



**Program Directory for  
Net.Data for OS/390  
with National Language Features**

Version 02 Release 02 Modification Level 00

Program Number 5655-DB2

FMID H242220

for Use with  
OS/390

Document Date: March 1999

G110-6971-02

**Note!**

Before using this information and the product it supports, be sure to read the general information under "Notices" on page vi.

A form for reader's comments appears at the back of this publication. When you send information to IBM, you grant IBM a nonexclusive right to use or distribute the information in any way it believes appropriate without incurring any obligation to you.

© **Copyright International Business Machines Corporation 1997, 1999. All rights reserved.**

US Government Users Restricted Rights – Use, duplication or disclosure restricted by GSA ADP Schedule Contract with IBM Corp.

---

# Contents

Notices	vi
Trademarks	vii
<b>1.0 Introduction</b>	<b>1</b>
1.1 Net.Data Version 2.2 Description	2
1.2 Net.Data Version 2.2 FMIDs	3
<b>2.0 Program Materials</b>	<b>4</b>
2.1 Basic Machine-Readable Material	4
2.2 Optional Machine-Readable Material	5
2.3 Program Publications	5
2.4 Program Source Materials	6
2.5 Publications Useful During Installation	6
<b>3.0 Program Support</b>	<b>7</b>
3.1 Program Services	7
3.2 Preventive Service Planning	7
3.3 Statement of Support Procedures	8
<b>4.0 Program and Service Level Information</b>	<b>9</b>
4.1 Program Level Information	9
4.2 Service Level Information	9
4.3 Cumulative Service Tape	9
<b>5.0 Installation Requirements and Considerations</b>	<b>10</b>
5.1 Driving System Requirements	10
5.1.1 Machine Requirements	10
5.1.2 Programming Requirements	10
5.1.2.1 Required Toleration PTFs	11
5.2 Target System Requirements	11
5.2.1 Machine Requirements	11
5.2.2 Programming Requisites	11
5.2.2.1 Minimum Requisites	12
5.2.2.2 Functional Requisites	13
5.2.2.3 Optional Software	13
5.2.2.4 Incompatibility (Negative) Requisites	13
5.2.3 DASD Storage Requirements	13
5.3 FMIDs Deleted	17
5.4 Special Considerations	17
<b>6.0 Installation Instructions</b>	<b>18</b>
6.1 Installing Net.Data Version 2.2	18

6.1.1	SMP/E Considerations for Installing Net.Data Version 2.2	18
6.1.2	SMP/E Environment	18
6.1.3	SMP/E Options Subentry Values	19
6.1.4	SMP/E CALLLIBS Processing	19
6.2	Unload the Sample JCL from the Product Tape	19
6.3	Update and Execute the Desired Allocation Jobs	20
6.3.1	Allocate Distribution and Target Libraries - Base	20
6.3.2	Allocate HFS Data Set — Optional	20
6.3.3	DDDEF Entries for Target and Distribution Target Libraries for Net.Data Version 2.2	21
6.4	Create the Hierarchical File System Structure	21
6.5	Update and Execute the SMP/E RECEIVE Job	22
6.5.1	Receive the Cumulative Service Tape	22
6.6	Update and Execute the SMP/E APPLY CHECK and APPLY Job	22
6.6.1	Perform SMP/E APPLY CHECK	22
6.6.2	Perform SMP/E APPLY	23
6.7	Update and Execute the SMP/E ACCEPT CHECK and ACCEPT Job	23
6.7.1	Perform SMP/E ACCEPT CHECK	23
6.7.2	Perform SMP/E ACCEPT	24
6.8	Install the Net.Data Version 2.2 Executables and DLLs	24
6.8.1	Approach A: Using Net.Data Version 2.2 Directories	25
6.8.2	Approach B: Using Web Server Directories	26
6.9	Customize the Net.Data Version 2.2 Initialization File	27
6.10	Install the Net.Data Version 2.2 Applet	30
6.11	Install the Net.Data Version 2.2 Icons and HTML files	30
6.12	Set Up the SQL and ODBC Language Environments	31
6.13	Specify the Default Code Page Environment	32
6.13.1	Modifying the Web Server's Configuration File	32
6.13.2	Modifying the Net.Data Version 2.2 Initialization File	32
6.14	Enable the Message Catalog	33
<b>7.0</b>	<b>Installation Verification Process</b>	<b>34</b>
7.1	Create and Load the Sample Single Byte Character Set DB2 Tables	34
7.1.1	Create The Tables	34
7.1.2	Load the Tables	35
7.2	Create and Load the Sample Double-byte Character Set DB2 Table	35
7.2.1	Create The Table	35
7.2.2	Load the Table	36
7.3	Customize the Verification and Sample Macros	36
7.4	Install the Sample Stored Procedures	36
7.5	Bind the DBRM for Net.Data Version 2.2	38
7.6	Test the Installation of Net.Data Version 2.2	39
7.6.1	Prepare the Test Environment	39
7.6.2	Execute the Verification Macros	39
<b>Appendix A.</b>	<b>Net.Data Version 2.2 Install Logic</b>	<b>42</b>

<b>Appendix B. SMP/E JCLIN</b> .....	43
<b>Reader's Comments</b> .....	48

---

## Figures

1. Basic Material: Program Tape - Base .....	4
2. Basic Material: Program Tape - Japanese .....	4
3. Basic Material: Program Tape - Korean .....	5
4. Program Tape: File Content .....	5
5. Publications Useful During Installation .....	6
6. PSP Upgrade and Subset ID .....	7
7. Component IDs .....	8
8. Driving System Software Requirements .....	10
9. Minimum Requisites .....	12
10. Functional Requisites .....	13
11. Functional Requisites - Net.Data Servlets .....	13
12. Total DASD Space Required by Net.Data Version 2.2 .....	14
13. Storage Requirements for SMP/E Work Data Sets .....	14
14. Storage Requirements for SMP/E Data Sets .....	15
15. Storage Requirements for Net.Data Version 2.2 Target Libraries .....	15
16. Storage Requirements for Net.Data Version 2.2 Distribution Libraries .....	16
17. Storage Requirements for Net.Data Version 2.2 HFS Directories .....	16
18. FMIDs Deleted .....	17
19. SMP/E Options Subentry Values .....	19
20. Sample Net.Data Version 2.2 Initialization File .....	28

---

## Notices

References in this document to IBM products, programs, or services do not imply that IBM intends to make these available in all countries in which IBM operates. Any reference to an IBM product, program, or service is not intended to state or imply that only IBM's product, program, or service may be used. Any functionally equivalent product, program, or service that does not infringe on any of IBM's intellectual property rights may be used instead of the IBM product, program, or service. Evaluation and verification of operation in conjunction with other products, except those expressly designated by IBM, is the user's responsibility.

APAR numbers are provided in this document to assist in locating PTFs that may be required. Ongoing problem reporting may result in additional APARs being created. Therefore, the APAR lists in this document may not be complete. To obtain current service recommendations and to identify current product service requirements, always contact the IBM Customer Support Center.

IBM may have patents or pending patent applications covering subject matter in this document. The furnishing of this document does not give you any license to these patents. You can send license inquiries, in writing, to the

International Business Machines Corporation  
IBM Director of Licensing  
500 Columbus Avenue  
Thornwood, New York 10594  
USA

For online versions of this book, we authorize you to:

- Copy, modify, and print the documentation contained on the media, for use within your enterprise, provided you reproduce the copyright notice, all warning statements, and other required statements on each copy or partial copy.
- Transfer the original unaltered copy of the documentation when you transfer the related IBM product (which may be either machines you own, or programs, if the program's license terms permit a transfer). You must, at the same time, destroy all other copies of the documentation.

You are responsible for payment of any taxes, including personal property taxes, resulting from this authorization.

THERE ARE NO WARRANTIES, EXPRESS OR IMPLIED, INCLUDING THE WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.

Some jurisdictions do not allow the exclusion of implied warranties, so the above exclusion may not apply to you.

Your failure to comply with the terms above terminates this authorization. Upon termination, you must destroy your machine readable documentation.

---

## Trademarks

The following terms are trademarks of the IBM Corporation in the United States or other countries or both:

Net.Data  
CBPDO  
CBIPO  
IBM  
MVS/ESA  
SystemPac  
S/390  
ProductPac  
Language Environment  
RACF  
OpenEdition  
DB2  
AIX  
CustomPac





---

## 1.0 Introduction

This program directory is intended for the system programmer responsible for program installation and maintenance. It contains information concerning the material and procedures associated with the installation of IBM Net.Data for OS/390 Version 2.2. This publication refers to IBM Net.Data for OS/390 Version 2.2 as Net.Data Version 2.2. You should read all of this program directory before installing the program and then keep it for future reference.

The program directory contains the following sections:

- 2.0, "Program Materials" on page 4 identifies the basic and optional program materials and documentation for Net.Data Version 2.2.
- 3.0, "Program Support" on page 7 describes the IBM support available for Net.Data Version 2.2.
- 4.0, "Program and Service Level Information" on page 9 lists the APARs (program level) and PTFs (service level) incorporated into Net.Data Version 2.2.
- 5.0, "Installation Requirements and Considerations" on page 10 identifies the resources and considerations for installing and using Net.Data Version 2.2.
- 6.0, "Installation Instructions" on page 18 provides detailed installation instructions for Net.Data Version 2.2. It also describes the procedures for activating the functions of Net.Data Version 2.2, or refers to appropriate publications.
- 7.0, "Installation Verification Process" on page 34 describes a process that verifies the successful installation of Net.Data Version 2.2 for OS/390.
- Appendix A, "Net.Data Version 2.2 Install Logic" on page 42 provides the install logic for Net.Data Version 2.2.
- Appendix B, "SMP/E JCLIN" on page 43 provides the SMPJCLIN for Net.Data Version 2.2.

Before installing Net.Data Version 2.2, read 3.2, "Preventive Service Planning" on page 7. This section tells you how to find any updates to the information and procedures in this program directory.

Do not use this program directory if you are installing Net.Data Version 2.2 with an MVS Custom-Built Installation Process Offering (CBIPO), SystemPac, or ServerPac. When using these offerings, use the jobs and documentation supplied with the offering. This documentation may point you to specific sections of the program directory as required.

If you are installing Net.Data Version 2.2 using the MVS Custom-Built Product Delivery Offering (CBPDO) (5751-CS3), use the softcopy program directory provided on the CBPDO tape. Your CBPDO contains a softcopy preventive service planning (PSP) upgrade for this product. All service and HOLDDATA for Net.Data Version 2.2 are included on the CBPDO tape.

Documentation is available in HTML at the Net.Data Web site. Please see:  
<http://www.software.ibm.com/data/net.data/library.html>

For general information, please see:  
<http://www.software.ibm.com/data/net.data>

---

## 1.1 Net.Data Version 2.2 Description

With IBM's Net.Data product, you can create dynamic Web pages using data from both relational and non-relational database management systems (DBMSs), including DB2, IMS, and ODBC-enabled databases, and using applications written in programming languages such as Java, JavaScript, Perl, C, C++, and REXX.

Net.Data for OS/390 is a macro processor that executes as middleware on an OpenEdition server machine containing a Web server. You can write Net.Data application programs, called macros, that Net.Data interprets to create dynamic Web pages with customized content based on input from the user, the current state of your databases or Hierarchical File System (HFS) files, existing business logic, and other factors that you design into your macro.

A request, in the form of a URL (uniform resource locator), flows from a browser, such as Netscape Navigator or Internet Explorer, to a Web server that forwards the request to Net.Data for execution. Net.Data locates and executes the macro and builds a Web page that it customizes based on functions that you write. These functions can:

- Encapsulate business logic within Perl scripts, C and C++ applications, or REXX programs.
- Access databases such as DB2

Net.Data passes this Web page to the Web server, which in turn forwards the page over the network for display at the browser. Other members of the Net.Data family of products provide similar capabilities on machines executing the Windows NT, AIX, OS/2, AS/400, HP-UX, Sun Solaris, and Santa Cruz Operating System (SCO) operating systems.

Net.Data supports industry-standard interfaces such as HyperText Transfer Protocol (HTTP) and Common Gateway Interface (CGI). HTTP is used between the browser and the Web server, and CGI is used between the Web server and Net.Data. This support lets you select your favorite browser or Web server for use with Net.Data. Net.Data for OS/390 Version 2 also supports the ICAPI and GWAPI Web server Application Programming Interfaces (APIs) for improved performance.

