

HEWLETT PACKARD
PC NETWORKING ALTERNATIVES

PREPARED BY

CHRIS OLSON

HEWLETT-PACKARD COMPANY
NEELY SALES REGION
3003 Scott Boulevard
Santa Clara, California 95054

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HEWLETT PACKARD PC NETWORKING ALTERNATIVES

Hewlett-Packard offers a variety of PC networking products that allow PCs to be connected to one another as well as to an HP 3000. In a PC network, either a PC or an HP 3000 can be used as a server. The benefit of a network is that users can share data and peripherals. This sharing results in cost savings and/or organizational efficiencies.

The four options presented here assume that an HP 3000 is already installed and operating in an existing data processing environment. These options build upon this environment and further utilize the multi-tasking capabilities of the HP 3000 computer. These networking strategies represent those configurations most frequently used in an office environment and address a multitude of PC networking needs.

Options #1, #2, and #3 basically offer the same capabilities; shared disc, shared printers, shared files, and the ability to perform tape back-ups of all disc drives. Option #4, which is not a network, offers shared printers and shared files. All four options vary in price, performance (speed), and capabilities. In order to compare these strategies, a sample configuration is presented for each option which assumes that two departments or work groups are implementing a PC network, and that each group of PCs has access to an HP 3000 Series 70.

While these strategies are described separately, the final networking configuration for a particular organization may be a combination of one or more of these options. In order to determine which option is best, additional information will need to be gathered. This information includes disc and print volumes, tasks performed most frequently (e.g. word processing, graphics etc.), physical dimensions of the building(s), expected growth, budget, and the importance of speed, versus functionality, versus support.

None of these options address specific software needs. Again, more information will need to be gathered to recommend specific packages. However, each option includes Hewlett-Packard's most popular PC application bundles, the Vectra Office Professional. This bundle includes an easy to use word processor, graphics, a database application, a spreadsheet application, and a terminal emulator.

It is important that this paper be used only as a guideline in determining a PC networking strategy due to the many issues surrounding the implementation of PC networks. Because Hewlett-Packard is committed to the long-term success of each of its customers, it is strongly recommended that customers considering the implementation of a PC network work closely with the Hewlett Packard support team to ensure maximum success.

OPTION #1: ADD-ON MICRO 3000GX AS A SERVER

(Business System 3000 with Business System Plus Software)

The Business System 3000 (MICRO 3000GX) is a complete entry level integrated business system which is ideal for departmental applications where local area networking and PC integration is desired. In this configuration, the HP MICRO 3000 mini-computer acts as a server to PCs which are connected via twisted pair type cabling (HP StarLAN). PC users have access to all of the MICRO 3000GX's peripherals including printers, discs, plotters, and tape drives. Users can have private and shared PC files on the MICRO 3000GX, eliminating the need for floppy diskettes to share and store data. Additionally, PC hard discs can be backed up to the HP 3000, significantly reducing the risk of lost PC data. Also, by connecting the Business System 3000 to the existing HP 3000, all users on the network will have access to applications on the HP 3000 such as HPDeskManager.

Business System Plus software is a key component of the Business System 3000. In the sample configuration, Business System Plus includes:

- 1) Software to allow PC users access to the MICRO 3000GX peripherals;
- 2) Utilities that aid in the configuration and maintenance of the network, and;
- 3) Five key PC applications for each PC on the network. The five applications are Advancelink, Executive Card Manager., Executive Memomaker, Graphics Gallery, and Lotus(R) 1-2-3(R).

As an option, electronic mail (HPDeskManager) and software that allows a PC access to Image databases and the ability to download data to the PC (Information Access) can be added to Business System Plus. These two components are not included in the pricing of the sample configuration.

The following is a description of the advantages and disadvantages of this option versus the other options being presented.

Advantages

- o Ability to print/plot to more than one printer/plotter at the same time -- the HP 3000 uses a multi-tasking operating system (MPE) which can manage several devices at a time.
- o Excellent spooler manipulation capabilities via the MPE spooler (SPOOK), -- capabilities include the ability to suspend printing, re-start printing without loss of data, alter print priorities and the number of copies to be printed.
- o Offloads existing HP 3000 by running on a completely separate HP 3000.
- o High security due to built in MPE security.

