this document gives a summary of the commands; and 6) Other versions of Poker exists; consult Appendix B for your particular system. (kr)

1341275/7

1341275 PB88-868625/XAB

DECNET: Digital Equipment Corporation Network Architecture. January 1976-September 1988 (Citations from

the INSPEC: Information Services for the Physics and Engineering Communities Database) (Rept. for Jan 76-Sep 88)
National Technical Information Service, Springfield, VA.
Corp. Source Codes: 055665000

Sep 88 63p

Languages: English Document Type: Bibliography

Journal Announcement: GRAI8822

Supersedes PB87-867958.

NTIS Prices: PC N01/MF N01

Country of Publication: United States

This bibliography contains citations concerning the network architecture DECNET provided by the Digital Equipment Corporation. Topics include hardware and software for implementing communications between different computer operating systems. DECNET's ability to create resource sharing, communications networks, and distributed computing is examined by employing specialized protocol layers which serve the functions of network control, data access control, interprogram communications, and automatic error detection and retransmission. Applications for medical information systems, chemical laboratories, electronic mail systems, and industrial process control are presented. (This updated bibliography contains 126 citations, 40 of which are new entries to the previous edition.)

? t 1356758/7;t 1356357/7;t 1356011/7;t 1353023/7;t
1353013/7;t 1353009/7;t 1352984/7

1356758/7

1356758 PB89-122394/XAB

GRAMPS (General Real-Time Asynchronous Multiprocessor System) Operating System: User's Guide

Mansbach, P. ; Shneier, M.

National Bureau of Standards, Gaithersburg, MD.

Corp. Source Codes: 081914000;

Sponsor: Philips Labs., Briarcliff Manor, NY.

Report No.: NBSIR-88/3776

Sep 88 43p

Languages: English

Journal Announcement: GRAI8903

Prepared in cooperation with Philips Labs., Briarcliff Manor, NY. NTIS Prices: PC A03/MF A01

Country of Publication: United States

The guide describes the GRAMPS real-time multiprocessor operating system from an applications viewpoint. It presents the information needed to use GRAMPS in implementing distributed processing applications. Additional information needed by an administrator to set up and maintain a specific application appears in the Administrator's Guide.

1356357/7

1356357 PB89-115315/XAB

ESPRIT SPAN Project: A Kernel System for Integrating Parallel Symbolic and Numeric Processing (Technical rept.)

Refenes, A. N. ; McCabe, S. C. ; Treleaven, P. C.
University Coll., London (England). Dept. of Computer
Science.

Corp. Source Codes: 019989026

Report No.: UCL-CS-TR-149

May 88 30p

Languages: English

Journal Announcement: GRAI8903

NTIS Prices: PC E05/MF E05

Country of Publication: United Kingdom

Within ESPRIT, Europe's \$3 billion Information
Technology research program, projects are developing next
generation parallel computers. Each project is undertaken
by a consortium of companies and universities. One such
consortium (SPAN) is investigating the integration of
numeric and symbolic processing involving research at the
applications, language, and architecture levels. The core
of the SPAN project consists of a Kernel System which
connects languages and applications to a range of parallel
computer architectures. The Kernel System comprises a
Target Machine Language and its corresponding Virtual
Machine. The paper describes the design of the SPAN Target
Machine Language and its Virtual Machine. The Target Machine
Language is a procedural programming language providing
explicit constructs to facilitate parallel execution of
programs and primitive n-ary list operations to support
array and list-processing in a uniform way.

1356011/7

1356011 N88-30321/9/XAB

Performance Analysis of FDDI (Fiber Distributed Data
Interface) Johnson, M. J.

National Aeronautics and Space Administration, Moffett
Field, CA. Ames Research Center.

Corp. Source Codes: 019045001; NC473657

Report No.: NAS 1.26:183206; RIACS-TR-88.11; NASA-CR-183206

Apr 88 20p

Languages: English

Journal Announcement: GRAI8903; STAR2624

NTIS Prices: PC A03/MF A01

Country of Publication: United States

Contract No.: NCC2-387

The Fiber Distributed Data Interface (FDDI) is an emerging
ANSI and ISO standard for a 100 megabit per second
fiber optic token ring. The performance of the FDDI media
access control protocol is analyzed using a simulation
developed at NASA Ames. Both analyses using standard measures
of performance (including average delay for asynchronous
traffic, channel utilization, and transmission queue length)
and analyses of characteristics of ring behavior which can
be attributed to constraints imposed by the
timed token protocol on token holding time (including
bounded token rotation time, support for synchronous
traffic, and fairness of channel access for nodes transmitting

asynchronous traffic) are included.

1353023/7
1353023 N88-29425/1/XAB
Networking and AI (Artificial Intelligence) Systems:
Requirements and Benefits (Abstract Only)
Gold Hill Computers, Inc., Cambridge, MA.
Corp. Source Codes: 092849000; G1146597
Sponsor: National Aeronautics and Space Administration,
Washington, DC.
Aug 88 2p
Languages: English
Journal Announcement: GRAI8902; STAR2623
In NASA, Marshall Space Flight Center, Second Conference
on Artificial Intelligence for Space Applications p 623-624.
NTIS Prices: (Order as N88-29351/9, PC A99/MF E04)
Country of Publication: United States

The price performance benefits of network systems is well documented. The ability to share expensive resources sold timesharing for mainframes, department clusters of minicomputers, and now local area networks of workstations and servers. In the process, other fundamental system requirements emerged. These have now been generalized with open system requirements for hardware, software, applications and tools. The ability to interconnect a variety of vendor products has led to a specification of interfaces that allow new techniques to extend existing systems for new and exciting applications. As an example of the message passing system, local area networks provide a testbed for many of the issues addressed by future concurrent architectures: synchronization, load balancing, fault tolerance and scalability. Gold Hill has been working with a number of vendors on distributed architectures that range from a network of workstations to a hypercube of microprocessors with distributed memory. Results from early applications are promising both for performance and scalability.

1353013/7
1353013 N88-29415/2/XAB
Design Consideration in Constructing High
Performance Embedded Knowledge-Based Systems (KBS)
Dalton, S. D. ; Daley, P. C.
Martin Marietta Aerospace, Denver, CO. Denver Div.
Corp. Source Codes: 100103001; MI411300
Sponsor: National Aeronautics and Space Administration,
Washington, DC.
Aug 88 6p
Languages: English
Journal Announcement: GRAI8902; STAR2623
In NASA, Marshall Space Flight Center, Second Conference
on Artificial Intelligence for Space Applications p 591-596.
NTIS Prices: (Order as N88-29351/9, PC A99/MF E04)
Country of Publication: United States

As the hardware trends for artificial intelligence (AI) involve more and more complexity, the process of optimizing the computer system design for a particular problem will also increase in complexity. Space applications of knowledge based systems (KBS) will often require an ability to perform both numerically intensive vector computations and real time symbolic computations. Although parallel machines can theoretically achieve the speeds necessary for most of these problems, if the application itself is not highly parallel, the machine's power cannot be utilized. A scheme is presented which will provide the computer systems engineer with a tool for analyzing machines with various configurations of array, symbolic, scaler, and multiprocessors. High speed networks and interconnections make customized, distributed, intelligent systems feasible for the application of AI in space. The method presented can be used to optimize such AI system configurations and to make comparisons between existing computer systems. It is an open question whether or not, for a given mission requirement, a suitable computer system design can be constructed for any amount of money.

1353009/7

1353009 N88-29411/1/XAB

Expert System for a Distributed Real-Time Trainer

Purinton, S. C. ; Wang, C. K.

National Aeronautics and Space Administration, Huntsville, AL. George C.

Marshall Space Flight Center.

Corp. Source Codes: 019043002; ND736801

Aug 88 9p

Languages: English

Journal Announcement: GRAI8902; STAR2623

In Its Second Conference on Artificial Intelligence for Space Applications p 545-554.