Net.Data Version 2.2 provides the following enhancements:

- Performance and scalability enhancements include:
  - Ability to cache macro files
  - Improved performance with the Net.Data built-in functions
  - Improved scalability of table variables holding large result sets
  - Reuse of DB2 for OS/390 connections when using the ODBC language environment
- Macro Language enhancements include:

- Ability to receive multiple result sets from a stored procedure
  - Built-in functions for manipulating the contents of table variables
  - Built-in functions that allow Net.Data applications to get and set Netscape cookies
  - Support for START\_ROW\_NUM, DTW\_SET\_TOTAL\_ROWS, and TOTAL\_ROWS to reduce result set sizes
  - Ability to exit a macro file immediately
  - Support for INCLUDE statements in WHILE blocks
  - Support for functions consisting of only macro language statements
  - Built-in function that allows Net.Data applications to send e-mail
- Ability to execute Net.Data as a servlet
  - Support for use of the Eurocurrency symbol
  - Ability to disable SHOWSQL
  - Ability to disable Net.Data Direct Request

---

## 1.2 Net.Data Version 2.2 FMIDs

Net.Data Version 2.2 consists of the following FMIDs:

H242220

---

## 2.0 Program Materials

An IBM program is identified by a program number and a feature number. The program number for Net.Data Version 2.2 is 5655-DB2.

Basic Machine-Readable Materials are materials that are supplied under the base license and feature code, and are required for the use of the product. Optional Machine-Readable Materials are orderable under separate feature codes, and are not required for the product to function.

The program announcement material describes the features supported by Net.Data Version 2.2. Ask your IBM representative for this information if you have not already received a copy.

---

### 2.1 Basic Machine-Readable Material

The distribution medium for this program is 9-track magnetic tape (written at 6250 BPI), 3480 cartridge, 3590 cartridge, or 4mm cartridge. The tape or cartridge contains all the programs and data needed for installation. It is installed using SMP/E, and is in SMP/E RELFILE format. See 6.0, "Installation Instructions" on page 18 for more information about how to install the program.

Figure 1, Figure 2, and Figure 3 on page 5 describes the tape or cartridge. Figure 4 on page 5 describes the file content of the program tape or cartridge.

**Note:** If you are installing Net.Data Version 2.2 using the MVS Custom-Built Product Delivery Offering (CBPDO) (5751-CS3), some of the information in these figures may not be valid. Consult the CBPDO documentation for actual values.

*Figure 1. Basic Material: Program Tape - Base*

Medium	Feature Number	Physical Volume	External Label Identification	VOLSER
6250 tape	5811	1 of 1	Net.Data Base	242220
3480 tape	5812	1 of 1	Net.Data Base	242220
4mm cartridge	6172	1 of 1	Net.Data Base	242220

*Figure 2. Basic Material: Program Tape - Japanese*

Medium	Feature Number	Physical Volume	External Label Identification	VOLSER
6250 tape	6773	1 of 1	Net.Data Japanese	242220
3480 tape	6774	1 of 1	Net.Data Japanese	242220
4mm cartridge	6775	1 of 1	Net.Data Japanese	242220

Figure 3. Basic Material: Program Tape - Korean

Medium	Feature Number	Physical Volume	External Label Identification	VOLSER
6250 tape	6776	1 of 1	Net.Data Korean	242220
3480 tape	6777	1 of 1	Net.Data Korean	242220
4mm cartridge	6778	1 of 1	Net.Data Korean	242220

Figure 4. Program Tape: File Content

VOLSER	File	Name	Dist Library	RECFM	LRECL	BLK SIZE
242220	1	SMPMCS	n/a	FB	80	6400
	2	IBM.H242220.F1	ADTWBASE	FB	80	6400
	3	IBM.H242220.F2	ADTWDBRM	FB	80	8800
			ADTWSPUF	FB	80	8800
			ADTWSTRD	FB	80	8800
	4	IBM.H242220.F3	ADTWCMD	VB	256	2600
			ADTWHTML	VB	256	2600
	5	IBM.H242220.F4	ADTWDATA	VB	256	6233
			ADTWMACS	VB	256	2600
			ADTWICON	VB	256	2600
	6	IBM.H242220.F5	ADTWLOAD	U	0	6144

## 2.2 Optional Machine-Readable Material

No optional machine-readable materials are provided for Net.Data Version 2.2.

## 2.3 Program Publications

Net.Data Administration and Programming Guide for OS/390

Net.Data Reference

Net.Data Language Environment Reference

Net.Data Messages and Codes

HTML, PostScript, and PDF versions of these books are available at the following url:

<http://www.software.ibm.com/data/net.data/library.html>

---

## 2.4 Program Source Materials

No program source materials or viewable program listings are provided for Net.Data Version 2.2.

---

## 2.5 Publications Useful During Installation

*Figure 5. Publications Useful During Installation*

<b>Publication Title</b>	<b>Form Number</b>
SMP/E User's Guide	SC28-1740
SMP/E Reference	SC28-1806
SMP/E Messages and Codes	SC28-1738
IBM Internet Connection Secure Server Planning for Installation Version 2.2	GC31-8489
IBM Internet Connection Secure Server Webmaster's Guide Version 2.2	GC31-8490

---

## 3.0 Program Support

This section describes the IBM support available for Net.Data Version 2.2.

---

### 3.1 Program Services

Contact your IBM representative for specific information about available program services.

---

### 3.2 Preventive Service Planning

Before installing Net.Data Version 2.2, you should review the current Preventive Service Planning (PSP) information. If you obtained Net.Data Version 2.2 as part of a CBPDO, there is HOLDDATA and PSP information included on the CBPDO tape.

If you obtained Net.Data Version 2.2 on a product tape, or if the CBPDO is more than two weeks old when you install it, you should contact the IBM Support Center or use S/390 SoftwareXcel to obtain the current "PSP Bucket".

PSP Buckets are identified by UPGRADEs, which specify product levels, and SUBSETs, which specify the FMIDs for a product level. The UPGRADE and SUBSET values for Net.Data Version 2.2 are:

*Figure 6. PSP Upgrade and Subset ID*

UPGRADE	SUBSET	Description
DB2510	H242220	Net.Data for OS/390 Version 2.2

---

### 3.3 Statement of Support Procedures

Report any difficulties you have using this program to your IBM Support Center. If an APAR is required, the Support Center will provide the address to which any needed documentation can be sent.

Figure 7 identifies the component IDs (COMPID) for Net.Data Version 2.2.

<i>Figure 7. Component IDs</i>			
<b>FMID</b>	<b>COMPID</b>	<b>Component Name</b>	<b>RETAIN Release</b>
H242220	5655A2401	Net.Data for OS/390 Version 2.2	220



---

## **4.0 Program and Service Level Information**

This section identifies the program and any relevant service levels of Net.Data Version 2.2. The program level refers to the APAR fixes incorporated into the program. The service level refers to the PTFs integrated. Information about the cumulative service tape is also provided.

---

### **4.1 Program Level Information**

No APARs have been incorporated into Net.Data Version 2.2.

---

### **4.2 Service Level Information**

No PTFs against this release of Net.Data Version 2.2 have been incorporated into the product tape.

---

### **4.3 Cumulative Service Tape**

A cumulative service tape, containing PTFs not incorporated into this release, might be included with this program. Installation instructions for cumulative service tapes can be found in the SMP/E publications.

If you received this product as part of a CBPDO or a ProductPac, PTFs not incorporated into this release are provided on the tape, and a separate cumulative service tape will not be provided.

---

## 5.0 Installation Requirements and Considerations

The following sections identify the system requirements for installing and activating Net.Data Version 2.2. The following terminology is used:

- *Driving system*: the system used to install the program.
- *Target system*: the system on which the program is installed.

In many cases, the same system can be used as both a driving system and a target system. However, you may want to set up a clone of your system to use as a target system by making a separate IPL-able copy of the running system. The clone should include copies of all system libraries that SMP/E updates, copies of the SMP/E CSI data sets that describe the system libraries, and your PARMLIB and PROCLIB.

Some cases where two systems should be used include the following:

- When installing a new level of a product that is already installed, the new product will delete the old one. By installing onto a separate target system, you can test the new product while still keeping the old one in production.
- When installing a product that shares libraries or load modules with other products, the installation can disrupt the other products. Installing onto a test system or clone will allow you to assess these impacts without disrupting your production system.

---

### 5.1 Driving System Requirements

This section describes the environment of the driving system required to install Net.Data Version 2.2.

#### 5.1.1 Machine Requirements

The driving system can run in any hardware environment that supports the required software.

#### 5.1.2 Programming Requirements

*Figure 8. Driving System Software Requirements*

<b>Program Number</b>	<b>Product Name and Minimum VRM/Service Level</b>
5645-001	OS/390 System Modification Program/Extended (SMP/E) Release 1

**5.1.2.1 Required Toleration PTFs:** Starting with OS/390 Version 2 Release 7, the DESCRIPTION operand on the ++FUNCTION statement of the System Modification Control Statements (SMPMCS) is introduced. Net.Data Version 2.2 uses the new DESCRIPTION operand on the ++FUNCTION statement. In order to avoid syntax errors on the DESCRIPTION operand during installation of Net.Data Version 2.2, **you are required to install a toleration PTF**. Once installed, the toleration PTF allows previous releases of SMP/E to ignore the DESCRIPTION operand.

#### Required Toleration PTFs For Earlier SMP/E Releases

- OS/390 Version 1 Release 3 and Version 2 Release 4:
  - PTF UR50597
- OS/390 Version 2 Release 5 and Release 6:
  - PTF UR50598

---

## 5.2 Target System Requirements

This section describes the environment of the target system required to install and use Net.Data Version 2.2.

### 5.2.1 Machine Requirements

The target system can run in any hardware environment that supports the required software.

### 5.2.2 Programming Requisites

**5.2.2.1 Minimum Requisites:** A minimum requisite is defined as one of the following:

1. *Installation Requisite:* A product that is required at installation time. i.e. this product **will not install** successfully unless this requisite is met. This includes products that are specified as REQs, PREs, or CALLLIBs.
2. *Run Time Requisite:* A product that is **not** required for the successful installation of this product, but **is** needed at run time in order for this product to work.

<i>Figure 9. Minimum Requisites</i>		
<b>Program Number</b>	<b>Product Name and Minimum VRM/Service Level</b>	<b>Install Req?</b>
5695-039	RACF 2.1 or equivalent security product with necessary support	No
Any <b>one</b> of the following:		
5645-001	OS/390 Version 1 Release 3 with APAR: PQ12091, OW32688, PQ10074,PQ04514	Yes
5647-A01	OS/390 Version 2 Release 4 with PQ12091, OW32688, PQ04657, PQ04514, OW30084, OW30096, OW30100, OW30104, OW30206, OW30249, OW30288	Yes
5647-A01	OS/390 Version 2 Release 5 with APARs PQ12091, OW32688, PQ04657, PQ04514	Yes
5647-A01	OS/390 Version 2 Release 6 or subsequent releases	Yes
Any <b>one</b> of the following:		
5697-B14	Internet Connection Secure Server for OS/390 Version 2 Release 2 with APARS: PQ16990, PQ05981	No
	Lotus Domino Go Webserver for OS/390 Version 4.6.1 <a href="http://www.ics.raleighbm.com/dominogowebserver">http://www.ics.raleighbm.com/dominogowebserver</a> with APAR PQ15294 or subsequent releases	No

**5.2.2.2 Functional Requisites:** A functional requisite is defined as a product that is *not* required for the successful installation of this product or for the base function of the product, but *is* needed at run time for a specific function of this product to work. This includes products that are specified as IF REQs.

*Figure 10. Functional Requisites*

Program Number	Product Name and Minimum VRM/Service Level	Function	Install Req?
5655-DB2	DB2 for OS/390 Version 5 with APARs: PQ06950, PQ19586	RRS Attach Facility SQL Application Programming Interface DB2 CLI Feature	No
No			

In order to use Net.Data Version 2.2 Servlets you will need the following:

*Figure 11. Functional Requisites - Net.Data Servlets*

Program Number	Product Name and Minimum VRM/Service Level	Function	Install Req?
5647-A01	OS/390 Version 2 Release 5 with APARs PQ12091, OW32688, PQ04657, PQ04514	Net.Data Servlets	Yes
	Lotus Domino Go Web Server Version 5.0 or subsequent releases <a href="http://www.ics.raleighibm.com/dominogowebserver">http://www.ics.raleighibm.com/dominogowebserver</a>	Servlet Express	No

**5.2.2.3 Optional Software:** For IMS transactions and data access, you need IMS/ESA Version 5.1 or later in your enterprise.

For access to heterogeneous data source through DataJoiner, you need DataJoiner for AIX Version 1.2 with PTF U447593 or DataJoiner for HP-UX Version 1.1 in your enterprise.

**5.2.2.4 Incompatibility (Negative) Requisites:** A negative requisite identifies products which must *not* be installed on the same system as this product. Net.Data Version 2.2 has no negative requisites.

## 5.2.3 DASD Storage Requirements

Net.Data Version 2.2 libraries can reside on 3380 or 3390 DASD.

Figure 12 lists the total space required for each type of library.