- o Ability to use the same printer for both PC applications and HP 3000 applications such as HPDesk.
- o With Business System Plus, new versions of PC applications can be downloaded from the HP 3000 to all PCs on the network. This greatly reduces installation time and aids in "version" control.
- o Provides centralized control -- multiple servers do not need to be maintained. The MICRO 3000GX could be located in the computer room for easy maintenance by the MIS staff.
- o Already have personnel trained on the HP 3000. The only additional training would be on the use of the network software. Backups and routine maintenance would be done in the same manner as the existing HP 3000.
- o Remote PC users can access the network via HP SERIAL.

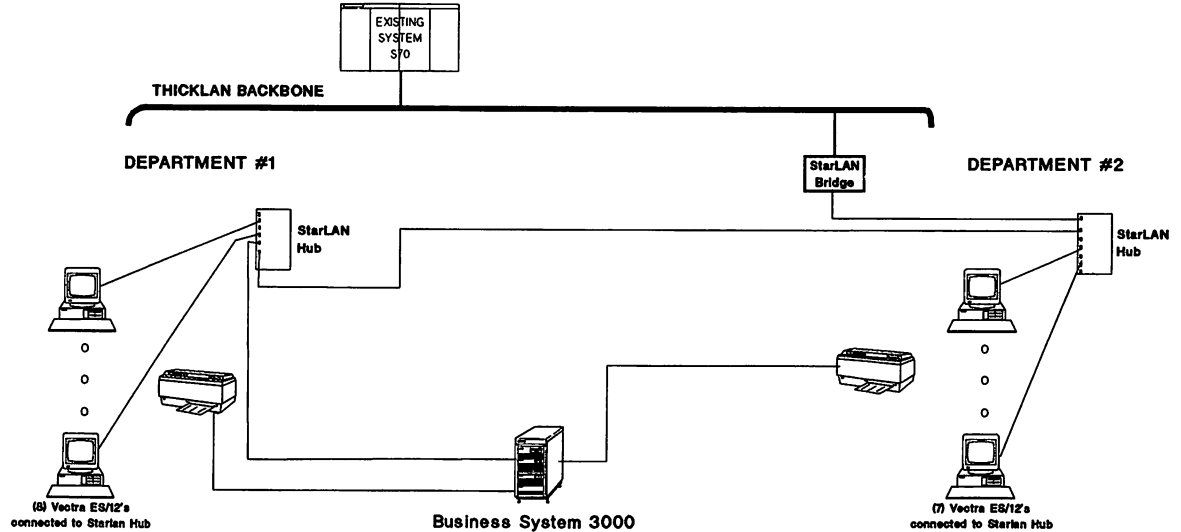
Disadvantages

- o Costs more than a PC server due to its increased functionality.
- o Performance of transaction based PC network software such as database applications will perform noticeably slower on an HP 3000 server than they would on a PC server. This is due to the extra overhead associated with running the network over MPE.
- o If HP 3000 has a system failure the network will go down. Users can continue to work on their PCs in local mode but will be unable to print or get at files on shared discs attached to the HP 3000.

OPTION #1
ADD-ON MICRO 3000 AS A SERVER

Business System 3000 with Business System Plus Software

2060



OPTION #1: MICRO 3000GX AS A SERVER
(Business System 3000 with Business System Plus Software)

CONFIGURATION AND PRICING FOR 15 USERS

(List Prices)

