Barnard Software, Inc.

- **OPTI-CACHE**   **OPTI-WORKLOAD**
- **OPTI-AUDIT**   **OPTI-TAPE**
-      **TCP/IP-TOOLS**

- http://www.bsiopti.com
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The IPPack TCP/IP Package

- TCP/IP-TOOLS
  - TCP/IP Communications Stack
  - TCP/IP Applications (FTP, TN3270E, Utilities)
- VSE2PDF Report Distribution
  - PDF, HTML and Text Format via Email, FTP
  - Form Overlay Support
- IPServer
  - CICS based HTTP (web) server
- IP/Bridge 3270-To-HTML

The TCP/IP-TOOLS Complete TCP/IP Solution

- Features Available
  - Batch FTP Client and FTP Server
  - TN3270E Servers
    » Non-VTAM Server and VTAM Server
  - Utility Bundle
    » Batch Mail Client   NTP Client and Server
    » GZIP Compression   LPR
    » Remote Execution Client
  - TCP/IP Communications Stack
  - SSL Security Proxy Server

External Batch FTP Client

- Batch FTP Client
- Runs completely outside of TCP/IP
- Can check progress of transfer
  - MSG xx,DATA=PROGRESS

External Batch FTP Client

- Supports 'standard' I/O methods
  - SAM (SD and VSAM SAM)
  - VSAM (ESDS, KSDS, RRDS)
  - POWER Queues
  - VSE Library Data
- Transfer Tape Files
  - Standard label (SL)
  - Non Labeled (NL)

EXTERNAL FTP Server

- Multiple FTP Server tasks within a partition
- Multiple FTP Server partitions

- Supports SMNT (structure mount)
  - SMNT VSAM catalog.name
  - SMNT POWER
  - SMNT LIBRARY libname
- Uses SITE for INPUT/OUTPUT commands

TN3270E Servers

- 2 External TN3270E Servers
- Supports standard TN3270
- Supports TN3270E Terminals
- Supports TN3270E Printers
- 2 Versions
  - Non-VTAM server connects *without* VTAM
  - VTAM server uses VTAM to connect
- VTAM may no longer be required

TN3270E Servers

- Sessions are Non-SNA Local Devices
- Standard TN3270 sessions
  - Server assigned LU name
- TN3270E Terminal Session
  - Generic LU name (Server assigned)
  - Specific LU name (Client requested)
- TN3270E Printer Sessions
  - Requires Specific LU name
- Specific LU names predefined by you

TN3270E Servers

- Multiple TN3270E Server Partitions
- Multi-Threaded Execution in Each Server
- Example, 3 CICS Partitions, VTAM Print
  - S1, Port 23 directed to CICSPROD
  - S2, Port 24 Menu for PROD, ICCF and TEST
  - S3, Port 1023 directed to CICSPROD Printers
  - S4, Port 1024 directed to VTAM Print Printers
- Maximize Performance
  - Low CPU usage, Excellent Responce Time

TN3270E Servers

- TN3270E Printer Clients
- Win95/98/NT PC
- Multiple printer driven
- Printers appear as non-SNA local
  - CICS Report controller
  - CA-RAPS
  - BIM-PRINT
  - VTAM-PRINT

Batch Email Client

- External Batch SMTP Client
- Send Email from a job running in a partition
- Regular Email
- MIME Attachments
- Uses FTP Client I/O routines
- Attach virtually any file
  - VSAM, POWER Data, Library member,
  - SAM files, Tape, Phases, etc

Remote Execution Client

- Runs a command or script on a remote system
  - Unix/Linux and Windows 95/98/NT/2000
- STDOUT and STDERR returned to VSE
- Output scanned to verify completion
- RC=0 indicates good completion
- RC=8 indicates failure

GZIP Compression

- GZIP is Unix style compression
- GZIP on the fly … (GZIP ON)
  - Batch FTP Client, FTP Server
- BSTTGZIP Batch GZIP Utility
  - Input from any source
  - Output to Library, SAM or VSAM ESDS
- MS-DOS GZIP utility provided
  - Most 'Zip' packages support the GZIP format too

