

NJE for Non-IBM Systems

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Agenda

- NJE Overview
- Why NJE Today?
- Interesting Enhancements to a Linux-based Appliance
- Scenarios for Using the NJE/IP Bridge
 - Unattended Encrypted File Transfer
 - Development Workstation
 - Delivering Mainframe Output to a Program for Post-Processing
 - Remote execution of Linux applications from z/OS
- Demonstration (network permitting)
- Q&A

Some Definitions

Term	Definition
Appliance	A pre-configured Linux-based "black box" implementing a specific function (for example, NJE) that is installed in a virtual machine or LPAR.
NJE	Network Job Entry: A facility for transmitting jobs (JCL and in-stream data sets), SYSOUT data sets, (job-oriented) operator commands/messages, and job accounting information from one computing system to another.
NJE/IP Bridge	Software that implements the NJE protocol and provides a CTC device driver that allows a bridge from a non-IP NJE system to an IP network.
NQS	The NJE/IP Bridge includes support for an optional batch submission and execution application for UNIX and UNIX-like systems. It is based on NQS (Network Queuing System).

NJE Overview

- Network Job Entry (NJE) is embedded in most IBM mainframe operating systems as a method of transmitting and receiving job streams, output, and interactive messages between nodes.
- Characteristics:
 - 8 character userid
 - 8 character node name
- Network is fully defined at all points (with some exceptions)

NJE Services

- Unattended File Transfer
- Interactive Message Transport
- Remote Job Submission
- Remote Printing
- Remote Management Traffic Delivery (PROP, etc)
- Set of Common Conventions for Delivering Jobs and Output

NJE Overview

- NJE supported as a application over different transports
 - Native BSC communications
 - Native CTC communications
 - SNA networks
 - TCP/IP (VM, VSE, JES2 at z/OS 1.7 only)
- Protocol governed by NJE Protocols and Formats manual

NJE Overview

- IBM has implemented NJE capability only for mainframe and iSeries OS
 - No AIX
 - No Linux
 - No Windows
 - No non-IBM workstation OS
- Large amounts of effort and expense necessary to integrate file transfer and output management capabilities between these systems

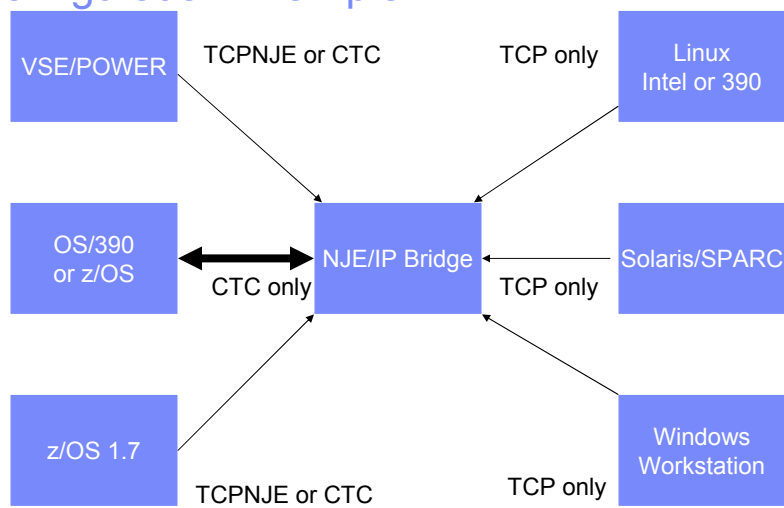
Why NJE Today?

- Why do NJE over IP?
 - Clean bidirectional integration of programmable workstations with mainframe data transfer
 - Leverage Linux-based development tooling and skills in tandem with mainframe services (right tool, right job).
 - Increasing necessity of data movement between IBM and non-IBM environments without complex automation requirements
 - Death of the 37x5 FEP
 - Demonstrate construction of Linux-based companion appliance
- Eliminate SNA requirement for z/OS to participate in NJE networks

NJE/IP Bridge Features

- IP connections are protected with SSL if desired
- No SNA stack or SNA services are required on host or workstation
- NQS integration provides RJE function for Unix/Linux systems

Configuration Example



Linux Enhancements: CTC Driver

- Parallel, ESCON, FICON CTC necessary to communicate with unmodified IBM operating systems
- New device driver needed: `/dev/ctc0`
 - Implements NJE line discipline over physical or virtual CTC
 - Presented to application as connection similar to serial link
 - Installed with Appliance
 - Cannot be used with “regular” CTC drivers