32519A	Business System 3000 - includes MICRO 3000GX, 4Mb main memory, 304 Mb disc drive, 67 Mb embedded cartridge tape, 8 ports (4 with modem capability), 700/92 console with cable, StarLAN Link, and StarLAN Hub		27,140
32508A	Business System 3000 Software - includes HPEasytire, Disc Caching, and LAN Link 3000 Software		0
51450A	FOS - Fundamental Operating System		0
OPT. 001	Integrated System Shipments		0
33440A	Laserjet Series II Printer with RS-232 and Centronics interface	2x 2,595	5,190
13242X	25-pin M/3-pin M RS-232 serial cable, 5m	2x 80	160
27212A	HP StarLAN Hub	2x 1,415	2,830
28647A	HP StarLAN-10Mbps 802.3 Bridge		5,000
OPT. 903	US/CAN 125V Power Cord		
32510A	Business System Plus for MICRO 3000GX includes Resource Sharing, Network utilities and 10 right to copy for Lotus(R) 1-2-3(R), Exec. Memomaker, Exec. Card Mgr., Advancelink, and Graphics Gallery		29,220
OPT. 311	Deletes Information Access		- 4,250
OPT. 312	Deletes HPDeskManager and AdvanceMail		- 6,380
35510L	Business System Plus License Upgrade for 10 additional PCs		21,595
OPT. 311	Deletes Information Access		- 4,030
OPT. 312	Deletes HPDeskManager and AdvanceMail		- 2,730
OPT. 313	Deletes 10 right to copy for Lotus(R) 1-2-3(R), Exec. Memomaker, Exec. Card Mgr., Advancelink, and Graphics Gallery		- 13,865

68300F	Vectra Office Software Pack includes Lotus(R) 1-2-3(R), Exec. Memomaker, Exec. Card Mgr., Advancelink, Graphics Gallery, and AdvanceMail	5x 1,650	8,250
50923F	Network Services-User Services For HP Vectra and IBM PCs		100
OPT. OA9	License for 10 users		800
50923F	Network Services-User Services For HP Vectra and IBM PCs	5x 100	500
50926F	StarLAN/HP Vectra PC Link	15x 395	5,925
50929F	LAN PC user configuration and diagnostics package for HP Vectra		90
OPT. OA9	License for 10 users		720
50929F	LAN PC user configuration and diagnostics package for HP Vectra	5x 90	450
		Total	<hr/> 76,715

OPTION #2: PC'S AS SERVERS

(Vectra Servers with Officeshare Networking Software)

Hewlett Packard's local area network offering is actually a family of products called Officeshare. The family consists of three products: HP StarLAN, which is based on twisted pair cabling; HP THinLAN, which is based on co-axial cabling, and; HP SERIAL, which is based on RS 232 connection and is used for connecting remote PCs to the HP 3000 server. (HP SERIAL is not available on a PC server.)

In general, HP recommends HP StarLAN be used for the office environment because existing phone wire can often be utilized. With an HP Vectra PC server, StarLAN supports disc and file sharing, printer sharing with spooling, and plotter sharing with spooling. In order to implement two departments using PC Servers, HP would recommend that each department use its own local server. These servers would then be networked to each other, allowing users to share data and printers on both servers. In addition, both servers would be networked to the existing HP 3000 which would give users access to applications on the HP 3000 such as HPDeskManager.

The following is a description of the advantages and disadvantages of this option versus the other options being presented.

Advantages

- o Best overall performance, particularly for transaction based PC network software such as database applications.
- o Offloads the existing HP 3000.
- o Relatively low cost.

