

NICs NETWORK INFORMATION CONNECTION

AN ESSENTIAL SUPPORT RESOURCE FROM THE INSTITUTE FOR NETWORK PROFESSIONALS

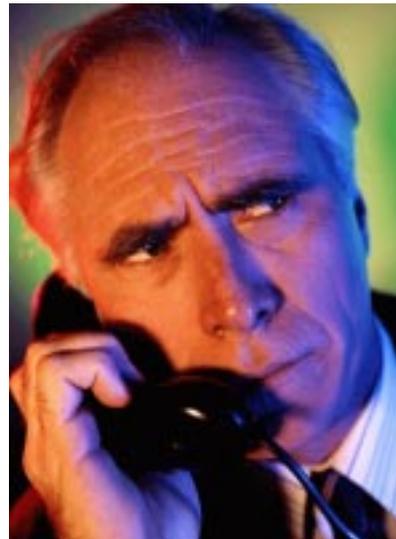
Counseling and Coaching (Part 1)

by Darryl Alder

As a leader, counseling and coaching in one form or another is part of the work you do with team members. Counseling can be used to encourage or reassure an individual, useful in developing a more effective team member or to help someone solve a specific problem. Successful counseling is almost always based more on good listening than on giving advice. Coaching, on the other, hand comes from the concept that you as leader are a tutor; you instruct or train your team members to improve their knowledge and skill. Just as a sports coach would, you direct team strategy. Coaching is a great way to give directions to an employee while you are trying to build an interpersonal relationship with them. Our focus, however, in part one of this article will be to use good listening to build that relationship even before we start to coach.

Max the IT Terror

Have you ever known a manager like Max? He has plenty of certifications and an "I'm better than you" attitude to go right along with it! He is too busy with the network to be interested in his staff; he seems to feel employees are there to be used (or abused). He doesn't listen or give feedback; he won't delegate and could care less about employee growth or development. His performance appraisals make a mockery of management, if he even does them at all. To get what he wants, he gets angry. He puts down team members in front of each other, rather than pointing out specific work mistakes privately. His poor interpersonal skills would keep him from a relationship with the best natured of us. The work place he makes is full of fear and paranoia.



Far too many of today's corporations have a "Max", but you can change that. Today's high tech work place needs the "high touch" skill of coach/counseling. Filling this want in our human interactions can be an unusually difficult assignment for the technical professional, but it doesn't have to be hard; all you need to do is become a better listener.

This LISTEN mnemonic device will help you remember the basics:

- L**end your full attention to the conversation
- I**nformation. Offer any additional information that you may have.
- S**ummarize what they have said periodically
- T**alking. Keep them talking with a question now and then, but avoid cross-examination.
- E**ncourage them to explore options
- N**o advice

IN THIS ISSUE

1

Leadership
Development:
**Counseling
and Coaching
Part 1**

4

Update on
**Certified
NetAnalyst
Certification
Training**

8

Y2K Alert!
Comfort

11

Exam
Preparation
**Microsoft
Exchange 5.5**

12

Editorial
**On the Track to
Becoming a
MCSE**

16

Member
Specials
**Cybox Duette
Commander
and
PC-Extender
SNAP-I**

The six parts of this mnemonic device make up the basics of counseling:

Lend your full attention to the conversation. Pay attention to the process. Take notes to keep focused. Follow the first theorem of listening: you have two ears and only one mouth, so listen twice as much as you talk.

Information. Offer additional information such as new facts. Help to identify unseen resources — it may be all that is needed.

Summarize frequently to be sure you understand the other person. Also summarize to keep you both on track and to review what has already been discovered in the conversation.

Talking. Keep them talking, while avoiding staying out of the conversation yourself. Have them try to explain their feeling or ask a question now and then to stimulate thought.

Encourage the person to explore different alternatives as they begin to formulate solutions to their problem. The fact is they may be coming to you only to get a confirmation of their own decision.

No advice. Be sure that only information, not advice, is offered.

Practice Listening

One way to become a better listener is to develop a routine that fosters communication. For example, try giving yourself some listening opportunities like:

- consult with peers to hear their ideas
- compare opinions with a focus on others views
- confer on some matter
- converse about concerns
- hold a conference just to listen to what others have to say
- deliberate an issue to find another perspective
- conference in on an idea to observe the synergy of others
- discuss a topic to hear other's views

Use occasions like these to practice your listening skills. Take notes to keep focused and too busy to be unnecessarily drawn into the conversation. Try not to say much and see what you can learn.

Here are five ways to respond while you are listening to help keep the conversation going:

- Restate their words in your own words.
- Ask about their feelings on the matter.
- Show that you are listening with appropriate gestures and acknowledgments.
- Add any facts you may have.
- Check for and explore alternatives.

The habit of good listening won't happen unless you make a concerted effort. As you practice these skills, you will find your ability to listen improving.

As skills improve, surprisingly enough, your team will feel and perform better.

Listening Blocks

When others speak to us, we listen at various levels that range from ignoring to being quite attentive. However our own past experiences and personality can get in the way of good listening. This makes it necessary to work on personal listening blocks.

One such block is tensing up and making the whole process of listening too much work. In his book *Effective Listening*, Kevin Murphy suggests "Learn to take listening easy and listening will come easy." (p. 17, ELI Press, 1992). Murphy lists other blocks to watch out for:

- not focusing in the here and now—lack of concentration
- preconceived thoughts and ideas (personal paradigms)
- talking too much and too often (it's that ear mouth thing again)
- listening only long enough to jump into the conversation
- lack of interest in the subject or speaker

Working to eliminate these blocks goes a long way toward improving your communication.

Listening to Understand

Though listening is the first step to counseling, effective counseling goes deeper than just hearing what is being said. It must be listening and responding with both the heart and mind to understand the speaker's words, intent and feelings.

Think back to a time when you really felt understood by someone else. What was your relationship them? How do you feel about them now? Besides my spouse, my best listener is a running partner. Though our careers are very different, listening to each other during a run seems to be enough to solve many problems we discuss.

It is uncanny how many discoveries emerge from explaining a difficulty to someone else. Often solutions dawn on us as we describe a concern. Other times they seem less serious when we hear them spoken.

So follow this is second theorem for counseling: listening may be enough for effective counseling! This may not seem satisfying to you as a leader—after all with your experience, shouldn't you give advice? Isn't that what you are paid for? The Franklin Covey Company says no! In fact, they warn you not to prescribe before you diagnose. "Most people



... immediately diagnose someone else's condition, situation or problem and quickly offer their own advice. They listen with the intent to respond instead of listening with the intent to understand. If we first listen to understand, however, we can take the necessary time to properly diagnose before prescribing." *The Seven Habits of Highly Effective People Training Program*, p 127.

Imagine a consultant who visited a business to diagnose problems with a slow network. The only solution suggested was to add another server, because that worked somewhere else. What would be different about this diagnosis if it was based on a few hours or days of good network analysis, not just past experience? Perhaps segmenting the network, replacing hubs with switches or moving from 10 to 100 Base T, would be better solutions.

