



44

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In this issue

- 3 PC-controlled FTP data transfer and job submission
 - 12 Web-to-host and XML in action
 - 24 TCP/SNA and related education
 - 27 TCP/SNA Internet-based training
 - 41 Other TCP/SNA self-study
 - 46 TCP/SNA classroom courses
 - 60 TCP/SNA training directories
 - 63 TCP/SNA conferences
 - 69 March 1997 – December 2001 index
 - 72 TCP/SNA news
-

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PC-controlled FTP data transfer and job submission

Our company network consists of an IBM mainframe with OS/390 and hundreds of personal computers with Windows or Unix. Some segments of our intranet are assigned for special purposes such as serving ATM and POSs, some are for home banking support, and many are responsible for data entry. A lot of the data originating on our PCs needs processing on the mainframe.

In the past, we used to process PC data on the mainframe in the following ways:

- TSO or CICS data transfer via terminal session, and postponed processing during batch window.
- CICS programs (APPC or TCP/IP Sockets) for controlled data transfer and postponed processing during batch window.

However, some of our applications need more frequent updates and can't wait for the batch window during the night. We therefore decided to alter our methods, to achieve more frequent data transfer and automatic submission of production jobs. We need to transfer data and update host databases as frequently as possible; over time, we've found that a five-minute interval is optimal, so we use `SetTimer()` function and `OnTime` event in our program.

This article describes how we collect data originating from four PC networks. It should give you some ideas as to how FTP data transfer or automatic job execution can help in your business. The C++ program presented is designed to:

- Transfer data from the PC to mainframe by standard FTP.
- Submit the job for data processing.
- Check the success of job execution.
- Transfer control information back to the PC.

We use the following command to do the FTP data transfer:

```
ftp -s:FTPCOMM.TXT > OUT.TXT,
```

Where `-s` defines a PC file `FTPCOMM.TXT` for commands and `OUT.TXT` is a result file.

The content of the `FTPCOMM.TXT` file is as follows:

```
1   Open <IP address of IBM>
2   <username>
3   <password>
4   cd..
5   Get or put commands (depending on direction of communication)
6   Bye
```

If everything is OK, we should see the content of `OUT.TXT` file, as follows:

```
ftp> Connected to 1.2.3.4.
open 1.2.3.4
220-FTPD1 IBM FTP CS/390 V2R5 at PSJES229, 07:46:05 on 2001-09-17.
220 Connection will close if idle for more than 5 minutes.
User (172.20.4.1:(none)):
331 Send password please.

230 PIPPG31 is logged on. Working directory is "PIPPG31.".
ftp> ftp>
cd ..
250 "" is the working directory name prefix.
ftp> get PIPPG31.DATA1.STAL DATA1.TXT
200 Port request OK.
125 Sending data set PIPPG31.DATA1.STAL FIXrecfm 80
250 Transfer completed successfully.
65 bytes received in 0.00 seconds (65000.00 Kbytes/sec)
ftp> bye
221 Quit command received. Goodbye.
```

The data transfer is correct if the string ‘successfully.’ exists in the `OUT.TXT` file.

The job is started by entering the command `SUBMIT <job name>` on a TSO opened terminal session, with `READY` state and search for string ‘`SUBMITTED`’.

The content of the session after `SUBMIT` is as follows:

```
SUBMIT 'PIPPG31.USER.CNTL(OPTI001)'
IKJ56250I JOB OPTI001N(JOB04288) SUBMITTED
READY
```

We then wait for the string "`MAXCC=`" (or "`JCL ERROR`"), to detect the end of the job. We now have to code `MAXCC`. When `MAXCC` does not equal zero, we have to do rollback on PC and mainframe too.

The content of the session once the job has executed is as follows:

```
11.49.27 JOB04288 $HASP165 OPTI001N ENDED AT PSJES229 MAXCC=0
CN(INTERNAL)
```

```
READY
```

We also have to predict a situation for timeout. ‘Sleep’ statements can be used to calculate this time (ignoring execution time for statements between two ‘sleep’ statements):

- 500ms after sending clear key
- 5000ms for HostWait("MAXCC=",50)
- 100ms for HostWait("JCL ERROR",1).

We calculate a minimum 5.6s per cycle. Therefore, for the loop ‘for(i=0;i<150 && IOK;i++)’, we calculate a minimum execution time of 14min (150x5.6s= 840s).

PROGRAM CODE

```
#include <string.h>
#include <stdio.h>
#include "hapi_c32.h"
#include <direct.h>
#include <time.h>

int HostWait(char * Search, int Time);
void ErrorLog(char *,int);
char t1[80];

int HostSubmit(char * Job)
{
    int hRetCode=0,hCode,hLen;
    char hData|80|;
    int i,lOK=-1;
    char s1|1921|;

    hCode=HA_CONNECT_PS;
    // CONNECT WITH SESSION A
    sprintf(hData,"A");
    hLen=strlen(hData);
    hllapi((LPINT)&hCode,(LPSTR)hData,(LPINT)&hLen,(LPINT)&hRetCode);
    if (hRetCode)
    {
        sprintf(t1,"SESSION CONNECT PS ERROR. CODE: %d",hRetCode);
        ErrorLog(t1,1);
    }
}
```

```

    return -1;
}

hCode=HA_SEARCH_PS;
// SEARCH FOR READY
sprintf(hData,"READY");
hLen=strlen(hData);
hllapi((LPINT)&hCode,(LPSTR)hData,(LPINT)&hLen,(LPINT)&hRetCode);
if (hRetCode)
{
    sprintf(t1,"SESSION SEARCH PS FOR 'READY' ERROR. CODE:
%d",hRetCode);
    ErrorLog(t1,2);
    return -1;
}

hCode=HA_SENDKEY;
// WRITE ON THE SESSION: SUBMIT('<JOB NAME>')
sprintf(hData,"SUBMIT %s",Job);
hLen=strlen(hData);
hllapi((LPINT)&hCode,(LPSTR)hData,(LPINT)&hLen,(LPINT)&hRetCode);
if (hRetCode)
{
    sprintf(t1,"SESSION SENDKEY: %s ERROR. CODE: %d",t1,hRetCode);
    ErrorLog(t1,3);
    return -1;
}

hCode=HA_SENDKEY;
// SEND ENTER KEY TO THE SESSION
sprintf(hData,"@E");
hLen=strlen(hData);
hllapi((LPINT)&hCode,(LPSTR)hData,(LPINT)&hLen,(LPINT)&hRetCode);
if (hRetCode)
{
    sprintf(t1,"SESSION SENDKEY: @E ERROR. CODE: %d",hRetCode);
    ErrorLog(t1,4);
    return -1;
}

// SEARCH FOR SUBMITTED
if (HostWait("SUBMITTED",50))
{
    sprintf(t1,"SESSION SEARSH PS FOR SUBMITTED ERROR");
    ErrorLog(t1,5);
    return -1;
}

for(i=0;i<150 && !OK;i++)
{

```

```

hCode=HA_SENDKEY;
// SEND CLEAR KEY TO THE SESSION
sprintf(hData,"@C");
hLen=strlen(hData);
hllapi((LPINT)&hCode,(LPSTR)hData,(LPINT)&hLen,(LPINT)&hRetCode);
if (hRetCode)
{
    sprintf(t1,"SESSION SENDKEY: @C ERROR. CODE: %d",hRetCode);
    ErrorLog(t1,6);
    return -1;
}

Sleep(500);
hCode=HA_SENDKEY;
// SEND ENTER KEY
sprintf(hData,"@E");
hLen=strlen(hData);
hllapi((LPINT)&hCode,(LPSTR)hData,(LPINT)&hLen,(LPINT)&hRetCode);
if (hRetCode)
{
    sprintf(t1,"SESSION SENDKEY: @E ERROR. CODE: %d",hRetCode);
    ErrorLog(t1,7);
    return -1;
}
// IF STRING MAXCC EXISTS ON THE SESSION THEN JOB FINISHED
lOK=HostWait("MAXCC=",50);
// ERROR IN THE JOB
if(HostWait("JCL ERROR",1)==0)
{
    ErrorLog("JCL ERROR",8);
    return -1;
}

} // for

if (lOK==0)
{
    // IF STRING MAXCC EXISTS ON THE SESSION THEN WE HAVE TO
    // NOW VALUE OF MAXCC
    hCode=HA_SEARCH_PS;
    sprintf(hData,"MAXCC=");
    hLen=strlen(hData);
    hllapi((LPINT)&hCode,(LPSTR)hData,(LPINT)&hLen,(LPINT)&lOK);
    if(lOK==0)
    {
        int i,i1=hLen;
        char tmp|80|;
        hCode=HA_COPY_PS;
        hLen=1920;
        hllapi((LPINT)&hCode,(LPSTR)s1,(LPINT)&hLen,(LPINT)&hRetCode);
        if(s1|i1+5|=='0')

```

```

    {
        hCode=HA_SEARCH_PS;
        sprintf(hData,"CN(INTERNAL)");
        hLen=strlen(hData);
        hllapi((LPINT)&hCode,(LPSTR)hData,(LPINT)&hLen,
                (LPINT)&hRetCode);
        for(i=i1+5;i<(hLen-1);i++) tmp|i-i1-5|=s1|i|;
        tmp|i-i1-5|='\0';
        lOK=-1;
        sprintf(t1,"JOB FINISHED WITH MAXCC=%s",tmp);
        ErrorLog(t1,9);
    }
}
else
    ErrorLog("TIMEOUT WAITING FOR MAXCC OR JCL ERROR",10);

hCode=HA_DISCONNECT_PS;
sprintf(hData,"A");
hLen=strlen(hData);
hllapi((LPINT)&hCode,(LPSTR)hData,(LPINT)&hLen,(LPINT)&hRetCode);
if (hRetCode)
{
    sprintf(t1,"SESSION DISCONNECT ERROR. CODE: %d",hRetCode);
    ErrorLog(t1,11);
    return -1;
}

hCode=HA_RESET_SYSTEM;
hLen=0;
hllapi((LPINT)&hCode,(LPSTR)hData,(LPINT)&hLen,(LPINT)&hRetCode);
if (hRetCode)
{
    sprintf(t1,"SESSION RESET SYSTEM ERROR. CODE: %d",hRetCode);
    ErrorLog(t1,12);
    return -1;
}

return lOK;
}

int HostWait(char * SearchString, int Time)
{
    // SEARCH A STRING IN THE SESSION
    int i;
    int lOK=-1;
    int hRetCode=0,hCode,hLen;
    for (i=0;i<Time && lOK;i++)
    {
        hCode=HA_SEARCH_PS;
        hLen=strlen(SearchString);

```



```

        hllapi((LPINT)&hCode,(LPSTR)SearchString,(LPINT)&hLen,(LPINT)&10K);
        if(10K) Sleep(1000);
    } // for
    return 10K;
}

int FtpTransfer(char * filePC, char * fileIBM,char * cUser,
               char * cPass, int mode)
{
    // mode=1: transfer to IBM
    // mode|=1: transfer to PC
    FILE * f1;
    char Temp1[80]="ftp -s:FTPCOMM.TXT > OUT.TXT";
    int lCancel=-1;
    if((f1=fopen("FTPCOMM.TXT","w"))==NULL)
    {
        ErrorLog("FILE FTPCOMM.TXT OPEN ERROR (FOR WRITING)",13);
        return -1;
    }
    fprintf(f1,"open 172.20.4.1\n");
    fprintf(f1,"%s\n",cUser);
    fprintf(f1,"%s\n",cPass);
    fprintf(f1,"cd ..\n");
    if(mode==1)
        fprintf(f1,"put %s %s\n",filePC,fileIBM);
    else
        fprintf(f1,"get %s %s\n",fileIBM,filePC);
    fprintf(f1,"bye\n");
    fclose(f1);
    Sleep(1000);
    system(Temp1);
    if((f1=fopen("OUT.TXT","r"))==NULL)
    {
        ErrorLog("FILE: OUT.TXT OPEN ERROR (FOR READING)",18);
        return -1;
    }
    // SEARCH FOR SUCCESSFULLY IN THE FILE OUT.TXT
    while(!feof(f1))
    {
        fscanf(f1,"%s",Temp1);
        if(!feof(f1))
            if(strcmp(Temp1,"successfully.")==0) lCancel=0;
    }

    if (lCancel)
    {
        if(mode==1)
            ErrorLog("FILE TRANSFER ERROR (TO IBM). SEE FILE: OUT.TXT",14);
        else
            ErrorLog("FILE TRANSFER ERROR (TO PC). SEE FILE: OUT.TXT",15);
    }
}

```

```

    fclose(f1);
    return !Cancel;
}

void ErrorLog(char * desc, int num)
{
    FILE * f1;
    char msg|85|;
    sprintf(msg,"%d%s",num,desc);
    AfxMessageBox(msg);
    if((f1=fopen("ERRLOG.TXT","a"))==NULL)
    {
        AfxMessageBox("FILE ERRLOG.TXT OPEN ERROR (FOR APPENDING)");
        return;
    }
    fprintf(f1,"%s\n",msg);
    fclose(f1);
}

int JobExecute(char * JobInputPC, char * JobInputIBM,
               char * JobName,
               char * JobOutputPC, char * JobOutputIBM,
               char * UserName, char * Password)
{
    int res=-1;
    if(strlen(JobName)==0)
    {
        ErrorLog("EMPTY STRING FOR JOBNAME",16);
        return -1;
    }
    if(strlen(JobInputPC)!=0 && strlen(JobInputIBM)!=0)
        if(FtpTransfer(JobInputPC,JobInputIBM,UserName,Password,1))
            return -1;
    if(HostSubmit(JobName))
        return -1;
    if(strlen(JobOutputPC)!=0 && strlen(JobOutputIBM)!=0)
        if(FtpTransfer(JobOutputPC,JobOutputIBM,UserName,Password,2))
            return -1;
    return 0;
}

int JobList(char * FileName)
{
    FILE * f1;
    int i1=0;
    int Fail=0;
    char par|5||80|;
    char UserName|80|, Password|80|;
    if((f1=fopen(FileName,"r"))==NULL)
    {
        sprintf(t1,"FILE: %s OPEN ERROR",FileName);
    }
}

```

```

    ErrorLog(t1,16);
    return -1;
}
while(!feof(f1) && !Fail)
{
    fscanf(f1,"%s",t1);
    if(!feof(f1))
    {
        if(strcmp(t1,"#")==0) strcpy(t1,"");
        switch(i1)
        {
            case 0:
                strcpy(Username,t1);
                i1++;
                break;
            case 1:
                strcpy>Password,t1);
                i1++;
                break;
            default:
                strcpy(par|i1-2|,t1);
                if (++i1>6)
                {
                    if(JobExecute(par|0|,par|1|,par|2|,
                                par|3|,par|4|,
                                Username>Password))
                    {
                        sprintf(t1,"ERROR WHILE EXECUTING JOB: %s", par|0|);
                        Fail=-1;
                    }
                    i1=2;
                }
            } // switch
        } // if !feof(f1)
    } // while
    if(i1!=2)
    {
        sprintf(t1,"PARAMATERS ERROR IN FILE: %s", FileName);
        ErrorLog(t1,17);
        Fail=-1;
    }
    return Fail;
}

```

This program can be used for the automatic execution of group of jobs by creating a file on the PC and using function `int JobList(char * FileName)`. We sign the empty parameter with "#".

The file `JOBLIST1.TXT` which we use in the `JobList("JOBLIST1.TXT")` statement is as follows:

```
<your TSO username>
<your TSO password>
<JobInputPC1>
<JobInputIBM1>
<JobName1>
<JobOutputPC1>
<JobOutputIBM1>
<JobInputPC2>
<JobInputIBM2>
<JobName2>
<JobOutputPC2>
<JobOutputIBM2>
...
```

We use `#include 'hapi_c32.h'` and `'pcscal32.lib'` existing in the subdirectory of IBM Personal Communications to link this program with our C++ program.

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(Yugoslavia)

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Web-to-host and XML in action

Thankfully, the capitulation of the dot-com companies, the related contraction of e-business initiatives, and the on-going slowdown of the global economy haven't combined to make enterprises totally lose interest in Web-to-host and host integration projects. Although Web-to-host adoption is slower than originally anticipated, enterprises ranging from the US National Archives and Records Administration to Mercedes Benz in Belgium are still actively migrating to this technology. Reduced IT budgets and cost containment are now a fact of life, and IT professionals are discovering that 'thin-client' Web-to-host technology can help them realize immediate and demonstrable cost savings on multiple fronts.

The real-life case studies presented in this article describe how some organizations are leveraging different types of Web-to-host solutions to enhance and expand their business operations. Figure 1 summarizes the characteristics of the six representative case studies discussed in this article, and shows the key payoff realized in each case.

These case studies demonstrate the now proven advantages of

contemporary ‘thin-client’ Web-to-host integration solutions, typically implemented to work across the Internet, compared with traditional, thick-client host emulation schemes. Web-to-host solutions, like those illustrated here, can significantly reduce both capital and operational costs, and, at the same time, increase an organization’s effectiveness and competitiveness. The broad cost reduction capabilities of Web-to-host, so important in the current economic climate, can be broken-down into the following categories:

- *A reduction in client-side software installation and maintenance due to ‘thin-client’ technology.* Most Web-to-host solutions come as either Java- or ActiveX-based ‘thin-client’ solutions, or ‘zero footprint’ server-side host-to-HTML conversion solutions that require only a standard Web browser on the client machines. The Java and ActiveX emulators don’t have to be individually installed on each client; instead, they’re installed on a central Web server. The emulator will be dynamically downloaded to the client when it’s invoked for the first time, typically via a Web browser, from that client machine. Normally, the emulator will then be cached on the client system’s hard drive to remove the need for repeated downloads.

