

Creative Ways to Expand HP e3000 Applications

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Introduction

My hope is that this paper and interactive discussion will give you ideas as to how you can dramatically expand the horizons of your HP e3000 applications using creative ideas and various technologies.

Using these technologies is not science fiction, it's a fact on the HP e3000.

- [ODBC for Interactive Voice Response \(IVR\) Systems](#)
- [Berkeley Sockets for Interactive Interfaces](#)
- [Web-to-Host for Internet Access](#)
- [Data compression for Report Archival/Electronic Records Management \(ERM\)](#)
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Most people that are not familiar with the 3000 have no idea as to its capabilities. These people perceive the 3000 as a legacy system that is not up-to-date with the technology. The fact is that most useful technologies are available on the 3000, it will easily integrate into a heterogeneous environment and does provide outstanding application solutions.

Use Technology for applications, not for technology sake!

I would like to discuss how we at Quadax have used some of the technologies available on the 3000 to build outstanding applications.

Perhaps my experiences can inspire you to think of ways you can use common technologies available on the 3000 to solve your business challenges.

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ODBC for IVR Systems

A new phone system

About two years ago Quadax was outgrowing our phone system. We have a medical billing service and receive calls from patients that have questions about their bills. We currently receive between 5000 and 10,000 calls per week. So one of our goals with the new system was to take advantage of IVR to reduce the time each agent spends on a phone call. We decided that we needed a PBX system.

IVR Interactive Voice Response

I am sure you that you have encountered IVR systems in the past that are not integrated into the agent's enterprise system. In other words, as long as you were interacting with the IVR system, it knew who you were. But if you ended up with an agent, the identification information you entered into your phone's keypad was not passed to the agent. I wanted no part of this.

In discussion with our vendor, they presented the solution of screen popping. Screen popping amounts to having the caller enter some kind of identification and then having that information appear on a window of the agent's workstation. This was better, but not quite what we wanted. There were two problems with this solution. First of all, the agent would have to manually cut and past the identification information into our software. Secondly, most of our agents have terminals, not PCs.

Enterprise System Integration

I took some time to think about an alternative. I wanted IVR integrated into our enterprise system. Our enterprise system is a medical billing solution that we have developed called HARP. HARP is 100% Speedware, HP e3000 and Image/SQL. If we could get the data to the 3000, I knew we could handle the rest.

The Solution

I learned from our phone system vendor that the IVR system would be a networked Windows system and had the capability to open an Access database. This was great news because Access can link to an Image/SQL database using ODBC! At this point, you may ask, "How did he know that?". That is a matter of exposing yourself to the right people, places and events where you will learn enough about different technologies. Access is very common in most companies that use Microsoft Office. ODBC is Microsoft's baby and most of their programs can use it. Knowing that Image/SQL could be accessed via ODBC was knowledge I gained from HP events, user group meetings and HP documentation. If you wish to learn more about ODBC, there should be at least one How To session at HP World and NEORUG will be having an ODBC Bootcamp this fall. If you are the type that likes to dig in yourself, you can start out with the *ODBCLink/SE Reference Manual* available on-line at www.docs.hp.com.

Now that I knew it was possible to get data from the phone system into a database on the 3000, I started to think about how to make this application work. In our medical billing service we have hundreds of databases. Each database is in a separate MPE account. So creating links to each individual database was not practical. At least for our first version. What we wanted to accomplish is to reduce the time that an

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agent spends handling a phone call. So if we can get the patient to enter an identifier, we can save 20 to 30 seconds off each phone call.

General Application Information

- Quadax sends billing statements to healthcare patients. The physicians that these patients visit are Quadax clients
- Patients call Quadax to get answers to questions they have about their statements and communicate updated insurance information
- Quadax agents receive these phone calls and help the patients with their issues

Functionality of the IVR System

- The phone number that the patient dials identifies the database where the patient data is stored.
- Prompt the patient for his or her account number
- Once the IVR system knows the agent that the call is being transferred to it writes a record of data to an ODBC database.

