



Network Protocol and Operating System Integration

A faint, light gray silhouette of a globe showing the continents, positioned to the left of the title text.

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"A network protocol is a set of agreements and specifications for sending data over a network TCP/IP Transmission Control Protocol/Internet Protocol (TCP/IP) is the network protocol that has the widest use in industry: TCP/IP protocol stacks exist for all operating systems currently in use. It is an extremely robust and reliable protocol. It is routable, which means that it can be sent between disparate networks.."

(McGovern)

Even though microcomputer network operating systems have come a long way since Bill Gates and Paul Allen launched a computer revolution by writing the first software for the Altair computer in 1974, today's network managers still need to consider reliability, scalability, usability, cost of ownership, and the IT expertise of their employees when making decisions concerning microcomputer network operating systems implementation.

An operating system is the software that enables a computer to receive input, display output, coordinate processing functions, and orchestrate RAM/ROM memory operations. Without an operating system a computer is just a fancy plastic and metal box with not much practical use. Prior to 1974 most computers were large, slow, and expensive mainframes owned by the government, universities or large corporations used mainly for tabulation, repetitive calculations, and IT research. Given there were so few computers and no single computer architecture standard mainframe operating systems were mostly custom scripted. Because of the fragmentation of standards accepted standard network protocols necessary to enable computers to communicate and share objects between were custom scripted as well.

In 1974 two things happened that would forever revolutionize the use of computers. Ed Roberts developed the Altair 8080 which was the first personal computer available to for less than a \$500 incorporating the revolutionary Intel 8080 microprocessor. Although this computer was very impressive for its day it had no practical use because it did not have an operating system and therefore could not function asides from being able to accept simple binary data inputs via a series of switches on the hard drive casing. That same year Bill Gates while attending Harvard University worked with his friend Paul Allen to develop the first operating system for the Altair thereby launching his software development career. Their early success was followed by their leadership in a multibillion dollar operating system and computer software industry where they helped create the MS-DOS operating system and further network protocols that are the foundation of 90% of today's computer use.

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Operating systems play a very important role in how a computer is able to install and operate a variety of different software. For that reason most software developers design their applications to run off two to five operating systems at the most. Prior to the MS-DOS, Windows, UNIX, and LINUX operating systems it was very difficult for the commercial software industry to take off because of a lack of operating systems standards.

Even with today's standards there are different operating system flavors. Plain vanilla is a term that is usually ascribed to very popular operating systems such as UNIX, MS-DOS, and LINUX that, as the name implies, provide basic functionality necessary to operate a computer. Operating systems like Windows and its various product line extensions are more sophisticated in that they provide a Graphical User Interface (GUI) as well as a variety of graphic, multimedia, and audio processing standards. Although the latter provide a fuller experience to the non IT professional home and business user they have a higher propensity for bugs especially when operated with other software. This problem has been mitigated over the years as in the example of Microsoft Windows where teams of developers constantly tested so as to provide patches and service packs to correct flaws within previous operating system versions. Over the years TCP/IP has evolved as the universal networking protocol across the Internet and 90% of home and business computers. The evolution of this standard has been facilitated by the dominance of the Windows operating system among the latter groups of users.

" Network management means different things to different people. In some cases, it involves a solitary network consultant monitoring network activity with an outdated protocol analyzer. In other cases, network management involves a distributed database, autopolling of network devices, and high-end workstations generating real-time graphical views of network topology changes and traffic. In general, network management is a service that employs a variety of tools, applications, and devices to assist human network managers in monitoring and maintaining networks." (Cisco)

Today's network managers need to consider reliability, scalability, usability, cost of ownership, and the IT expertise of their employees when making decisions concerning microcomputer network operating systems implementation. Over the last 10 years there have been arguments for and against utilizing plain vanilla operating systems like LINUX as opposed to the established Windows platform. LINUX tends to be more reliable than Windows but in turn does not have the wide variety of commercial business software on the market. Cost of ownership is much lower for LINUX systems but is characterized by decreasing returns as companies who adopt the former need to spend more money on custom application development as their network use becomes more sophisticated. In turn, Microsoft Windows is continuing to enhance integration among its operating systems and multitude of business software making it increasingly easier for non IT professionals to accomplish tasks that years earlier would have not been easy. One must consider the technical prowess of ones workforce when deciding between an established architecture like windows and a more plain solution like LINUX. Employees that do not have an IT administration background will probably have an easier time learning how to use applications that are similar to those on their personal computers and vice-versa. Scalability is a concern when thinking of expansion in terms of interfacing with other companies, customers, and partners whereby one would want to minimize integration issues at the outset of making an important operating system and networking architecture decision.

" In a recent column, I postulated that the key to success as a network manager is to develop a sound strategy for addressing the business, technical and personnel issues that reach the corner office.." (Molta)



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