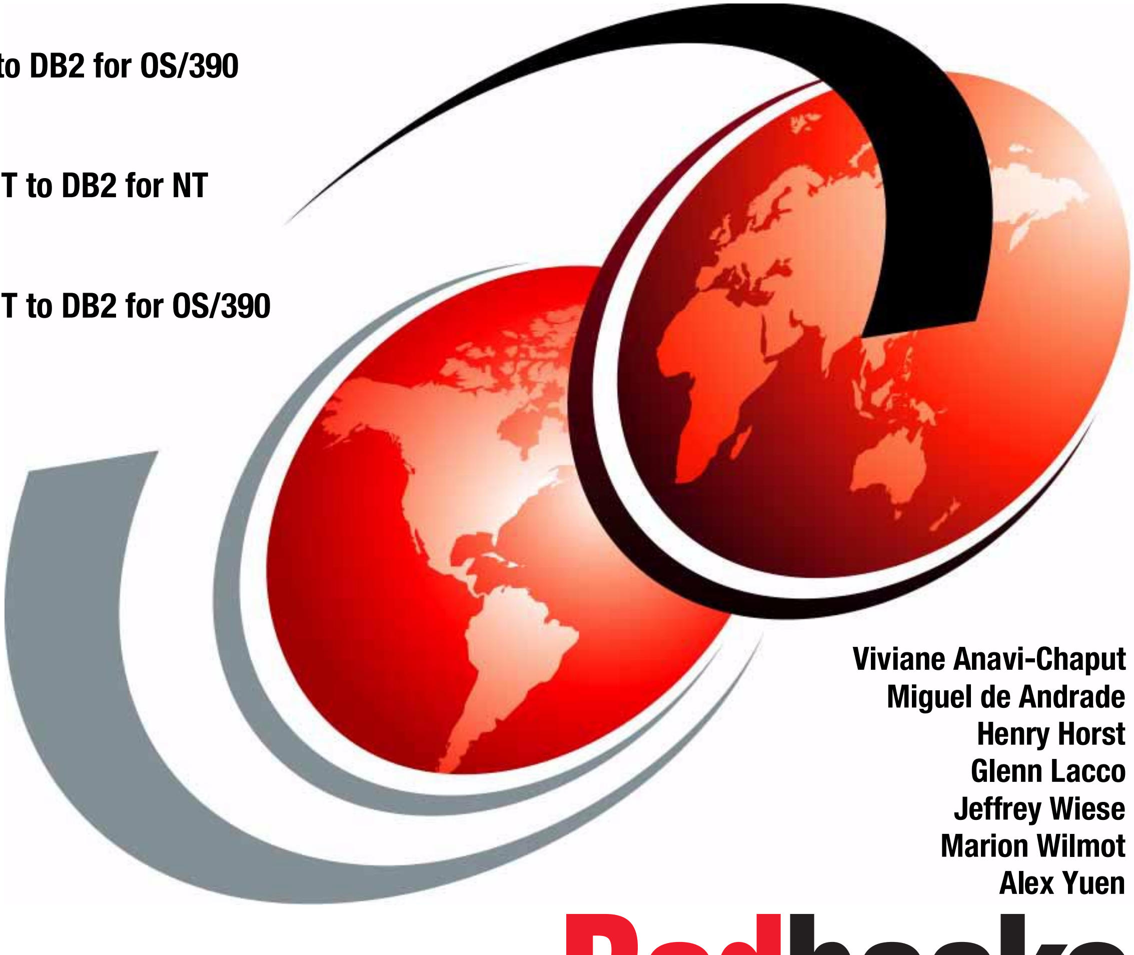
IBM

Migrating Siebel Database from DB2/Oracle for NT to DB2 for OS/390

DB2 for NT to DB2 for OS/390

Oracle for NT to DB2 for NT

Oracle for NT to DB2 for OS/390



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International Technical Support Organization

Migrating Siebel Database from DB2/Oracle for NT to DB2 for OS/390

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Take Note! Before using this information and the product it supports, be sure to read the general information in "Special notices" on page 209.

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This edition applies to Siebel 2000 Version 6.2.1 for use with Oracle for NT V8.1.6, DB2 for NT V6 and DB2 for OS/390 V6.

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Contents

Preface

This IBM Redbook will help you migrate the Siebel database from:

- DB2 for NT V6 to DB2 for OS/390 V6
- Oracle for NT V8.1.6 to DB2 for NT V6
- Oracle for NT V8.1.6 to DB2 for OS/390 V6

The book describes the migration experiences gained while migrating a Siebel database at the IBM ITSO Center in Poughkeepsie, New York, and at the IBM Hursley Laboratory in the UK.

It provides an overview of Siebel architecture, and introduces the migration methodology needed to move the Siebel database from a DB2/Oracle for NT platform to a DB2 for OS/390 platform. It provides a step-by-step description of the database migration process, and discusses in detail the different methods of moving data from one platform to the other.

This redbook will be especially useful for those migrating the Siebel database for the first time.

The team that wrote this redbook

This redbook was produced by a team of specialists from around the world working at the International Technical Support Organization Poughkeepsie Center.

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Special notice

This publication is intended to help technical professionals who are migrating the Siebel database for the first time. The information in this publication is not intended as the specification of any programming interfaces that are provided by Siebel, OS/390 and DB2. See the PUBLICATIONS section of the IBM Programming Announcement for OS/390 and DB2, and Siebel documentation for more information about what publications are considered to be product documentation.

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1

Introducing Siebel database migration

This chapter gives an overview of Siebel architecture and configurations, and introduces our migration experience. It also describes the database architecture, which will help you to understand the database migration.

Although this environment may be well known to Siebel users and developers on NT or AIX platforms, the subject might be new to OS/390 system programmers and database administrators (DBAs), and requires some explanation in order to prepare the OS/390 audience to undertake a Siebel database migration to the OS/390 platform.

The chapter describes the following:

- Siebel architecture and configurations
- When should you migrate the Siebel database?
- Siebel database migration
- Siebel database structure
- Which tool should you use to move data?
- Methodology for migrating to DB2 for OS/390
- Migration scenarios

1.1 Siebel architecture and configurations

Siebel 2000 is an application solution for Customer Relationship Management (CRM). Figure 1-1 shows its logical architecture and physical n-tier configurations. The logical architecture has three layers: client, application, and data. Those three logical layers can be physically implemented on one platform (1-tier), or two platforms (2-tier), or three platforms (3-tier). The OS/390 can be used for the Siebel database in a three-tier configuration as shown in Figure 1-1.

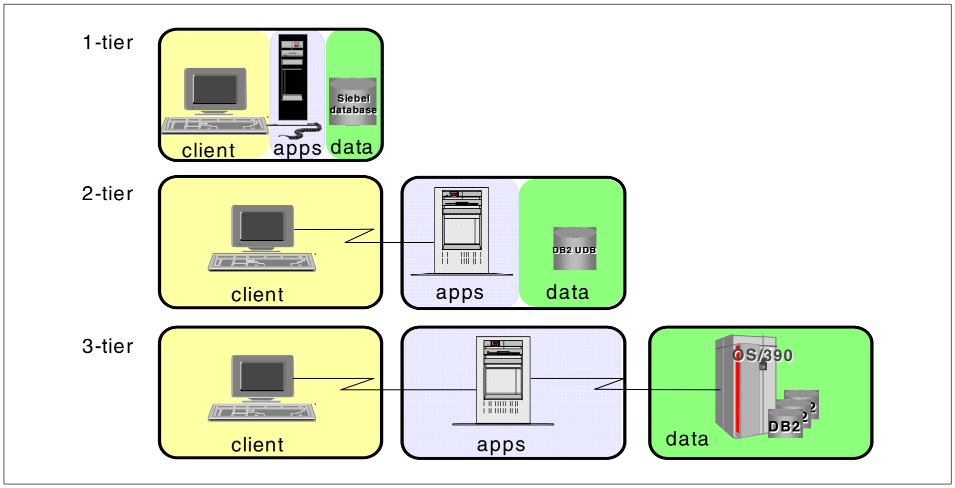


Figure 1-1 Siebel architecture and n-tier configurations

For example, a customer environment might have developers working on 1-tier or 2-tier configurations, while test, integration and production are done on 2-tier configurations. If capacity needs increase because of, for example, a growing number of connected users or growing volumes of data, a customer may consider moving its production environment to a 3-tier implementation with the database on OS/390. Going from a 2-tier to a 3-tier configuration implies a database migration.

1.2 When should you migrate the Siebel database

Database migrations are undertaken because of a need for a higher level of performance, scalability, availability, integrity, and security required by corporate businesses. Integrating the capabilities of the OS/390, DB2, and Enterprise Storage Servers on the same platform can significantly improve Siebel performance, as explained in the following sections.

Need for performance and scalability

Capacity needs due to growth in either the number of users or in the amount of data could drive a customer to consider moving to DB2 for OS/390, which is acknowledged to be a highly scalable platform, capable of supporting in excess of 50,000 users. DB2 supports very large databases. It allows the parallel processing needed to process large volumes of data—especially to load, back up, reorganize, and recover the data.

Need for reliability, availability, and serviceability

The OS/390 computing platform is unmatched in its proven ability to support mission-critical business applications. OS/390 has many system management capabilities, providing a very high level of data security, integrity, and the ability to manage diverse workloads.

Need for server consolidations

One of the key selling points of the Siebel application is that it gives your employees a consolidated enterprise view of customer databases; any Call Center rep or sales rep can see customer information. This is not possible if you have to split your database because you need multiple servers.

Need to move off a competitive platform

A customer may want to change hardware vendors (moving off a competitive platform to an IBM platform) which could also drive a change of the RDBMS. The cost of deploying a large database supporting very high numbers of users on a single DB2 for OS/390 database instance can be significantly less than the cost of implementing and managing multiple database instances on multiple machines, especially when leveraging an existing hardware and support infrastructure.

1.3 Siebel database migration

Figure 1-2 on page 4 shows a typical Siebel application implementation including five Siebel Enterprise environments: development, test, integration, production, and new production.

In this example, each Siebel Enterprise environment is a 2-tier implementation except for the new production environment, which is a 3-tier implementation with the Siebel database moving to the DB2 for OS/390 platform. This redbook focuses on the database migration.

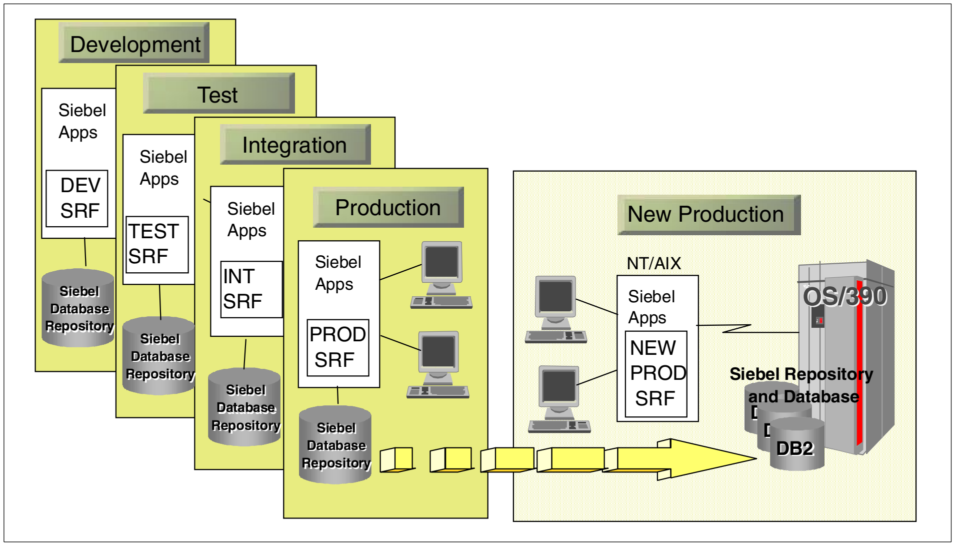


Figure 1-2 Siebel implementation with database migration

Figure 1-2 also positions the Siebel databases and repositories used in this implementation. Notice that the repository resides in the database (148 tables) and also has a compiled version residing on a flat file in the application server and the connected clients. The repository is further explained in 1.4.1, "The repository" on page 4.

1.4 Siebel database structure

Before you undertake a database migration to OS/390, it helps to understand the Siebel database structure; we describe it in the following sections.

The Siebel application uses relational databases to store data. Nevertheless, the data model is controlled directly by the Siebel application (and not by the RDBMS) using a repository. By controlling the data model, the Siebel application relieves itself of RDBMS product dependency, so the Siebel code gains the possibility of porting on different RDBMSs.

1.4.1 The repository

Siebel Systems uses a repository to control its data model. The repository contains, among other things, the description of the database objects, such as tables, indexes, and control information, to manage referential integrity and dependency between data. To access data in the database, the Siebel application must first check the data model control information in the repository.

The repository resides in the database (148 tables). To improve access performance to the repository, there is also a binary representation of the repository, called the .srf file, which is compiled and stored on each Siebel Enterprise environment.

When newly developed applications trigger schema changes, those modifications must be reflected in the production repository as well as in the physical database schema before the application goes on production. Siebel Tools are used to customize the repository. This is done by checking out a copy of the repository from the application server to a Siebel Tools environment residing on a client workstation. Here, customizations can be made (for example, presentation enhancements like applet component additions, or data schema changes such as adding columns to a table). These changes to the repository are propagated to the application server site, where they are integrated with other development activity when the repository is checked back in. The dev2prod utility is used to migrate the customized repository to production, as well as to identify and record the schema changes.

1.4.2 The data

When migrating the Siebel database from one RDBMS to another (such as Oracle to DB2), or moving the same RDBMS to a different hardware platform (such as Oracle/DB2 for NT to DB2 for OS/390), the issue of moving *data* presents itself. During a database migration, three categories of data need to be addressed:

- Repository data
- Seed data
- User data

Migrating repository data

Migrating repository data does not present any challenges because dev2prod is a commonly used procedure in the development environment. Customizing the Siebel database for new applications makes moving the repository a regular occurrence, since it has to be updated to enable these changes.

Note: Keep in mind that the Siebel .srf file resides on a file system, not in the RDBMS, and the source and target repositories should be kept in sync.

Migrating seed data

Seed data doesn’t get moved unless you migrate the database. *Seed data* refers to data that maps “users to responsibilities”, version information, and other control data used by the Siebel database to manage itself. Basic seed data is moved into specific seed data tables, named S_xxx etc, during the Siebel installation process.

Seed data also evolves and changes over time. Therefore, when you are migrating the database, you must also migrate the seed data to the new target RDBMS.

Migrating user data

Moving user data presents the biggest challenge due to its large volumes.

1.5 Which tool should you use to move data

There are several tools you can use to move data: there are Siebel tools, and there are the RDBMS tools on which the Siebel database resides. The choice of which technique to use is based on the kind of migration to be performed and the volumes of data involved. We can categorize those tools as follows.

1.5.1 Siebel database utilities

Using Siebel database utilities offers the advantage that they are well known by Siebel Systems and if you have any issues during your migration, you can request assistance from Siebel.

Dataexp/Dataimp utilities

These export/import utilities are currently reserved for Siebel Technical Services usage, and obtaining access to them might require involvement by Siebel. Those utilities are not currently documented in Siebel manuals.

Dataexp/Dataimp work very well in every situation except perhaps for very large volumes of data. Nevertheless, you must be careful with the referential integrity issue. You should copy all tables to make sure you will not corrupt any foreign keys and their dependencies.

Siebel Enterprise Integration Manager

Siebel Enterprise Integration Manager (EIM) is fully supported by Siebel Systems and guarantees the referential integrity of the Siebel data, but it can be complex to implement.

The complexity derives from the fact that some base tables get mapped to several interface tables, so you need to determine which interface tables are appropriate for the table you want to migrate. You need to prepare your migration carefully and run tests on small volumes of data to make sure your data will be migrated correctly.

EIM is suitable for small or large volumes of data.

1.5.2 RDBMS-specific database utilities

These utilities are fast and offer the advantage of greater efficiency in moving large data volumes. The tables you are moving may need the same column definitions at both ends. This procedure should be thoroughly tested beforehand to make sure there will be no referential integrity issues.

1.5.3 Data warehousing tools

There are many data warehousing tools on the market, such as IBM DB2 Warehouse Manager, IBM DataPropagator, ETI, and Sagent, to name a few. For a one-time migration, those tools might be difficult to justify unless you already have them in-house, in which case they can be very helpful.

1.6 Methodology for migrating to DB2 for OS/390

The recommended method for migrating the Siebel database to DB2 for OS/390 is as follows:

1. First, install a standard, out-of-the-box, new target production environment including a Siebel Server on NT and a Siebel-DB2 database on OS/390 and make sure the environment works as expected. (Refer to the IBM Redbook *Siebel 2000 Database Implementation on OS/390 Using NT Siebel Servers,* SG24-5953, which provides a detailed, step-by-step description of this installation).
2. Next, migrate the data from the source Oracle/DB2 for NT environment to the target DB2 for OS/390 environment.

   Note that it is strongly recommended that you migrate from one equivalent version/release to another. For example, if you want your target system to be at Version 6 level, but your source system is backlevel, you should first upgrade your source system to Version 6 level before you start the migration process. You should not attempt to migrate and upgrade at the same time.

This method allows a *phased* migration, which diminishes the risk of errors and simplifies problem determination.

1.7 Migration scenarios

In this redbook, we consider migrations to the DB2 for OS/390 from two different source environments:

- DB2 for NT to DB2 for OS/390
- Oracle for NT to DB2 for OS/390.

We describe step-by-step the following scenarios:

- We first migrated DB2 for NT to DB2 for OS/390. This is a one-phase direct migration.
- We next migrated Oracle for NT to DB2 for OS/390 in two ways:
  - Two-phase approach: Oracle for NT to DB2 for NT to DB2 for OS/390
  - One-phase approach: Oracle for NT to DB2 for OS/390 directly

We first needed to set up a source NT test environment from which to migrate. For reference purposes, we document the implementation of the Siebel source environment on NT, using a DB2 for NT database, in Appendix A, "Implementing the Siebel source environment on NT" on page 89. Those who already have a Siebel source environment to test with will obviously not need this section. On the other hand, the section can be very useful for those who want to create a test source environment for database migration purposes.

The next step was to set up the target migration environment and migrate the data. We did the following:

- We set up a new out-of-the-box target environment using a DB2 for OS/390 database as described in Chapter 2, "Implementing the target Siebel environment on OS/390" on page 11. This chapter covers:
  - NT Siebel Server configuration to support the Siebel database on OS/390
  - Siebel database configuration on DB2 for OS/390.

  This chapter is actually an abstract of the IBM Redbook *Siebel 2000 Database Implementation on OS/390 Using NT Siebel Servers,* SG24-5953, which details this installation.
- We migrate the data from the DB2 for NT source environment to the target DB2 for OS/390 environment as described in Chapter 3, "Migrating Siebel data from DB2 for NT to DB2 for OS/390" on page 31. This chapter covers the following migration techniques:
  - Siebel Dataexp/Dataimp
  - Siebel EIM
  - IBM DB2 tools
- Next, we look into Oracle for NT migration to DB2 for OS/390. We start with the two-phase migration.

  The first migration phase is to move the data from Oracle for NT to DB2 for NT as described in Chapter 4, “Migrating Siebel data from Oracle for NT to DB2 for NT” on page 53. This chapter covers the following migration techniques:

  – Siebel Dataexp/Dataimp with and without schema changes
  – Siebel EIM

  The second migration phase is to move the data from DB2 for NT to DB2 for OS/390, which is described in Chapter 3, “Migrating Siebel data from DB2 for NT to DB2 for OS/390” on page 31.

- We then look into one-phase migrations of Oracle for NT to DB2 for OS/390 as described in Chapter 5, “Migrating Siebel data from Oracle for NT to DB2 for OS/390” on page 73. This chapter covers the following migration techniques:
  - Dataexp/Dataimp with and without schema changes
  - Dataexp/ftp/DB2 Load
  - DB2 Relational Connect/DB2 Load

2

Implementing the target Siebel environment on OS/390

This chapter describes the implementation of the target Siebel environment to which we are going to migrate.

It covers the following sections:

- Preparing the OS/390 environment for the Siebel database

  OS/390, RACF, and DB2 customizations

- Establishing database connectivity to DB2 for OS/390
  - DDF setup
  - DB2 Connect EE setup
- Installing Siebel 2000 on NT
- Installing the Siebel-DB2 database on OS/390
- Installing the Siebel connected client
- Testing the installation using the Siebel Call Center

We describe the procedures we used to install the Siebel Server on NT, supporting the Siebel database on DB2 for OS/390. See Figure 2-1.

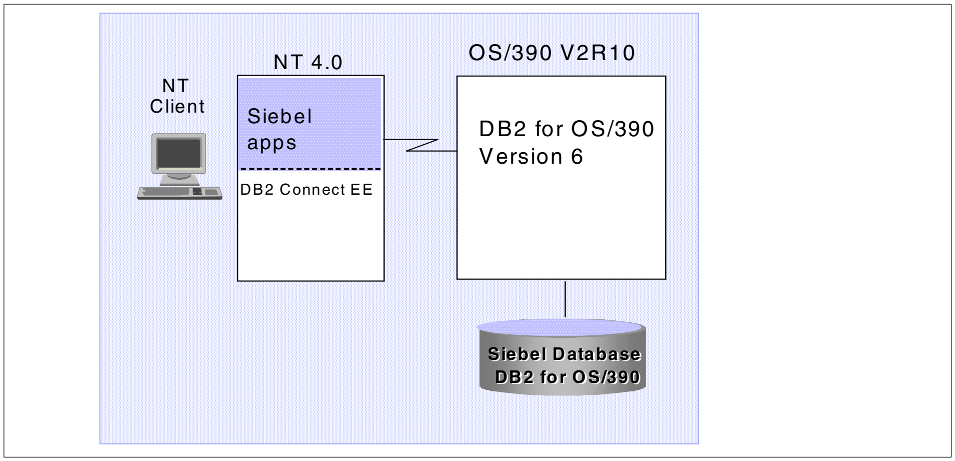


Figure 2-1 Target Siebel environment on OS/390 with Siebel Server on NT

This is a standard, out-of-the-box, new target environment with a Siebel database on OS/390. In this chapter, we give a high-level abstract of the implementation procedures, with the specifics for Siebel V6.2.1. Detailed explanations of how to implement such an environment can be found in the redbook *Siebel 2000 Database Implementation on OS/390 Using NT Siebel Servers,* SG24-5953.

2.1 Preparing the OS/390 environment for the Siebel database

You need to prepare and customize the OS/390 environment before you start implementing Siebel 2000. The following documentation will help you plan for this installation:

- *Siebel Server Installation Guide,* Version 6.2 (Chapters 12 and 13)
- *Siebel 2000 Database Implementation on OS/390 Using NT Siebel Servers,* SG24-5953

You also need the help of the OS/390 database administrator (DBA) to manually perform certain tasks described in this section on the OS/390 platform.

We assume DB2 V6 is installed on OS/390. Customizing DB2 and OS/390 environments includes the following.

2.1.1 Checking the maintenance level

We recommend that you provide a separate DB2 subsystem on OS/390 for the Siebel database for ease of maintenance.

Ensure that all maintenance is applied to the DB2 V6 subsystem. Our DB2 subsystem was at PUT level 0012. Make sure the required PTFs have been applied to your system, otherwise you may not enable the Siebel database. Check especially for:

- PTF UQ38405 with APAR PQ30652 (includes identity columns support)
- APAR II12440 (includes several Siebel requirements for DB2 for OS/390)

2.1.2 Creating RACF user IDs

You need to create RACF user IDs and grant them DB2 authorization. These user IDs are used by the Siebel application to connect to the DB2 for OS/390 Siebel database. You need to perform the following tasks:

- Enable DB2 secondary authorization IDs.
- Create RACF group IDs SSEROLE and SSEEIM.
  - The SSEROLE group has Siebel user privileges.
    SSEROLE has DB2 authority (select, insert, update, and delete authority on all tables) granted to it when the Siebel install scripts are run.
  - The SSEEIM group has EIM user privileges (use of storage groups and buffer pools for EIM temporary tables).
- Create RACF user IDs SIEBEL and SADMIN.
  - SIEBEL has table owner privileges.

- SADMIN has DB2 administrator privileges (DBADM).
- Connect both SIEBEL and SADMIN user IDs to RACF group SSEROLE.

Note that DB2 authority will be granted automatically to the group ID SSEROLE during the installation of Siebel database scripts. The user ID SIEBEL will be used as the table owner, and the TSO session will be started using the SIEBEL user ID. The TSO session will be used to submit the DDL to create the SIEBEL database objects.

2.1.3 Creating a large VTOC

When many indexes are created (which are small VSAM files), it is possible that you will fill up the VTOC before filling up the DASD space available. Review your VTOC space after you have completed your installation.

2.1.4 Creating DB2 storage groups

The DB2 DBA must create the STOGROUPs and grant use of the storage groups to the SIEBEL table owner ID and the SSEEIM group. There is no Siebel script to help you build and run this job. Refer to “Creating STOGROUPs” on page 134 to see the job we built.

For higher performance, consider using multiple storage groups, particularly for the separation of indexes and data.

2.1.5 Customizing DB2 buffer pools

Make sure that buffer pools used by the Siebel database are active. The Siebel database uses 4K, 16K and 32K tablespaces, so the DBA needs to make sure that these buffer pools have been activated. Buffer pools are activated by altering the buffer pool and assigning a VPSIZE>0.

Grant use of these buffer pools to the SIEBEL table owner and to the SSEEIM group.

For higher performance, consider using a separate buffer pool for the indexes.

2.1.6 Customizing the EDM pool

Ensure that the EDM pool size is large enough to handle the Siebel DBDs.

2.1.7 Customizing DSNZPARM parameters

Customize the following DSNZPARM and DSNHDECP parameters as required by Siebel:

ENSCHEME (ASCII) Is the system wide option and implies that all applications on this system use ASCII data. If you want more flexibility and allow other applications to use EBCDIC data, you can leave ENSCHEME (EBCDIC) in the DSNZPARM and specify CCSID (ASCII) on the CREATE DATABASE command for all Siebel databases.

CACHEDYN (YES) Use of dynamic SQL caching improves performance.

SPRMMXT (40) Maximum number of tables in a join.

DSMAX (21000) Maximum number of open data sets.

IDLE Idle thread time-out should be used.

CMTSTAT (INACTIVE) Activates thread/connection pooling with DB2. If your installation must support a large number of connections, specify INACTIVE.

MAXDBAT (500) Maximum number of database access threads (DBATs) that can be active concurrently. 500 is recommended for a large number of users (19K users, for example).

CONDBAT (150000) Maximum number of concurrent remote connections. When the maximum is reached, the connection request is rejected. You can go up to 150000.

Refer to “DSNZPARM parameters” on page 128 to see the values we used for DSNZPARM.

2.1.8 Enabling DB2 stored procedures

Siebel EIM processes use DB2 stored procedures to trigger the DB2 RUNSTATS utility, when required in the middle of an EIM run, to update the statistics of the EIM tables.

To enable DB2 stored procedures, verify the following:

- The temporary database with three table spaces (4K, 16K and 32K) required to enable DB2 stored procedures has been created.
- DSNUTILS is installed and operational.
- The OS/390 Workload Manager (WLM) is enabled and running in GOAL mode, as required, to support DB2 stored procedures.
- OS/390 Resource Recovery Services (RRS) are enabled to support DB2 stored procedures.

Refer to “Creating stored procedure objects” on page 158 to see the jobs we built to create the stored procedure objects.

For more information on WLM and RRS setup, refer to redbook *Siebel 2000 Database Implementation on OS/390 Using NT Siebel Servers,* SG24-5953.

2.2 Enabling database connections to DB2 for OS/390

The following tasks are required to enable these connections.

2.2.1 DDF setup on OS/390

The DB2 subsystem on OS/390 uses the location name DB2D. This DB2D instance is our target database for the Siebel database.

In our system, DDF listens on TCP/IP port 33322. DDF must be up and running for the connection to be established.

2.2.2 DB2 Connect EE setup on NT

On the NT server you do not need to install a full DB2 EE. You only need to install DB2 Connect EE to establish connectivity betwen the Siebel Server on NT and the Siebel database on OS/390. Refer to *Siebel 2000 Database Implementation on OS/390 Using NT Siebel Servers,* SG24-5953, for information about installing DB2 Connect EE.

During this process we created the administrator ID sadmin/sadmin**.**

After successfully installing DB2 Connect EE (including the Fix Pack), you now need to configure it.

To establish an ODBC connection between DB2 Connect EE and DB2 for OS/390, go to **Start -> Programs -> DB2 for Windows NT -> Client Configuration Assistant** to create and catalog database descriptors. On the welcome screen, choose **Add Database** and select the following options:

1. For the Source, choose **Manually configure a connection to a DB2 database**.
2. For the Protocol, choose **TCP/IP**, and **OS/390** as the target operating system.
3. For the TCP/IP configuration, enter the OS/390 fully qualified hostname or the IP address of the OS/390 host. Enter the port that is reserved for the DDF in the DB2 instance. In our case, the host name is wtsc04.itso.ibm.com and the port is 33322.

4. For the Database, add the Location name, in our case DB2D, which is the DB2 OS/390 instance name where we want to connect. Enter the Database alias name that will be used by DB2 Run-Time clients to connect to the DB2 OS/390 instance. We choose DB2DSB.
5. For ODBC, select **Register this database for ODBC** source, and **As a system data source.** This will allow DB2 Run-Time clients to access the host database.
6. For Node Options, click **Next.**
7. For security Options, select **Configure security options** and choose **On the host or AS/400 (DCS)**.
8. Skip Host or AS/400 Options, and click **Done.**

When you get the confirmation message that the connection configuration for DB2DSB is added successfully, you are ready to test the connection. To verify that DB2D and its DDF are up and running, click **Test Connection**.

You are prompted to enter a valid TSO user ID and password. The user ID should also be DB2-authorized. We used the user ID/password SADMIN/SADMIN.

You should get a message saying that our connection is successful. If you do not receive this message, you have to check that you can ping the host and that DDF is running.

2.2.3 Client setup on a PC

The next step is to set up a client PC. We choose to install DB2 Run-Time client to connect the PC to the NT where we installed the DB2 Connect EE. Next we tested the client connection to DB2 for OS/390 by issuing the following commands:

```
db2start
connect to db2dsb user sadmin using sadmin
```

A successful connection results in the following message:

```
Database Connection Information
   Database server = DB2 OS/390 6.1
   SQL Authorization ID = sadmin
   Local Database Alias = db2dsb
```

2.3 Installing Siebel 2000 on the NT server

For this installation, either follow the instructions in *Siebel 2000 Database Implementation on OS/390 Using NT Siebel Servers,* SG24-5953, or refer to Appendix A, “Implementing the Siebel source environment on NT” on page 89.

2.3.1 Creating required NT user accounts

Create the administrator ID SIEBEL.

Add SIEBEL and SADMIN to RACF group SSEROLE.

2.3.2 Creating the Siebel File System

The file system should be sharable in read and write mode.

2.3.3 Installing the Siebel Gateway Server

We used the NT Administrator account value of ITSONT0\sadmin (domain\username).

2.3.4 Installing the Siebel Server

For this installation:

- Our Gateway server address is ITSONT0.
- The enterprise server is Siebel_390.
- Our Database Alias is DB2DSB.
- The table owner is SIEBEL.
- Database username/password is sadmin/sadmin.
- Siebel Server name is ITSONT0.
- The Synch Manager port has the default value 40400.

2.4 Installing the Siebel Database Server on OS/390

Installing the database server on OS/390 involves the following tasks.

2.4.1 Installing the database server scripts

Insert the Siebel Server CD-ROM, navigate to the dbsrvr directory, and double-click **setup.exe** to start the installation of the database server scripts.

2.4.2 Creating the Siebel physical schema on OS/390

At this point, you must have done your preparations on OS/390, as follows:

- Your RACF user IDs and groups are defined and authorized appropriately.

  You will use those user IDs to connect from the NT server to the DB2 for OS/390 using an ODBC/DRDA connection.
- The DB2 for OS/390 settings are customized.
- DB2 storage groups are defined.
- You have an ODBC conection established between the NT server and the DB2 for OS/390, using the connection name DB2DSB.

The next step is to create the Siebel-DB2 databases, table spaces, tables and indexes on OS/390.

Creating the Siebel-DB2 databases

The DB2 DBA must create ten Siebel-DB2 databases. The Siebel application does not provide a script to help you build and execute this job. Refer to “Creating the Siebel databases” on page 134 to see the job we built.

To figure out the names of the ten databases, we looked in the sample configuration files provided by Siebel Systems to build the table spaces (tbspaces.sql and tbspaces.ctl).

The database prefixes/names used for the table spaces in the samples were XXXXX001 through XXXXX010. We chose to replace the Xs with a more significant name and used the database names SIEBEL01 to SIEBEL10 in the job we ran to create them.

Creating the Siebel-DB2 table spaces

Siebel Systems provides installation scripts that generate the DDL to create the table spaces and tables required for the Siebel application. The layout in V6.2.1 is different from the previous versions/releases.

The file sea621\dbsrvr\db2390\tbspaces.sql must be changed to specify the correct database name, buffer pool name, storage group, and parameters, then uploaded (using FTP, for example) to the OS/390 TSO session and submitted. Refer to “Creating the Siebel table spaces” on page 135 to see the job we submitted to create the Siebel-DB2 table spaces.

A DB2 for OS/390 DBA must review the table space parameters to adjust them according to the particular shop requirements.

Segmented table spaces

Defining table spaces as segmented can speed up both inserts and deletes. Currently, Siebel Systems recommends using segmented table spaces, as shown in the following example:

```
CREATE TABLESPACE FFFFF001
               IN SIEBEL01
               SEGSIZE 32 USING STOGROUP STOGRP01
               BUFFERPOOL BP32K1
               LOCKSIZE PAGE;
COMMIT;
```

Segsize

Several factors need to be considered in determining the right segsize:

- The size of the repository tables depends on the Industry Vertical applications selected and user-specific customizations.
- Other tables contain user data or are empty. Empty tables differ according to the Industry Vertical application installed. The size of user data depends on the user’s specific use of the Siebel application.
- A user can also move tables around, which complicates things, because those tables may end up in different table spaces than they were originally assigned to. Consequently, for instance, if the largest table happens to be moved out, the remaining tables of the table space will incur a completely different size attribute.

It is, therefore, not easy to recommend a segsize. Much depends on user customizations, and DBAs usually have their own opinion on what value to choose.

In our test environment, we chose a segsize of 32. We wanted a segsize that would make it possible to fetch the maximum number of pages per prefetch, and that would be the most efficient for the majority of the tables. For small tables that may only contain a few rows, having a large segsize will use more DASD than required. On the other hand, a large segsize might waste some disk space but maintain a better physical clustering on large tables. The trade-off is between choosing small tables that efficiently use disk space, or maintaining a higher level of clustering for larger tables which will have a bigger impact on performance.

DB2 Administration Guide has the following recommendations on segsizes.

Number of pages	SEGSIZE recommendation
<= 28	4 to 28
> 28 <128	32
>= 128	64

We made the assumption that most Siebel tables would be in the <128 page range, and thought a segsize of 32 would be a safe starting point. Production environments should nevertheless evaluate their table sizes and determine if a segsize of 64 might be more appropriate for some tables.

PRIQTY/SECQTY

PRIQTY and SECQTY quantities must be specified when the tablespaces and indexes are created. The install will not work if the PRIQTY and SECQTY values are defaulted.

Coming up with the exact PRIQTY/SECQTY values can become very involved depending on how precise you want to be. The following is a relatively simple approach to come up with a rough estimate for PRIQTY and SECQTY. You may want to put the following information in a spreadsheet or DB2 table.

- Get a row count of each table that will be migrated.
- Estimate the number of rows that will fit on a page, something like 15 rows per page, and divide the rows by the number of rows per page to determine the number of 4K pages that will be required. Picking a number like 15 should allow for free space for most tables.
- Multiply the number of pages you come up with by 4. The 4 represents a 4K page and you want to determine the number of 1K blocks that are required.

  Now you can get more precise if you also identify whether a table is in a 4K, 16K, or 32K tablespace, then multiply the number by 1, 4, or 8, respectively, but for this quick estimate that may not be necessary.

  The number you come up with can be used as the PRIQTY value. Remember that the PRIQTY value in the CREATE TABLESPACE DDL statement is in 1K blocks.
- Choose 25% - 50% of the PRIQTY value as the SECQTY value, depending on the initial size of PRIQTY.
- Using the DDL that gets generated by the Siebel system, record the tablespaces each table is assigned to. Calculate the sum of the PRIQTY values for all the tables in the same tablespaces. Do the same for the

SECQTY values. Use the calculated PRIQYT and SECQTY values in the CREATE TABLESPACE statements.

The important thing is to cover the largest tables. Normally, these will be in their own tablespaces; if not, they should be placed in their own tablespaces.

The PRIQTY/SECQTY values are specified in 1024 1K blocks, which has already been taken care of by multiplying by 4 rather than 4096.

There are more scientific ways of calculating the PRIQTY and SECQTY values, which are documented in the DB2 manuals based on actual row size, but since Siebel uses VARCHARS that are not filled to capacity, the more scientific approach is more complex and may not give you any better results.

- Take a percentage of the PRIQTY/SECQTY values calculated for a table, for example 20%-40%, depending on the size of PRIQTY, and use this value for the PRIQTY values in the creation of the table's indexes. Use 25%-50% of the indexs' PRIQTY as the SECQTY value.
- The minimum size for tablespaces and indexes should be 720 for PRIQTY/SECQTY.

For exporting the repository database SIEBEL05, Siebel recommends the following PRIQTY and SECQTY values in the CREATE statement:

```
CREATE TABLESPACE HHHHH001
          IN SIEBEL05
          SEGSIZE 32 USING STOGROUP STOGRP01
          PRIQTY 7200 SECQTY 720
          BUFFERPOOL BP16K1
          LOCKSIZE PAGE;
COMMIT;
```

Buffer pools

If you are planning to migrate customized tables, with Long Varchar columns for example, data might not fit into the 4K or 16K table spaces defined at the target OS/390 database. You will have to alter those table spaces to allocate 16K or 32K buffer pools to them.

Commit

We also recommend that you issue a COMMIT after each CREATE statement. This allows a restart from the last commit point in case of failure of the CREATE job.

Database, table space and buffer pool layout

Table 2-1 shows the database, table space, and buffer pool layout for Siebel V6.2.1 in our installation, which includes 10 databases and 144 table spaces.

Table 2-1 Database, table space, and buffer pool layout

Databases	Table spaces	Buffer pools
SIEBEL01	FFFFF001	BP32K1
SIEBEL02	EEEEE001	BP16K1
SIEBEL03	GGGGG010 to GGGGG017	BP16K1
SIEBEL04	GGGGG001 to GGGGG008	BP16K1
SIEBEL05	HHHHH001 to HHHHH002	BP16K1
SIEBEL06	BBBBB024 to BBBBB029 BBBBB031 to BBBBB044 CCCCC002 DDDDD015 to DDDDD024 DDDDD055	BP1 BP1 BP16K1 BP1 BP1
SIEBEL07	AAAAA001 to AAAAA005 BBBBB045 to BBBBB060 DDDDD005 DDDD014	BP1 BP1 BP1
SIEBEL08	BBBBB001 to BBBBB004 BBBBB061 to BBBBB062 CCCCC001 DDDDD001 to DDDDD003 DDDDD041 to DDDDD054	BP1 BP1 BP16K1 BP1 BP1
SIEBEL09	BBBBB006 to BBBBB016 DDDDD030 to DDDDD040	BP1 BP1

Databases	Table spaces	Buffer pools
SIEBEL10	AAAAA006 to AAAAA008 BBBBB017 to BBBBB023 DDDDD025 to DDDDD029	BP1 BP1 BP1

Create Siebel tables and indexes on OS/390

Creating Siebel tables and indexes on the DB2 for OS/390 platform requires the generation of a DDL script. This script will create the tables and indexes, and grant the appropriate authorities.

Navigate to the d:\sea621\dbsrvr\db2390 directory and edit the generate_ddl.ksh script to contain the parameter values shown in Table 2-2. Refer to “Editing the Database Schema Generation Script” in Chapter 12 of *Siebel Server Installation Guide,* Version 6.2.