Note that caching doesn’t preclude automated updating of the emulator software. Each time the emulator is invoked, an automatic query is sent to the Web server from which the software was initially downloaded, to determine whether there’s a new version of the software. If a new version is available, the user can download the new software. Automating client-side software installation using this ‘thin-client’ approach, or eliminating host access-related client software altogether by adopting a zero footprint solution, can save enterprises approximately \$150 per client (ie desktop and laptop) per year. If you’re dealing with thousands of clients this soon adds up to a hard-to-ignore cost saving. The Old Florida Bank, C.H. Robinson, and National Archives case studies all testify to these ‘thin-client’ cost savings. Old Florida Bank and C.H. Robinson both use solutions provided by ICOM Informatics – a French company with a strong US operation that offers Java, ActiveX, and zero footprint products, and has done much to publicize the cost-savings possible with Web-to-host technology.

Customer	Industry sector	Web-to-host technology	Key payoff	Solution provided by	Rejuvenated user interface
Old Florida Bank www.oldfloridabank.com	banking	ActiveX-based 'thin-client' tn3270(E) emulation	Minimized client software installation, maintenance and upgrade costs	ICOM Informatics www.icominfo.com	No
US National Archives and Records Administration www.nara.gov	federal govt	'on-the-fly' 3270-to-HTML conversion	Slashed remote host access costs by adopting Internet-based mainframe access	ResQNet.com www.resqnet.com	Yes
Museum of Modern Art in New York city www.moma.org	Entertainment/ education	ActiveX 'thin-client' AS/400 access with extensive customization	Vastly improved user productivity and reduced training costs	looksoftware www.looksoftware.com	Yes
C.H. Robinson www.chrobinson.com	transport	ActiveX-based 'thin-client' host access	Expedited new user activation & reduced remote access costs	ICOM Informatics www.icominfo.com	No
Mercedes Benz (Belgium) www.daimlerchrysler.be	automotive	NT server-based integration of mainframe and SQL database data	Expedite order processing and enhance customer satisfaction	NetManage www.netmanage.com	Yes
Lykes Lines www.lykeslines.com	transport	Representation of 5250 screen data in XML for integration with Web pages	Reduce call center costs, increase business volumes and enhance customer satisfaction	Farabi Technology www.farabi.com	Yes

Figure 1: Case studies

- *A reduction in remote access costs.* Given the built-in Secure Sockets Layer (SSL) based authentication and end-to-end encryption now available with most Web-to-host solutions, the Internet can be safely and profitably used as a means of realizing data centre access from any remote location across the globe. Internet-based host access thus provides a near zero-cost (ie less than \$50/month unlimited usage per 'location' through an ISP account) means for remote access applications such as remote office networking, telecommuting, mobile user communications, agent/distributor access, and b2b interactions. The National Archives and C.H. Robinson case studies demonstrate the significant cost-savings possible with Internet-based data centre access.
- *A reduction in call centre costs.* By giving host applications a rejuvenated 'point-and-click' interface and making them Internet-accessible, it's often possible to ensure that business partners, agents, and customers can directly interact with that application and obtain authorized information rather than having to call and deal with a representative. This is the notion of so-called 'self-service' applications. The Lykes Lines and Museum of Modern Art case studies are examples of how call centre costs can be minimized by permitting direct, but secure, access to designated host applications.
- *A reduction in operational costs by improving productivity.* Providing a well-designed, contemporary 'point-and-click' interface to a hitherto purely textual 'green screen' application can expedite data entry, minimize orientation time, reduce errors, lessen user training needs, and increase transaction volumes. The Mercedes Benz (Belgium), Museum of Modern Art, and National Archives case studies all demonstrate the advantages of providing certain host applications with rejuvenated user interfaces.

Some of the ways in which Web-to-host solutions can bolster business operations and increase competitiveness include:

- *Affordably increasing the overall reach of the organization.* A 'self-service' application, with user-ID/password-based authentication if necessary, can be accessed across the Internet,

24x7, from around the world. This resolves all issues related to time-zone differences, long-distance telephone costs, and even language difficulties. All that's normally required to make a host application a 'self-service' application is a good host-to-HTML conversion product and a standard Web server. The Lykes Lines case study in particular shows how a company with a worldwide operation can benefit from exploiting the 'access without boundaries' possibilities of the Internet.

- *Increasing customer satisfaction.* 'Self service' applications provide customers with instant access to the information they're seeking, without the frustrating delays and misunderstandings that can arise when dealing with a call centre. 'Self service' applications also let customers see in real-time what they're getting and when they can get it by. The Mercedes Benz and Lykes Lines case studies are good examples of this.
- *Eliminating new user activation lead-time.* Traditional remote access schemes didn't permit new users to be added 'on-the-fly'. There was always a lead-time, either to get the necessary access software to the remote user, or to add the necessary 'port' at the central site. Internet-based Web-to-host schemes, whether 'thin-client' or zero footprint, in marked contrast, permit instantaneous new user activation, provided that the user already has an Internet connection and a standard Web browser. In around 1997, The Chickering Group, one of the first adopters of Web-to-AS/400 technology, cited this fast activation as the pivotal factor in its decision to go with the Internet. Now, C.H. Robinson and Old Florida Bank echo this theme again.

OLD FLORIDA BANK

Old Florida Bank, with offices in Fort Myers and Bonita Springs, was formed in 1998 by a group of local bankers and business leaders to provide high-quality financial products and personalized customer service to people and businesses in Southwest Florida. It aims to be a premier financial services company with a proactive approach to its customers' needs, fostered and facilitated through local management and timely decision making. Its overriding goal is to provide value to its customers through outstanding customer service, competitive

products and services, and progressive technology. Old Florida Bank targets small businesses and their owners, and takes pains to thoroughly understand their operation, needs, and aspirations. It also addresses all of the banking needs for commercial real estate.

The tellers and customer service representatives at Old Florida Bank use the PC-based EZTeller package from Easy Systems (www.easysystems.com) for most of their daily transactions. However, their customer information is maintained at a mainframe data centre in Omaha, NE. 3270 emulation on the teller and customer service representatives' PCs is used to access this customer information. Soon after transitioning to Y2K, Old Florida Bank upgraded its EZTeller software to the latest 32-bit, Windows version – referred to as EZTeller32. At the same time, it decided to upgrade its 3270 emulation package which was from a company known as Data Interface Systems – then the US distributor for ICOM Informatics. Since ICOM now marketed a feature-rich Windows 'fat client' called Winsurf+, the MIS Director of Old Florida Bank contacted it to inquire about possible upgrade paths.

When looking at ICOM's repertoire of solutions, the MIS Director saw the all-inclusive Winsurf Mainframe Access (WMA) Web-to-host solution with its Java and ActiveX clients, as well as a zero footprint 'on-the-fly' 3270/5250-to-HTML conversion solution. Old Florida Bank wasn't looking for a Web-to-host product at that time, since it used a private Frame Relay network to access the outsourced mainframe. However, with a remote office to support and a relatively small IT staff, the automatic remote installation and upgradability hallmarks of a 'thin client' scheme were hard to ignore. The ability to easily add new PCs to the network and have the host access software automatically installed the first time a user tried to access the mainframe was the icing on the cake. Old Florida Bank decided to purchase WMA instead of a traditional 'fat client'.

ICOM supplied Old Florida Bank with a CD-ROM containing all the WMA software. (It could also have downloaded it all from the ICOM Web site.) The MIS Director could install all the WMA software and have all its PCs, across both offices, running the new software within 2 hours, whereas with a fat client approach he would have been lucky to get 5 PCs up and running in that time.

US NATIONAL ARCHIVES AND RECORDS ADMINISTRATION

The National Archives was founded in 1934 and became an independent Federal agency, now known as the National Archives and Records Administration, in 1985. NARA is dedicated to helping preserve the USA's history by overseeing the management and safe-keeping of all Federal records. Among the many historical treasures preserved by NARA are the cornerstone documents of the country and the government, including the Declaration of Independence, the Constitution of the United States, and the Bill of Rights. NARA's mission is to ensure ready access to the essential evidence that documents the rights of American citizens, the actions of Federal officials, and the national experience. NARA's goal is to make sure that it's easy for citizens to access this essential evidence regardless of the location of the documentation or of the other people using it.

Only a relatively small amount of NARA's enormous volume of 'holdings', which include movies, audio recordings, and videos, is currently available in digital form – but this includes a plethora of documents and photos of historic and cultural significance. NARA, however, already provides a prototype of an on-line database, called NARA Archival Information Locator (NAIL), which currently contains information relating to around 750,000 NARA holdings. Much of the information requested from NARA is physically stored at sixteen Federal records centres located throughout the country. A Record Center Program that enables users to request access to these records has existed within NARA since 1950. The users of this program include the US Senate, the Department of Defense, the Social Security Administration, the Immigration and Naturalization Service, and other similar federal agencies. For the last ten years or so, NARA's customers have requested these documents via a mainframe CICS application known as the 'Centers Information Processing System' (CIPS).

NARA's mainframe-related data centre operations have been outsourced to the Department of Veterans Affairs Austin Automation Center (VA) (www.va.gov) over the last couple of years. The NARA CIPS application therefore now runs on a System/390 mainframe at VA's Austin, Texas data centre. Since most CIPS users have Internet access, enabling them to interact with CIPS over the Web rather than

via dial-up, remote access not only reduces costs but also simplifies and streamlines network operation. Now users can just use their existing Internet connection to reach CIPS without having to dial out over a modem to contact the mainframe. Using the Web for mainframe access thus eliminates the dial-up costs, which, in this case, meant a saving of millions of dollars. It also ensured that new authorized users can be quickly activated through their existing Web connection.

NARA asked the VA Austin Automation Center IT to find a way to Web-enable CIPS. The VA Austin Automation Center located ResQNet's ResQPortal, which offered Web-to-mainframe integration via 'on-the-fly' 3270-to-HTML conversion along with dynamic user interface rejuvenation. The VA Austin Automation Center evaluated ResQPortal with help from ResQNet, with ResQNet customizing some of the screens to demonstrate the user interface rejuvenation prowess of the ResQNet technology. (IBM licenses ResQNet technology for use with its Host On-Demand and Screen Customizer products.) The VA Austin Automation Center and NARA were impressed with the ResQPortal solution and its ability to deliver a user-friendly Web page-based interface to CIPS complete with end-to-end SSL security via the Web server.

The ResQPortal Web-to-mainframe solution, with the Java-based ResQPortal installed on a Sun Ultra 10 Server running Solaris, was put into production use in Autumn 2000.

NARA has been very pleased with the results of this zero footprint Web-to-host solution. The ResQPortal approach offers many advantages to the CIPS users, NARA, and the VA Austin Automation Center. For a start, it's a totally self-contained server-side solution that doesn't require any applets (or software) to be downloaded and executed on the client systems. This prevents applet download delays and the need to be concerned about the possibility of back-level software versions lurking on some client systems. Moreover, all of the mainframe access is realized directly through the Web browser interface, through a rejuvenated 'point-and-click' interface, without the presence of any emulation or Java applet windows. It is therefore a *bona fide*, fully integrated, browser-based, Web-to-mainframe solution with user interface rejuvenation and end-to-end security. ResQPortal, running on Solaris, is also highly scalable and responsive.

This is important, because this is a high-traffic volume application with a growing user base. (Since ResQPortal is Java-based, there's always the option of moving it to the mainframe in the future.)

LYKES LINES – AN XML EXAMPLE

Lykes Lines is a regional container shipping subsidiary within the sprawling Canadian Pacific empire. Its Web site provides extensive, quasi-real time shipping schedules accessed via a button labelled 'Routes and Schedules' on the home page. The data for these schedules is obtained from a 'Vessel Scheduling System (VSS)' running on an AS/400 in Tampa, Florida. This heavily used Web system is based on an off-the-shelf host integration solution from Farabi Technology running on an NT server. To obtain real-time shipping schedules from the VSS system, you have to move through multiple 5250 'green screens', with a typical query involving up to seven screens. Farabi discovered that trying to access all the necessary 5250 screens, on-demand, each time there was a Web query for a shipping schedule was too resource-intensive and resulted in unacceptable response times.

Rather than trying to interactively access the 5250 screens, Farabi came up with a scheme, implemented with a C++ program running on the NT server, whereby all the 5250 screens are periodically accessed through a continually looping mechanism. The shipping schedules thus obtained are then transcribed to a file on the NT server using a XML schema that conforms to Microsoft's XML guidelines for its Active Server Page (ASP) server-side scripting system. ASP technology is widely used to build interactive Web pages and Web applications. The Web pages displaying the Lykes Lines shipping schedules were built using ASP technology. The actual shipping data, represented in XML, is embedded into these pages using a standard XML integration feature now available with ASP.

As well as showing the benefits possible with XML, this case study also illustrates another feature of host integration, namely host screen consolidation and streamlining. In this example, a single Web page displays the data that could have required up to seven separate 5250 screen interactions. FedEx has an in-house intranet flight-booking system for its employees, where a single Web page with point-and-

click GUI interface replaces a flight selection and booking process that involved up to twenty 3270 screens. This screen consolidation is possible because host integration sets out to isolate the business logic of a host application from its native 'green screen' user interface.

MUSEUM OF MODERN ART IN NEW YORK CITY

MoMA was the first museum to devote its programmes and collection entirely to the modern movement. From an initial gift of eight prints and one drawing, the collection has grown to encompass more than 100,000 works in a variety of media, divided into six collecting areas: architecture and design, drawings, film and video, painting and sculpture, photography, and prints and illustrated books. The works in the collection date from the 1840s for photography, and from the 1880s to the present day for other media.

As well as an AS/400, MoMA currently has 60 to 70 NT and Unix servers running applications ranging from supply ordering to film archiving. Membership, membership development, acquisition tracking, and retail applications are run on the AS/400. MoMA's goal is to migrate as many of the other applications onto the AS/400 as possible, and to develop new applications in RPG for the AS/400. The one issue that it has with the AS/400 is the 'green screen' textual user interface of typical AS/400 applications. With many volunteers using its system, for example to add new members to the membership database, the textual, 'non-Windows' interface was a hindrance; MoMA wanted a way to quickly and dramatically rejuvenate its 5250 screens.

newlook by **looksoftware** has taken the AS/400 market by storm over the last few years. **newlook** is an ActiveX-based 'thin-client', PC-to-AS/400 scheme with an inordinately powerful autoGUI scheme that takes raw 5250 screens and dynamically (ie 'on-the-fly' and run-time) converts them into appealing GUI screens using an extensive library of pre-defined 5250-to-GUI transformations developed by **looksoftware**. Customers can then customize the screens further using a Designer tool.

MoMA evaluated a number of leading 5250 user interface rejuvenation schemes, including those from IBM and SEAGULL, before opting for

newlook because of its impressive, ‘straight-out-of-the-box’ autoGUI capability. It evaluated **newlook** for 30 days before purchasing it. Five of its programmers then received three days of training by **look**software. Following this training, MoMA converted 350 ‘green screens’ into ‘point-and-click’ GUI screens in less than a month! The MoMA staff and the volunteers who use the membership applications are delighted with the results. **newlook**, which will be available for 3270 screens soon, is a way to improve productivity and user satisfaction quickly and affordably.

MERCEDES-BENZ (BELGIUM)

Ordering a Mercedes-Benz with exactly the options that a customer requires, and then getting a manufacturing slot for it to be built, used to be a lengthy and involved process. To determine the exact options available for a specific model and to price those options, a Mercedes Benz sales person would have to look up information on print-outs as well as refer to an on-line mainframe system. In some instances, option numbers from the print-outs would have to be entered into a 3270 screen to get the necessary information. This process could be long and cumbersome. Furthermore, once a car was configured with the exact options required by the customer, the order to manufacture it had to be placed with a different mainframe system in Germany. Sometimes, the sales person wouldn’t be able to complete this whole process in real-time with the customer. Instead, they would have to call the customer back to tell them how much the options would cost and then place the order. Mercedes-Benz customers in Belgium weren’t happy with this lengthy process.

Mercedes-Benz (Belgium) decided to implement its own system to enable its customers to interactively configure the car of their choice on a PC screen – aided, throughout, by dynamically updated visual prompts. This new application would then enable the customer, in conjunction with the salesperson, to actually place the order for the customized car and book a manufacturing slot. This would require access to two separate mainframe applications as well as the ability to integrate vehicle build data stored on a SQL database running on an NT Server.

After investigating various host integration solutions from leading

players, Mercedes-Benz (Belgium) decided to go with NetManage's NT-based OnWeb, which provided it with the necessary mainframe and SQL database integration capability. The software for handling the Web interface, interchanging data with the mainframes, and accessing the SQL database was developed by NetManage's European consulting group using Visual Basic and REXX. This software runs on an NT-server alongside OnWeb, which handles the mainframe and SQL access needs. This project was successfully completed within 80 days. Now Mercedes-Benz customers in Belgium can customize and order their cars in real-time using a user-friendly, browser-based GUI that shows them exactly what their car will look like as they add or remove various options.