Client Phone Number (dialed by patient)	X10
Patient Account Number (entered by patient)	X16
Agent that the call is being sent to	X8
Current Time	X8
Current Date	X8
Patient Phone Number	X10

Functionality within HARP

When answering phone calls, the agent has a form on the screen that allows entry of key patient identifiers. A new function key has been programmed. This key is labeled "Next Call". When the agent presses the Next Call Key, HARP reads that agent's record from the IVR database, opens the appropriate HARP billing database and brings up that patient's information on the screen. The system also puts a message into the HARP billing database that this agent received a call from the patient, along with other statistical information.

This application saves our agents up to 30 seconds per phone call. Thus increasing agent productivity using technology and applications that run on the HP e3000!

We have additional functionality that we would like to add to this application in the future, such as automatically identifying the patient using their phone number. And we are working on an internet based solution called MyDrBill.com.

Questions and Discussion

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Berkeley Sockets for Interactive Interfaces

This is an interesting story that I have to give credit to Jon Broz of Hewlett-Packard and Joe Cygan. Joe wrote two articles in the old *Interact* magazine about Berkeley Sockets on the 3000. These articles were in the July and August 1993 issues.

The Prospect and Project

One of our salesmen had a big prospect in Columbus that he wanted me to visit. This prospect was an educational hospital and had many systems already in place. They were interested in creating an electronic interface between their hospital information system (HIS) and our medical billing package (HARP). This was in 1994 long before the entire world was networked. We had been doing EDI for many years, so I was comfortable with handling interfaces in batch formats.

I went with our salesman to Columbus to meet with the prospect and their IS representative. We easily impressed the client with our EDI skills. However, this client was requesting an interactive interface. We were familiar with batch interfaces. So we recruited Jon Broz to help us out. We discussed alternatives such as NFS and Berkeley Sockets. It turned out that the HIS vendor had a Berkeley Sockets server that could route the necessary patient information out to the network. I was able to find Joe Cygan's articles on Berkeley Sockets in *Interact* magazine and I did not look too difficult.

The Solution

Using two programs, we created an interactive interface. The first program was a C program that handled the Berkeley Sockets interaction. This can also be done in other languages such as COBOL. It connects to a configurable IP address and port, than receives information from the server. After a record is received, the C program writes the record to an MPE message file. The second program is a Speedware program that waits for records to arrive in the message file. The Speedware program moves the patient information into the billing database. With this interface, patient registration information entered into the HIS and is loaded into the billing system within a few minutes.

In this case I called upon HP and *Interact* magazine to help create a slick solution for our client.

Using Berkeley Sockets really is not too difficult. Many programs use sockets and you could write your own if you wish. The *Berkeley Sockets/iX Reference Guide* is available on-line at www.docs.hp.com.

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Web-to-Host for Internet Access

This is a fairly simple solution for any HP e3000 shop that currently does not offer internet access to their applications. And perhaps an additional option for those sites that already offer internet access.

Terminal Emulation

We have been using terminal emulators since the middle 1980's to access our 3000 applications. Just to make sure that everyone knows, a terminal emulator is a program that runs on a workstation that will let you have a terminal session. There are several terminal emulation solutions available for HP e3000. These programs can connect to the server using asynchronous or network communication paths.

Web-to-Host Arrives

Recently a new solution called Web-to-Host has entered the terminal emulation arena. A Web-to-Host program will allow workstations to emulate terminal sessions over the Internet or an Intranet. First a server program is installed on your web server. After the server program is properly configured, it's really simple. The client connects via a web browser and a Java Applet is downloaded to the workstation. This program will allow the user to run your HP e3000 applications with no changes!

What has this done for our clients?

This all sounds great and works well. As a matter of fact, it is extremely efficient. In the past, most of our remote clients had leased lines. We used the usual muxes, multiplexors, bridges and DTCs. The response time for Web-to-Host users is far superior to leased line sites. It's like network speed. Minimum recommended client configuration would be a Pentium PC or greater with a 28.8 or greater Internet connection.

Your Configuration

Your 3000 needs to be configured for network access. You need a Web Server and an Internet connection.

