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Introduction to the NJE/IP Bridge

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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

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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)

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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

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NJE Overview

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

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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

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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
  - Somebody at MVMRUG said they wanted it…8-)
- Eliminate SNA requirement for z/OS to participate in NJE networks

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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

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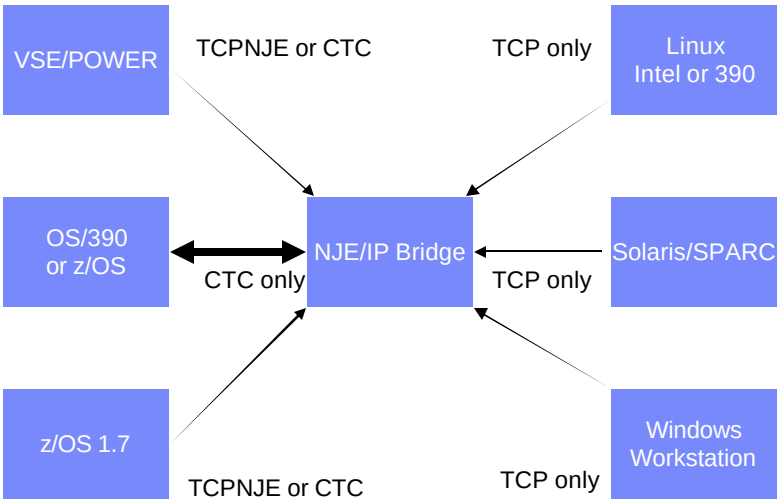
Configuration Example



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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

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Scenario: Unattended File Transfer

- Mainframe:
- DEST=(node, userid) in JCL
- SENDFILE/XMIT cmd
- Benefits:
  - Automatic retry
  - Multiple file transmission in parallel
  - Positive success/fail return code
  - ASCII/EBCDIC translation if needed
  - Easily automated with mainframe tools
- Open Systems:
- sendfile /etc/hosts userid@node

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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/1 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

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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

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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 (eg, Netview, PROP, CA products, TWS, etc)

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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

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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 (s390, s390x only)
  - 31/64-bit preconfigured guest for z/VM (s390, s390x only)
  - Open systems packages
    - Linux (s390, s390x, IA32, IA64, AMD64, PPC)
    - Solaris (SPARC, x86)
    - AIX 5.x
    - HP/UX 11 and 11i
    - Windows
    - Mac OS X

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Licensing and Packaging

- zSeries appliance packages licensed by physical CEC (no per-image or per-LPAR charges), processor size neutral
- Open systems packages licensed by platform (no per-seat or per-copy charges)
  - Platform = HW processor architecture + operating system major version
- Requires activation code per platform or appliance to function
- Source code available

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Summary

- The NJE/IP Bridge allows all IBM and non-IBM operating systems to interoperate in a natural, supported, integrated fashion
- The NJE/IP Bridge allows rapid implementation of sophisticated output and application development solutions at very low cost.
- The NJE/IP Bridge 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 allow elimination of VTAM and SNA networking completely.

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For More Information

- Talk to any of us at BSI or Sine Nomine
- Check out the BSI WWW site at www.bsiopti.com
- Call +1 407 323 4773 for pricing and terms.

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