NTIS Prices: (Order as N88-29351/9, PC A99/MF E04)

Country of Publication: United States

The problem addressed by this expert system concerns the expansion of capability of a Real Time Trainer for the Spacelab flight crew. As requirements for more models or fidelity are placed upon the system, expansion is necessary. The simulator can be expanded using a larger processor or by going to a distributed system and expand by adding additional processors. The distributed system is preferable because it is more economical and can be expanded in a more incremental manner. An expert system was developed to evaluate modeling and timing capability within a real time training simulator. The expert system is based upon a distributed configuration. Components of the modeled system are control tasks, network tasks, emulator tasks, processors, displays, and a network. The distributed module expert system (DMES) allows the configuring of processors, tasks,

display use, keyboard use, and selection of alternate methods to update the data buffer. Modules can be defined with execution occurring in a specific processor on a network. The system consists of a knowledge front end editor to interactively generate or update the knowledge base, an inference engine, a display module, and a recording module.

1352984/7

1352984 N88-29386/5/XAB

Distributed Cooperating Processes in a Mobile Robot Control System

Skillman, T. L.

Boeing Co., Seattle, WA.

Corp. Source Codes: 004210000; BR564481

Sponsor: National Aeronautics and Space Administration, Washington, DC.

Aug 88 12p

Languages: English

Journal Announcement: GRAI8902; STAR2623

In NASA, Marshall Space Flight Center, Second Conference on Artificial Intelligence for Space Applications p 325-336.

NTIS Prices: (Order as N88-29351/9, PC A99/MF E04)

Country of Publication: United States

A mobile inspection robot has been proposed for the NASA Space Station. It will be a free flying autonomous vehicle that will leave a berthing unit to accomplish a variety of inspection tasks around the Space Station, and then return to its berth to recharge, refuel, and transfer information. The Flying Eye robot will receive voice communication to change its attitude, move at a constant velocity, and move to a predefined location along a self generated path. This mobile robot control system requires integration of traditional command and control techniques with a number of AI technologies. Speech recognition, natural language understanding, task and path planning, sensory abstraction and pattern recognition are all required for successful implementation. The interface between the traditional numeric control techniques and the symbolic processing to the AI technologies must be developed, and a distributed computing approach will be needed to meet the real time computing requirements. To study the integration of the elements of this project, a novel mobile robot control architecture and simulation based on the blackboard architecture was developed. The control system operation and structure is discussed.

? t 1339013/7;t 1337246/7;t 1332983/7;t 1332768/7;t
1332523/7;t 1332050/7;t 1331894/7;t 1331892/7

1339013/7

1339013 AD-A195 520/2/XAB

TAC-1: A Knowledge-Based Air Force Tactical Battle

Management Testbed (Interim rept. Oct 86-Sep 87)

Nugent, R. O. ; Tucker, R. W.

MITRE Corp., McLean, VA.

Corp. Source Codes: 045505000; 402364

Sponsor: Rome Air Development Center, Griffiss AFB, NY.

Report No.: RADC-TR-88-10

Jan 88 78p

Languages: English

Journal Announcement: GRAI8822

NTIS Prices: PC A05/MF A01

Country of Publication: United States

Contract No.: F19628-87-C-0001; 5581; 27

This report describes the framework for, and a demonstration vehicle of, a knowledge-based testbed for integrating multiple artificial intelligence systems into a distributed processing network for purposes for evaluation and exploitation. TAC-1 is a version of the testbed applied to the domain of Air Force tactical battle management. The domain-independent framework includes a centralized control subnet, including a message router and a common protocol language for message passing among component systems. A Common Database and a Common Knowledge Base are essential components of the testbed. The Router directs data queries to the Common Database (one of the hosted systems) and, through the use of a Common Knowledge Base, directs service requests to the systems which can handle them. Keywords: Knowledge based systems, Distributed artificial intelligence, Cooperating knowledge based systems, Knowledge based tactical battle management. (sdw)

1337246/7

1337246 AD-A195 395/9/XAB

ACCESS: A Communicating and Cooperating Expert Systems System

(Final rept. 30 Jun 87-31 Jan 88)

Cottman, B. H. ; Paslay, R. C.

Symbiotics, Inc., Cambridge, MA.

Corp. Source Codes: 092500000; 419151

31 Jan 88 112p

Languages: English

Journal Announcement: GRAI8821

NTIS Prices: PC A06/MF A01

Country of Publication: United States

Contract No.: DAAB10-87-C-0053

The primary focus of Phase I was to prototype a development environment, ACCESS, for A Communicating and Cooperating Expert Systems System. More generally, this work explored the question of what capabilities were needed in a development environment for embedding distributed knowledge-based systems applications on personal computer or work-station class platforms. The stated goal of the Phase I research and development effort was to investigate and implement a software environment for the realization of cooperating knowledge sources on personal computers. This system was to

be Lisp based, distributed processing was to be facilitated by message passing using TCP/IP, control was to be accomplished by meta-level objects and a variety of features were to be provided to aid developers in building such systems. Underlying these goals was the assumption that the tools needed to support such an effort, mainly Common Lisp, Portable Common Loops and TCP/IP, were adequate to do so. During the course of this work Symbiotics found several short-comings in these software tools and identified a need for higher level tools to facilitate distributed processing development. This report documents that work and the results of the Phase I effort.

1332983/7

1332983 N88-23083/4/XAB

Strategies for Concurrent Processing of Complex Algorithms in Data Driven Architectures

Stoughton, J. W. ; Mielke, R. R.

Old Dominion Univ., Norfolk, VA.

Corp. Source Codes: 045163000; OS853217

Sponsor: National Aeronautics and Space Administration, Washington, DC.

Report No.: NAS 1.26:181657; NASA-CR-181657

Feb 88 73p

Languages: English

Journal Announcement: GRAI8819; STAR2616

NTIS Prices: PC A04/MF A01

Country of Publication: United States

Contract No.: NAG1-683

Research directed at developing a graph theoretical model for describing data and control flow associated with the execution of large grained algorithms in a special distributed computer environment is presented. This model is identified by the acronym ATAMM which represents Algorithms To Architecture Mapping Model. The purpose of such a model is to provide a basis for establishing rules for relating an algorithm to its execution in a multiprocessor environment. Specifications derived from the model lead directly to the description of a data flow architecture which is a consequence of the inherent behavior of the data and control flow described by the model. The purpose of the ATAMM based architecture is to provide an analytical basis for performance evaluation. The ATAMM model and architecture specifications are demonstrated on a prototype system for concept validation.

1332768/7

1332768 DE88008019/XAB

Graphical Multiprocessing Analysis Tool (GMAT)

Seager, M. K. ; Campbell, S. ; Sikora, S. ; Strout, R. ; Zosel, M.

Lawrence Livermore National Lab., CA.

Corp. Source Codes: 068147000; 9513035

Sponsor: Department of Energy, Washington, DC.

Report No.: UCID-21348; ISCR-87-2
Mar 88 47p
Languages: English
Journal Announcement: GRAI8819; NSA1300
NTIS Prices: PC A03/MF A01
Country of Publication: United States
Contract No.: W-7405-ENG-48

The design and debugging of parallel programs is a difficult task due to the complex synchronization and data scoping issues involved to aid the programmer in parallel code development we have developed two methodologies for the graphical display of execution of parallel codes. The Graphical Multiprocessing Analysis Tools (GMAT) consist of stategraph, which represents an inheritance tree of task states, and timeliness, which represents task as flowing sequence of events. Information about the code can be displayed as the application runs (dynamic mode) or played back with time under user control (static mode). This document discusses the design and user interface issues involved in developing the parallel application display GMAT family. Also, we present an introductory user's guide for both tools. 4 figs. (ERA citation 13:032031)

1332523/7
1332523 AD-A194 128/5/XAB
Cauldrons: An Abstraction for Concurrent Problems Solving.
Revision (Memorandum rept.)
Haase, K.
Massachusetts Inst. of Tech., Cambridge. Artificial
Intelligence Lab.
Corp. Source Codes: 001450241; 407483
Report No.: AI-M-673
Sep 86 45p
Languages: English
Journal Announcement: GRAI8819
Revision of report dated Dec 82.
NTIS Prices: PC A03/MF A01
Country of Publication: United States
Contract No.: N00014-79-C-0260

The abstractions we have for serial programming are powerful: concepts like data types, variable binding, generalized operators, the subroutine. We do not yet have the same sort of powerful abstractions for distributed computation, but I believe that the place to look for them is the same place that we found many of our abstractions for serial computation--in our own minds. This research extends a tradition of distributed theories of mind into the implementation of a distributed problem solver. In this problem solver a number of ideas from Minsky's Society of Mind are implemented and are found to provide powerful abstractions for the programming of distributed systems. These abstractions are the cauldron, a mechanism for instantiating reasoning contexts, the frame, a way of modularly describing those contexts and the goal-mode,

a mechanism for bringing a particular context to bear on a specific task. The implementation of both these abstractions and the distributed problem solver in which they run is described, accompanied by examples of their application to various domains.