Issues to Consider

We have two issues with several of our clients.

The first is printing forms to a slave printer. Plain reports are fine, however, if you need to print pre-formatted forms, the current technologies do not work. The products do not provide the level of control necessary to get the data to the positions that are required.

The second issue is dealing with firewalls. These Java Applets are using sockets and a port other than 80 to connect to the server. Most network administrators consider this a security risk.

Although we do have these two issues, we have been very happy with Web-to-Host. It is great in most cases. Perhaps you should consider it.

Options

The price per user is very reasonable. Minisoft and WRQ have solutions for the HP e3000.

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Data Compression for Report Archival/Electronic Records Management (ERM)

Reports are what users want. Just about all systems create reports. Most reports go to paper and this is ok for some cases, but the functionality of paper is very limited.

Electronic Report Access

We have been giving our users on-line report access for over ten years.

Just having the reports in an electronic format opens up a world of possibilities for your users.

They can:

- Search for text
- Copy parts of the report to another application
- Print selected pages
- Export the data into other tools

Printing is Optional

Our users like electronic reports so much, we send every report to disc before it is printed. Now printing is just an option. Ten years ago all reports were printed. With all of our reports being stored on disc, it took quite a bit of disc to store them all.

White Space Compression

Every report has what is called White Space. White Space is the area where nothing is printed. White Space compresses nicely. Most data compression programs do a great job of compressing reports. There are several available on the Interex CSL. LZW, Squisher and Quark are three of them. Any of these work fine on the 3000.

Our Implementation on the 3000

After the report is written to disc, the file is compressed and a record is written to an index database. The index database stores information about the report, its name, size, date and the name of the compressed file. The user interface allows the usual sorting and selection capabilities such as date and report name. Once the user selects a report to be viewed, it is uncompressed and displayed on the screen. Uncompressing is much faster than compression, so the user does not even know that the file was originally compressed. Then the user has the ability to view, search, print and export data from the report.

Document Imaging Terminology

COLD – Computer Output to Laser Disc (Old Terminology)
ERM – Electronic Records Management (New Terminology)

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E-mail for Event Notification and Report Delivery

E-mail: Pervasive Method of Communication

With e-mail now the preferred method of communication for most business professionals, it became obvious that we should use it increase the functionality of our applications. Most of our applications run on the 3000. So I did some research to find out if we could do e-mail on the 3000. Of course we can.

E-mail Programs

There are several solutions for doing e-mail on the 3000. Some are full-featured e-mail solutions and others offer various levels of functionality. You can find out about these by searching the 3000-L archives at <http://raven.utc.edu/archives/hp3000-1.html>. Since we already had an Exchange e-mail server in place, I was not interested in implementing complete e-mail functionality on the 3000. Basically what we needed was the ability to generate e-mail from processes on the 3000. The first place I always look for utility programs is in the Interex Contributed Software Library (CSL) at <http://www.interex.org/tech/csl/csl.html>. There are many there.

Our Preferred Program

I ended up finding a program that works very well for us. It is a freeware program a friend told me about at ftp://ftp.telamon.com/mpe_freeware/. Download the MAIL program from there. They also have a pager program you might find useful. This mail program has several of the usual options and you can send various types of attachments such as txt, html and csv.

Requirements

There are just a few items you need to check before this can be done on your 3000. Your 3000 must be networked and you need to have an e-mail server, such as Exchange, running on your network. Then you need the IP address of your mail server. Next you need to find a program.