Scenario: Unattended File Transfer

Mainframe:

- DEST=(node, userid)
in JCL
- SENDFILE/XMIT cmd

Open Systems:

- `sendfile /etc/hosts
userid@node`

Benefits -

- Automatic retry
- Multiple file transmission in parallel
- Positive success/fail return code
- ASCII/EBCDIC translation if needed
- Easily automated with mainframe tools

Scenario: Development Workstation

- JCL submission operates identically to remote NJE workstation
- Any development tools available on the workstation can be used
- Preserves module attributes in transmission automatically (within scope of NJE protocol)
- Output can be automatically routed back to workstation w/o complex transfer procedure
- Possible uses:
 - Using COBOL or PL/I language-sensitive editing in Eclipse with z/OS COBOL applications
 - Online debugging using IDE against z/OS code
 - Low cost configuration management using CVS or Subversion for z/OS or VM applications

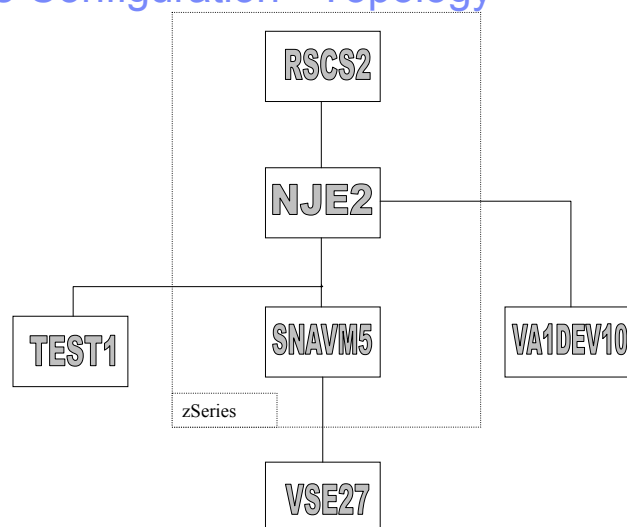
Scenario: Delivering Output to a Program

- Easy mapping of NJE node/userid to workstation program input via mapping table in NJE Bridge
- Mapping table specifies application and command line to use, and file is supplied to application standard input for processing
- Examples (not included, but easily constructed):
 - Automatic faxing of output to specified number
 - Line printer emulation for PostScript or PCL printers (full CUPS support, plus mainframe output management)
 - Automated PDF conversion and archival on DVD

Scenario: Remote Job Execution on Linux

- Available only on Unix/Linux variants
- Uses NQS to queue jobs and manage the remote execution.
- NQS selects system from a pool, transfers the job to the execution node and returns output and status info via NJE messages
- NJE/IP Bridge integration via program interface
- Messages and files produced by Linux application can be tracked and automated via standard mainframe tools (e.g., Netview, PROP, CA products, TWS, etc.)

Sample Configuration - Topology



Sample Configuration – Network Nodes

Node	Platform	O/S	IP Name
RSCS2	zSeries	z/VM 4.4	N/A
NJE2	zSeries	NJE/IP Appliance	nje2.vm.example.com
SNAVM5	zSeries	z/VM 4.4 (RSCS)	vm.example.com
TEST1	x86	Fedora Core 3	test1.example.com
VA1DEV10	Sparc	Solaris 8	va1dev10.example.com
VSE27	zSeries	VSE/ESA 2.7	vse27.external.net

Appliance Requirements

- Tape drive
- 2 minidisks:
 - 0x151 – 500 cylinders
 - 0x152 – 100 cylinders (may be bigger in case of larger spool area requirements)
- Main storage: 128MB
- IP addresses: node, gateway, DNS
- IP netmask

Appliance Virtual Machine

```

USER NJE2 XXXXXXXX 128M 512M G
CPU 0
CPU 1
IPL CMS PARM AUTOCR
MACHINE XA 2
CONSOLE 001F 3215 T *
# SPECIAL 005A QDIO 3 SYSTEM LNXLAN3
# SPECIAL 0060 CTCA
LINK MAINT 0190 0190 RR
LINK MAINT 019D 019D RR
LINK MAINT 019E 019E RR
LINK MAINT 019F 019F RR
MDISK 0150 3390 2501 500 VM100D
MDISK 0151 3390 1043 100 310W01
MDISK 0152 FB-512 V-DISK 200000
MDISK 0191 3390 2397 50 310W01