C. H. ROBINSON

C.H. Robinson Worldwide, with revenues approaching \$3B, is one of North America's largest third-party logistics and transport companies. It has 138 offices spread across the USA, Canada, Mexico, Europe, and South America. Last year, CHRW handled approximately 2.3 million shipments, serving more than 14,000 customers, in a variety of industries ranging from Fortune 100 companies to small businesses.

Certain CHRW employees, mostly sales representatives, are permitted to remotely access applications on CHRW's mainframe in Eden Prairie, MN, either from home or from the road. Initially, this access was provided via fat-client emulators working in tn3270 mode. The main problems with this approach were activating new users and maintaining the software on the remote PCs. When a new salesperson joined, the CHRW IT department had to either send the fat-client emulator software to that user by mail or make arrangements for it to be downloaded from a server. Instead, CHRW wanted a true 'thin-client' solution that the users could dynamically download without any central intervention. As with many of today's customers, CHRW started looking for such a solution by doing a Web search.

CHRW ended up picking the ActiveX emulator available with ICOM's WMA product, after also evaluating another ActiveX product from Zephyr. One of its main test criteria was ease of installation on remote client machines. It was particularly impressed with WMA's installation wizard and its ability to simplify remote connection configuration.

WMA's remote 3287-mode printing prowess was another plus. Right now, CHRW uses around 110 concurrent sessions to provide its remote users with mainframe access. Once it had chosen WMA for its remote users, CHRW started exploring the possibility of using WMA's 5250 and VT mode access to provide in-house users with extranet-based access to applications running on some of its strategic partners' AS/400 and Unix systems.

SUMMARY

With IT budgets under considerable pressure, today's Web-to-host solutions do offer a proven way to immediately and significantly reduce operational costs while at the same time increasing customer reach and competitiveness. The six real-life case studies above testify to the advantages of adopting 'thin client' Web-to-host solutions. There is no longer any real need to procrastinate. Large customers such as those mentioned above can attest to this technology. It's now time to evaluate Web-to-host technology not just as a Web-enabling mechanism but as a tangible way to reduce costs.

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TCP/SNA and related education

As a special feature this issue, we look at many of the outside sources of education for TCP/SNA and related networking topics. There are five articles immediately following this introduction, each covering a different approach:

- Internet-based training (IBT), with and without an instructor, including the scheduled virtual classroom method.
- Other forms of self-study, including Download and Play, intranet, LAN- and mainframe-based computer-based training (CBT) and Web-based training (WBT), CD-ROM, diskette, audio and video cassettes, text, and a combination of one or more of these.
- Classroom courses, both scheduled public and private in-house.

- Conferences.
- Training Directories.

IBT is listed first, not only because of its potential to provide highly effective training at a very low price, but also because it has become the medium of choice for most education vendors. Ironically, this growth has coincided with the so-called death of the dot-coms that began in March 2000.

WHAT'S MISSING?

Note that we've omitted many other forms of education, including vendor marketing seminars, satellite broadcasts (most notably IBM's), live conference calls (initially by telephone, but now evolving to Internet Web-based), and books and periodicals (including *TCP/SNA Update*). Their omission does not imply that much cannot be learned by attending or using any of them. It merely proved impractical to list them all.

WHAT YOU WILL FIND

Course listings are formatted as follows:

- Educational source - <http://www.url.com>
- Any notes on source or that apply to all courses.
- Course title (course number, length of course). Any notes that apply to course. Price.
- Next course ...

All of the information was obtained from the Web sites of the educational sources. For example, if you don't see a price listed for a course, even when all other courses from the same vendor have a price listed, that means that the Web site either did not list a price for the course or the price looked wrong. Likewise, courses were dropped when they appeared in a list of courses on the Web site, but the hypertext link to the course description was bad. If one course in a series of courses had a bad link, the entire series was dropped. Past experience indicates that, most often, a bad link means an obsolete

course that has not been deleted from a Web site, because most corporate Web sites are maintained with software that checks for bad links as each Web page is edited.

Where pricing is shown, it doesn't include any applicable taxes. The currency involved is indicated by the currency symbol preceding the price. The one exception is classroom courses offered only in Canada, where the price is quoted in Canadian dollars, currently worth about 64 US cents. For a series of courses, the total length of time required for the entire series is listed, but the price is quoted per course.

For each educational source, courses are listed alphabetically except for those deemed of special interest, which are listed first. Educational sources are also listed alphabetically, but, where relevant, are grouped geographically based on regions of the world served.

DISTRIBUTORS

With a few notable exceptions, distributors are not listed, but only the current owner of the rights to a given course. This decision was driven by purely practical reasons, most notably the number of distributors involved. For example, when last checked, one of the IBT companies listed had over 1,500 distributors worldwide.

The one place where you will find distributors is in the list of Training Directories. Most training directories are also distributors of the courses they list, and several distributors sell enough courses to make their course catalogues training directories in their own right. In fact, it's often difficult to tell which came first: was this a distributor that became a training directory, or a directory that became a distributor to fund the maintenance of the directory?

Distributors aren't difficult to find. Most of the education sources distribute their own courses, though your consumer savvy should tell you to also check a few of their distributors to see if you can negotiate a better price. Finding a distributor is usually as easy as checking the Web site of the education source listed by URL in these articles. If they don't list distributors on the Web site, most provide a Web form, e-mail address, or telephone number to call to be given the name of a distributor or to have a distributor contact you.

HIERARCHY

To reduce the amount of information presented, a hierarchy of preference is used, with the assumption that IBT is preferable to other forms of self-study, self-study to classroom courses, and public classroom to private in-house courses. Therefore, a course available in IBT is usually not listed under other self-study or classroom courses, even when it is also available in that form. In fact, an education vendor may not even be listed in these other categories if all relevant courses are also available as IBT. Likewise, self-study to classroom, and public to private.

The next article begins the series and focuses on IBT.

Editor's note: If you know of any additional sources of TCP/SNA-related education that have not been covered in this series of articles, please send details to the editor, Fiona Hewitt, at any of the addresses shown on page 2, or e-mail her at fionah@xephon.com

*Chris Bruns
(Canada)*

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TCP/SNA Internet-based training

Internet-Based Training (IBT) is presented first in this series of articles on TCP/SNA and related network education, because it holds the potential to be the most convenient and cost-effective form of technical training. But, as a friend and Computer-Based Training (CBT) pioneer recently warned me, there are many studies that support the theory that you need consistent subsecond response time for maximum effectiveness. Otherwise, the student loses concentration very quickly.

Since your organization's Internet connection(s) is probably part of your responsibility, you are doubtless already painfully aware of the difficulty of providing consistent end-to-end response time across the Internet. But my own evaluations of IBT indicate that much can be done with careful design on the part of the creator of the IBT. For example, by reusing a small set of colour backgrounds and icons, the Web browser can get them from its cache rather than reloading them

off the Web site for each page in turn. It may even be possible to preload the next few pages while the student reads the current page.

Note that the term 'IBT' is used here instead of the term 'Web-Based Training' (WBT), because this article deals only with courseware delivered directly to your workstation from the Internet. Download and Play, and WBT that requires installation on your local intranet, is listed in the article that follows, 'Other Self-Study'. For reasons of space, you will generally not find a course listed in 'Other Self-Study' if it is available in IBT and is listed here.

Three types of IBT are listed below:

- Unless otherwise noted, courses are self-paced without an instructor.
- With instructor is still self-paced IBT.
- Virtual classroom uses IBT technology for a scheduled course with instructor that you can take anywhere there is a workstation and Internet connection.

Caliber – <http://www.caliber.com>

- *CCNA Guide to Cisco Networking Fundamentals* (66 hr). \$599.
- *Data Communications and Computer Networks* (24 hr). \$299.
- *Linux Networking* (23 hr). \$299.
- *MCSE Guide to Networking Essentials* (50 hr). \$499.
- *MCSE Guide to TCP/IP on Windows NT 4.0* (48 hr). \$499, currently free for 30 day trial.
- *MCSE Guide to Windows 2000 Networking* (30 hr). \$399.
- *Network+ Guide to Networks* (44 hr). \$399, currently free for 30 day trial.

Candle – <http://www.candle.com>

- *OMEGAMON II for VTAM, the TCP/IP Feature* (OM2VTAMD, 2 hr).
- *WebSphere Technical Overview* (WEBSINTDL, 2 days). Virtual classroom. \$250.

DigitalThink – <http://www.digitalthink.com>

- *MS TCP/IP on NT 4.0 Certification Series* (40 hr). \$575/6 months.
- *Networking Essentials Series* (45 hr). \$875/6 months.
- *Unix Network Administration I* (8 hr). \$325/6 months.
- *Windows 2000 Networking Essentials* (8 hr). \$327/6 months.

EducationToGo – <http://www.ed2go.com>

- *MCSE Certification 3* (12 lessons). *Implementing and Administering a Microsoft Windows 2000 Network Infrastructure*. With instructor.

Element K – <http://www.elementk.com/corp/Catalog.html>

- *TCP/IP: Introduction and Advanced* (2 courses).
- *A+ Certification: LANs, WANs, and the Internet*.
- *Advanced Intranets for eCommerce*. With instructor.
- *AS/400 Introduction Part II*. Includes networking.
- *ATM Troubleshooting*.
- *Essentials of Microsoft Networking Second Edition* (2 courses).
- *i-Net+ Certification*. Also available with instructor.
- *Intranets: An Introduction*. Also available in German, Spanish, French, Italian, and Japanese.
- *Introduction to ATM*.
- *Introduction to Data Communications* (2 courses).
- *Introduction to Telecommunications*.
- *Microsoft Networking Essentials* (2 courses). With instructor.
- *NetMeeting 3.0: Internet Conferencing*.
- *NetWare 5.0 Principles of Internetworking* (2 courses).
- *Network+ Certification* (3 courses). Also available as two courses with instructor.
- *Technical Introduction to the Internet*.
- *Voice Over IP*.
- *Windows 2000: Designing Network Services* (2 courses). Also available with instructor.
- *Windows 2000: Implementing and Administering the Network Infrastructure* (2 courses). With instructor.
- *Windows 2000: Network and Operating System Basics* (2 courses).
- *Windows 2000: Network Infrastructure Implementation* (2 courses).
- *Windows NT 4.0: Internetworking with TCP/IP* (2 courses). With instructor.

Global Knowledge – <http://www.globalknowledge.com>

- Except for the virtual classroom courses, individual modules of each course are also sold separately.
- *Troubleshooting TCP/IP Networks*. \$795.
- *ATM Essentials*. \$795.
- *ATM Internetworking*.
- *Converging Voice and Data Networks*.
- *Fundamentals of e-Business* (16 hr). Virtual classroom. \$1195.
- *ICND (Interconnecting Cisco Network Devices)* (24 hr). Virtual classroom. \$1995.
- *Internet and Network Communications* (16 hr). Virtual classroom. \$1195.
- *Internetworking with TCP/IP*. \$1095.
- *Introduction to Voice Over IP*. \$795.
- *Introduction to Wireless Communications* (15 hr). Virtual classroom. \$1195.
- *IT Boot Camp*. \$1295.
- *Network Management Essentials*.
- *Networking for Professionals* (16 hr). Virtual classroom. \$1195.
- *Telecommunications Fundamentals* (2 courses). \$1395 for both courses.

- *The Internet and the Law* (20 hr). Virtual classroom. \$1195.
- *Understanding Networking Fundamentals*. \$1075.
- *Wireless IP Infrastructure & Data Mobility*.

Global Knowledge e-learning – <http://www.mindfire.com>

- *Converging Voice and Data Networks* (282116). \$795.
- *Essentials of Electronic Commerce* (2 courses, 281490-1). \$495/course.
- *Internetworking with TCP/IP* (4 courses, 282008-11). \$395-\$495/course.
- *Introduction to Voice Over IP* (282122). \$795.
- *Network Management Essentials* (282150). \$1095.
- *Telecommunications Fundamentals* (2 series of 4 courses each, 281997-2005). \$1395 or \$795/series or \$195-\$395/course. e-mentoring (on-line assistance) is an extra \$80.
- *Troubleshooting TCP/IP Networks* (2 courses, 282031-2). \$395-\$495/course.
- *Understanding Networking Fundamentals* (4 courses, 281992-5). \$1095 or \$295-\$395/course. e-mentoring is an extra \$110.
- *Wireless IP Infrastructure & Data Mobility* (282144). \$1095.

IBM UK – <http://www.ibm.com/services/learning/uk>

- *e-business Technology Fundamentals* (EB90v1, 12 hr). £350.

IBM US – <http://www.ibm.com/services/learning/lsweb/search>

- *5500 Express IP Control Unit Overview for AS/400* (IB008, 1 hr). Free.
- *AS/400 Networking* (IB083, 1.5 hr). Free.
- *AS/400 TCP/IP Tips and Techniques, Routing, and NAT* (IK028, 1 hr). Free.
- *Basic Data Communications* (AT110, 12 hr). \$155.
- *Basic Telecommunications* (AT120, 12 hr). \$155.
- *Building an e-Commerce Business Case* (WN879, 8 hr). \$150.
- *Cisco Internetwork Troubleshooting* (4 courses, WN773, WN822, WN772, WN771, 32 hr). \$150/course.
- *Client Access Express* (IB031, 2 hr). Using TCP/IP in the iSeries 400 environment. Free.
- *Designing and Securing a TCP/IP and DHCP Solution* (WD689, 8 hr). WD883 appears to be the same course. \$325.
- *Designing e-Commerce Solutions* (EB650, 12 hr). \$450.
- *Developing e-Commerce Solutions: The Full Life Cycle* (EB630, 12 hr). \$450.
- *e-Business 102* (IB074, 1 hr). Includes TCP/IP configuration in the iSeries 400 environment. Free.
- *e-Business Architecture* (WD627, 10 hr). \$325.
- *e-Business Technology Fundamentals* (EB900, 18 hr). \$225.
- *e-Commerce Fundamentals* (WD625, 10 hr). \$325.
- *e-Commerce Implementation Issues* (WN608, 8 hr). WN864 appears to be the same course, but is listed as 7 hr. \$150.
- *Elements of an e-Business Solution* (WD628, 10 hr). \$325.
- *Essential Global Design Decisions for Windows 2000 Networks* (WD693, 8 hr). \$325.
- *Evaluating e-Commerce Options* (WN865, 8 hr). \$150.

- *i-Net+ Part 1: Internet, Networking, and Protocols* (WN985, 8 hr). \$150.
- *Internetworking with MS TCP/IP on NT 4.0* (2 courses, WD711-2, 40 hr). \$325/course.
- *Introduction to e-Commerce* (WN607, 8 hr). WN927 appears to be the same course, but is listed as 7 hr. \$150.
- *Introduction to Legacy Systems and Connectors* (VJ30A, 10 hr). \$300.
- *Introduction to the Internet and World Wide Web* (WN756, 8 hr). Includes ftp. \$75.
- *Java 2 Programming Part 5: Streams and Networking* (WN998, 8 hr). \$150.
- *LAN/WAN Integration* (WN700, 8 hr). \$150.
- *Microsoft Visual InterDev 6.0: Accessing Remote Data* (WN692, 8 hr). \$150.
- *Microsoft Windows 2000 Installation Configuration and Administration Part 5: Networks* (WN662, 8 hr). \$150.
- *Microsoft Windows 2000 Network Infrastructure Administration* (5 courses, WN666, WN668, WN670, WN672, WN674, 40 hr). \$150/course.
- *Microsoft Windows NT Server 4.0 Network Analysis and Optimization* (2 courses, WN650, WN977, 16 hr). \$150/course.
- *MS Win 2000 – Designing a Network Infrastructure* (4 courses, WN844-6, 24 hr). Includes SNA. \$150/course.
- *Networking Essentials*. There are three separate series with this title. The first two each comprise three courses. WD694-6 is 45 hours in total and priced at \$325/course. WN739-41 is 24 hours in total and priced at \$150/course. The third series is known as the Second Edition, although some titles are Network Essentials while others are Networking Essentials. There are 4 courses in the series (in order: WN883, WN859, WN884, WN860) totalling 32 hours at \$150/course.
- *Networking Linux* (QX15S, 20 hr). A text book is also required. \$175.
- *Networking Technologies Series: TCP/IP* (WN876, 8 hr). \$150.
- *Networking Technologies Series: TCP/IP Internetwork Management* (WN880, 8 hr). \$150.
- *Red Hat Linux Networking Services* (2 courses, WD856-7, 16 hr). \$450/course.
- *Strategies for e-Commerce Site Implementation* (WD626, 10 hr). \$325.
- *Supporting Routing and RAS for MS Windows NT Server 4.0* (4 courses, WN834, WN875, WN852, WN851, 32 hr). \$150/course.
- *TCP/IP Communications and Support* (2 courses, IK078-9, 2 hr). TCP/IP in the iSeries 400 environment. Free.
- *TCP/IP Concepts and Architecture*. There are two courses with this title: WN701 and WN869. Although the contents differ, each is 8 hours long and \$150.
- *TCP/IP Network Administration* (2 courses, Q105S, Q109S, 40 hr). \$175/course.
- *TCP/IP Overview & Configuration* (IB080, 1 hr). TCP/IP in the iSeries 400 environment. Free.
- *Tivoli NetView 6.0 for NT for Operators* (WT150, 6 hr). \$300.
- *Tivoli Web Services Manager 1.6 for System Administrators* (WT130, 8 hr). \$300.