Figure 12. Total DASD Space Required by Net.Data Version 2.2

Library Type	Total Space Required
Target	115 blocks
Distribution	1486 blocks
HFS	39850 blocks (each block is 512 bytes)

**Notes:**

1. The data set sizes specified contain 15% extra space. You may wish to revise these numbers based on your plans for adding additional function or service.
2. IBM recommends use of system determined block sizes for efficient DASD utilization for all non-RECFM U data sets. For RECFM U data sets, IBM recommends a block size of 32760, which is the most efficient from a performance and DASD utilization perspective.

If you choose not to use system determined block sizes, use the block sizes and numbers of blocks specified to allocate the data sets. Data sets can be reblocked to a larger size. Please note that the maximum allowable block size will depend on the type of DASD on which the dataset will reside; for example, the block size of data sets on a 3350 DASD cannot exceed 19,069.

3. Abbreviations used for the data set type are:

- U** Unique data set used by only the FMIDs listed. In order to determine the correct storage needed for this data set, this table provides all required information; no other tables (or program directories) need to be referenced for the data set size.
- S** Shared data set used by more than the FMIDs listed. In order to determine the correct storage needed for this data set, the storage size given in this table needs to be added to other tables (perhaps in other program directories). If the data set already exists, it must have enough free space to accommodate the storage size given in this table.

If you currently have a previous release of this product installed in these libraries, the installation of this release will delete the old one and reclaim the space used by the old release and any service that had been installed. You can determine whether or not these libraries have enough space by deleting the old release with a dummy function, compressing the libraries, and comparing the space requirements with the free space in the libraries.

Figure 13 (Page 1 of 2). Storage Requirements for SMP/E Work Data Sets

Library DDNAME	T Y P E	D S R G	R E C F M	L R E C L	No. of Blks	BLK SIZE	No. of 3380/ 9345 Trks	No. of 3390 Trks	No. of DIR Blks
SMPWRK1	S	PO	FB	80	10	6160	3	2	250
SMPWRK2	S	PO	FB	80	10	6160	3	2	250

Figure 13 (Page 2 of 2). Storage Requirements for SMP/E Work Data Sets

Library DDNAME	T Y P E	D S R G	R E F M	L R E C L	No. of Blks	BLK SIZE	No. of 3380/ 9345 Trks	No. of 3390 Trks	No. of DIR Blks
SMPWRK3	S	PO	FB	80	10	3200	3	2	250
SMPWRK4	S	PO	FB	80	10	3200	3	2	250
SMPWRK6	S	PO	FB	80	10	3200	3	2	300

The following table provides an estimate of the storage needed in the SMP/E data sets for Net.Data Version 2.2. The estimates must be added to those of any other programs and service being installed to determine the total additional storage requirements.

Figure 14. Storage Requirements for SMP/E Data Sets

Library DDNAME	T Y P E	D S R G	R E F M	L R E C L	No. of Blks	BLK SIZE	No. of 3380/ 9345 Trks	No. of 3390 Trks	No. of DIR Blks
SMPLOG	S	PS	VB	260	6000	3200	510	435	--
SMPLOGA	S	PS	VB	260	6000	3200	510	435	--
SMPLTS	S	PO	U	0	800	6144	120	105	10
SMPMTS	S	PO	FB	80	60	3120	15	15	60
SMPPTS	S	PO	FB	80	400	3120	45	45	300
SMPSCDS	S	PO	FB	80	400	3120	45	45	300
SMPSTS	S	PO	FB	80	400	3120	45	45	150

The following figures list the target and distribution libraries (data sets) and their attributes required to install Net.Data Version 2.2. The storage requirements of Net.Data Version 2.2 must be added to the storage required by other programs having data in the same data set (library).

Figure 15 (Page 1 of 2). Storage Requirements for Net.Data Version 2.2 Target Libraries

Library DDNAME	T Y P E	D S R G	R E F M	L R E C L	No. of Blks	BLK SIZE	No. of 3380/ 9345 Trks	No. of 3390 Trks	No. of DIR Blks
SDTWBASE	U	PO	FB	80	30	8800	6	5	5
SDTWDATA	U	PO	VB	256	10	6233	3	2	5

Figure 15 (Page 2 of 2). Storage Requirements for Net.Data Version 2.2 Target Libraries

Library DDNAME	T Y P E	D S R O G	R E C F M	L E C L	No. of Blks	BLK SIZE	No. of 3380/ Trks	No. of 3390 Trks	No. of DIR Blks
SDTWDBRM	U	PO	FB	80	10	8800	3	2	5
SDTWSPUF	U	PO	FB	80	10	8800	3	2	5
SDTWSTRD	U	PO	FB	80	10	8800	3	2	5
SDTWLEIH	U	PO	VB	256	20	2600	3	2	5
SDTWLEID	U	PO	VB	256	20	2600	3	2	5

Figure 16. Storage Requirements for Net.Data Version 2.2 Distribution Libraries

Library DDNAME	T Y P E	D S R O G	R E C F M	L E C L	No. of Blks	BLK SIZE	No. of 3380/ Trks	No. of 3390 Trks	No. of DIR Blks
ADTWBASE	U	PO	FB	80	30	8800	6	5	5
ADTWDATA	U	PO	VB	256	15	6233	3	2	5
ADTWDBRM	U	PO	FB	80	10	8800	3	2	5
ADTWLOAD	U	PO	U	0	1250	6144	190	166	400
ADTWSPUF	U	PO	FB	80	10	8800	3	2	5
ADTWSTRD	U	PO	FB	80	10	8800	3	2	5
ADTWHTML	U	PO	VB	256	25	2600	3	2	5
ADTWICON	U	PO	VB	256	80	2600	6	5	5
ADTWMACS	U	PO	VB	256	35	2600	4	3	5
ADTWCMD	U	PO	VB	256	25	2600	3	2	5

Figure 17 (Page 1 of 2). Storage Requirements for Net.Data Version 2.2 HFS Directories

Library DDNAME	Path	Space Required
SDTWCMD	/usr/lpp/netdata/testcmd/IBM	32768 bytes
SDTWHTM	/usr/lpp/netdata/html/IBM	13249 bytes
SDTWHTML	/usr/lpp/netdata/pub/IBM	1350 bytes
SDTWHTM2	/usr/lpp/netdata/file-data/IBM	208 bytes
SDTWLOA3	/usr/lpp/netdata/icapi-lib/IBM	2543616 bytes



Figure 17 (Page 2 of 2). Storage Requirements for Net.Data Version 2.2 HFS Directories

Library DDNAME	Path	Space Required
SDTWLOA2	/usr/lpp/netdata/cgi-bin/IBM	2404352 bytes
SDTWICON	/usr/lpp/netdata/icons/IBM	6788 bytes
SDTWJAVA	/usr/lpp/netdata/java/IBM	4169 bytes
SDTWMACS	/usr/lpp/netdata/macros/IBM	62138 bytes
SDTWENUS	/usr/lpp/netdata/C/IBM	17069 bytes
SDTWJAJP	/usr/lpp/netdata/Ja_JP/IBM	17839 bytes
SDTWKOKR	/usr/lpp/netdata/Ko_KR/IBM	18972 bytes
SDTWLOA4	/usr/lpp/netdata/servlet-lib/IBM	2424563 bytes

### 5.3 FMIDs Deleted

Installing Net.Data Version 2.2 will result in the deletion of the following FMIDs:

Figure 18. FMIDs Deleted

Deleted FMID	Deleting FMID	Description	:
H24C110	H242220	Net.Data Version 5 Base	
H24C111	H242220	Net.Data Version 5 Japanese	
H242210	H242220	Net.Data Version 2 Release 1	

### 5.4 Special Considerations

Net.Data Version 2.2 has no special considerations for the target system.

---

## 6.0 Installation Instructions

This chapter describes the installation method and the step-by-step procedures to install and to activate the functions of Net.Data Version 2.2.

Please note the following:

- If you want to install Net.Data Version 2.2 into its own SMP/E environment, consult the SMP/E manuals for instructions on creating and initializing the SMPCSI and the SMP/E control data sets.
- Sample jobs have been provided to help perform some or all of the installation tasks. The SMP/E jobs assume that all DDDEF entries required for SMP/E execution have been defined in the appropriate zones.
- The SMP/E dialogs may be used instead of the sample jobs to accomplish the SMP/E installation steps.

---

### 6.1 Installing Net.Data Version 2.2

#### 6.1.1 SMP/E Considerations for Installing Net.Data Version 2.2

This release of Net.Data Version 2.2 is installed using the SMP/E RECEIVE, APPLY, and ACCEPT commands. The SMP/E dialogs may be used to accomplish the SMP/E installation steps.

#### 6.1.2 SMP/E Environment

All SMP/E installation jobs provided assume that all necessary DD statements for the execution of SMP/E are defined using DDDEFs.

Sample jobs are provided to assist you in installing Net.Data Version 2.2. After the RECEIVE step has been completed, the sample jobs can be found in SMPTLIB: **IBM.H242220.F1**. Make a copy of these jobs in your own library and modify them to use during the installation of Net.Data Version 2.2. The sample jobs are:

<b>DTWALC</b>	Sample job to allocate the Base target and distribution libraries
<b>DTWHFS</b>	Sample JCL to allocate HFS data set (Optional)
<b>DTWDDDEF</b>	Sample job to define SMP/E DDDEFs
<b>DTWISMKD</b>	Sample job to invoke the DSNMKDIR REXX exec
<b>DTWMKDIR</b>	Sample REXX exec to create Hierarchical File System Structure
<b>DTWREC</b>	Sample RECEIVE job
<b>DTWAPPLC</b>	Sample APPLY CHECK job

- DTWAPPLY**    Sample APPLY job
- DTWACCPC**    Sample ACCEPT CHECK job
- DTWACPT**    Sample ACCEPT job

In the sample SMP/E jobs provided, the name of the SMP/E CSI is `hlqual.SMPCSi.CSI`. The global zone name in the SMP/E CSI is `GLOBAL`. The distribution zone name is `distlib`. The target zone name is `targlib`. The sample jobs should be updated to reflect the CSI and zone names used at your installation.

### 6.1.3 SMP/E Options Subentry Values

The recommended values for some SMP/E CSI subentries are shown in Figure 19. Use of values lower than these may result in failures in the installation process. `DSSPACE` is a subentry in the `GLOBAL` options entry. `PEMAX` is a subentry of the `GENERAL` entry in the `GLOBAL` options entry. Refer to the SMP/E manuals for instructions on updating the global zone.

<i>Figure 19. SMP/E Options Subentry Values</i>		
<b>SUB-ENTRY</b>	<b>Value</b>	<b>Comment</b>
DSSPACE	(200,200,500)	3390 DASD tracks
PEMAX	5500	The SMP/E default is larger than what can be specified here

### 6.1.4 SMP/E CALLLIBS Processing

Net.Data Version 2.2 uses the `CALLLIBS` function provided in SMP/E Release 8 to resolve external references during installation. When Net.Data Version 2.2 is installed, ensure the following:

- Verify that the SMP/E `SMPLTS` data set has been allocated. Refer to *SMP/E Reference* for information on allocating the `SMPLTS` data set.

**Note:** For Net.Data Version 2.2, 120 cylinders of 3380/3390 DASD space is adequate for the `SMPLTS`.

- Provide DDDEFs for the following libraries:
  - `SCEELKED`

**Note:** The DDDEFs above are used only to resolve the link-edit for Net.Data Version 2.2 using `CALLLIBS`. These data sets are not updated during the installation of Net.Data Version 2.2.

---

## 6.2 Unload the Sample JCL from the Product Tape

Sample installation jobs are provided on the distribution tape to help you install Net.Data Version 2.2. The following sample JCL will copy the Net.Data Version 2.2 jobs from the tape. Add a job card and modify the parameters in boldface to uppercase values to meet your site's requirements before submitting.

```

//STEP1 EXEC PGM=IEBCOPY
//SYSPRINT DD SYSOUT=A
//IN DD DSN=IBM.H242220.F1,UNIT=tunit,VOL=SER=242220,
// LABEL=(2,SL),DISP=(OLD,KEEP)
//OUT DD DSNAME=DTW220.INSTALL,
// DISP=(NEW,CATLG,DELETE),
// VOL=SER=dasdvol,UNIT=dunit,
// DCB=*.STEP1.IN,SPACE=(8800,(15,5,5))
//SYSUT3 DD UNIT=SYSDA,SPACE=(CYL,(1,1))
//SYSIN DD *
COPY INDD=IN,OUTDD=OUT
SELECT MEMBER=(DTWALC,DTWDDDEF,DTWREC,DTWAPPLC,DTWAPPLY)
SELECT MEMBER=(DTWISMKD,DTWMKDIR,DTWACPC,DTWACPT,DTWHFS)
/*

```

Where **tunit** is the unit value matching the product tape or cartridge, **DTW220.INSTALL** is the name of the data set where the sample jobs will reside, **dasdvol** is the volume serial of the DASD device where the data set will reside, and **dunit** is the DASD unit type of the volume.