```

2 virtual CPUs were defined just to verify SMP operation of CTC driver

Appliance Installation...

```

#CP REW 181
Rewind complete
#CP IPL 181 CLEAR
Linux version 2.4.27-2-s390 (waldi@raptor) (gcc version
3.3.5 (Debian 1:3.3.5-6)) #1 SMP Wed Jan 26 14:44:31 CET
2005
We are running under VM (31 bit mode)
This machine has no PFIX support
This machine has an IEEE fpu
On node 0 totalpages: 32768
zone(0): 32768 pages.
zone(1): 0 pages.
zone(2): 0 pages.
Kernel command line: ro debian-installer/locale=C

```

The installer is based on a 2.4 kernel, but the appliance itself is a 2.6 kernel

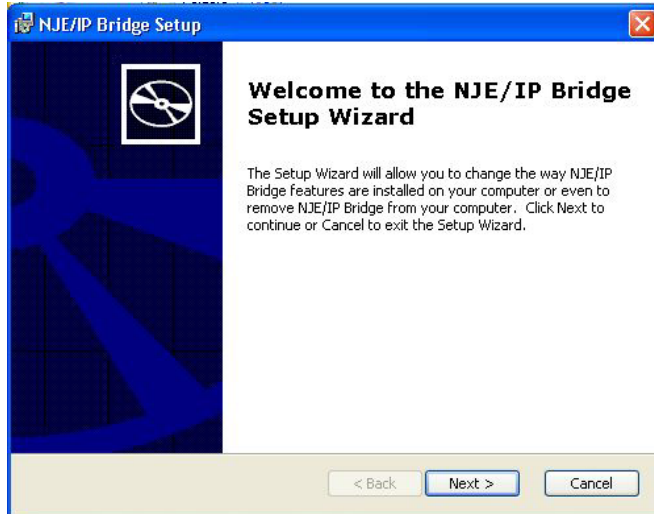
...Appliance Installation

- **Installer:**
 - Formats disks
 - Prompts for IP data
- **First IPL of appliance:**
 - Configures NJE
 - Prompts for license key
 - Configures NQS (batch job system for Linux)
- **Now ready to configure NJE**

Linux Installation

```
rpm -Uhv nje-1.0-5.i386.rpm
Preparing... ##### [100%]
 1:nje ##### [100%]
rpm -Uhv nqs-4.0-1.i386.rpm
Preparing... ##### [100%]
 1:nqs ##### [100%]
NMAP_SUCCESS: Successful completion.
NMAP_SUCCESS: Successful completion.
MID      PRINCIPAL NAME  ALIASES
---      -
3232261406  test1.example.com    test1
Utility [nqsmkdirs]: Creating: control/+++++.
Utility [nqsmkdirs]: mkdir exited (0).
:
Utility [nqsmktrans]: Exiting.
NQS manager[TCML_COMPLETE ]: Transaction complete at local host
NQS manager[TCML_COMPLETE ]: Transaction complete at local host
Queue standard created.
:
NQS manager[TCML_COMPLETE ]: Transaction complete at local host
```

Windows Installation



NJE Configuration

Node	IP Name	Port	Device	Buffer Size
RSCS2	N/A	N/A	600	31000
VA1DEV10	va1dev10.example.com	175	N/A	4096
TEST1	test1.example.com	175	N/A	4096
VSE27	vse27.external.net	175	N/A	24000
SNAVM5	vm.example.com	175	N/A	4096

NJE Configuration...

- Node definition done in `/etc/nje/nje.conf`
- Performed with text editor
- Two main sections:
 - Global settings
 - Node definitions
- Changes can be picked via HUP signal to process:
 - `/etc/init.d/njed reload`

...NJE Configuration...

```
NAME                NJE2
IPADDRESS           nje2.vm.example.com
QUEUE               /var/spool/nje
CMDMAILBOX          UDP 127.0.0.1 175
LOG                  /var/log/nje/nje.log
TABLE                /etc/nje/nje.route
INFORM              ROOT@VM932
USEREXITS            /etc/nje/file-exit.cf
MSGEXITS             /etc/nje/msg-exit.cf
LLEVEL              1
DEFAULT-ROUTE       SNAVM5
```

