

WHITE PAPER

April 1999
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Adding Compaq Windows NT Professional Workstations to a UNIX Unigraphics Environment

Many organizations have developed very productive product development environments utilizing Unigraphics running on UNIX workstations. At the same time, Windows NT workstations have made significant advances in both system and graphics performance. Today, Compaq Windows NT Professional Workstations beat the performance of many UNIX workstations while costing less. They further lower the cost of ownership by allowing users to run both Unigraphics and their office automation applications on one workstation. Therefore, many companies are introducing Windows NT workstations into their existing UNIX environments.

This paper will address the common interoperability issues that arise when Windows NT workstations are added to a UNIX Unigraphics environment. Specific issues to be addressed include sharing data between systems, sharing licenses among UNIX and Windows NT workstations, providing access to applications that are only available on a UNIX system, and migration of scripts from UNIX to Windows NT. This paper also provides references to solution providers that address each of these issues.

For more information about Compaq Professional Workstation product offerings, refer to www.compaq.com/products/workstations.

To find the latest version of this paper, or to find out more information on Compaq interoperability partners, refer to www.compaq.com/products/workstations/intsol/index.html

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Adding Compaq Windows NT Professional Workstations to a UNIX Unigraphics Environment

April 1999

0183-0699-A

Introduction

Many product development organizations have been utilizing Unigraphics on UNIX workstations for many years. Compaq Windows NT Professional Workstations offer these organizations the opportunity to provide additional workstations or replace existing UNIX workstations with systems that provide more performance at a lower cost. In addition to providing the performance Unigraphics users are looking for, a Windows NT workstation allows the user to utilize industry-standard e-mail and office automation software to improve their productivity.

While many Unigraphics users realize the performance and cost benefits of Windows NT workstations, some still have questions about how easily Compaq Windows NT Professional Workstations will integrate into their existing UNIX environment. This paper addresses this issue.

Existing UNIX Unigraphics Environments

The majority of UNIX Unigraphics environments store their data on UNIX servers. These servers provide data security by storing data on RAID arrays and by providing routine data backups.

In many cases, the Unigraphics application software is also stored on the UNIX server. This allows the system administrator to provide updates to all users by updating software on one server. It is common for the Unigraphics license manager to run on this same server.

As Windows NT workstations are introduced, most organizations want to keep their existing UNIX investments and want the new Windows NT workstations to easily coexist with the existing UNIX servers and workstations. This minimizes the changes that have to be made to the existing environment.

Common Interoperability Issues

As Windows NT workstations are introduced into a UNIX Unigraphics environment, some common interoperability issues are encountered. They include the following areas of concern:

- Sharing of files
- Sharing of printers and plotters
- License management
- Access to applications running on UNIX or mainframe systems
- Use of UNIX utilities and scripts

File Sharing

UNIX Unigraphics users that store their data and/or applications software on a UNIX server currently use Network File System (NFS) software as the way to share these files. They also use NFS to provide access to remote printers and plotters.

Windows NT workstations use Server Message Block (SMB) as their default method for sharing files, printers and plotters. There are a variety of alternatives available to allow these two different technologies to work together.

Multiple File and Printer Sharing Alternatives

There are three main ways to provide a Windows NT workstation access to UNIX files and printers:

- Provide an NFS client on the Windows NT workstation
- Provide SMB on the UNIX server
- Introduce a gateway between the Windows NT workstation and the UNIX server

NFS Client on the Windows NT Workstation

NFS clients for Windows NT workstations have been available for many years from a variety of vendors. The new Windows NT workstation NFS clients available today for Compaq Professional Workstations offer the same high levels of performance as UNIX workstation NFS clients.

By installing an NFS client on a Windows NT workstation and providing the user with a valid UNIX account, the Windows NT user can use files and printers residing on a UNIX server or workstation. Windows NT users can access the UNIX files by using either Windows Explorer or Unigraphics and can add printers and plotter access from the Windows NT control panel.

An NFS client on the Windows NT workstation provides the same flexibility a UNIX workstation user has to obtain access to files, printers and plotters that are available on UNIX servers or workstations.