Table 2-2 The generate_ddl.ksh parameters

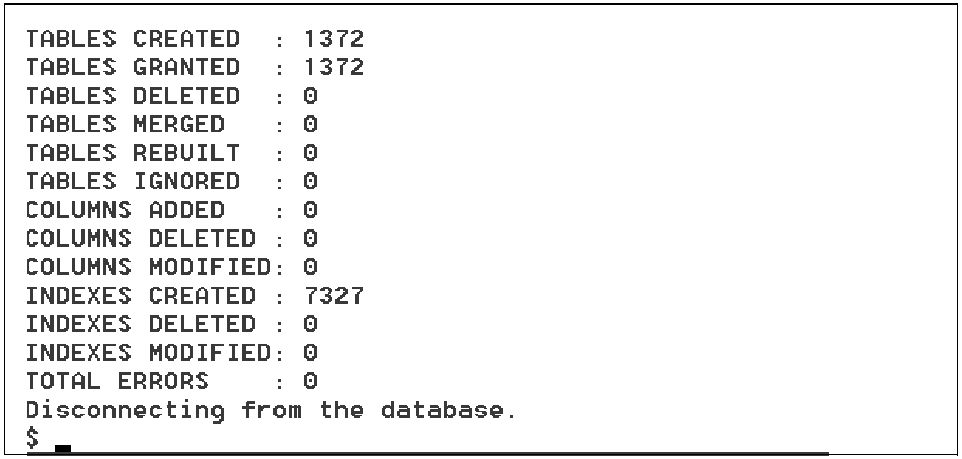
Parameter	Value
SRC_TBLO	SIEBEL
SRC_TBLO_PSWD	SIEBEL
ODBC	SiebServer_Siebel_390
DBSRVR_ROOT	d:\sea621\dbsrvr
SIEBEL_HOME	d:\sea621\dbsrvr
MODE	Install
MERGE_FLG	N
DO_DDL	N
TBSPACE_FILE	tbspaces.ctl

Execute the generate_dll script. When the script has run, the parameter values are displayed for confirmation. Reedit the file, if necessary, or enter `Y` to continue.

The generate_dll.ksh script generates a schema file named sieb_schema.sql.

This file contains the DDL to create tables and indexes and grant the appropriate database authorities. 1372 tables and 7327 indexes are created.

Figure 2-2 shows the information given by the script when successful execution took place.

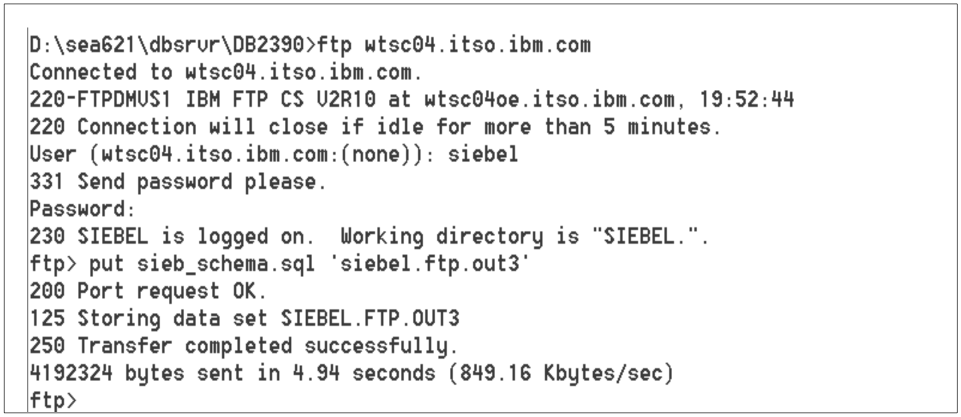


```
TABLES CREATED  : 1372
TABLES GRANTED  : 1372
TABLES DELETED  : 0
TABLES MERGED   : 0
TABLES REBUILT  : 0
TABLES IGNORED  : 0
COLUMNS ADDED   : 0
COLUMNS DELETED : 0
COLUMNS MODIFIED: 0
INDEXES CREATED : 7327
INDEXES DELETED : 0
INDEXES MODIFIED: 0
TOTAL ERRORS    : 0
Disconnecting from the database.
$
```

Figure 2-2 Execution result from generate_ddl.ksh

Review the file ddlimp.log for any errors. Be very careful with index truncation errors. DB2 for OS/390 limits the index length to 250 characters, which is shorter than the index length limit in DB2 for AIX/NT and Oracle. Ddlimp.log shows the truncated indexes. _U1 index truncation may affect performance. The error.rtf file contains a list of acceptable errors, including truncated indexes, and should be consulted when reviewing the Siebel log files.

Ship the sieb_schema.sql file to the Siebel DB2 for OS/390 host. If using FTP, the command line will appear as in Figure 2-3.



```
D:\sea621\dbsrvr\DB2390>ftp wtsc04.itso.ibm.com
Connected to wtsc04.itso.ibm.com.
220-FTPDMVS1 IBM FTP CS V2R10 at wtsc04oe.itso.ibm.com, 19:52:44
220 Connection will close if idle for more than 5 minutes.
User (wtsc04.itso.ibm.com:(none)): siebel
331 Send password please.
Password:
230 SIEBEL is logged on.  Working directory is "SIEBEL.".
ftp> put sieb_schema.sql 'siebel.ftp.out3'
200 Port request OK.
125 Storing data set SIEBEL.FTP.OUT3
250 Transfer completed successfully.
4192324 bytes sent in 4.94 seconds (849.16 Kbytes/sec)
ftp>
```

Figure 2-3 Shipping schema to host using FTP

Collaborate with the DB2 for OS/390 DBA to execute this script on the OS/390 host to create the Siebel database schema. Refer to “Creating Siebel tables and indexes” on page 153 to see the DDL we executed on OS/390.

2.4.3 Importing seed data

Siebel Systems provides the install_siebel.ksh utility to load initial business data and establish the initial database views. Navigate to the d:\sea621\dbsrvr\DB2390 directory and edit the install_siebel.ksh script, i.e., update the parameter values according to Table 2-3. This script establishes initial Siebel table data and views.

Table 2-3 Install_siebel.ksh script parameter values

Parameter	Value
SRC_USR	SADMIN
SRC_PSWD	SADMIN
SRC_TBLO	SIEBEL
SRC_TBLO_PSWD	SIEBEL
ODBC	SiebServer_Siebel_390
DBSRVR_ROOT	d:/sea621/dbsrvr
DO_DDL	Y
DB_LANG	enu
SIEBEL_HOME	d:/sea621/siebsrvr

Invoke the UNIX shell by entering `sh` at the DOS prompt.

Execute the script by typing `./install_siebel.ksh` at the UNIX shell prompt.

The script will prompt you to confirm the parameter values. Enter `Y` to confirm and submit the script for execution.

Validating the database objects

Siebel Systems supplies the validate_objects.ksh script to validate the views that have been created when the install_siebel.ksh script executed.

Edit the validate_objects.ksh script to contain the parameter values shown in Table 2-4.

Table 2-4 Validate_objects.ksh parameter values

Parameter	Value
SRC_TBLO	SIEBEL
SRC_TBLO_PSWD	SIEBEL
ODBC	SiebServer_Siebel_390
SEIBEL_HOME	d:/sea621/siebsrvr

Invoke the UNIX shell by typing `sh` at the DOS prompt.

Enter `./execute` to run the validate_objects.ksh script to validate schema. The script will prompt for confirmation of the parameter values. When executed, this script generates the report 390_objects.txt. Review this report to make sure that the following database views exist:

- S_PERSON_V
- S_TXN_LOG_ITEM_V
- S_TXN_LOG_NODE_V
- S_TXN_LOG_OPER_V

2.4.4 Importing the Siebel repository

Siebel Systems provides the utility imprep.ksh to import the Siebel out-of-the-box repository stored in an NT directory (this is not the repository in the DB2 for NT database). The Siebel repository contains application objects, such as views and applets.

Navigate to d:\sea621\dbsrvr\DB2390 and edit the imprep.ksh script to contain the values shown in Table 2-5.

Table 2-5 Imprep parameter values

Parameters	Values
SRC_USR	SADMIN
SRC_PSWD	SADMIN
SRC_TBLO	SIEBEL
ODBC	SiebServer_Siebel_390
REPOS_NAME	SIEBEL REPOSITORY
DBSRVR_ROOT	d:\sea621\dbsrvr

Parameters	Values
DATABASE_PLATFORM	DB2390
DB_LANG	enu
SIEBEL_HOME	d:\sea621\siebsrvr

Invoke the UNIX shell by typing `sh` at the DOS prompt. Execute the script imprep.ksh at the shell prompt.

2.5 Populating the File System

A subdirectory called *files* is created automatically when you install the Siebel Database Server.

You must populate the File System directory with these file attachments after installing the Database Server, and before running the Siebel Client.

To populate the File System directory, do the following:

- Select **Start->Programs->Windows Explorer,** navigate to the d:\sea621\dbsrvr\files directory and copy the files to the File System d:\siebfile directory.
- Verify that the files are where they need to be.

2.6 Installing the Siebel connected client

We installed the connected client on the same machine as the other Siebel servers. This connected client points to the OS/390 database.

We selected **IBM DB2 UDB 6_1 for OS/390** on the database identification screen. The database alias is DB2DSB**,** the table owner is SIEBEL, and the SQLID is SSEROLE.

To see the detailed installation steps of the client, refer to *Siebel 2000 Database Implementation on OS/390 Using NT Siebel Servers,* SG24-5953. You may also follow those steps in “Installing the Siebel client” on page 113.

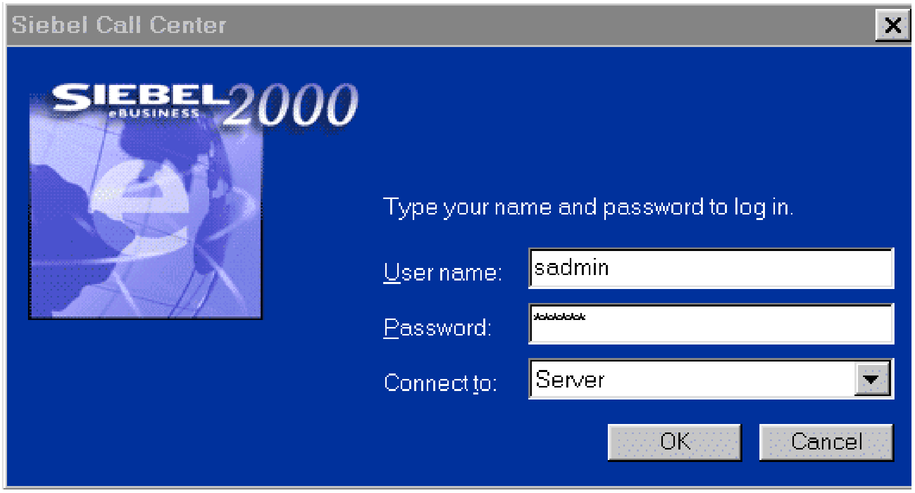
Note: When you migrate to a new platform, you need to have a new .cfg file and distribute it to all clients. Do not reuse the .cfg file from the previous platforms.

2.7 Testing the installation using Siebel Call Center

At this point in the migration process, we have created a vanilla Siebel database on OS/390 including a standard repository and seed data. Achieving this first step demonstrates that our connections to the DB2 for OS/390 work well, and that we have a Siebel-DB2 database with a repository and seed data (but no user data) in good working order.

You may now want to connect to Siebel Call Center and verify that the application connects correctly to the Siebel database on OS/390.

From the client node, log into Siebel Call Center and connect to Server as shown in Figure 2-4. Successful connection provides confirmation that the Siebel application is interacting correctly with the DB2 for OS/390 database.


Siebel Call Center

Type your name and password to log in.

User name: sadmin

Password: ******

Connect to: Server

Figure 2-4 Log into Siebel Call Center

3

Migrating Siebel data from DB2 for NT to DB2 for OS/390

This chapter describes the methods for migrating the Siebel database from a source DB2 for NT environment to a target DB2 for OS/390 environment. We consider a migration with no schema changes for this first exercise.

To move data from DB2 for NT to DB2 for OS/390, we investigated the following utilities:

- Siebel Dataexp/Dataimp and EIM utilities
- IBM DB2 Import/Export, DSNTIAUL/Load, and Cross Loader utilities

Figure 3-1 on page 32 graphically illustrates this migration.

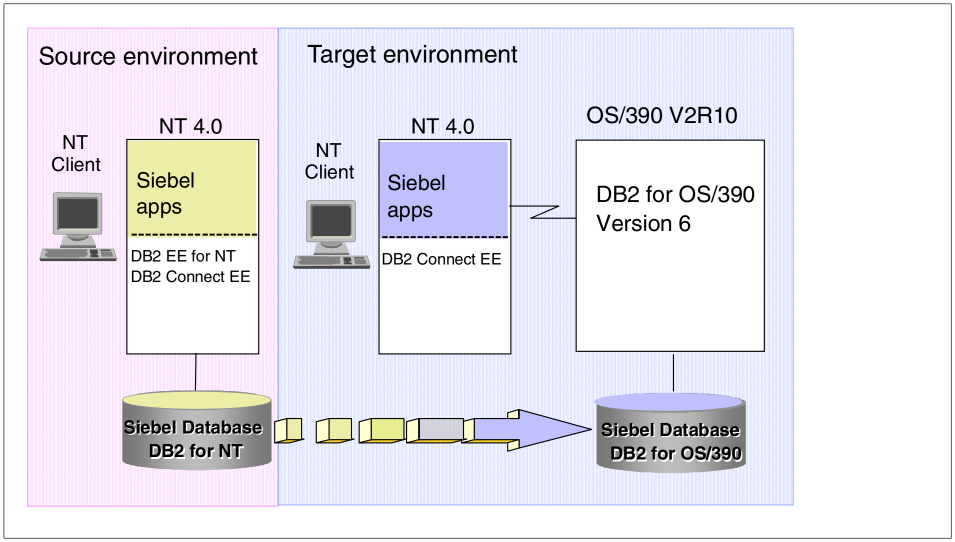


Figure 3-1 Migrating the database from DB2 for NT to DB2 for OS/390

3.1 Preparing for data migration

At this point, we have a source environment (a production environment, for example) using DB2 for NT as the Siebel database, and a target environment (a new production environment, for example) that is using DB2 for OS/390 as the Siebel database. Now the migration of the data must be addressed.

Before moving the data, the following tasks need to be accomplished:

- Determine a list of source tables that need to be migrated
- Clean up the target database and remove seed, repository, and user data.

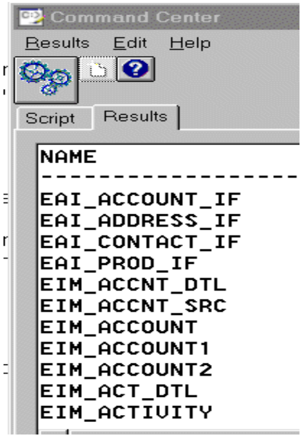
3.1.1 Generating a list of tables to migrate

You need to determine a list of source tables containing both system and user data that will be copied to DB2 for OS/390.

From the DB2 Command Center go to **Start->Programs->DB2 For Window NT->Command Center->Script** and issue the following SQL statement. Follow the Siebel Systems recommendations as described in the white paper *IBM DB2 RDBMS Migration Guide Siebel 2000*, which can be obtained from Siebel Systems upon request. Exclude S_DOCK_STATUS and S_DOCK_TXN_LOG from the list of tables being migrated. These tables need to be empty on the target database when data extracts are first run for remote users.

```
SELECT NAME FROM SIEBEL.S_TABLE
WHERE NAME NOT IN (‘S_DOCK_STATUS’,’S_DOCK_TXN_LOG’)
ORDER BY NAME
```

Execute the SQL statement from the DB2 Command Center and save the resulting output (Figure 3-2 on page 34) to the file Ibm_all.inp.



```
NAME
------------------
EAI_ACCOUNT_IF
EAI_ADDRESS_IF
EAI_CONTACT_IF
EAI_PROD_IF
EIM_ACCNT_DTL
EIM_ACCNT_SRC
EIM_ACCOUNT
EIM_ACCOUNT1
EIM_ACCOUNT2
EIM_ACT_DTL
EIM_ACTIVITY
```

Figure 3-2 List of table names

At this point you have created the list of table names that will be migrated from DB2 for NT to DB2 for OS/390.

You may further remove empty tables from the list of tables to migrate by checking the cardinality of the tables, assuming your statistics are up-to-date.

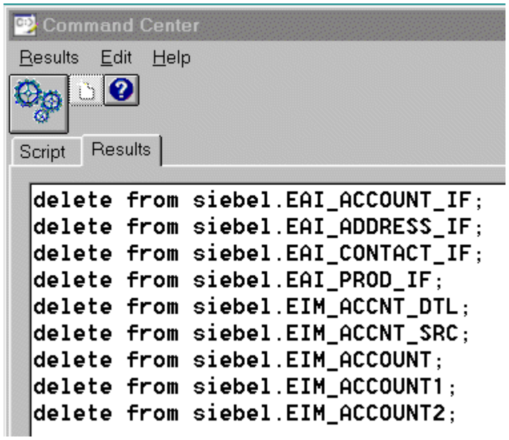
3.1.2 Cleaning up target tables

With no schema changes, migrating the data moves everything from the source to the target, including repository data, seed data, and user data. You need to delete any data you might have on the target DB2 for OS/390 database before attempting the data migration.

Go to DB2 Command Center and execute the following SQL statement (see also the white paper *IBM DB2 RDBMS Migration Guide Siebel 2000*). Be sure to exclude tables S_DOCK_STATUS and S_DOCK_TXN_LOG from the resulting table list; otherwise, the subsequent import task will fail.

```
SELECT ‘DELETE FROM SIEBEL.’||NAME||’;’FROM SIEBEL.S_TABLE
WHERE NAME NOT IN (‘S_DOCK_STATUS’,’S_DOCK_TXN_LOG’)
ORDER BY NAME
```

In Command Center, go to **Script->Execute** to run the SQL. It will generate the output shown in Figure 3-3.



```
delete from siebel.EAI_ACCOUNT_IF;
delete from siebel.EAI_ADDRESS_IF;
delete from siebel.EAI_CONTACT_IF;
delete from siebel.EAI_PROD_IF;
delete from siebel.EIM_ACCNT_DTL;
delete from siebel.EIM_ACCNT_SRC;
delete from siebel.EIM_ACCOUNT;
delete from siebel.EIM_ACCOUNT1;
delete from siebel.EIM_ACCOUNT2;
```

Figure 3-3 SQL delete statement

Save the results to del_all_s_tabs.sql, then ship the file to OS/390 and execute from DB2 Spufi. At this point you have cleaned up the seed data and repository data contained in the target Siebel database tables on OS/390.

The target tables are now clean and empty of any Siebel data on OS/390. You are now ready to move the data.

3.2 Moving data from DB2 for NT to DB2 for OS/390

Data can be moved in different ways from the source to the target Siebel database. We describe the following techniques:

- **Siebel utilities**
  - Dataexp/Dataimp
  - EIM
- **IBM DB2 utilities**
  - DB2 Import/Export
  - DB2 DSNTIAUL/Load
  - DB2 Family Cross Loader function

The premise for using the IBM DB2 data movement utilities is that the migrated target Siebel database server will be an exact replica of the Siebel source database server. All Siebel database objects and data must be migrated from the source system to the target system. Based on this premise, we can assume that all inter-table relationships (such as the Referential Integrity) are maintained. Any customizing must be performed prior to or following the migration, not during the migration process.

3.3 Siebel Dataexp/Dataimp - no schema changes

The Siebel Dataexp and Dataimp utilities execute on the NT platform as shown in Figure 3-4.

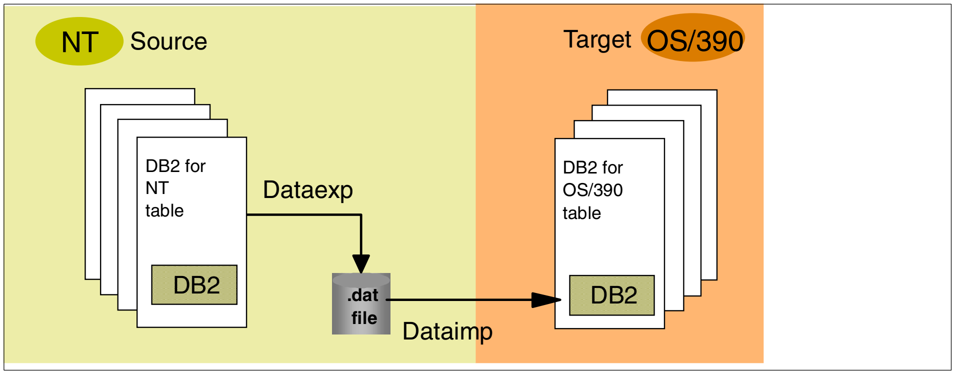


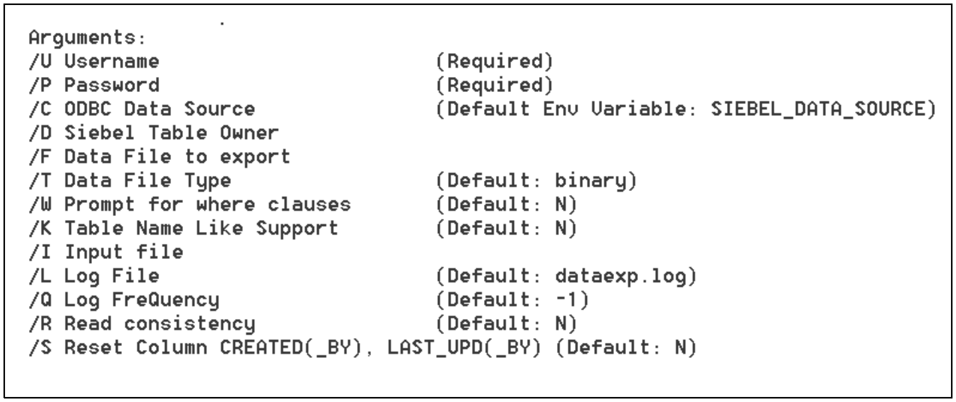
Figure 3-4 Dataimp/Dataexp data migration processes

With no schema changes, the Dataexp/Dataimp migration process includes the following:

- Export data from DB2 for NT database including seed data, repository data and user data. The export job creates a .dat output file.
- Import data from the .dat output file created by the export, into DB2 for OS/390 via SQL inserts.
- Validate the migration.

3.3.1 Exporting data with Dataexp

You can find dataexp.exe by navigating to the d:\sea621\siebsrvr\bin directory. Obtain a description of the parameters for exporting data by entering dataexp/? at the command line as shown in Figure 3-5.



```
Arguments:
/U Username                          (Required)
/P Password                          (Required)
/C ODBC Data Source                  (Default Env Variable: SIEBEL_DATA_SOURCE)
/D Siebel Table Owner
/F Data File to export
/T Data File Type                    (Default: binary)
/W Prompt for where clauses          (Default: N)
/K Table Name Like Support           (Default: N)
/I Input file
/L Log File                          (Default: dataexp.log)
/Q Log FreQuency                     (Default: -1)
/R Read consistency                  (Default: N)
/S Reset Column CREATED(_BY), LAST_UPD(_BY) (Default: N)
```

Figure 3-5 Dataexp parameter descriptions

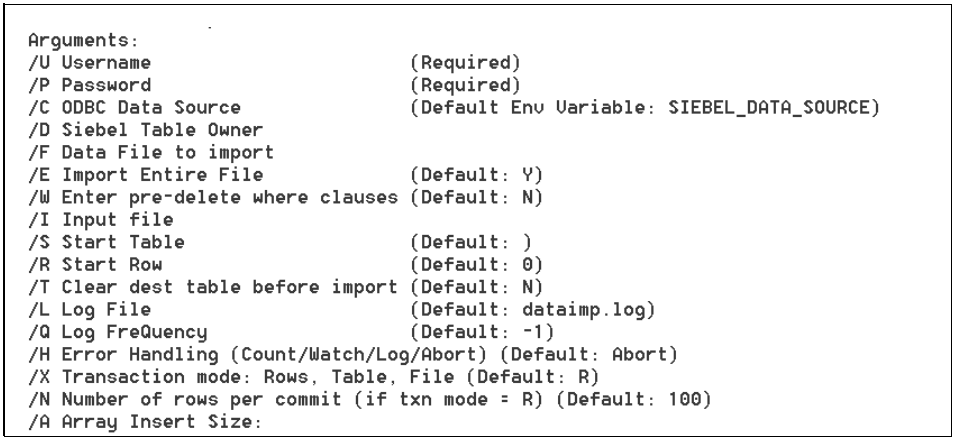
Execute this module by entering the following command:

```
d:\sea621\siebsrvr\bin\dataexp /u SIEBEL /p SIEBEL /c SiebSrvr_siebel /d
SIEBEL /f d:/Mov_dat/ibm_all.dat /i d:/Mov_dat/ibm_all.inp
```

This job creates the output file ibm_all.dat**.** This file will be used as input by the dataimp.exe module to import the data to the OS/390.

3.3.2 Importing data with Dataimp

You can find dataimp.exe by navigating to the d:\sea621\siebsrvr\bin directory. Obtain a description of the parameters used in previous commands by navigating to the d:\sea621\siebsrvr\bin directory and entering dataimp/? at the command line, as shown in Figure 3-6 on page 37.



```
Arguments:
/U Username                          (Required)
/P Password                          (Required)
/C ODBC Data Source                  (Default Env Variable: SIEBEL_DATA_SOURCE)
/D Siebel Table Owner
/F Data File to import
/E Import Entire File                (Default: Y)
/W Enter pre-delete where clauses    (Default: N)
/I Input file
/S Start Table                       (Default: )
/R Start Row                         (Default: 0)
/T Clear dest table before import    (Default: N)
/L Log File                          (Default: dataimp.log)
/Q Log FreQuency                     (Default: -1)
/H Error Handling (Count/Watch/Log/Abort) (Default: Abort)
/X Transaction mode: Rows, Table, File (Default: R)
/N Number of rows per commit (if txn mode = R) (Default: 100)
/A Array Insert Size:
```

Figure 3-6 Dataimp parameter descriptions

Execute this module by entering the following command:

```
d:\sea621\siebsrvr\bin\dataimp /u SIEBEL /p SIEBEL /c DB2DSB /d SIEBEL /f
d:/Mov_dat/ibm_all.dat
```

At the end of this job you have imported the repository, the seed data, and all user data to the target Siebel database on OS/390.

3.3.3 Validating the migration

To validate the data migration, connect from the Siebel client application to OS/390. Navigate to Siebel Call Center and make sure that the migrated user data exists there. You should be able to see the data entered in “Entering data using Siebel Call Center” on page 121.

3.4 Siebel EIM

Siebel Enterprise Integration Manager (EIM) is the Siebel-sanctioned technique to import and export data external to the Siebel system and is typically thought of as the technique to integrate data to and from *legacy* systems. This is because using EIM ensures that Siebel referential integrity is maintained.

It is also an option for migrating Siebel data from one RDBMS, or hardware platform, to another. In the source RDBMS system, we use the EIM export function to move the Siebel *base tables* into its EIM tables, unload these EIM tables and reload them into the target system’s EIM tables, and then use EIM import utility to move them into the target system’s tables.

To be able to use EIM, you must first find the EIM tables that map the base tables. In our test, we only mapped a few base tables, but for a migration of all data to the target RDBMS, you need to map all the system’s tables to EIM .

There is a caveat if this is being done. At this time, the Siebel EIM tables do not support all the base tables that can be created, so if you have chosen Siebel functions that result in the use of these tables, a manual intervention will be necessary. This is a dynamic situation and each release can affect which, if any, tables are not supported. If you encounter a situation like this, there are reasonable techniques to handle it, by writing a Siebel VB routine or using the Enterprise Application Interface (EAI) to populate the tables in question.

The migration of your tables with EIM involves four steps as shown in Figure 3-7—all utilities run on the NT platform:

1. EIM Export
2. Dataexp

3. Dataimp
4. EIM Import

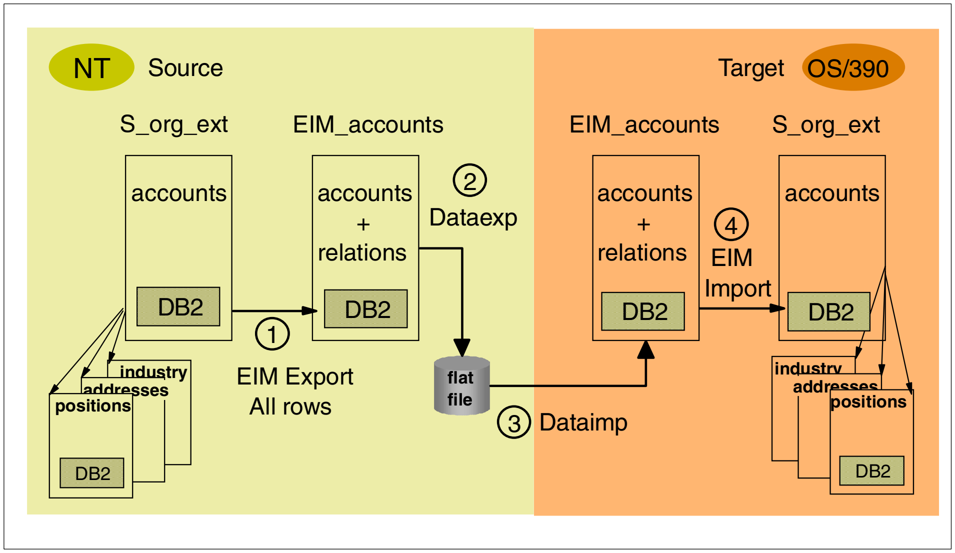


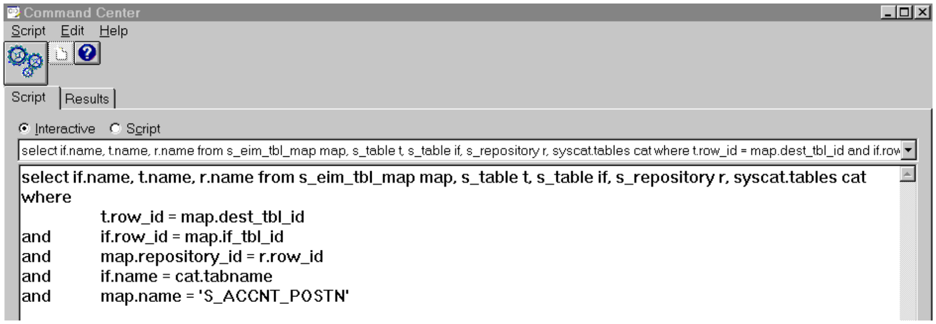
Figure 3-7 EIM data migration processes

3.4.1 EIM export

To export a table with EIM, do the following:

- Identify the base tables that will be migrated. For testing purposes, we decided to migrate one table S_org_ext. But because of the relationships of this table to other tables, we had to migrate the following five tables:
  - S_org_ext
  - S_accnt_postn
  - S_addr_org
  - S_org_indust
  - S_indust
- The next step is to identify the target interface tables related to the five tables we want to migrate. We searched for the base table names in the Interface Tables Reference Guide.

  Another way of searching for EIM tables is to run the following SQL statement using the relationship tables. We searched on S_accnt_postn relationship as shown in Figure 3-8:

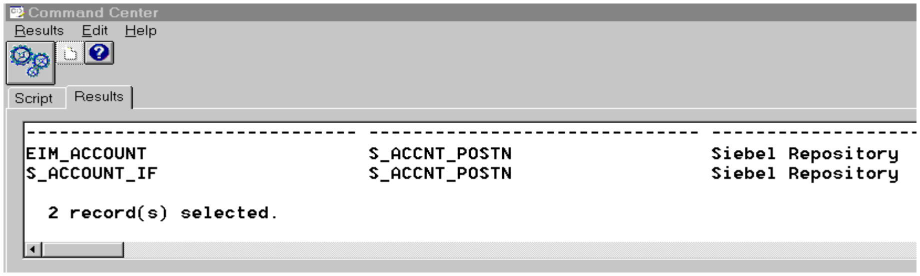


```
select if.name, t.name, r.name from s_eim_tbl_map map, s_table t, s_table if, s_repository r, syscat.tables cat where t.row_id = map.dest_tbl_id and if.row
```

```
select if.name, t.name, r.name from s_eim_tbl_map map, s_table t, s_table if, s_repository r, syscat.tables cat
where
        t.row_id = map.dest_tbl_id
and     if.row_id = map.if_tbl_id
and     map.repository_id = r.row_id
and     if.name = cat.tabname
and     map.name = 'S_ACCNT_POSTN'
```

Figure 3-8 SQL statement to search for S_accnt_postn interface tables

The result of this SQL statement is shown in Figure 3-9:



```
------------------------------ ------------------------------ -------------------
EIM_ACCOUNT                    S_ACCNT_POSTN                  Siebel Repository
S_ACCOUNT_IF                   S_ACCNT_POSTN                  Siebel Repository

  2 record(s) selected.
```

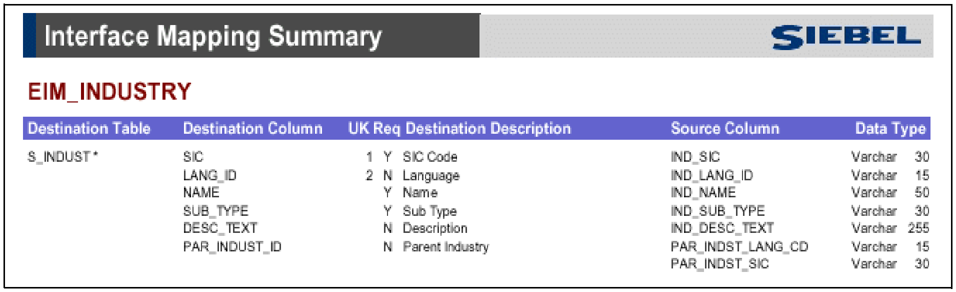
Figure 3-9 Resulting EIM tables for S_accnt_postn

Focusing on the relationship tables (S_accnt_postn, and S_org_indust), we identified the following interface tables:

- EIM_account (populates S_org_ext, S_accnt_postn, S_addr_org)
- EIM_account1 (populates S_org_indust)
- EIM_indust (populates S_indust)

We didn't need to export position data because we used the standard positions provided in the seed data.

Figure 3-10 shows—for the base table S_indust— all the columns in the interface table EIM_industry that have to be populated.



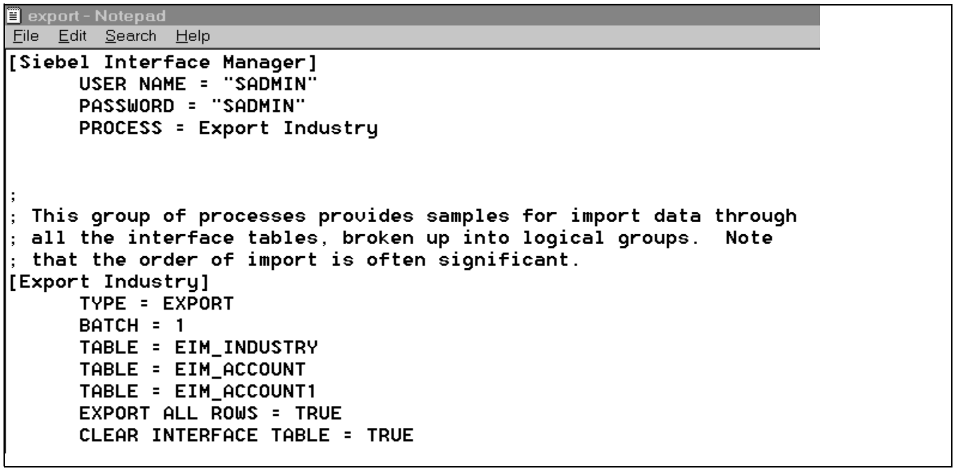
Interface Mapping Summary

EIM_INDUSTRY

Destination Table	Destination Column	UK	Req	Destination Description	Source Column	Data Type
S_INDUST *	SIC	1	Y	SIC Code	IND_SIC	Varchar 30
	LANG_ID	2	N	Language	IND_LANG_ID	Varchar 15
	NAME		Y	Name	IND_NAME	Varchar 50
	SUB_TYPE		Y	Sub Type	IND_SUB_TYPE	Varchar 30
	DESC_TEXT		N	Description	IND_DESC_TEXT	Varchar 255
	PAR_INDUST_ID		N	Parent Industry	PAR_INDST_LANG_CD	Varchar 15
					PAR_INDST_SIC	Varchar 30

Figure 3-10 Interface Mapping Summary

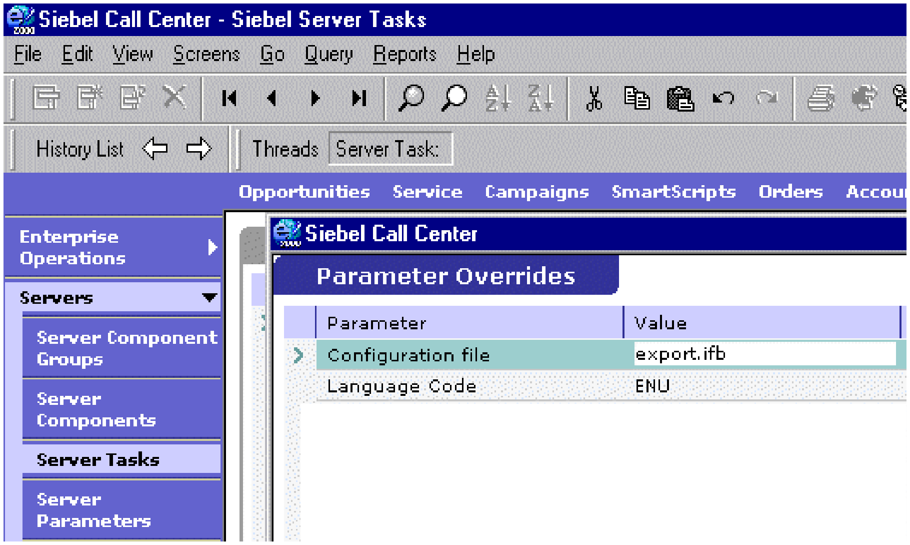
- To populate the EIM input parameter file for the first time, we copied the default.ifb (d:\sea621\siebsrvr\admin) file into a file we called export.ifb. We then updated this file with our own values, specifying what we want to do (export), and the interface tables to use for this process (EIM_industry, EIM_account, EIM_account1), as shown in Figure 3-11.



```
[Siebel Interface Manager]
      USER NAME = "SADMIN"
      PASSWORD = "SADMIN"
      PROCESS = Export Industry


;
; This group of processes provides samples for import data through
; all the interface tables, broken up into logical groups.  Note
; that the order of import is often significant.
[Export Industry]
      TYPE = EXPORT
      BATCH = 1
      TABLE = EIM_INDUSTRY
      TABLE = EIM_ACCOUNT
      TABLE = EIM_ACCOUNT1
      EXPORT ALL ROWS = TRUE
      CLEAR INTERFACE TABLE = TRUE
```

Figure 3-11 Modification to the export.ifb file

- The next step is to invoke the EIM server task:
  - From the client workstation, get into the Siebel Call Center.
  - Go to **Screens->Server Administration->Server->Server Tasks->Click** as shown in Figure 3-12.

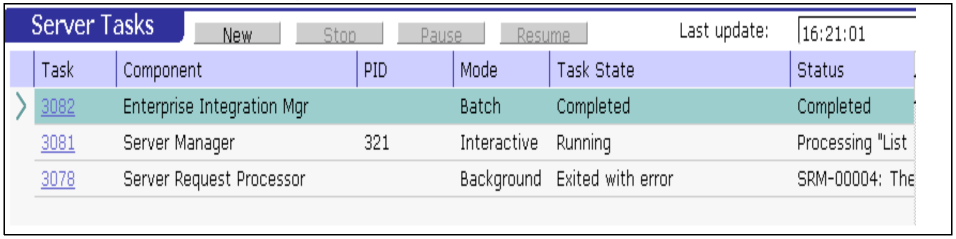


Parameter	Value
Configuration file	export.ifb
Language Code	ENU

Figure 3-12 Invoking EIM server task from the Siebel Call Center

- – On the Server Task screen select **New**.
- – In the Component drop-down list, select **Enterprise Integration Mgr.**
- – Select **Pick.**
- – On the server task screen, select **Parameters.**
- – Change the configuration file parameter to contain export.ifb.
- – Close the window.

- ► To start the EIM task, click **Start**. The Siebel application generates a task number for the EIM task. This number is used to check the results of the export.
- ► When the EIM export task completes, the status field displays the Completed status as shown in Figure 3-13.