Similarly we need to resist responding based on our past experience; we just need to listen.

Please Don't Throw A PIE

Franklin Covey also explains: "One of the biggest obstacles people encounter in interpersonal communications is the tendency to respond autobiographically. We advise, probe, interpret, and evaluate other people's messages based on our experiences and motives.

A dvising	Don't give advice or solutions to problems.
P robing	Don't ask questions from your frame of reference.
I nterpreting	Don't explain another's motives and behavior based on your own experiences.
E valuating	Don't judge, then agree or disagree.

"As we **overcome** the natural tendency to hastily diagnose, jump to conclusions, defend ourselves and push our opinions on other people, our interpersonal communications become more effective."

Tips for Counseling Individuals and Teams

Not all situations will merit taking the time necessary for serious reflective, empathic listening. So before you begin to counsel, find out if there is really a need for counseling.

Some situations where counseling is useful include encouraging team members, reassuring individuals who lack confidence, improving team effectiveness and helping solve problems.

<http://www.inpnet.org/html/nics.htm>

Decidedly you can use counseling with disruptive or dissatisfied team members to help them get where you need them to be. But when you use it to point out specific areas of performance, the situation can turn negative and should be done with great care.

A good leader takes interest in and tries to develop individual members. But remember, no two situations are alike, each person is different, and each problem is different; there are no "pat solutions!" Always ask yourself, "Do I really understand?" and as you work with group members, realize that once in a while an individual will need your complete attention. Decide a time and place you can meet privately when requested.

Work to include all members when you are talking over concerns. Help members to feel at ease. Foster diversity in your group (sometimes dissenting views help solve problems better than the agreeable members of your team). Work to hear everyone's ideas without expressing your own. When there is a disagreement, consider all the facts. Make sure each idea is interpreted correctly. Seek alternatives and forge compromises. Create a climate for talking things out.

Summary

This skill centers on listening to others—seeking to understand them. Listening is a useful and important skill to help solve problems, to reassure team members and to help each member of the group reach their **full** potential. Members of the group grow in both confidence and trust and the group's capability will be strengthened.

You cannot really solve a problem for another person. You can only help them reach their *own* solution. Talking it out may help them discover this. It may clarify the true nature of the problem. Talking about things can be effective when a person has made a hasty decision.

Counseling is helpful when a person is in need of encouragement or when they should have more information bearing on a task. It is also useful when someone needs help in interpreting facts or is uncertain about what to do. Good leaders who feel the need to correct situations such as, team members who don't prepare for meetings, who are tardy or quarrel with other team members, use counseling to improve employee behaviors. Though useful in these situations, a better use of counseling is to build trust relationships through listening until we understand those we lead. That should be our goal. ✚



Certified NetAnalyst Certification Training

By Keith Parsons

Pine Mountain Group
Contact Information



www.pmg.com
209 962 6247

Instead of only putting miles on my shoes walking the floors of Networld+Interop (N+I) this year, I opted to invest a couple of days in network analysis training offered during the show as part of the Interop Workshop series. I attended three one-day workshops presented by Pine Mountain Group (PMG), followed by a Certified NetAnalyst exam on the fourth morning.

Pine Mountain Group

This certification and training is supplied by one of the world's foremost network services companies. Bill Alderson, an authority on network analysis, formed PMG. Bill has put together a great group of network analysis experts. All of their trainers must also do field work with real clients. This experience is obvious in class. They use real-world examples to add stories and illustrations to the normally dry network protocol content.

Our main instructor was Mike Pennacchi,

Managing NetAnalyst and a great presenter with a game-show personality and voice. He made these subjects come alive. Mike also showed the geeks in the

audience that understanding the intricacies of networks is not only fun but can also be used to protect our turf as network professionals.

NetAnalyst Certification Programs

This five-year-old certification is designed to be vendor neutral, focusing on the independent standards of networking, but is only offered to PMG students. This certification allows Network Professionals an opportunity to achieve a vendor-independent competency rating. Currently nearly 2,000 people have been certified.

The Certified NetAnalyst program offers three levels. First is an IP specific Internet level, based on a two-day course specific to IP

troubleshooting, called *Certified NetAnalyst – Internet*.

The second level, which used to be called NetAnalyst Level I, is now titled Certified NetAnalyst – Cross-Technology. This exam allows the student to take 10 of 19 possible sections of the exam. For example, you might not want to take the Token Ring or SNMP sections if that's not what you prepared for. PMG graders use the top eight section scores and you must pass at the 70% level. About 75% of those taking exams pass on the first try.

The final level is titled *Certified NetAnalyst – Architect*. This requires an additional more detailed exam of 45 questions with a 70% pass rate required. Only 25% of those going for this level pass on the first attempt. This exam is based on not only those subjects covered in the PMG expanded courses, but also relies on the student's field experience.

Course Offerings

Before detailing the course contents, let me tell you that I don't consider myself an expert in network protocols. I have taught both Microsoft and Novell courses in Networking Essentials and TCP/IP, but don't have any training in the art/science of network protocol analysis. I would recommend at least a thorough understanding of IP and NetEss before attempting these courses. Obviously, the more real-world experience you have in working in a multi-protocol environment, and experience in network troubleshooting will be helpful.

Network Analysis Essentials

This was a nice warm-up section to get us all back in the network protocols mode. We covered the basics from OSI to IP, IPX, IEEE and the rest of the alphabet soup of network protocols. This was a nice review of the essentials, but with a focus on preparing us for further topics to come.

Switched Network Analysis & VLANs

We got inside of bridging and switching, looking at both the hows and whys of each. Then we went on to items like Spanning Tree algorithms, and how they work. We then tackled the growth of switches in our marketplace, and how to setup our networks to best



CERTIFIED
NetAnalyst
Standards-Based Certification

allow for optimization and testing. This was followed by a short introduction to VLANs and how they can help/hurt our networks.

Ethernet Operation and Analysis

If you've ever wanted to understand the workings of Ethernet, this is the course for you. We got into the nitty-gritty of Ethernet packets, and how to recognize them when using a network analyzer. *We also covered* 10Mbps, 100Mb and even Gigabit Ethernet concepts. Though each of these speeds have the same basic Ethernet structure, we needed to learn of the differences and how to best implement these new technologies. The tables and charts in the student material were especially helpful here.

Network Analysis Tools

This was a new offering from the folks at PMG. They have just announced agreements with the following vendors to provide "Tool Kit Approved" training on these specific tools. This section gave us a quick overview of the various tools available for network analysis and the good and bad for each technique. I think that these NetAnalysts have grown too accustomed to the expensiveness of their tools. We heard comments like "Oh, this one is only \$25,000 or so, not too bad". Though a couple of the solutions offered were under \$1,000. In fact, an evaluation copy of one of these tools, What's Up Gold is on your Q1 Technical Resource CD.