You can also access the sample installation jobs by performing an SMP/E RECEIVE for FMID fmid, and then copying the jobs from data set **hlq.IBM.H242220.F1** to a work data set for editing and submission.

---

## 6.3 Update and Execute the Desired Allocation Jobs

### 6.3.1 Allocate Distribution and Target Libraries - Base

All the installation jobs on the tape refer to private libraries. If you chose system libraries as your target libraries, you must change the installation jobs to refer to the system libraries.

Modify and run job **DTWALC** to allocate the SMP/E target and distribution libraries for Net.Data Version 2.2

**Note:** Be sure to read the notes in the comment section of the installation job stream. Add a job card and submit the job.

**Expected Return Codes and Messages:** This job should complete with a condition code of 0.

### 6.3.2 Allocate HFS Data Set — Optional

If you plan to install your product into a separate HFS data set instead of installing into the root filesystem, edit and run the sample job, member name **DTWHFS**, in the data set defined by the **DTW220.INSTALL** job, to allocate an HFS data set.

**Expected Return Codes and Messages:** This job should complete with a condition code of 0.

### 6.3.3 DDDEF Entries for Target and Distribution Target Libraries for Net.Data Version 2.2

Edit and run the sample job, member name **DTWDDDEF** in the data set defined by the **DTW220.INSTALL** job, to help you define the Net.Data Version 2.2 data sets to your SMP/E system.

**IMPORTANT:** Though all JCL must normally be in upper case to run, HFS path names may be mixed case.

**Note:** Be sure to read the notes in the comment section of the installation job stream. Add a job card and submit the job.

**Expected Return Codes and Messages:** This job should complete with a condition code of 0.

---

## 6.4 Create the Hierarchical File System Structure

1. Before SMP/E can install Net.Data Version 2.2 you have to have a directory skeleton in your HFS.

- Using the TSO MKDIR command, create the following directory:

```
TSO MKDIR '/usr/lpp/netdata' MODE (7 5 5)
```

You need to run with root authority if you are installing on '/usr/lpp/netdata'.

**Note:** THE SPACES IN MODE(7 5 5) ARE IMPORTANT!

**Note:** If your installation uses a different directory structure or name, you will need to edit the supplied default directory (/usr/lpp/netdata) accordingly.

2.

#### Optional

If you decided to install your product into a separate HFS data set instead of installing into the root filesystem, mount the new HFS created on the mountpoint. (The following command must be on one line.)

```
TSO MOUNT FILESYSTEM('dtw220.sdtwhfs')  
MOUNTPOINT('/usr/lpp/netdata') TYPE(HFS)
```

3. A sample job **DTWISMKD** found in DTW220.INSTALL will create the skeletons. DTWISMKD must be run with root authority if you are installing on the default directory (/usr/lpp/netdata).

If your installation uses a different directory structure or name, you will need to edit the supplied default directory (/usr/lpp/netdata) accordingly.

**Note:** Be sure to read the notes in the comment section of the installation job stream. Add a job card and submit the job.

**Expected Return Codes and Messages:** This job should complete with a condition code of 0.

---

## 6.5 Update and Execute the SMP/E RECEIVE Job

Go to the data set **DTW220.INSTALL** and edit member **DTWREC**. Make the necessary changes and run the **DTWREC** member.

**Note:** Be sure to read the notes in the comment section of the installation job stream. Add a job card and submit the job.

**Expected Return Codes and Messages:** This job should complete with a condition code of 4 or less.

**Note:** If you are running a lower level of OS/390 Version 2 Release 7, your RECEIVE job will end with a return code of 4. The following warning message will be issued: **GIM50050W**

### 6.5.1 Receive the Cumulative Service Tape

**Note:** This step is bypassed if receiving the product from a CBPDO.

**Expected Return Codes and Messages:** This job should complete with a condition code of 0.

---

## 6.6 Update and Execute the SMP/E APPLY CHECK and APPLY Job

When Net.Data is installed in the directory (`usr/lpp/netdata`), the SMP/E DTWAPPLY job must be run by a userid with a UID value of 0 (zero).

### 6.6.1 Perform SMP/E APPLY CHECK

Edit and submit sample job **DTWAPPLC** to perform an SMP/E APPLY CHECK for Net.Data Version 2.2. Consult the instructions in the sample job for more information.

To receive the full benefit of the SMP/E Causer SYSMOD Summary Report, do *not* bypass the following on the APPLY CHECK: PRE, ID, REQ, and IFREQ. This is because the SMP/E root cause analysis identifies the cause only of **ERRORS** and not of **WARNINGS** (SYSMODs that are bypassed are treated as warnings, not errors, by SMP/E).

The GROUPEXTEND operand indicates that SMP/E apply all requisite SYSMODs. The requisite SYSMODS might be applicable to other functions.

For CHECK processing on APPLY, change the APPLY SELECT statement to the following:

```
APPLY S(H242220) CHECK GROUPEXTEND
FORFMID(H242220)
BYPASS(HOLDSYS,HOLDUSER,
HOLDCLASS(UCLREL,ERREL)).
```

**Expected Return Codes and Messages:** This job should complete with a condition code of 4 or less.

**Note:** If you are running a lower level of OS/390 Version 2 Release 7, your APPLY CHECK job will end with a return code of 4. The following warning message will be issued: **GIM50050W**

## 6.6.2 Perform SMP/E APPLY

Edit and submit sample job **DTWAPPLY** to perform an SMP/E APPLY for Net.Data Version 2.2. Consult the instructions in the sample job for more information.

Change the APPLY SELECT statement in the sample job to the following:

```
APPLY S(H242220) GROUPEXTEND
FORFMID(H242220)
BYPASS(HOLDCLASS(UCLREL,ERREL),HOLDUSER)
COMPRESS(ALL).
```

**Expected Return Codes and Messages:** This job should complete with a condition code of 4 or less.

**Note:** If you are running a lower level of OS/390 Version 2 Release 7, your APPLY job will end with a return code of 4. The following warning message will be issued: **GIM50050W**

---

## 6.7 Update and Execute the SMP/E ACCEPT CHECK and ACCEPT Job

### 6.7.1 Perform SMP/E ACCEPT CHECK

Edit and submit sample job **DTWACCPC** to perform an SMP/E ACCEPT CHECK for Net.Data Version 2.2. Consult the instructions in the sample job for more information.

To receive the full benefit of the SMP/E Causer SYSMOD Summary Report, do *not* bypass the following on the ACCEPT CHECK: PRE, ID, REQ, and IFREQ. This is because the SMP/E root cause analysis identifies the cause only of **ERRORS** and not of **WARNINGS** (SYSMODs that are bypassed are treated as warnings, not errors, by SMP/E).

The GROUPEXTEND operand indicates that SMP/E accept all requisite SYSMODs. The requisite SYSMODS might be applicable to other functions.

For CHECK processing on ACCEPT, change the ACCEPT SELECT statement to the following:

```
ACCEPT S(H242220) CHECK GROUPEXTEND
FORFMID(H242220)
BYPASS(HOLDSYS,HOLDUSER,
HOLDCLASS(UCLREL,ERREL)).
```

**Expected Return Codes and Messages:** This job should complete with a condition code of 4 or less.

**Note:** If you are running a lower level of OS/390 Version 2 Release 7, your ACCEPT CHECK job will end with a return code of 4. The following warning message will be issued: **GIM50050W**

## 6.7.2 Perform SMP/E ACCEPT

Net.Data Version 2.2. Consult the instructions in the sample job for more information.

Change the ACCEPT SELECT in the sample job statement to the following:

```
ACCEPT S(H242220) GROUPEXTEND
FORFMID(H242220)
BYPASS(HOLDCLASS(UCLREL,ERREL))
COMPRESS(ALL).
```

Edit and submit sample job **DTWACPT** to perform an SMP/E ACCEPT for

Before using SMP/E to load new distribution libraries, it is recommended that you set the ACCJCLIN indicator in the distribution zone. This will cause entries produced from JCLIN to be saved in the distribution zone whenever a SYSMOD containing inline JCLIN is ACCEPTed. For more information on the ACCJCLIN indicator, see the description of inline JCLIN in the SMP/E manuals.

**Expected Return Codes and Messages:** This job should complete with a condition code of 4 or less.

**Note:** If you are running a lower level of OS/390 Version 2 Release 7, your ACCEPT job will end with a return code of 4. The following warning message will be issued: **GIM50050W**

---

## 6.8 Install the Net.Data Version 2.2 Executables and DLLs

Unless you modified the directory structure or name when you created the hierarchical file system directory for Net.Data Version 2.2, the previous steps installed the Net.Data Version 2.2 executables and DLLs in the directories:

```
/usr/lpp/netdata/cgi-bin
/usr/lpp/netdata/icapi-lib
/usr/lpp/netdata/servlet-lib
```

**Note:** If you did modify the directory structure or name, then substitute your choice for `/usr/lpp/netdata` in the installation instructions that follow.

Since `/usr/lpp/netdata` is not your Web server's root directory, the Web server cannot process client requests for Net.Data Version 2.2 unless you make some additional modifications to the Web server's configuration. Either of the following approaches can be used to complete the installation of the executables and DLLs:



## 6.8.1 Approach A: Using Net.Data Version 2.2 Directories

### For use of CGI:

1. Add an Exec directive to the Web server's configuration file (/etc/httpd.conf) that redirects Net.Data Version 2.2 requests to the /usr/lpp/netdata/cgi-bin directory. One possible Exec directive is the following:

```
Exec /netdata-cgi/* /usr/lpp/netdata/cgi-bin/*
```

2. Add your Net.Data Version 2.2 cgi-bin directory to the LIBPATH statement of the Web server's environment variables file (/etc/httpd.envvars). If your Net.Data Version 2.2 cgi-bin directory is /usr/lpp/netdata/cgi-bin, then your LIBPATH statement should be similar to the following:

```
LIBPATH=/usr/lpp/internet/bin:/usr/lpp/netdata/cgi-bin
```

### For use of ICAPI or GWAPI:

1. Add a ServerInit directive to the Web server's configuration file (/etc/httpd.conf) that tells the Web server how to initialize Net.Data Version 2.2. One possible ServerInit directive is the following:

```
ServerInit /usr/lpp/netdata/icapi-lib/db2www:dtw_init
```

2. Add a Service directive to the Web server's configuration file (/etc/httpd.conf) that redirects Net.Data Version 2.2 requests to the /usr/lpp/netdata/icapi-lib directory. One possible Service directive is the following:

```
Service /netdata-cgi/db2www* /usr/lpp/netdata/icapi-lib/db2www:dtw_icapi*
```

3. Add your Net.Data Version 2.2 icapi-lib directory to the LIBPATH statement of the Web server's environment variables file (/etc/httpd.envvars). If your Net.Data Version 2.2 icapi-lib directory is /usr/lpp/netdata/icapi-lib, then your LIBPATH statement should be similar to the following:

```
LIBPATH=/usr/lpp/internet/bin:/usr/lpp/netdata/icapi-lib
```

### For Use of Net.Data Servlets:

1. Add your NetDataServlets.jar file to the CLASSPATH statement of your Web server's environment variables file (/etc/httpd.envvars). If your NetDataServlets.jar file is /usr/lpp/netdata/servlet-lib/NetDataServlets.jar, then your CLASSPATH statement should be similar to the following:

```
CLASSPATH=/usr/lpp/JDK1.1.4/lib/classes.zip:  
/usr/lpp/netdata/servlet-lib/NetDataServlets.jar
```

**Note:** The entire path statement needs to be specified on the same line.

2. Add your Net.Data servlet-lib directory to the LIBPATH statement of your Web server's environment variables file (/etc/httpd.envvars). If your Net.Data servlet-lib directory is /usr/lpp/netdata/servlet-lib/, then your LIBPATH statement should be similar to the following:

```
LIBPATH=/usr/lpp/internet/bin:/usr/lpp/netdata/servlet-lib
```

**Attention:** Only one of the directories `/usr/lpp/netdata/cgi-bin`, `/usr/lpp/netdata/icapi-lib` and `/usr/lpp/netdata/servlet-lib` can be included in the LIBPATH of the Web server's environment variables file (`/etc/httpd.envvars`). Including more than one directory will lead to conflicts.

## 6.8.2 Approach B: Using Web Server Directories

### For use of CGI:

1. Move the executables and DLLs (`appldll`, `db2www`, `dtwle`, `dtwlei`, `dtwsqll`, `dtwsqllv6`, `filedll`, `odbcddl`, `perldll`, `rexcdll`, `sysdll`) to the Web server's `cgi-bin` directory. The Web server default `cgi-bin` directory is `/usr/lpp/internet/server_root/cgi-bin`.

