

UNIX OPEARTING SYSTEM

Abstract- We looked at several different operating system specifications trying to determine which OS would be the most versatile for our business environment. It should be taken into strong consideration that although an operating system's documentation will state the minimum system requirements is low, a user may not agree to the level of functionality. In short, the bare requirements are often not acceptable performance to your client. We compared Windows XP Home & Professional, Unix, Linux, Knoppix, Fedora and Macintosh's OS X, to see what requirements were needed to run the operating systems...The UNIX* operating system was designed to let a number of programmers access the computer at the same time and share its resources.

I. INTRODUCTION

Unix (all-caps UNIX for the trademark) is a multitasking, multiuser computer operating system that exists in many variants. The original Unix was developed at AT&T's Bell Labs research center by Ken Thompson, Dennis Ritchie, and others.[3] From the power user's or programmer's perspective, Unix systems are characterized by a modular design that is sometimes called the "Unix philosophy," meaning the OS provides a set of simple tools that each perform a limited, well-defined function,[4] with a unified filesystem as the main means of communication[3] and a shell scripting and command language to combine the tools to perform complex workflows.

The C programming language was designed by Dennis Ritchie as a systems programming language for Unix,[5] allowing for portability beyond the initial PDP-11 development platform and the use of Unix on numerous computing platforms.

While initially intended for use inside the Bell System, Unix developed into a standard operating system for academia during the late 1970s and 1980s. AT&T tried to commercialize it by licensing the OS to third-party vendors, leading to a variety of both academic (e.g.,BSD) and commercial variants of Unix (such as Xenix) and eventually to the "Unix wars" between groups of vendors. AT&T finally sold its rights in Unix to Novell in the early 1990s, which then sold its Unix business to the Santa Cruz Operation (SCO) in 1995,[6] but the UNIX trademark passed to the industry standards consortium The Open Group, which allows the use of

the mark for certified operating systems compliant with the Single UNIX Specification.

II. OVERVIEW OF UNIX OPEARTING

The UNIX* operating system was designed to let a number of programmers access the computer at the same time and share its resources.

The operating system coordinates the use of the computer's resources, allowing one person, for example, to run a spell check program while another creates a document, lets another edit a document while another creates graphics, and lets another user format a document -- all at the same time, with each user oblivious to the activities of the others.

The operating system controls all of the commands from all of the keyboards and all of the data being generated, and permits each user to believe he or she is the only person working on the computer.

This real-time sharing of resources make UNIX one of the most powerful operating systems ever.

While initially designed for medium-sized minicomputers, the operating system was soon moved to larger, more powerful mainframe computers. As personal computers grew in popularity, versions of UNIX found their way into these boxes, and a number of companies produce UNIX-based machines for the scientific and programming communities.

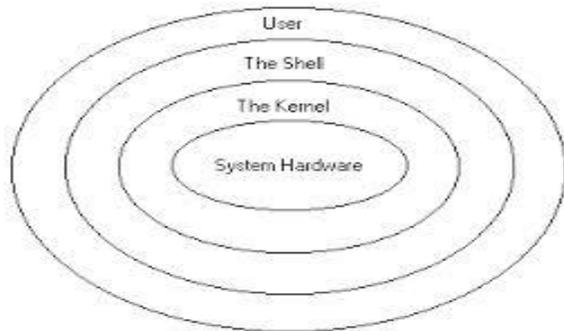
III. EVOLUTION OF UNIX TIME SHARING SYSTEM

The first version of UNIX was created in 1969 by Kenneth Thompson and Dennis Ritchie, system engineers at AT&T's Bell Labs. It went through many revisions and gained in popularity until 1977, when it was first made commercially available by Interactive Systems Corporation.

At the same time a team from the University of California at Berkeley was working to improve UNIX. In 1977 it released the first Berkeley Software Distribution, which became known as BSD. Over time this won favour through innovations such as the C shell.

Meanwhile the AT&T version was developing in different ways. The 1978 release of Version 7 included the Bourne Shell for the first time. By 1983

commercial interest was growing and Sun Microsystems produced a UNIX workstation. System V appeared, directly descended from the original AT&T UNIX and the prototype of the more widely used variant t.



IV. ORIGIN OF UNIX OPEARTING SYSTEM

1969 The Beginning The history of UNIX starts back in 1969, when Ken Thompson, Dennis Ritchie and others started working on the "little-used PDP-7 in a corner" at Bell Labs and what was to become UNIX.

1971 First Edition It had a assembler for a PDP-11/20, file system, fork(), roff and ed. It was used for text processing of patent documents.