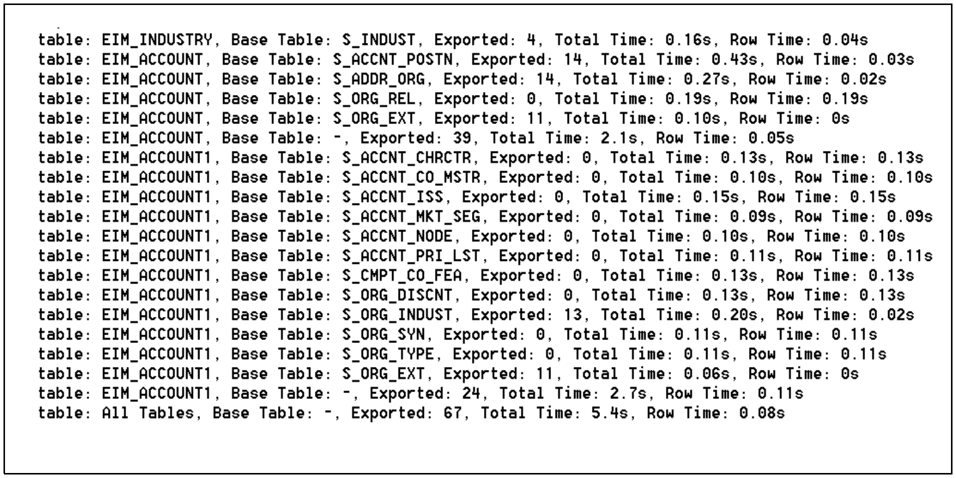
Last update: 16:21:01

Task	Component	PID	Mode	Task State	Status
3082	Enterprise Integration Mgr		Batch	Completed	Completed
3081	Server Manager	321	Interactive	Running	Processing "List
3078	Server Request Processor		Background	Exited with error	SRM-00004: The

Figure 3-13 Server tasks

- ► At this point EIM export is done and the data is moved from the base tables into the EIM interface tables. Nevertheless, we have to check the number of records we have exported. Please note that this will be more than the number of accounts in the system as an additional record is exported for each relationship.

Navigate the d:\sea621\siebsrvr\log directory and select the log file EIM_3082 (task number). Review the log file for any errors, as shown in Figure 3-14. It shows how many records have been exported to the interface table for each of our specified tables, EIM_INDUSTRY, EIM_ACCOUNT and EIM_ACCOUNT1.



```
table: EIM_INDUSTRY, Base Table: S_INDUST, Exported: 4, Total Time: 0.16s, Row Time: 0.04s
table: EIM_ACCOUNT, Base Table: S_ACCNT_POSTN, Exported: 14, Total Time: 0.43s, Row Time: 0.03s
table: EIM_ACCOUNT, Base Table: S_ADDR_ORG, Exported: 14, Total Time: 0.27s, Row Time: 0.02s
table: EIM_ACCOUNT, Base Table: S_ORG_REL, Exported: 0, Total Time: 0.19s, Row Time: 0.19s
table: EIM_ACCOUNT, Base Table: S_ORG_EXT, Exported: 11, Total Time: 0.10s, Row Time: 0s
table: EIM_ACCOUNT, Base Table: -, Exported: 39, Total Time: 2.1s, Row Time: 0.05s
table: EIM_ACCOUNT1, Base Table: S_ACCNT_CHRCTR, Exported: 0, Total Time: 0.13s, Row Time: 0.13s
table: EIM_ACCOUNT1, Base Table: S_ACCNT_CO_MSTR, Exported: 0, Total Time: 0.10s, Row Time: 0.10s
table: EIM_ACCOUNT1, Base Table: S_ACCNT_ISS, Exported: 0, Total Time: 0.15s, Row Time: 0.15s
table: EIM_ACCOUNT1, Base Table: S_ACCNT_MKT_SEG, Exported: 0, Total Time: 0.09s, Row Time: 0.09s
table: EIM_ACCOUNT1, Base Table: S_ACCNT_NODE, Exported: 0, Total Time: 0.10s, Row Time: 0.10s
table: EIM_ACCOUNT1, Base Table: S_ACCNT_PRI_LST, Exported: 0, Total Time: 0.11s, Row Time: 0.11s
table: EIM_ACCOUNT1, Base Table: S_CMPT_CO_FEA, Exported: 0, Total Time: 0.13s, Row Time: 0.13s
table: EIM_ACCOUNT1, Base Table: S_ORG_DISCNT, Exported: 0, Total Time: 0.13s, Row Time: 0.13s
table: EIM_ACCOUNT1, Base Table: S_ORG_INDUST, Exported: 13, Total Time: 0.20s, Row Time: 0.02s
table: EIM_ACCOUNT1, Base Table: S_ORG_SYN, Exported: 0, Total Time: 0.11s, Row Time: 0.11s
table: EIM_ACCOUNT1, Base Table: S_ORG_TYPE, Exported: 0, Total Time: 0.11s, Row Time: 0.11s
table: EIM_ACCOUNT1, Base Table: S_ORG_EXT, Exported: 11, Total Time: 0.06s, Row Time: 0s
table: EIM_ACCOUNT1, Base Table: -, Exported: 24, Total Time: 2.7s, Row Time: 0.11s
table: All Tables, Base Table: -, Exported: 67, Total Time: 5.4s, Row Time: 0.08s
```

Figure 3-14 Log file for EIM export

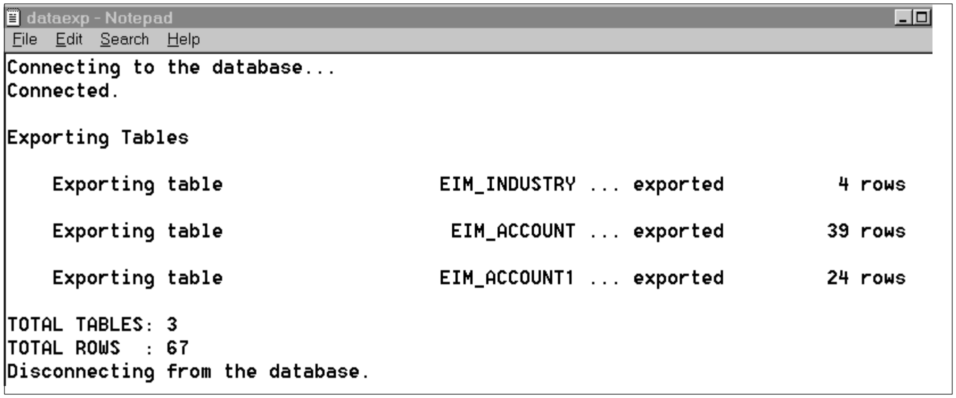
3.4.2 Dataexp

You are now ready to export the EIM interface tables using the dataexp.exe utility. Dataexp generates a flat file named ibm_1.dat.

Execute the dataexp utility from the DOS prompt, as follows:

```
d:\sea621\siebsrvr\bin\dataexp /u sadmin /p sadmin /c SiebSrvr_siebel /d
SIEBEL /f d:\Mov_dat\ibm_1.dat /i d:\Mov_dat\ibm_1inp
```

After execution, review the log dataexp.log file for any errors. Figure 3-15 on page 44 shows our dataexp.log file. It confirms that we exported 3 tables and 67 rows.



```
Connecting to the database...
Connected.

Exporting Tables

    Exporting table                  EIM_INDUSTRY ... exported         4 rows

    Exporting table                   EIM_ACCOUNT ... exported        39 rows

    Exporting table                  EIM_ACCOUNT1 ... exported        24 rows

TOTAL TABLES: 3
TOTAL ROWS  : 67
Disconnecting from the database.
```

Figure 3-15 Dataexp.log file

The dataexp utility has now created the flat file ibm_1.dat.

3.4.3 Dataimp

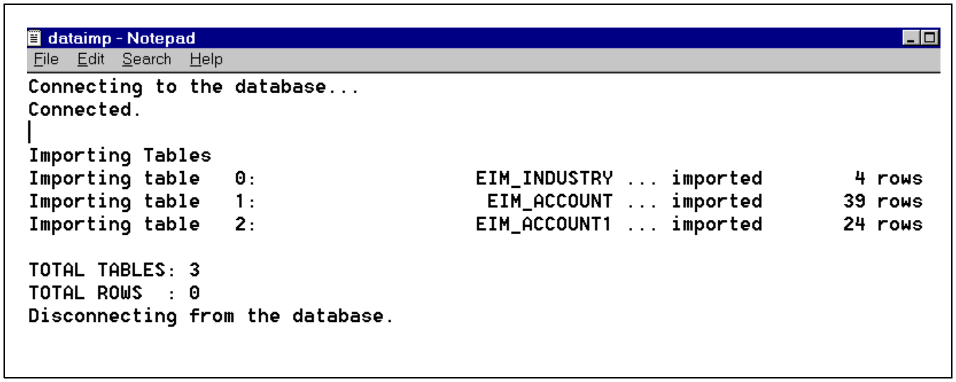
We now imported the content of ibm_1.dat in the EIM interface tables on the OS/390 environment. We did this in a client/server mode from the NT.

Execute (on the NT) the dataimp.exe utility from the DOS prompt, as follows:

```
d:\sea621\siebsrvr\bin\dataimp /u sadmin /p sadmin /c DB2DSB /d SIEBEL /f
d:\Mov_dat\ibm_1.bat
```

Note that the /c parameter is pointing to the OS/390 ODBC data source.

Review the log file dataimp.log for any errors. Figure 3-16 on page 44 shows our dataimp.log output.



```
Connecting to the database...
Connected.

Importing Tables
Importing table   0:                 EIM_INDUSTRY ... imported        4 rows
Importing table   1:                  EIM_ACCOUNT ... imported       39 rows
Importing table   2:                 EIM_ACCOUNT1 ... imported       24 rows

TOTAL TABLES: 3
TOTAL ROWS  : 0
Disconnecting from the database.
```

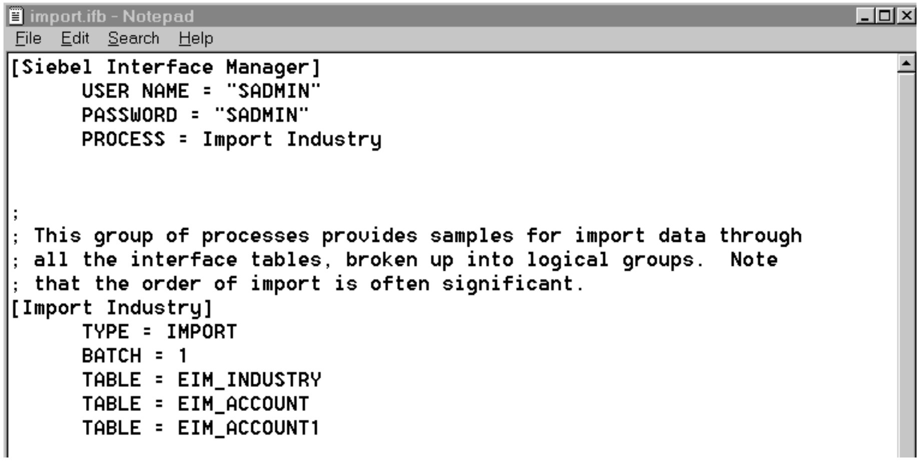
Figure 3-16 Dataimp.log output

At the end of the Dataimp step we had moved the data into the EIM interface tables on the OS/390.

3.4.4 EIM Import

We ran the EIM Import utility on the NT. The utility opens an ODBC connection to OS/390 where it reads the EIM interface tables (populated by Dataimp) and inserts them into the target DB2 tables.

- To populate the EIM input parameter file for the first time, we copied the default.ifb (d:\sea621\siebsrvr\admin) file into a file we named import.ifb. We then updated this file with our own values, specifying what we want to do (import), and the interface tables to use for this process (EIM_industry, EIM_account, EIM_account1). The edited import.ifb file is displayed in Figure 3-17.



```
[Siebel Interface Manager]
      USER NAME = "SADMIN"
      PASSWORD = "SADMIN"
      PROCESS = Import Industry


;
; This group of processes provides samples for import data through
; all the interface tables, broken up into logical groups.  Note
; that the order of import is often significant.
[Import Industry]
      TYPE = IMPORT
      BATCH = 1
      TABLE = EIM_INDUSTRY
      TABLE = EIM_ACCOUNT
      TABLE = EIM_ACCOUNT1
```

Figure 3-17 The edited import.ifb file

- The next step is to invoke the EIM server task:
  - From the client workstation, get into the Siebel Call Center.
  - Go to **Screens->Server Administration->Server->Server Tasks->Click.**
  - On the Server Task screen select **New**.
  - In the Component drop-down list select **Enterprise Integration Mgr.**
  - Select **Pick.**
  - On the server task screen select **Parameters.**
  - Change the Configuration file parameter to contain import.ifb.
  - Close the window.

- To start the EIM task, click **Start**. The Siebel application generates a task number for the EIM task. This number is used to check the results of the import.
- When the EIM import task completes, the status field displays the Completed status.
- You need now to confirm that data has been moved correctly by doing the following:
  - Check for error messages in the EIM log file - EIM_3085 (the name of the EIM log file contains the EIM task number).
  - Using the Siebel Call Center, check whether sample records have been imported correctly into OS/390.

    We specifically checked the Accounts screen to make sure that all our accounts were there. We also checked the addresses we imported.

3.5 DB2 for NT Import/Export

We tested the DB2 for NT Import/Export utilities for migrating a couple of EIM tables. We encountered a condition where the DB2 Import utility failed because the schema was different on the target platform. The target EIM table had a column, MS_IDENT, which did not exist on the source EIM table. This column was defined as an IDENTITY COLUMN, so there really was no need to move data, but the DB2 Import utility did not tolerate the mismatch.

The DB2 Import utility could have been customized to bypass this problem by specifying the columns to be moved, but the large number of columns needed to be specified eliminated this option.

Another alternative would have been to create views to include all columns except the IDENT column and load the data using the views.

3.6 DB2 for OS/390 DSNTIAUL and LOAD

The following database migration scenario was tested as a joint Siebel-IBM effort in Siebel premises, using Siebel utilities to extract and recreate database objects, and using IBM DB2 for OS/390 utilities to extract and reload the data. As a result of the tests, the solution was reported as quite efficient.

The scenario described in Figure 3-18 uses the DB2 for OS/390 DSNTIAUL and LOAD utilities to move the data. The LOAD utility is especially efficient in loading large volumes of data.

The DB2 for OS/390 sample utility program, DSNTIAUL, running on OS/390 and using an implicit remote DRDA connection to DB2 for NT is used to extract data from DB2 for NT tables and store it in files on OS/390. DSNTIAUL extracts data from DB2 for NT and stores the unloaded data in a "loadable" format acceptable to the DB2 for OS/390 LOAD utility. DSNTIAUL is also used to generate the LOAD utility control files while unloading the DB2 for NT data.

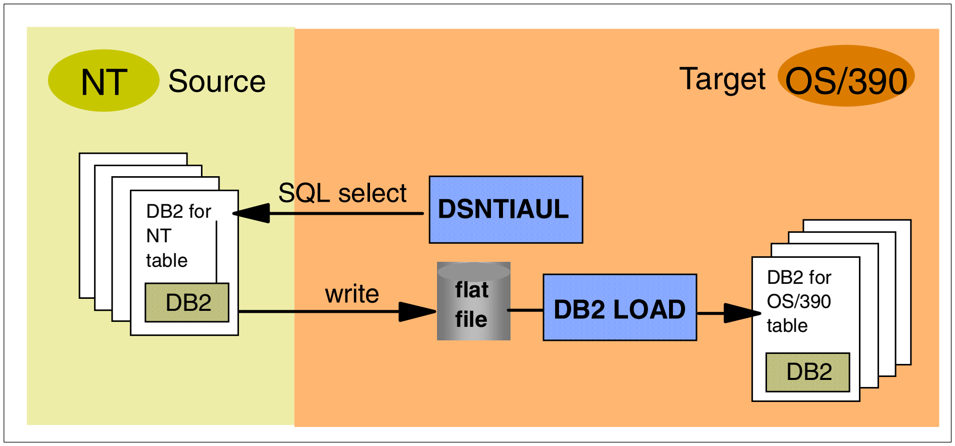


Figure 3-18 Migrating Siebel data with DB2 DSNTIAUL and LOAD utilities

The steps to migrate from a Siebel DB2 for NT database server to a DB2 for OS/390 database server are as follows:

1. Define the source DB2 for NT as a DRDA server to DB2 for OS/390, giving it an RDBNAME which can be used by DSNTIAUL. To do this, update the DB2 for OS/390 Communications Database to point to DB2 for NT via TCP/IP.
   – Update the SYSIBM.LOCATIONS LOCATION column with the location name of the source DB2 for NT, the LINKNAME column with a value identifying a row in the SYSIBM.IPNAMES table, and the PORT column

with the port number associated with the source DB2 for NT in your configuration (50000 in our case).

SYSIBM.SYSLOCATIONS		
LOCATION	**LINKNAME**	**PORT**
SIEBELDB	SIEBELNK	50000

– Update the SYSIBM.IPNAMES LINKNAME column with the value used in the SYSIBM.LOCATIONS LINKNAME column, the IPADDR column with the IP address of the source DB2 for NT server, the SECURITY_OUT column with P indicating a user ID and password will be sent during the connect process. With the P option, you need a SYSIBM.USERNAMES table for user ID/password resolution. In the USERNAMES column, specify O to indicate outbound translation.

SYSIBM.IPNAMES			
LINKNAME	**IPADDRESS**	**SECURITY_OUT**	**USERNAMES**
SIEBELNK	SIEBELF3	P	O

– Update SYSIBM.USERNAMES column TYPE to O for outbound translation, leave AUTHID blank to translate all user IDs, set the column LINKNAME to the same value used in the SYSIBM.LOCATIONS LINKNAME column. For the NEWAUTHID and PASSWORD columns specify the user ID and password of a user that has select access on all the Siebel tables.

SYSIBM.USERNAMES				
TYPE	**AUTHID**	**LINKNAME**	**NEWAUTHID**	**PW**
O		SIEBELNK	SIEBEL	SIEBEL

2. Use the installation job DSNTEJ2A to recompile, assemble, and linkedit DSNTIAUL. You need to modify the bind step since you must bind DSNTIAUL's DBRM using the CURRENTSERVER bind option specifying the location name used in the LOCATION column in the SYSIBM.LOCATIONS table. A plan and package is required to run DSNTIAUL, accessing the source DB2 for NT server.

   – To build a plan and package for DSNTIAUL, you cannot use certain bind options. When binding the DSNTIAUL package to DB2 for NT, you can only specify the following options: CURRENTDATA NO, ISOLATION CS or UR, and VALIDATE BIND. Do not specify SQLERROR CONTINUE. Bind a plan and specify a package list where the PKLIST includes *.DSNTIAUL.*, meaning any package in the DSNTIAUL collection at any location. Be sure to specify the CURRENTSERVER keyword in the bind of the plan so that an automatic connection is established when the application begins to execute and connects to DB2 for OS/390.

3. Build JCL to run one or more DSNTIAUL jobs using the plan created previously. Refer to Appendix E, "DB2 DSNTIAUL and LOAD jobs" on page 159, to see an example. Run DSNTIAUL to select all data from all tables plus creating load control files for all tables. You can run multiple DSNTIAUL jobs to extract data in parallel.
   - You can use the TSO DSN command processor to run DSNTIAUL. Look at the execute step of DSNTEJ2A to see how this is done.
   - Creating the JCL jobs to run DSNTIAUL against all the Siebel tables can be very time consuming, so writing a REXX exec to create a set of DSNTIAUL jobs is recommended. "REXX EXEC to generate DSNTIAUL unload jobs" on page 162 and "REXX EXEC to generate DB2 LOAD jobs" on page 165, show two REXX execs that can be used as samples to generate the DSNTIAUL unload jobs and the DB2 LOAD jobs.
   - The SYSPUNCH DD card is for the LOAD control cards and SYSREC00 is for the unloaded data, with SYSIN being just the fully qualified name of the table on input. One of the issues with this unload is that the file records are all padded out to full column lengths including the max column length of a long varchar which means there is a lot of null data in these files but they need to be there. By using an SMS storage group with stripping across, say, 8 disks, and compression, can reduce the DASD requirement.
4. Build JCL to run the DB2 for OS/390 LOAD utility to load the data extracted by DSNTIAUL. Refer to Appendix E, "DB2 DSNTIAUL and LOAD jobs" on page 159, to see an example of this process.
5. Run RUNSTATS to populate the statistics column for the Siebel tables.
6. If any triggers were created on the source database they have to be recreated on the target database using the normal Siebel Administration facilities.
7. Collect a count of all Siebel tables, indexes, triggers, and row counts for each table. Compare there results with the counts extracted from DB2 for NT.
8. Configure the Siebel clients and Application servers to point to the new Siebel database server.
9. Validate the schema.

This is the outline of the process required to migrate a DB2 for NT server to a DB2 for OS/390 server. Additional planning is required to put this in production. Authorization, backup and restore, disaster recovery, and performance tuning all have to be examined and merged into the current DB2 for OS/390 production processes.

Timings

It took 8 to 12 hours for the Siebel DB2 for OS/390 DBA to move 40 GB of data from DB2 for NT using DSNTIAUL running on OS/390. This was an early attempt and times have improved since. The additional time for the first move was because the operation was not optimized for DASD space usage. We estimate that this time can be cut to 4 to 6 hours with sufficient SMS-managed DASD.

To unload the approximately 1800 Siebel tables, the DSNTIAUL jobs were split into 18 physical jobs. DSNTIAUL can only take SYSREC00 - SYSREC99, so divide the number of tables by 100 for the number of jobs.

In our case, we run four job streams at a time mainly due to the amount of DASD available for DB2's usage. You will have to adjust the number of parallel streams based on the amount of DASD available for the SORTOUT, SYSUT1, SORTWK01- SORTWK08 datasets. You can experiment to see how many jobs can be run in parallel or you can go through the exercise of calculating the exact amount of DASD required using the formulas in the DB2 manuals. There is no simple formula since you have to take into account the number of rows, the number of indexes, and the sizes of indexes. The JCL attempts to handle the largest table so for most tables the allocation amounts may seem high but you have to be ready for peak demands if you want to run this process unattended.

To reload the data into DB2 for OS/390 after the unload, figure between 6 to 12 hours for the 40 GB. Run 4 jobs at a time that have multiple tables per job. They may clash on table space, DASD, core, etc. They need to be monitored for continuous processing. Again, having enough SMS-managed DASD helps speed things up. The loads include “resume yes”, indexes, and a lot of buffers (250 on input data sets and works and sorts); also specify external sorts (24). The total time includes parallel RUNSTAT jobs (4) after all the loads, but does not include a COPY.

3.7 DB2 family cross-loader function

The DB2 family cross-loader function is an alternative to the scenario described in the previous section, and available only in the DB2 for OS/390 V7 environments. It is a powerful data migration tool for the DB2 family.

With DB2 for OS/390 Version 7, the DB2 LOAD utility is enhanced to support the use of SQL SELECT to produce input directly into LOAD. This enhancement delivers a DB2 family cross-loader function. With DB2 for OS/390 Version 7, you can use any DRDA-compliant database server as a data input source for populating your tables in DB2 for OS/390. Your input can even come from non-DB2 data sources by using DataJoiner for access to data from sources as diverse as Oracle and Sybase, as well as the entire DB2 family of database servers.

Siebel 2000 is not currently supporting DB2 for OS/390 V7, but is likely to do it at a later time. The DB2 family cross-loader function will be available to Siebel Systems as soon as it supports DB2 for OS/390 V7.

For more information on the Cross Loader refer to *DB2 UDB for OS/390 and z/OS Utility Guide and Reference Version 7*, SC26-9945, and the redbook *DB2 UDB Server for OS/390 and z/OS Version 7 - Presentation Guide*, SG24-6121.

4

Migrating Siebel data from Oracle for NT to DB2 for NT

This chapter describes the methods we used for migrating the Siebel database from a source Oracle for NT environment to a target DB2 for NT environment, shown in Figure 4-1.

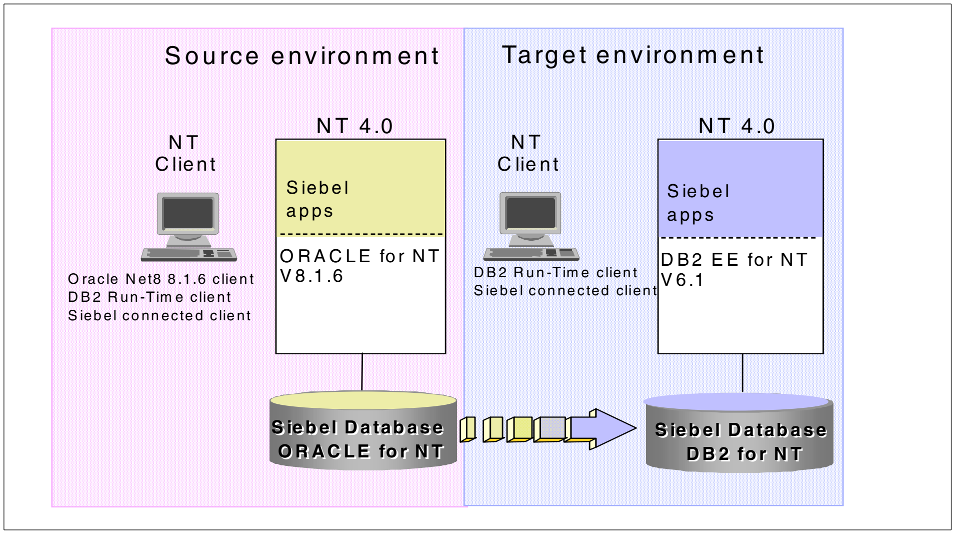


Figure 4-1 Migrating Siebel data from Oracle for NT to DB2 for NT

4.1 Test configuration

We ran the Oracle for NT to DB2 for NT migration tests on a configuration we set up at the IBM Hursley laboratory in the UK.

We used Siebel 2000 V6.2.1 with Fix Pack 3sa (Fix Pack 6s was not available at the time of testing).

1. First, we created a Siebel source environment on NT supporting an Oracle for NT V8.1.6 Siebel database, using the same methodology as in Appendix A, “Implementing the Siebel source environment on NT” on page 89. We populated the source Oracle database with SQL Anywhere sample data. (See “Migrating the Siebel sample database” on page 124).
2. Next, we created a Siebel target environment on NT supporting the DB2 for NT V6 Siebel database, again using the same methodology as in Appendix A, “Implementing the Siebel source environment on NT” on page 89.
3. Finally, we moved the data from the source Oracle for NT to the target DB2 for NT environment.

We chose the following naming conventions for the source Oracle for NT setup:

NT account/psw	SADMIN/SADMIN and SIEBEL/SIEBEL
Enterprise server name	SiebelOracle
Database SSID	SANDPIT
Table owner	SIEBEL
Database account login/psw	SADMIN/SADMIN
ODBC data source name	Siebsrvr_SiebelOracle

We chose the following naming conventions for the target DB2 for NT setup:

NT account/password	SADMIN/SADMIN
Database account/password	SADMIN/SADMIN
Enterprise server name	SiebelDB2
Table owner	SIEBEL
Database alias	siebeldb
Data source name	Siebsrvr_SiebelDB2

4.2 Migrating Siebel data from Oracle for NT to DB2 for NT

We investigated the following methods using Siebel utilities:

- The Dataexp/Dataimp method with schema changes
- The Dataexp/Dataimp method with no schema changes
- The EIM method

4.2.1 Siebel Dataexp/Dataimp - with schema changes

This method handles schema differences between the source and target environments. Figure 4-2 describes migrating Siebel data from Oracle to DB2 using the Dataexp and Dataimp utilities.

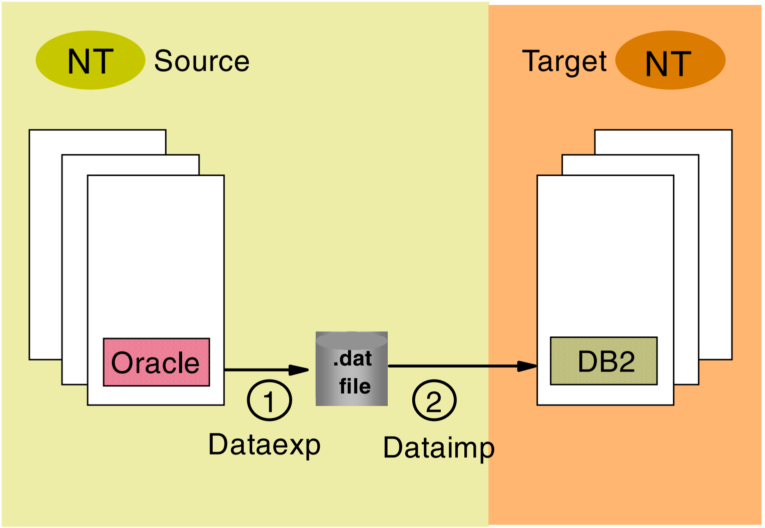


Figure 4-2 Migrating Siebel data from Oracle to DB2 using Dataexp and Dataimp

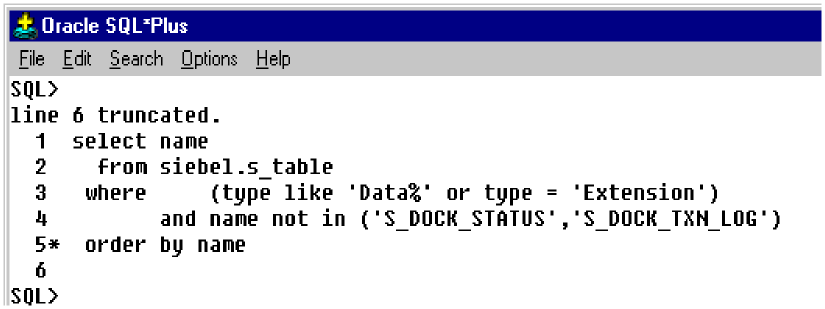
The procedure includes the following:

- Generating a list of tables to migrate
- Cleaning up target tables
- Renaming the repository at the target
- Moving the repository and synchronizing the schema
- Recompiling the SRF file
- Exporting data with Dataexp
- Importing data with Dataimp
- Validating the migration

Generating a list of tables to migrate

Before migrating the data, we need to determine which tables need to be migrated. We will migrate all tables except the repository, which will be handled in “Moving the repository and synchronizing the schema” on page 61.

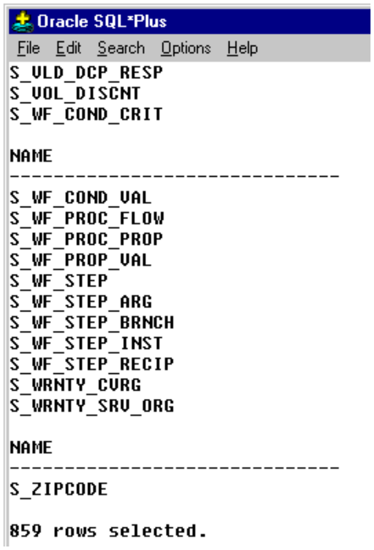
From the Windows desktop, go to **Start->Programs->Oracle->Application Development->SQL Plus** and issue the SQL statement shown in Figure 4-3.



```
SQL>
line 6 truncated.
  1  select name
  2    from siebel.s_table
  3   where     (type like 'Data%' or type = 'Extension')
  4          and name not in ('S_DOCK_STATUS','S_DOCK_TXN_LOG')
  5*  order by name
  6
SQL>
```

Figure 4-3 SQL statement to generate table names

The output of this SQL statement will give us a list of table names we will want to migrate and will be used as input for Dataexp. The output is shown in Figure 4-4.



```
S_VLD_DCP_RESP
S_VOL_DISCNT
S_WF_COND_CRIT

NAME
------------------------------
S_WF_COND_VAL
S_WF_PROC_FLOW
S_WF_PROC_PROP
S_WF_PROP_VAL
S_WF_STEP
S_WF_STEP_ARG
S_WF_STEP_BRNCH
S_WF_STEP_INST
S_WF_STEP_RECIP
S_WRNTY_CVRG
S_WRNTY_SRV_ORG

NAME
------------------------------
S_ZIPCODE

859 rows selected.
```

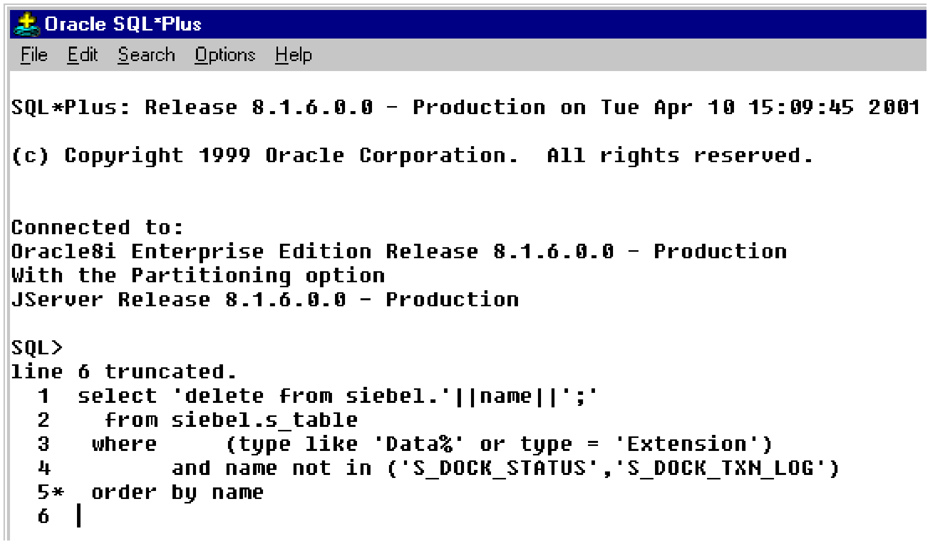
Figure 4-4 SQL statement output with table names

Drop the comments from the output file and save only the table names into a file named **ora_all_out.inp**, for example. This table list is used as input to the Dataexp utility later.

Cleaning up target tables

We need to make sure that there is no data in the target tables before we start migrating the data. We want to avoid running into duplicate data issues.

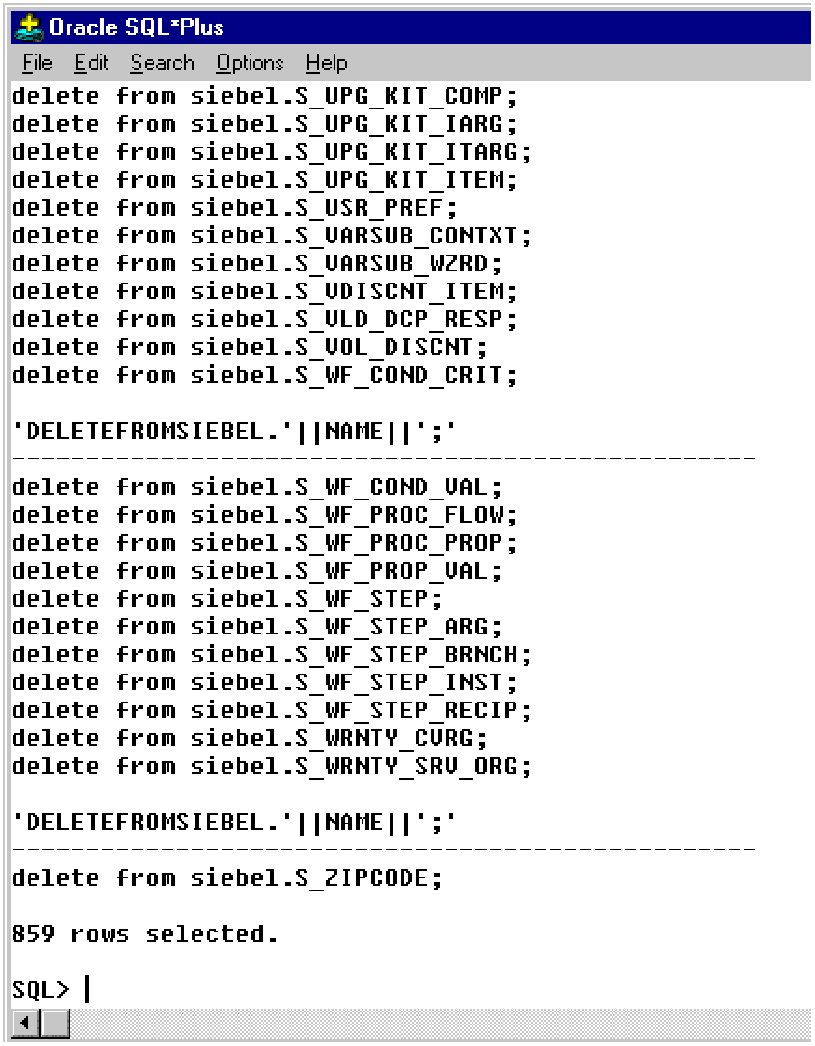
Go to SQL Plus and build the SQL statement shown in Figure 4-5.



```
SQL*Plus: Release 8.1.6.0.0 - Production on Tue Apr 10 15:09:45 2001

(c) Copyright 1999 Oracle Corporation.  All rights reserved.


Connected to:
Oracle8i Enterprise Edition Release 8.1.6.0.0 - Production
With the Partitioning option
JServer Release 8.1.6.0.0 - Production

SQL>
line 6 truncated.
  1  select 'delete from siebel.'||name||';'
  2    from siebel.s_table
  3   where      (type like 'Data%' or type = 'Extension')
  4          and name not in ('S_DOCK_STATUS','S_DOCK_TXN_LOG')
  5*  order by name
  6  
```

Figure 4-5   SQL statement to generate SQL DELETE statements

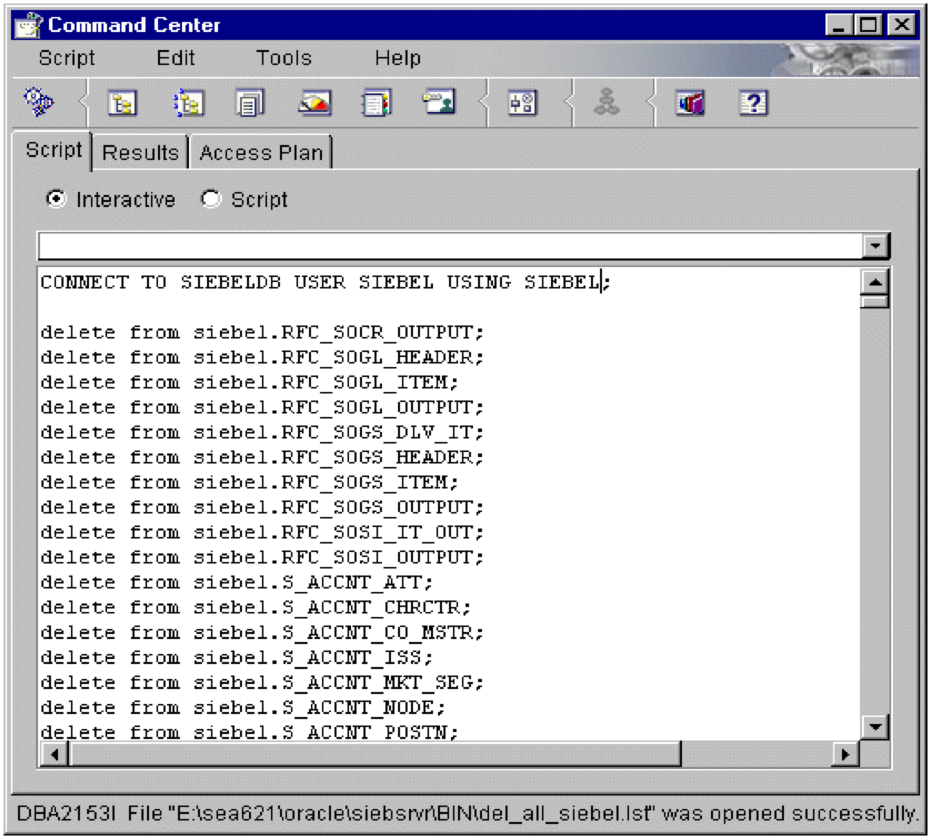
Running this SQL statement produces the output shown in Figure 4-6 on page 58. It builds the SQL DELETE statements required to clean up the target tables.



```
delete from siebel.S_UPG_KIT_COMP;
delete from siebel.S_UPG_KIT_IARG;
delete from siebel.S_UPG_KIT_ITARG;
delete from siebel.S_UPG_KIT_ITEM;
delete from siebel.S_USR_PREF;
delete from siebel.S_VARSUB_CONTXT;
delete from siebel.S_VARSUB_WZRD;
delete from siebel.S_VDISCNT_ITEM;
delete from siebel.S_VLD_DCP_RESP;
delete from siebel.S_VOL_DISCNT;
delete from siebel.S_WF_COND_CRIT;

'DELETEFROMSIEBEL.'||NAME||';'
---------------------------------------------------
delete from siebel.S_WF_COND_VAL;
delete from siebel.S_WF_PROC_FLOW;
delete from siebel.S_WF_PROC_PROP;
delete from siebel.S_WF_PROP_VAL;
delete from siebel.S_WF_STEP;
delete from siebel.S_WF_STEP_ARG;
delete from siebel.S_WF_STEP_BRNCH;
delete from siebel.S_WF_STEP_INST;
delete from siebel.S_WF_STEP_RECIP;
delete from siebel.S_WRNTY_CVRG;
delete from siebel.S_WRNTY_SRV_ORG;

'DELETEFROMSIEBEL.'||NAME||';'
---------------------------------------------------
delete from siebel.S_ZIPCODE;

859 rows selected.

SQL> |
```

Figure 4-6 SQL statement output with SQL DELETE statements

Consolidate the output and save it as del_data_run.inp, for example, and execute it in DB2 Command Center before you run Dataimp. See Figure 4-7 on page 59.