SMB on a UNIX Server

SMB on a UNIX server allows any Windows NT workstation to access files, printers and plotters on that UNIX server. SMB software is available from all the major UNIX vendors. Many vendors utilize Advanced Services for UNIX (ASU) from AT&T. ASU is native Windows NT software that AT&T licensed from Microsoft and then ported to UNIX. AT&T licenses the technology to other UNIX vendors.

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NFS Gateway

A third option is to use an NFS gateway. The NFS gateway consists of software running on a Windows NT server that shares files with a UNIX server via NFS and uses SMB to share the files with Windows NT workstations.

The benefits of an NFS gateway are that no software needs to be loaded on either the Windows NT workstation or the UNIX server, and it offers a centralized location to manage the access to UNIX files, printer and plotters for the Windows NT workstations. The NFS gateway has the same limitation that SMB on a UNIX server has: to share data between a UNIX and Windows NT workstation, the data must be stored on a UNIX server that both the NFS gateway and the UNIX workstation can access. Also, this alternative requires the purchase of an additional server of adequate size to provide good performance.

Additional File Access Issues

While each of the above solutions provides file and printer access between UNIX and Windows NT workstations, there are additional issues to keep in mind.

User Accounts

Users need accounts on both their Windows NT workstation and UNIX server. Having two accounts can increase the complexity for the user. More information on how to make this issue transparent to users is provided in the system administration section of this document.

Case Sensitivity

UNIX file names are case sensitive while Windows NT file names are not. However, both UNIX and Windows NT are case preserving. Thus, a file stored on a UNIX system as FOO is different than a file stored as foo, while Windows NT does not make this distinction. Windows NT NFS clients and NFS gateways provide an option to force the case on all files stored on the UNIX server to be either all lower case or all upper case. This prevents a Windows NT user from storing two files with the same name but different cases on the UNIX system.

If files named FOO and foo are created by a UNIX user on the UNIX system, the Windows NT user will only see one of the files. The Windows NT user could mistakenly use or delete the wrong file. Therefore, care must be taken when using case in file names.

File Naming

UNIX and Windows NT have different file naming conventions. For example, Windows NT will not allow a file name to end with a '.' While this is acceptable in UNIX, UNIX and Windows NT users must be aware of the naming conventions on both systems to insure both groups of users can access all files.

Printer and Plotter Access

The Unigraphics Plot Queue Manager provides access to network printers and plotters. A Windows NT workstation can use the same Plot Queue Manager that the existing UNIX workstations use. This makes it easy for all users to have access to the same output devices.

Any of the methods to provide file access outlined above also provide the ability for a Windows NT workstation to access general purpose printers on the network. These printers could be used for printing documents from applications such as Microsoft Word.

File And Printer Access		
Issue	Solution	Products
Access files, printers and plotters on a UNIX server from a Windows NT workstation	NFS client software on the Windows NT workstation	Microsoft Services for UNIX Hummingbird Maestro Client Intergraph DiskAccess
	NFS gateway on a Windows NT server	Hummingbird Maestro Gateway Intergraph Access NFS Gateway
	SMB on the UNIX server	Advanced Server for UNIX SAMBA

Unigraphics License Management

Unigraphics uses FLEXlm software to manage licenses on both UNIX and Windows NT systems. Both UNIX and Windows NT users can check out a license from a common license manager, which can be running on either a UNIX or Windows NT server. The UNIGRAPHICS license manager requires that the server running the license manager has a fixed IP address. The Unigraphics workstations can use either a fixed IP address or DHCP.

GRIP and UFUNC Utilities

Many sites have developed GGraphics Interactive Programming (GRIP) and User Function (UFUNC) utilities to automate routine tasks. These utilities can be moved from a UNIX environment to a Windows NT workstation. However, in many cases, platform specific information in the software must be changed for it to run. In many cases, the changes are not difficult or time consuming.

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Character Mode Access

For running character mode applications on remote systems, a Windows NT workstation user can use the telnet client software included with the Windows NT workstation.

Graphical Access

UNIX application vendors have standardized on Xwindows as the technology basis for their graphical user interfaces. Third party Xwindows servers are available for Windows NT workstations to allow users to run Xwindows applications remotely. These Xwindows servers are designed to take advantage of the graphics acceleration available on the Windows NT workstation.