- *Unix Part 2: Advanced Topics for Users* (WN616, 8 hr). \$150.
- *VB 6.0 Distributed Security and Advanced Client/Server Technologies* (WD658, 8 hr). Microsoft SNA Server is included. \$325.
- *VoIP Essentials* (AT160, 3 hr). \$155.
- *WebSphere Commerce Suite V4.1 Advanced Tuning and Performance* (EB960, 5 hr). \$25.
- *WebSphere Commerce Suite V5.1 System Administration* (WA230, 10 hr). \$25.
- *Windows 2000 Installing Configuring and Networking* (WD666, 8 hr). \$325.
- *Windows 2000 Networking Essentials* (WD665, 10 hr). WD874 appears to be the same course. \$325.
- *Windows 2000 RIS, Network Connectivity and Troubleshooting* (WD680, 8 hr). \$325.
- *Windows 2000 Router and Web Server Configuration* (WD679, 8 hr). \$325.
- *Windows NT Server 4.0 in the Enterprise* (3 courses, WD702-4, 30 hr). \$325/course.
- *Wireless Technologies* (AT1C0, 16 hr). \$155.

iLearning – <http://www.ilearninginc.com>

- Requires free registration to view the course catalogue which contains only titles of course and no course descriptions.
- *CCNA Guide to Cisco Networking Fundamentals*. \$299.
- *MCSE Guide to Networking Essentials*. \$299.
- *MCSE Guide to TCP/IP on MS Windows NT 4.0*. \$299.
- *Network+ Guide to Networks*. \$299.

InfoSource – <http://www.howtomaster.com>

- *Designing a Microsoft Windows 2000 Network Infrastructure* (8 courses, 34 hr).
- *Implementing and Administering a Microsoft Windows 2000 Network Infrastructure* (9 courses, 62 hr).
- *TCP/IP Addressing on CISCO Routers* (P0100164, 4 hr). \$19.99/month for unlimited access to a lot of courses.

KnowledgeNet – <http://www.knowledgenet.com>

- *CompTIA A+*. \$495.
- *CompTIA i-Net+*. \$495.
- *CompTIA Network+*. \$495.
- *Designing a Microsoft Windows 2000 Networking Services Infrastructure* (1562, 15 hr). With instructor. \$995.
- *Introduction to Internet Protocol (IP) Addressing* (1 hr). With instructor. \$95.
- *Introduction to Networking*. \$195.
- *Microsoft Windows 2000 Network and Operating System Essentials* (2151). With instructor. \$995.
- *Microsoft Windows 2000 Network Infrastructure*. \$495.
- *Microsoft Windows 2000 Server*. \$695.
- *Supporting Microsoft Windows 2000 Network Infrastructure* (2153, 18 hr). With instructor. \$1195.

- *Supporting Microsoft Windows 2000 Professional and Server* (2152, 18 hr).
With instructor. \$1195.

KT Solutions – <http://www.ktsolutions.com>

- *A+* (20 hr).
- *Advanced Internet Fundamentals* (5 hr).
- *Basic Internet Fundamentals* (5 hr).
- *Cisco CCNA Internetworking Technologies* (2 courses, 8 hr).
- *Cisco CCNA IP Routing Concepts* (4 hr).
- *Cisco CCNA IP Routing Configuration* (4 hr).
- *CISCO CCNA TCP/IP Addressing on CISCO Routers* (4 hr).
- *Introduction to Electronic Commerce* (4 hr).
- *Java 2: Networking* (3 hr).
- *MCSA Solution Architectures II* (2 hr).
- *Microsoft Windows 2000 Server MCSE: Implementing Interoperability* (4 hr).
- *Microsoft Windows 2000 Network Infrastructure Design MCSE: Designing a Network Strategy* (5 hr).
- *Microsoft Windows 2000 Network Infrastructure Implementation MCSE: Configuring IP Routing Protocols* (4 hr).
- *Microsoft Windows 2000 Network Infrastructure Design MCSE: Internet Connection Infrastructure* (4 hr).
- *Microsoft Windows 2000 Network Infrastructure Design MCSE: Internet Connectivity Strategies* (3 hr).
- *Microsoft Windows 2000 Network Infrastructure Design MCSE: Preparing for Windows 2000 Network Services Infrastructure* (5 hr).
- *Microsoft Windows 2000 Network Infrastructure Design MCSE: Wide Area Network Infrastructure* (5 hr).
- *Microsoft Windows 2000 Network Infrastructure Implementation MCSE: Configuring Network Protocols* (4 hr).
- *Microsoft Windows 2000 Professional End User Intermediate – Networking* (4 hr).
- *Microsoft Windows 2000 Server MCSE: Configuring Networking Services* (4 hr).
- *Microsoft Windows 2000 Server MCSE: Installing Windows 2000 Server* (3 hr).
Includes network settings.
- *Microsoft Windows 2000 Server MCSE: Managing File and Print Resources* (4 hr).
- *Microsoft Windows 2000 Server MCSE: Managing Hardware Devices* (4 hr).
Covers configuration of network adapters and protocols.
- *Microsoft Windows 2000 Server MCSE: Managing Terminal Services* (3 hr).
- *Microsoft Windows 2000 Server MCSE: Monitoring and Optimizing* (4 hr).
Includes network usage optimization.
- *Microsoft Windows 2000 Server MCSE: Setting Up Remote Access Service (RRAS)* (4 hr).
- *Microsoft Windows 2000 Server MCSE: Sharing Resources Over the Internet* (4 hr).
- *Networking Fundamentals* (8 hr).

Learn2 – <http://www.tutorials.com>

- *Basic Internet Business Fundamentals*. Part of CIW Foundations. \$39.95/6 months.
- *CCNA 2.0: Internetworking Technologies* (2 courses). \$129.95/course/6 months.
- *CCNA 2.0: IP Routing Concepts*. \$129.95/6 months.
- *CCNA 2.0: IP Routing Configuration*. \$129.95/6 months.
- *CCNA 2.0: TCP/IP Addressing on CISCO Routers*. \$129.95/6 months.
- *Designing a Microsoft Windows 2000 Network Infrastructure: Analyzing Network Requirements*. \$129.95/6 months.
- *Designing a Microsoft Windows 2000 Network Infrastructure: Designing Access Solutions*. \$129.95/6 months.
- *Designing a Microsoft Windows 2000 Network Infrastructure: Designing a Wide Area Network Infrastructure*. \$129.95/6 months.
- *Designing and Implementing Databases with Microsoft SQL Server 7.0: Accessing Remote Data*. \$129.95/6 months.
- *Getting the Most Out of the Internet* (4 courses). Includes *What is the Internet?*, *Client-Sided User of the Internet*, *Server-Side Use of the Internet*, and *Continuing Evolution*. \$19.95/6 months.
- *Implementing and Administering a Microsoft Windows 2000 Network Infrastructure: Configuring Network Protocols*. \$129.95/6 months.
- *Implementing and Administering a Microsoft Windows 2000 Network Infrastructure: Implementing IP Routing*. \$129.95/6 months.
- *Installing, Configuring and Administering Microsoft Windows 2000 Professional: Configuring Network Connectivity*. \$129.95/6 months.
- *Installing, Configuring and Administering Microsoft Windows 2000 Server: Configuring Hardware Devices*. Covers configuration of network adapters and protocols. \$129.95/6 months.
- *Installing, Configuring and Administering Microsoft Windows 2000 Server: Configuring Networking Services*. \$129.95/6 months.
- *Installing, Configuring and Administering Microsoft Windows 2000 Server: Configuring Web Services*. \$129.95/6 months.
- *Installing, Configuring and Administering Microsoft Windows 2000 Server: Implementing Interoperability*. \$129.95/6 months.
- *Installing, Configuring and Administering Microsoft Windows 2000 Server: Implementing Remote Access Service*. \$129.95/6 months.
- *Installing, Configuring and Administering Microsoft Windows 2000 Server: Managing Terminal Services*. \$129.95/6 months.
- *Installing, Configuring and Administering Microsoft Windows 2000 Server: Monitoring and Optimization*. \$129.95/6 months.
- *Installing, Configuring and Administering Microsoft Windows 2000 Server: Sharing Resources Over the Internet*. \$129.95/6 months.
- *MCSE Enterprise Interactive: Configuring Server Resources*. NT 4.0. \$129.95/6 months.
- *MCSE Enterprise Interactive: Internetworking NT 4 Server*. \$129.95/6 months.
- *MCSE Network Essentials*. \$69.95/6 months.

- *MCSE Networking Interactive: Maintaining Networks*. \$129.95/6 months.
- *MCSE Networking Interactive: Network Operations*. \$129.95/6 months.
- *MCSE Networking Interactive: Networking Fundamentals*. \$129.95/6 months.
- *MCSE Networking Interactive: Networking Standards*. \$129.95/6 months.
- *MCSE NT 4 Enterprise*. \$69.95/6 months.
- *MCSE NT 4 Server*. \$69.95/6 months.
- *MCSE NT 4 Workstation*. \$69.95/6 months.
- *MCSE NT Server 4.0 Interactive: Networking Win NT Server*. \$129.95/6 months.
- *MCSE NT Workstation 4.0 Interactive: Networking in NT Workstation*. \$129.95/6 months.
- *MCSE TCP/IP with NT 4.0 Interactive: Internetworking with TCP/IP*. \$129.95/6 months.
- *MCSE TCP/IP with NT 4.0 Interactive: Managing TCP/IP Networks*. \$129.95/6 months.
- *MCSE TCP/IP with NT 4.0 Interactive: MCSE TCP/IP with NT Bundle*. \$314.95/year.
- *MCSE TCP/IP with NT 4.0 Interactive: TCP/IP Services*. \$129.95/6 months.
- *MCSE TCP/IP with NT 4.0 Interactive: TCP/IP Windows NT 4 (5 courses)*. \$69.95/course/6 months.
- *Microsoft Windows 2000 End User: Networking*. \$129.95/6 months.
- *Networking Fundamentals*. Part of Certified Internet Webmaster (CIW) Foundations. \$49.95/6 months.
- *What is the Internet?* \$19.95/6 months.
- *Windows 98 Networking*. \$19.95/6 months.
- *Windows ME: Home Networking*. \$19.95/6 months.

MindLeaders – <http://www.mindleaders.com>

Technical general

- *A+ 2001 Hardware and Operating System Certification:11 Networks (APLU11, 4 hr).*
- *CCNA:10 TCP/IP Networking (SCOC10, 4 hr).*
- *Data Communication for Technical Users (DC201, 6 hr).* Covers SNA and IBM network components.

Technical MCSE

- *IIS Series (14 courses (IISCnn), 42 hr).*
- *Networking Essentials:4 Planning Connections (NESC04, 4 hr).*
- *TCP/IP:1 Introduction to TCP/IP Concepts (TCPC01, 4 hr).*
- *TCP/IP:2 Data Delivery and Routing (TCPC02, 4 hr).*
- *TCP/IP:3 Microsoft TCP/IP and IIS (TCPC03, 4 hr).*
- *TCP/IP:4 Printing Services and DHCP (TCPC04, 4 hr).*
- *TCP/IP:5 Name Resolution and WINS (TCPC05, 4 hr).*
- *TCP/IP:6 Introduction to DNS Server (TCPC06, 4 hr).*
- *TCP/IP:7 Managing DNS and TCP/IP (TCPC07, 4 hr).*
- *TCP/IP:8 Utilities for Monitoring TCP/IP (TCPC08, 4 hr).*
- *TCP/IP:9 Performance Monitor and RAS (TCPC09, 4 hr).*

- *TCP/IP:10 PPTP and Troubleshooting* (TCPC10, 4 hr).
- *Windows 2000 Professional MCSE 70-210:10 Using TCP/IP* (WINP10, 4 hr).
- *Windows 2000 Server MCSE 70-215:9 Networking Your Server* (W21509, 4 hr).

End user desktop computing

- *Networking: Data Communication for End Users* (DC101, 3 hr).
- *Teleprocessing: Introduction to Teleprocessing* (COM501, 14 hr).

netg - <http://www.netg.com>

- *VTAM Concepts and Commands* (13765, 9 hr).
- *VTAM for VSE Operators* (13959, 6-8 hr).
- *Internet Connection Server* (13933, 4-5 hr).
- *Net/Master Essentials* (13781, 6-7 hr).
- *A+ Certification Part 7 – Network Fundamentals* (13844, 7 hr).
- *Cisco Internetwork Design Part 2: TCP/IP Network Design* (20352, 6-8 hr).
- *Cisco Internetwork Design Part 5: ATM Internetwork Design* (20355, 6-8 hr). Half the course is on SNA.
- *CIW Internetworking Professional Part 1: TCP/IP Fundamentals* (87006, 7 hr).
- *CIW Internetworking Professional Part 2: IP Model* (87007, 7 hr).
- *i-Net+ Part 1: Internet, Networking, and Protocols* (13591, 6-8 hr).
- *Internetworking Microsoft TCP/IP on Microsoft Windows NT 4.0* (4 courses, 71435-8, 24-32 hr).
- *Internetworking Technologies – Part 3* (20013, 6-8 hr). Part of CCNA (Cisco). Unit 4 is SNA.
- *Microsoft Windows 2000 – Designing a Network Infrastructure Part 1: TCP/IP and Addressing* (72442, 6-8 hr). Unit 3 is Multiprotocols, which includes SNA.
- *Microsoft Windows 2000 Installation, Configuration, and Administration Part 5: Network Implementation* (72417, 6-8 hr).
- *Microsoft Windows 2000 Network Infrastructure Administration Part 3: IP Routing* (72423, 6-8 hr).
- *Network+ Part 3: TCP/IP Internetworking* (82513, 6-8 hr).
- *Networking Technologies Series: TCP/IP Concepts and Architecture* (12771, 6-8 hr).
- *Networking Technologies Series: TCP/IP Internetwork Management* (12773, 6-8 hr).
- *Networking Technologies Series: TCP/IP Protocols* (12772, 6-8 hr).

NetVarsity – <http://www.netvarsity.com>

- Requires free registration to view the course catalogue. Each course comes with mentoring support.
- *Analyzing Network Requirements* (N2501582, 4 hr). \$21.
- *Designing Access Solutions* (N2501585, 4 hr). \$21.
- *Designing Wide Area Network Infrastructure* (N2501587, 4 hr). \$21.
- *W2K 210: Network Connectivity configuration* (N2501558, 5 hr). \$27.
- *W2K 216: Network Protocol Administration* (N2501521, 6 hr). \$32.

New York University (NYU) – <http://www.scps.nyu.edu>

- *Advanced Online Techniques for Corporate Instructors* (X48.9905). \$600.

- *Basics of Online Instruction for Corporate Instructors* (X48.9904). \$1600.
- *Data Communications* (X52.9028). \$1045.
- *e-Enterprise Technologies and Applications* (X52.9418). \$1045.
- *Fundamentals of Electronic Commerce* (X52.9027). \$1045.
- *Technologies in Online Instruction* (X48.9903). \$995.

Northeastern University Distance Education On-Line – <http://www.nuol.edu>

- All courses are with instructor. Some courses are graded based partially on participation in on-line class discussions.
- *TCP/IP Architecture, Protocols, and Algorithms* (COM5845). \$995.
- *Advanced Wireless Communications* (COM5916). \$995.
- *Data Communications* (COM5830). \$995.
- *Developing Internet Applications with Java* (TMG5383). \$1200.
- *Effective Use of the Internet* (TMG5271). \$995.
- *High Speed Access to the Internet* (EE5461). \$1030.
- *Internet System Architecture* (TMG5372). \$1200.
- *Java Programming Advanced* (TMG5291). \$1030.
- *LANs, WANs, and Internetworking* (COM5843). \$995.
- *Planning for Network Evolution* (COM5844). \$995.
- *Telecommunications and Switching Systems* (EE5425). \$995.
- *Web Management* (MIS4246). \$740.
- *Wireless Communications* (COM5911). \$995.

OnlineLearning.net – <http://www.onlinelearning.net>

- *TCP/IP Specialist* (X417.83). With instructor. \$575.
- *Web Technology Fundamentals* (X418.113). With instructor. \$575.

ProsoftTraining – <http://www.computerprep2go.com>

- All courses listed are \$104 per course per year. Collections containing multiple courses are also available at significant savings.
- *Java 2: Networking* (NRSWB-IPJ2NW, 4-6 hr).
- *Cisco CCNA Internetworking Tech.* (2 courses, NRSWB-CCINT1-2).
- *Cisco CCNA TCP/IP Addressing on Cisco Routers* (NRSWB-CCTACR, 4-6 hr).
- *Microsoft Windows 2000 MCSE Designing Network Infrastructure: Designing a Network Strategy* (NRSWB-MTNINS, 4-6 hr).
- *Microsoft Windows 2000 MCSE Designing Network Infrastructure: Internet Connection Infrastructure* (NRSWB-MTNIIC, 4-6 hr).
- *Microsoft Windows 2000 MCSE Designing Network Infrastructure: Internet Connectivity Strategies* (NRSWB-MTNICS, 4-6 hr).
- *Microsoft Windows 2000 MCSE Designing Network Infrastructure: Preparing Network Infrastructure* (NRSWB-MTNIPI, 4-6 hr).
- *Microsoft Windows 2000 MCSE Designing Network Infrastructure: Wide Area Network Infrastructure* (NRSWB-MTNIWA, 4-6 hr).
- *Microsoft Windows 2000 Network Infrastructure MCSE: Configuring Network Protocols* (NRSWB-MT2CNP, 4-6 hr).
- *Microsoft Windows 2000 Professional MCSE: Connecting to Networks* (NRSWB-MTCPCN, 4-6 hr).