1332050/7

1332050 AD-A193 648/3/XAB

Combined And-Or Parallel Execution of Logic Programs

Gupta, G. ; Jayaraman, B.

North Carolina Univ. at Chapel Hill. Dept. of Computer Science. Corp. Source Codes: 045592060; 409668

Report No.: TR88-012

Mar 88 23p

Languages: English

Journal Announcement: GRAI8819

NTIS Prices: PC A03/MF A01

Country of Publication: United States

Contract No.: N00014-86-K-0680; NSF-DCR86-03609

A number of approaches have recently been proposed for the parallel execution of logic programming languages, but most of them deal with either or-parallelism or and-parallelism but not both. This paper describes a high-level design for efficiently supporting both and-parallelism and or-parallelism. Our approach is based on the binding arrays method for or-parallelism and the RAP method for and-parallelism. Extensions to the binding-arrays method are proposed in order to achieve constant access-time to variables in the presence of and-parallelism. The RAP (Restricted And-Parallelism) method becomes simplified because backtracking is unnecessary in the presence of or-parallelism. The author's approach has the added effect of eliminating redundant computations when goals exhibit both and-and or-parallelism. The paper first briefly describes the basic issues in pure and-parallelism and or-parallelism, states desirable criteria for their implementation (with respect to variable access, task creation and switching), and then describes the combined and-or implementation.

1331894/7

1331894 AD-A193 465/2/XAB

Programming Language Concepts for Multiprocessors
(Interim rept.)

Jordan, H. F.

Colorado Univ. at Boulder. Computer Systems Design Group.

Corp. Source Codes: 068646038; 418831

Report No.: CSDG-87-4; ECE-TR-87-1-3

Sep 87 14p

Languages: English

Journal Announcement: GRAI8819

NTIS Prices: PC A03/MF A01

Country of Publication: United States

Contract No.: N00014-86-K-0204

It is currently possible to build multiprocessor systems which will support the tightly coupled activity of hundreds to thousands of different instruction streams, or processes. This can be done by coupling many monoprocessors, or a smaller number of pipelined multiprocessors, through a high concurrency switching network. The switching network may be couple processors to memory modules, resulting in a shared memory multiprocessor system, or it may couple processor/memory pairs, resulting in a distributed memory system. The need to direct the activity of very many processes simultaneously places qualitatively different demands on a programming language than the direction of a single process. In spite of the different requirements, most languages for multiprocessors have been simple extensions of conventional, single stream programming languages. The extensions are often implemented by way of subroutine calls and have little impact on the basic structure of the language. This paper attempts to examine the underlying conceptual structure of parallel languages for large scale multiprocessors on the basis of an existing language for shared memory multiprocessors, known as the FORCE, and to extend the concepts in this language to distributed memory systems.

1331892/7

1331892 AD-A193 463/7/XAB

Force. (Parallel Programming Language)
(Interim rept.)

Jordan, H.

Colorado Univ. at Boulder. Computer Systems Design Group.

Corp. Source Codes: 068646038; 418831

Report No.: CSDG-87-1; ECE-TR-87-1-1

Jan 87 44p

Languages: English

Journal Announcement: GRAI8819

Sponsored in part by grants NAG-1-640, NAS1-17070.

NTIS Prices: PC A03/MF A01

Country of Publication: United States

Contract No.: N00014-86-K-0204; AFOSR-85-1089

The FORCE is a parallel programming language and methodology based on the shared memory multiprocessor model of computation. It is an extension to Fortran which allows a user to write a parallel program that is independent of the number of processes executing it and in which the management of processes is suppressed. Multiple instruction streams are managed as a group by operations that synchronize them and allocate work. The system is implemented on several machines as a macro preprocessor which expands FORCE programs into Fortran code for the host system.

? t 1331037/7;t 1329890/7;t 1329055/7;t 1328670/7;t
1326261/7;t 1321106/7;t 1320158/7

1331037/7
1331037 PB88-203997/XAB
Distributed Application Programming with Extended Prolog
(Distribuerad Applikationsprogrammering med Utvidgad Prolog)
Stroemberg, D.
Foersvarets Forskningsanstalt, Stockholm (Sweden).
Corp. Source Codes: 063330000
Report No.: FOA-B-30121-3.3
Jan 88 31p
Languages: English
Journal Announcement: GRAI8818
NTIS Prices: PC E03/MF A01
Country of Publication: Sweden

Many tasks in office oriented environments engage several experts and office workers. The increasing use of workstation based tools for such tasks calls for simpler and more appropriate ways to specify program distribution and user communication. The authors propose a facility to specify such task sharing. The main point in the approach is the localization term, which is an extension to a Prolog-like language. This allows us to describe a multi-user application as one unified program instead of as a set of distributed single-user programs.

1329890/7
1329890 AD-A193 297/9/XAB
Poker on the Cosmic Cube: The First Retargetable Parallel Programming Language and Environment (Technical rept.)
Snyder, L. ; Socha, D.
Washington Univ., Seattle. Dept. of Computer Science.
Corp. Source Codes: 005042231; 395224
Report No.: TR-86-02-05
Jun 86 17p
Languages: English
Journal Announcement: GRAI8818
Sponsored in part by Contract N00014-85-K-0328.
NTIS Prices: PC A03/MF A01
Country of Publication: United States
Contract No.: N00014-86-K-0264; NSF-DCR84-16878

This paper describes a technique for retargeting Poker, the first complete parallel programming environment, to new parallel architectures. The specifics are illustrated by describing the retarget of Poker to CalTech's Cosmic Cube. Poker requires only three features from the target architecture: MIMD operation, message passing inter-process communication, and a sequential language (e.g. C) for the processor elements. In return Poker gives the new architecture a complete parallel programming environment which will compile Poker parallel programs without modification, into efficient object code for the new architecture.

1329055/7
1329055 PB88-201769/XAB
Optimal Database Allocation in Distributed Computer Network Systems
Inamoto, A.
Mitsubishi Electric Corp., Tokyo (Japan).
Corp. Source Codes: 076350000
c1987 4p
Languages: Japanese
Journal Announcement: GRAI8817
Text in Japanese.
Included in Mitsubishi Denki Giho, v61 n12 p26-29 1987.
NTIS Prices: (Order as PB88-201751, PC E04/MF A01)
Country of Publication: Japan

The report concerns optimal database allocation and optimal location of processors in the distributed processing networks used for sales and product distribution management systems. The problems are formulated, and a mathematical methodology for solving these problems is presented. To minimize the system expense, the methodology is used to analyze the hardware cost of the distributed processors, the cost of the magnetic disk drive for database storage, the cost of communications over a packet switching network, and the cost of leased lines.