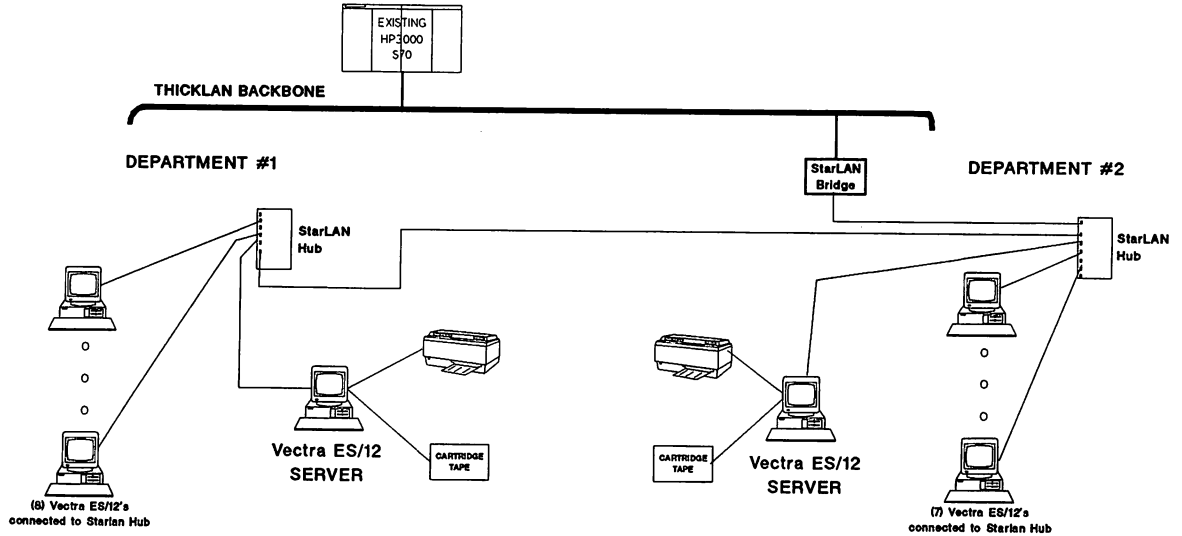
Disadvantages

- o Doesn't handle simultaneous printing and/or plotting due to MS-DOS being a single threaded operating system. Only 1 printer/plotter per server can be active at a time. This means if the plotter is active, nothing can be printed until it has finished. Conversely, if the printer is printing a large document, no other printing or plotting can take place.
- o Low security. Data on the network could be accessed. Having security violations could be minimized by placing the server in a secured location.
- o Someone must be trained and assigned to do routine network maintenance such as backups on each server.
- o Remote PCs cannot access the network.

OPTION #2
PC'S AS SERVERS

Vectra Servers with Officeshare Networking Software

2060



OPTION#2



OPTION #2: PC'S AS SERVERS
(Vectra Servers with Officeshare Networking Software)

CONFIGURATION AND PRICING FOR 15 USERS

			(List Prices)
D1340A	Vectra ES/12 Model 40 includes one 5.25 1.2Mb flexible disc drive and a 40 M byte hard disc	2x 4195	\$8,390
50925F	PC Server Software for the HP Vectra	2x 970	1,940
50926F	StarLAN/HP Vectra PC Link	2x 395	790
9144A	67M bytes (formatted) 1/4-inch Cartridge Tape Drive including Disc Tape interface and cable	2x 2,250	4,500
33440A	Laserjet Series II Printer with RS-232 and Centronics interface	2x 2,595	5,190
24542G	9-pin F/25-pin M serial printer cable 3M	2x 55	110
28647A	HP StarLAN-10Mbps 802.3 Bridge		5,000
OPT. 903	US/CAN 125V Power Cord		0
27212A	HP StarLAN Hub	2x 1,415	2,830
68300F	Vectra Office Software Pack includes Lotus(R) 1-2-3(R), Exec. Memomaker, Exec. Card Mgr., Advancelink, Graphics Gallery, and AdvanceMail	15x 1,650	24,750
50923F	Network Services-User Services For HP Vectra and IBM PCs		100
OPT. 0A9	License for 10 users		800
50923F	Network Services-User Services For HP Vectra and IBM PCs	5x 100	500
50926F	StarLAN/HP Vectra PC Link	15x 395	5,925
50929F	LAN PC user configuration and diagnostics package for HP Vectra		90
OPT. 0A9	License for 10 users		720
50929F	LAN PC user configuration and diagnostics package for HP Vectra	5x 90	450
Total			\$ 62,085

OPTION #3: EXISTING HP 3000 AS A SERVER

(Existing HP 3000 with Business System Plus Software)

Option #3 is basically the same as Option #1 except instead of using a Business System 3000 (MICRO 3000GX) as the server, the existing HP 3000 and Business System Plus software is used. A description of Business System Plus software is given under Option #1.