- *Microsoft Windows 2000 Server MCSE: Sharing Resources Over the Internet* (NRSWB-MT2CRI, 4-6 hr).

Quisic – <http://www.quisic.com>

- *e-business Infrastructure* (2-3 hr).

Serebra Learning Corporation – <http://www.firstclasssystems.com>

- *OS/390 and Networking* (WT2000, 5 hr).
- *OS/390 and the Internet* (WT780, 5 hr).
- *OS/390 eNetwork Server* (WT1820, 5 hr).
- *OS/390 Introduction to e-business* (WT1810, 5 hr).
- *Introducing TCP/IP* (IP0660, 4 hr).
- *TCP/IP Protocols & Network Management* (IP0670, 4 hr).
- *Administering Network Services and Protocols* (IP1260, 4 hr).
- *Cisco CCNA Internetworking Technologies* (2 courses, WT0530, WT0540, 10 hr).
- *Cisco CCNA TCP/IP Addressing and Cisco Routers* (WT0560, 5 hr).
- *e-commerce Fundamentals* (IP1170, 3 hr).
- *Electronic Commerce Strategies* (WT2630, 5 hr).
- *Getting the Most out of the Internet* (FC580, 4 hr).
- *Introduction to e-Commerce* (WT2620, 5 hr).
- *Networking Basics* (IP0420, 3 hr).
- *Networking in the Java Language* (FC1013, 10 hr).
- *WAN Fundamentals* (IP0440, 4 hr).
- *Web Server Concepts* (IP0750, 5 hr).
- *Win2000 Professional for End-Users Intermediate: Networking* (WT1360, 5 hr).
- *Win2000 Server: Sharing Resources Over the Internet* (WT0220, 5 hr).

SmartForce – <http://www.smartforce.com>

- *Internet Protocols* (4 hr).
- *Internetworking Overview* (6 hr).
- *Introduction to Common Networking Protocols* (5 hr).
- *Microsoft Networking Essentials* (15 courses, 51 hr).
- *Microsoft TCP/IP on Windows NT 4.0* (11 courses, 40 hr).
- *Microsoft Windows 98 – Implementation and Support: Networking* (4 hr).
- *NetWare TCP/IP Transport* (3 courses, 23 hr).
- *Networking Essentials: Data Transmission* (5 hr).
- *Networking Technologies* (9 courses, 33 hr).
- *Routing Protocols and TCP/IP* (4 hr).
- *Solaris 2.5.1 System Administration: The Network Environment* (6 hr).
- *TCP/IP Management: SNMP* (6 hr).
- *The TCP/IP Protocol Suite* (4 hr).
- *Technical Support: Networking Support* (4 hr).
- *Working with TCP/IP* (6 hr).
- Plus some Cisco-specific TCP/IP courses

Syberworks – <http://courses.syberworks.com>

- *Essentials of Networking, the Internet and Intranets* (8-10 hr). \$125/3 months.

TechOnLine – <http://www.techonline.com>

- Requires free registration to view the course catalogue, but all courses are free.
- *Broadband Wireless Access* (25 min).
- *Data Networking Hardware* (6 courses, 9.5 hr).
- *An Introduction to ATM* (20 min).
- *Policy and Management in a QoS Internet* (35 min).
- *QoS Internet Data Networks* (45 min).
- *Texas Instruments' Voice over Internet Protocol* (1.5 hr).
- *Understanding Wireless Communications* (2.5 hr).
- *xDSL Technologies* (3.5 hr).

Tier – <http://www.tier.com>

- All courses are virtual classroom.
- *An Introduction to Client/Server and Internet Computing* (e-305, 6 hr).
- *Making Sense of Internet Development* (e-351, 4 hr).
- *Using Java Effectively in the Enterprise – A Manager's Overview* (e-349, 4 hr).

Training Associates – <http://www.trainingassociates.com>

- All courses with instructor. Many courses have scheduled on-line chat times.
- *TCP/IP for Networking Professionals* (606, 12 weeks). \$795.
- *Fundamentals of Internetworking* (216, 12 weeks). \$795.
- *Networking Essentials 2nd Edition* (8 weeks). \$595.
- *Networking Technologies* (565, 12 weeks). \$795.

VCampus – <http://www.vcampus.com>

- *TCP/IP: Concepts and Applications* (6-8 hr). \$89.
- *Basic Data Communications* (8-12 hr). \$109.
- *Basic Telecommunications* (8-12 hr). \$159.
- *Broadband Technologies* (8-10 hr). \$109.
- *Communications Electronics* (6-8 hr). \$89.
- *Computer Telephony Integration Essentials* (5 hr). \$109.
- *Datacomm Fundamentals* (2 hr). \$89.
- *Emerging Network Technologies* (4-6 hr). \$89.
- *Introduction to Internet/Intranet Technology* (4-6 hr). \$89.
- *Telecommunications Technologies* (3-4 hr). \$89.
- *Wireless Technologies: Data Release 2* (3-5 hr). \$49.
- *Wireless Technologies: Overview Release 2* (3-5 hr). \$49.

WatchIT – <http://www.compchannel.com>

- Technically, these are seminars, not courses, and audio/video recordings of them are offered on video cassette and CD-ROM, and usually also as streamed media for corporate intranets and directly off the Internet. Prices are typically \$199.95 for video cassette and \$249.95 for CD-ROM. All except video cassette include useful Web links. The course numbers in parentheses are also the date of original broadcast in (20)ymmdd format.
- *Understanding TCP/IP Networking* (980404, 38 min).
- *SNMP: Understanding Simple Network Management Protocol* (991104, 46 min).

- *Bandwidth Management Strategies* (991003, 58 min).
- *Building Blocks of the New Network Infrastructure* (20010902, 43 min).
- *Converged Network Services: One-Stop Shopping* (991001, 44 min).
- *Development Technologies for Wireless Portals* (20010304, 53 min).
- *e-Commerce Infrastructure: Getting It Right* (20000107, 49 min).
- *Evaluating Technologies for Mobile Services* (20010305, 48 min).
- *The Future of the Network Infrastructure* (20010901, 49 min).
- *Meeting the Challenges of the Wireless Enterprise* (20010306, 49 min).
- *Organizing for e-Business: The Data, Information and Knowledge Perspective* (20001107, 58 min).
- *Scalable e-Commerce Infrastructure Solutions* (20001002, 56 min).
- *Successfully Migrating to IPv6* (981205, 50 min).
- *Update: Network Technologies* (20010404, 45 min).
- *Virtual Private Networks: A Technical Primer* (990804, 46 min).
- *Voice Over IP: IP Telephony Fundamentals* (991204, 55 min).
- *WAP: New Solutions for Wireless Data and Telephony* (20000904, 51 min).
- *Windows 2000 in a Heterogeneous e-Business Infrastructure* (20000602, 45 min).
- *Wireless Communications: New Tools and Technologies* (20010301, 40 min).

The next article in this series covers other self-study courses, including Download and Play and other forms of CBT, including WBT served from an intranet, LAN, or local host. More traditional forms, such as text-based, and audio and video cassette, are also included.

Chris Bruns
(Canada)

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Code from *TCP/SNA Update* articles

As a free service to subscribers and to remove the need to rekey the scripts, code from individual articles of *TCP/SNA Update*, and complete issues in PDF format, can be accessed on our Web site, at

<http://www.xephon.com/tcpsna>

You will be asked to enter a word from the printed issue.

Other TCP/SNA self-study

The previous article looked at IBT. This article lists other forms of self-study training for TCP/IP, SNA, and related network topics. Most of it falls under the general category of computer-based training (CBT) that is not Web-based and delivered over the Internet (IBT), typically delivered on CD-ROM or Download and Play, as IBM likes to call its Internet delivery of CBT.

Computer Associates – <http://ca.com/education/cbt>

- *TCP/IP on Windows NT 4.0 Administration* (MSC50). CD-ROM. \$500.

Datask – <http://www.datatrain.net>

- Offered as intranet-based Web-based training (WBT), LAN-based CBT, and, for mainframe courses, mainframe-based CBT.
- *VTAM Concepts and Commands* (7-9 hr).
- *VTAM for VSE Operators* (6-8 hr).
- *NET/Master Essentials* (6-7 hr).
- *Communications Introduction* (1 hr). Covers the Tandem environment.
- *Communications Subsystem* (1 hr). Covers the Tandem environment.
- *Internet Connection Server* (4-5 hr). Covers the iSeries 400 environment.
- *NCL Essentials* (5-7 hr).

Global Knowledge – <http://www.mindfire.com>

- *Cisco CCDA Training Kit* (281888). CD-ROM. \$119.95.
- *Internetworking with MS TCP/IP on MS Win NT 4.0* (280204). CD-ROM. \$516.
- *Microsoft Windows 2000 Network Infrastructure Administration Exam 70-216* (281540 is 5 courses #281541-5). CD-ROM. \$645.

Humber College – <http://cecal.humberc.on.ca/distance>

- *Telecommunication Concepts* (CPAN350, 3 months). \$315.
- *xDSL: Asymmetric Digital Subscriber Line* (ISYS357, 3 months). \$236.25.

IBM UK – <http://www.ibm.com/services/learning/uk>

- *AIX TCP/IP Communications* (AP05v2, 14 hr). Includes hands-on simulations of AIX operations. £240.
- *AS/400 Client Access for Administrators* (S4ACA1, 10 hr). Covers both SNA and TCP/IP. Audio cassettes and iSeries 400-based exercises. £395.
- *CISCO Internetworking Technologies Curriculum* (DLNG-CIS-0001, 32 hr). £280.
- *e-commerce Curriculum* (13183DI, 38 hr). CD-ROM. £379.
- *e-commerce Fundamentals* (IN85V1, 40 hr). CD-ROM. £150.
- *Novell's Networking Technologies Self-Study Kit* (NW565U). Manuals, videos, and computer-based simulations.

- *The Impact of e-business – Essential Training for Managers and Executives* (SB01). £199.

IBM US – <http://www.ibm.com/services/learning/lsweb/search>

- *VTAM Network Troubleshooting* (DN016, 8 hr). Download and Play. \$150.
- *TCP/IP for MVS* (DN015, 8 hr). Download and Play. \$150.
- *TCP/IP for MVS Advanced Concepts* (DN244, 8 hr). Download and Play. \$150.
- *TCP/IP – Concepts and Architecture* (DN048, 8 hr). Download and Play. \$150.
- *OS/390 and the Internet* (RM867, 5 hr). CD-ROM. \$195.
- *OS/390 e-business* (DT007, 5 hr). Download and Play. \$195.
- *OS/390 e-business* (RM808, 5 hr). CD-ROM. \$195.
- *OS/390 eNetwork Server* (RM869, 5 hr). CD-ROM. \$195.
- *A+ Certification: LANs, WANS and the Internet* (DN327, 8 hr). Download and Play. \$150.
- *AIX TCP/IP Communications* (S5053, 14 hr). \$1015/1-5 users.
- *AS/400 Client Access for Administrators* (RM919, 10 hr). Audio cassettes, text, and workbook. \$595.
- *Building an e-Commerce Business Case* (DN812, 8 hr). Download and Play. \$150.
- *Building Cisco Remote Access Networks* (5 courses, DN701-5, 40 hr). Download and Play. \$150/course.
- *Building Intranets with IntranetWare* (2 courses, DN197, DN211, 16 hr). Download and Play. \$150/course.
- *Building Intranets with IntranetWare* (2 courses, RM418-9, 16 hr). CD-ROM. From netg. \$150/course.
- *CCNA Basics* (CS010, 8 hr). CD-ROM. \$50
- *Cisco Designing Networks* (3 courses, DN693-5, 24 hr). Download and Play. \$150/course.
- *Cisco Internetwork Troubleshooting* (5 courses, DN582-6, 40 hr). Download and Play. \$150/course.
- *Designing Cisco Networks* (CS020, 20 hr). CD-ROM. \$389.
- *e-Business* (8 courses, DN813-20, 64 hr). Download and Play. \$150/course.
- *e-Business Technology Fundamentals* (EB901, 18 hr). Download and Play. \$225.
- *e-Commerce Fundamentals* (N3140, 20 hr). CD-ROM. \$295.
- *e-Commerce Implementation Issues* (DN811, 8 hr). Download and Play. \$150.
- *Enterprise Systems: Transaction Processing, Networking, and e-business* (EW04C, 6.5 hr). \$300.
- *Evaluating e-Commerce Options* (DN809, 8 hr). Download and Play. \$150.
- *The Impact of e-business* (SB01C, 7 hr). CD-ROM. \$299.
- *i-Net+* (4 courses, DN790-3, 32 hr). Download and Play. \$150/course.
- *Internet Connection/400 Operations and Implementation* (RM004, 20 hr). Audio cassettes, text, and iSeries 400 media. \$695.

- *Internetworking Microsoft TCP/IP on Microsoft Windows NT 4.0* (4 courses, 32 hr). \$150/course. This series of courses exists as Download and Play under several different sets of IBM course numbers, with seemingly identical course contents. There is also a version available in diskette, network, and CD-ROM versions. Like many other of the IBM courses listed here, there is also an IBM IBT course with a similar name and contents.
- *Internetworking Technologies* (4 courses, DN649-52, 32 hr). Download and Play. \$150/course.
- *Introduction to e-Commerce* (DN808, 8 hr). Download and Play. \$150.
- *Java and Distributed Objects* (DC010, 4 hr). Download and Play. \$125.
- *Java Business Application Development: Network Programming* (DN158, 8 hr). Download and Play. \$150.
- *Java Security, Networking, and the Internet* (DC007, 4 hr). Download and Play. \$125.
- *JES2 Operations* (DN115, 15 hr). Includes NJE. Download and Play. \$150.
- *Microsoft Windows 2000 Installation Configuration and Administration Part 5: Networking* (DN669, 8 hr). Download and Play. \$150.
- *Microsoft Windows 2000 Network Infrastructure Administration* (5 courses, DN673-7, 40 hr). Download and Play. \$150/course.
- *Microsoft Windows 2000: Upgrading from Microsoft Windows NT 4.0* (4 courses, DN795-8, 32 hr). Download and Play. \$150/course.
- *Network+* (5 courses, DN742-6, 40 hr). Download and Play. \$150/course.
- *Networking Essentials* (3 courses, RM096-8, 24 hr). CD-ROM. From netg.
- *Networking Essentials 2nd Edition* (4 courses, DN040, DN002, DN003, DN047, 30 hr). Download and Play. \$150/course.
- *Networking Foundations* (2 courses, RM063-4, 16 hr). From netg.
- *Networking Technologies Series* (9 courses, DN229, DN239, DN163, DN224, DN227, DN146, DN021, DN145, DN464, 72 hr). Download and Play. \$150/course.
- *Novell NetWare TCP/IP Transport* (2 courses, RM153-4, 16 hr). CD-ROM. From netg.
- *PERL 5: Working with Data and Communications* (DN259, 8 hr). Download and Play. \$150.
- *Supporting Microsoft Windows 98: Networking* (DN215, 8 hr). Download and Play. \$150.
- *TCP/IP Internetworking Management with SNMP and CMOT* (RM016, 8 hr). From netg.
- *TCP/IP on the AS/400* (RM827, 6 hr). CD-ROM. \$595.
- *Unix Advanced Topics* (DN151, 8 hr). Download and Play. \$150.
- *Unix Advanced Topics* (RM049, 8 hr). CD-ROM. From netg.

InfoSource – <http://www.howtomaster.com>

- *Unix SVR 4.0 Network Administration* (H910205, 7 hr). From NIIT.
- *Unix SVR 4.0 Network Programming* (H910207, 5 hr). TCP-based application development. Diskette-based CBT. From NIIT.

Learn2 – <http://www.tutorials.com>

- *CNE 4 Networking Technologies* (2 courses). Video. \$59.95/course.
- *Home Networking with NT 4*. Video. \$49.95.
- *Home Networking with Windows 98*. Video. \$49.95.
- *Home Networking, Primer*. Video. \$49.95.
- *Home Networking, Troubleshooting*. CD-ROM or video. \$49.95.
- *Linux, Networking Basics* (2 courses). Video. \$49.95/course.
- *Using the Internet with Windows 95*. CD-ROM or video. \$49.95.

Serebra Learning Corporation – <http://www.firstclasssystems.com>

- *Advanced Networking with Windows NT 4.0* (FC600, 7 hr). CD-ROM. \$199.
- *Internet: Ultimate Connectivity* (FC270, 3 hr). Covers the Unix environment. CD-ROM. \$199.
- *Microsoft Networking Fundamentals* (FC700, 3 hr). CD-ROM. \$199.

Wave Technologies International – <http://www.wavetech.com>

- *Cisco CCNA eCamp*. Manuals, CD-ROM, and on-line mentoring.
- *i-Net+ Exam Pack*. Manuals and CD-ROM.
- *The Linux Resource Kit*. Manuals and CD-ROM.
- *Master CIW Administrator Resource Kit*. Manuals and CD-ROM.
- *Network+ eCamp* (8 weeks). Manuals, CD-ROM, and on-line mentoring.
- *Novell CNE NetWare 5 eCamp*. Manuals, CD-ROM, and on-line mentoring.