1328670/7
1328670 N88-21688/2/XAB
Distributed Operating Systems: An Overview
Aksit, M.
Technische Univ. Twente, Enschede (Netherlands). Dept. of Computer Science.
Corp. Source Codes: 090700004; TJ309982
Sponsor: National Aeronautics and Space Administration, Washington, DC.
Report No.: INF-87-29; ETN-88-91830
Oct 87 26p
Languages: English
Journal Announcement: GRAI8817; STAR2614
NTIS Prices: PC A03/MF A01
Country of Publication: Netherlands

Layered systems, operating systems, and distributed computer systems are defined. The differences between parallel and distributed processing are identified. Existing distributed operating systems are listed. Distributed operating system design issues are summarized.

1326261/7
1326261 PB88-865043/XAB
Computer Networks: Data Communication Architecture and Development. January 1975-May 1988 (Citations from the INSPEC: Information Services for the Physics and Engineering Communities Database) (Rept. for Jan 75-May 88)
National Technical Information Service, Springfield, VA.
Corp. Source Codes: 055665000

Jun 88 147p

Languages: English Document Type: Bibliography

Journal Announcement: GRAI8816

Supersedes PB87-858429.

NTIS Prices: PC N01/MF N01

Country of Publication: United States

This bibliography contains citations concerning architecture and development of computer networks for data communication systems. Data network design, operation, performance analysis, reliability, security, maintenance and evolution are discussed. Techniques of packet switched and distributed data communication networks are presented. Applications of data communication technology are included. (This updated bibliography contains 345 citations, 22 of which are new entries to the previous edition.)

1321106/7

1321106 AD-A190 956/3/XAB

UNIX Based Programming Tools for Locally Distributed Network Applications (Master's thesis)

Frank, W. C.

Naval Postgraduate School, Monterey, CA.

Corp. Source Codes: 019895000; 251450

Dec 87 105p

Languages: English Document Type: Thesis

Journal Announcement: GRAI8815

NTIS Prices: PC A06/MF A01

Country of Publication: United States

The Graphics and Video Laboratory of the Department of Computer Science has a growing need for easy to use programming tools in support of distributed processing applications. The most pressing need is for software on three UNIX-based workstations connected via Ethernet. The remote interprocess communication tools that UNIX provides for using Ethernet are effective but complicated to learn. This requires researchers to spend

much of their time becoming proficient with them instead of concentrating on the distributed application at hand. This work presents the design and implementation of several programming tools that allow programmers to establish and experiment with distributed programs in the graphics laboratory environment. The tools allow a higher level of abstraction for remote interprocess communications and establish a straightforward method for implementing distributed programs. Additionally, they support code reuseability with software templates and are modularized to be both understandable and changeable. Recommendations are made for future research and management efforts that have been highlighted by these new tools.

1320158/7

1320158 N88-19147/3/XAB

Distributed Computation of Graphics Primitives on a

Transputer Network

Ellis, G. K.

National Aeronautics and Space Administration,
Cleveland, OH. Lewis Research Center.

Corp. Source Codes: 019039001; ND315753

Report No.: NAS 1.15:100814; ICOMP-88-3; NASA-TM-100814
1988 7p

Languages: English

Journal Announcement: GRAI8814; STAR2611

Prepared for Presentation at the Summer Computer
Simulation Conference, Seattle, Wash., 25-28 Jul. 1988;
Sponsored in Part by the Society for Computer Simulation.

NTIS Prices: PC A02/MF A01

Country of Publication: United States

A method is developed for distributing the
computation of graphics primitives on a parallel
processing network. Off-the-shelf transputer boards are used
to perform the graphics transformations and scan-conversion
tasks that would normally be assigned to a single transputer
based display processor. Each node in the network performs
a single graphics primitive
computation. Frequently requested tasks can be duplicated on
several nodes. The results indicate that the current
distribution of commands on the graphics network shows a
performance degradation when compared to the graphics
display board alone. A change to more computation per node
for every communication (perform more complex tasks on each
node) may cause the desired increase in throughput.

? t 1314371/7;t 1314308/7;t 1312882/7;t 1312569/7;t
1306589/7;t 1306289/7;t 1302419/7

1314371/7

1314371 N88-17312/5/XAB

Systeme de Programmation Parallele Occam/Ada
(Occam/Ada Parallel Programming System) (Doctoral thesis)

Nekkache, M.

Institut National des Sciences Appliquees de Lyon,
Villeurbanne (France).

Lab. d'Informatique Appliquee.

Corp. Source Codes: 067950006; II354902

Sponsor: National Aeronautics and Space Administration,
Washington, DC.

Report No.: ISAL-ID11-87-11; ETN-88-91630

1987 133p

Languages: French Document Type: Thesis

Journal Announcement: GRAI8812; STAR2609

In French; English Summary.

NTIS Prices: PC A07/MF A01

Country of Publication: France

A programming tool to specify and develop real time
applications in Ada language is presented. The Occam
system was chosen as a basis and translated into Ada

language. Programming is regarded as a scheduling activity rather than a sequencing one. The problems involved included splitting systems in smaller parallel systems, synchronizing of the components, and mutual exclusion of shared variables. Application experience indicates that Occam may be considered a language for specification and development in Ada.

1314308/7

1314308 N88-17230/9/XAB

Task Allocation in a Distributed Computing System
Seward, W. D.

Air Force Inst. of Tech., Wright-Patterson AFB, OH. Dept.
of Electrical and Computer Engineering.

Corp. Source Codes: 000805001; AI174479

Sponsor: National Aeronautics and Space Administration,
Washington, DC.

Oct 87 9p

Languages: English

Journal Announcement: GRAI8812; STAR2609

In NASA. Lyndon B. Johnson Space Center, Houston,
Texas, First Annual Workshop on Space Operations Automation and
Robotics (SOAR 87), p173-181.

NTIS Prices: (Order as N88-17206/9, PC A23/MF A01)

Country of Publication: United States

A conceptual framework is examined for task allocation in distributed systems. Application and computing system parameters critical to task allocation decision processes are discussed. Task allocation techniques are addressed which focus on achieving a balance in the load distribution among the system's processors. Equalization of computing load among the processing elements is the goal. Examples of system performance are presented for specific applications. Both static and dynamic allocation of tasks are considered and system performance is evaluated using different task allocation methodologies.

1312882/7

1312882 AD-A189 569/7/XAB

Why We Can't Program Multiprocessors the Way We're Trying
to Do It Now (Technical rept.)

Baldwin, D.

Rochester Univ., NY. Dept. of Computer Science.

Corp. Source Codes: 010090065; 410386

Report No.: TR-224

Aug 87 36p

Languages: English

Journal Announcement: GRAI8812

Sponsored in part by Grant NSF-DCR83-20136.

NTIS Prices: PC A03/MF A01

Country of Publication: United States

Contract No.: DACA76-85-C-0001; NSF-DMC86-13489

Parallel computation is an area in which software
technology lags considerably behind hardware technology. The
need for parallel computing in a number of applications

(e.g., scientific computing, machine vision, artificial intelligence) is unquestioned, and computers with hundreds of processors are now readily available (for instance, the Butterfly or the many derivatives of the Cosmic Cube). However, these machines are programmed in essentially the same way as existing sequential machines. The best available parallel programming languages are variants of standard sequential languages, with extensions to let the programmer explicitly divide a program into tasks and pass information between those tasks. Although designers of these languages claim that they are no harder to use than conventional sequential ones, programmers still face the problem of figuring out how to partition their application into tasks in addition to the usual problem of translating it into a program. An appealing alternative is to leave partitioning of programs to compilers. By hiding partitioning problems from programmers, this approach should make multi-processor computers easier to program than they are now. Unfortunately efforts to develop parallelizing compilers have so far been rather unsuccessful.

1312569/7

1312569 AD-A189 245/4/XAB

Interface between Object-Oriented Systems (Technical rept.)

Crowl, L. A.

Rochester Univ., NY. Dept. of Computer Science.