We covered the Fluke LANMeter, Visio's Enterprise product, Netcom Systems' SmartBits measurement systems, Shomiti's network analyzer, Ipswitch's What's Up Gold, Network ICE's Black Ice product and finally, NAI's Sniffer product lines

Throughput and Latency

"Throughput good, Latency Bad" That's all there is to this section. Well, that's like saying to succeed in business all one needs to know is "Buy Low, Sell High". Using some of the tools available from PMG we learned to set a baseline for our networks and calculate the absolute optimum time for a given network. This knowledge can then be used to find the trouble spots in our network to work on reducing the latency.

Latency is the grand total of a combination of *Client*, *Server*, and *Network* bottlenecks. The *Client* has Drivers, NICs, Disk Access, and OS issues that contribute. *Servers* have those same issues plus the additional services that might interfere with network access speeds.

Finally the *Network* deals with additional factors including media, switches, routers, WAN links, etc. The combination of these adds up to the total latency of the network. After finding which of all these contributing factors adds the greatest percentage to the Latency, it's easier, and cheaper to solve the problem. Sometimes merely getting faster pipes can't solve our latency issues.

IP Subnetting and Troubleshooting

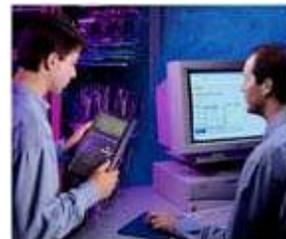
The final section we covered was an in-depth look at IP. From the internals of the various IP and TCP stack issues, to a very thorough look at IP Subnetting. This was the class that most interested me. As a TCP/IP instructor, I'm always looking for more stories and real-world exercises to help students better learn these sometimes dry topics. Our instructor didn't waste any time on the binary math issues, but assumed everyone in the room already understood those functions. We used a very detailed IP addressing chart to help in the subnetting exercises.

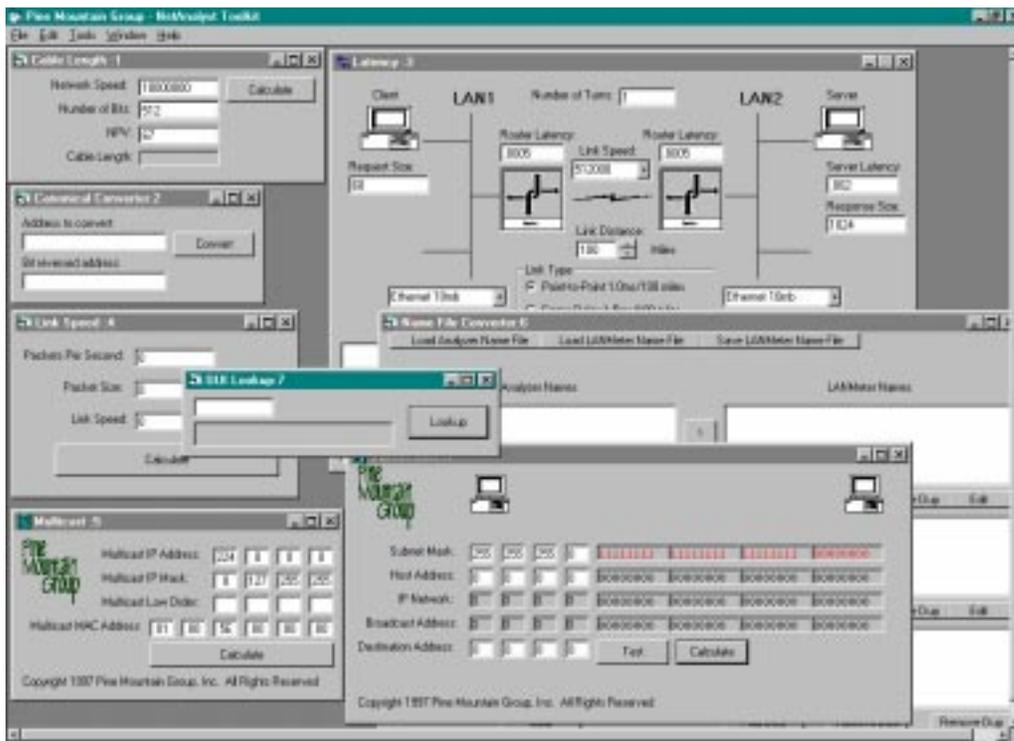
Using errors and problems with respect to local routing and adding switches to the network helped teach why the subnets must match the broadcast domain. We've all been adding switches and FastEthernet to our networks in order to lower the collision domains. But in this class we learned how to use correct subnetting to increase the broadcast domain in order to keep local routing to a minimum.

Course Materials

These courses included student handouts that were just a 'two-up' printout of the instructor's PowerPoint presentations. I would recommend sitting near the front of the class in order to see the detail on the instructor machine's output. The handouts would have been a bit more readable if they had merely printed them in a 'one-up' arrangement. I'm glad that PMG didn't follow the standard five-lines of five-words axiom in developing their slides, or it would have taken a couple of inches to cover the same information. *This is a complex subject* and students need all this information in order to get the big picture.

Additionally, all of the students were offered a copy of the PMG Network Analysis Reference Guide and a small tool they've named the *MacGyver* Tool to connect a simple Ethernet Transceiver to a 9-volt battery to make a quick and dirty Ethernet connection tester. We also received a great chart for determining IP subnetting and masking with all of Class B and Class C options in a nice usable format.





We also received a great network analysis tool via a web-site, www.pmg.com/toolkit.htm. This tool was developed by PMG's staff to help them do those tedious tasks that used to take manual and binary calculations. Yes you should first understand the theory of the calculations, but afterwards, it's much simpler just to use tools like this.

Overall, the student resources from these courses will be added to my personal technical library and I think will provide an additional value in the future.

Other Courses

The Pine Mountain Group also offers other courses in their training series for NetAnalyst Cross-Technology (but these weren't available at N+I). These include:

- Token Ring 802.5 Theory
- IPX, RIP, SAP and NetWare Protocols
- Microsoft Networking Details

PMG also has a 5-day NetAnalyst Architect curriculum that adds the following additional classes:

- Internetwork Analysis
- TCP/IP Tools – RMON, SNMP and DNS
- LLC2, NetBIOS, and SMB
- WAN, HDLC and Frame Relay Technologies
- High Speed Media – ATM & FDDI
- IP Troubleshooting & TCP
- Client Server Analysis & Network Impact Statement

After attending only three days of the PMG courses I'd love to continue my education in the network analysis arena with these further expanded courses. If these additional classes are anything like those I experienced this is the only way to learn the details of how our networks work.

The Exam

The exam is paper-based and offered in the same facility as the training. The level I, or Cross-Technology exam consisted of 19 five-question sections. You can choose ten of these sections to answer, and will be graded on your best 8 sections. The passing percentage is

70%, with a pass rate of around 75%. The PMG group will grade your exam, and if you pass you'll receive the requisite Certificate, suitable for framing, and a Certified NetAnalyst lapel pin.

My Recommendation

Even though I understand that the costs for continuing education in our industry are a given, it is increasingly more difficult to take time away from our 'real jobs' in order to spend the time and money to improve our own skills. Without this continual training, our skills stagnate, and we fall behind our peers.