IBM LEARNING SERVICES NETWORK

As this series of articles was being written, IBM announced a new Courses-on-Request service that uses digital satellite and computer storage technologies to download and store a course for later use. This is in addition to the scheduled broadcasts of the Learning Services Network. Both are the same professionally produced videos of classroom courses supplemented by Internet-based interactivity.

Both services are offered for an annual subscription fee with satellite receiving hardware installed at your site. There is no fee per course, but the annual fee is based, in part, on the number of students. To date, the service is available only in North America, and is being marketed only in the USA, undoubtedly because:

- Reception is not possible in all of Canada.
- It is offered only in English, not French or Spanish as would be required in parts of Canada, Mexico, and the Caribbean.

For more information, see:

<http://www.ibm.com/services/learning/satellite>

NEXT

Next, we look at the traditional classroom courses that most of us associate with computing education. The next article divides the courses by vendor, and the vendors by area of the world that they serve. The article is divided into two: scheduled public courses and private in-house courses.

Chris Bruns
(Canada)

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Need help with a TCP/SNA problem or project?

Maybe we can help:

- If it's on a topic of interest to other subscribers, we'll commission an article on the subject, which we'll publish in *TCP/SNA Update*, and which we'll pay for – it won't cost you anything.
- If it's a more specialized, or more complex, problem, you can advertise your requirements (including one-off projects, freelance contracts, permanent jobs, etc) to the hundreds of TCP/SNA professionals who visit *TCP/SNA Update's* home page every month. This service is also free of charge.

Visit the *TCP/SNA Update* Web site

<http://www.xephon.com/tcpsna>

and follow the link to [Opportunities for TCP/SNA specialists.](#)

TCP/SNA classroom courses

Classroom courses still provide the greatest variety in training, especially in more technical computing topics. In fact, there are so many sources and courses that large numbers have been left out of these listings; you will find only the most relevant here. This is especially true for academic institutions.

PUBLIC VERSUS PRIVATE

This article is divided into publicly scheduled (see Figures 1-11) and privately booked in-house courses (see Figures 12-20). To simplify the listings, and because courses stop being scheduled with little advance notice, you'll undoubtedly find courses listed as publicly scheduled even though they're currently available only as privately booked.

Remember that logistics may be an issue with technical hands-on courses. The student test environment used in the course may work best at the vendor's location, even when the vendor marketing staff seems willing to schedule the course on your premises. Consider the following:

- Setting up the test environment may be very disruptive to both your technical staff and your production computing environment – for example, it may require a new LPAR.
- Lab time may be wasted as students discover the test environment doesn't work properly, and then wait while the instructor tries to fix it.
- Instructors teach better in an environment they know and when they are not under the stress of having a lab environment that doesn't work properly.

In summary, for some heavily lab-oriented courses, it may make more sense to travel to a vendor location, even for privately-booked courses you would prefer to have in-house. What you spend in travel costs may be more than compensated for by how much more you learn.

Within the two sections, publicly scheduled and privately booked, vendors are grouped by the area of the world that they cover, alphabetically within each area. Courses are listed alphabetically except for especially relevant courses, which are listed first.

When pricing information is available, it is shown per student for publicly scheduled courses, and per course for privately booked. Prices for privately booked courses are usually based on a maximum of 10 students. Additional students are either not allowed or result in additional charges.

Circle Computer Group – <http://www.circle-group.com>

- US and UK only.
- *OS/390 Oriented Network Computing* (MCSU, 2 days). £625.
- *OS/390 Web Serving Concepts (e-business)* (MO9W, 3 days). £890.
- *CICS Web Support* (CWS, 5 days). £1725.
- *CICS Web Support for Application Programmers* (CWSP, 5 days). £1725.

Global Knowledge – <http://www.globalknowledge.com>

- Selection varies by country. The Global Knowledge courses listed in the Internet-Based Training article are also available as classroom courses.
- *CCDA Boot Camp* (5 days). \$2295.
- *CCNA Boot Camp* (5 days). \$2995.
- *CCNP Boot Camp* (12 days). \$10,995.
- *Network Performance Management and Optimization* (2 days). \$1195.
- *Network Solutions Boot Camp* (5 days). \$2995.

IBM – <http://www.ibm.com/services/learning/global/courses.htm>

- See North America section (below) for US.
- See UK section (below) for Britain.
- For all other countries, click on country name at above URL.

Landmark Systems – <http://www.landmark.com>

- *CICS/TS Web Server Implementation* (MVCICCWS, 5 days).
- *IBM Enterprise Service in e-Commerce and Open Systems* (PT-2120, 5 days).
- *Landmark Performance Monitor Training for VTAM* (MF-107, 1 day).
- *The Monitor for VTAM System Administration and Customization* (MF-108, 1 day).
- *Performance Management using TMON for TCP/IP* (MF-113).

Figure 1: Courses scheduled worldwide (part one)

Learning Tree International – <http://www.learningtree.com>

- *Data Network Design and Optimization* (453, 4 days).
- *Hands-On Internetworking with TCP/IP* (467, 4 days).
- *Hands-On Introduction to TCP/IP* (367, 4 days).
- *Hands-On SNMP* (464, 4 days).
- *Introduction to Datacomm and Networks* (350, 4 days).
- *Migrating to IPv6* (463, 4 days).
- *Network Architectures and Protocols* (355 4 days).
- *Telecommunications Introduction* (373, 4 days).

Tivoli – <http://www.tivoli.com/services/education>

- *Tivoli NetView for OS/390 TCP/IP Management* (2 days).
- *Tivoli NetView for OS/390 Mainframe Operations* (2 days).
- *Managing Systems and Network Events* (3 days).
- *Tivoli NetView 5.1 for NT for Implementers* (4 days).
- *Tivoli NetView 5.1 for Unix for Implementers* (5 days).
- *Tivoli NetView 5.1 Integration* (2 days).
- *Tivoli NetView 6.0 for NT for Administrators* (5 days).
- *Tivoli NetView 6.0 for Unix for Administrators* (5 days).
- *Tivoli NetView 6.0 for Unix for Operators* (2 days).

Verhoef Training – <http://www.verhoef.com>

- *Applied VTAM* (4 days).
- *Controlling TCP/IP* (3 days).
- *OS/390 TCP/IP and VTAM Sysplex Considerations* (3 days).
- *SNA Fundamentals* (3 days).
- *Understanding TCP/IP* (3 days).
- *Understanding TCP/IP* (4 days).

Wave Technologies International – <http://www.wavetech.com>

- *A+ 4 Day Boot Camp Class*.
- *CCIE Boot Camp Session* (5 days).
- *Cisco Boot Camp Session* (5 days).
- *Cisco Certified Network Professional Boot Camp* (2 courses, 10 days).
- *Enterprise Mail Systems for Linux Administrators* (4 days).
- *i-Net+ Boot Camp* (3 days).
- *MCSE Windows 2000 Boot Core* (2 courses, 10 days).
- *MCSE Windows 2000 Boot Elective 1 Net Design* (5 days).
- *Network+ Boot Camp* (3 days).
- *Novell CNE NetWare 5 Certified Novell Engineer* (2 courses, 10 days).
- *Windows 2000 MCSE Upgrade Boot Camp* (5 days).
- *Windows 2000 Network Infrastructure Design* (4 days).
- *Windows 2000 Network Infrastructure Implementation* (4 days).
- *Windows 2000 Professional & Server Administration* (5 days).

Figure 2: Courses scheduled worldwide (part two)

CAIT – <http://www.cait.wustl.edu>

- *TCP/IP Fundamentals* (TTTL74, 2 days). \$540.
- *TCP/IP Implementation and Management* (TTTL72, 2 days). \$540.
- *Next Generation TCP/IP* (TTTL79, 2 days). \$540.
- *Frame Relay* (TTTL94, 2 days). \$540.
- *Introduction to Communications and Networking* (TTTL00, 2 days). \$540.
- *LAN/WAN Integration* (TTTL67, 2 days). \$550.
- *Network Systems Management* (TTTL40, 2 days). \$540.
- *Unix System Administration Part 2: Networking Features* (TTUN40, 3 days). \$900.
- *Wireless Telecommunications Systems* (TTTL85, 2 days). \$650.

College of DuPage – <http://www.cod.edu>

- *Advanced Routing Techniques (Digital Microprocessor Technology (DMT) 123)*.
- *Data Communications and Networks* (DMT235).
- *Introduction to Internetworking* (DMT121).
- *Network Interfacing Techniques* (DM124).
- *Principles of Internetwork Routing* (DMT122).

CompuMaster – <http://www.compumaster.net>

- *Fundamentals of Telecommunications* (2 days). \$995.
- *Understanding Networking Fundamentals* (2 days). \$995.

Computer Associates – <http://www.ca.com>

- *NetworkIT Pro: Advanced Applications* (UT505, 2 days). \$1000.
- *NetworkIT Pro: Managing Your Network with NetworkIT Pro* (UT500, 3 days). \$1500.
- *Unicenter TNG:PM/RMO: Optimizing Your Network* (UT515, 3 days). \$1500.

Denning – <http://www.denning.com>

- *Enterprise Implementation with Linux* (5 days). \$1995.
- *Network Integration with Linux* (5 days). \$1995.

Emporia State University – <http://www.emporia.edu>

- *Computer Networks and Internet* (CS320 or CS620).
- *Introduction to Computer Networks* (CS580).
- *Telecommunications and Networking Applications* (IS503).

Hitachi – <http://www.hds.com>

- *TCP/IP Fundamentals Workshop* (CCI2110, 4 days).

Figure 3: Courses scheduled in USA (part one)

IBM – <http://www.ibm.com/services/learning/lswb/search>

- *TCP/IP for OS/390 Implementation Workshop* (CB695, 5 days). \$2195.
- *TCP/IP Implementation for OS/390* (CB694, 3 days). \$1395.
- *TCP/IP Implementation for OS/390: Hands-on Labs* (CB692, 2 days). \$895.
- *TCP/IP for OS/390: Diagnostics and Debugging* (NW791, 4 days). \$1695.
- *TCP/IP Architecture* (G3740, 2 days). \$795.
- *TCP/IP Network Design* (NW440, 3 days). \$1395.
- *Basic TCP/IP Skills: Hands-on Workshop* (G0180, 2 days). \$755.
- *Hands-on TCP/IP Networking Workshop* (N0260, 4 days). \$1625.
- *TCP/IP for VSE/ESA Under the Covers* (A3750, 4.5 days). \$1295.
- *Fundamentals of SNA* (G3717, 3 days). \$1195.
- *SNA LU 6.2 Data Flow* (G3664, 2 days). \$995.
- *SNA Network Problem Isolation Through Trace Analysis* (G3831, 5 days). \$2395.
- *VTAM/NCP Implementation Workshop* (G3854, 4.5 days). \$2195.
- *VTAM/NCP MSN and SNI Implementation* (G3769, 5 days). \$2495.
- *VTAM/APPN Concepts and Implementation* (G3945, 5 days). \$2295.
- *3746-950 & 3746-900 APPN and TCP/IP Implementation* (G3950, 3 days). \$1255.
- *3745 Model A & 3746-9x0 MOSS-E Operator Training* (G3828, 1 day). \$350.
- *3745 Model A and 3746-900 Migration Planning* (G3874, 2 days). \$895.
- *IBM 2210 and 2216 Configuration Workshop* (NW620, 4 days). \$1895.
- *2216 ESCON Implementation* (NW640, 1 day). \$495.
- *Tivoli NetView for OS/390 Installation and Administration* (SM421, 5 days). \$2495.
- *Tivoli NetView for OS/390 Automation Facilities* (TM751, 3 days). \$1500.
- *Tivoli NetView for OS/390 Enterprise Graphics* (TM771, 5 days). \$2500.
- *Tivoli NetView for OS/390 REXX CLISTS Panels and Pipes* (SM431, 4.5 days). \$2495.
- *Custom Tivoli NetView for OS/390* (X5121, 5 days).
- *IBM WebSphere Host On-Demand Workshop* (E4485, 2 days). \$1095.
- *Using OS/390 as Your e-business Server* (ES76A, 3.5 days). \$1995.
- *Advanced Protocol Analysis and Baselining* (G3982, 3 days). \$1795.
- *ATM Configuration* (S0087, 2 days). \$2975.
- *Basic Networking Skills Hands-On Workshop* (NW030, 2 days). \$755.
- *Communications Server for OS/390 V2R10: TCP/IP Update Workshop* (CS210, 2.5 days). \$900.
- *Data Communications Environment* (G3645, 4.5 days). \$1895.

Figure 4: Courses scheduled in USA (part two)

IBM – <http://www.ibm.com/services/learning/lswb/search> (continued)

- *e-business Technology Fundamentals* (N3102, 2 days). \$590.
- *e-business: Technology Workshop* (B3106, 5 days). \$3375.
- *Fundamentals of Networking* (NW002, 2 days). \$695.
- *IBM Communications Server for AIX* (E4470, 3 days). \$1615.
- *IBM WebSphere Everyplace Suite: Implement Network Connectivity* (PW52A, 2 days). \$1045.
- *IBM WebSphere Everyplace Suite: Implement Wireless Access Protocol Applications* (PW51A, 3 days). \$1275.
- *Internetworking Fundamentals* (NW090, 3 days). \$1095.
- *Internetworking Fundamentals: Hands-on Workshop* (NW095, 4 days). \$1495.
- *LAN Problem Determination: TCP/IP Networks* (G3861, 3 days). \$1095.
- *Linux TCP/IP Administration* (QLX07, 5 days). \$2095.
- *Network Data Flow and Tuning* (G3951, 4 days). \$1895.
- *Tivoli NetView 6.0 for Unix for Administrators* (TV050, 5 days). \$2395.
- *Tivoli NetView for NT for Administrators* (TV060, 5 days). \$2395.

New Instruction Inc. – <http://www.newinstruction.com>

- *Essentials of Internet Architecture.*
- *Fundamentals of Telecommunications.*
- *Testing Web Applications.*

Parkland College – <http://www.parkland.cc.il.us>

- *Network Communications* (CIS136).

ProTech – <http://www.protechpts.com/training>

- *Introduction to APPC LU6.2* (3 days).
- *Client/Server Networking Using APPN* (2 days).
- *WebSphere Concepts and OS/390 Support* (4-5 days).
- *Introduction to Enterprise TCP/IP* (3 days).
- *Advanced Enterprise TCP/IP* (5 days).
- *VTAM for Computer Operations* (2 days).
- *NetView for Operators* (2.5 days).
- *IBM Enterprise Server in eCommerce and Open Systems* (5 days).
- *AS/400 TCP/IP Concepts* (2 days).
- *How to Use Fast Packet Technology to Integrate Networks* (3 days).
- *Internetworking Technologies* (3 days).
- *Introduction to ATM* (3 days).
- *Introduction to SNMP* (2 days).
- *Networking Overview* (3 days).
- *Testing Internet Applications* (2-4 days).
- *Windows NT – TCP/IP Network Administration* (4 days).

Figure 5: Courses scheduled in USA (part three)

Southwest Tennessee Community College – <http://www.stcc.cc.tn.us>

- *AS/400 Distributed Programming Techniques* (ITEC2154).
- *Client Access/400 and Visual RPG* (ITEC2156).
- *Computer Networks and Systems* (CPET2324).
- *Concepts of Communications/Networking* (ITEC1330).
- *Digital Communication Systems* (CPET2314).
- *Internetworking* (ITEC2303).
- *Unix System Administration* (ITEC2205).

SYS-ED – <http://www.sysed.com>

- *SNA: Implementation* (3 days). \$1495.
- *TP and Network Fundamentals* (2 days). Mainframe. \$995.
- *VTAM/NCP* (4 days). \$1995.
- *VTAM for Operators* (1 day). \$495.
- *NetView* (4 days). \$1995.
- *Networking Essentials* (4 days). \$895.
- *TCP/IP Internetworking* (4 days). \$1595.
- *TCP/IP: Sockets Programming* (4 days). \$1595.
- *Unix: Network Administration* (3 days). \$1195.
- *Visual Basic: Internet Programming* (4 days). \$1595.

TechKnowledge Corporation – <http://www.techknowledge.com>

- Formerly the US operations of Amdahl Education, renamed in an attempt to woo Hitachi Data Systems (HDS) Global Education to join forces.
- *VTAM and NCP Implementation Workshop* (CMSNANET, 5 days).
- *Web Server Implementation for OS/390* (INWDV390, 5 days).
- *TCP/IP and SNA Integration* (CMTCPSTI, 2 days).
- *TCP/IP for OS/390 Implementation* (CMTCPSTOI, 3 days).
- *SNA Fundamentals* (CMSNASNF, 3 days).
- *TCP/IP Fundamentals* (CMTCPSTCP, 5 days).
- *Introduction to Data Communications* (CMGENINT, 2 days). Includes SNA.

Trinity College – <http://www.trnty.edu>

- *Data Communication* (CS261).
- *Microsoft Network Administration* (CS253).

Western Illinois University – <http://www.wiu.edu/catalog/01/compsci.shtml>

- *Computer Communication and Networks* (CS420).
- *E-Commerce Systems Development* (CS415).
- *Internet* (CS487).
- *Introduction to Digital Circuits* (CS300).
- *Network and Data Communications Concepts* (CS484).