Corp. Source Codes: 010090065; 410386

Report No.: TR-211

Apr 87 23p

Languages: English

Journal Announcement: GRAI8812

NTIS Prices: PC A03/MF A01

Country of Publication: United States

Contract No.: DACA76-85-C-0001; NSF-DCR83-20136

The Chrysalis operating system for the Butterfly Parallel Processor presents an object-oriented programming environment based on shared memory. However, because of Chrysalis's low level orientation and its use of type-unsafe features of the C programming language, programs using the environment are difficult to program and highly error-prone. Using C as the primary programming language for the Butterfly does not fully realize the benefit of Chrysalis's object orientation. An object-oriented programming language is natural candidate for improving the Chrysalis environment. The C ++ programming language provides a number of advantages in developing such an interface. This paper reports the successes and problems encountered in the development of Chrysalis ++, a C ++ interface to Chrysalis ++ uncovered many strengths and weakness in C ++. Some apply to C

++ in general, others apply only to its adaptation to a parallel programming environment. It is important to note that C++ is a sequential language; its use in a parallel programming environment is therefore outside the bounds of its design.

1306589/7

1306589 AD-A188 142/4/XAB

Implementing Dynamic Arrays: A Challenge for High-Performance Machines

Mago, G. ; Partain, W.

North Carolina Univ. at Chapel Hill. Dept. of Computer Science. Corp. Source Codes: 045592060; 409668

1986 3p

Languages: English

Journal Announcement: GRAI8810

NTIS Prices: PC A02/MF A01

Country of Publication: United States

Contract No.: DAAL03-86-G-0050

There is an increasing need for high-performance AI machines. What is unusual about AI is that its programs are typically dynamic in the way their execution unfolds and in the data structures they use. AI therefore needs machines that are late-binding. Multiprocessors are often held out as the answer to AI's computing requirements. However, most success with

multiprocessing has come from exploiting numerical computations' basic data structure-the static array (as in FORTRAN). A static array's structure does not change, so its elements (and the processing on them) may be readily distributed. In AI, the ability to change and manipulate the structure of data is paramount; hence, the pre-eminence of the LISP list. Unfortunately, the traditional pointer-based list has serious drawbacks for distributed processing. The dynamic array is a data structure that allows random access to its elements (like static arrays) yet whose structure-size and dimensions-can be easily changed, i.e., bound and re-bound at run-time. It combines the flexibility that AI requires with the potential for high performance through parallel operation. A machine's implementation of

dynamic arrays gives a good insight into its potential usefulness for AI applications. Therefore, the authors outline the implementation of dynamic arrays on a machine that we are developing.

1306289/7

1306289 AD-A187 824/8/XAB

Performance Measurements of Distributed Simulation Strategies

(Technical rept.)

Fujimoto, R. M.

Utah Univ., Salt Lake City. Dept. of Computer Science.

Corp. Source Codes: 016669107; 404949

Report No.: UUCS-87-026

1987 29p

Languages: English

Journal Announcement: GRAI8810

NTIS Prices: PC A03/MF A01

Country of Publication: United States

Contract No.: N00014-87-K-0184; NSF-DCR85-04826

Although many distributed simulation strategies have been developed, to date, little empirical data is available to evaluate their performance. A multiprocessor-based, distributed simulation testbed is described that was designed to facilitate controlled experimentation with distributed simulation algorithms. Using this testbed, the performance of simulation strategies using deadlock avoidance and deadlock detection and recovery techniques was examined under various synthetic workloads. The distributed simulators were compared with a uniprocessor-based event list implementation. Results of a series of experiments are reported that demonstrate that message population and the degree to which processes can look ahead in simulated time play critical roles in the performance of distributed simulators using these algorithms. An avalanche phenomenon was observed in the deadlock detection and recovery simulators as message population was increased, and was found to be a necessary condition for achieving good performance. It is demonstrated that these distributed simulation algorithms can provide significant speedups over sequential event list implementations for some workloads, even in the presence of only a moderate amount of parallelism and many feedback loops. However, a moderate to high degree of parallelism was not sufficient to guarantee good performance for all workloads that were tested.

1302419/7

1302419 N88-13886/2/XAB

Introduction to Local Area Network Design on Ariane 5 and Future Launchers

Durand, Y. ; Pic, J.

Societe Nationale Industrielle Aerospatiale, Les Mureaux (France).

Corp. Source Codes: 071736000; SQ445108

Sponsor: National Aeronautics and Space Administration, Washington, DC.

Report No.: SNIAS-872-422-102; ETN-88-91203

17 Jan 86 11p

Languages: English

Journal Announcement: GRAI8808; STAR2605

NTIS Prices: PC A03/MF A01

Country of Publication: France

The impact of real time local area networks (LAN) on launchers is discussed. Communication needs of a launch vehicle that call for distributed processing techniques are reviewed. The design drivers of the system are

identified. A method to ensure the fulfillment of design goals, i.e., to benefit from the potentials of real time LAN is outlined.

? t 1297257/7;t 1291911/7;t 1291909/7;t 1285013/7

1297257/7

1297257 N88-12287/4/XAB

Mapping a Battlefield Simulation onto
Message-Passing Parallel Architectures (Final rept.)

Nicol, D. M.

National Aeronautics and Space Administration, Hampton,
VA. Langley Research Center.

Corp. Source Codes: 019041001; ND210491

Report No.: NAS 1.26:178396; ICASE-87-51; NASA-CR-178396

Oct 87 18p

Languages: English

Journal Announcement: GRAI8806; STAR2603

NTIS Prices: PC A03/MF A01

Country of Publication: United States

Contract No.: NAS1-18107

Perhaps the most critical problem in distributed simulation is that of mapping: without an effective mapping of workload to processors the speedup potential of parallel processing cannot be realized. Mapping a simulation onto a message-passing architecture is especially difficult when the computational workload dynamically changes as a function of time and space; this is exactly the situation faced by battlefield simulations. This paper studies an approach where the simulated battlefield domain is first partitioned into many regions of equal size; typically there are more regions than processors. The regions are then assigned to processors; a processor is responsible for performing all simulation activity associated with the regions. The assignment algorithm is quite simple and attempts to balance load by exploiting locality of workload intensity. The performance

of this technique is studied on a simple battlefield simulation implemented on the Flex/32 multiprocessor. Measurements show that the proposed method achieves reasonable processor efficiencies. Furthermore, the method shows promise for use in dynamic remapping of the simulation.

1291911/7

1291911 N88-11402/0/XAB

Report from the MPP (Massively Parallel Processor) Working Group to the NASA (National Aeronautics and Space Administration) Associate Administrator for Space Science and Applications. Technical Memorandum

Report, October 1, 1985-September 30, 1986

Fischer, J. R. ; Grosch, C. ; McAnulty, M. ; O'Donnell, J. ; Storey, O.

National Aeronautics and Space Administration,
Greenbelt, MD. Goddard Space Flight Center.

Corp. Source Codes: 013129001; NC999967
Report No.: NAS 1.15:87819; REPT-87B0265;s jPT]5B;C Kj&h'oY
87 64p

Languages: English

Journal Announcement: GRAI8804; STAR2602

NTIS Prices: PC A04/MF A01

Country of Publication: United States

NASA's Office of Space Science and Applications (OSSA) gave a select group of scientists the opportunity to test and implement their computational algorithms on the Massively Parallel Processor (MPP) located at Goddard Space Flight Center, beginning in late 1985. One year later, the Working Group presented its report, which addressed the following: algorithms, programming languages, architecture, programming environments, the way theory relates, and performance measured. The findings point to a number of demonstrated computational techniques for which the MPP architecture is ideally suited. For example, besides executing much faster on the MPP than on conventional computers, systolic VLSI simulation (where distances are short), lattice simulation, neural network simulation, and image problems were found to be easier to program on the MPP's architecture than on a CYBER 205 or even a VAX. The report also makes technical recommendations covering all aspects of MPP use, and recommendations concerning the future of the MPP and machines based on similar architectures, expansion of the Working Group, and study of the role of future parallel processors for space station, EOS, and the Great Observatories era.