With this option, the existing HP 3000 can continue to run HP 3000 applications and also act as a server to PCs connected to it via twisted pair cabling (HP StalLAN). These users will have access to applications running on the HP 3000 such as HPDeskManager via this connection. PC users will also have access to all of the HP 3000's peripherals including printers, discs, plotters, and tape drives. Users can have private and shared PC files on the HP 3000, eliminating the need for floppy diskettes to share and store data. Additionally, PC hard discs can be backed up to the HP 3000, significantly reducing the risk of lost PC data.

As an option, electronic mail (HPDeskManager) and software that allows a PC access to Image databases and the ability to download data to the PC (Information Access) can be added to Business System Plus. These two components are not included in the pricing of the sample configuration.

The following is a description of the advantages and disadvantages of this option versus the other options being presented.

Advantages

- o Already own the server which is the existing HP 3000.
- o Backup of PC data is done as part of normal system backup since PC data is stored in groups and accounts on the HP 3000.
- o High security due to MPE security and because the server (HP 3000) is typically located in the computer room which is a controlled environment.
- o Can use the same printer for both PC applications and HP 3000 applications such as HPDeskManager.
- o Can print/plot to more than one printer/plotter at the same time, -- the HP 3000 uses a multi-tasking operating system (MPE) which can manage more than one device at a time.
- o Excellent spooler manipulation capabilities via the MPE spooler (SPOOK). These capabilities include the ability to suspend printing, re-start printing without loss of data, and alter print priorities and the number of copies to be printed.
- o With Business System Plus, new versions of PC applications can be downloaded from the HP 3000 to all PCs on the network. This greatly reduces installation time and aids in "version" control.

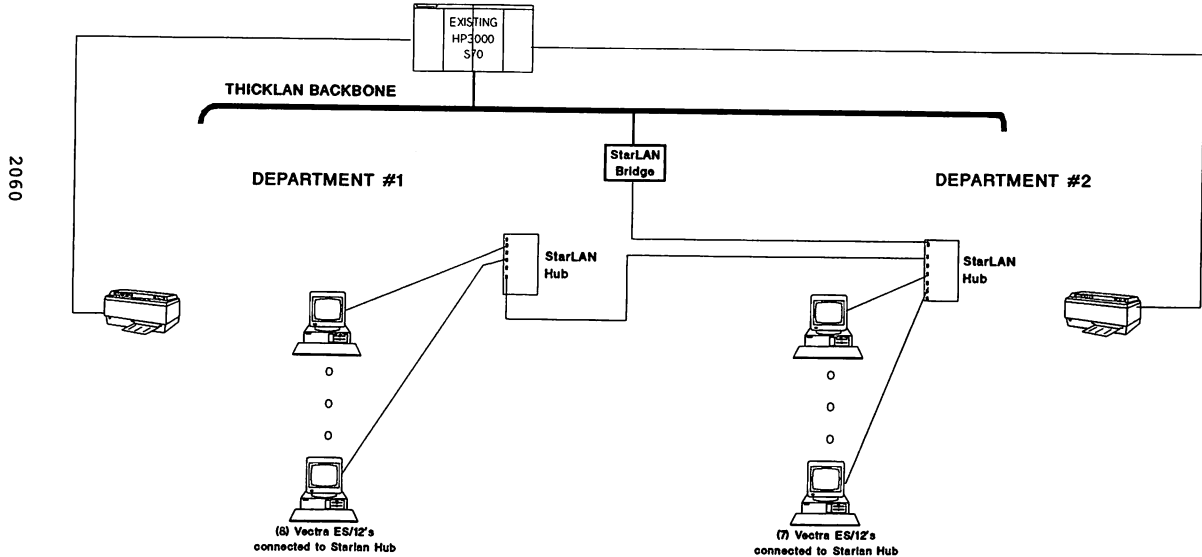
- o Provides centralized control, -- multiple servers do not need to be maintained.
- o Already have personnel trained on the HP 3000. The only additional training would be on the use of the network software. Backups and routine maintenance of the server (existing HP 3000) would be done in the same manner as is being done today.
- o Remote PC users have access to the local area network via HP SERIAL.