Sample Command File

We have created several command files to make it even easier to use. Here is an example of a command file that will send a file as an attachment with a csv extension. A csv file is a comma separated values file. Most PC programs can import a csv file.

```
COMMENT ** SENDCSV. EMAIL. SPEED command file
COMMENT **      This is a command file to make sending email
COMMENT **      from the hp e3000 using MAIL, easy!
COMMENT ** GLC 6/2/2001
COMMENT **      Use this command file to send CSV attachments!
COMMENT *****
COMMENT The vars SUBJECT, SENDER, RECI P and ATFILE must be set before
COMMENT calling this command file!
COMMENT You can put other mail parameters into the SENDER variable
COMMENT The MESSAGE needs to be in a file!
COMMENT *****
SETVAR PARMS " -h 192.168.1.29"
SETVAR PARMS PARMS + " -s '" + SUBJECT + "' "
SETVAR PARMS PARMS + " -f " + SENDER
SETVAR PARMS PARMS + " -t " + RECI P
SETVAR PARMS PARMS + " -a " + ATFILE + "=" + ATFILE + ".csv"
SETVAR PARMS PARMS + " -m " + MESSAGE
```


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```
SETVAR TRIES 0
WHILE TRIES < 3 DO
  SETVAR MAIL 0
  COMMENT *****
  COMMENT You can find information about this MAIL program
  COMMENT in the file MAILREAD.EMAIL.SPEED.
  COMMENT *****
  CONTINUE
  MAIL.EMAIL.SPEED "!PARMS"
  ECHO ***** >> MLG! HPJOBNUM
  ECHO >> MLG! HPJOBNUM
  ECHO MAIL LOG >> MLG! HPJOBNUM
  SHOWTIME >> MLG! HPJOBNUM
  ECHO >> MLG! HPJOBNUM
  SHOWVAR >> MLG! HPJOBNUM
  SHOWVAR HPJOBNUM >> MLG! HPJOBNUM
  SHOWVAR HPACCOUNT >> MLG! HPJOBNUM
  ECHO >> MLG! HPJOBNUM
  ECHO ***** >> MLG! HPJOBNUM
  IF SMTPRESULT = 500 THEN
    ECHO We have a problem with this file!
    ECHO ERROR, Can't handle this file for some reason!
    SETVAR TRIES 4
  ENDIF
  IF MAIL = 0 THEN
    SETVAR TRIES 4
  ELSE
    IF TRIES < 2 THEN
      SETVAR TRIES TRIES + 1
      ECHO We will try again!
      PAUSE 10
    ENDIF
  ENDIF
ENDIF
ENDWHILE
IF MAIL <> 0 THEN
  TELLOP E-MAIL FROM THIS JOB IS HAVING PROBLEMS!
  ECHO UNABLE TO E-MAIL FROM THIS JOB!
  SAVE MLG! HPJOBNUM
ENDIF
COMMENT ** DELETE MY VARIABLES
DELETEVAR SUBJECT
DELETEVAR SENDER
DELETEVAR RECI P
DELETEVAR ATFI LE
DELETEVAR MESSAGE
DELETEVAR PARMS
DELETEVAR TRI ES
DELETEVAR MAIL
DELETEVAR FSERROR
DELETEVAR I PCERROR
DELETEVAR SMTPRESULT
```

To use this command file you need to setup a few variables first:

SUBJECT	– Text subject
SENDER	– Your e-mail address
RECIP	– Recipient's e-mail address
ATFILE	– The file to send as the attachment
MESSAGE	– The file that contains the text message

This mail program has several other parameters you can explore.

There are several places where we send e-mail from the 3000.

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Event Notification

We use it in job streams to tell us if a job has finished or aborted. Many times we include statistics about jobs and programs. Clients love this because they do not have to wait for someone to call or log on to a system. They just receive an e-mail moments after their processing is completed. It gives them that warm fuzzy feeling of control and information.

Production

We use Espul to examine our \$Stdlists and have created a command file that Espul runs if it finds an aborted job. Our command file looks at the name of the job and determines the appropriate person on call. Then sends an e-mail to that person with the \$Stdlist as the text message.

Report Delivery

Report delivery is another great use for 3000 e-mail. Keep in mind that many e-mail servers limit the size of attachments. We only e-mail small reports. For larger reports, we post them on our secure web site. Then we e-mail a link to the report. When the client receives the e-mail, they click on the link and they can access the report online! Much better than waiting for a paper report days later.

If you have users that like to create their own reports from data on your 3000, I suggest e-mailing them a csv file. It is simple to create a csv file on the 3000, then you can e-mail it with my example command file.

Questions and Discussion