It was shocking to see how fast this atrophy takes place. It takes a training experience like this offered by PMG to see outside of the technology box we find ourselves in. I loved the growth and 'stretching' that was needed to expand my technical horizons. Even though at the time I wrote this I wouldn't know if I passed the Certified Net-Analyst exam for another week, I was sure that the time and money spent to attend these courses was well worth it. The new understanding, and new skills learned are important. But more important is the confidence I've gained through better understanding of the network protocol details.

I whole-heartedly recommend taking these courses to keep you out on the edge and valuable to yourself and your employer. Perhaps next year I'll have a chance to attend their expanded courses and work on the Certified NetAnalyst – Architect level.

Y2K Alert! Comfort

by HowardBelasco

We are coming to the middle of the year and by now we should have seen SOME signs of the **Sturm und Drang** that some people have been talking about, yet nothing major has emerged. We should have begun to see something of the Jo Anne Effect (the situation where accounting packages read one year into the future and so would finally be reading 00, calculating for that date, and running into problems) and yet we hear very little.

The Euro was supposed to be a precursor of Y2K and yet those conversions have gone very well with minimal impact. The stock market was supposed to be reacting by this time to the impending Y2K problems, yet it is at record levels. Gold, that eternal hedge against inflation, deflation, disruption and general “not good times” continues it’s downward trend, having coasted from 414 in 1996 to 290 in 1999. Things that have been pointed out in the past as harbingers of bad times continue to be harbingers of good times.

Of course, some people recall the ancient story of the thief that was caught stealing a loaf of bread and brought before the Caliph for judgement.

The Caliph, in his standard manner, said “Off with his head” and turned to other matters.

“Wait,” the thief cried. “I have the power to make your favorite horse talk.”

The Caliph was interested in this and asked, “Just how do you plan on doing this?”

“It is a secret and takes a long time, Sire, but I can do this!” exclaimed the thief.

The Caliph believed the thief, ordered him to perform this task within one year, and then ordered him off to spend the year in the barn with the horse.

As the thief was being dragged off to serve his sentence, the guard said to him, “You must be mad! No one can make a horse talk!”

“Well,” the thief said, “much can happen in a year. I may die, the Caliph may die...or the horse may talk!”

So we have this nagging feeling in the back of our heads that maybe, just maybe, we should prepare because, indeed, anything may happen.

<http://www.inpnet.org/html/nics.htm>

Time is Running Short

I have long been a proponent of finding and then maintaining your comfort level, but we no longer have enough time to plan all the things we want to do for time is short, if not nonexistent. The time for preparation is at hand.

In light of the government talking about having two to three days of food and water in the house and the Red Cross and FEMA talking about two to three weeks of food in the house it is now time to look to implement our real Y2K contingency plans.

No matter what you decide to do there will be someone who will think that you are A: stupid, B: crazy, C: an enemy of the people or D: all of the above.

One of my favorite expressions, what I call the Belasco Law of Gold Bullion, says that if I were to give away gold bullion, someone would complain about the weight of the bar.

You will never be correct in everyone’s eyes. It is not productive to base your actions on what others will say about you but to do what you yourself feel is important for you and your family in your individual and specific locales.

What will Happen

Let’s look at what will really happen. Well, we can’t. No one knows what will really happen. You could really be in a position where nothing happens to you. It is my belief that people will be impacted on different levels in different locales. I think the impact will range from a mere bump in the road for some people to an economic disaster for some other people, and almost every possible combination in-between.

It is not possible to prepare for a complete economic disaster. It is impossible for a large number of people to prepare for that because a complete economic disaster would bring us back to the agrarian societies of the 1850’s which could support far fewer than the billions of people that exist in the world today.

In order for many people to feel that they have done what they need to do and that they are at their comfort level, they need to at least know what things they should be thinking about in order to keep themselves going during those possibly very difficult times.



Pets

One of the things you need to think about is your pet. It is time to make some hard decisions. If you have a pet, you must decide what you are going to do with that pet. If you feel that there will be disruptions severe enough in your locale, so that you will need to prepare for weeks and weeks, maybe even months, then you must decide to either incorporate your pet into your family plans, as if that pet was another child, or make arrangements with someone else to take care of your pet as if that pet was a member of **their** family, or you must prepare to put that pet to sleep.

If you are in a city and feel that you will need to use a public shelter, you must understand that shelters will not take pets. You will wind up having to abandon the pet on the street. No matter what kind of pet it is, it must stay in the street and out of the shelters. Dogs, cats, parrots, parakeets, fish, ferrets, etc. ALL are excluded from the shelters.

Priorities

There are many survival techniques, for those in the cities as well as in the suburbs and farms that are available to us and can bring us through almost any disruption. Moreover, in any disastrous situation, these techniques can maintain us until we are back to the level that we are at today. As Susan Conniry tells us, *we can not immediately have everything that we want but we can have everything that we need.* It was Susan who told us that our priorities, in order, must be shelter, water, fire and food. No matter what the situation, those are the priorities. Those are what our needs are, what it takes to keep us alive.

In these times I keep thinking about my cousin and his wife that live on the 39th floor of a hi-rise building in New York City and what they can and should do in order to keep themselves going. It is clear that we need to have a community structure in a city environment and especially in a hi-rise building. It would be almost impossible to get beyond the week or two worth of survival in an apartment building if you are on your own.

However, by banding together within the building you would be able to do such things as arrange tag teams to bring supplies from floor to floor, either walking them up the stairs or using block and tackle, pulleys, well wheels and rope, etc. to bring them up on the outside of the building and then distributing them, both hot and cold, throughout the building. These same teams could be removing the

garbage and other waste materials from the building the same way.

Do you know how to cook? Will you have the ability to cook in your apartment if you lose electricity or gas for any period, even for 6 hours? Do you know how to make hot food? Does anybody in your building have the ability to cook in his or her apartment? Does anybody in your building have a camp stove, a kerosene stove, a barbecue on the terrace? Have you made contact with them to exchange food or water for the use of their equipment?

Do you have water? Do you know how to get water from your environment, urban or suburban? Do you know how to collect dew? Alternatively, are there Sycamore trees near you? Do you know how to collect water from them? Or from other sources?

Do you know how to create a cooking fire from steel wool? (Not in your house, of course, but on your terrace, patio, roof?) Do you know how to create and maintain a fire INSIDE a dwelling? It takes special knowledge and care but the information is readily available. Do have that information? Would it increase your comfort level if you had it, even if you never used it?

Information

If you don't have this kind of information, but feel it would be important to your comfort zone to have it, then there are three sources I want to suggest to you.

A free source is the National Crisis Response Institute. They have a Y2K Preparedness Brochure that is very helpful. The brochure, "Preparing Yourself for the Y2K Crisis," is available for \$0.50 plus a self-addressed, stamped envelope from:

National Crisis Response Institute,
2817 West End Ave. 126-427,
Nashville, TN 37203

It may also be downloaded from NCRI's website (www.public.usit.net/jupiter) free. NCRI gives permission to make copies of the brochure for noncommercial use, and encourages organizations to use it to prepare and implement their contingency plans.