Mainframe Access

For access to mainframe applications, third-party vendors provide software for mainframe access via a variety of terminal types including VT100, IBM 3270 and IBM 5250.

Access to Applications Only Available on UNIX or Mainframe Systems		
Issue	Solution	Products
Access character mode UNIX applications from a Windows NT workstation	Telnet client software on the Windows NT workstation	Microsoft® Windows NT Workstation
Access graphical UNIX applications from a Windows NT workstation	Xwindows server software on the Windows NT workstation	Hummingbird Exceed
Access legacy mainframe applications from a Windows NT workstation	VT100, IBM 3270 and 5250 emulation software on the Windows NT workstation	Hummingbird Host Explorer

Use of UNIX Commands and Scripts

Many UNIX Unigraphics users and system administrators have extensive knowledge of UNIX commands and use them frequently during the course of a day. They also use scripting languages

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Common UNIX Commands and Scripting Languages for Windows NT		
Issue	Solution	Products
Use UNIX commands on a Windows NT workstation	UNIX command set on Windows NT	Microsoft Windows NT Resource Kit Microsoft Services for UNIX Mortice Kern Systems (MKS) Toolkit Softway Systems Interix
Use UNIX scripts on a Windows NT workstation	UNIX shells and scripting languages on Windows NT	Microsoft Windows NT Resource Kit Mortice Kern Systems (MKS) Toolkit Softway Systems Interix

System Administration

When Compaq Windows NT Professional Workstations are introduced into a UNIX environment, a number of system administration issues arise.

User Accounts

Users need valid accounts on both their Windows NT workstation and the UNIX servers where their data is stored. This means a user could have two different user names and passwords. However, this can be avoided in a variety of ways.

Windows NT NFS client software can use either a pcnfsd daemon or Network Information Service (NIS) to validate users. Many of the NFS client software vendors provide utilities to automatically update the NIS password on the UNIX system every time it is changed on the Windows NT workstation. Therefore, the user will only have one username and one password for both systems.

For organizations using SMB software on a UNIX server, an NT Domain Controller can be used to validate users needing access to the UNIX server.

Access from UNIX Systems

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- Utilize third-party software that provides utilities to centrally manage their NFS and Xwindows software.

Asset Management

Managing a large number of Windows NT workstations can be simplified by utilizing Compaq Insight Manager. Insight Manager is based on the Desktop Management Initiative (DMI) standard for management of remote systems. Compaq has been very active in helping to develop these standards and provide DMI compliant software agents with each Windows NT Professional Workstation. These software agents work with Compaq Insight Manager to provide system administrators the ability to remotely view asset information. Compaq Insight Manager can also be used to alert system administrators if the performance of disks, memory or CPUs is degrading. If the system administrator is notified that any of these components have begun to degrade, Compaq will replace them under warranty before they fail. Compaq Insight Manager software also integrates with Microsoft SMS and can be "snapped into" all the major enterprise management systems.

System Administration		
Issue	Solution	Products
Use UNIX commands and scripts on a Windows NT workstation	UNIX commands, shells and scripting languages on Windows NT	Microsoft Services for UNIX Mortice Kern Systems (MKS) Toolkit Softway Systems Interix
Access Windows NT workstation from a UNIX system	Telnet server on Windows NT workstation	Microsoft Services for UNIX
Synchronize Windows NT workstation and UNIX server passwords	Password synchronization software for Windows NT NFS clients	Microsoft Services for UNIX Hummingbird Maestro Intergraph DiskAccess
Remotely manage Windows NT interoperability applications	Software management application	Hummingbird Jconfig & Sconfig Microsoft SMS
Manage Windows NT	Utilize system management	Compaq Insight Manager

Summary

Introducing Windows NT workstations into an existing Unigraphics environment provides many benefits. Current Windows NT workstations provide better performance than UNIX workstation at a lower cost, while providing one desktop for running Unigraphics as well as a wide range of engineering and office automation software.