...NJE Configuration...

```
LINE 0 VSE27
  TYPE          UNIX_TCP
  BUFSIZE       24000
  TIMEOUT       3
  IPPORT        175
  TCPNAME       vse27.bsinet.org
  TCP-SIZE      24000
  MAX-STREAMS   1
```

```
LINE 1 SNAVM5
  TYPE          UNIX_TCP
  BUFSIZE       4096
  TIMEOUT       3
  IPPORT        175
  TCPNAME       VM.EXAMPLE.COM
  TCP-SIZE      8192
  MAX-STREAMS   7
```

...NJE Configuration...

```
LINE 2 RSCS2
  TYPE          UNIX_CTC
  BUFSIZE       24000
  TIMEOUT       3
  DEVICE       /dev/njectc0
  MAX-STREAMS   2
```

```
LINE 3 VA1DEV10
  TYPE          UNIX_TCP
  BUFSIZE       4096
  TIMEOUT       3
  IPPORT        175
  TCPNAME       valdev10.example.com
  TCP-SIZE      8192
  MAX-STREAMS   7
```

...NJE Configuration

```
LINE 4 TEST1
TYPE          UNIX_TCP
BUFSIZE      4096
TIMEOUT      3
IPPORT       175
TCPNAME      test1.example.com
TCP-SIZE     8192
MAX-STREAMS  7
```

RSCS Configuration

```
LINKDEFINE NJE2 TYPE TCPNJE QUEUE SIZE RETRY NODE NJE2
PARM NJE2 TCPID=TCPIP HOSTN=NJE2.VM.EXAMPLE.COM
KEEPALIV=YES
ROUTE NODE NJE2 TO LINK NJE2
```

VSE Configuration...

- Recommended PTFs:
 - DY46418 for 6.7 (VSE/ESA 2.7)
 - DY46426 for 6.6 (VSE/ESA 2.6)
 - DY46427 for 7.1 (z/VSE 3.1)

...VSE Configuration...

```
V27NBT  PNODE  NODE=VSE27,          -  
          LOCAL=YES,                -  
          PORT=175                    -  
*  
          PNODE  NODE=NJE2, LOCAL=NO, IPHOSTAD=192.168.203.218, -  
          IPEXTRAD=010.033.204.020, PORT=0175,                -  
          AUTH=NET, BUFSIZE=32000                               -  
*  
          END
```

Power PNODE Macro Definitions

...VSE Configuration

```
NETPOWER POWER
-
...
                                PNET=V27NBT,
-
...
```

Power Generation Macros

Starting NJE

```
/etc/init.d/njed start
```

```
Starting NJE daemon...NJE/IP Bridge licensed to: Example Company
```

```
Expires: 2010/12/31
```

```
Platform: s390
```

```
done.
```

Command Interface...

- The `ucp` command is used to control the behavior of the NJE daemon
- Intended to be an administrator command so is placed in the `/usr/local/sbin` directory
- Operates by sending a message to the NJE daemon without waiting for response
- Response is directed to the user who issued the command (who may be logged on in multiple places)

...Command Interface...

```

ucp help
HELP - Show this message
SHOW LINE/QUEUE - Show lines or queue status
START LINE n - Start a closed line
* START STREAM n LINE m - Start specific stream in active line
SHUT [ABORT] - Shutdown or abort the whole program
STOP LINE - Stop a line
FORCE LINE - Stop a line immediately
* STOP STREAM n LINE m - Stop a single stream in active line
* FORCE STREAM n LINE m - Stop immediately
QUEUE file-name [SIZE size] - To queue a file to send
RESCAN EXITS - Rescan file and message exits.
RESCAN QUEUE - Rescan queue and requeue files.
RESCAN ROUTE - Reopen route database.
DEBUG DUMP - Dump all lines buffers to logfile
% DEBUG RESCAN - Rescan queue and requeue files.
LOGLEVEL n - Set the loglevel to N
ROUTE xxx TO yyy - Change the routing table.
    Route to OFF will delete the route entry.
GONE username LoginDirectory - Add username to gone list
UNGONE username - Remove a user from the Gone list.
EXIT/QUIT - Exit this utility.
* - Not yet implemented, % - obsoleted