Disadvantages

- o Uses resources on the existing HP 3000 which may already be approaching maximum capacity.
- o Performance of transaction based PC network software such as database applications will perform noticeably slower on an HP 3000 server than they would on a PC server. This is due to the extra overhead associated with running the network over MPE.
- o If HP 3000 has a system failure the network will go down. Users can continue to work on their PCs in local mode but will be unable to print, plot or get at files on shared discs attached to the HP 3000.

OPTION #3
EXISTING HP3000 AS A SERVER

Existing HP3000 with Business System Plus Software



OPTION3



OPTION #3: EXISTING HP 3000 AS A SERVER
(Existing HP 3000 with Business System Plus Software)

CONFIGURATION AND PRICING FOR 15 USERS

		(List Prices)
32510C	Business System Plus for Series 68-70 includes Resource Sharing, Network utilities and 10 right to copy for Lotus(R) 1-2-3(R), Exec. Memomaker, Exec. Card Mgr., Advancelink, and Graphics Gallery	65,570
OPT. 331	Deletes Information Access	- 15,210
OPT. 332	Deletes HPDeskManager and AdvanceMail	- 23,295
35510L	Business System Plus License Upgrade for 10 additional PCs	21,595
OPT. 311	Deletes Information Access	- 4,030
OPT. 312	Deletes HPDeskManager and AdvanceMail	- 2,730
OPT. 313	Deletes 10 right to copy for Lotus(R) 1-2-3(R), Exec. Memomaker, Exec. Card Mgr., Advancelink, and Graphics Gallery	- 13,865
27212A	HP StarLAN Hub	2x 1,415 2,830
28647A	HP StarLAN-10Mbps 802.3 Bridge	5,000
OPT. 903	US/CAN 125V Power Cord	
68300F	Vectra Office Software Pack includes Lotus(R) 1-2-3(R), Exec. Memomaker, Exec. Card Mgr., Advancelink, Graphics Gallery, and AdvanceMail	5x 1,650 8,250
50923F	Network Services-User Services For HP Vectra and IBM PCs	100
OPT. 0A9	License for 10 users	800
50923F	Network Services-User Services For HP Vectra and IBM PCs	5x 100 500
50926F	StarLAN/HP Vectra PC Link	15x 395 5,925
50929F	LAN PC user configuration and diagnostics package for HP Vectra	90
OPT. 0A9	License for 10 users	720

50929F	LAN PC user configuration and diagnostics package for HP Vectra	5x	90	450
33440A	Laserjet Series II Printer with RS-232 and Centronics interface	2x	2,595	5,190
13242G	25-pin M/3-pin M RS-232 serial cable, 5m	2x	104	208
		Total		<u>\$ 58,098</u>

OPTION #4: NON-LAN SOLUTION

(PCs with HPDeskManager and AdvancePrint)

HPDeskManager, AdvanceMail and AdvancePrint can be used to provide file sharing and printer/plotter sharing for PC users. File sharing can be accomplished by using AdvanceMail with HPDeskManager to distribute files to other users. Although this method is not as transparent as "true" file sharing, it can be used to accomplish the same task. Printer/plotter sharing can be accomplished by using AdvancePrint.

AdvanceMail is a PC application that provides electronic mail between the PC and HPDeskManager. AdvanceMail users can exchange messages and files, including any MS-DOS file, with any HPDeskManager or AdvanceMail users. A user wishing to share a word processing document, spreadsheet or any PC file could accomplish this by sending the file using AdvanceMail, which in turn would use HPDeskManager to transport the file to the user's HPDeskManager In-Tray.

AdvancePrint is an application that allows PC users to share printers and plotters which are attached to the HP 3000. These printers and plotters can be used for both PC applications as well as HP3000 applications. This eliminates the need to have separate printers/plotters, one for PC applications and one for HP 3000 applications.

The following is a description of the advantages and disadvantages of this option versus the other options being presented.