NTP Client

- Connects to 'Net' time source
  - NASA, Navy, Etc.
- Uses TIME command to set the TOD clock
- VSE's TOD clock accurate to 4 seconds/Yr
  - Much more accurate than 'PC' clocks
- Use NTP Client after time changes
  - Twice per year

NTP Server

- Allows a 'PC' system to connect to VSE
- Set the 'PC' TOD clock to VSE's TOD clock
  - Freeware available for this function
- Sync your 'PC' network to VSE's TOD clock
- VSE's TOD clock much more accurate
- All 'PC's on the network are in sync

TCP/IP-TOOLS Client Software

- MS-DOS GZIP Utility
- Free Windows FTP Client (Renex BZFTP)
- Serv-U FTP Server Trial Package
  - Serv-U FTP Server
  - Serv-U FTP Client
- BlueZone TN3270E Client (w/SSL)
  - Excellent TN3270E Printer Emulator
  - Excellent TN3270E Terminal Emulator

TCP/IP Communication Stack

- TCP/IP-TOOLS TCP/IP Stack Requires ...
  - VSE/ESA 2.1 (or higher)
  - BSI Stack will not run under VSE/ESA 1.4
  - BSI Stack will not run in 370 mode
- TCP/IP-TOOLS Applications Require ...
  - BSI or IBM/CSI TCP/IP Stack
  - VSE/ESA 1.4 (or higher)
    - » Except Non-VTAM TN3270E server

TCP/IP Communication Stack

- Runs in a partition by itself
  - No applications (except SNMP, RIP Daemons)
- Fully 31-bit enabled
- Extensive use of Access Registers
- Dynamic Partition Aware
  - Best possible performance when TCP/IP stack is run in a dynamic partition *AND* TCP/IP applications are also run in dynamic partitions
- No System GETVIS used

TCP/IP Communication Stack

- BSI TCP/IP API provided
  - This API is specific to the BSI TCP/IP stack
- IBM/CSI API interface also provided
  - Completely transparent binary API
  - No changes to 3rd party applications
  - IBM/CSI applications not supported ***
- BSI BSD/C sockets interface
  - LE C and Non-LE versions
- BSI COBOL/ASM processor, REXX Sockets

TCP/IP Communication Stack

- Device Support
  - CTCA
  - CLAW
  - LCS (3172)
  - OSA/2
  - IUCV (to VM TCP/IP and LINUX/390)
    - » 140-450% greater throughput than CTCA
    - » Usage limited to one stack per VSE/ESA system
      - This is a VSE/ESA VSIUCV Restriction
- CETI currently not supported

TCP/IP Communication Stack

- IP over Ethernet Support
  - MTU size range is 576 to 1500
    - » 1500 is default
- IP over Token Ring Support
  - LCS
  - OSA/2
  - MTU size up to 16K
    - » 4K or 8K is typical

TCP/IP Communication Stack

```
msg m1,d=ip netinfo
AR 0015 1I40I   READY
M1 0045 BSTT010I IP NETINFO
M1 0101 BSTT608I DEVICE 01 NAME LCS612   MAC 00A0C9FCBAF3 MTU   1500
M1 0101 BSTT609I IP 192.168.1.13     NA 192.168.1.0      SA 192.168.1.0
M1 0101 BSTT610I MS 255.255.255.0    BR 192.168.1.255   NB 192.168.1.255
M1 0101 BSTT611I DNS SERVER 24.95.227.33
M1 0101 BSTT611I DNS SERVER 192.168.1.2
M1 0101 BSTT011I COMMAND PROCESSING COMPLETE
```

TCP/IP Communication Stack

```
msg m1,d=ip route print
AR 0015 1I40I   READY
M1 0045 BSTT010I IP ROUTE PRINT
M1 0101 BSTT607I NETWORK           MASK                GATEWAY           IFN MTR
M1 0101 BSTT606I 0.0.0.0           0.0.0.0             192.168.1.100      01 01
M1 0101 BSTT606I 127.0.0.1         255.255.255.255 127.0.0.1             00 00
M1 0101 BSTT606I 192.168.1.12      255.255.255.255 192.168.1.4          01 01
M1 0101 BSTT606I 192.168.1.255     255.255.255.255 192.168.1.13         00 00
M1 0101 BSTT606I 192.168.1.0       255.255.255.255 192.168.1.13         00 00
M1 0101 BSTT606I 192.168.1.13      255.255.255.255 192.168.1.13         00 00
M1 0101 BSTT606I 192.168.1.0       255.255.255.0   192.168.1.100        01 00
M1 0101 BSTT606I 192.168.2.0       255.255.255.0   192.168.1.20         01 01
M1 0101 BSTT011I COMMAND PROCESSING COMPLETE
```