```

...Command Interface

ucp show line

```

NJE2: NJE/IP Bridge version 1.0(sna)/200511022000, Lines status:
NJE2: Line.0 VSE27 (0x439a48)  0 (Q=0000)  ACTIVE   TCP
NJE2:  Bufinfo: InAge=23.319s, RecvSize=0, XmitAge=24.851s, XmitSize=0
NJE2:  Flags: AUTO_RESTART|DEFERRED_OK|RELIABLE|RESET_BCB|VMNET_FORMAT|XMIT_QUEUE
NJE2:  1 streams in service. WrSum: 1fil/1659699B RdSum: 1fil/2366615B
NJE2: Line.1 SNAVM5 (0x460348)  0 (Q=0000)  ACTIVE   TCP
NJE2:  Bufinfo: InAge=18.120s, RecvSize=0, XmitAge=18.120s, XmitSize=0
NJE2:  Flags: AUTO_RESTART|DEFERRED_OK|RELIABLE|RESET_BCB|VMNET_FORMAT|XMIT_QUEUE
NJE2:  7 streams in service. WrSum: 0fil/4399346B RdSum: 0fil/4384771B
NJE2: Line.2 RSCS2 (0x486c48)  0 (Q=0000)  ACTIVE   CTC
NJE2:  Bufinfo: InAge=1.494s, RecvSize=6, XmitAge=515347.294s, XmitSize=0
NJE2:  Flags: AUTO_RESTART|DEFERRED_OK|RELIABLE|RESET_BCB|SLOW_LEAVE|XMIT_QUEUE
NJE2:  2 streams in service. WrSum: 0fil/310B RdSum: 2fil/2793544B
NJE2: Line.3 VALDEV10 (0x44cec8)  0 (Q=0000)  ACTIVE   TCP
NJE2:  Bufinfo: InAge=24.848s, RecvSize=0, XmitAge=24.851s, XmitSize=0
NJE2:  Flags: AUTO_RESTART|RELIABLE|RESET_BCB|SLOW_LEAVE|VMNET_FORMAT|XMIT_QUEUE
NJE2:  7 streams in service. WrSum: 1fil/1743081B RdSum: 3fil/5222288B
NJE2: Line.4 TEST1 (0x4737c8)  2 (Q=0000)  Retry    TCP
NJE2:  Bufinfo: InAge=1209479.239s, RecvSize=0, XmitAge=1209180.335s, XmitSize=24
NJE2:  Flags: AUTO_RESTART|CALL_ACK|RELIABLE|VMNET_FORMAT|WAIT_V_A_BIT|XMIT_QUEUE
NJE2: End of Q SYS display

```

Querying a Remote Node

send -c rscs2 q sys

```

RSCS2: Link
RSCS2: Name      Status      Type      Addr LU Name  Logmode  Queuing
RSCS2: NJE2     active     NJE       0800 ...     ...     priority
RSCS2: 1 link found

```

send -c test1 cpq cpu

```

TEST1: CPU: i686

```

Submitting a Job from Linux...

```
* $$ JOB JNM=PRINTLOG,CLASS=P,LDEST=(,NEALE),XDEST=VSE27,NTFY=YES
* $$ LST CLASS=0
// JOB TEST NOTIFY
// EXEC PRINTLOG,SIZE=PRINTLOG,PARM='F4'
/*
/ &
* $$ EOJ
```

```
submit @vse27 test.jcl
VSE27: 1Q5DI EXECUTION COMPLETED FOR PRINTLOG 00575 ON VSE27,
RC=****, TIME=16:28:56
NJE2: FILE (0575) spooled to NEALE -- origin NJE2(NEALE) 11/18/05
16:16:06 EST
NJE2: FILE (0575) spooled to NEALE -- origin NJE2(NEALE) 11/18/05
16:16:06 EST
VSE27: 1RA0I OUTPUT PRINTLOG 00575(00133) TRANSMITTED TO NJE2 FOR
NJE2 O-TR1
```