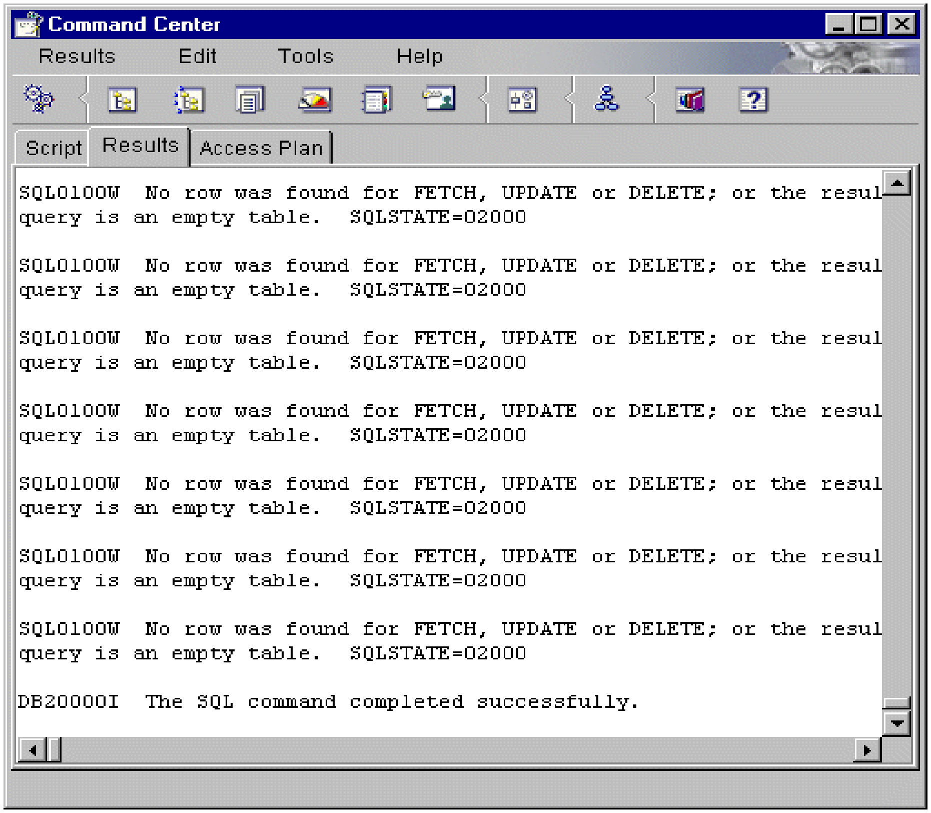


```
CONNECT TO SIEBELDB USER SIEBEL USING SIEBEL;

delete from siebel.RFC_SOCR_OUTPUT;
delete from siebel.RFC_SOGL_HEADER;
delete from siebel.RFC_SOGL_ITEM;
delete from siebel.RFC_SOGL_OUTPUT;
delete from siebel.RFC_SOGS_DLV_IT;
delete from siebel.RFC_SOGS_HEADER;
delete from siebel.RFC_SOGS_ITEM;
delete from siebel.RFC_SOGS_OUTPUT;
delete from siebel.RFC_SOSI_IT_OUT;
delete from siebel.RFC_SOSI_OUTPUT;
delete from siebel.S_ACCNT_ATT;
delete from siebel.S_ACCNT_CHRCTR;
delete from siebel.S_ACCNT_CO_MSTR;
delete from siebel.S_ACCNT_ISS;
delete from siebel.S_ACCNT_MKT_SEG;
delete from siebel.S_ACCNT_NODE;
delete from siebel.S_ACCNT_POSTN;
```

DBA2153I File "E:\sea621\oracle\siebsrvr\BIN\del_all_siebel.lst" was opened successfully.

Figure 4-7 Executing the DELETE statements from the DB2 Command Center

Figure 4-8 on page 60 shows the result of the execution of the SQL DELETE statements. You should expect to see messages informing you that there are no rows in the tables because we are not using most of the Siebel business components.



```
SQL0100W  No row was found for FETCH, UPDATE or DELETE; or the resul
query is an empty table.  SQLSTATE=02000

SQL0100W  No row was found for FETCH, UPDATE or DELETE; or the resul
query is an empty table.  SQLSTATE=02000

SQL0100W  No row was found for FETCH, UPDATE or DELETE; or the resul
query is an empty table.  SQLSTATE=02000

SQL0100W  No row was found for FETCH, UPDATE or DELETE; or the resul
query is an empty table.  SQLSTATE=02000

SQL0100W  No row was found for FETCH, UPDATE or DELETE; or the resul
query is an empty table.  SQLSTATE=02000

SQL0100W  No row was found for FETCH, UPDATE or DELETE; or the resul
query is an empty table.  SQLSTATE=02000

SQL0100W  No row was found for FETCH, UPDATE or DELETE; or the resul
query is an empty table.  SQLSTATE=02000

DB20000I  The SQL command completed successfully.
```

Figure 4-8 Result of executing SQL DELETE statements

At the end of the execution, the target tables will be cleaned up.

Renaming the repository

When the repository gets moved to the target, we create a situation where there are two repositories (the target and the moved one) with the same name, which is a problem. To avoid this problem, we rename the repository at the target.

To rename the repository, we use Siebel Tools from the client workstation and change the name Siebel Repository to *OLD Siebel Repository*. See Figure 4-9 on page 61.

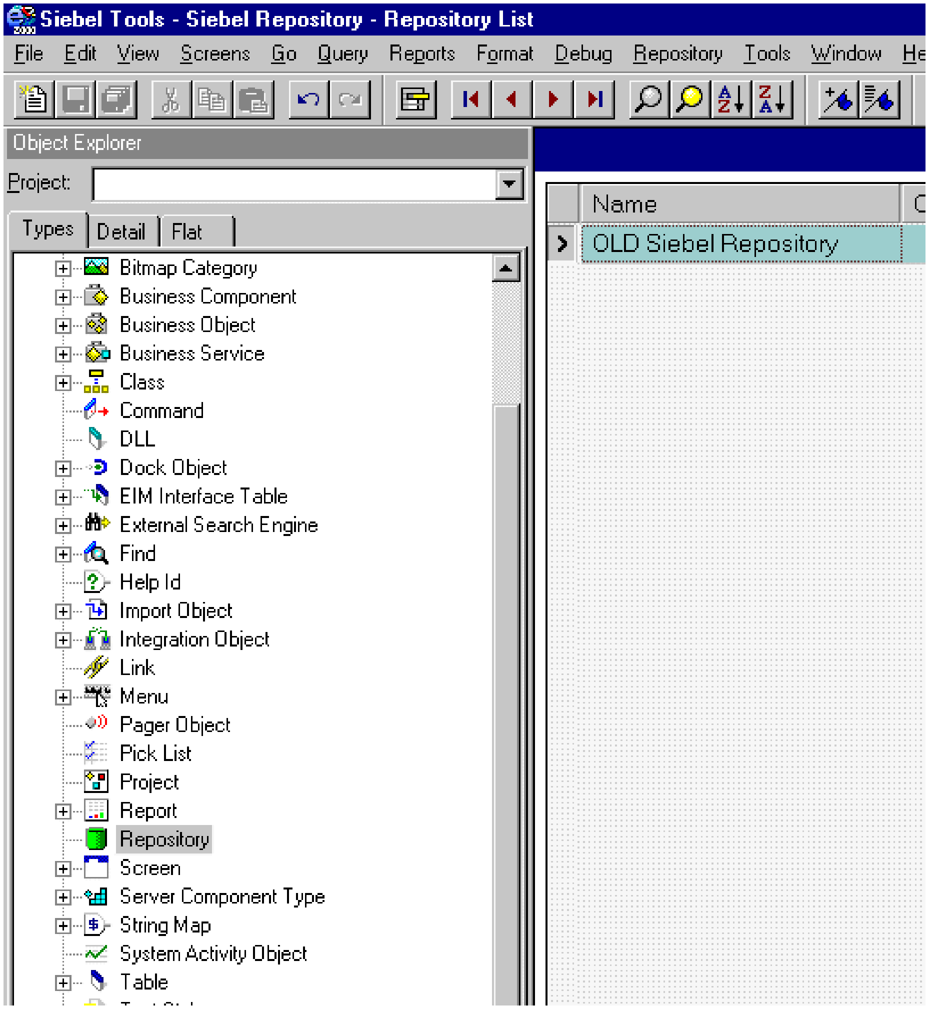
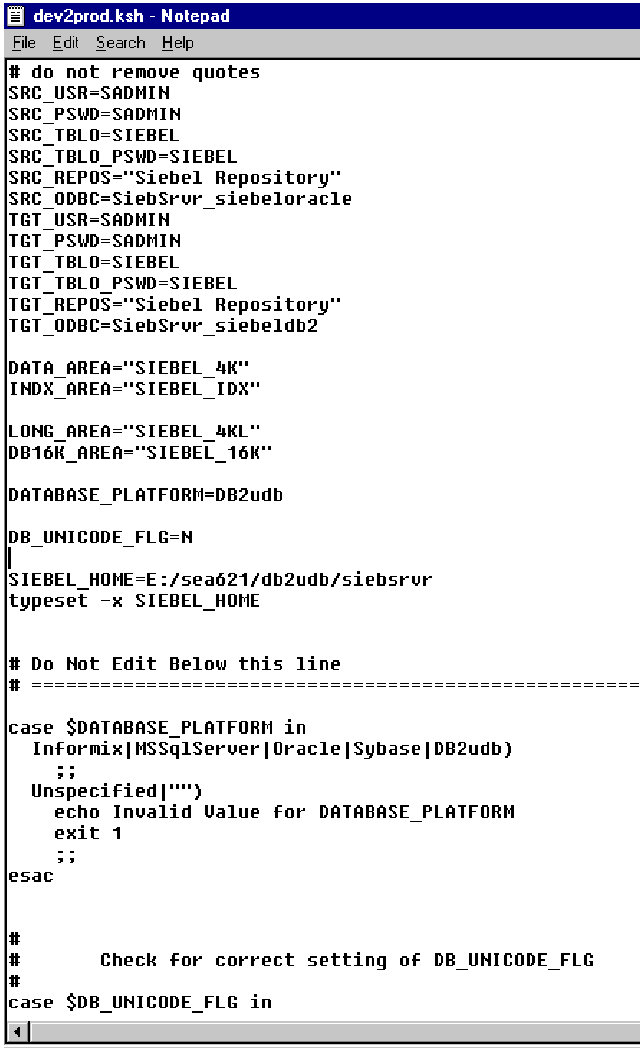


Figure 4-9 Using Siebel Tools to rename the repository

Moving the repository and synchronizing the schema

Dev2prod will move the repository and synchronize the logical and physical schema at the target environment.

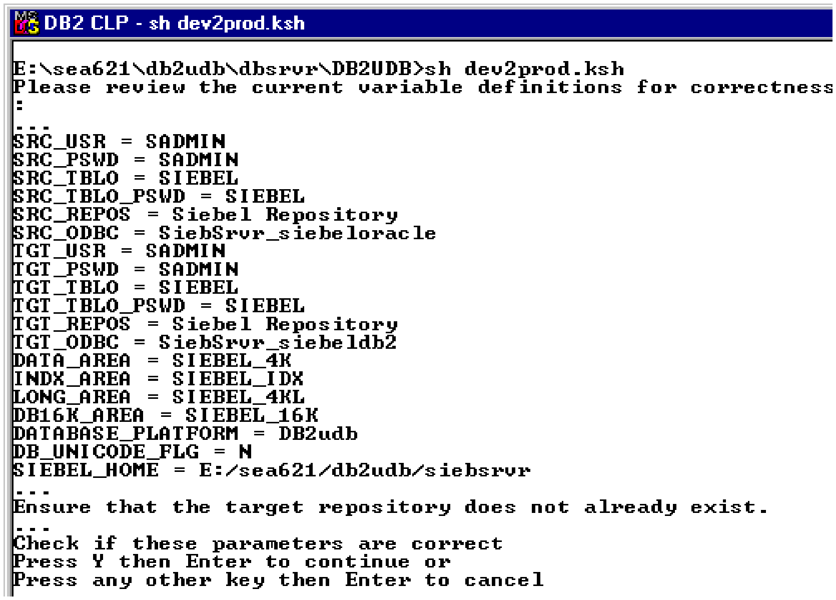
Navigate to E:\sea621\db2udb\dbsrvr\db2udb\dev2prod.ksh. Edit and update it according to your environment settings, as shown in Figure 4-10 on page 62.



```
# do not remove quotes
SRC_USR=SADMIN
SRC_PSWD=SADMIN
SRC_TBLO=SIEBEL
SRC_TBLO_PSWD=SIEBEL
SRC_REPOS="Siebel Repository"
SRC_ODBC=SiebSrvr_siebeloracle
TGT_USR=SADMIN
TGT_PSWD=SADMIN
TGT_TBLO=SIEBEL
TGT_TBLO_PSWD=SIEBEL
TGT_REPOS="Siebel Repository"
TGT_ODBC=SiebSrvr_siebeldb2

DATA_AREA="SIEBEL_4K"
INDX_AREA="SIEBEL_IDX"

LONG_AREA="SIEBEL_4KL"
DB16K_AREA="SIEBEL_16K"

DATABASE_PLATFORM=DB2udb

DB_UNICODE_FLG=N

SIEBEL_HOME=E:/sea621/db2udb/siebsrvr
typeset -x SIEBEL_HOME


# Do Not Edit Below this line
# =====================================================

case $DATABASE_PLATFORM in
  Informix|MSSqlServer|Oracle|Sybase|DB2udb)
    ;;
  Unspecified|"")
    echo Invalid Value for DATABASE_PLATFORM
    exit 1
    ;;
esac


#
#       Check for correct setting of DB_UNICODE_FLG
#
case $DB_UNICODE_FLG in
```

Figure 4-10   Dev2prod.ksh

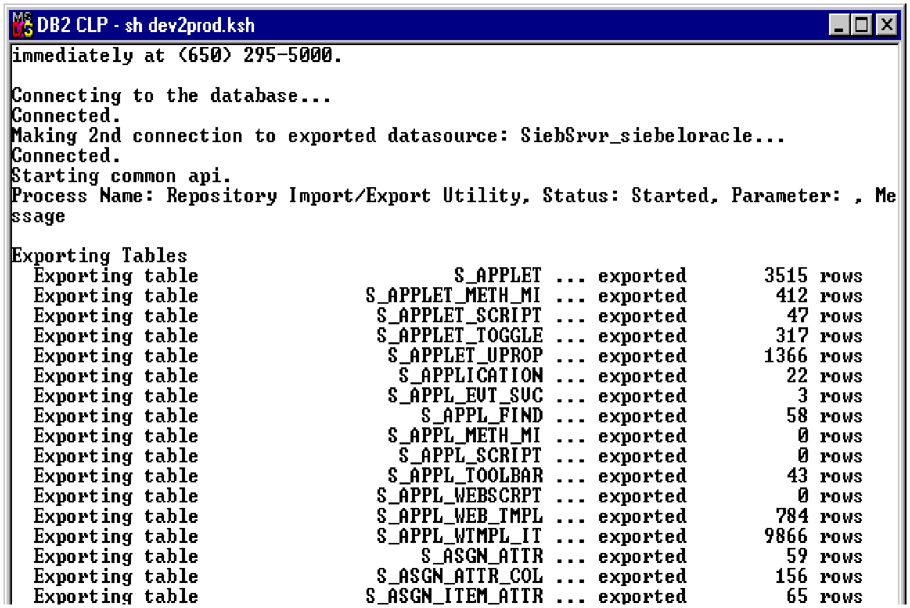
Figure 4-11 shows the beginning of the execution of dev2prod.ksh.



```
E:\sea621\db2udb\dbsrvr\DB2UDB>sh dev2prod.ksh
Please review the current variable definitions for correctness
:
...
SRC_USR = SADMIN
SRC_PSWD = SADMIN
SRC_TBLO = SIEBEL
SRC_TBLO_PSWD = SIEBEL
SRC_REPOS = Siebel Repository
SRC_ODBC = SiebSrvr_sieberoracle
TGT_USR = SADMIN
TGT_PSWD = SADMIN
TGT_TBLO = SIEBEL
TGT_TBLO_PSWD = SIEBEL
TGT_REPOS = Siebel Repository
TGT_ODBC = SiebSrvr_siebeldb2
DATA_AREA = SIEBEL_4K
INDX_AREA = SIEBEL_IDX
LONG_AREA = SIEBEL_4KL
DB16K_AREA = SIEBEL_16K
DATABASE_PLATFORM = DB2udb
DB_UNICODE_FLG = N
SIEBEL_HOME = E:/sea621/db2udb/siebsrvr
...
Ensure that the target repository does not already exist.
...
Check if these parameters are correct
Press Y then Enter to continue or
Press any other key then Enter to cancel
```

Figure 4-11 Dev2prod settings and execution

We press Y, then Enter. We get the screen in Figure 4-12, which shows the export of the source repository tables.

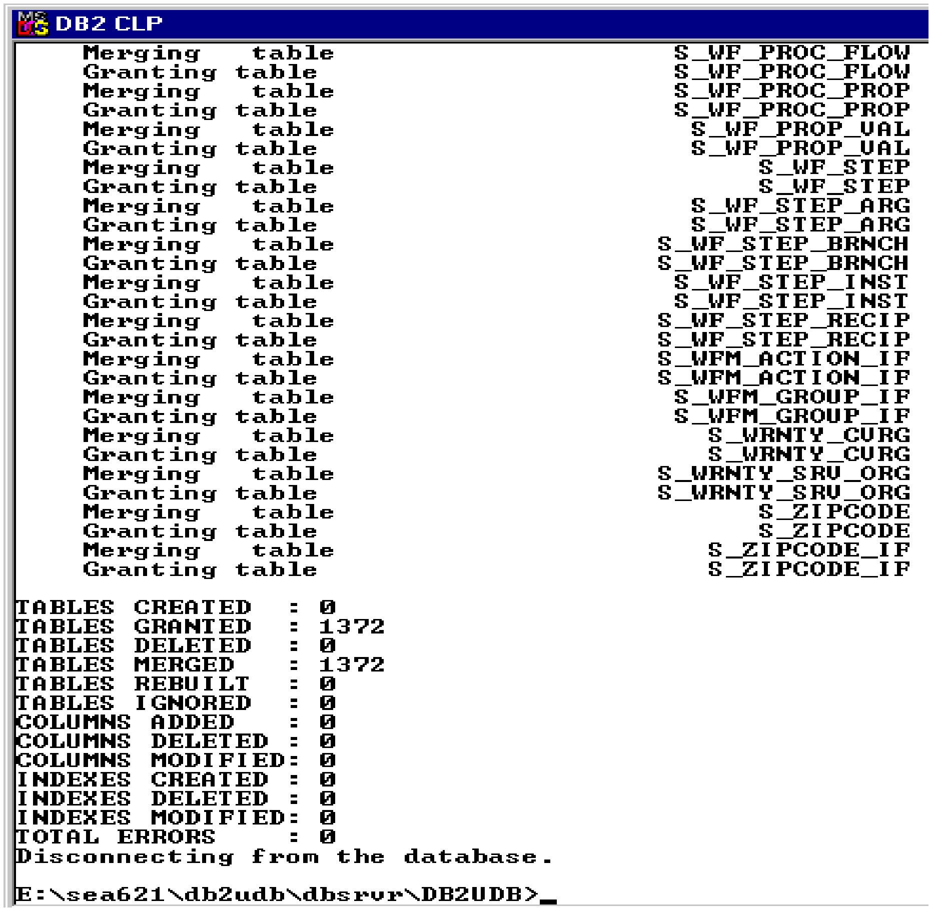


```
immediately at (650) 295-5000.

Connecting to the database...
Connected.
Making 2nd connection to exported datasource: SiebSrvr_siebeloracle...
Connected.
Starting common api.
Process Name: Repository Import/Export Utility, Status: Started, Parameter: , Me
ssage

Exporting Tables
  Exporting table                       S_APPLET ... exported      3515 rows
  Exporting table               S_APPLET_METH_MI ... exported       412 rows
  Exporting table                S_APPLET_SCRIPT ... exported        47 rows
  Exporting table                S_APPLET_TOGGLE ... exported       317 rows
  Exporting table                 S_APPLET_UPROP ... exported      1366 rows
  Exporting table                  S_APPLICATION ... exported        22 rows
  Exporting table                 S_APPL_EVT_SVC ... exported         3 rows
  Exporting table                    S_APPL_FIND ... exported        58 rows
  Exporting table                 S_APPL_METH_MI ... exported         0 rows
  Exporting table                  S_APPL_SCRIPT ... exported         0 rows
  Exporting table                 S_APPL_TOOLBAR ... exported        43 rows
  Exporting table                S_APPL_WEBSCRPT ... exported         0 rows
  Exporting table                S_APPL_WEB_TMPL ... exported       784 rows
  Exporting table                S_APPL_WTMPL_IT ... exported      9866 rows
  Exporting table                    S_ASGN_ATTR ... exported        59 rows
  Exporting table                S_ASGN_ATTR_COL ... exported       156 rows
  Exporting table               S_ASGN_ITEM_ATTR ... exported        65 rows
```

Figure 4-12 Export of source repository tables

Figure 4-13 shows the end of the execution of dev2prod.ksh

.



```
    Merging   table                                S_WF_PROC_FLOW
    Granting table                                 S_WF_PROC_FLOW
    Merging   table                                S_WF_PROC_PROP
    Granting table                                 S_WF_PROC_PROP
    Merging   table                                 S_WF_PROP_VAL
    Granting table                                  S_WF_PROP_VAL
    Merging   table                                     S_WF_STEP
    Granting table                                      S_WF_STEP
    Merging   table                                 S_WF_STEP_ARG
    Granting table                                  S_WF_STEP_ARG
    Merging   table                               S_WF_STEP_BRNCH
    Granting table                                S_WF_STEP_BRNCH
    Merging   table                                S_WF_STEP_INST
    Granting table                                 S_WF_STEP_INST
    Merging   table                               S_WF_STEP_RECIP
    Granting table                                S_WF_STEP_RECIP
    Merging   table                               S_WFM_ACTION_IF
    Granting table                                S_WFM_ACTION_IF
    Merging   table                                S_WFM_GROUP_IF
    Granting table                                 S_WFM_GROUP_IF
    Merging   table                                  S_WRNTY_CVRG
    Granting table                                   S_WRNTY_CVRG
    Merging   table                               S_WRNTY_SRV_ORG
    Granting table                                S_WRNTY_SRV_ORG
    Merging   table                                     S_ZIPCODE
    Granting table                                      S_ZIPCODE
    Merging   table                                  S_ZIPCODE_IF
    Granting table                                   S_ZIPCODE_IF

TABLES  CREATED   :  0
TABLES  GRANTED   :  1372
TABLES  DELETED   :  0
TABLES  MERGED    :  1372
TABLES  REBUILT   :  0
TABLES  IGNORED   :  0
COLUMNS  ADDED    :  0
COLUMNS  DELETED  :  0
COLUMNS  MODIFIED:  0
INDEXES  CREATED  :  0
INDEXES  DELETED  :  0
INDEXES  MODIFIED:  0
TOTAL  ERRORS     :  0
Disconnecting from the database.

E:\sea621\db2udb\dbsrvr\DB2UDB>_
```

Figure 4-13 End of dev2prod.ksh execution

At this point we have moved the repository to the target and synchronized the logical and physical schema at the target environment.

Recompiling the SRF file

Every time the repository gets updated, we need to recompile the SRF file.

From the client workstation, go to **Siebel Tools->Repository,** option **Compile** as shown in Figure 4-14 on page 65.

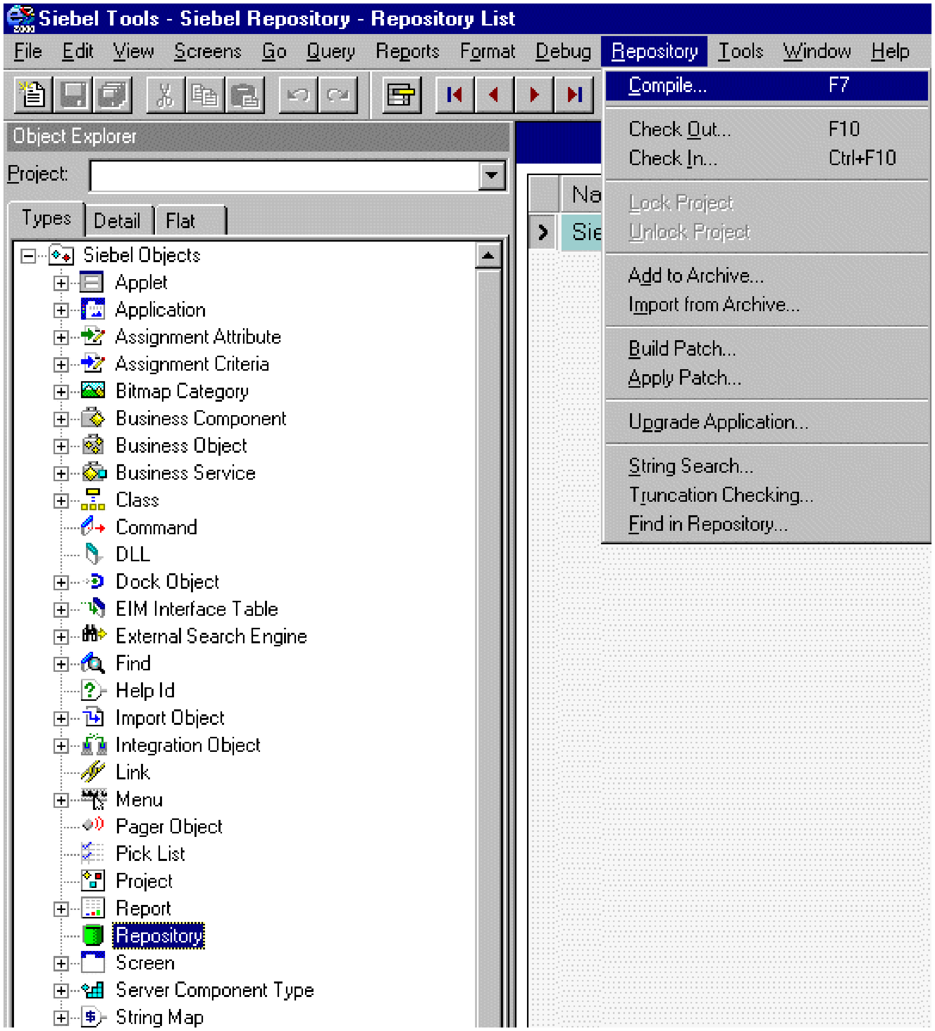
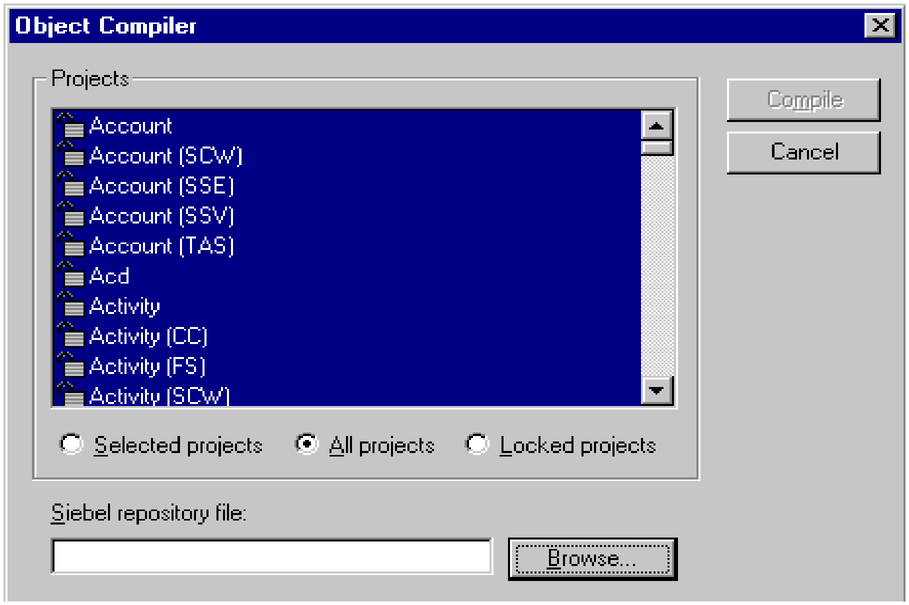


Figure 4-14 Compiling the SRF file - 1

The Object Compiler screen appears, as shown in Figure 4-15 on page 66.



○ Selected projects ● All projects ○ Locked projects

Siebel repository file:

Figure 4-15 Compiling the SRF file - 2

Select **All projects**, give a name to the Siebel repository file (for example, Siebelora), and save by default into the tools/objects directory as siebelora.srf. Click **Compile** to compile the new srf file.

After successful compilation, all clients need to pull this new srf file into their local client objects directory.

Exporting data with Dataexp

Dataexp will export both seed data and user data from the source tables.

It will use as input file the list of table names we have generated and saved in ora_all_out.inp file (see “Generating a list of tables to migrate” on page 56). It will import the tables listed in the input file ora_all_out.inp.

Siebel Systems provides an execute module named dataexp.exe that you will find by navigating to the e:\sea621\oracle\siebsrvr\bin directory. Obtain a description of the parameters for exporting data by entering dataexp/? at the command line.

Execute this module by entering the following command:

```
e:\sea621\oracle\siebsrvr\bin\dataexp /u SIEBEL /p SIEBEL /c
SiebSrvr_SiebelOracle /d SIEBEL /f SIEBEL.DAT/I ora_all_out.imp
```

This job creates the output file called siebel.dat. This file will be used as input by the dataimp.exe module to import the data to DB2 for NT.

Importing data with Dataimp

Dataimp will import the output of Dataexp into the target tables. It uses as input the siebel.dat file generated by Dataexp.

Navigate to the e:\sea621\oracle\siebsrvr\bin directory to find dataimp.exe. Obtain a description of the parameters by entering dataimp/? at the command line.

Execute this module by entering the following command:

```
e:\sea621\oracle\siebsrvr\bin\dataimp /u SIEBEL /p SIEBEL /c
SiebSrvr_SiebelDB2 /d SIEBEL /f siebel.dat
```

At the end of this execution you have imported the seed data and all user data to the target Siebel-DB2 database on NT.

Validating the migration

You can now go to Siebel Call Center and verify that the migrated user data is there.

4.2.2 Siebel Dataexp/Dataimp - no schema changes

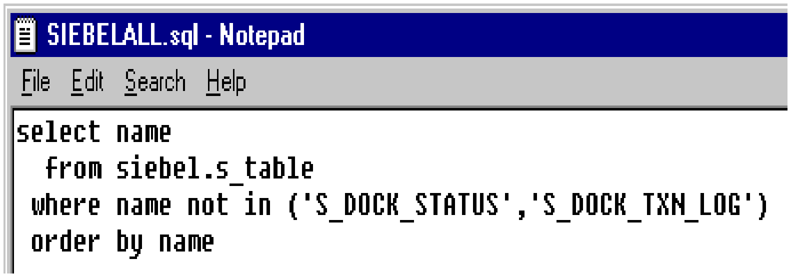
This method can be used when there are no schema changes between the source and target environments (typically a first time migration). It includes the following steps:

- Generating a list of tables to migrate, and cleaning up target tables
- Running Dataexp to export all source tables (including the repository, seed data, and user data) from Oracle for NT
- Running Dataimp to import the output of the previous step into the target tables on DB2 for NT
- Validating the migration

Generating a list of tables to migrate

Before migrating the data, we need to determine which tables need to be migrated. We will migrate all tables including the repository, the seed tables, and user tables.

From the Windows desktop, go to **Start->Programs->Oracle->Application Development->SQL Plus** and issue the SQL statement shown in Figure 4-16 on page 68.



```
select name
  from siebel.s_table
 where name not in ('S_DOCK_STATUS','S_DOCK_TXN_LOG')
 order by name
```

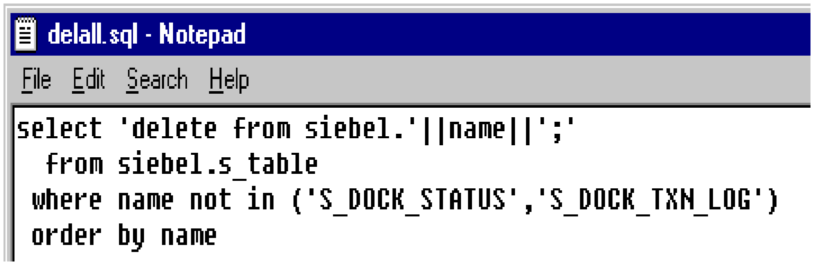
Figure 4-16   SQL statement to generate table names

The output of this SQL statement will give us a list of table names we will want to migrate. Consolidate the table names and save this output as ora_all_out.inp, for example. We will use this list as input to the Dataexp utility later.

Cleaning up target tables

We need to make sure there is no data in the target tables before we start migrating the data. We want to avoid running into duplicate data issues.

Go to SQL Plus and build the SQL statement shown in Figure 4-17.



```
select 'delete from siebel.'||name||';'
  from siebel.s_table
 where name not in ('S_DOCK_STATUS','S_DOCK_TXN_LOG')
 order by name
```

Figure 4-17   SQL statement to generate SQL DELETE statements

Running this SQL statement produces output that builds the SQL DELETE statements required to clean up the target tables. Consolidate the output and save it as del_data_run.inp, for example, and execute it in DB2 Command Center before you run Dataimp. After the execution the target tables will be cleaned up.

Exporting data with Dataexp

Dataexp will export repository, seed, and user data from the source tables.

It will use as input file the list of table names we have generated and saved in the ora_all_out.inp file (see “Generating a list of tables to migrate” on page 56). Dataexp will import the tables listed in the input file ora_all_out.inp.

Siebel Systems provides an execute module named dataexp.exe that you will find by navigating to the d:\sea621\oracle\siebsrvr\bin directory. Obtain a description of the parameters for exporting data by entering dataexp/? on the command line.

Execute this module by entering the following command:

```
e:\sea621\oracle\siebsrvr\bin\dataexp /u SIEBEL /p SIEBEL /c
SiebSrvr_SiebelOracle /d SIEBEL /f e:/Mov_dat/ora_all.dat /i
d:/Mov_dat/ora_all_out.inp
```

Note: The input file ora_all_out.inp is generated from the S_table, which contains the logical schema. It is therefore possible to have tables that are not physically created (for example, EAI_....). Dataexp complains about not physically finding those tables. Ignore these messages.

Dataexp creates an output file we called ora_all.dat. This file will be used as input by the dataimp.exe module to import the data to the DB2 for NT.

Importing data with Dataimp

Dataimp will import the output of Dataexp into the target tables. It will use the ora_all.dat file as input file.

Navigate to the e:\sea621\oracle\siebsrvr\bin directory to find dataimp.exe. Obtain a description of the parameters by entering dataimp/? at the command line.

Execute this module by entering the following command:

```
e:\sea621\oracle\siebsrvr\bin\dataimp /u SIEBEL /p SIEBEL /c
SiebSrvr_SiebelDB2 /d SIEBEL /f e:/Mov_dat/ora_all.dat
```

At the end of this execution you have imported the seed data and all user data to the target Siebel-DB2 database on NT.

Validating the migration

You can now go to Siebel Call Center and verify that the migrated user data is there.

4.2.3 Siebel EIM

We tested the EIM method to migrate the Siebel database from Oracle to DB2 for NT. EIM can be used to migrate both small and large volumes of data. Figure 4-18 describes the Oracle-DB2 data migration using EIM.

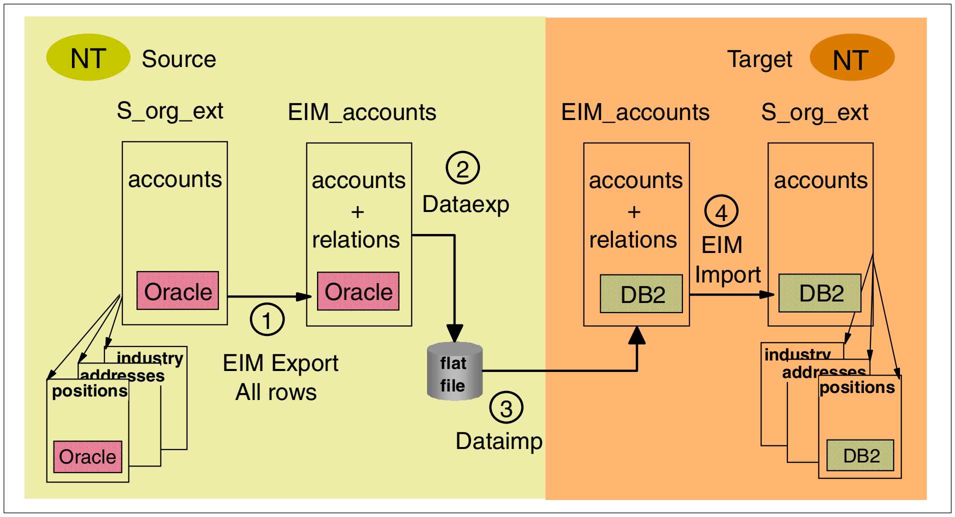


Figure 4-18 Migrating Siebel data from Oracle to DB2 using EIM

This EIM process is very similar to the one explained in Chapter 3, “Migrating Siebel data from DB2 for NT to DB2 for OS/390” on page 31.

We perform the following processes:

- Using Siebel Tools, rename the repository at the target.
- Move the repository and synchronize the schema with Dev2prod.
- Compile the new SRF file.
- Identify the EIM staging tables that map the base tables.
- Run EIM Export to get the data into the EIM staging tables.
- Run Dataexp to unload EIM staging tables into a flat file.
- Run Dataimp, which imports the content of the flat file into the EIM staging tables at the target.
- Run EIM Import to move the EIM staging tables into the base tables at the target.

Renaming the repository

Using Siebel Tools from the client workstation, rename the repository as explained in “Renaming the repository” on page 60.

Moving the repository and synchronizing the schema

We use the Dev2prod utility to migrate the repository and synchronize the schema. Dev2prod compares the source and target schema and implements only the differences at the target. Refer to “Moving the repository and synchronizing the schema” on page 61 to see how to run this process.

Recompiling the SRF file

Recompile the SRF file as described in “Recompiling the SRF file” on page 64.

Running EIM Export

First, make sure the EIM source tables are clean. Refer to “Cleaning up target tables” on page 57 to see an example of how to clean the tables. 3.4, “Siebel EIM” on page 38 gives detailed explanations on how to run EIM Export. The process with Oracle is exactly the same.

Running Dataexp and Dataimp

Run Dataexp and Dataimp as explained in 3.4.2, “Dataexp” on page 43 and 3.4.3, “Dataimp” on page 44.

Running EIM Import

Run EIM Import as explained in 3.4.4, “EIM Import” on page 45. Make sure the EIM target tables are clean.

5

Migrating Siebel data from Oracle for NT to DB2 for OS/390

This chapter investigates the methods for migrating the Siebel database from a source Oracle for NT environment to a target DB2 for OS/390 environment.

We investigated the following alternatives:

- Two-phase migration

  Oracle for NT => DB2 for NT => DB2 for OS/390

- One-phase migration

  Oracle for NT => DB2 for OS/390

  Using three methods:

  – Dataexp/Dataimp

  – Dataexp/FTP/DB2 Load

  – Relational Connect/DB2 Load

5.1 Two-phase migration - Oracle for NT to DB2 for OS/390

Figure 5-1 shows the two-phase migration from Oracle for NT to DB2 for OS/390.