1973 Fourth Edition It was rewritten in C. This made it portable and changed the history of OS's.

1975 Sixth Edition UNIX leaves home. Also widely known as Version 6, this is the first to be widely available out side of Bell Labs. The first BSD version (1.x) was derived from V6.

1979 Seventh Edition It was a "improvement over all preceding and following Unices" [Bourne]. It had C, UUCP and the Bourne shell. It was ported to the VAX and the kernel was more than 40 Kilobytes (K).

1980 Xenix Microsoft introduces Xenix. 32V and 4BSD introduced.

1982 System III AT&T's UNIX System Group (USG) release System III, the first public release outside Bell Laboratories. SunOS 1.0 ships. HP-UX introduced. Ultrix-11 Introduced.

1983 System V Computer Research Group (CRG), UNIX System Group (USG) and a third group merge to become UNIX System Development Lab. AT&T announces UNIX System V, the first supported release. Installed base 45,000.

1984 4.2BSD University of California at Berkeley releases 4.2BSD, includes TCP/IP, new signals and much more. X/Open formed.

1984 SVR2 System V Release 2 introduced. At this time there are 100,000 UNIX installations around the world.

1986 4.3BSD 4.3BSD released, including internet name server. SVID introduced. NFS shipped. AIX announced. Installed base 250,000.

1987 SVR3 System V Release 3 including STREAMS, TLI, RFS. At this time there are 750,000 UNIX installations around the world. IRIX introduced.

1988 POSIX.1 published. Open Software Foundation (OSF) and UNIX International (UI) formed. Ultrix 4.2 ships.

1989 1989 AT&T UNIX Software Operation formed in preparation for spinoff of USL. Motif 1.0 ships.

1990 1989 SVR4 UNIX System V Release 4 ships, unifying System V, BSD and Xenix. Installed base 1.2 million.

1991 1990 XPG3 X/Open launches XPG3 Brand. OSF/1 debuts. Plan 9 from Bell Labs ships. 1991 UNIX System Laboratories (USL) becomes a company - majority-owned by AT&T. Linus Torvalds commences Linux development. Solaris 1.0 debuts.

1992 1992 SVR4.2 USL releases UNIX System V Release 4.2 (Destiny). October - XPG4 Brand launched by X/Open. December 22nd Novell announces intent to acquire USL. Solaris 2.0 ships.

1993 1993 4.4BSD 4.4BSD the final release from Berkeley. June 16 Novell acquires USL Late 1993 SVR4.2MP Novell transfers rights to the "UNIX" trademark and the Single UNIX Specification to X/Open. COSE initiative delivers "Spec 1170" to X/Open for fasttrack. In December Novell ships SVR4.2MP , the final USL OEM release of System V

1994 1994 Single UNIX Specification BSD 4.4-Lite eliminated all code claimed to infringe on USL/Novell. As the new owner of the UNIX trademark, X/Open introduces the Single UNIX Specification (formerly Spec 1170), separating the UNIX trademark from any actual code stream.

1995 1995 UNIX 95 X/Open introduces the UNIX 95 branding programme for implementations of the Single UNIX Specification. Novell sells UnixWare

business line to SCO. Digital UNIX introduced. UnixWare 2.0 ships. OpenServer 5.0 debuts.

1996 1996 The Open Group forms as a merger of OSF and X/Open.

1997 1997 Single UNIX Specification, Version 2 The Open Group introduces Version 2 of the Single UNIX Specification, including support for realtime, threads and 64-bit and larger processors. The specification is made freely available on the web. IRIX 6.4, AIX 4.3 and HP-UX 11 ship.

1998 1998 UNIX 98 The Open Group introduces the UNIX 98 family of brands, including Base, Workstation and Server. First UNIX 98 registered products shipped by Sun, IBM and NCR. The Open Source movement starts to take off with announcements from Netscape and IBM. UnixWare 7 and IRIX 6.5 ship.

1999 1999 UNIX at 30 The UNIX system reaches its 30th anniversary. Linux 2.2 kernel released. The Open Group and the IEEE commence joint development of a revision to POSIX and the Single UNIX Specification. First LinuxWorld conferences. Dot com fever on the stock markets. Tru64 UNIX ships.

2000 2001 Single UNIX Specification, Version 3 Version 3 of the Single UNIX Specification unites IEEE POSIX, The Open Group and the industry efforts. Linux 2.4 kernel released. IT stocks face a hard time at the markets. The value of procurements for the UNIX brand exceeds \$25 billion. AIX 5L ships.

