1528

Bell Laboratories

subject: Changes to Text Processing Software
for UNIX Release 3.0
Charge Case 49579-980
File Case 39382-900

date: April 7, 1980

from: N. E. Bock
PY 3646
2F-203 x3275
3646-800407.01MF

ABSTRACT

Many changes have been made to the Text Processing Software for the UNIX™ Release 3.0 (approximately 140 maintenance requests have been resolved). This memorandum summarizes these changes and addresses five major areas: Programmer's Workbench Memorandum Macros (PWB/MM), *nroff/troff*, UNIX User's Manual Entry Macros, new facilities, and miscellaneous text software.

Items of particular note are: changes made to PWB/MM for conformance to the BTL Office Guide and to include features developed outside Department 3646, changes to *nroff/troff* for improved efficiency, the *nroff* bold and italic feature, an escape feature to allow UNIX command execution from within *nroff/troff* text, additional terminal driving tables, and changes to improve portability.

The software described in this memorandum is now beginning system testing and is subject to change prior to general availability of UNIX Release 3.0.

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UNPL 1498

Bell Laboratories Cover Sheet for Technical Memorandum

The information contained herein is for the use of employees of Bell Laboratories and is not for publication (see GEI 13.9-3)

Title: Recent Changes to C

Date: October 2, 1979

Other Keywords: programming languages
UNIX(TM)
C

TM: 79-3621-2

Author(s)	Location	Extension	Charging Case: 49461-60
B. R. Rowland	IH	4140	Filing Case: 40125

ABSTRACT

The C programming language is currently in widespread use across Bell Laboratories. It is the primary programming language (along with FORTRAN 77) on computers using the UNIX(TM) operating system and is available on many other general purpose computers such as the IBM System/370 with TSS and OS, the Intel 8086, and Honeywell HIS-6080 with GCOS. C is implemented for several of the processors produced by the Bell System including MAC-8 and 3B-20. C is a language with a flexible variety of both control and data structures as well as low level data access primitives. Recently C has evolved to meet new Bell Laboratory needs.

This memo describes recent enhancements to the C language that are not currently documented. These include:

- structure assignment
- structure valued functions
- structure valued parameters
- enumerations
- non-unique structure and union members
- fully qualified structure and union references

Examples of all the above are given.

Pages Text: 8 Other: 1 Total: 9

No. Figures: 0 No. Tables: 0 No. Refs.: 8

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SOFTWARE—PRACTICE AND EXPERIENCE, VOL. 9, 701–709 (1979)

Experiences with the UNIX Time-sharing System

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SUMMARY

The UNIX* Time-sharing System has been in use at the University of New South Wales since 1975, and favourable experience has led to its widespread adoption on campus for both teaching and research. It has proved very adaptable to the university's needs, and very usable in a situation where staffing levels are critically low. One important application area, the teaching of Computer Science, is now firmly based upon the use of the UNIX system.

KEY WORDS UNIX Time-sharing Computer Science

INTRODUCTION

There is a commonly held view, consistent with this author's own early experiences, that software obtained for free is likely to be worth what one has paid. Thus when the University of New South Wales negotiated a licence for UNIX software from the Western Electric Company of New York at the end of 1974, there was no particular expectation on our part as to what might result. Certainly we did not anticipate the major changes that have since occurred in our local computing practice. This paper is a personal account, by a member of the Department of Computer Science, some of the recent history of computing at the University of New South Wales. On our campus the UNIX system has proved to be not only an effective software tool, but an agent of technical and social change within the University.

The UNIX time-sharing system, for those who have not yet read Thompson and Ritchie's paper,[1] or better, seen the recent issue of the *Bell System Technical Journal*[2] devoted to the UNIX system, was written at Bell Laboratories to run on the larger models of the PDP11 class of computers. This time-sharing system was designed very much for the convenience of its first users, who happened also to be its designers and implementers. In practice it has proved to be convenient and effective for all its users, be they novice or expert. Running on a large PDP11/70 configuration, the UNIX system can serve up to 40 users before the response time becomes unacceptable (although it may be noted that most users of UNIX systems are intolerant of response times that users of some other systems would consider normal). The UNIX system may also be used effectively on much smaller computers. In fact, it can be run on a small PDP11/34 in single user mode to make a very attractive personal computer.

Western Electric distributes UNIX software without warranty or any after-sales support. There is no publicity and new releases outside the Bell System are made only very irregularly. (More than 3 years after the release of the sixth edition of the UNIX system, the seventh edition had still not appeared.) That a software package can achieve fame and success in the face of a policy of benign neglect argues for its being something special.

* UNIX is a trademark of Bell Laboratories.

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UNIX [TM] OPERATING SYSTEMS BIBLIOGRAPHY

This bibliography lists the current documents on the various UNIX operating systems which are available from the Bell Laboratories Computing Information Libraries. The bibliography contains a subject section, a permuted title index, a listing by UNIX number, and an author index.

A limited number of these documents are approved for release outside the Company. Please refer outside requests for such documents to the Murray Hill Computing Information Library.