Another excellent source is Jack Brown's web site at <http://www.northern-survival.com>. This is not a free site. Jack asks for ten dollars for access to his site. Text from his welcoming screen follows to give you some idea of what is available on the site:

<http://www.inpnet.org/html/nics.htm>



To be prepared by January 1, 2000, we will need a plan. This plan will have to specify what is to be done and when. The plan given here does that and is certainly modifiable to fit your unique circumstances. Every thing in this site is geared toward the freezing and thawing conditions which are normal in the north.

Some of the topics covered in this site are:

- Food storage
- Potable water without electricity
- Hand pump installation for wells
- Practical firearm information
- Freezing canned goods
- Disaster planning guide
- Choosing a safe place
- Making your safe place more independent

Print out the information that you need. This information is updated weekly.

The third item is a detailed manual and tape of survival information for urban dwellers. It comes from Susan Conniry and Tom Beasley. Their web site is members.home.net/shadow-scout/. The manual details such things as how to find water in a city environment as well as in the suburbs, how to collect water from trees, dew, sidewalks and other places. How to start a fire without matches, or what to use instead of matches. It tells you how to create a cave in your house to conserve heat and how to make a life saving taco out of a mattress or blankets.

The amount of information is very large and very comforting as it lets you know how to stay alive in the most primitive conditions, if that is what happens. The Y2K survival manual and 90 minute audiotape is available by mail order. Y2K KISS - Keep It Simple Survival costs \$34.95 and includes shipping and handling. Copies can be ordered by sending a money order to:

Susan Conniry
P.O. Box 2351
Lakeside, CA 92040

If you have an RV, you are ahead of the game. If you have a cabin in the woods you are ahead of the game. If you have a boat that you can use as a second home, you're ahead of the game. If you have any other second home of any sort, you're ahead of the game, not because you will really need it but because your comfort level will be increased because it will be there for you, just in case.

It does not matter whether your comfort level is the three days worth of canned goods that the government says you should have, or the week

<http://www.inpnet.org/html/nics.htm>

or two that the Red Cross and FEMA says you should have, or the month that your friends say you should have, or the six months, or the two harvests, or the five years that the extremists say you should have. Part of this comfort zone is to know the kinds of things that you might be called upon to do.

I have been talking for some time in nonspecific terms about planning and preparations, with a few real suggestions here and there but I have stayed away from any extensive discussion of details, leaving it to you, the reader, to seek out the necessary details for your specific conditions. I have stressed the need for team work and community involvement in the trying times that might be coming. How much community involvement? It could be (in a city) you and you're next door neighbor, or your floor, or your building or the block you live on, etc. Whatever your decisions are, I think that if you are in a city, you will need to make different plans than those from a suburban or country model. Your comfort zone in a city apartment building will need to be different than your comfort zone in a private house.

There is no one answer. No one thing will suffice for everyone. You might read 50 points just in the above three sources before you have that AH! HA! moment, the connection between an external idea and an internal concept. Keep reading. Keep learning about Year 2000.

Everyone's experiences will be different and everyone's needs will be different. Do not hesitate to follow your beliefs and feelings for your comfort zone. The time for planning is past. If you feel the necessity for it, do not hesitate to execute your plans now. ✚

Howard Belasco is a networking professional with superior communication skills, proven experience and unique skills in network administration, project management, training, and end-user support. He is especially skilled in analyzing situations, developing plans, designing solutions and motivating people.

Howard has been working as an independent consultant since 1992. As a consultant he implements, maintains, and manages Microsoft and Novell networking solutions, as well as other projects requiring computer expertise. His most recent projects include working as the Year 2000 Project Manager for a Fortune 100 trading group, as a Manager of Desktop Services for a Fortune 100 food company, as a mentor for a Fortune 100 insurance company, and as the Senior LAN Coordinator for a major Northeastern hospital.

Howard is a former Chairman of the Board of Directors of The Network Professional Association. He can be reached via E-mail: howard-belasco@worldnet.att.net



Implementing and Supporting Microsoft Exchange 5.5 Exam Preparation(Part 1)

by RexMoffitt

Exam Details

Exam Name: **Exchange Server 5.5**

Exam Number: **070-081**

Number of Questions: **30**

Passing Score: **633/1000**

Time to take Exam: **90 minutes**

Standard or Adaptive: **Shortened Standard**

Certifications Exam Counts Toward: **MCSE elective, MCP, MCP+I, and MCSE+I elective**

What you need to know

- Ports, their numbers and functions
- How to recover deleted mail
- The REQMAIN tool and its options
- OST and PST files
- T1, T2 and T3 events
- Where to put database and transaction log files
- Replication
- Backup and restore options and methods
- Licensing
- Where to put and replicate public folders
- IMS
- How to import NetWare user accounts
- How to migrate user accounts from various other systems
- How to add and remove newsgroups
- Remote access protocols and methods
- Migration files
- How to import from an SQL database
- How and where to enable message tracking
- SMTP, IMAP, POP3 and LDAP
- SMTP forwarding
- Key management
- Server monitor
- How to upgrade from Exchange 4
- How firewalls are used to allow or restrict packet types, IP addresses, etc.
- Chat servers
- Intervals and retry intervals
- MSMAil and migrating from MSMAil

Client/Server messaging system

Exchange Server 5.5 is an example of a Client/Server messaging system

Shared-file: All processing done on clients who need Read and Write permis-

sion to entire file structure, increased network traffic.

Client-Server: Executable code runs on server, processes client request.

Exchange Server uses Remote procedure calls or RPC to communicate between client and server.

MAPI subsystem

Exchange Server interoperates with many different mail protocols through the MAPI subsystem running on the client. Exchange provides access for MAPI-compliant clients like Outlook.

SMTP Simple Mail Transfer Protocol
POP3 Post Office Protocol version 3
IMAP4 Internet Message Access protocol version 4
NNTP Network News Transfer Protocol
MIME Multipurpose Internet Mail Extensions
LDAP Lightweight Directory Access protocol
HTTP Hypertext Transfer protocol

Mail systems that interact with Exchange include:

SMTP mail systems
Microsoft Mail for PC Networks and Apple Networks
IBM PROFS/OV (Office Vision)
SNADS
X.400 systems
Lotus cc:Mail networks (running DB versions 6 and 8)
Lotus Notes systems
Digital's ALL-IN-1
Novell Mail Handling System or MHS, etc

Exchange Server Reliability Factors

- Reroutes messages if one connection between servers fail
- Server Monitors check services running on all servers in a site
- Link Monitors send test messages to and from other Exchange computers
- Exchange uses transaction based architecture so data integrity is guaranteed.



Hierarchical Model

- Resources are organized by Organization level, Site Level, and Server Level.
- Different permissions can be configured at each level and permissions do not flow between levels.
- Exchange uses Windows NT domain security model. A computer running Windows NT Server validates all users.

Exchange Message Infrastructure

Exchange has core components and additional components.

