



# IBM Network Data Couplers for MVS/ESA and OS/390

## **Networking tools designed to meet your TCP/IP-based business needs**

Simplifying information access reliably and securely is critical to enterprises with distributed network environments. Applications and system programmers want cost-efficient, high-quality networking tools to link existing applications, develop new applications, or link data across systems. To meet these needs, IBM offers IBM Network Data Couplers for MVS/ESA™ and OS/390®. Included in this offering are two couplers the Network File Server (NFS) Coupler and Remote Shell (RSH) Coupler providing supportive functionality.

## **Major advantages of using IBM Network Data Couplers are:**

- *No data duplication*  
IBM Network Data Couplers enable applications to access data directly, therefore data does not have to be duplicated. This improves system performance and resource utilization and eliminates the risk of inconsistencies in duplicated data.
- *No changes to MVS applications*  
Simple Job Control Language (JCL) statements drive the IBM Network Data Couplers.

- *Easy single MVS or OS/390 installation*  
User machines (clients) do not require any new software.
- *Open protocols*  
IBM Network Data Couplers use open TCP/IP protocols – Network File System (NFS) and Remote Shell (RSH).
- *No need to retrain*  
The need to retrain programmers to use private network protocols is eliminated.
- *Secure access to data*  
NFS Coupler uses standard NFS security and provides a mechanism to map MVS and UNIX NFS security differences transparently to the application.

RSH Coupler controls which combination of user and machine (clients) is allowed to execute MVS JOBS remotely.

- *No passwords needed or transferred*  
IBM Network Data Couplers use the security built into the operating environment. This eliminates the need for new user IDs or passwords.

## **A one-of-a-kind solution**

IBM Network Data Couplers offer advantages that are unique. NFS Coupler is the only product currently on the market which allows MVS JOBS to transparently read and write files residing on NFS servers. RSH Coupler is the only product currently on the market which allows MVS JOBS to communicate transparently with RSH client processes using the standard MVS I/O interface.



## *It's not just about technology. It's about business.*

IBM Network Data Couplers for MVS/ESA and OS/390 enable applications and system programmers to reliably and securely link MVS, UNIX,<sup>®</sup> NetWare, Windows NT<sup>®</sup>, or OS/2<sup>®</sup> data. The RSH and NFS Couplers function independently of each other, but are similar because they both are MVS-based JOB and data linkage solutions. Both Couplers rely on standard, open protocols to enable access to information resources across network environments that include UNIX-based systems or PC network operating systems.

### **Network File Server (NFS) Coupler**

NFS Coupler provides transparent read/write access to any file on any server from any MVS APPL./JOB, removing the need to rewrite existing MVS/ESA or OS/390 applications. It offers extensive data conversion between MVS and UNIX/DOS, and full security without passwords. Also, NFS Coupler uses the NFS protocol, which is supported by all UNIX operating systems and most DOS-compatible network operating systems. Access files directly instead of transferring them, and take advantage of the following NFS Coupler detailed features.

#### *Transparent access*

NFS Coupler uses the NFS protocol to provide direct read and write access from MVS applications to files residing on UNIX, OS/2, NetWare, Windows NT, OVMS and other NFS servers. NFS Coupler is fully transparent: a simple JCL change is all that is needed to access files across the network.

#### *Data conversion*

NFS Coupler takes care of data conversion between MVS data formats on one side and UNIX or DOS data formats on the other. Data conversion includes EBCDIC to ASCII translation and mapping of record boundaries. NFS Coupler also supports conversion of

print files from the MVS format (ANSI or MACHINE carriage control) to the UNIX or DOS format and vice versa. Data conversion can be disabled with a JCL keyword.

#### *Security*

NFS Coupler uses the standard NFS security protocol. MVS user IDs are mapped to the corresponding user IDs of the NFS server where the file being accessed resides. No passwords need to be supplied or transmitted across the network.

#### *Fault tolerance*

NFS Coupler delivers robustness with MVS Checkpoint/Restart and fault tolerance when accessing NFS servers with multiple network interfaces. For straight data transfer using IEBGENER, an exit is provided, which executes a checkpoint with a time frequency specified by the user.

#### *Directory read access*

NFS Coupler supports directory and file creation. When a directory is opened for input, each record is read until the End Of File condition is raised. Each directory record contains a description of the directory entry.