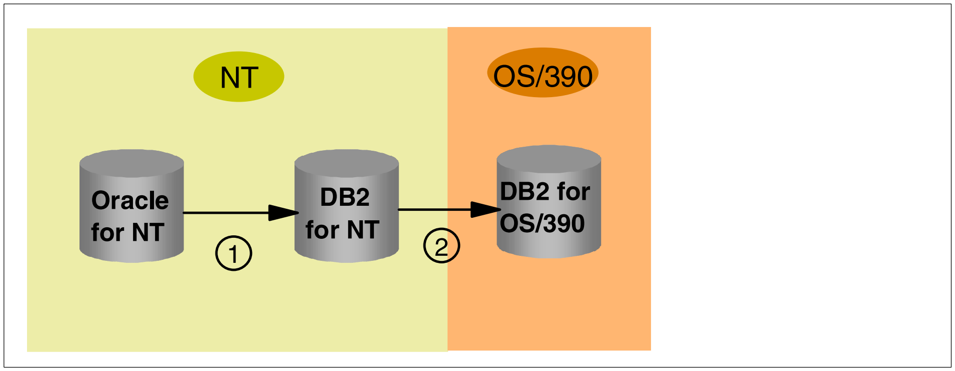


Figure 5-1 Two-phase migration: Oracle for NT to DB2 for NT to DB2 for OS/390

The two-phase migration consists of the following:

- Phase one: migrate Oracle for NT to DB2 for NT

  This migration process is described in Chapter 4, “Migrating Siebel data from Oracle for NT to DB2 for NT” on page 53.

- Phase two: migrate DB2 for NT to DB2 for OS/390

  This migration process is described in Chapter 3, “Migrating Siebel data from DB2 for NT to DB2 for OS/390” on page 31.

The advantage of the two-phase migration is that it breaks the migration process into smaller steps so that different skill sets can accomplish each step.

- The first phase, Oracle for NT to DB2 for NT, requires mostly a DBA familiar with the NT platform and with Oracle and DB2 skills. This phase also makes it possible to detect and resolve some of the migration issues on the NT tier, taking advantage of the DBA skills available on this platform.
- The second phase, DB2 for NT to DB2 for OS/390, requires mostly DB2 for OS/390 DBA skills with some understanding of DB2 for NT and its connectivity to the DB2 for OS/390 platform.

Each phase can be planned at different times with different people. Little interaction is required between the different skill sets.

The downside of this method is that it takes more time because the data is moved twice, but if the volume of data to move is small, the time it takes to move the data might not be an issue. If the volume of data to move is large, the time it takes to move the data might then become an issue.

5.2 One-phase migration - Oracle for NT to DB2 for OS/390

Figure 5-2 shows the one-phase migration from Oracle for NT to DB2 for OS/390.

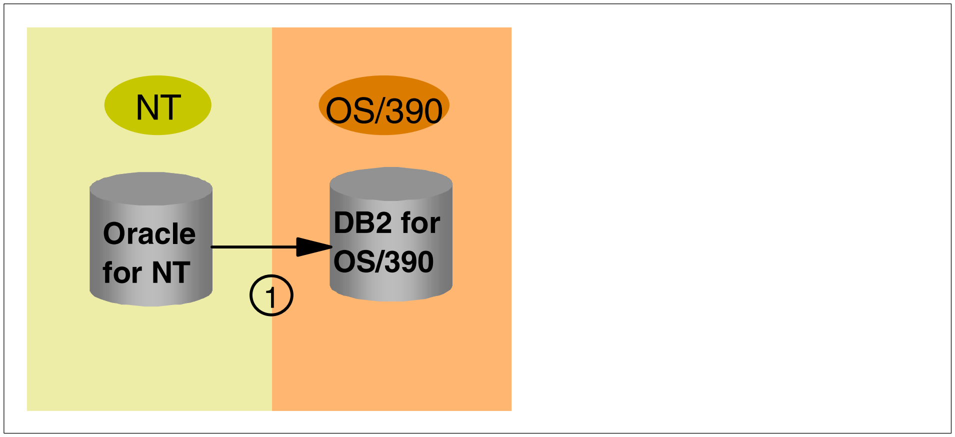


Figure 5-2 One-phase migration: Oracle for NT to DB2 for OS/390

The advantage of the one-phase migration is that it is faster than the two-phase migration. You move the data once. With large volumes of data to move, this method is better.

On the other hand, this method requires a higher interaction of skill sets, such as Oracle/DB2 for NT and DB2 for OS/390.

We consider the following methods here:

- Dataexp/Dataimp
- Dataexp/FTP/DB2 Load
- Relational Connect/DB2 Load

5.3 Dataexp/Dataimp - no schema changes

This migration scenario assumes that there are no source object names that violate the DB2 for OS/390 naming conventions. There are no schema changes to take care of at the target environment.

The migration process, with no schema changes, is straightforward and very similar to the one described in Chapter 3, “Migrating Siebel data from DB2 for NT to DB2 for OS/390” on page 31. The migration process includes the following steps:

- Generate a list of source tables to migrate
- Clean up target tables on DB2 for OS/390
- Export data from Oracle for NT with Dataexp
- Import data into DB2 for OS/390 with Dataimp
- Validate the migration

5.4 Dataexp/Dataimp - with schema changes

You will typically have schema changes if you have customized, in your source Oracle environment, any database objects that violate the size limitations imposed by the target DB2 for OS/390 environment. You will have to fix those size limitation issues when migrating to the DB2 for OS/390 environment.

Siebel Systems and the IBM Hursley laboratory tested this scenario in a joint effort as a proof of concept at a customer site in UK.

5.4.1 Verifying object names

DB2 for OS/390 allows a maximum of 18 characters for table, index and column names, and up to 255 bytes for index key length. If you have any source table, column and index names that exceed these limitations, you must address the issues in one of the following ways:

- Consolidate object names in the source environment before starting the migration. This is the recommended approach because it brings both the source and target environments in line with the DB2 for OS/390 naming conventions, which will be used once the migration is accomplished.
- Consolidate object names during the migration. This is doable but is not the simplest and easiest way of accomplishing it.

5.4.2 Consolidating object names before the migration

The migration process is as follows:

- Run the validate_obj_names.ksh script against the source Oracle database. Note that this script is shipped with the DB2 for OS/390 installation. Navigate to the d:\sea621\dbsrvr\db2390 subdirectory to find it. If you do not have DB2 for OS/390 install scripts available on your source environment, you will not see this script. In this case you can still directly execute the relevant SQL statements (see Appendix F, “Validating object names” on page 169).

  The validate_obj_names.ksh script generates the List of Invalid Objects Report, which lists all objects that exceed the DB2 for OS/390 size limitations for table, column and index names and sizes.

  Review the report and fix all source objects that violate the maximum length limit for DB2 for OS/390. Do this on the source Oracle environment before starting the migration.

  Make sure that the DB2 for OS/390 tables are also customized accordingly at the target site. The DBA can do the customization manually on OS/390.

- Generate a list of tables to migrate using the following SQL at the source site:

  ```
  SELECT NAME FROM SIEBEL.S_TABLE
  WHERE (TYPE LIKE ‘DATA%’ OR TYPE = ‘EXTENSION’)
  AND NAME NOT IN (‘S_DOCK_STATUS’,’S_DOCK_TXN_LOG’)
  ORDER BY NAME
  ```

  The output of the SQL statement gives the list of source tables to migrate. Save them into a file that will be used as input to Dataexp.

- To clean up target tables, use the following SQL at the target site to generate the SQL DELETE statements:

  ```
  SELECT ‘DELETE FROM SIEBEL.’||NAME||’;’FROM SIEBEL.S_TABLE
  WHERE (TYPE LIKE ‘DATA%’ OR TYPE = ‘EXTENSION’)
  AND NAME NOT IN (‘S_DOCK_STATUS’,’S_DOCK_TXN_LOG’)
  ORDER BY NAME
  ```

  The output of this SQL statement builds the SQL DELETE statements. Save those statements into a file. Run those DELETE statements against DB2 for OS/390.

- Rename the target repository using Siebel Tools. See “Renaming the repository” on page 60.

- Move the repository and synchronize the schema using dev2prod. See “Moving the repository and synchronizing the schema” on page 61.

- Recompile the .SRF file using Siebel Tools. See “Recompiling the SRF file” on page 64.

- Export data from Oracle for NT using Dataexp. See “Exporting data with Dataexp” on page 66.
- Import data into DB2 for OS/390 using Dataimp. See “Importing data with Dataimp” on page 67.
- Validate the migration. Connect from the Siebel client application to OS/390. Navigate to Siebel Call Center and make sure that the migrated user data exists there.

5.4.3 Consolidating object names during the migration

Alternatively, you can consolidate object names during the migration process.

Figure 5-3 shows an Oracle for NT to DB2 for OS/390 migration using the Dataexp/Dataimp process, including object name size modifications.

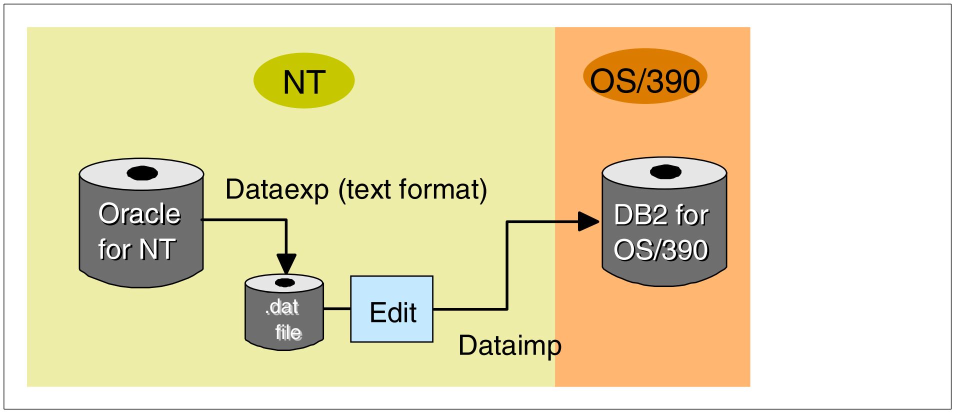


Figure 5-3 Dataexp/Dataimp migration process with object name size modifications

The migration process is as follows:

- Generate a list of tables to migrate using the following SQL:

  ```
  SELECT NAME FROM SIEBEL.S_TABLE
  WHERE (TYPE LIKE ‘DATA%’ OR TYPE = ‘EXTENSION’)
  AND NAME NOT IN (‘S_DOCK_STATUS’,’S_DOCK_TXN_LOG’)
  ORDER BY NAME
  ```

  The output of the SQL statement gives the list of tables to migrate. Save it into a file.

- Clean up target tables in DB2 for OS/390 using the following SQL to generate the SQL DELETE statements:

  ```
  SELECT ‘DELETE FROM SIEBEL.’||NAME||’;’FROM SIEBEL.S_TABLE
  WHERE (TYPE LIKE ‘DATA%’ OR TYPE = ‘EXTENSION’)
  ```

```
AND NAME NOT IN (‘S_DOCK_STATUS’,’S_DOCK_TXN_LOG’)
ORDER BY NAME
```

The output of this SQL statement builds the SQL DELETE statements. Save them into a file. Run these DELETE statements against DB2 for OS/390.

Export data with Dataexp using the text format option. The last switch, /Tt, makes it possible to have the file in text format.

```
dataexp /U sadmin /P sadmin /C SiebSrvr_SiebelOracle /D siebel /F
dataexp.dat /I dataexp.inp /l dataexp.log /Tt
```

This lets you have not only the data but the table and column names in the same file. You can then edit the .dat file.

- Edit the .dat file
  - First, determine which source objects need to be modified to conform to DB2 for OS/390 size limitations. Use the validate_obj_names.ksh script, which generates the List of Invalid Objects, or run the SQL statements described in Appendix F, “Validating object names” on page 169, to determine the offending object names and index key sizes.
  - Once you have the list of the offending object names, you can update the .dat file, which is in text format. “The .dat file” on page 171 shows a one-table example of a .dat file in text format.
- Make sure that the corresponding DB2 for OS/390 objects are correctly defined and created at the target site.
- Rename the repository at the target using Siebel Tools. See “Renaming the repository” on page 60.
- Move the repository and synchronize the schema with dev2prod. See “Moving the repository and synchronizing the schema” on page 61.
- Import data with Dataimp

  To speed up the import process into DB2 for OS/390, you can also split Dataimp into multiple batch processes by generating multiple dataexp .dat files. For example, the SQL that extracts the table names can be split by type of tables or alphabetic order. Once this is done, several Dataimps can execute in parallel against each .dat file previously generated.
- Use Siebel Tools to update the business components in the repository at the target OS/390 site. Business components that reference the table, index, and column names we changed must also be updated. This extra step is needed to make sure that the business logic is using the correct object names.
  - The business components need to call the right column and field names.
  - Scripts, if any, also need to be changed.

  From Siebel Tools, you can also export the business component as an .SIF file, edit and change it, and import the modified file into Siebel Tools.

- Next, the .SRF file needs to be created by recompiling in Siebel Tools. This .SRF needs to be distributed to all clients.
- Finally, you validate the migration by connecting to Siebel Call Center and verifying that the migrated data is there.

5.5 Dataexp/FTP/DB2 Load

The Dataexp/FTP/DB2 Load migration method is an alternative to Dataexp/Dataimp. When large volumes of data are involved, Dataimp can become inappropriate for moving the data over to the OS/390 platform for the following reasons:

- Dataimp uses dynamic SQL INSERTs to load the target DB2 for OS/390 tables remotely over a DRDA connection. A local batch process, such as the DB2 Load utility on OS/390 can perform faster in loading large volumes of data.
- With large volumes of data to load, the dynamic SQL technique causes a flooding of the logs and generates many archive logs on the OS/390 site.
- Dataimp does not issue COMMITs. As a result, parts of the DB2 for OS/390 catalog are locked out, preventing any other dynamic SQL programs from running.
- Many page splits may also occur in the indexes.

Migration process

We recommend that you consolidate object names up front in the Oracle source environment before starting the migration. The first part of this process is the same as the one described in 5.4.2, “Consolidating object names before the migration” on page 77.

The migration process is as follows:

- Consolidate object names. Run the validate_obj_names.ksh script against the source Oracle database. Review the List of Invalid Objects Report, which lists all objects that exceed the DB2 for OS/390 size limitations for table, column and index names and sizes. Fix the problem in the Oracle source environment before starting the migration. Consolidate object names and sizes accordingly on the target DB2 for OS/390 site.
- Generate a list of source tables to migrate.
- Clean up target tables.
- Rename the target repository using Siebel Tools.
- Move the repository and synchronize the schema at the target.

- Recompile the SRF file using Siebel Tools.
- Export data (in binary format) from Oracle using Dataexp:

  ```
  e:\sea621\oracle\siebsrvr\bin\dataexp /u userid /p password /c ODBC
  name/d tablecreator /f outputfilename /t binary /I tablenamesfile
  ```

  At the end of Dataexp execution, a report is produced stating how many rows have been extracted from each table. Note this information to check and validate your migration later.

  Dataexp produces a .dat output file. FTP this file to OS/390 using the binary option to ensure that it is sent as an ASCII file.

- Size the DB2 for OS/390 table spaces. You can do this manually or automate it as follows:
  - Produce, at the source site, a list containing the table name and a count of the number of rows in that table.
  - FTP that file to OS/390. It will be read in by the REXX procedure.
  - Develop a REXX procedure to generate, for each table space, an ALTER statement with a PRIQTY based on the maximum length of records in each of the table spaces. An example of such a REXX procedure is provided in “REXX procedure” on page 175.
  - Execute the REXX procedure using “JCL to run the REXX procedure” on page 178. The REXX procedure builds the ALTER statements and saves them into a file. The following are examples of such ALTER statements:

    ```
    ALTER TABLESPACE SIEBEL00.DDDDD601
    PRIQTY 684 SECQTY 68;
    ALTER TABLESPACE SIEBEL00.DDDDD602
    PRIQTY 56 SECQTY 5;
    ALTER TABLESPACE SIEBEL00.DDDDD603
    PRIQTY 1 SECQTY 1;
    ALTER TABLESPACE SIEBEL00.DDDDD604
    PRIQTY 1 SECQTY 1;
    ALTER TABLESPACE SIEBEL00.DDDDD606
    PRIQTY 1 SECQTY 1;
    ALTER TABLESPACE SIEBEL00.DDDDD607
    PRIQTY 1 SECQTY 1;
    ```

  - Execute the ALTER statements at the target DB2 for OS/390 site.
- At this point, you need to develop a program to transform the format of Dataexp output (.dat file) into DB2 internal format. An example of such a program is provided in , “PLFSIEBL COBOL program” on page 179.

You must compile this program on OS/390 with the TRUNC(BIN) option. COBOL, by default, truncates on the number in the picture clause. So PIC S9(4) COMP, for example, would hold a number up to 9999. But DB2 SMALLINT can hold a number up to 32767. If TRUNC(STD) is used, then 32767 in DB2 would be seen as 2767 by COBOL. TRUNC(BIN) truncates at the byte level, so COBOL will still see 32767.

The program also handles the date format differences between Oracle (10 characters) and DB2 (26 characters). It pads the Oracle date fields with zeros on the right up to 26 characters.

PLFSIEBL is a COBOL program that extracts the data from the .dat file and creates load data in DB2 internal format. It also generates the DB2 Load utility cards. A LOADFILE and a LOADCARDS file are created for each table space as shown in Figure 5-4.

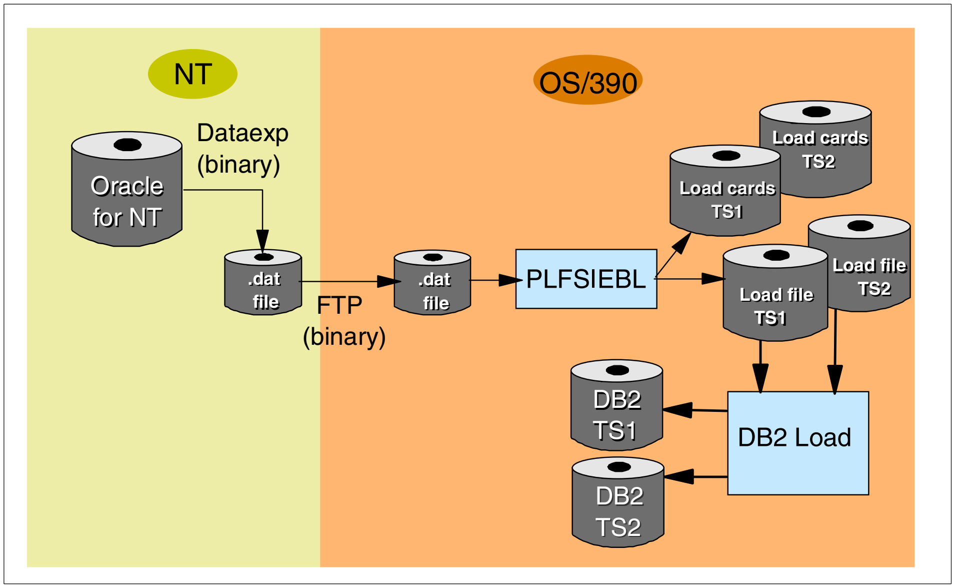


Figure 5-4   Dataexp/FTP/DB2 Load migration process

- Run the PLFSIEBL program using the “JCL to run the PLFSIEBL program” on page 204.
- After the LOADFILE and LOADCARDS files are created, the next step is to run them through the DB2 LOAD utility with the LOG=NO option. See “JCL to run the DB2 LOAD utility” on page 205. Table spaces can be loaded in parallel by running multiple Load jobs. Statistics are updated as part of the Load job.

- Validate the migration. You should check that the number of rows loaded at the target corresponds to the number of rows extracted by Dataexp and put in the .dat file.
- The final step is to take an image copy.

5.6 Relational Connect/DB2 LOAD

This data migration tool was designed and prototyped by the DB2 for OS/390 Porting Center at IBM Silicon Valley Laboratory (SVL). It extends and refines an approach used successfully for migrating Siebel database data from DB2 for NT to DB2 for OS/390, and was architected to meet the following objectives:

- Perform well when migrating gigabytes or terabytes of data
- Minimize the use of file I/O and DASD resources
- Minimize datatype conversions
- Reduce the complexity of migrating data from Oracle to DB2 for OS/390

Other approaches for migrating large quantities of data from relational data stores to DB2 for OS/390 often do not perform well and are overly complex. Poor performance and complexity can be attributed to a variety of factors, including the use of SQL to both extract the data from the source data store and place the data into DB2 for OS/390; the writing of a large number of records to the DB2 log, the storing of the data in one or more intermediate data stores (e.g., local file systems); performing multiple datatype conversions as the data is moved between environments; the use of less efficient data transfer mechanisms; and the use of processes that are not fully automated.

This data migration tool uses DB2 for OS/390 bulk data loading interfaces (i.e., the DB2 LOAD Utility) to place the data into DB2 for OS/390. LOAD LOG(NO) is specified for the load so that no logging occurs during the load process. The jobs that extract the data from the source data store and place the data into DB2 for OS/390 execute in parallel. The tool eliminates the use of intermediate data stores, minimizes the datatype conversions that are performed, and transfers the data from the source machine to the target machine in large blocks, using the efficiencies of the DRDA protocol. In addition, the setup, creation, and execution of the data migration jobs is fully automated.

Migration process

Figure 5-5 on page 84 illustrates the migration process using the Relational Connect/DB2 Load Utility method.

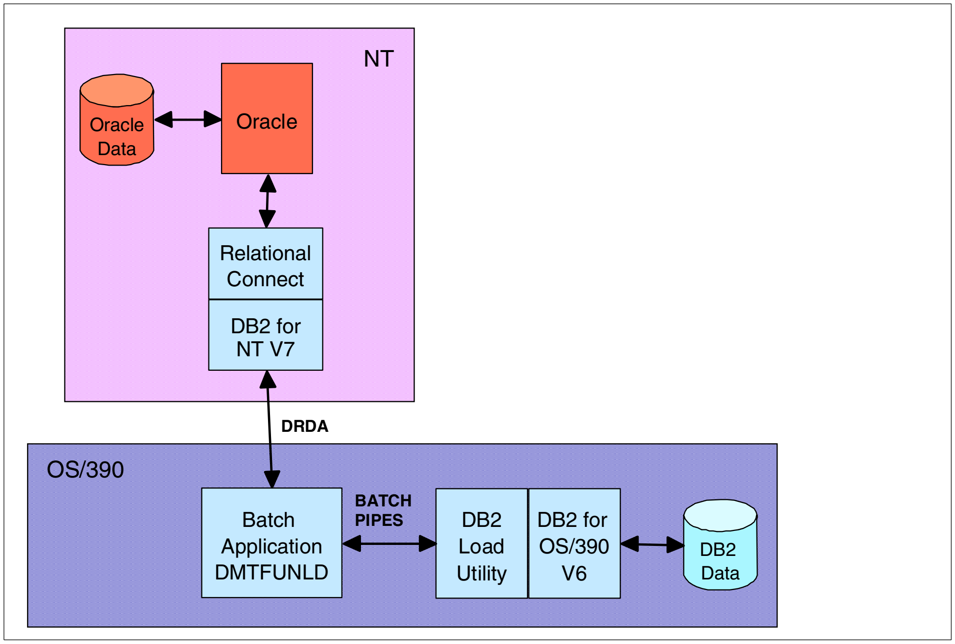


Figure 5-5 Relational Connect/DB2 Load migration process

The data migration process is initiated by DMTFUNLD, a batch application that executes under OS/390. Each invocation of the application does the following:

1. Unloads a table from an Oracle database using Relational Connect and DB2 for NT by executing a SELECT * FROM tablename statement.
2. Uploads the table to the OS/390 machine using DRDA flows.
3. Generates the DB2 for OS/390 LOAD Utility control statement for the subsequent load of the table into DB2 for OS/390.

The LOAD Utility control statement has the following form:

```
LOAD DATA LOG NO INDDN ddname ENFORCE NO RESUME YES
SORTKEYS 150000000 INTO TABLE into_table_specification
```

The batch application is designed to pass the LOAD Utility control statement and the data to the DB2 for OS/390 LOAD Utility using Batch Pipes.

Batch Pipes are a performance option that can significantly cut down the overall elapsed time of the migration process. They allow you to:

- Parallelize the unload of the source data and the load into the target database
- Reduce the number of I/O operations and the use of DASD by transferring data through processor storage rather than to and from DASD

Figure 5-6 explains the Batch Pipes concept.

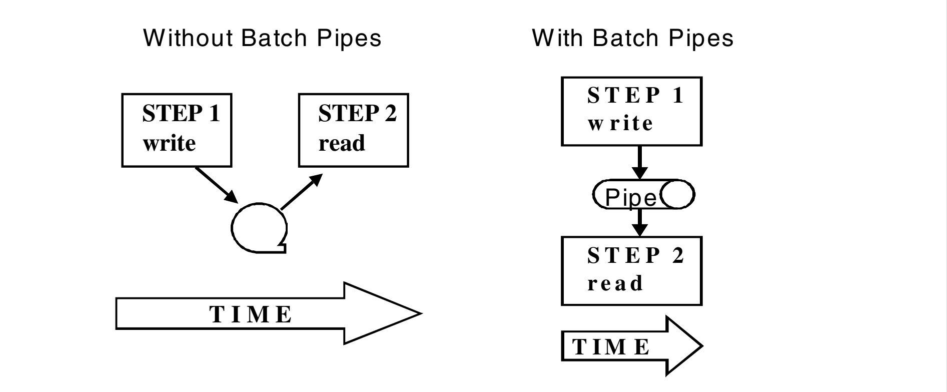


Figure 5-6 OS/390 Batch Pipes concept

With Batch Pipes you can pipe the output of DMTFUNLD directly into the DB2 LOAD Utility input as shown in Figure 5-7.

.

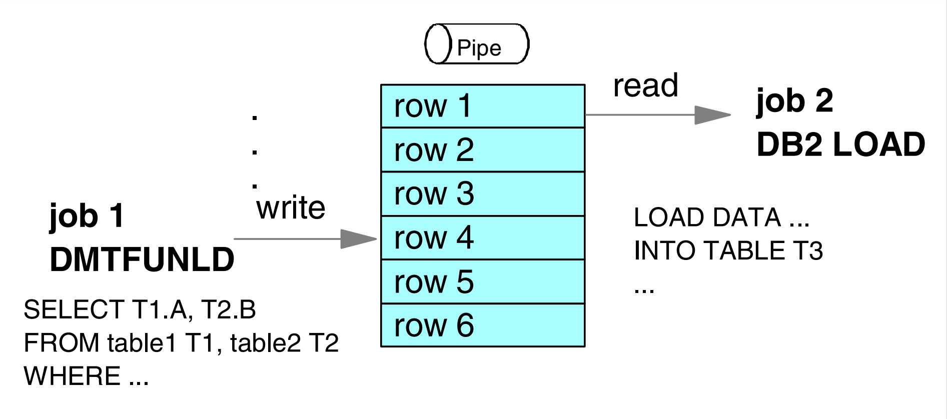


Figure 5-7 Piping the DMTFUNLD output into the DB2 Load Utility input

The use of Batch Pipes is recommended but not required.

In addition, multiple instances of DMTFUNLD can be executed concurrently so that multiple tables can be migrated in parallel from the Oracle server to DB2 for OS/390.

The tool also has the capability to create a copy of the data being loaded—in parallel with the execution of the extraction and the load. This copy is useful in situations where the amount of data being migrated is large and the LOAD Utility fails to execute to completion because it permits a restart from the last internal LOAD Utility checkpoint rather than from the start of the load phase. This optional facility does create a copy of the data in an intermediate data store, the local OS/390 file system.

This discussion of the migration tool makes the following assumptions about the Oracle and DB2 schemas:

- The schemas contain the same tables (for example, all of the Siebel database objects and data will be migrated from the Oracle source system to the DB2 for OS/390 target system).
- The DB2 tables will have the same table and column names as the Oracle tables. The Oracle datatypes associated with columns will be replaced with equivalent DB2 datatypes.

These assumptions permit the existing Siebel applications to access the DB2 for OS/390 tables and preserve the referential integrity relationships that are introduced and managed by those applications. If the Oracle and DB2 schemas are not the same, then the source and target schemas need to be synchronized prior to the use of the migration tool. This can be accomplished using tools described in the Siebel Tools Reference, which is contained in the Siebel Bookshelf.

The steps to migrate are as follows:

- Install the source code for DMTFUNLD, the JCL for the precompile, assemble, link-edit, and bind of DMTFUNLD, and the DMT REXX EXEC in your favorite OS/390 assembler source code, JCL, and REXX libraries.
- Install the DMTASU REXX EXEC in your favorite NT REXX directory.
- Precompile, assemble, link-edit, and bind the plan for DMTFUNLD. Grant EXECUTE authority on the plan for DMTFUNLD to the user or user IDs that will be performing the data migration.
- Configure DB2 for NT V7 and DB2 Relational Connect as a federated system for access to Oracle data.
- Modify the configuration of DB2 for NT so that DB2 can retrieve data from large Oracle tables containing one or more columns having a datatype of long.
- Generate a list of source tables to be migrated using the REXX EXEC DMTASU.
- Migrate the Siebel database schema from Oracle to DB2 for OS/390.

- Configure the DB2 for OS/390 Communications Database so that DB2 for OS/390 can function as a DRDA Application Requester to access the remote Oracle server via DB2 for NT.
- Use the REXX EXEC DMT to generate the JCL for the unload and load of the source tables to be migrated. The JCL generated for the unload initiates and synchronizes both the unload and load jobs.
- Clean up the target tables.
- Execute the JCL for the unload.
- Validate the migration.

Performance results

The elapsed time for migrating a table depends on a number of factors, including the size of the table, the number of columns, the number of columns of type Oracle long, and the number of indexes created on the table.

A performance assessment of this data migration tool is currently underway. In one of our early performance runs, we migrated the table S_NOTE_OPTY in 1 hour and 13 minutes. S_NOTE_OPTY contains 12 columns, has one column of type Oracle long, and has two indexes: S_NOTE_OPTY_F2 and S_NOTE_OPTY_P1. Our instance of this table contained 2,056,254 rows or about 1.54 gigabytes of data.

Availability of the Relational Connect/DB2 Load Utility tool

At the time of writing, the Relational Connect/DB2 Load Utility tool is not generally available for use by customers. The use of this tool can be made available in customer environments through DB2 for OS/390 Data Management Consulting Services at IBM Silicon Valley Laboratory. Please contact your IBM representative for further details.

A

Implementing the Siebel source environment on NT

This section is intended for those who want to create a test migration environment and need to set up a source NT environment from which to migrate.

Those who already have a source environment, such as a production environment, can skip this section and go directly to Chapter 2, “Implementing the target Siebel environment on OS/390” on page 11.

Setting up a source environment

In order to document our migration scenario, we needed a source Siebel system to migrate from. Figure A-1 shows the environment we created for this purpose.

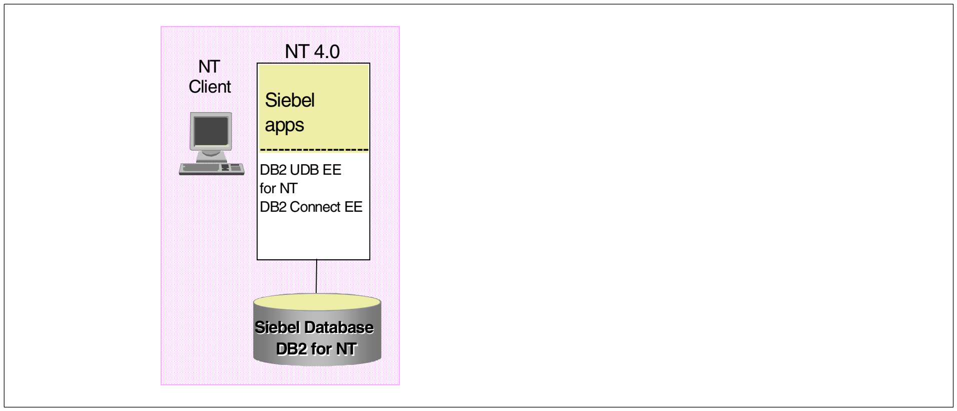


Figure A-1 Siebel source environment on NT

To achieve our Siebel implementation on NT we followed the guidelines described in *Installing Siebel 2000 On Microsoft Windows NT 4.0 Using IBM's DB2 UDB 6.1,* SWG CECI Bulletin, which you can find only on the following IBM internal Web site:

```
http://integration.raleigh.ibm.com/CPITWeb/CPITWeb.nsf/Main?OpenPage
```

We found this document very useful; it saved us a lot of time. It is reproduced in this section, updated with the values we used for our implementation.

This section contains the procedures we used to create our Siebel Server environment on NT, supporting the Siebel database on DB2 for NT. The scenario does not intend to provide a production environment, but was designed rather to let us install just enough to allow us to bring up a Siebel 2000 system to use as a source environment to migrate from.

We discuss the following:

- Installing the base NT software
- Installing DB2 for NT
- Configuring DB2 for Siebel 2000
- Creating the Initial DB2 database
- Installing the Siebel Gateway Server
- Installing the Siebel Server
- Installing the Siebel Database Server
- Initializing the Siebel database
- Verifying the install

- Installing Siebel Tools
- Creating sample data

Installing the base NT software

The following product set is required for installing the Siebel application on NT:

- Microsoft Windows NT 4.0 Server with Service Pack 5 or 6
- Microsoft Office 2000
- Adobe Acrobat Reader 4.0
- Microsoft Internet Explorer 5.0
- IBM DB2 EE for NT V6.1 with DB2 Fix Pack 6s (We used Fix Pack 3sa because it was the only one available when we did our tests).
- Siebel 2000 V6.2.1 for Microsoft Window

The implementation procedures require a number of files to be downloaded from the Web. We have listed them here in case you want to download them before they are called out in the procedures:

- DB2 Connect EE Fix Pack:

  `ftp://ftp.software.ibm.com/ps/products/db2/fixes/english-us/siebel/siebel2000/nt/FP6s`

- Microsoft Windows NT Service Pack 5:

  `http://www.microsoft.com/ntserver/nts/downloads/recommended/sp5/128bitX86/`

- We already had Adobe Acrobat Reader on our machine, but if you do not, it is available at:

  `http://www.adobe.com/products/acrobat/readstep.html`

Installing Microsoft Windows NT 4.0 server

We chose NT as our application server platform and installed Microsoft Windows NT 4.0 server with Service Pack 6. The installation procedure is as follows:

1. Install Microsoft Windows NT 4.0 server with Service Pack 6.

   Our recommendation for hardware includes the following:

   – Minimum processor speed of 300 MHz
   – 512 Mb of RAM
   – 10 GB of DASD, partitioned into a minimum of two logical drives: a C drive of 2 GB, and a D drive of the remaining 8 GB, both formatted for the NTFS file system

2. Create an appropriate machine name (ITSONT0, in our example).
3. Make sure that the TCP/IP protocol is operational.
4. Make sure that Internet Explorer is configured and working.

Installing Microsoft Office 2000

Siebel requires the Microsoft Office suite for their solution; even though we did not use it for our project, the Siebel installation procedures require it.

1. Insert the Microsoft Office 2000 CD-ROM into the drive and wait for the Installation setup to start. If it does not start automatically, select **Start->Programs->Windows NT Explorer** and double-click the **Setup.exe** program in the root directory of the CD-ROM to start the installation.
2. Enter your Customer Information and click **Next >>.**
3. Select **I accept the terms in the license Agreement** and click **Next >>**.
4. Click **Customize…**, choose the location where you want Microsoft Word 2000 to be installed, and click **Next >>**.
5. Make sure that the Update Windows to Include: screen shows Microsoft Internet Explorer 5.0 - Standard in the pick list, and click **Next >>**.
6. Press the **v** beside Microsoft Word for Windows and select **Run all from My Computer**. Repeat for Converters and Filters.
7. Click **Install Now**.
8. When prompted regarding whether or not you want to restart your system, click **Yes** to restart.
9. After Windows Update has completed, the message `Finishing Microsoft Office 2000 Setup` will appear.
10. Verify that Microsoft Word is available by selecting **Start->Programs->Microsoft Word** and seeing that Word opens.

Installing Adobe Acrobat

The Siebel application requires the Adobe Acrobat reader (note that the requirement is Adobe Acrobat 3.x or later).

We already had Adobe Acrobat reader 4.0 on our system.

Installing Internet Explorer

When we installed Microsoft Office 2000, it automatically upgraded to Microsoft Internet Explorer 5.0 (this is a function of installing Office 2000).

Installing DB2 for NT

This section describes the implementation of our DB2 for NT environment, including the creation of a DB2 Startup Account, installation of the DB2 server, and verification of the installation.

Creating the DB2 startup account

To create the DB2 user startup account, do the following:

1. Select **Start->Programs->Administrative Tools(Common)->User Manager for Domains**.
2. Make SADMIN a member of the Administrators group.
3. Make SADMIN the password and set the password to never expire.
4. Add **Act as Part of the Operating System** Rights in NT.
5. In User Manager for Domains, select **Policies->User Rights...**

   Click the box to the left of Show Advanced User Rights.
6. From the Rights pull-down, select **Act as Part of Operating System**.
7. If the SADMIN account does not appear in the Grant To box, click **Add...**, click **Show Users**, scroll down in the Names box and select **sadmin**, and press **Add** followed by **OK** to add the account.
8. Follow the same procedure with Logon as a service.
9. Click **OK**.

Installing the DB2 server

To install DB2 for NT V6, do the following:

1. Log off and log in to the system, using the newly created sadmin account.
2. Shut down any other running programs so that the setup program can update files as required.
3. Insert the DB2 for NT CD-ROM into the drive and wait for the Installation setup to start. If it does not start automatically, select **Start->Run...,** click **Browse…,** navigate to the \EE subdirectory, double-click the **Setup.exe** program, and click **OK** to begin the installation.
4. When the Welcome to IBM DB2 Universal Database for Windows 32-bit operating systems screen appears, click **Next>**.
5. When the Select Products screen appears, make sure that the DB2 Enterprise Edition check box is checked and click **Next >**.
6. Click **Typical Install**.

7. Set the destination folder and click **Yes** to create the folder (if it doesn't already exist).
8. Click **Next >**.
9. On the Enter Username and Password for the Administration Server screen, enter `sadmin` for the Username, Password, and Confirm password fields and click **Next >**.
10. You may receive the message `Setup is unable to validate the username sadmin`...; click **OK** to continue.
11. When the Start Copying Files screen appears, click **Next>** to begin the file copying process.
12. When the Setup Complete screen appears, select **Yes, I want to restart my computer now** and click **Finish**.
13. Install the DB2 run-time client.

Installing the Siebel 2000 DB2 for NT Fix Pack

Currently the Fix Pack level available for Siebel 2000 is Fix Pack 6s. This is the one you should use. We used Fix Pack 3sa because it was the only one available at the time we did our tests. To install the Fix Pack, do the following:

1. Download the Siebel2000/DB2 Fix Pack from:

   `ftp://ftp.software.ibm.com/ps/products/db2/fixes/english-us/siebel/siebel2000/nt/FP6s/wr21223s.zip.`

2. Log in to the system using the sadmin account.
3. Select **Start->Programs->Windows NT Explorer**, navigate to the directory in which you downloaded the Siebel 2000/DB2 Fix Pack, double-click **Setup.exe**, and click **OK** to begin the installation.
4. When the WARNING screen appears, indicating that there are DB2 processes currently running and locked, click **YES** to stop the processes.
5. When the Welcome screen appears, click **Next >**.
6. When the Choose Destination Location screen appears, click **Next >**.
7. When the Start Copying Files screen appears, click **Next >**.
8. When the Setup Complete screen appears, select **Yes, I want to restart my computer now** and click **Finish**.

Verifying the DB2 installation

Verify the installation as follows:

1. Start First Steps by choosing **Start->Programs->DB2 for Windows NT->First Steps**.
2. Click **Create the SAMPLE Database** on the main panel.
3. When the DB2 First Step screen appears, click **Yes** to continue.
4. The command may take a few minutes. When the SAMPLE database has been created successfully, you receive a completion message.
5. Click **OK**.
6. Once the database has been created, click the **View the SAMPLE Database** to select data from the SAMPLE database. Specify `sadmin` when prompted for the User ID and Password fields, and press **OK** to continue.
7. Select **Script->Execute** and the results should be displayed.
8. Click the **Script** tab and select **Script->Shut Down DB2 Tools** to exit the **Command Center**.
9. Close DB2 First Steps.
10. After you have verified the installation, you can remove the SAMPLE database to free up disk space. Select **Start->Programs->DB2 for Windows NT->Command Window** and enter the `db2 drop database sample` command to delete the SAMPLE database.
11. Type `exit` and press **Enter** to close the Command Window**.**

Configuring DB2 for Siebel 2000

In these sections we describe how to configure and customize the DB2 for NT product just installed.