1291909/7

1291909 N88-11398/0/XAB

Cache-Based Error Recovery for Shared Memory Multiprocessor Systems

Wu, K. ; Fuchs, W. K. ; Patel, J. H.

Illinois Univ. at Urbana-Champaign.

Corp. Source Codes: 034597000; IB655059

Sponsor: National Aeronautics and Space Administration, Washington, DC.

Report No.: NAS 1.26:181470; NASA-CR-181470

20 Nov 87 21p

Languages: English

Journal Announcement: GRAI8804; STAR2602

Sponsored in cooperation with Texas Instruments, Inc. and Digital Equipment Corp. Presented at FTCS 18, Tokyo, Japan, June 27-30, 1987.

NTIS Prices: PC A03/MF A01

Country of Publication: United States

Contract No.: NAG1-613

The problem of recovering from processor failures in shared memory multiprocessor systems is examined. A cache-based checkpointing scheme is developed utilizing a checkpointing algorithm which guarantees that a consistent global state is always maintained. Processes can recover

from errors due to a faulty processor by restarting from the consistent saved computation state. There are no difficulties with checkpoint propagation in that when a process p takes a checkpoint, no other process is forced to join p in the checkpoint. The recovery algorithm allows only those processes encountering errors to perform rollback recovery while other unaffected processes on fault free processors continue normal execution. The checkpointing recovery schemes are shown to be easily integrated into standard bus-based cache coherence protocols. An analytical model is used to estimate the checkpointing frequency and the performance degradation incurred by the checkpointing scheme during normal execution.

1285013/7

1285013 AD-A184 969/4/XAB

Test and Evaluation of the Transputer in a Multi-Transputer System (Master's thesis)

Filho, J. V.

Naval Postgraduate School, Monterey, CA.

Corp. Source Codes: 019895000; 251450

Jun 87 200p

Languages: English Document Type: Thesis

Journal Announcement: GRAI8802

NTIS Prices: PC A09/MF A01

Country of Publication: United States

The purpose of this thesis is to start the evaluation of the Transputer, a 32 bit microprocessor on a chip, to verify its potentials and limitations for real time applications, in distributed systems. The evaluation concentrates on the four physical communication links, and its advertised capability to operate in parallel with the main processor (CPU), each one

of them at rate of 10 mbit/sec in each direction. It also presents to the reader an introduction to the machine itself, to the Occam Programming Language, a description of the environment at the Naval Postgraduate School (NPS), and suggests to the novice a learning sequence. The evaluation programs and other example programs presented in this thesis were implemented using the Occam Programming Language (Proto-Occam) in either the Occam Programming System (OPS) or the Transputer Development System (TDS), both resident on the VAX 11/780 computer under the VMS Operating System (VAX/VMS).

? t 1277155/7;t 1276980/7;t 1273325/7;t 1269040/7;t 1267878/7;t 1264037/7;t 1254966/7

1277155/7

1277155 PB87-867958/XAB

DECNET: Digital Equipment Corporation Network Architecture. January 1976-September 1987 (Citations from the INSPEC: Information Services for the Physics and

Engineering Communities Database) (Rept. for Jan 76-Sep 87)
National Technical Information Service, Springfield, VA.
Corp. Source Codes: 055665000
Oct 87 44p
Languages: English Document Type: Bibliography
Journal Announcement: GRAI8723
Supersedes PB86-877123.
NTIS Prices: PC N01/MF N01
Country of Publication: United States

This bibliography contains citations concerning the network architecture DECNET provided by the Digital Equipment Corporation. Topics include hardware and software for implementing communications between different computer operating systems. DECNET's ability to create resource sharing, communications networks, and distributed computing is examined by employing specialized protocol layers which serve the functions of network control, data access control, interprogram communications, and automatic error detection and retransmission. Applications for medical information systems, chemical laboratories, electronic mail systems, and industrial process control are presented. (This updated bibliography contains 86 citations, 28 of which are new entries to the previous edition.)

1276980/7

1276980 PB87-226098/XAB

Network Protocols: Proceedings of the Joint IBM (International Business Machines)/University of Newcastle upon Tyne Seminar Held in the University Computing Laboratory, September 3-6, 1985

Randell, B.

Newcastle upon Tyne Univ. (England). Computing Lab.

Corp. Source Codes: 020410010

c1986 279p

Languages: English Document Type: Conference proceeding

Journal Announcement: GRAI8723

NTIS Prices: PC E12/MF E12

Country of Publication: United Kingdom

Contents: The performance of LAN protocols; Open systems interconnection communication architecture; Realization of open systems; Electronic messaging; Another look at computer communication protocols; Computerized commerce; High layer protocol standardization for distributed processing; IBM logical unit type 6.2--An overview; Verifying a protocol algebraically using CCS; Communication architectures for distributed systems; The state of the art in testing protocol implementations; Notes on automated protocol analysis; Standardization for open systems; On protocol engineering.

1273325/7

1273325 N87-26568/2/XAB

Network Protocols for Real-Time Applications

Johnson, M. J.

National Aeronautics and Space Administration, Moffett Field, CA. Ames Research Center.

Corp. Source Codes: 019045001; NC473657

Report No.: NAS 1.26:180977; RIACS-TR-87.15; NASA-CR-180977
May 87 17p

Languages: English Document Type: Conference proceeding

Journal Announcement: GRAI8722; STAR2520

NTIS Prices: PC A02/MF A01

Country of Publication: United States

Contract No.: NCC2-387

The Fiber Distributed Data Interface (FDDI) and the SAE AE-9B High Speed Ring Bus (HSRB) are emerging standards for high-performance token ring local area networks. FDDI was designed to be a general-purpose high-performance network. HSRB was designed specifically for military real-time applications. A workshop was conducted at NASA Ames Research Center in January, 1987 to compare and contrast these protocols with respect to their ability to support real-time applications. This report summarizes workshop presentations and includes an independent comparison of the two protocols. A conclusion reached at the workshop was that current protocols for the upper layers of the Open Systems Interconnection (OSI) network model are inadequate for real-time applications.

1269040/7

1269040 AD-A182 513/2/XAB

CRONUS, A Distributed Operating System: CRONUS DOS Implementation (Final rept. Oct 84-Jan 86)

Schantz, R. ; Schroder, K. ; Barrow, M. ; Bono, G. ; Dean, M.

Bolt Beranek and Newman, Inc., Cambridge, MA.

Corp. Source Codes: 004246000; 060100

Sponsor: Rome Air Development Center, Griffiss AFB, NY.

Report No.: BBN-6183; RADC-TR-86-183

Dec 86 70p

Languages: English

Journal Announcement: GRAI8721

NTIS Prices: PC A04/MF A01

Country of Publication: United States

Contract No.: F30602-84-C-0171; 2530; 01

This is the final report for the second contract phase for development of the CRONUS Project. CRONUS is the name given to the distributed operating system (DOS) and system architecture for distributed application development environment being designed and implemented by BBN Laboratories for the Air Force Rome Air Development Center (RADC). The project was begun in 1981. The CRONUS distributed operating system is intended to promote resources which are shared. Its major purpose is to provide a coherent and integrated system based on clusters of interconnected heterogeneous computers to support the development and use of distributed applications. Distributed applications range from simple programs that merely require

convenient reference to remote data, to collections of complex subsystems tailored to take advantage of a distributed architecture. One of the main contributions of CRONUS is a unifying architecture and model for developing these distributed applications; as well as support for a number of system-provided functions which are common to many applications.

1267878/7

1267878 N87-24949/6/XAB

New Technology Impacts on Future Avionics Architectures

Mejzak, R. S.

Naval Air Development Center, Warminster, PA.

Corp. Source Codes: 032381000; NO000154

Sponsor: National Aeronautics and Space Administration, Washington, DC.

c1987 7p

Languages: English

Journal Announcement: GRAI8720; STAR2518

In AGARD Advanced Computer Aids in the Planning and Execution of Air Warfare and Ground Strike Operations, 7p.