Figure 6: Courses scheduled in USA (part four)

CDI – <http://www.cdicorporateeducation.com>

- *Modern Internetworking Workshop* (1241, 3 days).
- *Network Fundamentals* (1229, 2 days).
- *Understanding Emerging Technologies* (1248, 2 days).
- *Voice Over IP Workshop* (1247, 3 days).

Humber College – <http://cecal.humberc.on.ca/comptech>

- *TCP/IP* (CPAN553). \$236.25
- *Data Communications and Networks* (CENG309). \$315.
- *Data Communications 2* (WLS.602). \$315.
- *Internetworking Protocols* (ISYS374). \$236.25.
- *Math for Communication Systems* (TCOM103). \$315.
- *Network Management* (ISYS272). \$236.25.
- *Network Storage Technology* (ISYS706). \$236.25.
- *Network Technologies: Introduction* (NEST303). \$315.
- *Networking in a Unix Environment* (CENG705). \$315.
- *Networks* (BISM292). \$377.10.
- *Telecommunications Concepts* (CPAN350). \$315.
- *Telecommunications Systems* (TCOM204). \$315.
- *Web/Internet Services* (NEST405). \$236.25.
- *Windows 2000 Server Operating Systems Administration* (NEST402). \$315.
- *Wireless Data Networks* (WLS.707). \$450.
- *xDSL: Asymmetric Digital Subscriber Line* (ISYS357). \$236.25.

Figure 7: Courses scheduled in Canada

Amdahl – <http://www.dmr-education.co.uk>

- *VTAM & NCP Implementation* (CNET, 4 days). £1100.
- *TCP/IP for OS/390 Implementation* (CTMI, 3 days). £840.
- *SNA & TCP/IP Integration* (CTSI, 2 days). £625.
- *SNA Fundamentals* (CSNF, 3 days). £835.
- *TCP/IP Fundamentals* (CTCP, 2 days). £605.
- *OS/390 Web Serving Concepts* (MO9W, 2 days). £620.
- *OS/390 Oriented Network Computing* (MCSU, 2 days). £625.
- *APPN Concepts* (CP21, 2 days). £605.
- *Introduction to Data Comms & Networking* (DCCOMIN1, 2 days). £745.

FastPath International – <http://www.fastpath.co.uk>

- *TCP/IP Networking* (2 days). £695.
- *Networking Overview* (2 days). Covers the iSeries 400 (AS/400) and mainframe environments.

Figure 8: Courses scheduled in UK (part one)

IBM – <http://www.ibm.com/services/learning/uk>

- *VTAM and NCP Cross-Domain Implementation* (CB12B, 3 days). £1050.
- *VTAM and NCP Single-Domain Implementation* (CB12A, 4 days). £1400.
- *SNA Concepts and Protocols* (CB10, 3 day). £1050.
- *SNA Introduction and Products* (CB02, 3 days). £1050.
- *TCP/IP in a Sysplex for OS/390* (CB691SU, 1 day). £350.
- *TCP/IP for OS/390* (CB691U, 4 days). £1600.
- *TCP/IP Hands-on Workshop* (NW16U, 1 day). £400.
- *TCP/IP Network Design* (NW441U, 4 days). £1440.
- *TCP/IP Architecture* (NW48U, 3 days). £900.
- *Introduction to TCP/IP* (NW14U, 1 day). £350.
- *OS/390 JAVA Applications Using WebSphere* (ES49U, 3.5 days). £1200.
- *Managing OS/390 and z/OS e-business Performance* (ES85GB, 3.5 days). £1225.
- *Advanced Internet Systems Management* (ICIWASU, 3 days). £1050.
- *Domino Go Webserver* (ES171U, 5 days). £1750.
- *Implementing Domino (Notes) on OS/390* (ES72U, 4 days). £1600.
- *Internet System Management* (ICIWSU, 2 days). £700.
- *Network Concepts* (NW00U, 2 days). £600.
- *Networking Fundamentals* (ICIWNU, 2 days). £700.
- *Principles of ATM* (NW01U, 2 days). £600.

KnowledgePool – <http://eu.knowledgepool.com>

- *VME Networking Implementation and Support* (VNET, 5 days). £1540.

RSM – <http://www.rsm.co.uk>

- *Configuring VTAM & NCP* (3 days).
- *VTAM Operations in an MVS Environment* (1 day).
- *VTAM Operations in a VM Environment* (1 day).
- *VTAM Operations in a VSE Environment* (1 day).
- *Operating VTAMPRINT and CICSPRINT* (1 day).
- *SNA TCP/IP Integration* (3 days). £675.
- *SNA Fundamentals* (3 days). £900.
- *Implementing and Configuring TCP/IP* (2 days).
- *Advanced TCP/IP Administration* (1 day).
- *Understanding TCP/IP* (1 day).
- *TCP/IP Fundamentals* (2 days). £625.
- *Web Concepts & Overview for Mainframe Technicians* (C3138, 1 day).
- *Web Serving Concepts and OS/390 WebServer* (C3136, 3 days). £925.
- *Understanding Network Computing with Large Systems* (C3134, 3 days).
- *Introduction to APPC* (1 day).
- *APPN Concepts* (1 day).
- *NETMASTER Operations* (1 day).

Figure 9: Courses scheduled in UK (part two)

RSM – <http://www.rsm.co.uk> (cont)

- *Introduction to CONNECT:Direct (0.5 day). Formerly Network Data Mover (NDM).*
- *Client Access/400 (3 days). £950.*
- *Effective Network Operations (1 day).*
- *The Network Foundation Course (2 days). £650.*
- *TCP/IP in an AS/400 Environment (3 days). £925.*
- *Web Concepts and e-Business (C3139, 1 day).*

WDR – <http://www.wdr.co.uk>

- *OS/390 SecureWay CS (TCP/IP) Installation, Operation (NE06, 2 days). £675.*
- *WebSphere Appreciation for OS/390 Technicians (WE01, 2 days). £675.*
- *Introduction to TCP/IP for Open Networking (NE05, 2 days). £675.*
- *Network Essentials (NE08, 2 days). £675.*

Figure 10: Course scheduled in UK (part three)

390 IT Services – <http://www.390itservices.nl/training>

- *VTAM Operations (1 day). ¢325.*
- *VTAM Concepts (1 day). ¢325.*
- *NetView Operations (1 day). ¢325.*
- *NetView Concepts (1 day). ¢325.*

Figure 11: Courses scheduled in Europe

Advantage Computing Education – <http://www.adcomed.com.au>

- *TCP/IP for OS/390 (3 days).*

Candle – <http://www.candle.com>

- *TCP/IP for OS/390 Implementation (CMTCPTOI, 3 days). \$9900.*
- *TCP/IP and SNA Integration (CMTCPTSI, 2 days). \$6600.*
- *TCP/IP Principles, Protocols, and Architecture (TCP1, 3 days). \$9900.*
- *CICS/VTAM Network Operations (CICSNO, 2 days). \$6600.*
- *CandleNet ETEWatch Installation, Administration and Use (ETEW, 2 days). \$6600.*
- *CL/SUPERSESSION Application Programming with SSPL (CL147C, 2 days). \$6600.*
- *CL/SUPERSESSION Product Administration (CL147B, 2 days). \$6600.*
- *Data Communications Concepts and Networking (DCCN, 3 days). \$9900.*

Figure 12: Privately booked worldwide (part one)

Candle – <http://www.candle.com> (cont)

- *Enterprise to Web Technical Overview* (ENTWEB, 3 days). \$9900.
- *ETWatch Customizer and TN3270 Workshop* (ETECBM, 5 days). \$16,500.
- *Introduction to the Internet* (INTR, 2 days). \$6600.
- *Open Systems Client/Server Concepts* (OSGENSCF, 2 days). \$6600.
- *Solving Problems with OMEGAMON II for VTAM* (ON500C, 2 days). \$6600.

Computer Associates – <http://www.ca.com>

- *TCP/IP: OS/390 Implementation* (TK141, 3 days). \$10,500.
- *TCP/IP & SNA: Integration* (TK142, 2 days). \$7000.
- *SNA: Fundamentals* (TK005, 3 days). \$10,500.
- *TCP/IP: Fundamentals* (TK140, 5 days). \$17,500.
- *VM: Web-to-Host* (VM170, 3 days). \$10,500.
- *Data Communications: Introduction* (TK001, 2 days). \$7000.

Maintec Technologies – <http://www.maintec.com>

- *VTAM/NET*

Tier – <http://www.tier.com>

- *TCP/IP Fundamentals* (360, 3 days).

Figure 13: Privately booked worldwide (part two)

Advanced Concepts Training – <http://www.actisit.com>

- *CICS LU6.2 Programming Workshop* (3 days).
- *Controlling TCP/IP* (2 days).
- *Understanding TCP/IP* (3 days).
- *TCP/IP for Network Professionals in a Multi-Platform Environment* (5 days).
- *Introduction to DECnet* (2 days).
- *LAN/WAN: Working With Datacomm and Networks* (2 days).
- *Networking Overview*.
- *OS/2 APPC Programming* (5 days).
- *OS/2 Communication Manager/2* (4 days).
- *Understanding LAN/WAN Technologies* (2 days).

Applied Computer Technology – <http://www.acomtech.com>

- *SNA Concepts and Facilities*.
- *TCP/IP Concepts and Facilities*.
- *tn3270x Concepts and Facilities*.
- *3270 Concepts and Facilities*.

Figure 14: Privately booked in North America (part one)

Applied Computer Technology – <http://www.acomtech.com> (cont)

- *APPC and LU6.2 Concepts and Facilities.*
- *SDLC Concepts and Facilities.*
- *APPN Concepts and Facilities.*
- *tn5250 Concepts and Facilities.*
- *5250 Concepts and Facilities.*

Barker Pacific Group – <http://www.bpgtraining.com>

- *TCP/IP for OS/390 Implementation (3 days).*
- *Unix Networking Features (3 days).*

Jeff Markiewicz – <http://www.jmarked.com>

- *SNA Networking, APPC/LU6.2 & VTAM/NCP Fundamentals (5 days).*
- *Networking in the IBM SNA Environment (3-5 days).*
- *CICS/VTAM Network Operations (2 days).*
- *APPN & HPR, Introduction (3-5 days).*
- *Data Communications Concepts & Networking (3 days).*
- *Enterprise to Web, A Technical Overview (2 days).*
- *TCP/IP Advanced Topics (3-5 days).*
- *TCP/IP for Administrators (3 days).*
- *TCP/IP Principles, Protocols, & Architecture (3 days).*
- *Telecommunications, An Introduction (2 days).*

KAZCOM – <http://www.kazteach.com>

- *Hands-On Basic Linux Network Administration (3 days). \$8000.*
- *Hands-On Data Networking for the Telecom Professional (3 days). \$8000.*
- *Hands-On Introduction to Networking (4 days). \$9000.*
- *Hands-On Networking Protocols (2 days). \$7000.*
- *Hands-On Protocols Using the Observer Protocol Analyzer (2 days). \$7000.*
- *Hands-On SNMP (3 days). \$8000.*
- *Hands-On TCP/IP (3 days). \$8000.*
- *Hands-On Troubleshooting Ethernet LANs and TCP/IP (3 days). \$8000.*
- *Hands-On Voice Over IP (2 days). \$7000.*
- *Network Fundamentals and Data Communications (3 days). \$8000.*

Mentor Services Corporation – <http://www.mentor-services.com>

- *OS/390 TCP/IP Installation & Implementation.*
- *Operating VTAM (3 days).*
- *Operating NetView (2 days).*
- *SNA Fundamentals (3.5 days).*
- *TCP/IP (3 days).*
- *Connect:Direct (1 day). Formerly Network Data Mover (NDM).*
- *Introduction to the Internet (1 day).*
- *Networking Concepts (2 days).*
- *Networking Concepts for Operators (2 days).*

Figure 15: Privately booked in North America (part two)

MVS Training – <http://www.mvstraining.com>

- TCP/IP.
- JES2 – MVS & VTAM Commands and Messages (3 Days).

Network World – http://www.networkworld.com/ev_onlsem.htm

- Understanding TCP/IP.
- Essentials of Networking and Data Communications.

New Instruction Inc. – <http://www.newinstruction.com>

- Introduction to TCP/IP (2 days).
- Business Networking Technologies Overview (1 day).
- Data Networking Basics (2 days).
- LAN/WAN Internetworking (2-10 days).
- Telecommunications 2000 – Plus (2 days).

PARITY TelTech – <http://www.teltechinc.com>

- Using TCP/IP to Build Enterprise Networks (S320, 3 days).
- Introduction to Systems Network Architecture (SNA) (S110, 2 days).
- Data Communications & Networking (S212, 2 days).
- High Speed Networks (S220, 4 days).
- Introduction to Telecommunications (S210, 4 days).
- Networking Essentials (S300, 3 days).

Figure 16: Privately booked in North America (part three)

BM International – <http://www.bminternational.co.uk>

- VTAM.
- TCP/SNA Integration (3 days).
- SNA Fundamentals (3 days).
- APPN Concepts.

Millennia Business Systems – <http://www.sysprog.co.uk>

- TCP/IP for OS/390 Installation.
- TCP/IP Introduction for MVS Systems Programmers.
- Introduction to Networking.
- Networking.

StoreNet Technology – <http://www.snt.co.uk>

- ACF/VTAM.
- TCP/IP.

Figure 17: Privately booked in UK (part one)

Tony Cross – <http://www.tcr.co.uk>

- *SNA & TCP/IP Integration.*
- *TCP/IP for OS/390 Implementation.*
- *SNA Fundamentals.*
- *TCP/IP Fundamentals.*
- *APPN Concepts.*

WDR – <http://www.wdr.co.uk>

- *VTAM & NCP Implementation (NE03, 5 days).*
- *SNA Concepts & Data Flows (NE02, 3 days).*
- *Network Operations (NE04, 1 day).*

Figure 18: Privately booked in UK (part two)

Cross Systems – <http://www.cross-systems.de>

- *PC/LAN/WAN Administration.*
- *X.400 Konzept und Technologie.*
- *X.500 Konzept und Technologie.*

Figure 19: Privately booked in Europe

ACT Puerto Rico – <http://www.actpr.com>

- *VTAM/NCP Installation (4 days). \$1000.*
- *TCP/IP for Windows (4 days). \$1500.*

Software Education – <http://www.softed.co.nz>

- *Practical TCP/IP Networking (2 days).*

Figure 20: Privately booked elsewhere

As indicated at the outset, so many organizations offer classroom education that it's impossible to list them all here. So the next article looks at ways to find additional sources of classroom courses, most notably through Web-based training directories.

*Chris Bruns
(Canada)*

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TCP/SNA training directories

Most Human Resources (HR) departments don't even try to handle the education planning internally for their computing staff. Given the amount and cost of training involved, there are many consultants and even entire companies making a living fulfilling that need. And a few have begun to offer Web-based services.

But the Internet has some free sources of great information. And that's what most of the Web sites listed in Figures 1-4 provide. You'll find training directories and distributors of large numbers of course vendors, and a look at a few other approaches to education.

Click2Learn – <http://www.click2learn.com/c2l>

- 26 SNA, 0 VTAM, 181 TCP/IP, 1 NetView, 34 SNMP.

Eric Loriaux – <http://www.loriaux.com/s390/training.html>

- List of mainframe consultants and trainers.

Open Directory Project – <http://dmoz.org/Computers/Software/Online-Training>

- Vendor list only; no course list.

SolutionCentral

<http://syndication.solutioncentral.com/traininghome.asp?isyndid=5>

- 6 SNA, 22 VTAM, 9063 TCP/IP, 7 NetView, 280 SNMP.
- Requires free registration to get course details.

TrainSeek – <http://www.trainseek.com>

- 18 SNA, 0 VTAM, 92 TCP/IP, 0 NetView, 6 SNMP.

Figure 1: Training directories worldwide

AllNet Training – <http://www.allnettraining.com>

- 6 SNA, 0 VTAM, 642 TCP/IP, 0 NetView, 12 SNMP.

Hartford Area Trainers – <http://www.hatrainers.org/vendlist.htm>

- Vendor list only; no course list.

Seminar Information Service – <http://www.seminarinformation.com>

- 13 SNA, 6 VTAM, 49 TCP/IP, 4 NetView, 5 SNMP.

Training Registry – <http://www.trainingregistry.com>

- 9 SNA, 0 VTAM, 37 TCP/IP, 2 NetView, 8 SNMP.

Figure 2: North America

CourseLeader – <http://www.courseleader.co.uk>

- 7 SNA, 1 VTAM, 39 TCP/IP, 0 NetView, 2 SNMP.

Learndirect – <http://www.learndirect.co.uk>

- 67 SNA, 4 VTAM, >500 TCP/IP, 5 NetView, 7 SNMP.

Figure 3: UK

Australian Training Register – <http://www.atr-training.com.au>

- 7 SNA, 2 VTAM, 81 TCP/IP, 0 NetView, 1 SNMP.
- Requires free registration to search and substantial subscription fee to get course details.

Figure 4: Elsewhere

The training directories are divided up by the areas of the world they cover. The numbers indicate search results (ie number of courses listed) based on a few networking keywords.

OTHER APPROACHES

Because their projects often have a requirement for knowledge transfer, many consultants can also teach on-site courses in their areas of expertise. Local consultants can be found in a telephone directory. For more specialized needs, there is a directory of US consultants at <http://www.icca.org>

A search of ICCA's member consulting firms had the following number of matches for companies with the listed expertise:

- 16 VTAM
- 19 SNA
- 182 TCP/IP
- 7 NetView
- 12 SNMP.

