

# Monitoring CATI Enumerators

by

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## Introduction

In the fall of 1997 the Census of Agricultural was transferred from the Census Bureau to the National Agricultural Statistics Service (NASS). To meet the new demands for this survey NASS had to revamp all aspects of its computer systems. With 46 locations throughout the USA this was a major undertaking. All servers were upgraded to Dell multi-processors and the server software was upgraded to Novell 4.1 from Novell 3.12. The major client operating system at the time on the desktop computers was upgraded from Windows 3.1 to Windows 95. In Headquarters and our 45 field offices this meant all 386 and 486 machines were replaced with Pentium base machines. Almost all 16 bit software packages had to be replaced since they did not work in the Windows 95 environment or functioned improperly. One of the packages NASS lost was our video monitoring system.

In early 1998 NASS took on a special survey for National Institute for Occupational Safety and Health (NIOSH) called the Childhood Injury Survey. NIOSH demanded that NASS monitor a certain percentage of the CATI interviews. NASS needed an inexpensive solution very quickly.

## Past History

In the past NASS has had problems with both the audio and video parts of its monitoring system. Phone systems differed across the 43 state statistical offices where CATI was used. For the majority of the offices the telephone supervisor had the ability to select a certain phone line and could tell who was using it. Other offices had rolling phone numbers and this meant the supervisor had no way of telling who was talking on the phone. These office phone systems were upgraded when budget permitted. The major problem with the monitoring system was the video system. In the past the video system was very faulty. It caused machines to lock up during interviews resulting in the loss of data. At times it also slowed down the delivery of Blaise forms to the machine. The major contribution to this problem was the limitation of one meg of base memory under Windows 3.1 and DOS. The video monitoring package that NASS was using had to be loaded into base memory. Over time NASS Blaise applications were getting larger. It reached the point where these two systems were fighting for conventional memory. We loaded as much software into upper memory as possible. Loading these applications to upper memory only bought NASS time. We eventually had to totally unload the video monitoring system.

## New system

Any replacement product would have to be very flexible. It needed to work on a variety of personal computers. With the client software in our field offices being converted at various times from late fall of 1997 through spring of 1998, the new system had to work under Windows 3.1 and Windows 95. Another major concern was cost. Since NASS had just gone through a major hardware and software conversion there was a limited amount of money left to spend on new items. Also, man hours were not available to develop an in house system.

As we started to look at other criteria, security was another main issue. All field offices are connected to a WAN which connects all field offices together with HQ. We needed to be able to restrict and/or control access across the WAN environment. We also had the concerns of outside forces hacking into our system. We had to have control over the system since many of our machines during the day are used by the office staff and at night the machines or used by the enumerator staff. Since the offices were setup as an LAN, which was connected to a WAN, we wanted to make sure unauthorized people inside and outside of NASS could not view any machines. Data confidentiality takes an extremely high priority in NASS. We needed a system that was easy to use with little or no maintenance once it was set up, and required minimal training.

About this time telecommuters were starting to use a new package call Reachout. This allowed them to log in from remote locations and work on their personal machines. After some discussion we decide to pursue this system as a possible replacement for our video monitoring system. It seemed to fit most up our criteria NASS needed and it was a package we already owned.

## **Problems**

Once the system was up in a test environment, the system basically met all our goals. In implementing the package we did however have to overcome several hurdles. When the viewing machine (this is the machine setup to view other machines) called a host machine (this is the machine that is being viewed) the host machine screen display slowed to a crawl. It was as if the machine was locking up. The individual Blaise questions would slowly be displayed on the screen. The screen problem increased as the viewing machine tried to view more then one machine at a time. Another problem was the viewing machine keyboard and mouse. If the viewing machine moved the mouse or typed something on the keyboard the host machine keyboard and mouse would react to the input. This problem was easily fixed. NASS discovered one of the options for the viewing machine was to disable the local keyboard and mouse. We could set this option on the host machine too. We opted not to do this since most host machines were used by Stats and they would need to control the keyboard and mouse from a remote location. By setting this option on the host machine all viewers to this machine could not use the keyboard and mouse. By setting the option on the viewer machine we could control who had command of the input on the host machines. The down side to this option was it had to be made to each icon (each host machine is represented by an icon on the viewing machine) setup under the viewing machine. This option is not a global setting.