**Note:** The Web server's default root directory is specified by the `ServerRoot` directive in the Web server's configuration file (`/etc/httpd.conf`) and may have been changed when the Web server was installed. The Web server's default `cgi-bin` directory is specified by an `Exec` directive in the Web server's configuration file and may also have been changed when the Web server was installed. If your Web server's root directory is different than `/usr/lpp/internet/server_root` or your Web server's `cgi-bin` directory is different than `/usr/lpp/internet/server_root/cgi-bin`, then substitute your choices as appropriate in these installation instructions.

2. Add the Web server's `cgi-bin` directory to the LIBPATH statement of the Web server's environment variables file (`/etc/httpd.envvars`). If your Web server `cgi-bin` directory is `/usr/lpp/internet/server_root/cgi-bin`, then your LIBPATH statement should be similar to the following:

```
LIBPATH=/usr/lpp/internet/bin:  
        /usr/lpp/internet/server_root/cgi-bin
```

**Note:** The entire path statement needs to be specified on the same line.

### For use of ICAPI or GWAPI:

1. Move the executables and DLLs (`appldll`, `db2www`, `dtwle`, `dtwlei`, `dtwsqll`, `dtwsqllv6`, `filedll`, `odbcddl`, `perldll`, `rexcdll`, `sysdll`) to the Web server's `cgi-bin` directory. The Web server default `cgi-bin` directory is `/usr/lpp/internet/server_root/cgi-bin`.
2. Add a `ServerInit` directive to the Web server's configuration file (`/etc/httpd.conf`) that tells the Web server how to initialize Net.Data Version 2.2. One possible `ServerInit` directive is the following:

```
ServerInit /usr/lpp/internet/server_root/cgi-bin/db2www:dtw_init
```

3. Add a `Service` directive to the Web server's configuration file (`/etc/httpd.conf`) that redirects Net.Data Version 2.2 requests to the `/usr/lpp/internet/server_root/cgi-bin` directory. One possible `Service` directive is the following:

```
Service /cgi-bin/db2www* /usr/lpp/internet/server_root/cgi-bin/db2www:dtw_icapi*
```

4. Add the Web server's `cgi-bin` directory to the LIBPATH statement of the Web server's environment variables file (`/etc/httpd.envvars`). If your Web server `cgi-bin` directory is `/usr/lpp/internet/server_root/cgi-bin`, then your LIBPATH statement should be similar to the following:

```
LIBPATH=/usr/lpp/internet/bin:  
        /usr/lpp/internet/server_root/cgi-bin
```

**Note:** The entire path statement needs to be specified on the same line.

### For Use of Net.Data Servlets

1. Add your NetDataServlets.jar file to the CLASSPATH statement of your Web server's environment variables file (/etc/httpd.envvars). If your NetDataServlets.jar file is /usr/lpp/netdata/servlet-lib/NetDataServlets.jar, then your CLASSPATH statement should be similar to the following:

```
CLASSPATH=/usr/lpp/JDK1.1.4/lib/classes.zip:  
        /usr/lpp/netdata/servlet-lib/NetDataServlets.jar
```

**Note:** The entire path statement needs to be specified on the same line.

2. Move the Net.Data DLLs (libdtwndapi.so, appldll, dtwle, dtwlei, dtwsqll, dtwsqllv6, filedll, odbcdll, perldll, rexxdll, sysdll) to your Web server's cgi-bin directory. The Web server default cgi-bin directory is:

```
/usr/lpp/internet/server_root/cgi-bin/
```

3. Add your Web server's cgi-bin directory to the LIBPATH statement of your Web server's environment variables file (/etc/httpd.envvars). If your Web server cgi-bin directory is /usr/lpp/internet/server\_root/cgi-bin/, then your LIBPATH statement should be similar to the following:

```
LIBPATH=/usr/lpp/internet/bin:  
        /usr/lpp/internet/server_root/cgi-bin/
```

**Note:** The entire path statement needs to be specified on the same line.

**Note:** If you choose to move the executables and DLLs to the Web server's cgi-bin directory, then these copies must be manually refreshed whenever maintenance is applied to the Net.Data Version 2.2 product.

For more detail on installing the Web server configuration file directives, refer to the Webmaster's Guide for your Web server. For more information, refer to 2.5, "Publications Useful During Installation" on page 6.

Ensure that the permissions for the Net.Data Version 2.2 executables and DLLs and for each directory in the path to the executables and DLLs are 755.

---

## 6.9 Customize the Net.Data Version 2.2 Initialization File

The previous steps created a sample Net.Data Version 2.2 initialization file named db2www.ini in directory /usr/lpp/netdata/pub. Copy this file to the Web server's document root directory.

**Note:** The Web server's document root directory is specified in the Web server's configuration file (/etc/httpd.conf) by the Pass directive with request template "/\*". The Web server's default document root directory is /usr/lpp/internet/server\_root/pub, but this may have been changed when the Web server was installed. If your Web server's document root directory is different than

/usr/lpp/internet/server\_root/pub, then substitute your choice as appropriate in these installation instructions.

If you installed Net.Data Version 2.2 in the directory /usr/lpp/netdata, then you can copy the initialization file by executing the following shell command under OMVS:

```
cp /usr/lpp/netdata/pub/db2www.ini /usr/lpp/internet/server_root/pub
```

Figure 20 contains the sample Net.Data Version 2.2 initialization file that is shipped with Net.Data Version 2.2.

First off, in section 6.9, Figure 19 has the sample INI file that we ship. This needs to be replaced with the following:

```
%{ ***** Path Configuration Statements ***** %}  
%{ Modify the following paths to specify the macro, executable,%}  
%{ and flat-file paths for your applications %}  
MACRO_PATH /usr/lpp/netdata/macros;  
EXEC_PATH /usr/lpp/netdata/testcmd;  
FFI_PATH /usr/lpp/netdata/file-data;  
  
%{ ***** Configuration Variable Statements ***** %}  
%{ Change DB2SSID to specify the default subsystem ID you will %}  
%{ use for your applications. Change DB2PLAN to specify the %}  
%{ default plan name for your applications. %}  
%{ If your applications require the use of the variable %}  
%{ SHOWSQL, then change DTW_SHOWSQL to yes. If your %}  
%{ application require the use of Direct Request, then change %}  
%{ DTW_DIRECT_REQUEST to yes. %}  
DB2SSID DBNC  
DB2PLAN DTWGAV22  
DTW_SHOWSQL no  
DTW_DIRECT_REQUEST no  
  
%{ ***** Environment Configuration Statements ***** %}  
%{ If you plan to use DB2 V6 for your applications, %}  
%{ change dtwsql to dtwsqlv6 in the ENVIRONMENT statement %}  
%{ for DTW_SQL. %}  
ENVIRONMENT (DTW_SQL) dtwsql ()  
ENVIRONMENT (DTW_SYSTEM) sysdll ()  
ENVIRONMENT (DTW_PERL) perl.dll ()  
ENVIRONMENT (DTW_REXX) rexx.dll ()  
ENVIRONMENT (DTW_FILE) filedll ()  
ENVIRONMENT (DTW_APPLET) appl.dll ()  
ENVIRONMENT (DTW_ODBC) odbcdll ()
```

Figure 20. Sample Net.Data Version 2.2 Initialization File

**Note:** Version 2.2 removes the requirement that RETURN\_CODE must be placed on the ENVIRONMENT statements. If you are using an initialization file from a prior version, remove RETURN\_CODE from the ENVIRONMENT statements. Also, DTW\_DEFAULT is no longer a separate language environment and its ENVIRONMENT statement must be removed from the initialization file.

The sample Net.Data Version 2.2 initialization file makes several assumptions about customizing the setting of Net.Data Version 2.2 variables and about configuring Net.Data Version 2.2 language environments and search paths. These assumptions may not be correct for your environment:

- If your Net.Data Version 2.2 macros directory path is different from /usr/lpp/netdata/macros, then edit the MACRO\_PATH statement accordingly.

**Note:** The files contained in the Net.Data Version 2.2 /usr/lpp/netdata/macros directory are under SMP/E control and cannot be modified. If subsequent installation steps require that you modify any of these files, then you must make the modifications to copies of the files stored in directories that you create. Since these modified copies are replacements for the originals, Net.Data Version 2.2 must be instructed to search for these files in your private directories prior to searching the SMP/E created directories. This is accomplished by adding your private directories in front of the SMP/E created directories in the path statements of the db2www.ini file. For example, if you customize a macro provided by the SMP/E installation and place this macro in the directory /u/SYSADM/macros, then the default MACRO\_PATH statement should be replaced with the following:

```
MACRO_PATH /u/SYSADM/macros;/usr/lpp/netdata/macros;
```

- If your Net.Data Version 2.2 external program directory path is different than /usr/lpp/netdata/testcmd, then modify the EXEC\_PATH statement accordingly.
- If your Net.Data Version 2.2 flat file directory path is different from /usr/lpp/netdata/file-data, then edit the FFI\_PATH statement accordingly.
- If your default DB2 subsystem ID is different than DBNC, then modify the DB2SSID specification accordingly.
- If your DB2 plan name is different than DTWGAV22, then modify the DB2PLAN specification accordingly.
- If your applications require the use of the variable SHOWSQL, then change the DTW\_SHOWSQL configuration variable to yes.
- If your applications require the use of Direct Request, then change the DTW\_DIRECT\_REQUEST configuration variable to yes.

Net.Data Version 2.2 specifies several variables that affect the way in which Net.Data Version 2.2 language environments process calls to functions defined in %FUNCTION blocks. The settings of these variables must be passed to a language environment in order to have an affect. For example, a macro defines a LOCATION variable to specify the location name of the remote DBMS at which an SQL statement within a DTW\_SQL function is to be executed. The value of LOCATION must be passed to the SQL language environment (DTW\_SQL) so that the SQL language environment can connect to the designated remote DBMS. In order to accomplish this goal, change the line

```
ENVIRONMENT (DTW_SQL) dtwsq1 ()
```

to

```
ENVIRONMENT (DTW_SQL) dtwsq1 (IN LOCATION)
```

If you want to be able to override the default settings of the DB2PLAN and DB2SSID variables in macro files when the SQL language environment is invoked, then you need to also include them on the environment statement for DTW\_SQL as follows:

```
ENVIRONMENT (DTW_SQL) dtwsq1 (IN DB2SSID, IN DB2PLAN, IN LOCATION)
```

Refer to the *Net.Data Version 2.2 Language Environment Guide* for a complete list of the variables that can be passed to the language environments.

If you desire to use the Net.Data Version 2.2 ODBC language environment, then you must specify the name of your DB2 CLI initialization file in the Net.Data Version 2.2 initialization file using the DSNAOINI statement. For example, if the name of your DB2 CLI initialization file is DBNC.DSNAOINI, then add the following statement to the Net.Data Version 2.2 initialization file:

```
DSNAOINI DBNC.DSNAOINI
```

**Note:** The user ID or user IDs under which Net.Data Version 2.2 executes must have read access to your DB2 CLI initialization file.

Ensure that the permissions for the Net.Data Version 2.2 initialization file are 644.

---

## 6.10 Install the Net.Data Version 2.2 Applet

Subsequent sections of this document specify an installation verification test that allows you to verify the successful installation of Net.Data Version 2.2 for OS/390. The installation verification test executes a Net.Data Version 2.2 macro that references an applet class contained within a directory created by the SMP/E installation process. This macro does not function properly unless the following pass directive is added to the Web server's configuration file (*/etc/httpd.conf*):

```
Pass /netdata-java/* /usr/lpp/netdata/java/*
```

**Note:** This pass directive must be placed before the pass rules for server administration in order to supersede the installation server administration rules.

---

## 6.11 Install the Net.Data Version 2.2 Icons and HTML files

The sample Net.Data Version 2.2 macros included in the directory */usr/lpp/netdata/macros* make use of icons and HTML files within directories created by the SMP/E installation process. These macros do not function properly unless the following pass directives are added to the Web server's configuration file (*/etc/httpd.conf*):

```
Pass /netdata-html/* /usr/lpp/netdata/html/*
Pass /netdata-icons/* /usr/lpp/netdata/icons/*
```

**Note:** These pass directives must be placed before the pass rules for server administration in order to supersede the installation

---

## 6.12 Set Up the SQL and ODBC Language Environments

If you do plan to go through the installation verification process for Net.Data, then postpone this step until after you have built the sample stored procedures.

The SQL and ODBC Language Environments require RRS Attach Facility when using Net.Data with ICAPI or GWAPI. Make sure the RRS Attach Facility is installed for DB2 and OS/390 RRS is installed and configured properly.

The SQL language environment (DTW\_SQL) and the ODBC language environment (DTW\_ODBC) use the DB2 load module library SDSNLOAD. The Net.Data Version 2.2 SQL and ODBC language environments require that this library reside in LINKLIST or that it be specified in the STEPLIB DD statement of the Web server startup procedure. The name and location of the Web server startup procedure depends on your system configuration.