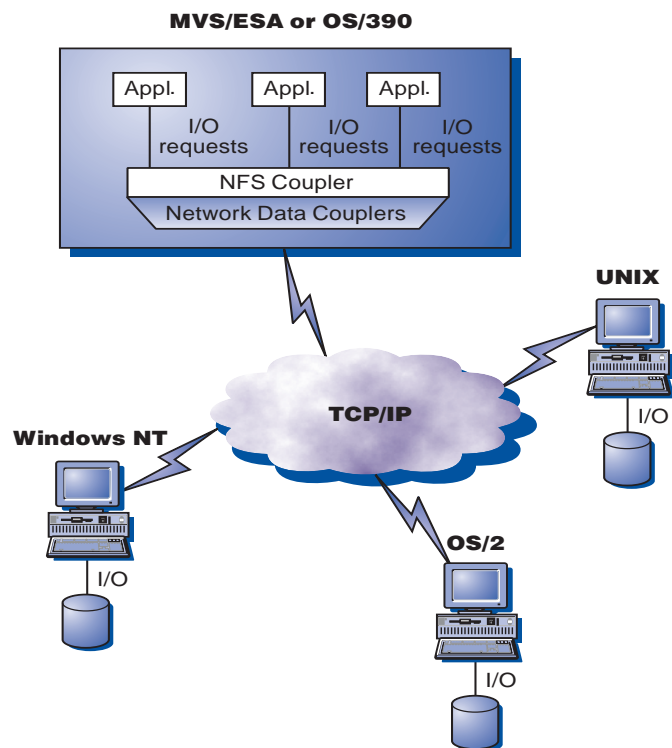
#### *File creation and deletion*

Files can be dynamically created and deleted with NFS Coupler. For new output files, NFS Coupler provides overwrite protection. NFS Coupler also supports data append mode, which adds data being written to the end of the file.

### **NFS architecture**

#### *Subsystem interface*

NFS Coupler uses the MVS subsystem interface (SSI) to intercept BSAM and QSAM I/O requests and to reroute them to the appropriate NFS server in realtime.



No physical I/O-to-disk takes place on MVS. NFS Coupler executes in the JOB address space as an extension of the MVS I/O routines. There is no started task.

#### High performance

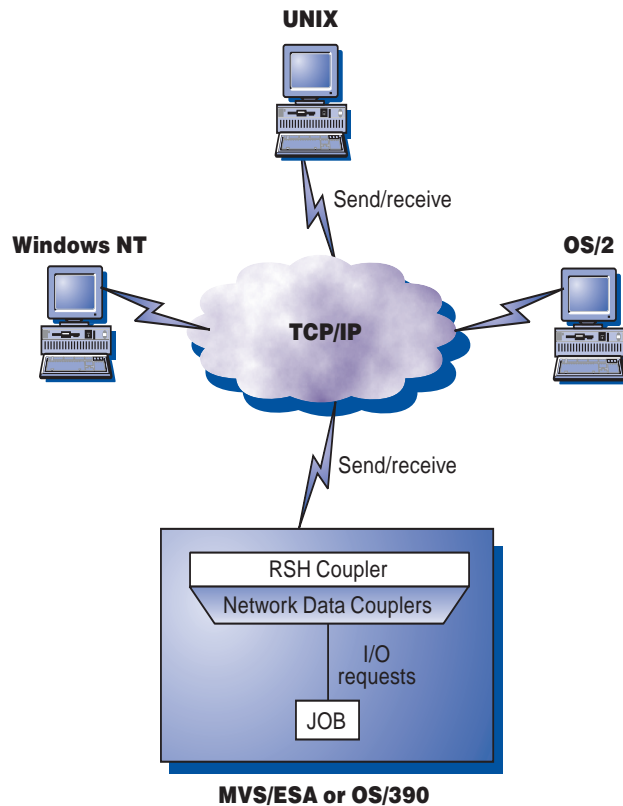
NFS Coupler achieves high performance in several ways. It executes in the JOB address space and calls the underlying TCP/IP subsystem directly. It uses a buffer size which optimizes I/O throughput on the NFS servers. It also uses overlapping NFS Coupler requests to achieve high data-transfer rates. Finally, NFS Coupler allows the system programmer to separately optimize performance parameters for each NFS server being accessed.

#### Remote Shell (RSH) Coupler

The RSH Coupler enables secure access to S/390® JOBS transparently from virtually any network operating system, including UNIX, OS/2, NetWare, Windows NT, and OVMS systems, without requiring existing MVS applications to be recoded. With RSH Coupler, MVS JOBS can be invoked, including DB2® utilities, IMS® BMPs, VSAM Access Programs, SAS report generators, REXX EXECs, and many others. For outstanding performance, RSH Coupler provides a MULTI-TRAN feature which allows a single JOB, such as an IMS BMP, to serve multiple RSH client processes. The following RSH Coupler features can help enhance your existing applications.