We used the siebelbf.zip file we downloaded from the IBM intranet site:

```
http://integration.raleigh.ibm.com/CPITWeb/CPITWeb.nsf/Business+Intelligenc
e?OpenView
```

Unzip siebelbf.zip to get the following files:

- db2_db_mgr_cfg.bat
- db2_db2set. bat
- db2_db_cfg.bat
- tablespace.bat
- forceit.bat
- bufpool.bat

You can view the content of those files in Appendix B, “The .bat files” on page 117.

DB2 Database Manager configuration parameters

We set up the DB2 Database Manager configuration parameters by executing the db2_db_mgr_cfg.bat file in a DB2 Command Window.

Table A-1 reflects the final parameter values after the batch file completes execution.

Table A-1 DB2 Database Manager configuration parameters

Parameter	Explanation/Comment	Setting/Comment
UDF_MEM_SZ	UDF shared memory set size (1 KB)	1024
SHEAPTHRES	Sort heap threshold (4 KB)	100000
DIR_CACHE	Directory cache support	YES
ASLHEAPSZ	Application support layer heap size (1 KB)	15
RQRIOBLK	Maximum requester I/O block size (bytes)	65535
QUERY_HEAP_SZ	Query heap size (4 KB)	8192
MAXAGENTS	Maximum number of existing agents	1000
NUM_INITAGENTS	Initial number of agents in pool	0
MAX_COORDAGENTS	Maximum number of coordinating agents	MAXAGENTS[a]
INDEXREC	Index re-creation time	RESTART
MAX_QUERYDEGREE	Maximum query degree of parallelism	1
INTRA_PARALLEL	Enable intra-partition parallelism	NO
FCM_NUM_BUFFERS	Number of internal communication buffers (4 KB)	4096
FCM_NUM_RQB	Number of FCM request blocks	1024
FCM_NUM_CONNECT	Number of FCM connection entries	(FCN_NUM_RQB * 0.75)[1]
FCM_NUM_ANCHORS	Number of FCM message anchors	(FCN_NUM_RQB * 0.75)[1]

[a] To set this value, you must input “-1” for the Setting.

Setting the DB2 environment parameters

Next, set the DB2 environment parameters. We executed the batch file db2_db2set.bat in a DB2 command window.

Table A-2 reflects the final parameter values after the batch file completes execution.

Table A-2 DB2 set parameters

Parameter	Explanation	Setting/Comment
DB2_HASH_JOIN	Turns off hash joins in Optimizer.	NO
DB2_RR_TO_RS	Improves DB2 performance with the Siebel application. *Set to YES only in production environment servers.*[a]	NO
DB2_MMAP_WRITE	Recommended setting only; you should evaluate this setting for your particular configuration and environment.	OFF
DB2_MMAP_READ	Recommended setting only; you should evaluate this setting for your particular configuration and environment.	OFF
DB2_CORRELATED_PREDICATES	When set to YES, the optimizer is able to determine whether predicates in a query are related, which permits DB2 to calculate the filter factor more accurately.	YES

[a] The tools check-out procedure requires an isolation level of “repeatable read.” Turning this parameter on disables all repeatable reads, causing an application to use “read stability.” This status is unacceptable for tools check-out and, therefore, development purposes.

Creating the initial DB2 database

Next, create the skeleton Siebel-DB2 database with initial buffer pool and table spaces, verify that they are created correctly, configure the database, create the database user accounts, and create the shared Siebel File System.

Creating the skeleton Siebel database

To create the skeleton Siebel-DB2 database, we do the following:

1. Select **Start->Programs->DB2 for Windows NT->Control Center,** enter `SADMIN` for the User ID and Password when prompted and click **OK**.
2. Click the plus sign (**+**) beside ITSONT0.
3. Click the **+** beside the Instances.
4. Click the**+** beside the **DB2** Instance.
5. Right-click **Databases**, then select **Create Database using Smart Guide** and insert the values as follows**:**

New database name	`siebeldb`
Comment	`Siebel Database`
Database alias	`siebeldb`

6. Click **Done**.

Creating the initial buffer pools

To create the initial buffer pools, do the following:

1. Click the plus sign (**+)** beside **SIEBELDB**.
2. Click the **Buffer Pools** folder to display the existing list of Buffer Pools, and in the right-hand pane, right-click the IBMDEFAULTBP buffer pool and select **Alter…**.
3. Change the Size in 4 KB pages to 50% of available memory. Right-click the toolbar at the bottom of the screen and select **Task Manager...**. Then, select the **Performance** tab and look at Available under the Physical Memory (K) section on the right side. Divide this value by 8 to obtain the size; for example, 720,000 kilobytes of available memory / 8 or 90,000 4 KB pages.
4. At this point, we created the remaining buffer pools by executing the bufpool.bat file in a DB2 Command Window.

Verifying the buffer pools

To verify that the buffer pools were created correctly, do the following:

1. Go to **DB2 Control Center ->View ->Refresh**.
2. Click the plus sign (**+)** beside ITSONT0.
3. Click the **+** beside the Instances.
4. Click the **+** beside the DB2 Instance.

5. Click the **+** beside Databases.
6. Click the **+** beside SIEBELDB and wait for a few moments for the connect to take place.
7. Click the **Buffer Pools** folder and the new buffer pools should show up in the list, along with the revised setting of the IBMDEFAULTBP buffer pool.

Note that the newly created buffer pools would not become usable until the next time the database is started. You need to do this before creating new table spaces (in the following step) and associating them to the new bufferpools.

Creating the regular and temporary table spaces

Create the required regular and temporary DB2 table spaces by executing the tblspace.bat file in a DB2 Command Window.

Verifying the table spaces

To verify the table space creation, do the following:

1. Go to **DB2 Control Center ->View->Refresh**
2. Click the plus sign (**+)** beside ITSONT0.
3. Click the + beside the Instances.
4. Click the + beside the DB2 Instance.
5. Click the + beside Databases.
6. Click the + beside SIEBELDB and wait a few moments for the connect to take place.
7. Click the **Table Spaces** folder and the new table spaces should show up in the list.
8. Click **Control Center->Exit**.

Configuring the database

Before we executed db2_db_cfg.bat to configure the database, we edited it to change the SORTHEAP parameter to a value of 32 (instead of the existing 20000) as per a Siebel consultant’s recommendation. We then executed db2_db_cfg.bat in a DB2 Command Window.

The final values are reflected in Table A-3 on page 100.

Table A-3 DB2 Database Configuration parameters

Parameter	Explanation	Setting/Comment
DFT_DEGREE	Degree of parallelism (1 - turn query parallelism off)	1
DFT_QUERYOPT	Default query optimization class	5
DBHEAP	Database heap (4 KB)	7429
CATALOGCACHE_SZ	Catalog cache size (4 KB)	5558
LOGBUFSZ	Log buffer size (4 KB)	512
UTIL_HEAP_SZ	Utilities heap size (4 KB)	5000
LOCKLIST	Maximum storage for lock list (4 KB)	5000[a]
APP_CTL_HEAP_SZ	Maximum applications control heap size (4 KB)	152
SORTHEAP	Sort list heap (4 KB)	32[b]
STMTHEAP	SQL statement heap (4 KB)	8192
APPLHEAPSZ	Default application heap (4 KB)	2500
PCKCACHESZ	Package cache size (4 KB)	2048
STAT_HEAP_SZ	Statistics heap size (4 KB)	8000
MAXLOCKS	Percentage of lock lists per application	20
LOCKTIMEOUT	Lock timeout (sec.)	300 or higher
CHNGPGS_THRESH	Changed pages threshold	60
NUM_IOCLEANERS	Number of asynchronous page cleaners	Number of CPUs
NUM_IOSERVERS	Number of I/O servers	Number of disks
INDEXSORT	Index sort flag	YES
SEQDETECT	Sequential detect flag	YES
DFT_PREFETCH_SZ	Default prefetch size (4 KB)	128
LOGRETAIN	Sequential or circular log files	YES[c]

MAXAPPLS	Maximum number of active applications	Based on the number of users plus at least 20 for Application Server connections
AVG_APPLS	Maximum DB files open per application	Depends on the environment
MAXFILOP	Maximum DB files sopped per application	500
LOGFILSIZ	Log file size (4 KB)	8000
LOGPRIMARY	Number of primary log files	100
LOGSECOND	Number of secondary log files	10
SOFTMAX	Percent log file reclaimed before soft checkpoint	80

a. The setting should never be smaller than this, but may be increased.

b. Recommended size; this may increase or decrease depending on the amount of memory in the database server machine and the size of the database.

c. Setting this will cause the database to go into “Backup Pending” state. We recommend leaving this parameter set to the default.

Creating required NT user accounts

Create specific administrative and user accounts as follows:

1. Select **Start->Programs->Administrative Tools(Common)->User Manager for Domains** and copy the Administrator account as SIEBEL. This should create the SIEBEL account with all the needed privileges.

   Uncheck the USER MUST CHANGE PASSWORD box.

   Note that SIEBEL must be capitalized in order for the grantusr.sql script to run correctly later when adding the Siebel Database Server.

2. Select **User->New Local Group**, **sse_role**, and add the SADMIN and SIEBEL accounts to it.

Creating the Siebel File System

In addition to the RDBMS, the Siebel application requires a file system to hold objects such as user documents and spread sheets. To create the directory, open a DOS Command Window and enter:

```
d:
md siebfile
```

To make the file system sharable in read/write, do the following:

1. Navigate to **Start->Programs->Windows NT Explorer**, right-click the new siebfile folder and select **Sharing...**.
2. Click **Shared As:**.
3. Click **Permissions** and verify that Type of Access: is Full Control.
4. If it is not, change it to Full Control.
5. Click **OK**, **Apply**, and then **OK** again.

Installing the Siebel Gateway Server

Next, we installed the Siebel Gateway Server and started the Siebel Gateway Name Server Service.

Installing the Siebel Gateway Server

To install the Siebel Gateway Server, do the following:

1. Insert the *Siebel Windows Server Programs* CD-ROM.
2. Select **Start->Programs->Windows NT Explorer**, navigate to the CD-ROM directory \gtwysrvr, and double-click **Setup.exe** to start the installation program.
3. Read the Welcome to Gateway Server Setup screen and click **Next >** to continue.
4. A notice appears that `Resonate Central Dispatch is not installed`. Click **Yes** to continue installing without Resonate support.
5. Change your directory, if desired, and select **Next >.** For this example we installed Siebel 2000 on the d: drive, so we specified d:\sea621\gtwysrvr as the target directory.
6. Enter the Gateway Server NT Account Information, which is the NT account that will be used to run the NT service. We provided the following values:

Account	`SADMIN`
Password	`SADMIN`
Password (retype)	`SADMIN`

7. Click **Next >**.

8. When the **G**ateway Server NT Services screen appears, click **Next >** to accept the default to start the service automatically.
9. When the Start Copying Files screen appears, click **Next >** to start copying the files.
10. When the Event Log screen appears, review the contents of the Event Log. Look for the message `GtwyNS()NT Service successfully installed`.
11. Click **Next >**.
12. The Restarting Windows screen appears.
13. Select **No, I will restart my computer later** and click **OK**.

At this point , we installed the Siebel 6.2.1.7 patch for Siebel Gateway Server from the distribution CD and followed the installation instructions (execute setup).

Starting the Siebel Gateway Server NT service

We choose not to reboot. To start the Gateway service, do the following:

1. Select **Start->Settings->Control Panel**.
2. Double-click **Services**.
3. Select the **Siebel Gateway Name Server** Service.
4. Click **Start**.
5. The status should be changed to Started.
6. Click **Close** to exit.

Inspecting the Gateway Server directory

To inspect the gateway directory, do the following:

1. Verify that the d:\sie621\gtwysrvr directory is created.
2. Inspect the contents of the GTWsetup.log file located in the d:\sea621\gtwysrvr directory.
3. Verify that there are many .dll files in the d:\sea621\gtwysrvr\bin directory.

   If you use NT Explorer to do this verification, be sure you have “display all files” enabled.

Installing the Siebel Server

In this section, we describe how to create the Siebel Enterprise Server, start the Siebel Enterprise Server NT Service, inspect the server directory, and verify the Siebel Server ODBC Data Source.

Installing the Siebel Server

To install the Siebel Server, make sure that the Siebel Gateway Server is installed and running by doing the following:

1. Select **Start->Programs->Windows NT Explorer**, navigate to the CD-ROM directory **\siebsrvr**, and double-click **Setup.exe** to launch the installation program.
2. Read the Welcome to the Siebel Server Installer screen and click **Next >**.
3. A notice appears indicating that `Resonate Central Dispatch is not installed`. Click **Yes** to continue installing without Resonate support.
4. When the Start the Siebel Gateway Server screen appears, click **Next >** since the Siebel Gateway Server is already started.
5. The Setup Type screen appears; select **Typical** to perform a typical installation and click **Next >**.
6. We specify `d:\sea621\siebsrvr` as the target directory.
7. The Gateway Server Address screen appears; click **Browse** and select **ITSONT0** (our machine name) to specify the Gateway Server Address, then click **OK**.
8. Click **Next >**.
9. The Enterprise Server Information screen appears; accept the default parameters as shown:

Name	`siebel`
Description	`Siebel Enterprise Server`

10. Click **Next >.**
11. When asked if you want to create the Enterprise Server (siebel), click **Yes**.
12. The Siebel File System Location screen appears; click **Browse**, type in `d:\siebfile`, and click **OK** to specify the Siebel File System Location.
13. Click **Next >**.
14. The Server Database screen appears. Make sure that **IBM DB2 Universal Database 6_1** is selected and then click **Next >.**

15. The Database Identification screen appears, we specified the database identification as shown:

Database alias	`siebeldb`
Table Owner	`SIEBEL`

16. Click **Next>**.
17. The Server Database Account Login Information screen appears; specify the database login information as shown:

User Name:	`SADMIN`
Password:	`SADMIN`
Confirm Password:	`SADMIN`

18. Click **Next >**.
19. The Siebel Server screen appears; specify the server information as shown:

Siebel Server Name	`<Machine Name> (for example: ITSONT0)`
Siebel server Description	`Siebel Server`

20. Click **Next >**.
21. The Siebel Server NT Service screen appears; click **Next >** to accept the default to start the Siebel Server NT Service Automatically.
22. The Synchronization Port Assignment screen appears; click **Next >** to accept the default of 40400 for the Synch Manager Port.
23. The eBriefings and eContent Services screen appears; select **Neither** and click **Next >** to turn off eBriefings and eContent Services.
24. The Java Thin Client Help File URL screen appears; type in `http://www.siebel.com/JavaClient/help/start.html` and click **Next >**.
25. The Start Copying Files screen appears; click **Next >**.
26. The Enterprise Server “siebel” has been successfully created... screen appears; click **OK**.
27. When the Event Log screen appears, verify that there are no errors and click **Next >**.
28. When the Setup Complete screen appears, select **No I will restart my computer later** and click **OK**.

Inspecting the Siebel Server directory

Perform a verification as follows:

1. Verify that the d:\sie621\siebsrvr directory is created.
2. Inspect the contents of the SVRsetup.log file located in the d:\sea621\siebsrvr directory.
3. Verify that there are many .dll files in the d:\sea621\siebsrvr\bin directory.

At this point we installed the Siebel 6.2.1.7 server patch (siebsrvr) from the distribution CD and followed the installation instructions (execute setup).

Starting the Siebel Server NT service

Start the service as follows:

1. Select **Start->Programs->Control Panel**.
2. Double-click **Services**.
3. Select the **Siebel Server [siebel_ ITSONT0]** service.
4. Click **Start**.
5. The status should be changed to **Started**.
6. Click **Close** to exit.

Verifying the Siebel Server ODBC data source

The Siebel Server installation program automatically creates the ODBC system data source name (DSN) that it uses to connect to the Siebel Database Server; verify this by doing the following:

1. Select **Start->Settings->Control Panel**.
2. Double-click **ODBC Data Sources**.
3. Click the **System DSN** tab.
4. Select **SiebSrvr_siebel** and click **Configure...**.
5. The **DB2 Message** screen appears asking if you want to connect to the database; click **Yes**.
6. Enter `SADMIN` for the User ID and Password when prompted and click **OK**.
7. The DB2 Message screen appears indicating that the connection completed successfully; click **OK**.
8. Make sure that CLI/ODBC Settings - siebeldb are set as shown:

Data source name	`SiebSrvr_siebel`
Description	`Siebel`

User ID	`SIEBEL`
Password	`SIEBEL`

9. Click **OK**.
10. Click **OK**.

Installing the Siebel Database Server

In this section, we describe how to install the Siebel Database Server code, execute grantusr.sql to create a Siebel Administrator (sadmin) and Database Owner (SIEBEL) of the Siebel database, configure the Siebel DB2 Database instance, and install the stored procedures code.

Installing the Siebel Database Server scripts

To install these scripts, do the following:

1. Select **Start->Programs->Windows NT Explorer** and navigate to the CD-ROM directory \dbsrvr; double-click **Setup.exe** to begin the installation.
2. Read the Welcome to Database Scripts Setup screen and click **Next >** to continue with the setup program.
3. Make sure that **Typical** is selected, change the destination directory to d:\sea621\dbsrvr, if necessary, and click **Next >**.
4. The Event Log screen appears; click **Next >**.
5. `Setup completed successfully` should appear on the Setup Complete screen.
6. Click **Finish**.
7. Install the Siebel 6.2.1.7 database server patch from the distribution CD and follow the installation instructions (execute setup). To commit the changes, we executed forceit.bat in a DB2 Command Window.

Granting database privileges

Next, to grant privileges, do the following:

1. Navigate to **Start->Programs->DB2 for Windows NT->Command Window**.
2. Issue the following commands:

```
DB2 CONNECT TO siebeldb USER sadmin USING sadmin
```

```
DB2 -VF d:\sea621\dbsrvr\db2udb\grantusr.sql
```

Configuring the Siebel DB2 instance

To configure the DB2 instance, do the following:

1. Choose **Start->Settings->Control Panel->Services**.
2. Highlight the **DB2-DB2** service and press **Startup…**.
3. In the **Log On As:** box, press **This Account:**
4. Choose the local computer (**ITSONT0**) in the List Names From: pick list.
5. Highlight **SIEBEL,** click **Add**, and click **OK** set the Password and Confirm password fields to **SIEBEL**, and then click **OK**.
6. Click **Close**.

Installing the stored procedures code

Now transfer and install the user-defined functions (UDFs) and stored procedures on the Siebel Database Server as follows:

1. Choose **Start->Programs->DB2 for Windows NT->Command Window**.
2. In the DB2 Command Window, navigate to the d:\sea621\dbsrvr\db2udb\siebproc\winnt directory, type `installsiebel`, and click **Enter.** Follow the screen prompts to install the files.

Initializing the Siebel database

Next, we created the Siebel schema (tables and columns) in the precreated skeleton Siebel database and imported seed data; edited and ran the imprep.ksh script to import object definitions data (Siebel repository) into the procreated Siebel database; and populated the procreated Siebel File System with the required correspondence templates and Siebel Marketing files.

Creating the Siebel schema

Creating the Siebel schema implies the following:

- Edit, then run the install and imprep batch files to set all variables and create the tables and indexes needed to set up the database server. Modify the specified parameters below.
- Use Notepad or an appropriate editor to edit the install.ksh script in the d:\sea621\dbsrvr\db2udb directory with the appropriate names for our installation, as follows:

```
SRC_USR = SADMIN
SRC_PSWD = SADMIN
SRC_TBLO = SIEBEL
SRC_TBLO_PSWD = SIEBEL
ODBC = SiebSrvr_siebel
DBSRVR_ROOT = d:/sea621/dbsrvr
DATA_AREA = "SIEBEL_4K"
INDX_AREA = "SIEBEL_IDX"
LONG_AREA = "SIEBEL_4KL"
DB16K_AREA = "SIEBEL_16K"
DATABASE_PLATFORM = DB2udb
DB_LANG = enu
DB_UNICODE_FLG = N
DBSERVER_OS = winnt
SIEBEL_HOME = d:/sea621/siebsrvr
```

To accomplish this, do the following:

1. Make sure that the line SRC_USR user SADMIN is in uppercase. This is recommended by Siebel Systems.
2. Make sure that the line SRC_PSWD user password SADMIN is in uppercase. This is recommended by Siebel Systems.
3. Make sure that the line SRC_TBLO table owner user SIEBEL is capitalized.
4. Make sure that the line SRC_TBLO_PSWD table owner password SIEBEL is capitalized.
5. Specify ODBC = SiebSrvr_siebel.
6. Specify DBSRVR_ROOT = d:/sea621/dbsrvr.
7. Specify DATA_AREA = “SIEBEL_4K”.
8. Specify INDX_AREA = “SIEBEL_IDX”.
9. Specify LONG_AREA = “SIEBEL_4KL”.
10. Specify DB16K_AREA = “SIEBEL_16K”.
11. Place the text pound sign “#” (without quotes) in front of the line DATABASE_PLATFORM = Unspecified.
12. Remove the text “#” from the line # DATABASE_PLATFORM = DB2udb.
13. Place the text “#” (without quotes) in front of the line DB_LANG = Unspecified.
14. Remove the text “#” from the line DB_LANG = enu.
15. Place the text “#” (without quotes) in front of the line DB_UNICODE_FLG = Unspecified.
16. Remove the text “#” from the line DB_UNICODE_FLG = N.

17. Place the text "#" (without quotes) in front of the line DBSERVER_OS = Unspecified.

18. Remove the text "#" from the line DBSERVER_OS = winnt.

19. Specify SIEBEL_HOME = d:/sea621/siebsrvr.

20. Save the edited install.ksh file.

21. Select **Start->Programs->Windows NT Explorer,** navigate to the database platform subdirectory d:\sea621\dbsrvr\db2udb, and double-click **sh.exe** (this opens a Korn shell window).

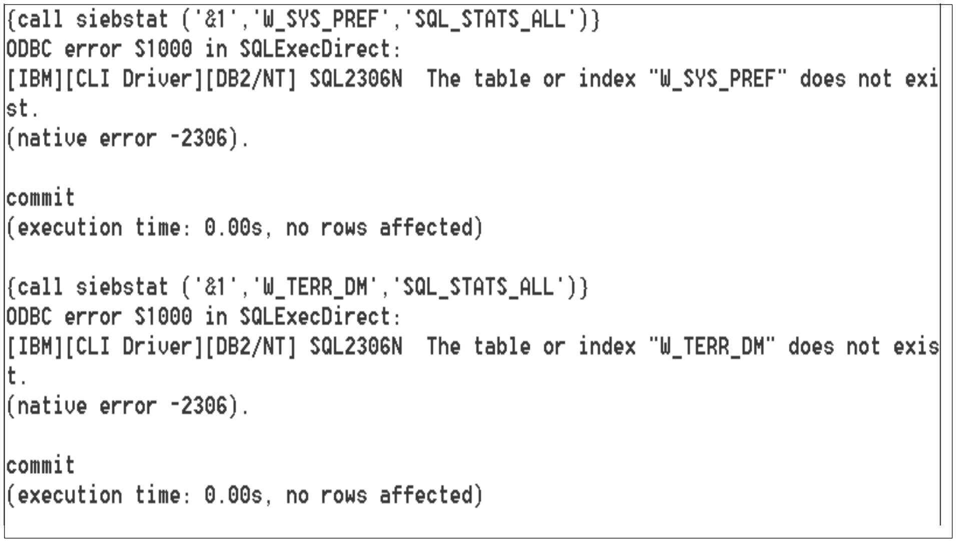
22. In the Korn shell window, type `./install.ksh` and press **Enter**.

23. Press **Y** and **Enter** if the values are correct (type any other key to terminate if the values are incorrect).

24. The install.ksh command should run approximately 45 minutes. It *must* run in this directory, or it will not set all the environment variables.

    Note: You must *finish* running install.ksh before you run the imprep.ksh command file.

    Figure A-2 shows some error messages we received. W_ tables are not yet created at this point of the installation. We therefore got error messages indicating they do not exist. It is safe to ignore those error messages.



```
{call siebstat ('&1','W_SYS_PREF','SQL_STATS_ALL')}
ODBC error S1000 in SQLExecDirect:
[IBM][CLI Driver][DB2/NT] SQL2306N  The table or index "W_SYS_PREF" does not exi
st.
(native error -2306).

commit
(execution time: 0.00s, no rows affected)

{call siebstat ('&1','W_TERR_DM','SQL_STATS_ALL')}
ODBC error S1000 in SQLExecDirect:
[IBM][CLI Driver][DB2/NT] SQL2306N  The table or index "W_TERR_DM" does not exis
t.
(native error -2306).

commit
(execution time: 0.00s, no rows affected)
```

Figure A-2 Error messages

25. Type `exit` and press **Enter** to close the Korn shell window.

Verifying the results of install.ksh

To verify the results of the installation, do the following:

1. Select **Start->Programs->DB2 for Windows NT->Command Center**.
2. In the interactive window, enter:

   ```
   connect to siebeldb user sadmin using sadmin
   ```

3. Click **Script->Execute** or the gears icon at the top; the result should be that you are connected to the database.
4. In the interactive window, enter:

   ```
   select count (*) from SIEBEL.S_ZIPCODE
   ```

5. Click **Script->Execute** or the gears icon at the top; the result displayed should be approximately 42785.
6. Select **Results->Shutdown DB2 tools** to close the Command Center.

Importing the Siebel object definitions

To import the object definitions, we used Notepad to edit the imprep.ksh script in the d:\sea621\dbsrvr\db2udb directory as follows:

```
SRC_USR = SADMIN
SRC_PSWD = SADMIN
SRC_TBLO = SIEBEL
ODBC = SiebSrvr_siebel
REPOS_NAME = “Siebel Repository”
DBSRVR_ROOT = d:\sea621\dbsrvr
DATABASE_PLATFORM = DB2udb
DB_LANG = enu
SIEBEL_HOME = d:\sea621\siebsrvr
```

To accomplish the above, do the following:

1. Make sure that the line SRC_USR user SADMIN is in uppercase.
2. Make sure that the line SRC_PSWD user password SADMIN is in uppercase.
3. Make sure that the line SRC_TBLO table owner user SIEBEL is capitalized.
4. Specify ODBC = SiebSrvr_siebel.
5. Specify REPOS_NAME = “Siebel Repository”.
6. Specify DBSRVR_ROOT = d:\sea621\dbsrvr.
7. Place the text pound sign “#” (without quotes) in front of the line DATABASE_PLATFORM = Unspecified.
8. Remove the text “#” from the line “ DATABASE_PLATFORM = DB2udb.
9. Place the text “#” (without quotes) in front of the line DB_LANG = Unspecified.

10. Remove the text “**#**” from the line **DB_LANG = enu**.
11. Specify SIEBEL_HOME = d:\sea621\siebsrvr.
12. Save the edited imprep.ksh file.
13. Navigate to the database platform subdirectory and double-click **sh.exe** (this opens a Korn shell window).
14. In the Korn shell window, type `./imprep.ksh` and press **Enter**.
15. Press **Y** and **Enter** if the values are correct (type any other key to terminate if the values are incorrect).
16. The imprep.ksh command should run approximately 20 minutes.
17. Type `exit` and press **Enter** to close the Korn shell window.

Verifying the results of imprep.ksh

To verify that imperp.ksh ran successfully, do the following:

1. Select **Start->Programs->DB2 for Windows NT->Command Center**.
2. In the interactive window, enter:

   ```
   connect to siebeldb user sadmin using sadmin
   ```

3. Click **Script->Execute** or the gears icon at the top; the results should be that you are connected to the database.
4. In the interactive window, enter:

   ```
   select count(*) from SIEBEL.S_VIEW
   ```

5. Click **Script->Execute** or the gears icon at the top; the results displayed should be approximately `1780`.
6. Select **Results->Shutdown DB2 tools** to close the Command Center.

Populating the Siebel File System

Specific files needed to run the Siebel File System are provided with the Siebel Database Server software. These files need to be manually moved to the subdirectory named files, which is created automatically when you install the Siebel Database Server. You must populate the File System directory with these files after installing the Database Server, and *before* running the Siebel Client.

To populate the file system directory, do the following:

1. Select **Start->Programs->Windows Explorer**, navigate to the d:\sea621\dbsrvr\files directory, and copy all the files to the File System d:\siebfile directory.
2. Verify that the files are where they need to be.

Verifying the install

Next, install the Siebel Client and log on to the Siebel Call Center Demo to verify that the installation is successful.

Installing the Siebel client

Install the Siebel client as follows:

1. Select **Start->Programs->Windows NT Explorer**, navigate to the \sea subdirectory on the Siebel Client Installation CD-ROM, and double-click **Setup.exe** to begin the installation.
2. When the Welcome to Client Setup screen appears, click **Next >** to begin the installation.
3. Make sure that **Typical** is selected, change the destination directory to **d:\sea\client**, and click **OK**.
4. Click **Next >**.
5. When the Server Database screen appears, make sure that **IBM DB2 Universal Database 6_1** is selected and click **Next >**.
6. Click **NEXT** (take default) when the Document Integrator question displays.
7. Click **NEXT** (take default) when the ODBC Pack question displays.
8. Click **NEXT**.
9. On the Server Locations screen, Siebel Remote Server should be set to blank and Siebel File System should be set to d:\siebfile.
10. Click **Next >**.
11. On the Database Identification screen, the Database Alias should be set to siebeldb and the Table Owner should be set to SIEBEL.
12. Click **Next >**.
13. On the Enterprise Server Information screen, the Gateway Server Address should be set to the machine name of the Siebel Gateway Server (ITSONT0). The Enterprise Server should be set to siebel (this corresponds to the name used when you installed Siebel Enterprise Server.
14. Click **Next >**.
15. On the Server Request Information screen, accept the defaults of SRMSynch for the Request Component and blank out (clear out the field) the Request Server Name.
16. Click **Next >**.

17. On the Analysis Proxy Server Setup, the Siebel Server Name should be set to blank (clear out field).
18. Click **Next >**.
19. On the Fulcrum Setup window, the Search Hostname and Search Port Number fields should be blank (clear out the fields). The Search Definition Name can remain as the default of Fulcrum Sample.
20. Click **Next >**.
21. On the Select Program Folder screen, click **Next >** to accept the default program folder.

Note: You may see several `Self-registration error` messages during the installation; ignore them.

After the install is completed, an Event Log screen is displayed. Scroll through the log to view the events.

In the Event Log screen you see the following messages, which are expected:

```
The Fulcrum ODBC Driver Software component was not found
The IdCentric Software component was not found
```

To view the event log using Notepad, you can also go to d:\sea\client and view the SEAsetup.err and SEAsetup.log files.

Click **Next >** after viewing the Event Log window.

The Registry Log screen is displayed. Scroll through to view and do as follows:

1. Click **Next >** when done.
2. Click **Finish (Restart system later)**.
3. Install the Siebel Client patch version 6.2.1.7.
4. Select **Start->Programs->Control Panel->Services** and stop and start the Siebel Enterprise Server.

Testing the installation using the Siebel Call Center

To test the installation, use the Call Center as follows:

1. Select **Start->Programs->Siebel Client 6.0->Siebel Call Center**.
2. Agree with the licensing terms.
3. Log in with a User name of SADMIN and the Password SADMIN. For the Connect to drop-down, select the **Server** option.
4. Click **OK**.

5. The first time you log in, an error window displays the message: `No valid license keys were found in the database. Please enter a license key in the following dialog, or contact your systems administrator.`
6. Click **OK**.
7. On the License Keys window press **Add Key** and enter the license key found on the back of the CD case.
8. Click **OK**.
9. Press **OK** again on the License Key window that displays the current license keys with a status of OK on the key just entered.
10. The Siebel Call Center window displays. Select **Screens->Server Administration->Enterprise Operations->Enterprise Servers**. Verify that the Server State column displays Running**.**

Installing Siebel Tools

Next, we install the Siebel Tools.

Detailed instructions

To install the Siebel Tools, we do the following:

1. Select **Start->Programs->Windows NT Explorer,** navigate to the \seatools subdirectory on the Siebel Client Installation CD-ROM, and double-click **Setup.exe**.
2. When the Welcome to Client Setup screen appears, press **Next >** to start the installation.
3. Select **Typical**, change the Destination Directory, if needed, and press **Next >.**
4. On the Server Database screen, make sure that **IBM DB2 Universal database 6_1** is selected and press **Next >**.
5. We choose not to install the ODBC pack.
6. On the Servers Location screen, set the Siebel Remote Repository to blank, the Siebel File System to **d:\siebfile**, and press **Next >**.
7. On the Database Identification screen, set the Database Alias to **siebeldb**, the Table Owner to **SIEBEL**, and click **Next >**.
8. Click **Next >** to accept the default Program Folder (i.e., Siebel Tools 6.0).
9. View the Event Log and press **Next >**.

10. On the **Setup Complete** screen, a message displays the setup has completed successfully. Click **Finish** to exit
11. Install Siebel Tools patch version 6.2.1.7 from the distribution CD and follow the installation instructions (execute setup).

Testing Siebel Tools

To test the Siebel Tools, we do the following:

1. Select **Start->Programs->Siebel Tools 6.0->Siebel Tools**.
2. Agree with the licensing terms.
3. Log in with a User name of SADMIN and the Password SADMIN. For the Connect to drop-down, select the **Server** option.
4. Click **OK**.
5. The first time we log in, an error window displays the message indicating `No valid license keys were found in the database. Please enter a license key in the following dialog, or contact your systems administrator.`
6. Click **OK**.
7. On the License Keys window press **Add Key** and enter the license key found on the back of the CD case.
8. Click **OK**.
9. Press **OK** again on the License Key window that displays the current license keys with a Status of OK on the key just entered.
10. The Siebel Tools explorer window displays.

Creating sample data

The supplied sample Siebel database is an SQL Anywhere database. There is no supplied tool to move this sample data into the database you create in the installation phase. You have to migrate it, which we did later on in the Oracle for NT environment. For this first test in the DB2 for NT environment, we keyed directly into the DB2 database some sample data using Siebel Call Center. What we did is documented in “Entering data using Siebel Call Center” on page 121.

B

The .bat files

db2_db_mgr_cfg.bat

```
DB2 UPDATE DATABASE CONFIGURATION FOR siebeldb USING DFT_DEGREE 1
DB2 UPDATE DATABASE CONFIGURATION FOR siebeldb USING DFT_QUERYOPT 5
DB2 UPDATE DATABASE CONFIGURATION FOR siebeldb USING DBHEAP 7429
pause
DB2 UPDATE DATABASE CONFIGURATION FOR siebeldb USING CATALOGCACHE_SZ 5558
DB2 UPDATE DATABASE CONFIGURATION FOR siebeldb USING LOGBUFSZ 512
DB2 UPDATE DATABASE CONFIGURATION FOR siebeldb USING UTIL_HEAP_SZ 5000
pause
DB2 UPDATE DATABASE CONFIGURATION FOR siebeldb USING LOCKLIST 5000
DB2 UPDATE DATABASE CONFIGURATION FOR siebeldb USING APP_CTL_HEAP_SZ 152
DB2 UPDATE DATABASE CONFIGURATION FOR siebeldb USING SORTHEAP 20000
pause
DB2 UPDATE DATABASE CONFIGURATION FOR siebeldb USING STMTHEAP 8192
DB2 UPDATE DATABASE CONFIGURATION FOR siebeldb USING APPLHEAPSZ 2500
DB2 UPDATE DATABASE CONFIGURATION FOR siebeldb USING PCKCACHESZ 2048
pause
DB2 UPDATE DATABASE CONFIGURATION FOR siebeldb USING STAT_HEAP_SZ 8000
DB2 UPDATE DATABASE CONFIGURATION FOR siebeldb USING MAXLOCKS 20
DB2 UPDATE DATABASE CONFIGURATION FOR siebeldb USING LOCKTIMEOUT 300
pause
DB2 UPDATE DATABASE CONFIGURATION FOR siebeldb USING CHNGPGS_THRESH 60
DB2 UPDATE DATABASE CONFIGURATION FOR siebeldb USING NUM_IOCLEANERS 1
DB2 UPDATE DATABASE CONFIGURATION FOR siebeldb USING NUM_IOSERVERS 1
pause
```

```
DB2 UPDATE DATABASE CONFIGURATION FOR siebeldb USING INDEXSORT YES
DB2 UPDATE DATABASE CONFIGURATION FOR siebeldb USING SEQDETECT YES
DB2 UPDATE DATABASE CONFIGURATION FOR siebeldb USING DFT_PREFETCH_SZ 128
pause
DB2 UPDATE DATABASE CONFIGURATION FOR siebeldb USING LOGRETAIN NO
DB2 UPDATE DATABASE CONFIGURATION FOR siebeldb USING MAXAPPLS 25
DB2 UPDATE DATABASE CONFIGURATION FOR siebeldb USING AVG_APPLS 15
pause
DB2 UPDATE DATABASE CONFIGURATION FOR siebeldb USING MAXFILOP 500
DB2 UPDATE DATABASE CONFIGURATION FOR siebeldb USING LOGFILSIZ 8000
DB2 UPDATE DATABASE CONFIGURATION FOR siebeldb USING LOGPRIMARY 10
pause
DB2 UPDATE DATABASE CONFIGURATION FOR siebeldb USING LOGSECOND 100
DB2 UPDATE DATABASE CONFIGURATION FOR siebeldb USING SOFTMAX 80
pause
DB2 FORCE APPLICATIONS ALL
DB2 DB2STOP
DB2 DB2START
```

db2_db2set.bat

```
DB2SET DB2_HASH_JOIN=NO
DB2SET DB2_RR_TO_RS=YES
DB2SET DB2_MMAP_WRITE=OFF
DB2SET DB2_MMAP_READ=OFF
DB2SET DB2_CORRELATED_PREDICATES=YES
```

db2_db_cfg.bat

```
DB2 UPDATE DATABASE CONFIGURATION FOR siebeldb USING DFT_DEGREE 1
DB2 UPDATE DATABASE CONFIGURATION FOR siebeldb USING DFT_QUERYOPT 5
DB2 UPDATE DATABASE CONFIGURATION FOR siebeldb USING DBHEAP 7429
pause
DB2 UPDATE DATABASE CONFIGURATION FOR siebeldb USING CATALOGCACHE_SZ 5558
DB2 UPDATE DATABASE CONFIGURATION FOR siebeldb USING LOGBUFSZ 512
DB2 UPDATE DATABASE CONFIGURATION FOR siebeldb USING UTIL_HEAP_SZ 5000
pause
DB2 UPDATE DATABASE CONFIGURATION FOR siebeldb USING LOCKLIST 5000
DB2 UPDATE DATABASE CONFIGURATION FOR siebeldb USING APP_CTL_HEAP_SZ 152
DB2 UPDATE DATABASE CONFIGURATION FOR siebeldb USING SORTHEAP 20000
pause
DB2 UPDATE DATABASE CONFIGURATION FOR siebeldb USING STMTHEAP 8192
DB2 UPDATE DATABASE CONFIGURATION FOR siebeldb USING APPLHEAPSZ 2500
DB2 UPDATE DATABASE CONFIGURATION FOR siebeldb USING PCKCACHESZ 2048
pause
```

```
DB2 UPDATE DATABASE CONFIGURATION FOR siebeldb USING STAT_HEAP_SZ 8000
DB2 UPDATE DATABASE CONFIGURATION FOR siebeldb USING MAXLOCKS 20
DB2 UPDATE DATABASE CONFIGURATION FOR siebeldb USING LOCKTIMEOUT 300
pause
DB2 UPDATE DATABASE CONFIGURATION FOR siebeldb USING CHNGPGS_THRESH 60
DB2 UPDATE DATABASE CONFIGURATION FOR siebeldb USING NUM_IOCLEANERS 1
DB2 UPDATE DATABASE CONFIGURATION FOR siebeldb USING NUM_IOSERVERS 1
pause
DB2 UPDATE DATABASE CONFIGURATION FOR siebeldb USING INDEXSORT YES
DB2 UPDATE DATABASE CONFIGURATION FOR siebeldb USING SEQDETECT YES
DB2 UPDATE DATABASE CONFIGURATION FOR siebeldb USING DFT_PREFETCH_SZ 128
pause
DB2 UPDATE DATABASE CONFIGURATION FOR siebeldb USING LOGRETAIN NO
DB2 UPDATE DATABASE CONFIGURATION FOR siebeldb USING MAXAPPLS 25
DB2 UPDATE DATABASE CONFIGURATION FOR siebeldb USING AVG_APPLS 15
pause
DB2 UPDATE DATABASE CONFIGURATION FOR siebeldb USING MAXFILOP 500
DB2 UPDATE DATABASE CONFIGURATION FOR siebeldb USING LOGFILSIZ 8000
DB2 UPDATE DATABASE CONFIGURATION FOR siebeldb USING LOGPRIMARY 10
pause
DB2 UPDATE DATABASE CONFIGURATION FOR siebeldb USING LOGSECOND 100
DB2 UPDATE DATABASE CONFIGURATION FOR siebeldb USING SOFTMAX 80
pause
DB2 FORCE APPLICATIONS ALL
DB2 DB2STOP
DB2 DB2START
```

tablespace.bat

```
rem ***********************************************************************
rem * If you installed your siebel DB2 database using other than "db2admin" you
rem * will have to edit the next line of this bat file accordingly.
rem ***********************************************************************
rem DB2 CONNECT TO siebeldb USER db2admin USING db2admin
db2 connect to siebeldb user sadmin using sadmin2
rem ***********************************************************************
rem * If you installed on a drive other than "D" or into a directory other than
rem * "SQLLIB" you will have to edit the remaining CREATE lines of this bat
rem * file accordingly.
rem ***********************************************************************
DB2 CREATE REGULAR TABLESPACE SIEBEL_4K PAGESIZE 4 K MANAGED BY DATABASE USING
( FILE 'D:\SQLLIB\SIEBEL_4K' 64000) EXTENTSIZE 16 OVERHEAD 24.1 PREFETCHSIZE 8
TRANSFERRATE 0.9 BUFFERPOOL IBMDEFAULTBP
pause
DB2 CREATE REGULAR TABLESPACE SIEBEL_16K PAGESIZE 16 K MANAGED BY DATABASE
USING (FILE 'D:\SQLLIB\SIEBEL_16K' 16000) EXTENTSIZE 16 OVERHEAD 24.1
PREFETCHSIZE 8 TRANSFERRATE 0.9 BUFFERPOOL BUF16K
```

```
pause
DB2 CREATE LONG TABLESPACE SIEBEL_4KL PAGESIZE 4 K MANAGED BY DATABASE USING
(FILE 'D:\SQLLIB\SIEBEL_4KL' 25600) EXTENTSIZE 16 OVERHEAD 24.1 PREFETCHSIZE 8
TRANSFERRATE 0.9 BUFFERPOOL IBMDEFAULTBP
pause
DB2 CREATE REGULAR TABLESPACE SIEBEL_IDX PAGESIZE 4 K MANAGED BY DATABASE USING
(FILE 'D:\SQLLIB\SIEBEL_IDX' 80000) EXTENTSIZE 16 OVERHEAD 24.1 PREFETCHSIZE 8
TRANSFERRATE 0.9 BUFFERPOOL IBMDEFAULTBP
pause
DB2 CREATE TEMPORARY TABLESPACE TEMP4K PAGESIZE 4 K MANAGED BY SYSTEM USING
('D:\SQLLIB\TEMP4K') EXTENTSIZE 32 OVERHEAD 24.1 PREFETCHSIZE 128 TRANSFERRATE
0.9 BUFFERPOOL BUF4KTEMP
pause
DB2 CREATE TEMPORARY TABLESPACE TEMP16K PAGESIZE 16 K MANAGED BY SYSTEM USING
('D:\SQLLIB\TEMP16K') EXTENTSIZE 32 OVERHEAD 24.1 PREFETCHSIZE 128 TRANSFERRATE
0.9 BUFFERPOOL BUF16K
pause
DB2 CREATE TEMPORARY TABLESPACE TEMP32K PAGESIZE 32 K MANAGED BY SYSTEM USING
('D:\SQLLIB\TEMP32K') EXTENTSIZE 32 OVERHEAD 24.1 PREFETCHSIZE 128 TRANSFERRATE
0.9 BUFFERPOOL BUF32KTEMP

DB2 FORCE APPLICATIONS ALL
```

forceit.bat

```
DB2 FORCE APPLICATIONS ALL
DB2 DB2STOP
DB2 DB2START
```

bufferpool.bat

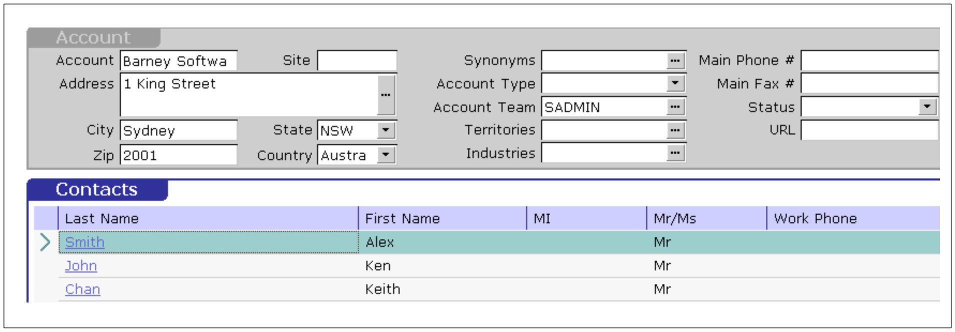
```
DB2 CONNECT TO siebeldb USER sadmin USING sadmin2
DB2 CREATE BUFFERPOOL BUF4KTEMP SIZE 25000 PAGESIZE 4 K
DB2 CREATE BUFFERPOOL BUF32KTEMP SIZE 1000 PAGESIZE 32 K
DB2 CREATE BUFFERPOOL BUF16K SIZE 1000 PAGESIZE 16 K
DB2 FORCE APPLICATIONS ALL.
```

C

Creating sample data

Entering data using Siebel Call Center

In order to have data to move for our project, we created a small number of records in the Siebel database on DB2/NT (for subsequent migration). See the following figures for examples of the user data we entered. You may wish to enter a similar amount of data, which was: five account records, 12 contact records, seven activity records, five invoice records and one opportunity record.