...Submitting a Job from Linux

```
qrdr
QRDR: Spool dir:  `/var/spool/nje/NEALE/'
From:                To:                FName:   FExt:   Type   Form:
SpoolID
NEALE@NJE2           NEALE@NJE2           PRINTLOG OUTPUT   PRT O
0112
Found 1 file.
```

```
peek 1
// JOB TEST NOTIFY                DATE 11/18/2005, CLOCK 16/28/53
// EXEC PRINTLOG,SIZE=PRINTLOG,PARM='F4'
1S54I PHASE PRINTLOG IS TO BE FETCHED FROM IJSYSRS.SYSLIB
OPTIONS SPECIFIED:  F4                11/18/2005 PAGE    1

COUNT   MESSAGE TEXT                CLOCK   DATE   CONSOLE
1 ***** LOGGING RESUMED AFTER VSE SYSTEM RE-IPL ***** 10:56:40 09/21/2005
```

```
receive 112
ls -l printlog.output
-rw-r--r-- 1 neale users 10976 2005-11-18 16:28 printlog.output
```

Sending Commands to VSE

```

send -c @VSE27 d a
VSE27: 1R48I C-RV ,TCP,      AWAITING      NODE=BSIVM43
VSE27: 1R48I C-RV ,TCP,      AWAITING      NODE=BSIVSE26
VSE27: 1R48I C-RV ,TCP,      AWAITING      NODE=BSIVSE31
VSE27: 1R48I C-RV ,TCP,      PROCESSING    NODE=NJE2
VSE27: 1R48I C-RV ,TCP,      AWAITING      NODE=BSIJCB
VSE27: 1R48I C-RV ,TCP,      AWAITING      NODE=TEIVM43
VSE27: 1R48I  BG,FEC,A0I,,      INACTIVE,
VSE27: 1R48I  F2,FEC,L2,,      CICSICCF,00573,2
VSE27: 1R48I  F3,FEC,K3,,      VTAMSTRT,00025,3
:
:
VSE27: 1R48I  F3,FEE,,,      VTAMSTRT,00025,A      21 LINES SPOOLED,QNUM=01886
:
VSE27: 1R48I  Z3,FEE,,,      FTSP20 ,00289,O      25 LINES SPOOLED,QNUM=01879
:
:
VSE27: 1R48I  R1,FEE,,,      ITAMTEST,00572,O      170 LINES SPOOLED,QNUM=01881
VSE27: 1R48I  F2,FEE,,,      CICSICCF,00573,A      1864 LINES SPOOLED,QNUM=01870
VSE27: 1R48I  RDR,00C,A,,
VSE27: 1R48I  PUN,00D,O,VM,      INACTIVE,
VSE27: 1R48I  LST,00E,O,1,VM,      INACTIVE,

```

Sending Commands to VM

```

send -c @snavm5 q sys
SNAVM5: Link
SNAVM5: Name      Status      Type      Addr LU Name  Logmode  Queueing
SNAVM5: PUCC      inactive   TCPNJE    0000 ...      ...      size
SNAVM5: MARIST    connect   TCPNJE    0000 ...      ...      size
SNAVM5: FSFZVM51 active     TCPNJE    0000 ...      ...      size
SNAVM5: FC3       inactive   TCPNJE    0000 ...      ...      size
SNAVM5: NJE2      connect   TCPNJE    0000 ...      ...      size
SNAVM5: D26TEST   active     TCPNJE    0000 ...      ...      size
SNAVM5: 6 links found

```

```

send -m neale@snavm5 Hello VM!
SNAVM5: DMTRGX332E NEALE not receiving

```

Sending Files

```
sendfile neale@snavm5 printlog.output
```

```
SNAVM5: DMTAXM104I File (0134) spooled to NEALE -- origin NJE2(NEALE)
11/18/05 17:35:37 CDT
```

```
query rdr all *
```

ORIGINID	FILE	CLASS	RECORDS	CPY	HOLD	DATE	TIME	NAME	TYPE	DIST	
RSCS	0664	A	PUN	00000142	001	NONE	11/18	16:33:48	PRINTLOG	OUTPUT	NEALE

```
tag query file 664
```

```
FILE (0134) ORIGIN NJE2 NEALE 11/18/05 17:35:38 CDT JOBID 00134
```

```
peek 664
```

```
0664 PEEK A0 V 132 Trunc=132 Size=109 Line=0 Col=1 Alt=0
File A.PRINTLOG.OUTPUT from NEALE at NJE2 Format is NETDATA.
* * * Top of File * * *
**// JOB TEST NOTIFY DATE 11/18/2005, CLOCK 16/28/53
// EXEC PRINTLOG,SIZE=PRINTLOG,PARM='F4'
"1S54I PHASE PRINTLOG IS TO BE FETCHED FROM IJSYSRS.SYSLIB"OPTIONS SPECIFIED:F4
11/18/2005 PAGE 1
```