Core Components:

- a. Directory Service – maintains information on all objects created (users, DL's, etc)
- b. Message Transfer Agent – provides routing functions, expands DL's
- c. Information Store – private and public (PRIV.EDB, PUB.EDB), public folders
- d. System Attendant – service and link monitoring, creation of e-mail addresses, routing tables, and other support functions.

Additional Components:

- a. Internet Mail Service – use with Exchange and SMTP system
- b. Internet News Service – replicate USENET newsgroups to Exchange public folder
- c. Outlook Web Access – clients can access e-mail, address book etc. using standard browser
- d. Microsoft Mail Connector – communication between Microsoft Mail 3.x system and Exchange
- e. Directory synchronization – synchronize directories between Exchange and Microsoft mail system using Microsoft Mail 3.x DirSync protocol.
- f. Connector for Lotus cc:Mail – for message transfer and directory synchronization between Exchange server and Lotus cc:Mail post office
- g. Connector for Lotus Notes – for message transfer and directory synchronization between Exchange server and Lotus Notes Domino server.

Features for Exam

Improved Scalability

- Unlimited message store - required Exchange enterprise edition, not standard
- Backup enhancements – can back up to 25 GB per hour
- Cluster Server support – now supports MS Cluster Server 1.0, need Enterprise Edition

Offline user support

- Can use Offline Address Book to download only items that are new or have changed
- Since the last download (good for remote users who don't need consume bandwidth)

Increased Internet Support

- Support for IMAP4 so clients can send and receive e-mail
- Support for LDAP 3, so clients can manipulate many directory objects
- Support for Secure Socket Layer encryption (SSL) and Simple Authentication Security layer (SASL) to authenticate SMTP client log on.
- Support for MHTML or MIME E-mail Encapsulation of Aggregate Documents
- So clients can embed HTML pages directly into an e-mail message

Exchange Server Management Administrator Program on Exchange Server

- Can run on any Windows NT computer and can administer any server in any Site as long as you establish a RPC connection to that site.
- Administrator program installed in \EXCHSRVR\BIN directory on the Exchange Server (you can specify alternate location). Shortcut to this program is put in a Program Group.
*Note: Administrator program automatically installed if you choose **Typical or Custom***
- Installation, but NOT WITH MINIMUM INSTALLATION option. Install this program on multiple computers for FAULT TOLERANCE.

Be familiar with the Views in Administrator program:

- Organization is the root of the directory hierarchy
- Address Book Views (sort recipients by attributes)
- Folders (public folder hierarchy)
- Global Address List (all recipients in organization)
- Site (contains Configuration containers, Servers in a Site, Recipients containers)
- Configuration (objects for site-level configuration)
- Servers (configure server-level objects)

Administrator program shows 2 views: Container pane on left and Contents pane on the right.



Objects created are either Containers or objects (container is like directory and object is like a file)

Permission and Contexts:

- Permissions are rights granted to a user or group to access an object in the organization
- Context is a boundary of permissions, there are 3 context levels:
 - Organization
 - Site.permissions apply to public folder, Address book views, etc.
 - Configuration
- Permissions don't flow between these contexts!

Rights and roles:

- There are 10 different rights that can be assigned to a user or group
 - Add Child – can create objects
 - Modify user attribute – e.g. can modify members of a DL
 - Modify Admin attributes – e.g. can modify display name for a user
 - Delete
 - Send As – can send messages with the sender's return address
 - Log on Right – give access to the directory; services need this right
 - Replication – replicate directory information with other servers
 - Modify Permissions – e.g. modify access permission on existing mailbox
 - Mailbox Owner – read and delete messages in a mailbox
 - Search
- There are 7 different default roles or predefined sets of rights
 - Admin – has all rights except Modify permission, replication, mailbox owner, and Send As
 - Permissions Admin – all rights except Replication, mailbox owner, and Send As
 - Service Account Admin – has all rights
 - View Only Admin – Only has Log On rights!
 - User – only has modify user attribute, mailbox owner and send as Rights
 - Send As Role – has send as Right
 - Search – can search

Exchange Administrator tools:

Exchange is integrated with NT, so we can use NT Server tools to administer Exchange!

- Control panel Services – check status of Exchange services
- Event Viewer – most components write diagnostic information to Windows

- NT Event Log (application log).
- Server manager – use to manage services on local and remote servers
- Performance Monitor – use special counters to track statistical data
- Task manager – use to monitor programs and processes running on your computer

Note: the names in Task manager for your Exchange services are different than the Control panel Services:

Remember the following...

directory service in Task Manager = DSAMAIN.EXE

Message Transfer Agent = EMSMTA.EXE

Information Store = STORE.EXE

System Attendant =MAD.exe

Internet mail service

=MSEXCIMC.exe

Event Service = EVENTS.exe

Directory Synchronization =DXA.exe

- Registry Editor – to modify server-specific settings like protocol binding order
- User manager for domains – allows connectivity to the Administrator program to create a mailbox in Exchange and a Windows NT account for a user simultaneously.

Recipient Configuration

Types of Recipients:

- Mailboxes
- Custom Recipients – points to foreign address like Internet recipient with SMTP address
- Public Folders
- Distribution Lists – can contain multiple DL's as recipients
- Agents – similar to mailbox, but contains an active process that reads and acts on messages. Example: Microsoft Schedule+ Free/Busy agent which communicates with Schedule+ Free/Busy

Rule: All recipient objects must be placed inside a "Recipients" container!

Ways to create a mailbox:

- Use Exchange Administrator Program
- Use Windows NT User Manager for Domains program
- Use the Administrator Extract and Import utilities
- Use the Migration Wizard to migrate users from existing mail systems, like Microsoft Mail for PC Networks, Lotus cc:Mail, and Lotus Notes (if you use SP1 with Exchange 5.5)



Setting permissions with Exchange Administrator:

The default is to show “permissions” tab on container objects only. You have to modify this setting in Exchange Administrator by:

Selecting Tools, then Options, then permissions Tab, then check “SHOW PERMISSIONS PAGE FOR ALL OBJECTS” and also check “DISPLAY RIGHTS FOR ROLES ON PERMISSION PAGE”

Configuring E-Mail Addresses

- Every recipient has an “E-Mail Addresses” tab to create their e-mail address
- If you change a user’s ALIAS name, the e-mail address is not updated!
- E-mail addresses are called PROXY ADDRESSES.
- To globally change an address for all FUTURE recipients created, use the Site Addressing Object in the Configuration Container and select Site Addressing
- Use “Delivery Options” page to specify who has “Send on Behalf of permissions” (also do this directly in Client program)
- Use “Delivery Options” to specify alternate recipient to receive your incoming mail
- Use “Protocols” tab to enable or disable all protocols, except LDAP, on a per-user basis.
- Use “Limits” tab to configure Deleted Item retention time for message storage, also configure server to keep deleted messages until the IS has been backed up here.
- Uses “Advanced” tab to set trust levels, home servers, and outlook web access server name.