2003 ISO/IEC 9945:2003 The core volumes of Version 3 of the Single UNIX Specification are approved as an international standard. The "Westwood" test suite ship for the UNIX 03 brand. Solaris 9.0 E ships. Linux 2.6 kernel released.

The uniqueness of UNIX

he UNIX system is successful because the minimum number of keystrokes achieve the maximum effort. In addition, the system says very little to explain errors and relies on the intelligence of the user to deduce reasons for failure.

V. FEATURE OF UNIX OPEARTING SYSTEM

The features that made UNIX a hit from the start are:

- Multitasking capability
- Multiuser capability
- Portability
- UNIX programs

- Library of application software

Multitasking

Many computers do just one thing at a time, as anyone who uses a PC or laptop can attest. Try logging onto your company's network while opening your browser while opening a word processing program. Chances are the processor will freeze for a few seconds while it sorts out the multiple instructions.

UNIX, on the other hand, lets a computer do several things at once, such as printing out one file while the user edits another file. This is a major feature for users, since users don't have to wait for one application to end before starting another one.

Multiusers

All flavors of UNIX are multi-user systems; a number of users can have accounts on one machine and even use it simultaneously if hardware allows. In fact, many of the parts of the operating system are organized with multiple different users in mind.

The most powerful and important user on any UNIX system is the root user. This is the account for the system administrator and has all possible privileges to all parts of the machine.

The root user is usually the one responsible for:

1. keeping the machine up and working properly
2. setting disk quotas (limits on the amount of hard drive space each user can write to)
3. permissions for use of software on the machine (so ordinary users cannot wipe out each other's work or take over control of the computer)
4. installing software for global (everybody's) use
5. applying software patches when bugs are found and fixed
6. setting system policies (like security and access control)

If you have your own system, then you are the root user of your system. Since, the root user account is normally reserved strictly for system administrator tasks.

If there are a lot of users on a particular UNIX machine, then the concept of groups becomes important. Each of these groups would have a different set of privileges, perhaps different set of specialized programs they are allowed to use, and a different set of files on the computer they are allowed to access.

The same design that permits multitasking permits multiple users to use the computer. The computer can take the commands of a number of users -- determined by the design of the computer -- to run programs, access files, and print documents at the same time.

System portability

A major contribution of the UNIX system was its portability, permitting it to move from one brand of computer to another with a minimum of code changes. At a time when different computer lines of the same vendor didn't talk to each other -- yet alone machines of multiple vendors -- that meant a great savings in both hardware and software upgrades.

It also meant that the operating system could be upgraded without having all the customer's data inputted again. And new versions of UNIX were backward compatible with older versions, making it easier for companies to upgrade in an orderly manner.

UNIX tools

UNIX comes with hundreds of programs that can be divided into two classes:

- Integral utilities that are absolutely necessary for the operation of the computer, such as the command interpreter, and
- Tools that aren't necessary for the operation of UNIX but provide the user with additional capabilities, such as typesetting capabilities and e-mail.

Tools can be added or removed from a UNIX system, depending upon the applications required.

UNIX Communications

E-mail is commonplace today, but it has only come into its own in the business community within the last 10 years. Not so with UNIX users, who have been enjoying e-mail for several decades.

UNIX e-mail at first permitted users on the same computer to communicate with each other via their terminals. Then users on different machines, even made by different vendors, were connected to support e-mail. And finally, UNIX systems around the world

were linked into a world wide web decades before the development of today's World Wide Web.

Applications libraries

UNIX as it is known today didn't just develop overnight. Nor were just a few people responsible for its growth. As soon as it moved from Bell Labs into the universities, every computer programmer worth his or her own salt started developing programs for UNIX.

Today there are hundreds of UNIX applications that can be purchased from third-party vendors, in addition to the applications that come with UNIX.

How UNIX is organized

The UNIX system is functionally organized at three levels:

- The kernel, which schedules tasks and manages storage;
- The shell, which connects and interprets users' commands, calls programs from memory, and executes them; and
- The tools and applications that offer additional functionality to the operating system

The three levels of the UNIX system: kernel, shell, and tools and applications.

The kernel

The heart of the operating system, the kernel controls the hardware and turns part of the system on and off at the programmer's command. If you ask the computer to list (ls) all the files in a directory, the kernel tells the computer to read all the files in that directory from the disk and display them on your screen.

The shell

There are several types of shell, most notably the command driven Bourne Shell and the C Shell (no pun intended), and menu-driven shells that make it easier for beginners to use. Whatever shell is used, its purpose remains the same -- to act as an interpreter between the user and the computer.

The shell also provides the functionality of "pipes," whereby a number of commands can be linked together by a user, permitting the output of one program to become the input to another program.