Although there are quite a few Web sites dedicated to matching other short-term computing needs to freelancers, there is not yet a popular site for instructors to bid on on-site courses required by organizations.

Finally, many organizations have capable instructors and merely require course materials. A few training firms will license the use of their course materials. But it's often merely a case of finding the right book or manual to use, and buying copies for the instructor and each student. Universities have used this approach for years.

NEXT

The final article in this series looks at a source of mini-courses: the sessions offered at technical conferences. In fact, many conferences go beyond the typical 30-90 minute session, also offering half-day and full-day courses.

Chris Bruns
(Canada)

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Call for papers – why not share your expertise and earn money at the same time?

Why not share your expertise and earn money at the same time? *TCP/SNA Update* is looking for REXX EXECs, macros, CLISTs, program code, etc, that experienced networkers have written to make their life, or the lives of their users, easier.

We will publish it (after vetting by our expert panel) and send you a cheque when the article is published. Articles can be of any length and can be sent or e-mailed to Fiona Hewitt at any of the addresses shown on page 2.

More information about how to contribute is contained in our *Notes for Contributors*, which is available from our Web site, at www.xephon.com/nfc

TCP/SNA conferences

Find the right conference, and you can learn as much in a one-hour conference session as you would in a two-day classroom course. But you have to work at it:

- Listen carefully.
- Take notes to expand on or cover points not listed on the handout (typically a copy of the slides).
- Invent your own tests and do them when you get back to the office.
- Research any questions that come up in the relevant product manuals.
- If possible, ask the speaker a question or discuss things with other attendees.

But, be warned: conferences can be exhausting experiences. To obtain maximum value:

- Come well rested.
- Don't plan any social activities in the evening if you are attending sessions all day.
- If you can afford/justify it, stay in the hotel where the conference is hosted, or at least one nearby, so that your waking hours are spent learning, not commuting.

More and more, conferences are adding half-day and full-day courses to their agendas, before, after, or during the conference itself. Offsetting the downsides of potential exhaustion or information overload is the fact that the incremental cost is relatively low, not to mention the reality of the travel approval process in most organizations: it is much easier to get one trip approved than two.

Unlike training, Internet-based Web delivery of conference sessions, either live or on-demand, has been very slow in coming. Back in 1996, Gartner Group offered streaming RealAudio with full-motion video,

and IBM used its proprietary Bamba technology to deliver streaming audio synchronized with slides of selected technical conference sessions. Now, more than five years on, we seem to have not yet come back to the point where we were in 1996. The truth, of course, is that there were major problems with the technology back then. And few of us had access to the kind of consistent high-speed Internet access necessary to view it properly even if we could get it to work.

The conferences shown in Figures 1-6 are listed alphabetically by the organization that sponsors them. Many of the conferences change over time, so check the site for up-to-date information. In fact, some sponsors never run the same conference twice.

AFCOM – <http://www.afcom.com>

- *AFCOM Conference & Expo.*

Canadian Information Processing Society – <http://www.cips.ca>

- *Edmonton Fall Conference.*
- *National Conference.*

COMDEX – <http://www.comdex.com>

- Several conferences annually worldwide.

COMMON – <http://www.common.org>

- Several conferences annually worldwide.

Computer Associates – <http://www.caworld.com>

- *CA World 200x.*

Data Warehousing Institute – <http://www.dw-institute.com>

- *TDWI World Conference.*

Digital Consulting Institute (DCI) – <http://www.dci.com>

- *Advanced Conference for Help Desk Professionals.*
- *B2B Solutions Conference.*
- *Conference for Help Desk Professionals.*
- *The Conference for Service & Support Professionals.*
- *Corporate and e-Business Portals Conference.*
- *The Enterprise Architectures Conference.*
- *Government Enterprise Architectures Conference.*
- *Mobile Business for the Enterprise Conference & Exposition.*
- *Summit on Wireless Computing.*

Figure 1: Conferences (part one)

Disaster Recovery Journal – <http://www.drj.com>

- *Corporate Contingency Planning Seminar and Exhibition.*
- *International Disaster Recovery Symposium and Exhibition.*

Gartner Group – <http://www.gartner.com>

- *AD Summit 200x: Technological Possibilities, Business Realities.*
- *Application Integration and Web Services: The Foundation for Total Business Integration.*
- *Conferencia SEGURANCA NO INFOCOSMO: Seguranca, Privacidade e Gerenciamento de Risco depois do e-business.*
- *Data Centre Conference.*
- *Forum on Business and Technology Convergence.*
- *Gartner Dataquest Service Trends.*
- *Gartner Storage Conference: Optimizing Business Advantage in a World of Networked Storage.*
- *Healthcare Business and IT Summit.*
- *Midsize Enterprise Summit.*
- *Mobile Business.*
- *Symposium/ITxpo 200x.*
- *Windows 2000.*
- *Wireless Access, Mobile Business Solutions.*
- *Wireless LAN Summit: Unplugged Access to Profitability.*

GSE UK – <http://www.gse.org.uk>

- *GSE UK Regional Conference.*

GUIDE SHARE Europe – <http://www.gse.org>

- *GSE Management Summit.*
- *GSE Technical Symposium.*

Help Desk Institute – <http://www.helpdeskinst.com>

- *HDI Annual Conference and Expo.*

IBM – <http://www.ibm.com/services/learning/conf>

- *Networking Conference.*
- *zSeries Technical Conference.*
- *z/OS and OS/390 Expo.*
- *AD Development.*
- *DB2 & Business Intelligence Technical Conference.*
- *DB2 and IMS Technical Conference.*
- *IBM eserver iSeries (AS/400) Technical Conference.*
- *IBM eserver pSeries (RS/6000) Technical University.*
- *IBM eserver xSeries Technical Conference.*

Figure 2: Conferences (part two)

IBM – <http://www.ibm.com/services/learning/conf> (cont)

- *IMS Technical Conference.*
- *iSeries Technical Symposium.*
- *Mobile e-Business Conference.*
- *pSeries and Unix Tech. Univ.*
- *Storage & Storage Networking Symposium.*
- *Transaction & Messaging Technical Conference.*
- *WebSphere200x.*
- *z/VM, VSE and Linux on IBM Enterprise Servers Conference.*

IFIP – <http://www.ifip.or.at>

- *World Computer Congress.*

Information Systems Audit and Control Association (ISACA)

<http://www.isaca.org>

- *Business of e-Business.*
- *International Conference.*

International Quality & Productivity Centre (IQPC) – [http://](http://www.iqpc.com)

www.iqpc.com

- *Broadband Canada.*
- *Location Based Services.*
- *Metro Optical Networks Summit.*

Key3 Media Group – <http://www.key3media.com>

- *NetWorld+Interop.*
- *COMDEX (see above).*
- *Customer 360.*
- *IT for Wallstreet.*
- *The JavaOne Conference.*
- *Seybold.*
- *Support Services Conference & Expo.*
- *TechnoFed.*
- *Technology in Government Week.*
- *Windows On HealthCare.*

marcus evans – <http://www.marcusevansconferences.com>

- *Advanced Networking Solutions Latin America.*
- *Annual Forum on Mobile Internet Services.*
- *Application Programming Strategies for Profitable Mobile Content & Services.*
- *B2E: Business to Employee Communications.*
- *Bandwidth Trading.*
- *Beyond e.*

Figure 3: Conferences (part three)

marcus evans – <http://www.marcusevansconferences.com> (cont)

- *Building on IT.*
- *Collaborative Networks.*
- *Contact Centre Strategy.*
- *Data Warehousing and the Enterprise Data Platform.*
- *Digital Asset Management.*
- *e-Business in the Oil & Gas Industry.*
- *Enabling Multiservice IP Networks.*
- *Enterprise Streaming Media.*
- *Enterprise VPN.*
- *Extended Supply Chain.*
- *Financial Middleware and Messaging..* • *Generating Revenue from Wireless LAN Services.*
- *HomeNet Forum.*
- *IP Routing & Optical Switching.*
- *Metro Optical Networks.*
- *Mobile Applications – The Next Generation.*
- *Mobile Multimedia Messaging.*
- *Outage Management Solutions.*
- *Segmented Marketing for Latin Telcos.*
- *Service Level Agreements.*
- *Service Level Management.*
- *Telecom Market Strategies.*
- *Web Content Management.*
- *The Wireless Enterprise.*
- *Wireless Intelligent and Signalling Network Services.*
- *Wireless LAN 200x.*
- *Wireless Positioning and Location for Next Generation Services.*

NaSPA – <http://www.naspa.com>

- *NaSTEC.*

SHARE – <http://www.share.org>

- *SHARE.*

SIGS Datacom – <http://www.sigs-datacom.de>

- *Netzwerktage 2002.*

Technology Transfer Institute – <http://www.ttivanguard.com>

- *Theme changes for each conference.*

Figure 4: Conferences (part four)

Vanguard – <http://www.vipexpo.com>

- *Enterprise Security Expo*, usually with associated conferences.

Xplor International – <http://www.xplor.org>

- *Xplor 200x*.

Figure 5: Conferences (part five)

DCI NetSessions – <http://www.netsessions.net>

- Only available live.

Ziff Davis eseminars – <http://www.webseminarslive.com>

- Available both live and archived.

Figure 6: On-going Web-delivered and such

IQPC offers the audio of its conference sessions on cassettes and CD-ROM. SHARE provides the slides from conference sessions on CD-ROM. In addition, many organizations offer live audio-only sessions by telephone.

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Interested in writing an article, but not sure what on?

We've been asked to commission articles on a variety of TCP/SNA-related topics. Visit the *TCP/SNA Update* Web site, <http://www.xephon.com/tcpsna>, and follow the link to *Opportunities for TCP/SNA specialists*.

March 1997 – December 2001 index

Items below are references to articles that have appeared in *TCP/SNA Update* since March 1996. References show the issue number followed by the page number(s). All these back-issues of *TCP/SNA Update* can be ordered from Xephon. See page 2 for details.

3174	24.28-30, 27.22, 27.48, 25.24, 40.18-24, 41.14-32, 42.51-59, 42.60-63	Information	37.57-63, 38.66-71, 39.53-63, 40.59-62 41.63-66, 43.66-70
3270 datastream	42.35-50	Integration	34.3-7
3745	25.24-27	Internet	30.3-8
Active Server Watcher	43.52-65	IP Version 6	33.21-25, 37.3-17, 37.17-20
Address translation	36.3-18	ISTCOSDF	28.12-14
AnyNet	34.6, 42.22-34	ISTRACON	25.51-59
APPN	26.27, 32.16	JES nodes	25.35-38, 27.31
ATM	32.17, 34.61-63	LAN	29.8-20
Auditing	28.6-12	Load balancing	36.32-42
Automation	33.3-11	Logon mode table	32.27-39, 33.25-44
Availability	42.10-21	LOSTERM	27.60-61, 28.57, 29.21
Bind	26.23-26	LPR	38.6
Buffer pool statistics	31.3-8	LUGROUP	24.3-6
CICS	27.30	LUSEED	24.3-6
Clustering	36.32-42	MAC	29.11
CMIP alerts	26.3-17	Maintenance	33.3-11
CS/390	42.3-9	Management	29.22-26
DLSw	29.13-15, 32.19, 34.5	Monitoring host sites	43.49-52
Dynamic line updates	27.51-60	Monitoring VTAM LUs	43.10-38
Dynamic reconfiguration	26.17-22	MVS system symbols	29.3-7
E-business	38.54-65	NCP	25.10-35, 26.31, 27.14-50, 29.46-59, 30.34.52, 31.16-18
Education	44.24-68	NetMaster	25.34
Encapsulation	34.4	NetView	25.35-38, 27.3-10, 28.14-53, 32.5-16, 40.36-50
Enterprise Extender	43.3-9	NetView Distribution Manager	26.38-59, 38.22-53, 39.23-33, 41.33-61
Enterprise printing	35.29-37	NetView Session Monitor	25.34
Ethernet LAN	40.51-58	NetWare SAA	37.39-43
File transfer	24.6-28	Network console	32.3-16, 33.11-21, 34.7-22
FRAD	32.17	Network management	23.17-56, 40.36-50
Frame relay	34.3	NMVT	24.30-45
FTP	28.14-53, 30.11, 33.45-47, 38.3-4, 44.3-12	OMEGAMON for CICS	27.16
Generalized Trace Facility (GTF)	21.30	OS/2	32.22-26
Half-Session Control Block (HSCB)	21.3-29	OSI	35.9-13
High Performance Routing (HPR)	27.10-14, 34.4-5	OSI BER	26.4-8
IBM enterprises	29.8-20		
IMS	27.31		
Independent logical units	26.23-38		

OSPF	29.9	tn3270	34.6-7, 38.12-21
Pacing	25.21-24, 26.27, 27.33	tn3270(E) server	38.12-21
Packet switching	37.44-57	Token Ring Network	25.13, 25.27-29, 40.51-58
Performance	27.14-50, 31.10-16	TSO	32.22-26
Performance tuning	39.3-7	Tuning	31.10-16
Printing	39.34-41	USS tables	28.53, 32.27-39
QLLC	32.40-41	VBR	30.53-59
Reflection	41.14-32	VIPA	42.10-21
Response times	27.22	VLAN	29.10-13
RIP	29.9	VTAM	33.3-11, 40.3-7, 42.3-9
RUMBA	42.51-59	VTAM applications	28.3-6
SAS/CPE	28.6-12	VTAM configuration restart	25.3-10
SCO Unix	28.54	VTAM constants	25.51-59
Security	30.3-8	VTAM exits	24.45-55, 40.3-7
Session management	40.3-17	VTAM monitor	35.3-8
S-HTTP	29.18-19	VTAM session termination	27.61-63
SMF	34.23-37, 35.13-28, 36.19-31	WAN	30.31-33
SMTP	29.27-46, 30.12-31, 31.19-48, 32.42-57, 33.48-63, 34.38-60, 35.38-67, 36.43-62, 37.21-37, 38.4-6	WAP	41.3-4
SNA	32.16-21, 32.39-41, 34.3-7	Web server	31.48-63
SNA APPC tuning	39.8-22	Web Services	43.38-49
Sockets	31.8-9	Web-to-host	38.54-65, 39.42-53 41.3-4, 41.5-13, 44.12-24
SOLVE:Netmaster NTS	26.17-23	Web-to-host glossary	40.25-35
TCP/IP	28.53, 30.9-10, 32.16-21, 34.3-7	X.25	28.54-57
Telnet	37.39-43	XML	44.12-24
Terminal emulation	41.14-32, 42.51-59 42.60-63	ZOC	42.60-63

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Contributing to *TCP/SNA Update*

In addition to *TCP/SNA Update*, the Xephon family of *Update* publications now includes *CICS Update*, *MVS Update*, *VSAM Update*, *DB2 Update*, *RACF Update*, *AIX Update*, *MQ Update*, *NT Update*, *Oracle Update*, and *TSO/ISPF Update*. Although the articles published are of a very high standard, the vast majority are not written by professional writers, and we rely heavily on our readers themselves taking the time and trouble to share their experiences with others. Many have discovered that writing an article is not the daunting task that it might appear to be at first glance.

They have found that the effort needed to pass on valuable information to others is more than offset by our generous terms and conditions and the recognition they gain from their fellow professionals. Often, just a few hundred words are sufficient to describe a problem and the steps taken to solve it.

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More information about contributing an article to a Xephon *Update*, and an explanation of the terms and conditions under which we publish articles, can be found at www.xephon.com/nfc. Alternatively, please write to the editor, Fiona Hewitt, at any of the addresses shown on page 2, or e-mail her at fionah@xephon.com

TCP/SNA news

TCP/IP enhancements in IBM's second release of z/OS include improved routing of TCP/IP traffic across a parallel sysplex and the ability to prioritize outbound HTTP server traffic based on business priorities, such as prioritizing Web purchase over browse requests.

In addition, HiperSockets provides for fast TCP/IP communications between z/OS, Linux for zSeries, and z/VM virtual server partitions on a z900 server.

URL: <http://www.ibm.com/servers/eserver/zseries>

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Computer Associates has announced the availability of enhanced versions of Unicentre NetSpy Network Performance and Unicentre NetMaster Network Management for TCP/IP for ensuring network availability and performance of mainframe applications.

URL: <http://www.ca.com>

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Landmark Systems has begun shipping Version 1.1 of its TMON for TCP/IP product for monitoring and managing network performance, with new features to help gain visibility and control over the entire TCP/IP network.

URL: <http://www.landmark.com>

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Logix has announced its WAN TCP/IP Analyser Agent, which integrates with popular LAN Analyser products to access, analyse, decode, and produce statistics from WAN HDLC links carrying TCP/IP data.

URL: <http://www.logixcomms.co.uk>

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IBM has announced Host Access Client Package for Multiplatforms Version 2.0, to make applications available to users with Personal Communications for Windows Version 5.5 and IBM Personal Communications Version 4.3.1 for OS/2, and providing access to applications and data on 5250, 3270, and VT hosts for Web users in SNA and intranet environments.

URL: <http://www.ibm.com/software/network>

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HP has launched its Storage on Ethernet (SoE) initiative, to provide SANs through an Ethernet and TCP/IP connection. The first products will ship by the end of the year.

URL: <http://www.hp.com>

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CS for AIX Version 6.1 now includes support for AIX 5L Version 5.1.

URL: <http://www.ibm.com>

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