The Windows NT workstation environment allows a wide variety of alternatives for interoperability with existing UNIX Unigraphics environments. While the number of options may be confusing at first, having this variety allows users to select a solution that best fits their current and future needs.

Compaq works with Microsoft and interoperability partners to insure that the solutions available on Compaq Professional Windows NT Workstations provide maximum performance.

The following sections provide reference materials that contain more detailed information, as well as information on Compaq's workstation interoperability partners.

Reference Material

The following reference material will be useful for organizations preparing to introduce Windows NT workstations into an existing UNIX Unigraphics environment.

Text Books

- *Windows NT and UNIX Integration* Guide by Gunter, Burnett and Gunter, from Osborne McGraw-Hill
- *Windows NT and UNIX Integration* by Henriksen, from MacMillan Technical Publications
- *Windows NT and UNIX: Administration, Coexistence, Integration, and Migration* by Williams and Gardner, from Addison Wesley

White Papers and Tutorials

- *Technical Overview of UNIX and Windows NT Integration*
www.microsoft.com/train_cert/courses/enm1166a.htm
- *UNIX Interoperability*
www.microsoft.com/ntserver/nts/exec/feature/UnixInterop.asp
- *Windows NT Server from a UNIX Point of View*
www.microsoft.com/ntserver/ntserverenterprise/techdetails/compares/winntfromunix.asp
- *Advanced Server for Compaq Tru64 UNIX Tutorial*
www.unix.digital.com/products/adv_server/tutorial/index.html

SMB Products for UNIX Servers

- Compaq Advanced Server for Tru64 UNIX
www.unix.digital.com/products/adv_server/
- HP Advanced Server/9000
www.hp.com/esy/systems_networking/networking/products/advanced.html
- SAMBA

Interoperability Partners

To ensure that Compaq Professional Workstations can be easily introduced into an existing UNIX Unigraphics environment, Compaq has partnered with the leading interoperability software vendors. These partnerships ensure that customers have access to industry leading solutions that have been completely tested on Compaq Professional Workstations.

The following section provides a brief overview of Compaq's Professional Workstation interoperability partners, and a link to their web sites where the reader can find more detailed information. More information on Compaq management partners can be found at www.compaq.com/im/partners/



Hummingbird Communications, Ltd.

Hummingbird Communications Ltd. specializes in the development of enterprise software solutions, including network connectivity and business intelligence products that provide high performance access to internetwork-based information and applications.

Hummingbird products are sold and supported internationally by authorized resellers in more than 40 countries. The company is headquartered in Toronto, Canada with offices strategically located throughout Canada and the United States, Australia, Switzerland, Germany, France, Italy, Sweden, the United Kingdom, and South Africa. www.hummingbird.com

INTERGRAPH Intergraph Corporation

Intergraph Corporation is the world's largest company dedicated to supplying interactive computer graphics systems. Intergraph's business is primarily in two areas:

- Hardware (workstations and servers)
- Technical software applications requiring state-of-the-art interactive computer graphics.

The company has five primary business units addressing the hardware, software, federal, electronics, and public safety marketplaces. Intergraph is a billion-dollar, Fortune 1000 supplier of hardware, software, and services with sales and support offices in 65 countries.

www.intergraph.com



Microsoft Corporation

Microsoft products include operating systems for personal computers, server applications for client/server environments, business and consumer productivity applications, and



Mortice Kern Systems, Inc.

Mortice Kern Systems Inc. (MKS) provides a complete solution for both interoperability and cross-platform development needs. MKS Toolkit is a comprehensive suite of Windows NT and UNIX utilities for Windows NT. The Toolkit enables you to customize, control and automate your software development and administrative processes. MKS NuTCRACKER can be used to develop single- or multi-threaded C, C++, or Fortran applications, shared libraries, and daemons, on Windows NT and Windows 9x. www.mks.com



Softway Systems, Inc.

Founded in September 1995, Softway Systems addresses the need of corporations, developers, ISVs, and VARs to exploit their existing investment in UNIX and Linux applications and tools as they move to new platforms. Developers of a POSIX subsystem for Microsoft Windows NT, Softway Systems develops and markets complete POSIX environments and the development tools to match. www.interix.com