Advantages

- o Relatively low cost solution. For the most part, cabling already exists and many users are already connected to the HP 3000.
- o Files can be distributed among PC users as well as terminal based users.
- o Best possible performance for PC applications because all file access is local to the PC.
- o One printer can be used for printing from PC based applications and HP 3000 applications.
- o The same printer can be used for both PC applications and HP 3000 applications such as HPDesk.

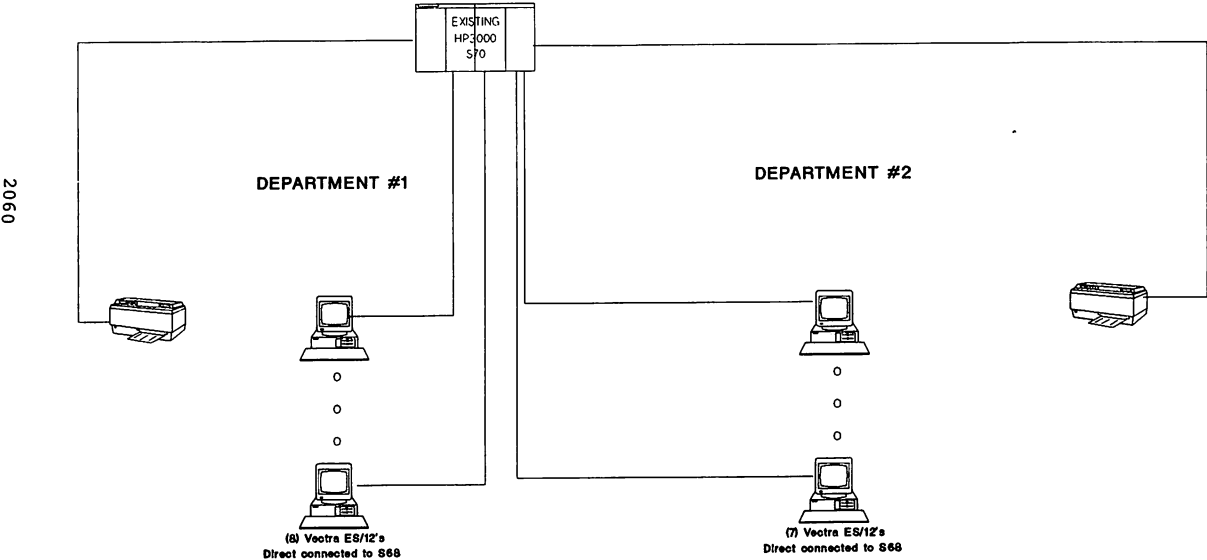
Disadvantages

- o No centralized storage of PC data. Data would have to be stored on each user's PC hard disc or on floppy diskettes.
- o No transparent backup of PC data. Individuals would be responsible for backing up their own PC hard discs.

- o Cannot run networked PC applications. For example, if Lotus releases a networked version of Lotus(R) 1-2-3(R) that allows multiple users to use the same copy, this could not be run on the HP 3000 in its existing configuration. Networking software for the HP 3000 would have to be purchased in order to run any networked software.

OPTION #4
NON-LAN SOLUTION

(PCs with HPDeskmanager and AdvancePrint



**OPTION #4: NON-LAN SOLUTION
(PCs with HPDeskManager and AdvancePrint)**

CONFIGURATION AND PRICING FOR 15 USERS

			(List Prices)
36570A	HPDeskManager OPT. 330 For use on a S70		25,000
32583L	AdvancePrint License for 10 users		1,530
32583F	AdvancePrint License for 1 user	5x 168	840
68300F	Vectra Office Software Pack includes Lotus(R) 1-2-3(R), Exec. Memomaker, Exec. Card Mgr., Advancelink, Graphics Gallery, and AdvanceMail	15x 1,650	24,750
33440A	Laserjet Series II Printer with RS-232 and Centronics interface	2x 2,595	5,190
13242G	25-pin M/3-pin M RS-232 serial cable, 5m	2x 104	208
			\$ 57,518