#### No recoding

RSH Coupler uses the RSH protocol to allow users on any workstation to execute MVS JOBS as remote commands. MVS JOBS do not need to be recoded or relinked, because RSH Coupler feeds data from the network to the JOB and vice versa through the standard MVS I/O interface (BSAM and QSAM). You can even execute JOBS for which source code has been lost.



#### Open protocol

RSH Coupler uses the Remote Shell open protocol which has been defined over TCP/IP. Remote Shell has been in use for over 10 years, and is supported by virtually any network operating system, such as UNIX, OS/2, NetWare, Windows NT, and OVMS. Any user logged on to any of these workstations can execute MVS JOBS as remote commands.

#### Security

RSH Coupler uses the standard RSH security protocol. Workstation user IDs are mapped to the corresponding MVS User IDs. No passwords need to be supplied by the user or transmitted across the network. Additional security is provided because only JOBS preselected by the MVS system programmer can be executed through RSH Coupler.

#### RSH architecture

##### The gateway

The RSH Coupler gateway runs as an MVS-started task and has several functions. It accepts connection requests coming from the TCP/IP network, checks security credentials, schedules a gateway between the JOB executing as an APPC transaction and the RSH client process running on the client workstation.

##### Subsystem interface

JOBS, executed by RSH Coupler as APPC transactions, communicate with the RSH client process on the client workstation through standard MVS I/O interfaces (BSAM and QSAM). RSH Coupler uses the SSI to intercept the JOB I/O requests for preselected files (for example, DD names) and converts them into TCP/IP send or receive requests. High performance is achieved through efficient buffering.

---

## IBM Network Data Couplers for MVS/ESA and OS/390 at a glance

---

### Software requirements

- MVS environment
  - MVS/ESA, Version 4, Release 2.2, or higher
  - IBM TCP/IP, Version 2, Release 1 (base only) or Interlink TCP/IP, Version 3 Release 1 (base only)
  - RACF®, Version 1 Release 9, or higher, or any equivalent security system
- OS/390 environment
  - any release

---

### Key benefits of NFS Coupler

- MVS and OS/390 applications have seamless, transparent read/write access to files on remote UNIX or PC network operating system servers. By eliminating the need to transfer data between MVS and remote servers, it saves time and reduces CPU and I/O usage.
- Robust fault tolerance capabilities and support for MVS Checkpoint /Restart makes it suitable for mission-critical applications.
- Full support of REXX allows it to be used from any automation tool currently available on MVS.
- It's easy to implement, and point-of-control issues are simplified because installation of NFS Coupler is required only on the MVS or OS/390 system.
- Seamless conversion between MVS data formats and UNIX or PC network operating system formats used on remote servers is included.
- Risk of security violations is reduced by using the standard NFS security protocol. MVS user IDs are mapped to the corresponding user IDs of the NFS servers, where the files being accessed reside. No passwords need to be supplied or transmitted across the network.
- You can create directories and files on NFS servers and specify their protection mode.
- You have the ability to delete a file at closure.

---

### Key benefits of RSH Coupler

- Existing applications can be executed in a distributed environment without the need to recode, recompile, or relink the existing software.
  - There is no need to retrain programmers. New servers can be written as batch programs that read and write network data as input and output files, using standard MVS access methods. Debugging requires no experience in network programming.
  - Installation is easy because RSH Coupler is installed only on the MVS or OS/390 system. No installation is required on the UNIX or PC client systems because applications are executed using the RSH command, which is available as a standard command on any UNIX package and on most TCP/IP packages for DOS, Windows, and OS/2 operating systems.
  - The risk of security violations is reduced by using standard RSH security. No passwords need to be supplied or transmitted across the network. APPC transactions execute under the correct MVS universal ID as though they were submitted by a TSO user.
- 

IBM Network Data Couplers enable enterprises to quickly and reliably accomplish their information access objectives with no recoding of existing applications, no retraining of programmers, and minimal installation, security, and administration requirements.

### For more information

Visit our Web site at:

[www.software.ibm.com/enetwork/datacouplers](http://www.software.ibm.com/enetwork/datacouplers)

or

email us at: [icingnet@us.ibm.com](mailto:icingnet@us.ibm.com)



© International Business Machines Corporation 1998

IBM Corporation  
Research Triangle Park, NC  
USA

6-98  
All rights reserved

IBM, DB2, the e-business logo, IMS, MVS/ESA, OS/2, OS/390, RACF, and S/390 are trademarks of International Business Machines Corporation in the United States and/or other countries.

Windows NT is a registered trademark of Microsoft Corporation.

UNIX is a registered trademark in the United States and other countries licensed exclusively through X/Open Company Limited.

Other company, product, and service names may be trademarks or service marks of others.



Printed in the United States of America on recycled paper containing 10% recovered post-consumer fiber



**For Position Only**

G325-3821-00