TCP/IP Communication Stack

```
msg m1,d=ip ping cfl.rr.com
AR 0015 1I40I   READY
M1 0045 BSTT010I  IP PING CFL.RR.COM
M1 0101 BSTT616I  PINGING 24.95.227.33
M1 0101 BSTT093I  REPLY FROM 24.95.227.33     TIME    24
M1 0101 BSTT093I  REPLY FROM 24.95.227.33     TIME    17
M1 0101 BSTT093I  REPLY FROM 24.95.227.33     TIME    27
M1 0101 BSTT093I  REPLY FROM 24.95.227.33     TIME    20
M1 0101 BSTT093I  REPLY FROM 24.95.227.33     TIME    23
M1 0101 BSTT011I  COMMAND PROCESSING COMPLETE
```
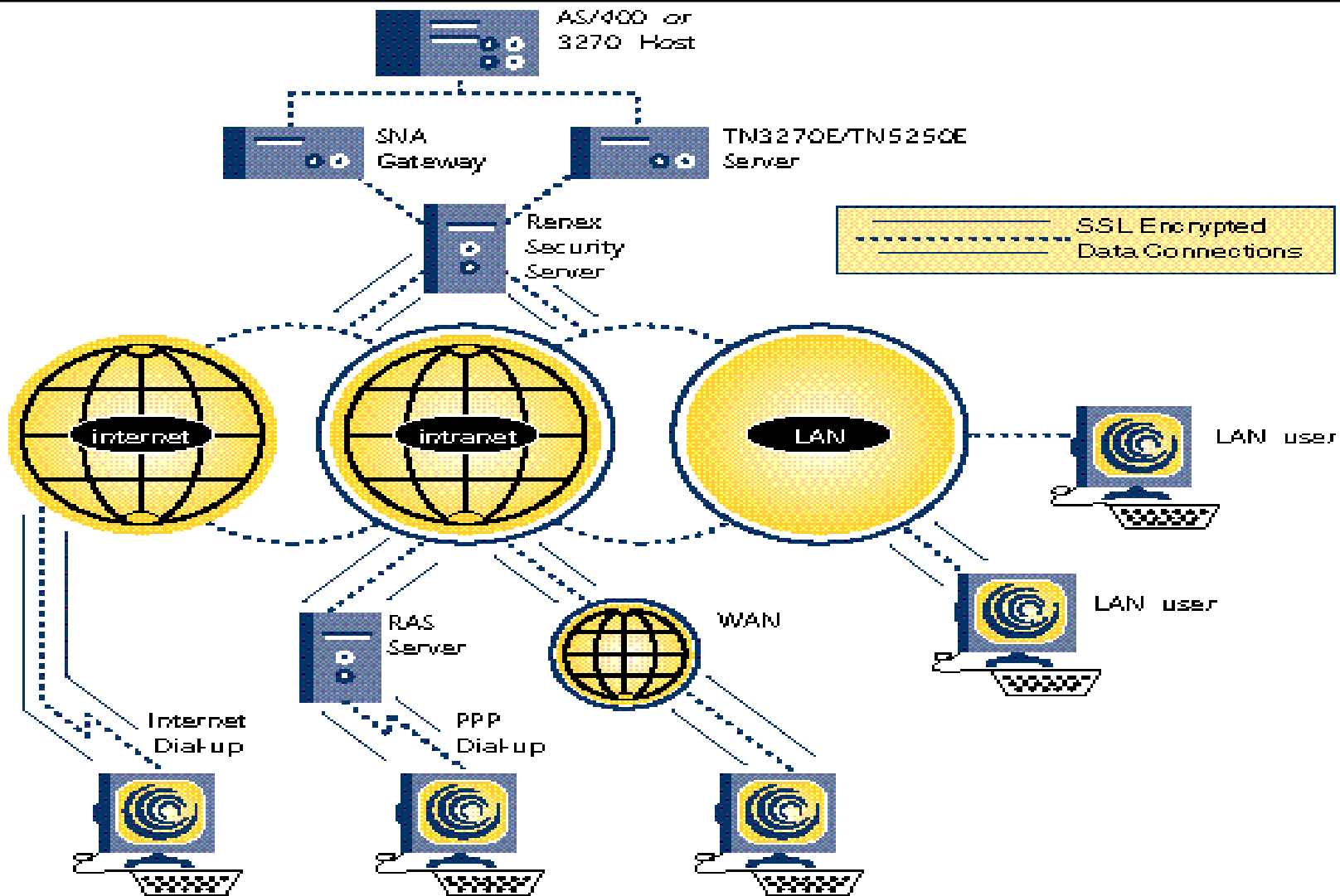
TCP/IP Communication Stack