Directing Output to Printers

```
LPR NJE2 * * * * * default
RUN /usr/local/bin/rprint $FRUSER $FRNODE $FID $SPOOL $CLASS $TOUSER $TONODE
$FNAME $FTYPE $TAG $DIST
```

```
/etc/nje/file-exit.cf
```

```
* $$ JOB JNM=PRINTLOG,CLASS=P,LDEST=(,LPR),XDEST=VSE27,NTFY=YES
* $$ LST CLASS=0
// JOB TEST NOTIFY
// EXEC PRINTLOG,SIZE=PRINTLOG,PARM='F4'
/*
/&
* $$ EOJ
```

Using NQS for batch execution...

```
#!/bin/sh
id
hostname
hostname --domain
uname -a
date
env
cat /proc/cpuinfo
```

sendfile test sh job at nje2

```
File TEST SH A1 sent to JOB at NJE2 on 11/21/05 12:40:32
Ready;
From NJE2(NJEANON): NQS request: R0188 (0.NJE2.vm.example.com)
beginning at 12:40 on NJE2.vm.example.com
From NJE2(NJEANON): NQS request: R0188 (0.NJE2.vm.example.com)
end at 12:40 on NJE2.vm.example.com
From NJE2(NJEANON): NQS request: R0188 (0.NJE2.vm.example.com)
end at 12:40 on NJE2.vm.example.com
```

...Using NQS for batch execution

```
RDR FILE 0677 SENT FROM RSCS      PRT WAS 0189 RECS 0000 CPY  001 A NOHOLD NO
DMTAXM104I File (0036) spooled to NEALE -- origin NJE2(ROOT) 11/21/05 13
:08 CDT
RDR FILE 0678 SENT FROM RSCS      PRT WAS 0190 RECS 0062 CPY  001 A NOHOLD NO
DMTAXM104I File (0037) spooled to NEALE -- origin NJE2(ROOT) 11/21/05 13
:08 CDT
q r all *
ORIGINID FILE CLASS RECORDS CPY HOLD DATE  TIME      NAME      TYPE      DIST
RSCS      0677 A PRT 00000000 001 NONE 11/21 12:40:44 NJE_ERR   00000000 ROOT
RSCS      0678 A PRT 00000062 001 NONE 11/21 12:40:44 NJE_OUT   00000000 ROOT
```

peek 678

```
0678      PEEK      A0 V 132 Trunc=132 Size=62 Line=0 Col=1 Alt=0
File NJE_OUT 00000000 from ROOT at NJE2 Format is PRINT.
* * * Top of File * * *
uid=1001(njeanon) gid=1003(njeanon) groups=1003(njeanon)
nje2
vm.example.com
Linux nje2 2.6.5-7.191-s390 #1 SMP Tue Jun 28 14:58:56 UTC 2005 s390 s390
s390 GNU/Linux
Mon Nov 21 12:40:42 EST 2005
```

Demonstration (Network Permitting)

- Link Status
- Interactive messages
- Unattended file transfer
- Job transmission from open system to IBM system
- Job transmission from IBM system to open system
- Remote control and logging via NJE messages

BSI NJE/IP Bridge

- NJE/IP Bridge implements a complete set of NJE over IP server and client applications, allowing complete NJE over IP or NJE over CTC peer functionality, including routing and output management functions.
- Three configurations:
 - LPAR appliance
 - 32/64-bit pre-configured guest for z/VM
 - Open systems packages
 - Linux (s390, s390x, IA32, IA64, AMD64, PPC)
 - Solaris, AIX 5.x, HP/UX 11 and 11i, Mac OSX
 - Windows

Summary

- The NJE/IP Bridge enables IBM and non-IBM operating systems to interoperate in a natural, supported, integrated fashion
- Allows rapid implementation of sophisticated output and application development solutions at very low cost.
- Enables IBM and non-IBM systems to leverage common and sophisticated system management solutions already in place in either environment
- In environments where the only SNA networking in place is to support a NJE link between z/OS and a system supported by the NJE/IP Bridge, the NJE/IP Bridge can facilitate the elimination of SNA networking.

Further Information

- “Using the NJE/IP Bridge: A Sample Configuration and Example White Paper” - <http://sinenomine.net/node/525>
- “z/OS Network Job Entry – Formats and Protocols”, SA22-7539-00.