A plan for Net.Data Version 2.2 must be created before the Net.Data Version 2.2 SQL and ODBC language environments can be used to call stored procedures or to execute other types of SQL statements. The binds required for creating this plan depend on the language environments that you plan to use and the location of your stored procedures.

Sample JCL for binding the Net.Data DBRM into a package, for creating a Net.Data plan that permits the use of the SQL language environment with DB2 Version 5, and for granting EXECUTE authority on the plan to PUBLIC can be found in DTW220.SDTWBASE(DTWBIND). If you plan to use both the SQL and ODBC language environments, then the DBRMs for DB2 CLI must be bound into the same plan as the Net.Data DBRM. Sample JCL for binding the Net.Data DBRM and the DB2 CLI DBRMs into a package, for creating a Net.Data plan that permits the use of the SQL and ODBC language environments with DB2 Version 5, and for granting EXECUTE authority on the plan to PUBLIC can be found in DTW220.SDTWBASE(DTWOBIND). You may need to make some minor changes to the sample JCL in order to successfully execute the JCL within your environment. The prefix of the SDSNEXIT and SDSNLOAD data set names specified in the STEPLIB DD statement may be incorrect for your installation. The values specified by the SYSTEM option of the DSN command and the PLAN option of the RUN command may also be incorrect for your installation. The SYSTEM option of the DSN command specifies the name of the DB2 subsystem and should be identical to the subsystem ID specified in the DB2SSID statement of the Net.Data initialization file. The PLAN option of the RUN command specifies the name of the application plan for the DSNTIAD program. If you do not plan to go through the installation verification process for Net.Data, which is described in 7.0, "Installation Verification Process" on page 34 then delete the TSTRPKG.TSTINSRT and TSTRPKG.TSDELETE from the package list. Make whatever other modifications are appropriate and submit the JCL.

If you plan to use the ODBC language environment with ICAPI or GWAPI, the MVSATTACHTYPE variable in the DB2 CLI initialization file must be set to RRSAF. Also, the PLANNAME variable must be set to the same plan name as the one specified for DB2PLAN in the Net.Data Version 2.2 initialization file.

---

## 6.13 Specify the Default Code Page Environment

Both Net.Data Version 2.2 and the Web server make assumptions about the default code page environment. If these assumptions are incorrect for your installation, then you must make modifications to the Web server's configuration file and to the Net.Data Version 2.2 initialization file.

### 6.13.1 Modifying the Web Server's Configuration File

The Web server's configuration file (/etc/httpd.conf) specifies the default code page environment through DefaultFsCp and DefaultNetCp directives. The DefaultFsCp directive specifies the default file system code page on the server. This is the EBCDIC code page in which the Web server expects to receive text streams from Net.Data Version 2.2. The DefaultNetCp directive specifies the default network codepage. This is the ASCII codepage used to encode text streams that are served by the Web server.

The Web server program default settings are:

```
DefaultFsCp IBM-1047 (Latin 1/Open Systems)
DefaultNetCp IS08859-1
```

These default settings work fine for Latin 1 languages but will not produce the correct results for other languages such as Japanese and Korean. One possible pair of default settings for Japanese is:

```
DefaultFsCp IBM-939 (Japanese Latin Extended)
DefaultNetCp IBM-932
```

One possible pair of default settings for Korean is:

```
DefaultFsCp IBM-933
DefaultNetCp IBM-949
```

### 6.13.2 Modifying the Net.Data Version 2.2 Initialization File

Net.Data Version 2.2 assumes that the codepage for your DB2 database is the same as the codepage specified by the Web server's DefaultFsCp directive. If this is incorrect, then you must use the DefaultDBCp variable to specify the codepage of your DB2 database. For example, if the codepage of your DB2 database is IBM-930, add the following to your Net.Data Version 2.2 initialization file:

```
DefaultDBCp IBM-930
```

The setting of this variable directs Net.Data Version 2.2 to convert SQL statements and stored procedure input parameters from the default file system codepage to the database codepage, and to convert result



sets and stored procedure output parameters from the database codepage to the file system codepage. No conversion is performed if this variable is not set.

**Tip:** You do not need to set this configuration variable if the codepage of your database is the same as the codepage of your macros. Doing so would lead to unnecessary codepage conversions.

---

## 6.14 Enable the Message Catalog

Net.Data Version 2.2 for OS/390 provides English, Japanese and Korean message catalogs. The setting of environment variables within the Web server's environment variables file (`/etc/httpd.envvars`) enables the use of message catalogs and specifies the particular message catalog from which Net.Data Version 2.2 messages will be obtained.

Unless you modified the directory structure or name when you created the hierarchical file system directory for Net.Data Version 2.2, you have already installed the Net.Data Version 2.2 English, Japanese and Korean message catalogs in the files `/usr/lpp/netdata/C/d2w.cat`, `/usr/lpp/netdata/Ja_JP/d2w.cat` and `/usr/lpp/netdata/Ko_KR/d2w.cat` respectively. If you did modify the directory structure or name, then substitute your choice for `/usr/lpp/netdata` in the following installation steps:

1. To enable the use of Net.Data Version 2.2 message catalogs, add `/usr/lpp/netdata/%L/%N` to the NLSPATH statement in the Web server's environment variables file. Your NLSPATH statement should be similar to the following:

```
NLSPATH=/usr/lib/nls/msg/%L/%N:  
        /usr/lpp/internet/%L/%N:/usr/lpp/netdata/%L/%N
```

**Note:** The entire path statement needs to be specified on the same line.

2. The value of the LANG statement in the Web server's environment variables file (`/etc/httpd.envvars`) selects the specific catalog that Net.Data Version 2.2 will use. To select the English message catalog, specify:

```
LANG=C
```

To select the Japanese message catalog, specify:

```
LANG=Ja_JP
```

To select the Korean message catalog, specify:

```
LANG=Ko_KR
```

---

## 7.0 Installation Verification Process

The process described in this section allows you to perform a simple test that verifies the successful installation of Net.Data Version 2.2 for OS/390. The setup for this test includes creating and loading sample databases, customizing verification macros, installing sample stored procedures, and binding Net.Data Version 2.2. Sample JCL for performing a number of these tasks is provided in the DTW220.SDTWBASE partitioned data set. Before executing this JCL on your system, you must make the following changes to the samples:

- Replace the user ID "IBMUUSER" with your user ID.
- Modify the JOB statement to conform to the requirements of your installation.

**Note:** The DTW220.SDTWBASE, DTW220.SDTWSPUF, and DTW220.SDTWSTRD partitioned data set is under SMP/E control and cannot be modified. Consequently, you must make these modifications and the other modifications described below to copies of these members stored within a partitioned data set that you create.

---

### 7.1 Create and Load the Sample Single Byte Character Set DB2 Tables

#### 7.1.1 Create The Tables

In order to execute the majority of the verification test macros, you must create a sample DB2 single byte character set (SBCS) database. The DDL statements for accomplishing this can be found in DTW220.SDTWSPUF(DTWDBDL).

DTWDBDL creates a database called CELDIAL containing the following four tables:

- CUSTOMER
- ORDER\_DE
- ORDER\_SU
- UIDCHK

The CREATE DATABASE and CREATE TABLESPACE SQL statements specify the default storage group SYSDEFLT. You may need to modify this storage group name before executing these statements.

DTWDBDL also includes GRANTs to PUBLIC for SELECT and UPDATE authority on the tables accessed in the verification test. If the security policies of your environment prohibit or discourage the use of PUBLIC, then other possibilities include granting SELECT and UPDATE authority on the tables to the user ID the Web server runs under, or, if a protection setup is specified in the Web server's configuration file, to the user ID specified in the protection directive.

For more detail on installing the Web server configuration file directives, refer to the Webmaster's Guide for your Web server. For more information, refer to 2.5, "Publications Useful During Installation" on page 6.

Submit the DDL for the creation of the CELDIAL database and the execution of these grants of authority using SPUFI or an equivalent facility.

## 7.1.2 Load the Tables

The JCL for loading the sample tables using the DB2 LOAD Utility can be found in DTW220.SDTWBASE(DTWDBLD). The members DTWCSTD, DTWORDE, DTWORSU, and DTWUIDC of the partitioned dataset DTW220.SDTWDATA contain data for populating the tables. You may need to modify the DB2 subsystem name and the user ID specified in the PARM field of the EXEC statement before executing this JCL.

**Note:** The sample table data is provided in the codepage IBM-1047. If your database codepage is different from IBM-1047, some characters may not display correctly in the Installation Verification Process unless the data is converted to the appropriate codepage.

For further information about the use of the DSNUPROC JCL procedure, refer to the *DB2 Utilities Guide and Reference*.

---

## 7.2 Create and Load the Sample Double-byte Character Set DB2 Table

**Note:** This step is for customers who plan to use a DBCS enabled operating system and browser and to retrieve double-byte character set data values from a DB2 database. If this does not apply to your installation, then you should skip this step.

### 7.2.1 Create The Table

In order to execute the double-byte character set verification test macro, you must create a sample DB2 database with double-byte data. The DDL statements for accomplishing this can be found in DTW220.SDTWSPUF(DTWCRED).

DTWCRED creates a database called CELDBCS containing the following table:

- DBCS

The CREATE DATABASE and CREATE TABLESPACE SQL statements specify the default storage group SYSDEFLT. You may need to modify this storage group name before executing these statements.

DTWCRED also includes a GRANTS to PUBLIC for SELECT and UPDATE authority on DBCS. If the security policies of your environment prohibit or discourage the use of PUBLIC, then other possibilities include granting SELECT and UPDATE authority on the table to the user ID the Web server runs under, or, if a protection setup is specified in the Web server's configuration file, to the user ID specified in the protection directive.

For more detail on installing the Web server configuration file directives, refer to the Webmaster's Guide for your Web server. For more information, refer to 2.5, "Publications Useful During Installation" on page 6.

Submit the DDL for the creation of the CELDBCS database and the execution of the grant of authority using SPUFI or an equivalent facility.

## 7.2.2 Load the Table

The SQL for inserting rows into the DBCS table can be found in DTW220.SDTWSPUF(DTWINSND).

---

## 7.3 Customize the Verification and Sample Macros

The SQL statements within the verification and sample macros specify `ibmuser` as the owner of the tables that the macros access. Replace `ibmuser` with the user ID of the user who executed the DDL that created the tables.

**Note:** To identify the macros that need to be modified, execute the following shell commands:

```
cd /usr/lpp/netdata/macros
```

```
grep -e ibmuser -i -l *
```

---

## 7.4 Install the Sample Stored Procedures

One of the features provided by Net.Data Version 2.2 is support for DB2 Stored Procedures. Two sample stored procedures (TSTINSRT and TSTDELET) have been provided to test this feature. TSTINSRT inserts a row into the CUSTOMER table. TSTDELET deletes one or more rows from the CUSTOMER table. The following steps install these stored procedures:

1. Enable Stored Procedure Support on your DB2 Subsystem.

If you do not have stored procedure support enabled on your DB2 subsystem, refer to your DB2 manuals and the following Redbook for instructions on enabling stored procedure support:

*Getting Started with DB2 Stored Procedures: Give them a Call through the Network*  
(SG24-4693-00)

2. Create the Stored Procedure Load Modules

- a. Modify the Source Code

The stored procedures specify `IBMUSER` as the owner of the tables that the stored procedures access. Replace `IBMUSER` with the user ID of the user who executed the DDL that created the tables. Members `DTWINSRT` and `DTWDELET` of the `DTW220.SDTWSTRD` partitioned data set contain the source code for the stored procedures.