NTIS Prices: (Order as N87-24940 PC A07/MF A01)

Country of Publication: United States

An interpretation of avionics architecture is provided with respect to system components, organization, and design factors. Initially, general avionics architecture characteristics are addressed followed by discussions on emerging technologies and their impact on advanced systems. Information handling requirements are projected for future tactical aircraft. In addition, advanced avionics architecture design consideration and technical issues are addressed relative to achieving improved performance, reliability, survivability, flexibility, and low life cycle cost.

1264037/7

1264037 DE87008229/XAB

Effect of Distributed Computing Technology on Wide Area Network Capacity Requirements

Hall, D. ; Johnston, W. ; Hutchinson, M. ; Rosenblum, M. ; Robertson, D.

Lawrence Berkeley Lab., CA.

Corp. Source Codes: 086929000; 9513034

Sponsor: Department of Energy, Washington, DC.

Report No.: LBL-22948; CONF-870277-1

Feb 87 12p

Languages: English Document Type: Conference proceeding

Journal Announcement: GRAI8719; NSA1200

Federal Coordinating Council on science, engineering and technology, San Diego, CA, USA, 17 Feb 1987.

Portions of this document are illegible in microfiche products. NTIS Prices: PC A02/MF A01

Country of Publication: United States

Contract No.: AC03-76SF00098

This report identifies a need to increase wide area network capacity by as much as three orders of magnitude over the next ten years. These increases are necessary to support new distributed computing products. Such products increase productivity, but are currently available only on local area networks. There is no technical reason for limiting these products to tightly constrained geographical areas, however. They can operate perfectly well over any terrestrial distance provided sufficient bandwidth is available. Such bandwidth is available today with fiber optics. To quantify capacity requirements, network traffic generated by this newer technology is compared with traditional traffic in a local network environment. An extrapolation to wide area networks is made. Speculation about the long term future of distributed computing technology and its effect on network capacity requirements is offered. It is argued that an increase of network capacity by one order of magnitude is sufficient to accommodate new distributed computing technology on existing wide area networks. Two orders of magnitude are needed to accommodate a fully integrated distributed system such as interactive graphics. Three orders of magnitude are needed to accommodate increases in hardware speed anticipated in the next five to ten years. Availability of highly integrated, nationwide distributed computing service would significantly increase the competitive edge of the United States in science and computing. (ERA citation 12:028235)

1254966/7

1254966 DE87003740/XAB

Numerical Computation on Massively Parallel Hypercubes
McBryan, O. A.

Los Alamos National Lab., NM.

Corp. Source Codes: 072735000; 9512470

Sponsor: Department of Energy, Washington, DC.

Report No.: LA-UR-86-4218; CONF-8609173-9

1986 20p

Languages: English Document Type: Conference proceeding

Journal Announcement: GRAI8716; NSA0000

Conference on hypercube multiprocessors, Knoxville, TN, USA,
29 Sep 1986.

NTIS Prices: PC A02/MF A01

Country of Publication: United States

Contract No.: AC02-76ER03077; W-7405-ENG-36

We describe numerical computations on the Connection Machine, a massively parallel hypercube architecture with 65,536 single-bit processors and 32 Mbytes of memory. A parallel extension of COMMON LISP, provides access to the processors and network. The rich software environment is further enhanced by a powerful virtual processor capability, which extends the degree of fine-grained parallelism beyond 1,000,000. We briefly describe the hardware and indicate the principal features of the

parallel programming environment. We then present implementations of SOR, multigrid and pre-conditioned conjugate gradient algorithms for solving partial differential equations on the Connection Machine. Despite the lack of floating point hardware, computation rates above 100 megaflops have been achieved in PDE solution. Virtual processors prove to be a real advantage, easing the effort of software development while improving system performance significantly. The software development effort is also facilitated by the fact that hypercube communications prove to be fast and essentially independent of distance. 29 refs., 4 figs.

? t 1249337/7;t 1247084/7;t 1227996/7;t 1227984/7;t
1218318/7;t 1216028/7;t 1214434/7

1249337/7

1249337 PB87-858429/XAB

Computer Networks: Data Communication Architecture and Development. January 1975-April 1987 (Citations from the INSPEC: Information Services for the Physics and Engineering Communities Database) (Rept. for Jan 75-Apr 87)

National Technical Information Service, Springfield, VA.

Corp. Source Codes: 055665000

Apr 87 135p

Languages: English Document Type: Bibliography

Journal Announcement: GRAI8713

Supersedes PB86-862703.

NTIS Prices: PC N01/MF N01

Country of Publication: United States

This bibliography contains citations concerning architecture and development of computer networks for data communication systems. Data network design, operation, performance analysis, reliability, security, maintenance and evolution are discussed. Techniques of packet switched and distributed data communication networks are presented. Applications of data communication technology are included. (This updated bibliography contains 323 citations, 37 of which are new entries to the previous edition.)

1247084/7

1247084 AD-A178 975/9/XAB

Durra: A Task-Level Description Language Preliminary Reference Manual (Final rept.)

Barbacci, M. R. ; Wing, J. M.

Carnegie-Mellon Univ., Pittsburgh, PA. Software Engineering Inst. Corp. Source Codes: 005343014; 416208

Sponsor: Electronic Systems Div., Hanscom AFB, MA.

Report No.: CMU/SEI-86-TR-3; ESD-TR-86-207

Dec 86 49p

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Journal Announcement: GRAI8713

NTIS Prices: PC A03/MF A01

Country of Publication: United States

Contract No.: F33615-84-K-1520; ARPA Order-4976

Durra is a language designed to support the development of large-grained parallel programming applications. This document is a preliminary reference manual for the syntax and semantics of the language. We are using the term description language rather than programming language to emphasize that a task-level application description is not translated into object code of some kind of executable machine language. Rather, it is to be understood as a description of the structure and behavior of a logical machine, that will be synthesized into resource allocation and scheduling directives. These directives are to be interpreted by a combination of software, firmware, and hardware in a heterogeneous machine. Although our ultimate goal is to design and implement a task-level description language that can be used for different machines and for varying applications, our first pass is influenced by both a specific architecture and by a specific application, the Autonomous Land Vehicle (ALV), and more specifically, the perception components of the ALV. We assume there is a cross-bar switch, intelligent buffers on the switch sockets, and a scheduler that can communicate with all processors, buffers, and I/O devices.

1227996/7

1227996 N87-12270/1/XAB

ELAND: An Expert System for the Configuration of Local Area Networks Applications

Tanca, L. ; Ceri, S.

Politecnico di Milano (Italy).

Corp. Source Codes: 016875000; PX565076

Sponsor: National Aeronautics and Space Administration, Washington, DC.

Report No.: REPT-86-008; ETN-86-97941

1986 30p

Languages: English

Journal Announcement: GRAI8705; STAR2503

NTIS Prices: PC A03/MF A01

Country of Publication: Italy

A rule-based expert system for configuring Local Area Networks (LAN) and for designing distributed database applications over them is described. The system includes a general-purpose inference machine for solving synthesis problems, based on two separated modules: the Tree Traversal and the Matcher. The former performs a recursive descent on a tree-structured solution space

and generates a description of requirements that the final solution should possess; the latter matches these requirements to existing commercial products. The inference machine and its concrete application to the design and configuration of LAN information systems are described.

1227984/7

1227984 N87-12247/9/XAB

Parallel Scheduling of Recursively Defined Arrays
(Final rept)

Myers, T. J. ; Gokhale, M. B.
National Aeronautics and Space Administration, Hampton,
VA. Langley Research Center.