C. L. Scheiderman MH X6058
January 1982

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UNOS 1447

SOFTWARE—PRACTICE AND EXPERIENCE, VOL. 9, 1-15 (1979)

The UNIX™ Programming Environment

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SUMMARY

The UNIX* operating system provides an especially congenial programming environment, in which it is not only possible, but actually natural, to write programs quickly and well.

Several characteristics of the UNIX system contribute to this desirable state of affairs. Files have no type or internal structure, so data produced by one program can be used by another without impediment. The basic system interface for input and output provides homogeneous treatment of files, I/O devices and programs, so programs need not care where their data comes from or goes to. The command interpreter makes it convenient to connect programs, by arranging for all data communication.

Complex procedures are created not by writing large programs from scratch, but by interconnecting relatively small components. These programs are small and concentrate on single functions, and therefore are easy to build, understand, describe, and maintain. They form a high level toolkit whose existence causes programmers to view their work as the use and creation of tools, a viewpoint that encourages growth in place of reinvention.

Tools interact in a limited number of ways, but can be used in many different combinations. Thus, an addition to the toolkit tends to improve the programming power of the user faster than it increases the complexity of interconnection and maintenance. Finally, tools are connected at a very high level by a powerful command language interpreter. The error-prone and expensive process of program writing can often be avoided in favor of program-using.

In this paper we will present a variety of examples to illustrate this methodology, focusing on those aspects of the system and supporting software which make it possible.

KEY WORDS Operating systems Programmer productivity

INTRODUCTION

"Software stands between the user and the machine."
(Harlan D. Mills)

There is more than a grain of truth in this remark, even though it probably wasn't meant the way it sounds. In particular, many operating systems do some things well, but seem to spend a substantial fraction of their resources interfering with their users. They are often clumsy, awkward, and present major obstacles to simply getting a job done.

Things needn't be that way. For at least five years, we have used the UNIX operating system[1]

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The Indian Hill Technical Library

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USING AND PROGRAMMING GOSLING'S EMACS FOR FUN AND PROFIT!

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Tony Hansen

and

George Otto

Bell Laboratories

MPHL 8811

Bell Laboratories

subject: IS25 to BELLMAC-32A Assembly Language Instruction Mappings
Charge Case 12143-117
File Case 39382-900

date: October 1, 1982

from: Don Kretsch
MH 45421
3B-427 x7676
45421-821001.01MF

ABSTRACT

This document describes in detail the IS25 implementation for the BELLMAC-32A microprocessor.

IS25 is the assembly language instruction set specified for the 3B family of processors. Since the BELLMAC-32A is used in the 3B5 project it was necessary to implement IS25 on the BELLMAC-32A module. Since all the IS25 instructions were not available on the module the Software Generation System's assembler provides assembly language mappings to implement the missing IS25 instructions. These mappings are documented in this memorandum.

R. E. RICHTON
HL 1C-344

8804

IH

Bell Laboratories Cover Sheet for Technical Memorandum

The information contained herein is for the use of employees of Bell Laboratories and is not for publication (see GEI 13.9-3)

Title: IS25 - The 3B Family Common Instruction Set - Release 1

Date: October 15, 1979

TM: 79-3621-3
3621-791015.01MF

Other Keywords: C
MAC-80
instruction set
assembly language
programming language

Author(s)	Location	Extension
David A. Poplawski	IH 4F-427	5934

Charging Case: 49461.60
Filing Case: 40125

ABSTRACT

IS25 is the assembly language and instruction set of the 3B family that is common to all models. It consists of a complete description (syntax and semantics) of the assembly language and common instructions and the object level description of data. It is designed to be a space and time efficient instruction set for compiled C programs, and is based on extensive measurements of the static and dynamic characteristics of "real" C programs.

This document is the first release of the specification of IS25. Should further changes be made to IS25, it will be updated and re-released.

Pages Text: 87 Other: 4 Total: 91

No. Figures: 0 No. Tables: 0 No. Refs.: 8

UNOS 1429

Bell Laboratories

subject: A UNIX™ Tutorial - Version 4.0
Update - Case 40288-100

date: February 5, 1982

from: K. E. Wendland
IH 55625
6D-507 x2068
55625-820205.01EN

ABSTRACT

This memorandum is a revision and considerable expansion of the document "A UNIX™ Tutorial" (5613-800715.01EN).

Covered are topics from "How to obtain a UNIX user ID" and login/logoff procedures, to a thorough discussion of the text editor, the file and directory structure of UNIX, online/offline printing, "shell" properties and simple "shell" scripts, the user's environment, and most commands (greatly expanded from previous issues) useful to the average user. All information is based on the latest Version 4.0 of UNIX available at Indian Hill.

The notes are meant to help the new user make effective use of the available UNIX facilities; they are written in a tutorial format (introducing simple concepts and expanding upon them, with many examples and homework). The "table of contents" is quite detailed, which also makes this document a good reference for the more experienced user.

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