Configuring Distribution Lists for the Exam:

- You need to specify an “expansion server” to expand the members of a DL
- Default is “any server in a site” can do this, but pick a high-processor machine for large DL’s
- Always specify an owner who can modify members – they don’t need administrative rights
- Configure the “Advanced” tab to send notification reports and hide from the address book

Additional Recipient Information on the Exam

- Moving mailboxes within a Site
 - Use the “move mailbox” option on the Tools menu to move to a different server.
 - Alternate method: “Rehome” a mailbox on the “Advanced” option of the mailbox object

- Moving mailboxes BETWEEN Sites (*cannot do this in Administrator!*) Steps are:
 - Download all private folders in IS to a local .PST file
 - Create new mailbox in new site, then DELETE THE OLD MAILBOX!
 - Log on to new server, and copy .PST file from the old IS to new server
- Cleaning a Mailbox
 - Does not delete the mailbox, only deletes messages in a mailbox!
 - Select Tools, then “Clean Mailbox”
 - Use “Mailbox Cleanup Agent” from Resource Kit to maintain consistent database size
- Address Book Views

Why? To organize recipients into “logical groupings”

 - Displayed in Outlook Address Book
 - Users can move between address book view containers dynamically
 - Address book view containers are created automatically
 - Must specify DIRECTORY and DISPLAY NAME and ATTRIBUTES



SITE CONFIGURATION

Object Description	
Add-Ins container	Holds information for DLLs needed for administration of connectors. No configuration is needed here.
Addressing container	For templates and E-mail proxy address generators
Connections container	For messaging connectors to other sites or foreign systems
Directory Replication container	Allow replication of directory information between sites
Monitors container	For created Link Monitor and Server Monitors. Used to troubleshoot messaging problems.
Protocols container	Configuration of protocols installed on a server
Certification Authority Configuration	Configure the default encryption used within a site when using Key Management Server
DS Site Configuration	Set behaviors for many directory objects, very important to know
Information Store Site Configuration	Set default values which control the Public Information Store such as who can create top-level public folders
MTA Site Configuration	Define settings for messaging defaults like window sizes and association parameters (VERY IMPORTANT!)
Site Addressing	Controls default addresses created when recipients are created
Site Encryption Configuration	Configure parameters related to advanced security.

SO YOU THINK YOU'RE A KNUCKLEHEAD

(On the track to becoming an MCSE)

by Steve Crowley



Well, it takes one to know one. Believe me, I know your pain. I know that feeling, that gut wrenching feeling of wondering if this is the right thing to do. Is this worth making a huge life change?

Am I smart enough to do this? It's been so long since I did any real studying; will I be able to study and learn things again? Do I really want to become a computer geek?

As I said before, I know your pain. I started into this "Hall of Terrors" with hardly any computer experience. I had done quite a bit of word processing for reports and resumes, but I had absolutely no experience with computer networking or even an idea of what it was.

What I did know is that I had a strong feeling to take care of my family and find a better way of making a living. After coming to the conclusion of which school to choose, I "jumped in," paid for the classes, and awaited "THE DAY."

Like all things, it did indeed come to pass. I found myself sitting in a small class with people I was sure were already computer experts. I knew I was about to make a complete fool of myself.

I was sitting there wondering "why am I here ... where am I going when this is over ... is where I came from better than what I've gotten myself into?"

I decided to try and at least make it to the lunch break, before confessing to the instructor that I was an idiot and was not worthy of his presence. I tried to think of how I should tell him that I was going to quit, without sounding like a quitter.

Somehow I made it through to lunch. Instead of confessing my stupidity, I asked the instructor if it really was true that someone with just basic computer experience could get through this. I was surprised that others, upon hearing my fears, expressed the same concern.

He did a good job of letting me know that yes, if you are willing to put the time in, you can do it. That got me through the next few hours and I finished the first day.

This was a major accomplishment; at least to me...with the way I was feeling. I went home,

grabbed something to eat and, still out of fear, went to the local library to study.

After a long, somewhat sleepless night, I found the courage to go back. We started talking about all kinds of things with terms I'd never heard of. All I was hearing was "blah blah blah...Ginger."

That familiar feeling of keeping the chunks down was once again present. The class was discussing the "Y2K" problem and all I could think of was the "Y me" problem.

What had I gotten myself into? I made it to lunch hour again, and again, pleaded for forgiveness at the instructor's feet. He again put some of my fears to rest by letting me know that pretty much everyone, regardless of computer experience, would go through exactly the same insecurity until we had gotten farther along.

He let me know that I could ask questions any time. Of course, I knew it was worse to raise your hand and ask a stupid question than to keep quiet and not embarrass yourself.

Is it true that there are no stupid questions, just stupid people? That's how I was feeling. So I got up courage to ask the stranger sitting next to me if he could answer some questions for me; some he could and some he couldn't.

I did start asking questions of the instructor during class breaks, so I wouldn't look so dumb in front of everyone. I found out, again, that many in the class had the same concerns and questions.

I still kept a certain level of timidity, but after the first week or two, I felt okay about asking questions in class. I found that after finding enough courage to push through the first few days, there were fewer and fewer sleepless nights, and I was actually starting to understand some of this "stuff." Do you sense what's starting to happen? Can you feel it? "All right...Janice!"

So I started to "clue in" on the terminology, and started to feel freer to ask questions. I jumped all over the practice tests for the first class. I did these until I pretty much had perfect scores.

I continued to ask questions, and I got through the first test. Wow!... what a feeling to actually get through something I had been so afraid of. I even allowed myself a little thought of "maybe I can do this."

Of course, that all changed the first day of the next class. We started to do actual "hands on" exercises on the computers. Things didn't work like I thought they should.

What's wrong with me, am I really an idiot? Why doesn't this exercise work? Is there any penitence I can do? Don't worry.... just REBOOT and the Heavens will open and light will again fill the earth.

I found enough courage to get through the first few days of this class. I again started to understand the new terminology and some of how this stuff worked. I found that if I got up enough gumption to face the fears of the first two or three days of each new class, I would start to catch on and find enough motivation and interest to keep going.

Let me get off this path for a moment to share a couple of insights I've found along the way. In these courses:

- **study only those things that will help you learn what you need to**
- **practice only those things that will make you proficient, at what you need to know how to do**

I had a coach years ago that told me to only practice the moves and the shots that I would actually use in a game. If you waste time on "hot-dogging," you're taking away precious practice time you need for the real game. He also said that practice in and of itself does not make perfect. Practice of the right things makes perfect.

In other words, it's sufficient to know the functional length of CAT 5 cable. It doesn't matter that you don't understand all the properties of copper cabling. This isn't the time to worry about it. Practice those things that will help. Don't worry about the atomic structure of a thread. Don't worry about understanding the theory of relativity and how it pertains to subnet masks, or how many MCSEs it takes to install a NIC.

Just practice the exercises that will get you the knowledge for that particular course. You will pick up a lot of other things along the way. After all, MCSE does not equal mc^2 . Whew!... did I make my point? I'll bet you used to believe there was no sense in shooting a dead horse. Now you know better.

