

# The ResNet Obstacle Course

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## Abstract

*There are many ways to train student employees, but hands-on experience is invaluable. To provide our Resident Computer Consultants (RCCs) with the experience they need to solve technical problems before our ResNet Installation Fair begins, we have a ResNet Obstacle Course through which we run the RCCs. In the Obstacle Course, the RCCs are faced with networking, OS, software, and hardware problems in a controlled environment with staff supervision. In addition, the machines, once fixed by one team of RCCs, can be "re-broken" for the next team.*

## Acknowledgements

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## ResNet at Notre Dame

In 1993, the University of Notre Dame began an ambitious program to install a high speed networking system in every undergraduate residence hall and the Fischer/O'Hara-Grace Graduate residences to enhance

the capabilities of the personal computers that students bring with them to campus. This program, called ResNet, was activated in 1996 and provides students with access to the Internet as well as software to send e-mail, read news, browse the web, check their grades, confer with classmates and professors, conduct research for papers, submit classwork, and even stay in touch with friends and family. The Notre Dame does not charge students for the ResNet software, nor is there any fee for connecting to ResNet.

All students are provided with personal network connections in their rooms. In addition, connections are provided in DeBartolo Hall (a classroom building), Hesburgh Library, LaFortune Student Center, and South Dining Hall. Approximately 2,000 of the almost 7,000 on-campus students connected to ResNet in 1996/97. That number increased to almost 4,000 students last year. We anticipate that close to 6,000 students will connect to ResNet during the 1998/99 school year.

In every residence hall, there are students employed as Resident Computer Consultants (RCCs) to help when students require assistance with their connections to ResNet. There are approximately 60 RCCs in the 27 undergraduate residence halls and graduate student apartments.

The main responsibility of an RCC is to diagnose problems that individual students may have either connecting to the ResNet network or using ResNet software. The RCCs determine whether a problem is software, hardware, or network related, and they are trained to solve common problems associated with these areas. The only software the RCCs are responsible for installing and supporting is the network software that the OIT provides to students on ResNet (electronic mail, Web browsers, telnet, tn3270, file transfer protocol, and newsgroups). The RCCs will not assist with non-ResNet software. (Siler, 1)

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## Our Goal for Successful Training

Our goal was to create a way to ensure that every RCC had a basic familiarity with the common problems associated with ResNet and would have the experience of fixing each type of problem at least once before working on “real” machines the Installation Fairs. We also wanted to train the RCCs well enough so they could solve the majority of technical problems themselves on the first visit to a student’s room. To meet this goal, we came up with the idea to configure a series of machines that exhibited networking errors, operating system errors, hardware problems, and installation conflicts on which the RCCs would work, trying to connect each computer to the network successfully.

## How Did We Do It?

Before we could worry about how we would set up the ResNet Obstacle Course, we had to decide which problems needed to be represented. In the fall of 1997, Notre Dame was heading into its second year of having the residence halls networked. This worked to our advantage in deciding what we were going to use in our ResNet Obstacle Course. We referred to a list of problems that had previously been encountered during our Installation Fairs, from our Notre Dame RCC listserv, and through our problem tracking system.

Once we identified common problems we wanted the RCCs to be able to solve, we started setting up the ResNet Obstacle Course. We switched one of our computer clusters from our ND network to our ResNet subnet (the ResNet network is separate from the network for the rest of campus), reformatted the drives of the computers in the cluster, and installed appropriate operating systems and ResNet software. In 1996 and 1997, we supported Macintosh, Windows 3.1, and Windows 95 operating systems on ResNet. In 1998, we are supporting Macintosh, Windows 95, and Windows 98 operating systems on ResNet.

Once we had these computers connected and working on ResNet, we “broke” each computer so that it would exhibit one of our common ResNet problems. This was done to ensure that we could replicate on our computers the problems we had seen throughout the previous year.

When we were certain the problems could be replicated, we created scripts that could be run off of floppies to “re-break” a computer after a group of

RCCs had fixed it. We used AppleScript and Stuffit InstallerMaker for the Macintosh computers and created batch files for the Windows computers.

In 1997, we had a total of 19 obstacles. We had 10 Windows 95 computers, 2 Windows 3.1 computers, 6 Macintosh computers, and one “station” that could be completed on any computer in the course that was fixed properly. In 1998, we had a total of 20 obstacles. We had 12 Windows 95 computers and 8 Macintosh computers.

Once we knew which problem each station would exhibit, we created documentation for each station.

Each obstacle in the course had a “User’s Explanation” describing the symptoms that were exhibited on the computer. The documentation also included a fill-in section that asked the RCCs about their experience working on each computer in the course. Questions included: What was the problem? What did you do to attempt to fix the problem? Were you successful in solving the problem? If you were not successful, why not? What would you say to the user? The RCCs were expected to complete the documentation and turn it in at the end of the course.

We also created detailed solutions for each station. The solutions provided suggested fixes and listed the target skills that the RCCs should have learned while working on each machine. Each staff member who supervised the RCCs as they went through the course had a copy of the solutions guide.

## Final Preparations

When the RCCs returned to campus for training before classes began, they completed an information sheet that included questions about which platform they were the most familiar with and what previous computer experience they had (i.e., were they consultants in the clusters, were they RCCs last year). The forms were compiled, and then the RCCs were divided into teams of three, making sure that there was at least one returning RCC assigned to a team and that the skill levels of each team were balanced.

## The Day of the Course

Rules were provided to the RCCs informing them of the resources that were available to them. Operating system, virus checker, system checker, and driver disks were provided to the RCCs when they requested them. Computers that were in working order in the cluster that housed the course were also

available to the RCCs if they wanted to check the networking database for information on the machines in the course. Each team was also provided with the packet containing the “User’s Explanations” of every station in the course. Finally, the RCCs were warned that not every station had a problem that an RCC could fix.

In 1997, two staff members armed with the Course Solutions were available to answer any questions that the RCCs had during the course. In 1998, only one staff member supervised the course.

Once a station was fixed by a team of RCCs, the supervising staff would “re-break” the computer using the reset disks.

## RCC Feedback

The 1997 ResNet Obstacle Course was extremely successful among the RCCs and the staff who assisted with the course, which is what prompted us to try it again in 1998. Now that we had the most difficult work behind us – figuring out how to create the course – we had the opportunity to add more stations and improve upon the flow of the RCCs from one obstacle to the next.

The RCCs really appreciated having the experience of going through the ResNet Obstacle Course. One RCC commented, “The Obstacle Course was the most useful part of training - you can tell people how to fix a computer, but it doesn’t mean anything unless they do it themselves.” Another RCC added to that, saying, “I liked the Obstacle Course. I thought a lot of the stations were difficult, but I later saw those problems in the dorm.” Of course, the most encouraging words were, “Do the Obstacle Course again - I really enjoyed it.”

## References

Siler, Scott and Kathy Hausman. *Residential Networking at Notre Dame: A Guide to Using Technology From Your Residence Hall*, University of Notre Dame, Notre Dame 1998.