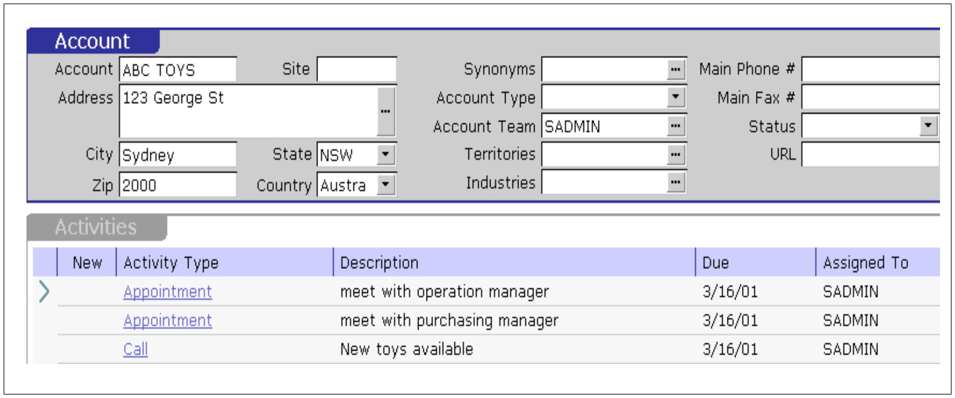
Account

Account	Barney Softwa	Site		Synonyms		Main Phone #	
Address	1 King Street			Account Type		Main Fax #	
				Account Team	SADMIN	Status	
City	Sydney	State	NSW	Territories		URL	
Zip	2001	Country	Austra	Industries			

Contacts

Last Name	First Name	MI	Mr/Ms	Work Phone
Smith	Alex		Mr	
John	Ken		Mr	
Chan	Keith		Mr	

Figure C-1 Entering Account and Contact user data



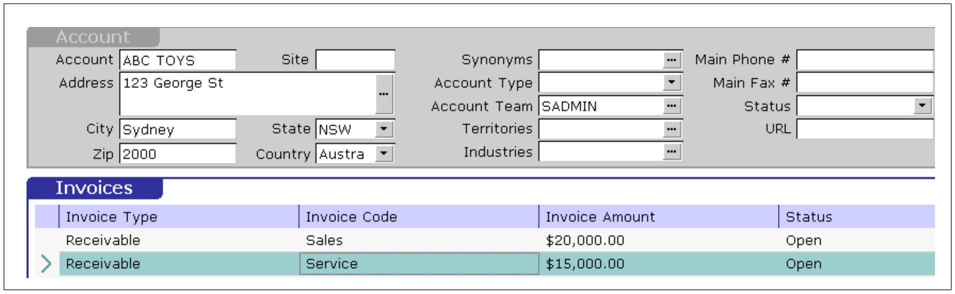
Account

Account	ABC TOYS	Site		Synonyms		Main Phone #	
Address	123 George St			Account Type		Main Fax #	
				Account Team	SADMIN	Status	
City	Sydney	State	NSW	Territories		URL	
Zip	2000	Country	Austra	Industries			

Activities

New	Activity Type	Description	Due	Assigned To
	Appointment	meet with operation manager	3/16/01	SADMIN
	Appointment	meet with purchasing manager	3/16/01	SADMIN
	Call	New toys available	3/16/01	SADMIN

Figure C-2 Entering Activities user data



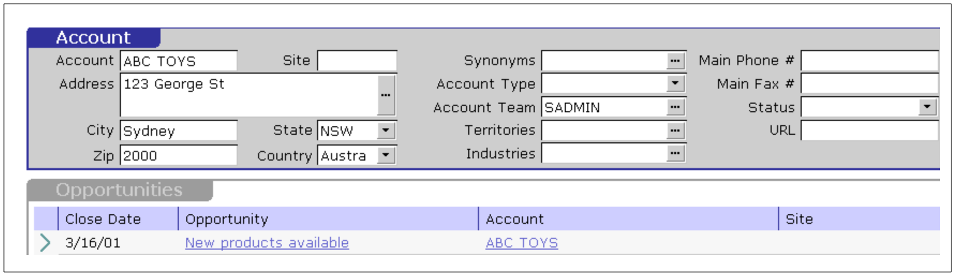
Account

Account	ABC TOYS	Site		Synonyms		Main Phone #	
Address	123 George St			Account Type		Main Fax #	
				Account Team	SADMIN	Status	
City	Sydney	State	NSW	Territories		URL	
Zip	2000	Country	Austra	Industries			

Invoices

Invoice Type	Invoice Code	Invoice Amount	Status
Receivable	Sales	$20,000.00	Open
Receivable	Service	$15,000.00	Open

Figure C-3 Entering Invoices user data



Account

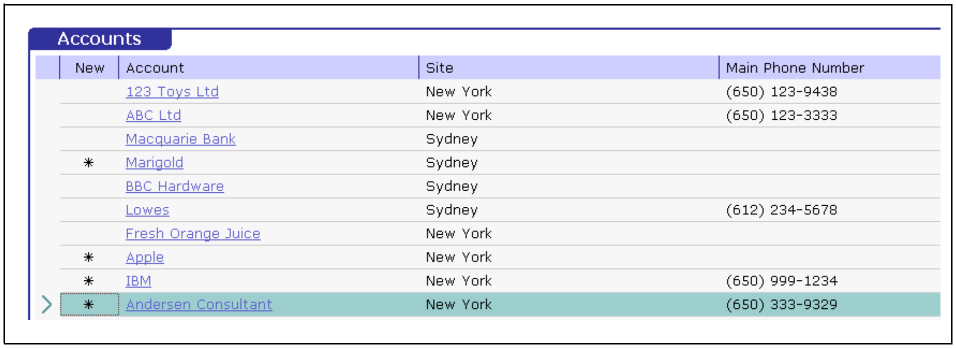
Account	ABC TOYS	Site		Synonyms		Main Phone #	
Address	123 George St			Account Type		Main Fax #	
				Account Team	SADMIN	Status	
City	Sydney	State	NSW	Territories		URL	
Zip	2000	Country	Austra	Industries			

Opportunities

Close Date	Opportunity	Account	Site
3/16/01	New products available	ABC TOYS	

Figure C-4 Entering Opportunities user data

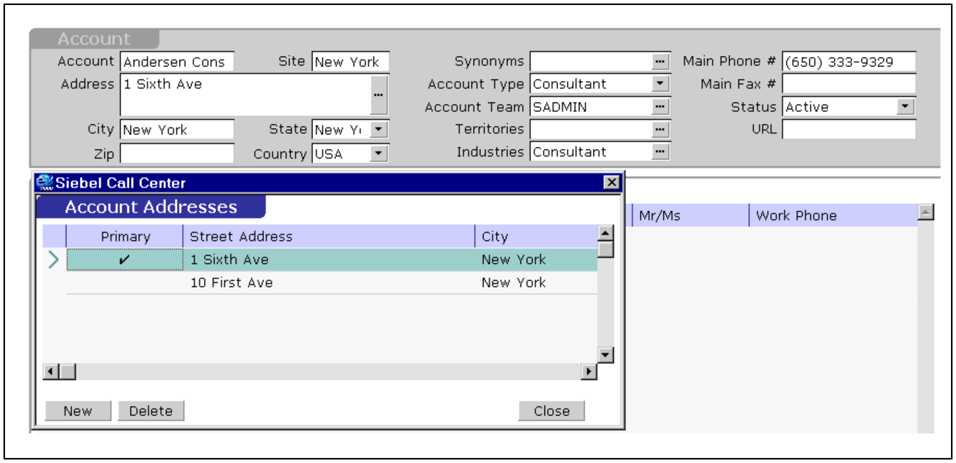
For our EIM migration tests we created data in the Accounts table and Account Addresses table as shown in Figure C-5 and Figure C-6.



Accounts

New	Account	Site	Main Phone Number
	123 Toys Ltd	New York	(650) 123-9438
	ABC Ltd	New York	(650) 123-3333
	Macquarie Bank	Sydney	
*	Marigold	Sydney	
	BBC Hardware	Sydney	
	Lowes	Sydney	(612) 234-5678
	Fresh Orange Juice	New York	
*	Apple	New York	
*	IBM	New York	(650) 999-1234
*	Andersen Consultant	New York	(650) 333-9329

Figure C-5 Entering data into Account table



Account

Account	Andersen Cons	Site	New York	Synonyms		Main Phone #	(650) 333-9329
Address	1 Sixth Ave			Account Type	Consultant	Main Fax #	
				Account Team	SADMIN	Status	Active
City	New York	State	New Y	Territories		URL	
Zip		Country	USA	Industries	Consultant		

Siebel Call Center

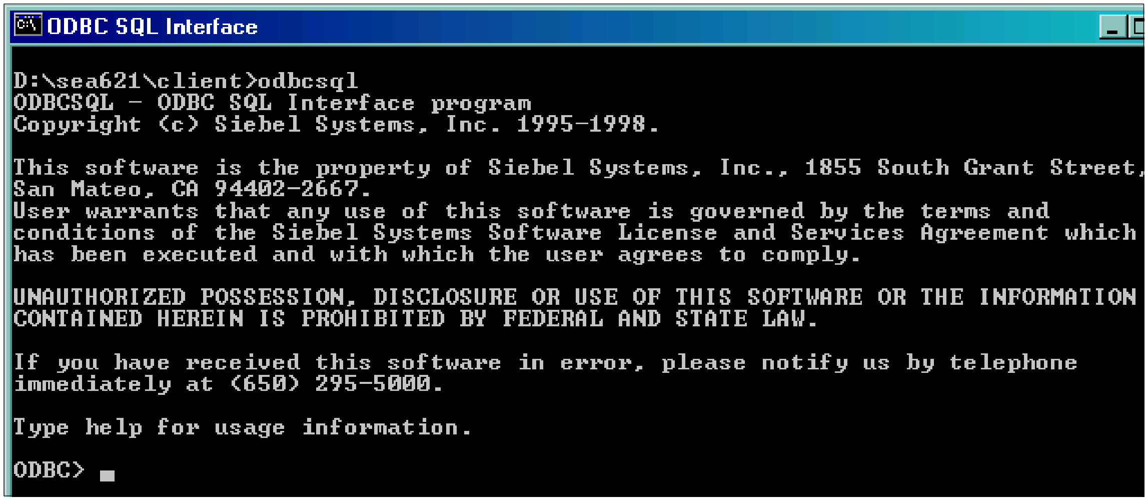
Account Addresses

Primary	Street Address	City
✓	1 Sixth Ave	New York
	10 First Ave	New York

Figure C-6 Manually entering Account Addresses

Migrating the Siebel sample database

We first invoke ODBCSQL as shown in Figure C-7.



```
D:\sea621\client>odbcsql
ODBCSQL - ODBC SQL Interface program
Copyright (c) Siebel Systems, Inc. 1995-1998.

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San Mateo, CA 94402-2667.
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If you have received this software in error, please notify us by telephone
immediately at (650) 295-5000.

Type help for usage information.

ODBC> 
```
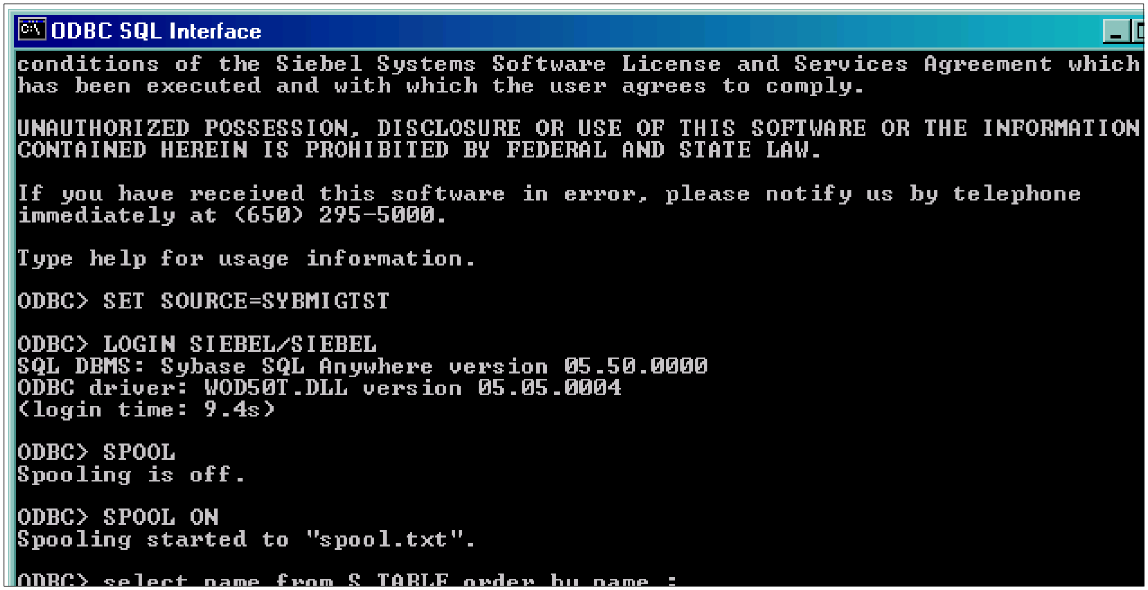

Figure C-7 Invoking ODBCSQL

Next, we spool the Siebel table names into the spool.txt file, as shown in Figure C-8.



```
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immediately at (650) 295-5000.

Type help for usage information.

ODBC> SET SOURCE=SYBMIGTST

ODBC> LOGIN SIEBEL/SIEBEL
SQL DBMS: Sybase SQL Anywhere version 05.50.0000
ODBC driver: WOD50T.DLL version 05.05.0004
(login time: 9.4s)

ODBC> SPOOL
Spooling is off.

ODBC> SPOOL ON
Spooling started to "spool.txt".

ODBC> select name from S_TABLE order by name ;
```
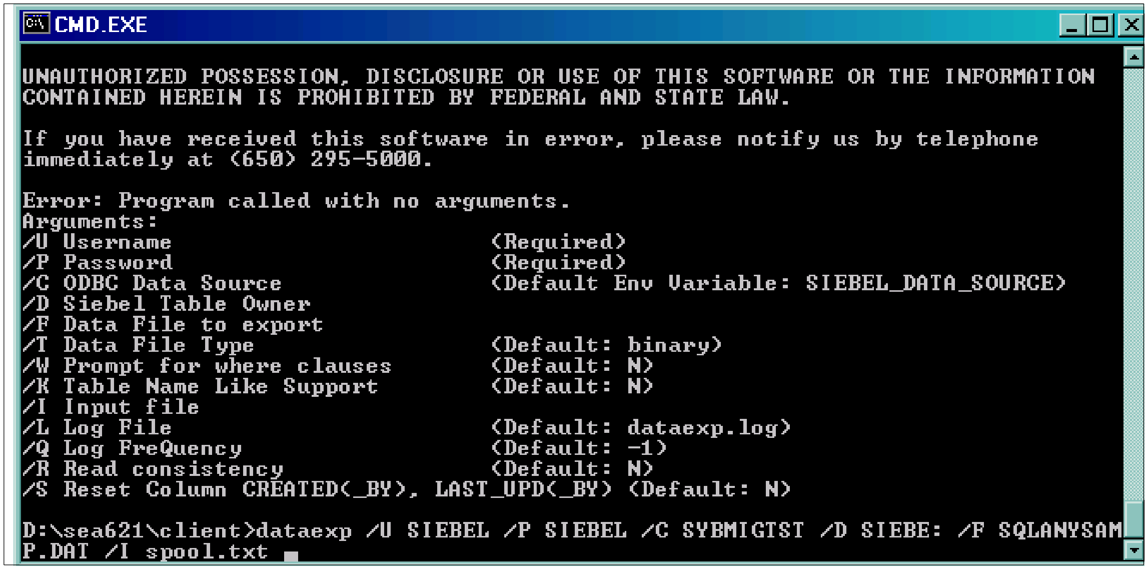

Figure C-8 Spooling the Siebel table names

The spool.txt file is used as input for DATAEXP. Because this file is extracted from S_TABLE it is expected that DATAEXP will have errors (Figure C-9). S_TABLE represents the Siebel logical entities and not the physical schema.



```
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CONTAINED HEREIN IS PROHIBITED BY FEDERAL AND STATE LAW.

If you have received this software in error, please notify us by telephone
immediately at (650) 295-5000.

Error: Program called with no arguments.
Arguments:
/U Username                       (Required)
/P Password                       (Required)
/C ODBC Data Source               (Default Env Variable: SIEBEL_DATA_SOURCE)
/D Siebel Table Owner
/F Data File to export
/T Data File Type                 (Default: binary)
/W Prompt for where clauses       (Default: N)
/K Table Name Like Support        (Default: N)
/I Input file
/L Log File                       (Default: dataexp.log)
/Q Log FreQuency                  (Default: -1)
/R Read consistency               (Default: N)
/S Reset Column CREATED(_BY), LAST_UPD(_BY) (Default: N)

D:\sea621\client>dataexp /U SIEBEL /P SIEBEL /C SYBMIGTST /D SIEBE: /F SQLANYSAM
P.DAT /I spool.txt
```

Figure C-9 Creating SQLANYSAMP.DAT

Figure C-9 shows how we create the input SQLANYSAMP.DAT for DATAIMP.

Next, we need to generate a list of delete statements to delete the target data environment. We use ODBCSQL and, assuming the table owner is SIEBEL, we issue the following SQL statement:

```
select 'delete from SIEBEL.'||"TABLE_NAME"||';' from all_tables where owner
= 'SIEBEL'
```

This statement creates a spool.txt file which needs to be edited and the headers deleted. Then, we need to connect to Oracle and run the delete statements.

We now have the Oracle database with all the tables empty.

The next step is to use DATAIMP to import the sample database into Oracle.

```
DATAIMP  /U SIEBEL /P br1g1te /C SiebSrvr_siebeloracle /D SIEBEL /F
sqlanysamp.dat
```

The final step is to verify the migration using Siebel Call Center and check the migrated data is in the Oracle for NT database.

D

DB2 customization jobs

This appendix shows the DB2 for OS/390 customizations we did and describes the jobs, commands, and parameter settings we implemented. It includes the following sections:

- DSNZPARM parameters
- Creating STOGROUPs
- Creating the Siebel databases
- Creating the Siebel table spaces
- Creating Siebel tables and indexes
- Creating stored procedure objects

DSNZPARM parameters

```
//DB2DE JOB (999,POK),'DB2  INSTALL',CLASS=A,MSGCLASS=T,
// NOTIFY=&SYSUID
/*JOBPARM L=9999,SYSAFF=SC04
//*********************************************************************/
//* JOB NAME = DSNTIJUZ                                               */
//*                                                                   */
//* DESCRIPTIVE NAME = ZPARMS USED FOR SIEBEL MIGRATION PROJECT       */
//*                                                                   */
//* STATUS = VERSION 6                                                */
//*                                                                   */
//* FUNCTION = DSNZPARM AND DSNHDECP UPDATES                          */
//*                                                                   */
//* PSEUDOCODE =                                                      */
//* DSNTIZA  STEP  ASSEMBLE DSN6.... MACROS, CREATE DSNZPARM          */
//* DSNTIZL  STEP  LINK EDIT DSNZPARM                                 */
//* DSNTLOG  STEP  UPDATE PASSWORDS                                   */
//* DSNTIZP  STEP  ASSEMBLE DSNHDECP DATA-ONLY LOAD MODULE            */
//* DSNTIZQ  STEP  LINK EDIT DSNHDECP LOAD MODULE                     */
//*   DSNTIMQ  STEP  SMP/E PROCESSING FOR DSNHDECP                    */
//*                                                                   */
//* NOTES = STEP DSNTIMQ MUST BE CUSTOMIZED FOR SMP.  SEE THE NOTES   */
//*         NOTES PRECEDING STEP DSNTIMQ BEFORE RUNNING THIS JOB.     */
//*                                                                   */
//*********************************************************************/
//*                                                                         */
//DSNTIZA EXEC PGM=ASMA90,PARM='OBJECT,NODECK'
//SYSLIB   DD  DISP=SHR,
//         DSN=DSN610.SDSNMACS
//         DD  DISP=SHR,
//         DSN=SYS1.MACLIB
//SYSLIN   DD  DSN=&&LOADSET(DSNTILMM),DISP=(NEW,PASS),
//             UNIT=SYSALLDA,
//             SPACE=(800,(50,50,2)),DCB=(BLKSIZE=800)
//SYSPRINT DD  SYSOUT=*
//SYSUDUMP DD  SYSOUT=*
//SYSUT1   DD  UNIT=SYSALLDA,SPACE=(800,(50,50),,,ROUND)
//SYSUT2   DD  UNIT=SYSALLDA,SPACE=(800,(50,50),,,ROUND)
//SYSUT3   DD  UNIT=SYSALLDA,SPACE=(800,(50,50),,,ROUND)
//SYSIN    DD  *
       DSN6ENV    MVS=XA
       DSN6SPRM   RESTART,
                  ALL,
                 ABEXP=YES
                 ABIND=YES,
                 AUTH=YES,
                 AUTHCACH=1024
                  BINDNV=BINDADD,
                  BMPTOUT=4,
                  CACHEDYN=YES,        <----IT WAS NO
                  CACHEPAC=32768,
                  CACHERAC=32768,
                  CATALOG=DB2V610D,
                  CDSSRDEF=1,
                  CHGDC=NO,
                  CONTSTOR=NO,
                  DECDIV3=NO,
                  DEFLTID=IBMUSER,
                  DESCSTAT=NO,
                  DLITOUT=6,
                   DSMAX=21000,         <---- WAS 3000
                  EDMPOOL=14812,
                  EDMDSPAC=0,
                  EDPROP=NO,
                  HOPAUTH=BOTH,
                  IRLMAUT=YES,
                  IRLMPRC=IRLDPROC,
                   IRLMPRC=IRLDPROC,
                   IRLMSID=IRLD,
                   IRLMRWT=60,
                   IRLMSWT=300,
                   LEMAX=20,
                   MAXRBLK=4000,
                   MAXKEEPD=5000,
                   NUMLKTS=1000,
                   NUMLKUS=1000, <--- WAS 10000 (WAS 0 FOR SIEBEL1)
                   OPTHINTS=NO,
                   RECALL=YES,
                   RECALLD=120,
                   RELCURHL=YES,
                   RETLWAIT=0,
                   RETVLCFK=NO,
                   RGFCOLID=DSNRGCOL,
                   RGFDBNAM=DSNRGFDB,
                   RGFDEDPL=NO,
                   RGFDEFLT=ACCEPT,
                   RGFESCP=,
                   RGFFULLQ=YES,
                   RGFINSTL=NO,
                   RGFNMORT=DSN_REGISTER_OBJT,
                   RGFNMPRT=DSN_REGISTER_APPL,
                   RRULOCK=NO,
                   SEQCACH=BYPASS,
                   SEQPRES=NO,
                   SITETYP=LOCALSITE,
                   SRTPOOL=1000,
                   SYSADM=KARRAS,
                   SYSADM2=HAIMO,
                   SYSOPR1=SYSOPR,
                   SYSOPR2=SYSOPR,
                   TRKRSITE=NO,
                   UTIMOUT=6,
                   XLKUPDLT=NO
       DSN6ARVP   ALCUNIT=BLK,
                   ARCWRTC=(1,3,4),
                   ARCWTOR=YES,
                   ARCPFX1=DB2V610D.ARCHLOG1,
                   ARCPFX2=DB2V610D.ARCHLOG2,
                   ARCRETN=9999,
                   BLKSIZE=28672,
                   CATALOG=NO,
                   COMPACT=NO,
                   PRIQTY=1234,
                   PROTECT=NO,
                   QUIESCE=5,
                   SECQTY=154,
                   TSTAMP=NO,
                   UNIT=TAPE,
                   UNIT2=
       DSN6LOGP   DEALLCT=(0),
                   MAXARCH=1000,
                   MAXRTU=2,
                   OUTBUFF=4000,
                   TWOACTV=YES,
                   TWOARCH=YES,
                   WRTHRSH=20,
                   ARC2FRST=NO
       DSN6SYSP    AUDITST=NO,
                   BACKODUR=5,
                   CONDBAT=150000, <--- WAS 64
                   CTHREAD=70,
                   DBPROTCL=DRDA,
                  DLDFREQ=5,
                  DSSTIME=5,
                  EXTRAREQ=100,
                  EXTRASRV=100,
                  IDBACK=20,
                  IDFORE=40,
                  IDXBPOOL=BP0,
                  LBACKOUT=AUTO,
                  LOBVALA=2048,
                  LOBVALS=2048,
                  LOGAPSTG=0,
                  LOGLOAD=50000,
                  MAXDBAT=500,    <--- WAS 64
                  MON=NO,
                  MONSIZE=8192,
                  PCLOSEN=5,
                  PCLOSET=10,
                  RLF=NO,
                  RLFTBL=01,
                  RLFERR=NOLIMIT,
                  RLFAUTH=SYSIBM,
                  ROUTCDE=(1),
                  EXTSEC=YES,     <--- WAS NO
                  SMFACCT=(1),
                  SMFSTAT=YES,
                  STATIME=30,
                  STORMXAB=0,
                  STORPROC=DB2DSPAS,
                  STORTIME=180,
                  TBSBPOOL=BP0,
                  TRACSTR=NO,
                  TRACTBL=16,
                  URCHKTH=0,
                  WLMENV=
       DSN6FAC    DDF=AUTO,
                  CMTSTAT=INACTIVE,
                  IDTHTOIN=0,
                  RESYNC=2,
                  RLFERRD=NOLIMIT,
                  TCPALVER=NO,
                  MAXTYPE1=0,
                  TCPKPALV=ENABLE,
                  POOLINAC=120
       DSN6GRP    DSHARE=NO,
                  GRPNAME=DSNCAT,
                  MEMBNAME=DSN1,
                  COORDNTR=NO,
                  ASSIST=NO
       END
//*********************************************************************
//* LINK EDIT THE NEW DSNZPARM MEMBER.  PUT LOAD MODULE IN SDSNEXIT.  *
//*********************************************************************
//DSNTIZL EXEC PGM=IEWL,PARM='LIST,XREF,LET,RENT',
//             COND=(4,LT)
//ADSNLOAD DD  DISP=SHR,
//         DSN=DSN610.SDSNLOAD
//         DD  DISP=SHR,
//         DSN=DSN610.ADSNLOAD
//SYSPUNCH DD  DSN=&&LOADSET(DSNTILMM),DISP=(OLD,DELETE)
//SYSLMOD  DD  DISP=SHR,
//         DSN=DB2V610D.SDSNEXIT
```

```
//SYSPRINT DD  SYSOUT=*
//SYSUDUMP DD  SYSOUT=*
//SYSUT1   DD  UNIT=SYSALLDA,SPACE=(1024,(50,50))
//SYSLIN   DD  *
   INCLUDE SYSPUNCH(DSNTILMM)
   INCLUDE ADSNLOAD(DSNZPARM)
   ORDER DSNAA
   INCLUDE ADSNLOAD(DSNAA)
   INCLUDE ADSNLOAD(DSNFSYSP)
   INCLUDE ADSNLOAD(DSNJARVP)
   INCLUDE ADSNLOAD(DSNJLOGP)
   INCLUDE ADSNLOAD(DSNTSPRM)
   INCLUDE ADSNLOAD(DSNVDIR1)
   INCLUDE ADSNLOAD(DSNZMSTR)
   INCLUDE ADSNLOAD(DSN3DIR1)
   INCLUDE ADSNLOAD(DSN7GRP)
   ENTRY   DSNZMSTR
   NAME    DSNZDB2D(R)
//*
//*        CHANGE LOG INVENTORY:
//*        UPDATE BSDS
//*
//DSNTLOG EXEC PGM=DSNJU003,COND=(4,LT)
//STEPLIB  DD  DISP=SHR,DSN=DSN610.SDSNLOAD
//SYSUT1   DD  DISP=OLD,DSN=DB2V610D.BSDS01
//SYSUT2   DD  DISP=OLD,DSN=DB2V610D.BSDS02
//SYSPRINT DD  SYSOUT=*
//SYSUDUMP DD  SYSOUT=*
//SYSIN    DD  *
 DDF    LOCATION=DB2D,LUNAME=SCPDB2D,
        NOPASSWD,RESPORT=33323,PORT=33322
//*
//*******************************************************************
//*   ASSEMBLE AND LINK EDIT DATA-ONLY LOAD MODULE DSNHDECP.
//*   THE FOLLOWING STEPS ARE NEEDED ONLY IF THE
//*   VALUES ARE CHANGED FROM THOSE WHICH ARE SHIPPED.
//*******************************************************************
//DSNTIZP EXEC PGM=ASMA90,PARM='OBJECT,NODECK',COND=(4,LT)
//SYSLIB   DD  DISP=SHR,
//         DSN=DSN610.SDSNMACS
//SYSLIN   DD  DSN=&&LOADSET(DSNHDECA),DISP=(NEW,PASS),UNIT=SYSALLD
//             SPACE=(80,(50,50,2)),DCB=(BLKSIZE=80)
//SYSPRINT DD  SYSOUT=*
//SYSUDUMP DD  SYSOUT=*
//SYSUT1   DD  UNIT=SYSALLDA,SPACE=(800,(50,50),,,ROUND)
//SYSUT2   DD  UNIT=SYSALLDA,SPACE=(800,(50,50),,,ROUND)
//SYSUT3   DD  UNIT=SYSALLDA,SPACE=(800,(50,50),,,ROUND)
//SYSIN    DD  *
   DSNHDECM    CHARSET=ALPHANUM,
               ASCCSID=819,      <--- WAS 0
               AMCCSID=65534,
               AGCCSID=65534,
               SCCSID=37,
               MCCSID=65534,
               GCCSID=65534,
               ENSCHEME=ASCII,   <--- WAS EBCDIC
               DATE=ISO,
               DATELEN=0,
               DECARTH=DEC15,
               DECIMAL=PERIOD,
               DEFLANG=IBMCOB,
               DELIM=DEFAULT,
               MIXED=NO,
               SQLDELI=DEFAULT,
               DSQLDELI=APOST,
               SSID=DB2J,
               STDSQL=NO,
               TIME=ISO,
               TIMELEN=0,
               DYNRULS=YES,
               LC_CTYPE=,
               COMPAT=OFF
     END
//*
//********************************************************************
//*   LINK EDIT DSNHDECP.
//*   DSNHDECP IS A DATA-ONLY LOAD MODULE CONTAINING DEFAULT VALUES
//*   REQUIRED BY DB2 AND APPLICATION PROGRAMS.
//*   THIS STEP IS CREATED ONLY WHEN THE DEFAULTS SUPPLIED IN
//*   DSNHDECP ARE NOT SUITABLE.
//********************************************************************
//DSNTIZQ EXEC PGM=IEWL,PARM='LIST,XREF,LET,RENT',
//             COND=(4,LT)
//ADSNLOAD DD  DISP=SHR,
//         DSN=DSN610.SDSNEXIT
//         DD  DISP=SHR,
//         DSN=DSN610.ADSNLOAD
//SYSPUNCH DD  DSN=&&LOADSET(DSNHDECA),DISP=(OLD,DELETE)
//SYSLMOD  DD  DISP=SHR,
//         DSN=DB2V610D.SDSNEXIT
//SYSPRINT DD  SYSOUT=*
//SYSUDUMP DD  SYSOUT=*
//SYSUT1   DD  UNIT=SYSALLDA,SPACE=(1024,(50,50))
//SYSLIN   DD  *
   INCLUDE SYSPUNCH(DSNHDECA)
   ORDER   DSNAA
   INCLUDE ADSNLOAD(DSNAA)
   INCLUDE ADSNLOAD(DSNARIB)
   INCLUDE ADSNLOAD(DSNHDECP)
   ENTRY   DSNHDECP
   MODE    AMODE(24),RMODE(24)
   NAME    DSNHDECP(R)
//*
```

Creating STOGROUPs

```
//CREATEST JOB (999,POK),'STOGROUP',NOTIFY=&SYSUID,
 //    CLASS=A,MSGCLASS=T,TIME=1439,
 //    MSGLEVEL=(1,1)
 //***
 //*** CREATE STOGROUPS FOR SIEBEL
 //***
 /*JOBPARM SYSAFF=SC04
 //JOBLIB  DD DSN=DB2V610D.RUNLIB.LOAD,DISP=SHR
 //        DD DSN=DSN610.SDSNLOAD,DISP=SHR
 //CREATEST EXEC PGM=IKJEFT01,DYNAMNBR=20
 //SYSPRINT DD SYSOUT=*
 //SYSTSPRT DD SYSOUT=*
 //SYSOUT DD SYSOUT=*
 //SYSUDUMP DD SYSOUT=*
 //SYSTSIN DD *
   DSN S(DB2D)
   RUN PROG(DSNTIAD) PLAN(DSNTIA61)
   END
 //SYSIN DD *
   CREATE STOGROUP STOGRP01
          VOLUMES(SIEBE1,SIEBE2,SIEBE3,SIEBE4,SIEBE5)
          VCAT DB2V610D;
   GRANT USE OF STOGROUP STOGRP01 TO SSEEIM;
   GRANT USE OF STOGROUP STOGRP01 TO SIEBEL WITH GRANT OPTION;
   COMMIT;
 //
```

Creating the Siebel databases

```
//CREATEDB JOB (999,POK),'CREATE DB',NOTIFY=&SYSUID,
//    CLASS=A,MSGCLASS=T,TIME=1439,
//    MSGLEVEL=(1,1)
//***
//*** CREATE SIEBEL DATABASES
```

```
//***
/*JOBPARM SYSAFF=SC04
//JOBLIB  DD DSN=DB2V610D.RUNLIB.LOAD,DISP=SHR
//        DD DSN=DSN610.SDSNLOAD,DISP=SHR
//CREATEDB EXEC PGM=IKJEFT01,DYNAMNBR=20
//SYSPRINT DD SYSOUT=*
//SYSTSPRT DD SYSOUT=*
//SYSOUT DD SYSOUT=*
//SYSUDUMP DD SYSOUT=*
//SYSTSIN DD *
  DSN S(DB2D)
  RUN PROG(DSNTIAD) PLAN(DSNTIA61)
  END
//SYSIN DD *
  CREATE DATABASE SIEBEL01 STOGROUP STOGRP01;
  CREATE DATABASE SIEBEL02 STOGROUP STOGRP01;
  CREATE DATABASE SIEBEL03 STOGROUP STOGRP01;
  CREATE DATABASE SIEBEL04 STOGROUP STOGRP01;
  CREATE DATABASE SIEBEL06 STOGROUP STOGRP01;
  CREATE DATABASE SIEBEL07 STOGROUP STOGRP01;
  CREATE DATABASE SIEBEL08 STOGROUP STOGRP01;
  CREATE DATABASE SIEBEL09 STOGROUP STOGRP01;
  CREATE DATABASE SIEBEL10 STOGROUP STOGRP01;
  COMMIT;
//
```