Okay, let's get on with it. I continued in my course. I went to ALL my classes. I stayed late and studied. I went to the library and the lab and studied. I took practice exams until I got nearly perfect scores. I brought a sack dinner and studied in the cafeteria until the school closed. I then checked the "brain dumps" to see if there were any areas on the test that I hadn't prepared for. *I walked uphill, both ways, to school in waste high snow.* Because of this level of commitment, I made it through.

Woo Hoo - MCSE - I am smrt, I am smrt.....I am smart. I am smart! I now join the ranks of such distinguished technical minds as Albert Einstein, Ben Franklin, Alexander Graham Bell, and Ed.

With that said, let me give a few parting thoughts. You don't have to have the genes of a geek to do this kind of "stuff." By giving the time and effort required, you can become as big a nerd as anyone.

You know Einstein (seriously) did not have an easy time in school. He struggled as much or more than the rest of us. He did however have imagination and enough "stick-to-itiveness" to succeed. I know that if you will commit yourself to doing what it takes, you too will succeed. I can only hope you find as great a bunch of people to work with as Keith, Ed, Darryl, Todd, Rex, Deni, and the others associated with the Institute for Network Professionals. — Hang In There! — 

<http://www.inpnet.org/html/nics.htm>

NICs

NETWORK INFORMATION CONNECTION

is published by the Institute for Network Professionals

Prices Domestic \$100/yr (\$8.50 each)
Outside US \$120/yr (\$10.00 each)

Phone US 801 223 9444
Fax 801 223 9486

Address Please send tips, special requests, change of address, subscriptions, fulfillment questions, requests for group subscriptions, and other correspondence to:

NICs
1372 South 740 East
University Office Park
Orem, UT 84097-8083

or contact us via Internet E-mail at
- NICs@inpnet.org

Postmaster Periodicals postage paid in Provo, UT.

Postmaster: Send address Changes to:

NICs
1372 South 740 East
University Office Park
Orem, UT 84097-8083

Copyright © 1999, Institute for Network Professionals. NICs is an independently produced publication of the Institute for Network Professionals. All rights reserved. Reproduction in whole or in part in any form or medium without express written permission of the Institute for Network Professionals is prohibited. The Institute for Network Professionals reserves the right, with respect to submissions, to revise, republish, and authorize its readers to use the tips submitted for personal and commercial use.

Microsoft, Windows, Windows NT, and MS-DOS are registered trademarks of Microsoft Corporation. NetWare is a registered trademark of Novell, Inc. All other product names or services identified throughout this journal are registered trademarks of their respective companies.

Staff Editor-in-Chief **KeithParsons**
Technical Editor **EdKrach**
Managing Editor **DarrylAlder**
Testing Editor **DeniBerger**
Tech Support Editor **ToddHindmarsh**
Test Prep Editor **RexMoffitt**

Back Issues To order back issues, call Customer Relations at 801 223 9444. Back issues cost \$8.50 each, \$10.00 outside the US. You can pay with MasterCard, Visa, or American Express or visit our archive at <http://www.inpnet.org/nics>.

The Institute for Network Professionals makes resources and support accessible for networking professionals with the objective of enhancing their member's technical knowledge, skills and professionalism. The Institute continues to serve more than 40,000 network professionals world-wide with products, training, events and through alliances with industry suppliers and other organizations.



1372 SOUTH 740 EAST
OREM, UT 84097-8083
801 223 9444-801 223 9486 FAX
WWW.INPNET.ORG OR INFO@INPNET.ORG



Member Specials (order at http://www.inpnet.org/member_specials.htm)

Duette Commander

Gets that Second Keyboard, Monitor and Mouse off your Desk!

Created for the power home user or the busy desktop, Duette fills the bill for a simple, cost effective switch. Free up needed space on your desk by eliminating one set of peripherals! Your computers can be as far as 30 feet away from the Commander, so you have lots of freedom in setting up your work area.

Easy to Install, Easier to Use

With the Duette Commander, there is no software to install. There are no boards to configure or networks to run. Just connect your computers to the Duette and you are ready to work. With the Duette's AutoBoot capability, both computers will boot automatically after powering up, so your PCs are always ready as soon as you are.

Two Ways to Switch for Fast, Convenient Operation

You can switch between your attached computers smoothly and easily using the push-buttons on the Duette front panel. If the Duette is out of reach, a simple keyboard sequence will change your active computer as well.

Keep Alive Feature Protects your System in an Emergency

The Keep Alive feature allows the attached PCs to power the Commander in the event of a Duette power failure. Keeping the system powered up in an emergency ensures continued emulation and keeps you from losing valuable time and data.



The Duette Commander Ships with a pair of 6 foot cables. Valued at \$295, Institute members can purchase it for only \$75 plus shipping.

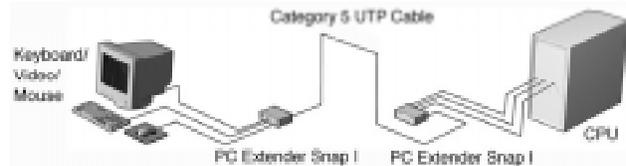
PC-Extender SNAP-I

Expand the Reach of your Computer System

Keep your PC in a secure, climate controlled environment and still have access from crowded or harsh work areas up to 300 feet away! By removing your CPU from your busy work area, you protect the most valuable components of your system and free up needed work space too!

Making Extended Distance Operation a SNAP!

With SNAP technology from Cybex, your video, keyboard and PS/2 mouse signals are carried across a single Category 5 UTP cable - the same type used by many Ethernet networks. UTP (Unshielded Twisted Pair) cabling provides increased resistance to interference for high quality video transmission.



Maintain System Security

PC-Extender SNAP-I takes the worry out of system security. Place your system unit, software and sensitive data in a secure area to minimize tampering, system damage and unauthorized software installation.

Easy Installation

PC-Extender SNAP-I is simple to install; no software or expensive networks are required. Just place your peripherals at your remote location, connect the cables, and use your PC just as if it were in the same room.

Valued at \$495, Institute members can purchase it for \$295 plus shipping.

A PC-Extender SNAP-I system consists of a transmitter located at the computer and a receiver at your remote workstation, linked by a single UTP extension cable. This Category 5 UTP cable, which enables the long distance operation, is the same type used in 10BaseT Ethernet networks. An input cable connects the transmitter to your system unit. A 12 VAC transformer is included to power the transmitter. No external power is required at the receiver. The remote workstation supports either a monochrome or color VGA monitor, and a PS/2 style mouse. The PC-Extender SNAP-I supports all VGA video modes up to 1280 x 1024 non-interlaced.

Institute Members Save \$20 on Microsoft Certification Exams *(while our vouchers last)*

Save \$20 on all Microsoft Certification Exams at VUE Testing Centers in the USA when you call toll-free 1.877 INP EXAM. To find the nearest VUE location check <http://www.vue.com>. Contact us at info@inpnet.org or call 1(801)223-9444 for more information about this program or your Institute membership status.