A major benefit of this option was that the screen display speed on the viewing and host machine increased to an acceptable level. The host machine user did not see any degradation in displaying questions to the screen. The viewing machine could view one or many host machines at one time and the refresh rate of the viewing machine was acceptable. This totally took care of the viewer machine disrupting the host machine during calling.

We had various other problems in the beginning. Machines were locking up or the installed package was not completing properly. Through testing we discovered these problems were inherent to Reachout and not in our setup. The initial version of Reachout that NASS was using was version 8.0. As we moved to a newer version of Reachout, these problems disappeared. NASS is currently using version 8.41 of Reachout and looking to possibly upgrading to version 8.42.

Another problem that NASS still has is the inability to hide the viewer toolbar. This toolbar has a keyboard and mouse button that supercede the viewing machine setup icon defaults. If a supervisory enumerator clicks on the keyboard and mouse button on this toolbar, it can turn on the local keyboard and mouse. Then this causes the viewer machine to affect the host machine and slows it down. Currently there is not a way to turn off or hide these buttons on the toolbar. NASS has determined this to be a training issue for the supervisory enumerator.

Another slight problem occurs when a workstation does not have the proper video resolution settings. The current NASS standard is 800x600. If a machine gets set to another video resolution, the viewer machine has more difficulty viewing the host=s screen. It can still see the screen but the text resolution changes a little. Again NASS has determined this as a training problem and suggests users don=t change their video resolution from the agency standard.

## **Excellent results**

The first real test for the monitoring system came when NASS had a training school for the NIOSH survey. Toward the end of the training school as everybody was busy inputting data with the Blaise NIOSH instrument a viewing machine called all 15 computers at once without them knowing it. After monitoring them for about thirty minutes their attention was bought to an overhead screen where they were shown that they were being monitored. They were totally amazed. Nobody had noticed anything in the audience as they were being monitored. Another test was done at a later date at one of our call centers with 25 machines. Again people were not told they were being monitored and nobody saw any degradation in any of the machines that were being monitored.

As mentioned earlier one of our goals was to make the system easy to install and maintain. One of the first states to implement the system was setup by a non-computer person in that state office. With the simple instructions provide by Headquarters they were able to install the system within a few hours.

A great side benefit from this system once it was installed was the debugging tools it allows us. Using Reachout across the NASS WAN, staff in headquarters can visually see what is happening on a workstation on another LAN. Of course this can only take place with the permission of the end user on the other LAN. This greatly cut down support time for fixing bugs in Blaise applications or getting a wayward end user back on track. One of the tools that makes this possible is Reachout's own built in Explorer. Reachout Explorer has the capability for us to upload a fix on the spot or download data as needed to or from the remote location. The old way of fixing a problem normally had the field office send the directories to headquarters and we would try to recreate the problem on our LAN. This took a lot of time and it did not always work. With Reachout, we can see the problem first hand, which allows us to spend less time and yet with better results.

## **Future enhancements**

With the basic video monitoring package installed in the field offices, NASS still wants to add several new enhancements to the system. The first major enhancement is to convert all paper forms used by our supervisors to an interactive supervisor interface. This system would wrap around the video system so the supervisor can input their data directly into a database. Another feature that NASS wants to add is the ability to capture screen displays. This could be used to capture Aproblem screens@ to aid debugging or training.

## **Summary**

NASS developed an extremely useful system that met our goals of a secure system with no side affects to the host machine. It is easy to install and maintain and allows us to view enumerator machines in an unobtrusive manner. NASS also discovered a great side benefit to this system. It allowed the Blaise programmers to see problems in the field offices as they occur in a live environment. This allows for quicker problem resolution. NASS did this without buying a new software package and with limited man hours. With the future enhancements NASS feels this system will meet all of ours goals of a well rounded monitoring system.