- b. Precompile the Source Code

Sample JCL for precompiling the TSTINSRT and TSTDELET stored procedures can be found in DTW220.SDTWBASE(DTWINPCM) and DTW220.SDTWBASE(DTWDLPCM), respectively. The prefix of the SDSNEXIT, SDSNLOAD, and SDSNSAMP data set names specified in the STEPLIB and SYSLIB DD statements of this sample JCL depends on the version of DB2 that you are using and may be incorrect for your installation. The data set names specified on the DBRMLIB, SYSIN, and SYSCIN DD statements may also be incorrect for your installation. The SYSIN DD statement specifies the data set name for the stored procedure source code. The SYSCIN DD statement specifies the data set name for the precompiler modified source code, which is the input data set to the C/C++ compile step. The DBRMLIB DD statement specifies the data set name for the DBRM, which is the input data set to the bind step. Modify the prefix and data set names as required and submit the JCL.

c. Compile the Modified Source Code

Sample JCL for compiling the precompiler modified source code for the TSTINSRT and TSTDELET stored procedures can be found in DTW220.SDTWBASE(DTWINCC) and DTW220.SDTWBASE(DTWDLCC), respectively. The program names specified on the EXEC statement and the data set names specified on the STEPLIB, SYSMSGs, and SYSLIB DD statements of this sample JCL depend on the level of C/C++ compiler that you are using and may be incorrect for your installation. The data set names specified on the SYSIN and SYSLIN DD statements may also be incorrect for your installation. The SYSIN DD statement specifies the data set name for the precompiler modified stored procedure source code. The SYSLIN DD statement specifies the data set name for the object code, which is the input data set to the prelink step. Make the appropriate modifications and submit the JCL.

d. Prelink and Link the Object Code

Sample JCL for prelinking and linking the object code for the TSTINSRT and TSTDELET stored procedures can be found in DTW220.SDTWBASE(DTWINLNK) and DTW220.SDTWBASE(DTWDLLNK), respectively. The prefix of the SDSNLOAD data set name specified in the STEPLIB DD statement of the prelink step and the SYSLIB DD statement of the link step depend on the version of DB2 that you are using and may be incorrect for your installation. The data set names specified on the STEPLIB, SYSMSGs, SYSLIB, and SYSIN DD statements of the prelink step depend on the level of prelinker that you are using and may be incorrect for your installation. The first data set name specified on the SYSLIB DD statement of the link step depends on the level of linkage editor that you are using and may be incorrect for your installation. The data set names specified on the OBJECT DD statement of the prelink step and on the SYSLMOD DD statement of the link step may also be incorrect for your installation. The OBJECT DD statement specifies the data set name for the stored procedure object code created by the compile step. The SYSLMOD DD statement specifies the data set name for the stored procedure load module, which is the output data set of the link step. Make the appropriate modifications and submit the JCL.

**Note:** The COND\_CODE for the prelink steps of DTWINLNK and DTWDLLNK will be 4.

For DTWINLNK you will receive the following warning:

```
WARNING EDC4015: Unresolved references are detected: CEEBETBL CEER00TA @@TRT
DSNHLI  sprintf CEESG003 EDCINPL
```

For DTWDLLNK you will receive the following warning:

```
WARNING EDC4015: Unresolved references are detected: CEEBETBL CEER00TA @@TRT
DSNHLI CEESG003 EDCINPL
```

The COND\_CODE for the link steps of DTWINLNK and DTWDLLNK will be 0.

### 3. Bind the Stored Procedures

Sample JCL for binding the DBRMs created during the precompile step for the TSTINSRT and TSTDELET stored procedures can be found in DTW220.SDTWBASE(DTWINBND) and DTW220.SDTWBASE(DTWDLBND), respectively. The prefix of the SDSNEXIT and SDSNLOAD data set names specified in the STEPLIB DD statement depend on the version of DB2 that you are using and may be incorrect for your installation. The data set name specified on the DBRMLIB DD statement and the value specified by the SYSTEM option of the DSN command may also be incorrect for your installation. The DBRMLIB DD statement specifies the data set name for the DBRM created by the precompile step. The SYSTEM option of the DSN command specifies the name of the DB2 subsystem and should be identical to the subsystem id specified in the DB2SSID statement of the db2www.ini file. Make the appropriate modifications and submit the JCL.

### 4. Define the Stored Procedures to DB2

You cannot use the TSTINSRT and TSTDELET stored procedures until they are defined to DB2.

In DB2 V5, these stored procedures cannot run until they are defined in the catalog table SYSPROCEDURES. The DDL statement for accomplishing this goal can be found in DTW220.SDTWSPUF(DTWSTPV5). Submit the DDL using SPUFI or an equivalent facility.

---

## 7.5 Bind the DBRM for Net.Data Version 2.2

A plan for Net.Data Version 2.2 must be created before the Net.Data Version 2.2 SQL and ODBC language environments can be used to call stored procedures or to execute other types of SQL statements. The binds required for creating this plan depend on the language environments that you plan to use and the location of your stored procedures.

Sample JCL for binding the Net.Data DBRM into a package, for binding the Net.Data package and the packages of the TSTINSRT and TSTDELET stored procedures into a plan that permits the use of the SQL language environment with DB2 Version 5, and for granting EXECUTE authority on the plan to PUBLIC can be found in DTW220.SDTWBASE(DTWBND). If you plan to use both the SQL and ODBC language environments, then the DBRMs for DB2 CLI must be bound into the same plan as the Net.Data DBRM. Sample JCL for binding the Net.Data DBRM and the DB2 CLI DBRMs into a package, for binding the Net.Data package and the packages of the TSTINSRT and TSTDELET stored procedures into a plan that permits the use of the SQL and ODBC language environments with DB2 Version 5, and for granting EXECUTE authority on the plan to PUBLIC can be found in DTW220.SDTWBASE(DTWOBIND). You may need to make some minor changes to the sample JCL in order to successfully execute the JCL within your environment. The prefix of the SDSNEXIT and SDSNLOAD data set names specified in the STEPLIB DD statement depend on the version of DB2 that you are using and may be incorrect for your installation. The values specified by the SYSTEM option of the DSN command and the PLAN option of the RUN

command may also be incorrect for your installation. The SYSTEM option of the DSN command specifies the name of the DB2 subsystem and should be identical to the subsystem ID specified in the DB2SSID statement of the Net.Data initialization file. The PLAN option of the RUN command specifies the name of the application plan for the DSNTIAD program. Make the appropriate modifications and submit the JCL.

---

## 7.6 Test the Installation of Net.Data Version 2.2

### 7.6.1 Prepare the Test Environment

The following steps complete the preparation of the test environment:

- Stop and start the Web server.
- Ensure that the DB2 subsystem specified in the db2www.ini file is started.
- If the DB2 subsystem was already started, stop and start the DB2 stored procedures address space.

If you are using a DB2-established address space, then use `-STOP PROCEDURE (*)` and `-START PROCEDURE (*)`. If you are using a WLM-established address space, then use the appropriate WLM commands.

### 7.6.2 Execute the Verification Macros

The test for verifying the successful installation of Net.Data Version 2.2 requires that you use a Web browser to execute the verification macros. Before performing this test, ensure that the permissions for the verification macros and for each directory in the path to the verification macros are 755.

**Note:** For the use of CGI, these instructions assume that you added the following Exec directive to your Web server's configuration file:

```
Exec /netdata-cgi/* /usr/lpp/netdata/cgi-bin/*
```

For the use of ICAPI or GWAPI, these instructions assume that you added the following Service directive to your Web server's configuration file:

```
Service /netdata-cgi/db2www* /usr/lpp/netdata/icapi-lib/db2www:dtw_icapi*
```

If you installed the Net.Data Version 2.2 executables and DLLs in the Web server's cgi-bin directory, then replace "netdata-cgi" with "cgi-bin" in the following instructions.

Use a Web browser to test the various Net.Data Version 2.2 components:

- Test the Net.Data installation by specifying the following URL:  
`http://<your Web server address>/netdata-cgi/db2www/he11o.d2w/report`
- Test the SQL language environment by specifying the following URL:  
`http://<your Web server address>/netdata-cgi/db2www/custqord.d2w/input`

- Test the sample SQL stored procedures using the SQL language environment by specifying either of the following URLs:
  - `http://<your Web server address>/netdata-cgi/db2www/stpins.d2w/input`
  - `http://<your Web server address>/netdata-cgi/db2www/stpdel.d2w/input`
- Test the Default language environment by specifying the following URL:
  - `http://<your Web server address>/netdata-cgi/db2www/tdclb023.d2w/input`
- Test the System language environment by specifying the following URL:
  - `http://<your Web server address>/netdata-cgi/db2www/tsysparm.d2w/input`
- If you have a Perl language interpreter program installed on your system, test the Perl language environment by specifying the following URL:
  - `http://<your Web server address>/netdata-cgi/db2www/tperl003.d2w/input`
- If you have a REXX interpreter installed on your system, test the REXX language environment by specifying one of the following URLs:
  - If you are using Korean codepages:
    - `http://<your Web server address>/netdata-cgi/db2www/tkrexx024.d2w/input`
  - Otherwise:
    - `http://<your Web server address>/netdata-cgi/db2www/trex024.d2w/input`
- Test the Flat File language environment by specifying the following URL:
  - `http://<your Web server address>/netdata-cgi/db2www/tffi001.d2w/input`
- If you are using a java enabled Web browser, test the Java Applets language environment by specifying the following URL:
  - `http://<your Web server address>/netdata-cgi/db2www/blink.d2w/input`
- If you have installed the DB2 CLI feature of DB2 and have configured the Net.Data Version 2.2 ODBC language environment, then test the ODBC language environment by specifying the following URL:
  - `http://<your Web server address>/netdata-cgi/db2www/custqord.odbc/input`
- If you have installed the DB2 CLI feature of DB2 and have configured the Net.Data Version 2.2 ODBC language environment, then test the sample SQL stored procedures using the ODBC language environment by specifying either of the following URLs:
  - `http://<your Web server address>/netdata-cgi/db2www/stpins.odbc/input`
  - `http://<your Web server address>/netdata-cgi/db2www/stpdel.odbc/input`
- If you are using a DBCS enabled operating system and browser, test Net.Data Version 2.2's ability to return double-byte character set data by specifying the following URL:
  - `http://<your Web server address>/netdata-cgi/db2www/nlsdbcs.d2w/input`



- If you configured Net.Data to execute as a Servlet, then test the installation by specifying the following URL:

```
http://<your Web server address>/servlet  
/com.ibm.netdata.servlets.MacroServlet?MACRO=custqord.d2w
```

**Note:** The entire path statement needs to be specified on the same line.

---

## **Appendix A. Net.Data Version 2.2 Install Logic**

The SMP/E Modification Control Statements (SMPMCS) for Net.Data Version 2.2 are contained in the SMPMCS file on the installation tape. The SMPMCS for each FMID in the product will be loaded to the SMPPTS data set, with a member name matching the FMID, when the FMID is SMP/E RECEIVED. You may browse or print these members using TSO/E, ISPF, or IEBGENER (or IEBPTPCH).

---

## Appendix B. SMP/E JCLIN

```
//H242220      (ACCT#),PGMRNAME,
//              MSGCLASS=A,CLASS=A,MSGLEVEL=(1,1)
//*****
//*   LICENSED MATERIALS - PROPERTY OF IBM
//*   5655-DB2
//*   (C) COPYRIGHT 1997, 1999 IBM CORP.  ALL RIGHTS RESERVED.
//*
//*   STATUS = VERSION 02 RELEASE 02 MODIFICATION 00
//*   DOC:   LINKEDIT JCL FOR IBM NET.DATA FOR OS/390
//*          LOAD MODULES AND APPLICATION INTERFACE MODULES.
//*          THIS JOB SERVES AS JCLIN FOR SMP.
//*
//*****
//*CALLLIBS=YES
//LKED EXEC PGM=IEWBLINK,
//  PARM='AMODE=31,RMODE=ANY,LIST,XREF,LET,RENT,CASE(MIXED),CALL'
//SYSLIB DD DSN=CEE.V1R7M0.SCEELKED,DISP=SHR
//SYSPRINT DD SYSOUT=*
//SYSLMOD DD PATH='/usr/lpp/netdata/cgi-bin/IBM'
//*LIBRARYDD=SDTWLOA2
//ADTWLOAD DD DSN=DTW220.ADTWLOAD,DISP=SHR
//SYSLIN DD *
  SETOPT PARM(PATHMODE(0,7,5,5))
  INCLUDE ADTWLOAD(DTWAPPL)
  ENTRY CEESTART
  ALIAS './appld11'
  NAME DTWAPPL (R)
  SETOPT PARM(PATHMODE(0,7,5,5))
  INCLUDE ADTWLOAD(DTWODBC)
  ENTRY CEESTART
  ALIAS './odbcd11'
  NAME DTWODBC (R)
  SETOPT PARM(PATHMODE(0,7,5,5))
  INCLUDE ADTWLOAD(DTWWWW)
  ENTRY CEESTART
  ALIAS './db2www'
  NAME DTWWW (R)
  SETOPT PARM(PATHMODE(0,7,5,5))
  INCLUDE ADTWLOAD(DTWFILE)
  ENTRY CEESTART
  ALIAS './filed11'
  NAME DTWFILE (R)
  SETOPT PARM(PATHMODE(0,7,5,5))
  INCLUDE ADTWLOAD(DTWLE)
  ENTRY CEESTART
```

```

    ALIAS './dtwle'
    NAME DTWLE (R)
SETOPT PARM(PATHMODE(0,7,5,5))
INCLUDE ADTWLOAD(DTWPERL)
    ENTRY CEESTART
    ALIAS './perl.dll'
    NAME DTWPERL (R)
SETOPT PARM(PATHMODE(0,7,5,5))
INCLUDE ADTWLOAD(DTWREXX)
    ENTRY CEESTART
    ALIAS './rex.dll'
    NAME DTWREXX (R)
SETOPT PARM(PATHMODE(0,7,5,5))
INCLUDE ADTWLOAD(DTWSQL)
    ENTRY CEESTART
    ALIAS './dtwsq1'
    NAME DTWSQL (R)
SETOPT PARM(PATHMODE(0,7,5,5))
INCLUDE ADTWLOAD(DTWSQL6)
    ENTRY CEESTART
    ALIAS './dtwsq1v6'
    NAME DTWSQL6 (R)
SETOPT PARM(PATHMODE(0,7,5,5))
INCLUDE ADTWLOAD(DTWSYS)
    ENTRY CEESTART
    ALIAS './sys.dll'
    NAME DTWSYS (R)
SETOPT PARM(PATHMODE(0,7,5,5))
INCLUDE ADTWLOAD(DTWLEI)
    ENTRY CEESTART
    ALIAS './dtwlei'
    NAME DTWLEI (R)
/*
//LKED2 EXEC PGM=IEWBLINK,
// PARM='AMODE=31,RMODE=ANY,LIST,XREF,LET,RENT,CASE(MIXED),CALL'
//SYSLIB DD DSN=CEE.V1R7M0.SCEELKED,DISP=SHR
//SYSPRINT DD SYSOUT=*
//SYSLMOD DD PATH='/usr/lpp/netdata/icapi-lib/IBM'
/*LIBRARYDD=SDTWLOA3
//ADTWLOAD DD DSN=DTW220.ADTWLOAD,DISP=SHR
//SYSLIN DD *
SETOPT PARM(PATHMODE(0,7,5,5))
INCLUDE ADTWLOAD(DTWIAPPL)
    ENTRY CEESTART
    ALIAS './appl.dll'
    NAME DTWIAPPL (R)
SETOPT PARM(PATHMODE(0,7,5,5))
INCLUDE ADTWLOAD(DTWIODBC)
    ENTRY CEESTART