Corp. Source Codes: 019041001; ND210491

Report No.: NAS 1.26:178195; ICASE-86-66; NASA-CR-178195

Oct 86 26p

Languages: English

Journal Announcement: GRAI8705; STAR2503

NTIS Prices: PC A03/MF A01

Country of Publication: United States

Contract No.: NAS1-18107; UDRF-LTR860114

A new method of automatic generation of concurrent programs which constructs arrays defined by sets of recursive equations is described. It is assumed that the time of computation of an array element is a linear combination of its indices, and integer programming is used to seek a succession of hyperplanes along which array elements can be computed concurrently. The method can be used to schedule equations involving variable length dependency vectors and mutually recursive arrays. Portions of the work reported here have been implemented in the PS automatic program generation system.

1218318/7

1218318 N86-31261/8/XAB

Optimal Partitioning of Random Programs Across Two
Processors

(Final rept)

Nicol, D. M.

National Aeronautics and Space Administration, Hampton,
VA. Langley Research Center.

Corp. Source Codes: 019041001; ND210491

Report No.: NAS 1.26:178159; ICASE-86-53; NASA-CR-178159

Aug 86 27p

Languages: English

Journal Announcement: GRAI8626; STAR2422

NTIS Prices: PC A03/MF A01

Country of Publication: United States

Contract No.: NAS1-18107

The optimal partitioning of random distributed programs is discussed. It is concluded that the optimal partitioning of a homogeneous random program over a homogeneous distributed system either assigns all modules to a single processor, or distributes the modules as evenly as possible among all processors. The analysis rests heavily on the approximation which equates the expected maximum of a set of independent random variables with the set's maximum expectation. The results are strengthened by providing an approximation-free proof of this result for two processors under general conditions on the module execution time distribution. It is also shown that use of this approximation

causes two of the previous central results to be false.

1216028/7

1216028 N86-30379/9/XAB

Dynamic Remapping of Parallel Computations with Varying Resource Demands (Final rept)

Nicol, D. M. ; Saltz, J. H.

National Aeronautics and Space Administration, Hampton, VA. Langley Research Center.

Corp. Source Codes: 019041001; ND210491

Report No.: NAS 1.26:178150; ICASE-86-45; NASA-CR-178150

Jul 86 56p

Languages: English

Journal Announcement: GRAI8625; STAR2421

NTIS Prices: PC A04/MF A01

Country of Publication: United States

Contract No.: NAS1-17070; NAS1-18107

A large class of computational problems is characterized by frequent synchronization, and computational requirements which change as a function of time. When such a problem must be solved on a message passing multiprocessor machine, the combination of these characteristics lead to system performance which decreases in time. Performance can be improved with periodic redistribution of computational load; however, redistribution can exact a sometimes large delay cost. We study the issue of deciding when to invoke a global load remapping mechanism. Such a decision policy must effectively weigh the costs of remapping against the performance benefits. We treat this problem by constructing two analytic models which exhibit stochastically decreasing performance. One model is quite tractable; we are able to describe the optimal remapping algorithm, and the optimal decision policy governing when to invoke that algorithm. However, computational complexity prohibits the use of the optimal remapping decision policy. We

then study the performance of a general remapping policy on both analytic models. This policy attempts to minimize a statistic $W(n)$ which measures the system degradation (including the cost of remapping) per computation step over a period of n steps. We show that as a function of time, the expected value of $W(n)$ has at most one minimum, and that when this minimum exists it defines the optimal fixed-interval remapping policy. Our decision policy appeals to this result by remapping when it estimates that $W(n)$ is minimized. Our performance data suggests that this policy effectively finds the natural frequency of remapping. We also use the analytic models to express the relationship between performance and remapping cost, number of processors, and the computation's stochastic activity.

1214434/7

1214434 N86-29550/8/XAB

Approximate Algorithms for Partitioning and Assignment Problems Iqbal, M. A.

National Aeronautics and Space Administration, Hampton, VA. Langley Research Center.

Corp. Source Codes: 019041001; ND210491

Report No.: NAS 1.26:178130; ICASE-86-40; NASA-CR-178130

Jun 86 31p

Languages: English

Journal Announcement: GRAI8624; STAR2420

NTIS Prices: PC A03/MF A01

Country of Publication: United States

Contract No.: NAS1-17070; NAS1-18107

The problem of optimally assigning the modules of a parallel/pipelined program over the processors of a multiple computer system under certain restrictions on the interconnection structure of the program as well as the multiple computer system was considered. For a variety of such programs it is possible to find linear time if a partition of the program exists in which the load on any processor is within a certain bound. This method, when combined with a binary search over a finite range, provides an approximate solution to the partitioning problem. The specific problems considered were: a chain structured parallel program over a chain-like computer system, multiple chain-like programs over a host-satellite system, and a tree structured parallel program over a host-satellite system. For a problem with m modules and n processors, the complexity of the algorithm is no worse than $O(mn \log(W \text{ sub } T/\epsilon))$, where $W \text{ sub } T$ is the cost of assigning all modules to one processor, and ϵ the desired accuracy.

? t 1183966/7

1183966/7

1183966 PB86-862703/XAB

Computer Networks: Data Communication Architecture and Development. 1975-March 1986 (Citations from the INSPEC: Information Services for the Physics and Engineering Communities Database) (Rept. for 1975-Mar 86)

National Technical Information Service, Springfield, VA.

Corp. Source Codes: 055665000

Apr 86 210p

Languages: English Document Type: Bibliography

Journal Announcement: GRAI8611

Supersedes PB85-859098.

NTIS Prices: PC N01/MF N01

Country of Publication: United States

This bibliography contains citations concerning architecture and development of computer networks for data communication systems. Data network design, operation, performance analysis, reliability, security, maintenance, and evolution are discussed. Techniques of packet switched and distributed data communication networks are presented.

Applications of data communication technology are included.
(This updated bibliography contains 286 citations, 32 of which are new entries to the previous edition.)

APPENDIX D

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THE DURRA RUNTIME ENVIRONMENT	D - 02
ADA ADOPTION HANDBOOK: A PROGRAM MANAGER'S GUIDE	D - 03
AN OOD PARADIGM FOR FLIGHT SIMULATORS, 2nd EDITION	D - 04
SUMMARY OF TECHNICAL OPERATIONS	D - 05
MASTER TASK: THE DURRA TASK EMULATOR	D - 06
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SUBJECT CARNEGIE-MELLON

TITLE COMMAND, CONTROL, COMMUNICATIONS,
AND INTELLIGENCE NODE: A DURRA
APPLICATION EXAMPLE

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SUBJECT CARNEGIE MELLON

TITLE ADA ADOPTION HANDBOOK: A PROGRAM
MANAGER'S GUIDE

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PUBLISHER CARNEGIE MELLON UNIVERSITY
DATE OF PUBLICATION MAY 1987
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SUBJECT CARNEGIE MELLON

TITLE AN OOD PARADIGM FOR FLIGHT
SIMULATORS, 2nd EDITION

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TITLE SUMMARY OF TECHNICAL OPERATIONS

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SUBJECT CARNEGIE MELLON

TITLE MASTER TASK: THE DURRA TASK
EMULATOR

AUTHOR(S) MARIO R. BARBACCI

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SUBJECT CARNEGIE MELLON

TITLE ADOPTION OF SOFTWARE ENGINEERING
INNOVATIONS IN ORGANIZATIONS

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SUBJECT CARNEGIE MELLON

TITLE SEI SOFTWARE ENGINEERING EDUCATION
AND TRAINING WEEK

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TITLE BRIDGE

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PAGE NUMBER 18
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SUBJECT CARNEGIE MELLON

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AUTHOR(S) VARIOUS

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AUTHOR(S) VARIOUS

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SUBJECT CARNEGIE MELLON

TITLE DURRA: A TASK LEVEL DESCRIPTION
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SUBJECT CARNEGIE MELLON

TITLE DURRA: A TASK LEVEL DESCRIPTION
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SUBJECT CARNEGIE MELLON

TITLE THE DURRA APPLICATION
DEBUGGER/MONITOR

AUTHOR(S) DENIS L. DOUBLEDAY

PUBLISHER CARNEGIE MELLON UNIVERSITY
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PAGE NUMBER 24
FILE # D - 15

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