- SSL Security Proxy Server
- PC running Windows 2000 Professional
  - Or Windows NT Workstation
- Renex Security Proxy Server
  - SSL FTP
  - SSL HTTP
  - SSL TN3270E

TCP/IP Communication Stack

- Why use a Security Proxy Server?
- 1) *Processing Overhead*
  SSL packets are 35 times more CPU to process
  The Renex Security Proxy Server can handle
  very high transactions rates
- 2) *Wanted a Certified SSL solution*
  Microsoft SSL solution is certified
  Is a non-certified solution worth anything?
- 3) *Cost*
  Total cost less than $2000

TCP/IP Communication Stack

TCP/IP Communication Stack

- Native SSL Solution under Study
- Uses OPENSSL Solution
- Provides
  - Secure Socket Layer (SSL) V2 and V3
  - Transport Layer Security (TLS) V1
- Open Source Solution
  - Originally SSLeay
  - Now owned by RSA
- Inexpensive

TCP/IP Communication Stack

- Performance
  - Your Milage May Vary
- Wrote Client and Server programs
  - Client sends packet, recieves packet (and loops)
  - Server receives packet, sends packet
- Uses 'loopback'
  - Measures relative internal stack throughput
- Run using IBM/CSI stack (Service Pack L)
- Run using BSI stack

TCP/IP Communication Stack

- VSE/ESA 2.3.2 Standard Dispatcher
  - 133 requests per second (IBM/CSI)
  - 282 requests per second (BSI)
- VSE/ESA 2.4.1 Turbo Dispatcher
  - 66 requests per second (IBM/CSI)
  - 186 requests per second (BSI)

TCP/IP Communication Stack

- Dual DNS Server support
- SNMP Daemon
  - Sys, NI, IP, ICMP, TCP, UDP, ARP, Route, SNMP
  - OPTI-AUDIT to audit the TCP/IP stack
  - TN3270E MIB Data (Coming Soon)
  - IPServer (HTTP) MIB Data (Coming Soon)
  - ESATCP (Velocity Software, Inc)

TCP/IP Communication Stack

- RIP vs. OSPF Dynamic Routing
  - Which do you use? Why?
- Stack Released with Static Routing
- Dynamic Routing ***
  - Routing Information Protocol (RIP) Ver 1
  - Open Shortest Path First (OSPF)
- DROUTE STATIC|RIP|OSPF

TCP/IP Communication Stack

- Dual Network Adapters Recommended
  - High Priority for Interactive Traffic
  - Lower Priority for Bulk Data Transfer Traffic
- Applications Can Run Higher Priority
  - Flexable Priority Management (Turbo/Share)
- All Network Connections should be Filtered
  - Only IP, ARP, RARP frames
  - Only Protocol ICMP, TCP, UDP, OSPF
  - Filter UDP by Port Number (limits broadcasts)

TCP/IP Communication Stack

- ISV Offering
- TCP/IP-TOOLS Provided to Vendors
  - FREE Non-Productive Use License
- Vendors Can Certify Products

The TCP/IP-TOOLS
Complete TCP/IP Solution

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  - Utility Bundle
    - » Batch Mail Client   NTP Client and Server
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    - » Remote Execution Client
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