```

```

    ALIAS './odbcd11'
        NAME DTWIODBC (R)
SETOPT PARM(PATHMODE(0,7,5,5))
    INCLUDE ADTWLOAD(DTWIWWW)
        ENTRY CEESTART
        ALIAS './db2www'
            NAME DTWIWWW (R)
SETOPT PARM(PATHMODE(0,7,5,5))
    INCLUDE ADTWLOAD(DTWIFILE)
        ENTRY CEESTART
        ALIAS './filed11'
            NAME DTWIFILE (R)
SETOPT PARM(PATHMODE(0,7,5,5))
    INCLUDE ADTWLOAD(DTWILE)
        ENTRY CEESTART
        ALIAS './dtwle'
            NAME DTWILE (R)
SETOPT PARM(PATHMODE(0,7,5,5))
    INCLUDE ADTWLOAD(DTWIPERL)
        ENTRY CEESTART
        ALIAS './perl11'
            NAME DTWIPERL (R)
SETOPT PARM(PATHMODE(0,7,5,5))
    INCLUDE ADTWLOAD(DTWIREXX)
        ENTRY CEESTART
        ALIAS './rexxd11'
            NAME DTWIREXX (R)
SETOPT PARM(PATHMODE(0,7,5,5))
    INCLUDE ADTWLOAD(DTWISQL)
        ENTRY CEESTART
        ALIAS './dtwsq1'
            NAME DTWISQL (R)
SETOPT PARM(PATHMODE(0,7,5,5))
    INCLUDE ADTWLOAD(DTWISQL6)
        ENTRY CEESTART
        ALIAS './dtwsq1v6'
            NAME DTWISQL6 (R)
SETOPT PARM(PATHMODE(0,7,5,5))
    INCLUDE ADTWLOAD(DTWISYS)
        ENTRY CEESTART
        ALIAS './sysd11'
            NAME DTWISYS (R)
SETOPT PARM(PATHMODE(0,7,5,5))
    INCLUDE ADTWLOAD(DTWILEI)
        ENTRY CEESTART
        ALIAS './dtwlei'
            NAME DTWILEI (R)
/*
//LKED3 EXEC PGM=IEWBLINK,

```

```

// PARM='AMODE=31,RMODE=ANY,LIST,XREF,LET,RENT,CASE(MIXED),CALL'
//SYSLIB DD DSN=CEE.V1R7M0.SCEELKED,DISP=SHR
//SYSPRINT DD SYSOUT=*
//SYSLMOD DD PATH='/usr/lpp/netdata/servlet-lib/IBM'
//*LIBRARYDD=SDTWLOA4
//ADTWLOAD DD DSN=DTW220.ADTWLOAD,DISP=SHR
//SYSLIN DD *
  SETOPT PARM(PATHMODE(0,7,5,5))
  INCLUDE ADTWLOAD(DTWSAPPL)
  ENTRY CEESTART
  ALIAS './apldll'
  NAME DTWSAPPL (R)
  SETOPT PARM(PATHMODE(0,7,5,5))
  INCLUDE ADTWLOAD(DTWSODBC)
  ENTRY CEESTART
  ALIAS './odbcdll'
  NAME DTWSODBC (R)
  SETOPT PARM(PATHMODE(0,7,5,5))
  INCLUDE ADTWLOAD(DTWSWWW)
  ENTRY CEESTART
  ALIAS './libdtwndapi.so'
  NAME DTWSWWW (R)
  SETOPT PARM(PATHMODE(0,7,5,5))
  INCLUDE ADTWLOAD(DTWSFILE)
  ENTRY CEESTART
  ALIAS './filedll'
  NAME DTWSFILE (R)
  SETOPT PARM(PATHMODE(0,7,5,5))
  INCLUDE ADTWLOAD(DTWSLE)
  ENTRY CEESTART
  ALIAS './dtwle'
  NAME DTWSLE (R)
  SETOPT PARM(PATHMODE(0,7,5,5))
  INCLUDE ADTWLOAD(DTWSPERL)
  ENTRY CEESTART
  ALIAS './perldll'
  NAME DTWSPERL (R)
  SETOPT PARM(PATHMODE(0,7,5,5))
  INCLUDE ADTWLOAD(DTWSREXX)
  ENTRY CEESTART
  ALIAS './rexxdll'
  NAME DTWSREXX (R)
  SETOPT PARM(PATHMODE(0,7,5,5))
  INCLUDE ADTWLOAD(DTWSSQL)
  ENTRY CEESTART
  ALIAS './dtwsq1'
  NAME DTWSSQL (R)
  SETOPT PARM(PATHMODE(0,7,5,5))
  INCLUDE ADTWLOAD(DTWSSQL6)

```

```

ENTRY CEESTART
  ALIAS '..\dtwsqlv6'
  NAME DTWSQL6 (R)
SETOPT PARM(PATHMODE(0,7,5,5))
INCLUDE ADTWLOAD(DTWSSYS)
  ENTRY CEESTART
  ALIAS '..\sysd11'
  NAME DTWSSYS (R)
SETOPT PARM(PATHMODE(0,7,5,5))
INCLUDE ADTWLOAD(DTWSLEI)
  ENTRY CEESTART
  ALIAS '..\dtwlei'
  NAME DTWSLEI (R)
/*

```

The JCLIN for Net.Data Version 2.2 is contained in the RELFILEs on the installation tape. These files will be loaded to disk by SMP/E when the product is SMP/E RECEIVED. You may browse or print these files using TSO/E, ISPF, or IEBGENER (or IEBPTPCH).

The files containing JCLIN are:

FMID H242220: 'high-level-qualifier.H242220.F1(H242220)

**Note:** The high-level qualifier is the qualifier specified as the DSPREFIX in the SMP/E OPTIONS.

# Reader's Comments

## Program Directory for IBM Net.Data for OS/390 Version 2.2

You may use this form to comment about this document, its organization, or subject matter with the understanding that IBM may use or distribute whatever information you supply in any way it believes appropriate without incurring any obligation to you.

For each of the topics below please indicate your satisfaction level by circling your choice from the rating scale. If a statement does not apply, please circle N.

RATING SCALE					
very satisfied	<----->	very dissatisfied	not applicable		
1	2 3 4	5	N		

	Satisfaction					
Ease of product installation	1	2	3	4	5	N
Contents of program directory	1	2	3	4	5	N
Installation Verification Programs	1	2	3	4	5	N
Time to install the product	1	2	3	4	5	N
Readability and organization of program directory tasks	1	2	3	4	5	N
Necessity of all installation tasks	1	2	3	4	5	N
Accuracy of the definition of the installation tasks	1	2	3	4	5	N
Technical level of the installation tasks	1	2	3	4	5	N
Ease of getting the system into production after installation	1	2	3	4	5	N

How did you order this product?

- CBIPO
- CBPDO
- CustomPac
- ServerPac
- Independent
- Other

Is this the first time your organization has installed this product?

- Yes
- No

Were the people who did the installation experienced with the installation of MVS products?





---

## How to send your comments

IBM Net.Data for OS/390 Version 2.2 Release 02 Modification Level 00  
OS/390

Publication No. GI10-6971-02

Your feedback helps IBM to provide quality information. Please send any comments that you have about this book or other DB2 for OS/390 documentation. You can use any of the following methods to provide comments.

- Send your comments by e-mail to [db2pubs@vnet.ibm.com](mailto:db2pubs@vnet.ibm.com) and include the name of the product, the version number of the product the number of the book. If you are commenting on specific text, please list the location of the text (for example, a chapter and section title, page number, or a help topic title).
- Send your comments from the Web. Visit the DB2 for OS/390 Web site at:

**<http://www.ibm.com/software/db2os390>**

The Web site has a feedback page that you can use to send comments.

- Complete the readers' comment form at the back of the book and return it by mail, by fax (800-426-7773 for the United States and Canada), or by giving it to an IBM representative.

---

## Readers' Comments

IBM Net.Data for OS/390 Version 2.2 Release 02 Modification Level 00  
OS/390

Publication No. GI10-6971-02

How satisfied are you with the information in this book?

	Very Satisfied	Satisfied	Neutral	Dissatisfied	Very Dissatisfied
Technically accurate	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Complete	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Easy to find	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Easy to understand	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Well organized	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Applicable to your tasks	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Grammatically correct and consistent	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Graphically well designed	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Overall satisfaction	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Please tell us how we can improve this book:

May we contact you to discuss your comments?  Yes  No

\_\_\_\_\_  
Name

\_\_\_\_\_  
Address

\_\_\_\_\_  
Company or Organization

\_\_\_\_\_

\_\_\_\_\_  
Phone No.

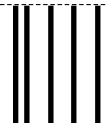
\_\_\_\_\_



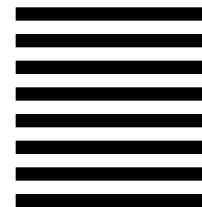
Fold and Tape

Please do not staple

Fold and Tape



NO POSTAGE  
NECESSARY  
IF MAILED IN THE  
UNITED STATES



# BUSINESS REPLY MAIL

FIRST-CLASS MAIL PERMIT NO. 40 ARMONK, NEW YORK

POSTAGE WILL BE PAID BY ADDRESSEE

International Business Machines Corporation  
Department BWE/H3  
PO Box 49023  
San Jose, CA 95161-9945



Fold and Tape

Please do not staple

Fold and Tape



Program Number: 5655-DB2 5811  
5812  
5812  
6172  
6773  
6774  
6775  
6776  
6777  
6778

Printed in U.S.A.

G110-6971-02



DSMKIM520E IMBED OR APPEND FILE NOT FOUND.  
DSMMOM395I '.EDF#INIT' LINE 1850: .im DSMREFS  
DSMMOM397I '.EDF#INIT' WAS IMBEDDED AT LINE 1850 OF '.EDF#INIT'  
DSMMOM397I '.EDF#INIT' WAS IMBEDDED AT LINE 360 OF '.EDF#MAIN'  
DSMMOM397I '.EDF#MAIN' WAS IMBEDDED AT LINE 178 OF 'EDFPRF40'  
DSMMOM397I 'EDFPRF40' WAS IMBEDDED AT LINE 0 OF 'NETDATA2'  
DSMKIM520E IMBED OR APPEND FILE NOT FOUND.  
DSMMOM395I '.EDFTOC' LINE 340: .im DSMTOC  
DSMMOM397I '.EDFTOC' WAS IMBEDDED AT LINE 340 OF '.EDFTOC'  
DSMMOM397I '.EDFTOC' WAS IMBEDDED AT LINE 319 OF 'NETDATA2'  
DSMKIM520E IMBED OR APPEND FILE NOT FOUND.  
DSMMOM395I '.EDFFLIST' LINE 270: .im DSMFIGL  
DSMMOM397I '.EDFFLIST' WAS IMBEDDED AT LINE 270 OF '.EDFFLIST'  
DSMMOM397I '.EDFFLIST' WAS IMBEDDED AT LINE 320 OF 'NETDATA2'  
DSMBEG323I STARTING PASS 2 OF 4.  
DSMBEG323I STARTING PASS 3 OF 4.  
DSMBEG323I STARTING PASS 4 OF 4.