VI. UNIX COMMAND

Command	Description
cat	Display File Contents
cd	Changes Directory to dirname
chgrp	change file group
chmod	Changing Permissions
cp	Copy source file into destination
file	Determine file type
find	Find files
grep	Search files for regular expressions.
head	Display first few lines of a file
ln	Create softlink on oldname
ls	Display information about file type.
mkdir	Create a new directory dirname
more	Display data in paginated form.
mv	Move (Rename) a oldname to newname.
pwd	Print current working directory.
rm	Remove (Delete) filename
rmdir	Delete an existing directory provided it is empty.
tail	Prints last few lines in a file.
touch	Update access and modification time of a file.

VII. COMPARISON OF WINDOWS NT AND UNIX AS OPEARTING SYSTEM

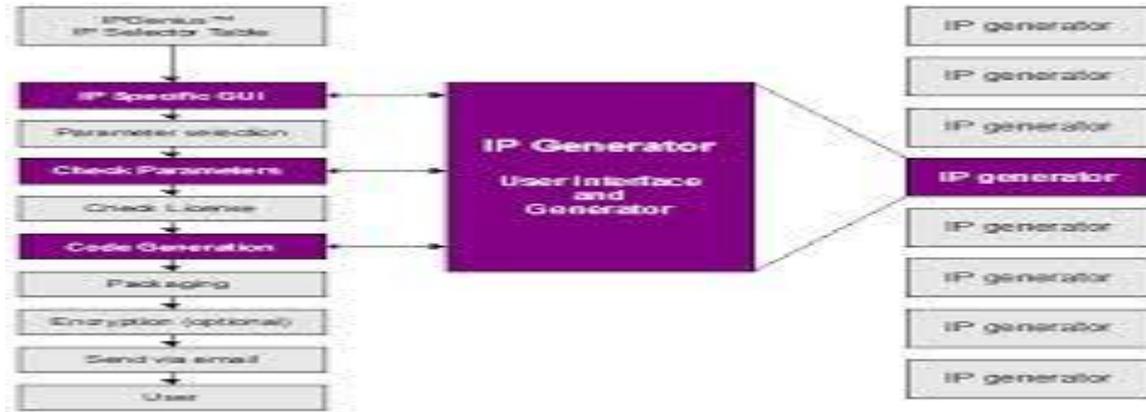
Comparison of Windows NT and Unix as Operating Systems Incomplete Essay In the late 1960s a combined project between researchers at MIT, Bell Labs and General Electric led to the design of a third generation of computer operating system known as MULTICS (MULTiplexed Information and Computing Service). It was envisaged as a computer utility, a machine that would support hundreds of simultaneous timesharing users. They envisaged one huge machine providing computing power for everyone in Boston. The idea that machines as powerful as their GE-645 would be sold as personal computers costing only a few thousand dollars only

20 years later would have seemed like science fiction to them...

VIII. UNIX SECURITY

An Overview of UNIX Security The purpose of this paper is to analyze the security of UNIX. Considerations shall be given regarding generalized security aspects of a typical UNIX system. The ultimate scope of the following presentation shall remain within the boundaries of a few of the more critical UNIX security aspects. Of particular note will be discussion regarding standard user access, root access, file system security, and internet access precautions. This will not focus on specific measures used to implement security, but

rather will investigate both pros and cons typical of a UNIX .



IX. COMPARISON OF MICROSOFT WITH UNIX

Comparing Microsoft DOS with UNIX As is suggestive of its name, an operating system (OS) is a collection of programs that operate the personal computer (PC). Its primary purpose is to support programs that actually do the work one is interested in, and to allow competing programs to share the resources of the computer. However, the OS also controls the inner workings of the computer, acting as a traffic manager which controls the flow of data through the system and initiates the starting and stopping processes, and as a means through which software can access the hardware and system software.

X. CONCLUSION

- UNIX is a computer operating system.
- An operating system is the program that controls all the other parts of a computer system, both the hardware and the software. It allocates the computer's resources and schedules tasks. It allows you to make use of the facilities provided by the system. Every computer requires an operating system.
- UNIX is a multi-user, multi-tasking operating system. Multiple users may have multiple tasks running simultaneously. This is very different from PC operating systems such as MS-DOS or MS-Windows (which allows multiple tasks to be carried out simultaneously but not multiple users).
- UNIX is a machine independent operating system. Not specific to just one type of computer

hardware. Designed from the beginning to be independent of the computer hardware.

- UNIX is a software development environment. Was born in and designed to function within this type of environment.

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