Creating the Siebel table spaces

We used the following job to create the table spaces:

```
//CRETBL  JOB (999,POK),'CREATE TBSPACE',NOTIFY=&SYSUID,
// CLASS=A,MSGCLASS=T,TIME=1439,
// MSGLEVEL=(1,1)
/*JOBPARM SYSAFF=SC04
//***
//***
//*** CREATE ALL THE TABLESPACES NEEDED FOR SIEBEL
//***
//***
//JOBLIB  DD DSN=DB2V610D.RUNLIB.LOAD,DISP=SHR
//       DD DSN=DSN610.SDSNLOAD,DISP=SHR
//CREATETB EXEC PGM=IKJEFT01,DYNAMNBR=20
//SYSPRINT DD SYSOUT=*
//SYSTSPRT DD SYSOUT=*
```

```
//SYSOUT DD SYSOUT=*
//SYSUDUMP DD SYSOUT=*
//SYSTSIN DD *
  DSN S(DB2D)
  RUN PROG(DSNTIAD) PLAN(DSNTIA61)
  END
//SYSIN DD *

CREATE TABLESPACE FFFFF001
   IN SIEBEL01
   SEGSIZE 32 USING STOGROUP    STOGRP01
   BUFFERPOOL   BP32K1
   LOCKSIZE PAGE; COMMIT;

CREATE TABLESPACE EEEEE001
   IN SIEBEL02
   SEGSIZE 32 USING STOGROUP      STOGRP01
   BUFFERPOOL   BP16K1
   LOCKSIZE PAGE; COMMIT;

CREATE TABLESPACE GGGGG010
   IN SIEBEL03
   SEGSIZE 32 USING STOGROUP      STOGRP01
   BUFFERPOOL   BP16K1
   LOCKSIZE PAGE; COMMIT;

CREATE TABLESPACE GGGGG011
   IN SIEBEL03
   SEGSIZE 32 USING STOGROUP      STOGRP01
   BUFFERPOOL   BP16K1
   LOCKSIZE PAGE; COMMIT;

CREATE TABLESPACE GGGGG012
   IN SIEBEL03
   SEGSIZE 32 USING STOGROUP      STOGRP01
   BUFFERPOOL   BP16K1
   LOCKSIZE PAGE; COMMIT;

CREATE TABLESPACE GGGGG013
   IN SIEBEL03
   SEGSIZE 32 USING STOGROUP      STOGRP01
   BUFFERPOOL   BP16K1
   LOCKSIZE PAGE; COMMIT;

CREATE TABLESPACE GGGGG014
   IN SIEBEL03
   SEGSIZE 32 USING STOGROUP      STOGRP01
   BUFFERPOOL   BP16K1
   LOCKSIZE PAGE; COMMIT;
```

```
CREATE TABLESPACE GGGGG015
   IN SIEBEL03
   SEGSIZE 32 USING STOGROUP      STOGRP01
   BUFFERPOOL   BP16K1
   LOCKSIZE PAGE; COMMIT;

CREATE TABLESPACE GGGGG016
   IN SIEBEL03
   SEGSIZE 32 USING STOGROUP      STOGRP01
   BUFFERPOOL   BP16K1
   LOCKSIZE PAGE; COMMIT;

CREATE TABLESPACE GGGGG017
   IN SIEBEL03
   SEGSIZE 32 USING STOGROUP      STOGRP01
   BUFFERPOOL   BP16K1
   LOCKSIZE PAGE; COMMIT;

CREATE TABLESPACE GGGGG001
   IN SIEBEL04
   SEGSIZE 32 USING STOGROUP      STOGRP01
   BUFFERPOOL   BP16K1
   LOCKSIZE PAGE; COMMIT;

CREATE TABLESPACE GGGGG002
   IN SIEBEL04
   SEGSIZE 32 USING STOGROUP      STOGRP01
   BUFFERPOOL   BP16K1
   LOCKSIZE PAGE; COMMIT;

CREATE TABLESPACE GGGGG003
   IN SIEBEL04
   SEGSIZE 32 USING STOGROUP      STOGRP01
   BUFFERPOOL   BP16K1
   LOCKSIZE PAGE; COMMIT;

CREATE TABLESPACE GGGGG004
   IN SIEBEL04
   SEGSIZE 32 USING STOGROUP      STOGRP01
   BUFFERPOOL   BP16K1
   LOCKSIZE PAGE; COMMIT;

CREATE TABLESPACE GGGGG005
   IN SIEBEL04
   SEGSIZE 32 USING STOGROUP      STOGRP01
   BUFFERPOOL   BP16K1
   LOCKSIZE PAGE; COMMIT;
```

```
CREATE TABLESPACE GGGGG006
   IN SIEBEL04
   SEGSIZE 32 USING STOGROUP      STOGRP01
   BUFFERPOOL   BP16K1
   LOCKSIZE PAGE; COMMIT;

CREATE TABLESPACE GGGGG007
   IN SIEBEL04
   SEGSIZE 32 USING STOGROUP      STOGRP01
   BUFFERPOOL   BP16K1
   LOCKSIZE PAGE; COMMIT;

CREATE TABLESPACE GGGGG008
   IN SIEBEL04
   SEGSIZE 32 USING STOGROUP      STOGRP01
   BUFFERPOOL   BP16K1
   LOCKSIZE PAGE; COMMIT;

CREATE TABLESPACE HHHHH001
   IN SIEBEL05
   SEGSIZE 32 USING STOGROUP      STOGRP01
   PRIQTY 7200 SECQTY 720
   BUFFERPOOL   BP16K1
   LOCKSIZE PAGE; COMMIT;

CREATE TABLESPACE HHHHH002
   IN SIEBEL05
   SEGSIZE 32 USING STOGROUP      STOGRP01
   PRIQTY 7200 SECQTY 720
   BUFFERPOOL   BP16K1
   LOCKSIZE PAGE; COMMIT;

CREATE TABLESPACE BBBBB024
   IN SIEBEL06
   SEGSIZE 32 USING STOGROUP      STOGRP01
   BUFFERPOOL   BP1
   LOCKSIZE PAGE; COMMIT;

CREATE TABLESPACE BBBBB025
   IN SIEBEL06
   SEGSIZE 32 USING STOGROUP      STOGRP01
   BUFFERPOOL   BP1
   LOCKSIZE PAGE; COMMIT;

CREATE TABLESPACE BBBBB026
   IN SIEBEL06
   SEGSIZE 32 USING STOGROUP      STOGRP01
   BUFFERPOOL   BP1
   LOCKSIZE PAGE; COMMIT;
```

```
CREATE TABLESPACE BBBBB027
   IN SIEBEL06
   SEGSIZE 32 USING STOGROUP      STOGRP01
   BUFFERPOOL   BP1
   LOCKSIZE PAGE; COMMIT;

CREATE TABLESPACE BBBBB028
   IN SIEBEL06
   SEGSIZE 32 USING STOGROUP      STOGRP01
   BUFFERPOOL   BP1
   LOCKSIZE PAGE; COMMIT;

CREATE TABLESPACE BBBBB029
   IN SIEBEL06
   SEGSIZE 32 USING STOGROUP      STOGRP01
   BUFFERPOOL   BP1
   LOCKSIZE PAGE; COMMIT;

CREATE TABLESPACE BBBBB031
   IN SIEBEL06
   SEGSIZE 32 USING STOGROUP      STOGRP01
   BUFFERPOOL   BP1
   LOCKSIZE PAGE; COMMIT;

CREATE TABLESPACE BBBBB032
   IN SIEBEL06
   SEGSIZE 32 USING STOGROUP      STOGRP01
   BUFFERPOOL   BP1
   LOCKSIZE PAGE; COMMIT;

CREATE TABLESPACE BBBBB033
   IN SIEBEL06
   SEGSIZE 32 USING STOGROUP      STOGRP01
   BUFFERPOOL   BP1
   LOCKSIZE PAGE; COMMIT;

CREATE TABLESPACE BBBBB034
   IN SIEBEL06
   SEGSIZE 32 USING STOGROUP      STOGRP01
   BUFFERPOOL   BP1
   LOCKSIZE PAGE; COMMIT;

CREATE TABLESPACE BBBBB035
   IN SIEBEL06
   SEGSIZE 32 USING STOGROUP      STOGRP01
   BUFFERPOOL   BP1
   LOCKSIZE PAGE; COMMIT;

CREATE TABLESPACE BBBBB036
```

```
   IN SIEBEL06
   SEGSIZE 32 USING STOGROUP      STOGRP01
   BUFFERPOOL   BP1
   LOCKSIZE PAGE; COMMIT;

CREATE TABLESPACE BBBBB037
   IN SIEBEL06
   SEGSIZE 32 USING STOGROUP      STOGRP01
   BUFFERPOOL   BP1
   LOCKSIZE PAGE; COMMIT;

CREATE TABLESPACE BBBBB038
   IN SIEBEL06
   SEGSIZE 32 USING STOGROUP      STOGRP01
   BUFFERPOOL   BP1
   LOCKSIZE PAGE; COMMIT;

CREATE TABLESPACE BBBBB039
   IN SIEBEL06
   SEGSIZE 32 USING STOGROUP      STOGRP01
   BUFFERPOOL   BP1
   LOCKSIZE PAGE; COMMIT;

CREATE TABLESPACE BBBBB040
   IN SIEBEL06
   SEGSIZE 32 USING STOGROUP      STOGRP01
   BUFFERPOOL   BP1
   LOCKSIZE PAGE; COMMIT;

CREATE TABLESPACE BBBBB041
   IN SIEBEL06
   SEGSIZE 32 USING STOGROUP      STOGRP01
   BUFFERPOOL   BP1
   LOCKSIZE PAGE; COMMIT;

CREATE TABLESPACE BBBBB042
   IN SIEBEL06
   SEGSIZE 32 USING STOGROUP      STOGRP01
   BUFFERPOOL   BP1
   LOCKSIZE PAGE; COMMIT;

CREATE TABLESPACE BBBBB043
   IN SIEBEL06
   SEGSIZE 32 USING STOGROUP      STOGRP01
   BUFFERPOOL   BP1
   LOCKSIZE PAGE; COMMIT;

CREATE TABLESPACE BBBBB044
   IN SIEBEL06
   SEGSIZE 32 USING STOGROUP      STOGRP01
   BUFFERPOOL   BP1
   LOCKSIZE PAGE; COMMIT;

CREATE TABLESPACE CCCCC002
   IN SIEBEL06
   SEGSIZE 32 USING STOGROUP      STOGRP01
   BUFFERPOOL   BP16K1
   LOCKSIZE PAGE; COMMIT;

CREATE TABLESPACE DDDDD015
   IN SIEBEL06
   SEGSIZE 32 USING STOGROUP      STOGRP01
   BUFFERPOOL   BP1
   LOCKSIZE PAGE; COMMIT;

CREATE TABLESPACE DDDDD016
   IN SIEBEL06
   SEGSIZE 32 USING STOGROUP      STOGRP01
   BUFFERPOOL   BP1
   LOCKSIZE PAGE; COMMIT;

CREATE TABLESPACE DDDDD017
   IN SIEBEL06
   SEGSIZE 32 USING STOGROUP      STOGRP01
   BUFFERPOOL   BP1
   LOCKSIZE PAGE; COMMIT;

CREATE TABLESPACE DDDDD018
   IN SIEBEL06
   SEGSIZE 32 USING STOGROUP      STOGRP01
   BUFFERPOOL   BP1
   LOCKSIZE PAGE; COMMIT;

CREATE TABLESPACE DDDDD019
   IN SIEBEL06
   SEGSIZE 32 USING STOGROUP      STOGRP01
   BUFFERPOOL   BP1
   LOCKSIZE PAGE; COMMIT;

CREATE TABLESPACE DDDDD020
   IN SIEBEL06
   SEGSIZE 32 USING STOGROUP      STOGRP01
   BUFFERPOOL   BP1
   LOCKSIZE PAGE; COMMIT;

CREATE TABLESPACE DDDDD021
   IN SIEBEL06
   SEGSIZE 32 USING STOGROUP      STOGRP01
   BUFFERPOOL   BP1
   LOCKSIZE PAGE; COMMIT;

CREATE TABLESPACE DDDDD022
   IN SIEBEL06
   SEGSIZE 32 USING STOGROUP      STOGRP01
   BUFFERPOOL   BP1
   LOCKSIZE PAGE; COMMIT;

CREATE TABLESPACE DDDDD023
   IN SIEBEL06
   SEGSIZE 32 USING STOGROUP      STOGRP01
   BUFFERPOOL   BP1
   LOCKSIZE PAGE; COMMIT;

CREATE TABLESPACE DDDDD024
   IN SIEBEL06
   SEGSIZE 32 USING STOGROUP      STOGRP01
   BUFFERPOOL   BP1
   LOCKSIZE PAGE; COMMIT;

CREATE TABLESPACE DDDDD055
   IN SIEBEL06
   SEGSIZE 32 USING STOGROUP      STOGRP01
   BUFFERPOOL   BP1
   LOCKSIZE PAGE; COMMIT;

CREATE TABLESPACE AAAAA001
   IN SIEBEL07
   SEGSIZE 32 USING STOGROUP      STOGRP01
   BUFFERPOOL   BP16K1
   LOCKSIZE ROW; COMMIT;

CREATE TABLESPACE AAAAA002
   IN SIEBEL07
   SEGSIZE 32 USING STOGROUP      STOGRP01
   BUFFERPOOL   BP1
   LOCKSIZE ROW; COMMIT;

CREATE TABLESPACE AAAAA003
   IN SIEBEL07
   SEGSIZE 32 USING STOGROUP      STOGRP01
   BUFFERPOOL   BP1
   LOCKSIZE ROW; COMMIT;

CREATE TABLESPACE AAAAA004
   IN SIEBEL07
   SEGSIZE 32 USING STOGROUP      STOGRP01
   BUFFERPOOL   BP1
   LOCKSIZE ROW; COMMIT;

CREATE TABLESPACE AAAAA005
   IN SIEBEL07
   SEGSIZE 32 USING STOGROUP      STOGRP01
   BUFFERPOOL   BP1
   LOCKSIZE ROW; COMMIT;

CREATE TABLESPACE BBBBB045
   IN SIEBEL07
   SEGSIZE 32 USING STOGROUP      STOGRP01
   BUFFERPOOL   BP1
   LOCKSIZE PAGE; COMMIT;

CREATE TABLESPACE BBBBB046
   IN SIEBEL07
   SEGSIZE 32 USING STOGROUP      STOGRP01
   BUFFERPOOL   BP1
   LOCKSIZE PAGE; COMMIT;

CREATE TABLESPACE BBBBB047
   IN SIEBEL07
   SEGSIZE 32 USING STOGROUP      STOGRP01
   BUFFERPOOL   BP1
   LOCKSIZE PAGE; COMMIT;

CREATE TABLESPACE BBBBB048
   IN SIEBEL07
   SEGSIZE 32 USING STOGROUP      STOGRP01
   BUFFERPOOL   BP1
   LOCKSIZE PAGE; COMMIT;

CREATE TABLESPACE BBBBB049
   IN SIEBEL07
   SEGSIZE 32 USING STOGROUP      STOGRP01
   BUFFERPOOL   BP1
   LOCKSIZE PAGE; COMMIT;

CREATE TABLESPACE BBBBB050
   IN SIEBEL07
   SEGSIZE 32 USING STOGROUP      STOGRP01
   BUFFERPOOL   BP1
   LOCKSIZE PAGE; COMMIT;

CREATE TABLESPACE BBBBB051
   IN SIEBEL07
   SEGSIZE 32 USING STOGROUP      STOGRP01
   BUFFERPOOL   BP1
   LOCKSIZE PAGE; COMMIT;
```

```
CREATE TABLESPACE BBBBB052
   IN SIEBEL07
   SEGSIZE 32 USING STOGROUP      STOGRP01
   BUFFERPOOL   BP1
   LOCKSIZE PAGE; COMMIT;

CREATE TABLESPACE BBBBB053
   IN SIEBEL07
   SEGSIZE 32 USING STOGROUP      STOGRP01
   BUFFERPOOL   BP1
   LOCKSIZE PAGE; COMMIT;

CREATE TABLESPACE BBBBB054
   IN SIEBEL07
   SEGSIZE 32 USING STOGROUP      STOGRP01
   BUFFERPOOL   BP1
   LOCKSIZE PAGE; COMMIT;

CREATE TABLESPACE BBBBB055
   IN SIEBEL07
   SEGSIZE 32 USING STOGROUP      STOGRP01
   BUFFERPOOL   BP1
   LOCKSIZE PAGE; COMMIT;

CREATE TABLESPACE BBBBB056
   IN SIEBEL07
   SEGSIZE 32 USING STOGROUP      STOGRP01
   BUFFERPOOL   BP1
   LOCKSIZE PAGE; COMMIT;

CREATE TABLESPACE BBBBB057
   IN SIEBEL07
   SEGSIZE 32 USING STOGROUP      STOGRP01
   BUFFERPOOL   BP1
   LOCKSIZE PAGE; COMMIT;

CREATE TABLESPACE BBBBB058
   IN SIEBEL07
   SEGSIZE 32 USING STOGROUP      STOGRP01
   BUFFERPOOL   BP1
   LOCKSIZE PAGE; COMMIT;

CREATE TABLESPACE BBBBB059
   IN SIEBEL07
   SEGSIZE 32 USING STOGROUP      STOGRP01
   BUFFERPOOL   BP1
   LOCKSIZE PAGE; COMMIT;
```

```
CREATE TABLESPACE BBBBB060
   IN SIEBEL07
   SEGSIZE 32 USING STOGROUP      STOGRP01
   BUFFERPOOL   BP1
   LOCKSIZE PAGE; COMMIT;

CREATE TABLESPACE DDDDD005
   IN SIEBEL07
   SEGSIZE 32 USING STOGROUP      STOGRP01
   BUFFERPOOL   BP1
   LOCKSIZE PAGE; COMMIT;

CREATE TABLESPACE DDDDD006
   IN SIEBEL07
   SEGSIZE 32 USING STOGROUP      STOGRP01
   BUFFERPOOL   BP1
   LOCKSIZE PAGE; COMMIT;

CREATE TABLESPACE DDDDD007
   IN SIEBEL07
   SEGSIZE 32 USING STOGROUP      STOGRP01
   BUFFERPOOL   BP1
   LOCKSIZE PAGE; COMMIT;

CREATE TABLESPACE DDDDD008
   IN SIEBEL07
   SEGSIZE 32 USING STOGROUP      STOGRP01
   BUFFERPOOL   BP1
   LOCKSIZE PAGE; COMMIT;

CREATE TABLESPACE DDDDD009
   IN SIEBEL07
   SEGSIZE 32 USING STOGROUP      STOGRP01
   BUFFERPOOL   BP1
   LOCKSIZE PAGE; COMMIT;

CREATE TABLESPACE DDDDD010
   IN SIEBEL07
   SEGSIZE 32 USING STOGROUP      STOGRP01
   BUFFERPOOL   BP1
   LOCKSIZE PAGE; COMMIT;

CREATE TABLESPACE DDDDD011
   IN SIEBEL07
   SEGSIZE 32 USING STOGROUP      STOGRP01
   BUFFERPOOL   BP1
   LOCKSIZE PAGE; COMMIT;

CREATE TABLESPACE DDDDD012
```

```
   IN SIEBEL07
   SEGSIZE 32 USING STOGROUP      STOGRP01
   BUFFERPOOL   BP1
   LOCKSIZE PAGE; COMMIT;

CREATE TABLESPACE DDDDD013
   IN SIEBEL07
   SEGSIZE 32 USING STOGROUP      STOGRP01
   BUFFERPOOL   BP1
   LOCKSIZE PAGE; COMMIT;

CREATE TABLESPACE DDDDD014
   IN SIEBEL07
   SEGSIZE 32 USING STOGROUP      STOGRP01
   BUFFERPOOL   BP1
   LOCKSIZE PAGE; COMMIT;

CREATE TABLESPACE BBBBB001
   IN SIEBEL08
   SEGSIZE 32 USING STOGROUP      STOGRP01
   BUFFERPOOL   BP1
   LOCKSIZE PAGE; COMMIT;

CREATE TABLESPACE BBBBB002
   IN SIEBEL08
   SEGSIZE 32 USING STOGROUP      STOGRP01
   BUFFERPOOL   BP1
   LOCKSIZE PAGE; COMMIT;

CREATE TABLESPACE BBBBB003
   IN SIEBEL08
   SEGSIZE 32 USING STOGROUP      STOGRP01
   BUFFERPOOL   BP1
   LOCKSIZE PAGE; COMMIT;

CREATE TABLESPACE BBBBB004
   IN SIEBEL08
   SEGSIZE 32 USING STOGROUP      STOGRP01
   BUFFERPOOL   BP1
   LOCKSIZE PAGE; COMMIT;

CREATE TABLESPACE BBBBB061
   IN SIEBEL08
   SEGSIZE 32 USING STOGROUP      STOGRP01
   BUFFERPOOL   BP1
   LOCKSIZE PAGE; COMMIT;

CREATE TABLESPACE BBBBB062
   IN SIEBEL08
   SEGSIZE 32 USING STOGROUP      STOGRP01
   BUFFERPOOL   BP1
   LOCKSIZE PAGE; COMMIT;

CREATE TABLESPACE CCCCC001
   IN SIEBEL08
   SEGSIZE 32 USING STOGROUP      STOGRP01
   BUFFERPOOL   BP16K1
   LOCKSIZE PAGE; COMMIT;

CREATE TABLESPACE DDDDD001
   IN SIEBEL08
   SEGSIZE 32 USING STOGROUP      STOGRP01
   BUFFERPOOL   BP1
   LOCKSIZE PAGE; COMMIT;

CREATE TABLESPACE DDDDD002
   IN SIEBEL08
   SEGSIZE 32 USING STOGROUP      STOGRP01
   BUFFERPOOL   BP1
   LOCKSIZE PAGE; COMMIT;

CREATE TABLESPACE DDDDD003
   IN SIEBEL08
   SEGSIZE 32 USING STOGROUP      STOGRP01
   BUFFERPOOL   BP1
   LOCKSIZE PAGE; COMMIT;

CREATE TABLESPACE DDDDD041
   IN SIEBEL08
   SEGSIZE 32 USING STOGROUP      STOGRP01
   BUFFERPOOL   BP1
   LOCKSIZE PAGE; COMMIT;

CREATE TABLESPACE DDDDD042
   IN SIEBEL08
   SEGSIZE 32 USING STOGROUP      STOGRP01
   BUFFERPOOL   BP1
   LOCKSIZE PAGE; COMMIT;

CREATE TABLESPACE DDDDD043
   IN SIEBEL08
   SEGSIZE 32 USING STOGROUP      STOGRP01
   BUFFERPOOL   BP1
   LOCKSIZE PAGE; COMMIT;

CREATE TABLESPACE DDDDD044
   IN SIEBEL08
   SEGSIZE 32 USING STOGROUP      STOGRP01
   BUFFERPOOL   BP1
   LOCKSIZE PAGE; COMMIT;

CREATE TABLESPACE DDDDD045
   IN SIEBEL08
   SEGSIZE 32 USING STOGROUP      STOGRP01
   BUFFERPOOL   BP1
   LOCKSIZE PAGE; COMMIT;

CREATE TABLESPACE DDDDD046
   IN SIEBEL08
   SEGSIZE 32 USING STOGROUP      STOGRP01
   BUFFERPOOL   BP1
   LOCKSIZE PAGE; COMMIT;

CREATE TABLESPACE DDDDD047
   IN SIEBEL08
   SEGSIZE 32 USING STOGROUP      STOGRP01
   BUFFERPOOL   BP1
   LOCKSIZE PAGE; COMMIT;

CREATE TABLESPACE DDDDD048
   IN SIEBEL08
   SEGSIZE 32 USING STOGROUP      STOGRP01
   BUFFERPOOL   BP1
   LOCKSIZE PAGE; COMMIT;

CREATE TABLESPACE DDDDD049
   IN SIEBEL08
   SEGSIZE 32 USING STOGROUP      STOGRP01
   BUFFERPOOL   BP1
   LOCKSIZE PAGE; COMMIT;

CREATE TABLESPACE DDDDD050
   IN SIEBEL08
   SEGSIZE 32 USING STOGROUP      STOGRP01
   BUFFERPOOL   BP1
   LOCKSIZE PAGE; COMMIT;

CREATE TABLESPACE DDDDD051
   IN SIEBEL08
   SEGSIZE 32 USING STOGROUP      STOGRP01
   BUFFERPOOL   BP1
   LOCKSIZE PAGE; COMMIT;

CREATE TABLESPACE DDDDD052
   IN SIEBEL08
   SEGSIZE 32 USING STOGROUP      STOGRP01
   BUFFERPOOL   BP1
   LOCKSIZE PAGE; COMMIT;

CREATE TABLESPACE DDDDD053
   IN SIEBEL08
   SEGSIZE 32 USING STOGROUP      STOGRP01
   BUFFERPOOL   BP1
   LOCKSIZE PAGE; COMMIT;

CREATE TABLESPACE DDDDD054
   IN SIEBEL08
   SEGSIZE 32 USING STOGROUP      STOGRP01
   BUFFERPOOL   BP1
   LOCKSIZE PAGE; COMMIT;

CREATE TABLESPACE BBBBB006
   IN SIEBEL09
   SEGSIZE 32 USING STOGROUP      STOGRP01
   BUFFERPOOL   BP1
   LOCKSIZE PAGE; COMMIT;

CREATE TABLESPACE BBBBB007
   IN SIEBEL09
   SEGSIZE 32 USING STOGROUP      STOGRP01
   BUFFERPOOL   BP1
   LOCKSIZE PAGE; COMMIT;

CREATE TABLESPACE BBBBB008
   IN SIEBEL09
   SEGSIZE 32 USING STOGROUP      STOGRP01
   BUFFERPOOL   BP1
   LOCKSIZE PAGE; COMMIT;

CREATE TABLESPACE BBBBB009
   IN SIEBEL09
   SEGSIZE 32 USING STOGROUP      STOGRP01
   BUFFERPOOL   BP1
   LOCKSIZE PAGE; COMMIT;

CREATE TABLESPACE BBBBB010
   IN SIEBEL09
   SEGSIZE 32 USING STOGROUP      STOGRP01
   BUFFERPOOL   BP1
   LOCKSIZE PAGE; COMMIT;

CREATE TABLESPACE BBBBB011
   IN SIEBEL09
   SEGSIZE 32 USING STOGROUP      STOGRP01
   BUFFERPOOL   BP1
   LOCKSIZE PAGE; COMMIT;
```

```
CREATE TABLESPACE BBBBB012
   IN SIEBEL09
   SEGSIZE 32 USING STOGROUP      STOGRP01
   BUFFERPOOL   BP1
   LOCKSIZE PAGE; COMMIT;

CREATE TABLESPACE BBBBB013
   IN SIEBEL09
   SEGSIZE 32 USING STOGROUP      STOGRP01
   BUFFERPOOL   BP1
   LOCKSIZE PAGE; COMMIT;

CREATE TABLESPACE BBBBB014
   IN SIEBEL09
   SEGSIZE 32 USING STOGROUP      STOGRP01
   BUFFERPOOL   BP1
   LOCKSIZE PAGE; COMMIT;

CREATE TABLESPACE BBBBB015
   IN SIEBEL09
   SEGSIZE 32 USING STOGROUP      STOGRP01
   BUFFERPOOL   BP1
   LOCKSIZE PAGE; COMMIT;

CREATE TABLESPACE BBBBB016
   IN SIEBEL09
   SEGSIZE 32 USING STOGROUP      STOGRP01
   BUFFERPOOL   BP1
   LOCKSIZE PAGE; COMMIT;

CREATE TABLESPACE DDDDD030
   IN SIEBEL09
   SEGSIZE 32 USING STOGROUP      STOGRP01
   BUFFERPOOL   BP1
   LOCKSIZE PAGE; COMMIT;

CREATE TABLESPACE DDDDD031
   IN SIEBEL09
   SEGSIZE 32 USING STOGROUP      STOGRP01
   BUFFERPOOL   BP1
   LOCKSIZE PAGE; COMMIT;

CREATE TABLESPACE DDDDD032
   IN SIEBEL09
   SEGSIZE 32 USING STOGROUP      STOGRP01
   BUFFERPOOL   BP1
   LOCKSIZE PAGE; COMMIT;
CREATE TABLESPACE DDDDD033
```

```
   IN SIEBEL09
   SEGSIZE 32 USING STOGROUP      STOGRP01
   BUFFERPOOL   BP1
   LOCKSIZE PAGE; COMMIT;

CREATE TABLESPACE DDDDD034
   IN SIEBEL09
   SEGSIZE 32 USING STOGROUP      STOGRP01
   BUFFERPOOL   BP1
   LOCKSIZE PAGE; COMMIT;

CREATE TABLESPACE DDDDD035
   IN SIEBEL09
   SEGSIZE 32 USING STOGROUP      STOGRP01
   BUFFERPOOL   BP1
   LOCKSIZE PAGE; COMMIT;

CREATE TABLESPACE DDDDD036
   IN SIEBEL09
   SEGSIZE 32 USING STOGROUP      STOGRP01
   BUFFERPOOL   BP1
   LOCKSIZE PAGE; COMMIT;

CREATE TABLESPACE DDDDD037
   IN SIEBEL09
   SEGSIZE 32 USING STOGROUP      STOGRP01
   BUFFERPOOL   BP1
   LOCKSIZE PAGE; COMMIT;

CREATE TABLESPACE DDDDD038
   IN SIEBEL09
   SEGSIZE 32 USING STOGROUP      STOGRP01
   BUFFERPOOL   BP1
   LOCKSIZE PAGE; COMMIT;

CREATE TABLESPACE DDDDD039
   IN SIEBEL09
   SEGSIZE 32 USING STOGROUP      STOGRP01
   BUFFERPOOL   BP1
   LOCKSIZE PAGE; COMMIT;

CREATE TABLESPACE DDDDD040
   IN SIEBEL09
   SEGSIZE 32 USING STOGROUP      STOGRP01
   BUFFERPOOL   BP1
   LOCKSIZE PAGE; COMMIT;

CREATE TABLESPACE AAAAA006
   IN SIEBEL10
   SEGSIZE 32 USING STOGROUP      STOGRP01
   BUFFERPOOL   BP1
   LOCKSIZE ROW; COMMIT;

CREATE TABLESPACE AAAAA007
   IN SIEBEL10
   SEGSIZE 32 USING STOGROUP      STOGRP01
   BUFFERPOOL   BP1
   LOCKSIZE ROW; COMMIT;

CREATE TABLESPACE AAAAA008
   IN SIEBEL10
   SEGSIZE 32 USING STOGROUP      STOGRP01
   BUFFERPOOL   BP1
   LOCKSIZE ROW; COMMIT;

CREATE TABLESPACE BBBBB017
   IN SIEBEL10
   SEGSIZE 32 USING STOGROUP      STOGRP01
   BUFFERPOOL   BP1
   LOCKSIZE PAGE; COMMIT;

CREATE TABLESPACE BBBBB018
   IN SIEBEL10
   SEGSIZE 32 USING STOGROUP      STOGRP01
   BUFFERPOOL   BP1
   LOCKSIZE PAGE; COMMIT;

CREATE TABLESPACE BBBBB019
   IN SIEBEL10
   SEGSIZE 32 USING STOGROUP      STOGRP01
   BUFFERPOOL   BP1
   LOCKSIZE PAGE; COMMIT;

CREATE TABLESPACE BBBBB020
   IN SIEBEL10
   SEGSIZE 32 USING STOGROUP      STOGRP01
   BUFFERPOOL   BP1
   LOCKSIZE PAGE; COMMIT;

CREATE TABLESPACE BBBBB021
   IN SIEBEL10
   SEGSIZE 32 USING STOGROUP      STOGRP01
   BUFFERPOOL   BP1
   LOCKSIZE PAGE; COMMIT;

CREATE TABLESPACE BBBBB022
   IN SIEBEL10
   SEGSIZE 32 USING STOGROUP      STOGRP01
   BUFFERPOOL   BP1
   LOCKSIZE PAGE; COMMIT;

CREATE TABLESPACE BBBBB023
   IN SIEBEL10
   SEGSIZE 32 USING STOGROUP      STOGRP01
   BUFFERPOOL   BP1
   LOCKSIZE PAGE; COMMIT;

CREATE TABLESPACE DDDDD025
   IN SIEBEL10
   SEGSIZE 32 USING STOGROUP      STOGRP01
   BUFFERPOOL   BP1
   LOCKSIZE PAGE; COMMIT;

CREATE TABLESPACE DDDDD026
   IN SIEBEL10
   SEGSIZE 32 USING STOGROUP      STOGRP01
   BUFFERPOOL   BP1
   LOCKSIZE PAGE; COMMIT;

CREATE TABLESPACE DDDDD027
   IN SIEBEL10
   SEGSIZE 32 USING STOGROUP      STOGRP01
   BUFFERPOOL   BP1
   LOCKSIZE PAGE; COMMIT;

CREATE TABLESPACE DDDDD028
   IN SIEBEL10
   SEGSIZE 32 USING STOGROUP      STOGRP01
   BUFFERPOOL   BP1
   LOCKSIZE PAGE; COMMIT;

CREATE TABLESPACE DDDDD029
   IN SIEBEL10
   SEGSIZE 32 USING STOGROUP      STOGRP01
   BUFFERPOOL   BP1
   LOCKSIZE PAGE; COMMIT;
```

Creating Siebel tables and indexes

Here is a subset of the job we used to create Siebel tables and indexes.

```
//CRETBL  JOB (999,POK),'CREATE TBSPACE',NOTIFY=&SYSUID,
 //    CLASS=A,MSGCLASS=T,TIME=1439,
 //    MSGLEVEL=(1,1)
 /*JOBPARM SYSAFF=SC04
 //***
```

```
//***
//*** CREATE ALL THE TABLE AND INDEXES NEEDED FOR SIEBEL
//***
//***
//JOBLIB  DD DSN=DB2V610D.RUNLIB.LOAD,DISP=SHR
//        DD DSN=DSN610.SDSNLOAD,DISP=SHR
//CREATETB EXEC PGM=IKJEFT01,DYNAMNBR=20
//SYSPRINT DD SYSOUT=*
//SYSTSPRT DD SYSOUT=*
//SYSOUT DD SYSOUT=*
//SYSUDUMP DD SYSOUT=*
//SYSTSIN DD *
  DSN S(DB2D)
  RUN PROG(DSNTIAD) PLAN(DSNTIA61)
  END
//SYSIN DD *
  CREATE TABLE EIM_ACCNT_DTL (
  MS_IDENT NUMERIC(15,0) GENERATED ALWAYS AS IDENTITY,
  ROW_ID                         VARCHAR(15)          NOT NULL,
  CREATED                        TIMESTAMP            DEFAULT ,
  CREATED_BY                     VARCHAR(15),
  LAST_UPD                       TIMESTAMP            DEFAULT ,
  LAST_UPD_BY                    VARCHAR(15),
  MODIFICATION_NUM               NUMERIC(10,0)        DEFAULT 0,
  CONFLICT_ID                    VARCHAR(15)          DEFAULT '0',
  IF_ROW_BATCH_NUM               NUMERIC(15,0)
        DEFAULT 0 NOT NULL,
 IF_ROW_STAT                    VARCHAR(30)          NOT NULL,
 NAME                           VARCHAR(100)         NOT NULL,
 ACCNT_BI                       VARCHAR(15),
 ACCNT_BU                       VARCHAR(50),
 ACC_PR_LOGO                    CHAR(1),
 ASGN_IT_TYPE_NAME              VARCHAR(75),
 ATT_COMMENTS                   VARCHAR(250),
 ATT_FILE_EXT                   VARCHAR(10),
 ATT_FILE_NAME                  VARCHAR(200),
 ATT_FILE_SRC_TYPE              VARCHAR(30),
 COMMENTS                       VARCHAR(250),
 EXT_ATTRIB_01                  VARCHAR(100),
 EXT_ATTRIB_02                  VARCHAR(100),
 EXT_ATTRIB_03                  VARCHAR(30),
 EXT_ATTRIB_04                  VARCHAR(30),
 EXT_ATTRIB_05                  VARCHAR(30),
 EXT_ATTRIB_06                  VARCHAR(30),
 EXT_ATTRIB_07                  VARCHAR(30),
 EXT_ATTRIB_08                  CHAR(1),
 EXT_ATTRIB_09                  CHAR(1),
 EXT_ATTRIB_10                  CHAR(1),
 EXT_ATTRIB_11                  CHAR(1),
 EXT_ATTRIB_12                  TIMESTAMP,
 EXT_ATTRIB_13                  TIMESTAMP,
 EXT_ATTRIB_14                  NUMERIC(22,7),
 EXT_ATTRIB_15                  NUMERIC(22,7),
 EXT_ATTRIB_16                  NUMERIC(22,7),
 EXT_ATTRIB_17                  NUMERIC(22,7),
 EXT_ATTRIB_18                  NUMERIC(22,7),
 EXT_ATTRIB_19                  NUMERIC(22,7),
 EXT_ATTRIB_20                  NUMERIC(22,7),
EXT_ATTRIB_21                  NUMERIC(22,7),
EXT_ATTRIB_22                  NUMERIC(22,7),
EXT_ATTRIB_23                  NUMERIC(22,7),
EXT_ATTRIB_24                  NUMERIC(22,7),
EXT_ATTRIB_25                  NUMERIC(22,7),
EXT_ATTRIB_26                  TIMESTAMP,
EXT_ATTRIB_27                  TIMESTAMP,
EXT_ATTRIB_28                  TIMESTAMP,
EXT_ATTRIB_29                  TIMESTAMP,
EXT_ATTRIB_30                  TIMESTAMP,
EXT_ATTRIB_31                  TIMESTAMP,
EXT_ATTRIB_32                  TIMESTAMP,
EXT_ATTRIB_33                  TIMESTAMP,
EXT_ATTRIB_34                  VARCHAR(50),
EXT_ATTRIB_35                  VARCHAR(50),
EXT_ATTRIB_36                  VARCHAR(50),
EXT_ATTRIB_37                  VARCHAR(50),
EXT_ATTRIB_38                  VARCHAR(50),
EXT_ATTRIB_39                  VARCHAR(50),
EXT_ATTRIB_40                  VARCHAR(50),
EXT_ATTRIB_41                  VARCHAR(50),
EXT_ATTRIB_42                  VARCHAR(50),
EXT_ATTRIB_43                  VARCHAR(50),
EXT_ATTRIB_44                  VARCHAR(100),
EXT_ATTRIB_45                  VARCHAR(100),
EXT_ATTRIB_46                  VARCHAR(100),
EXT_ATTRIB_47                  VARCHAR(255),
IF_ROW_MERGE_ID                VARCHAR(15),
IF_ROW_STAT_NUM                NUMERIC(10,0),
INCL_EXCL_CD                   VARCHAR(30),
IT_COMMENTS                    VARCHAR(250),
IT_EXPERTISE_CD                VARCHAR(30),
IT_LO_CHAR1                    VARCHAR(100),
IT_LO_CHAR2                    VARCHAR(50),
IT_LO_CHAR3                    VARCHAR(50),
IT_LO_CHAR4                    VARCHAR(250),
IT_LO_NUM1                     NUMERIC(10,0),
IT_LO_NUM2                     NUMERIC(10,0),
IT_LO_NUM3                     NUMERIC(10,0),
IT_LO_NUM4                     NUMERIC(10,0),
LOC                            VARCHAR(50),
NOTE_NOTE                      LONG VARCHAR,
NOTE_NOTE_TYPE                 VARCHAR(30),
NOTE_PRIV_FLG                  CHAR(1),
ORG_SKL_NAME                   VARCHAR(50),
T_ACCNT_ATT_PARROW             VARCHAR(15),
T_ACCNT_ATT__EXS               CHAR(1),
T_ACCNT_ATT__RID               VARCHAR(15),
T_ACCNT_ATT__STA               NUMERIC(10,0),
T_ACCNT_ATT__UNQ               CHAR(1),
T_DELETED_ROW_ID               VARCHAR(15),
T_EXPORTED_ROW_ID              VARCHAR(15),
T_MERGED_ROW_ID                VARCHAR(15),
T_NOTEACCNT_SRCROW             VARCHAR(15),
T_NOTEACCNT__EXS               CHAR(1),
T_NOTEACCNT__RID               VARCHAR(15),
T_NOTEACCNT__STA               NUMERIC(10,0),
T_NOTEACCNT__UNQ               CHAR(1),
T_ORGEXT_XM_PARROW             VARCHAR(15),
T_ORGEXT_XM__EXS               CHAR(1),
T_ORGEXT_XM__RID               VARCHAR(15),
T_ORGEXT_XM__STA               NUMERIC(10,0),
T_ORGEXT_XM__UNQ               CHAR(1),
T_ORGSKILLI_ORGSKI             VARCHAR(15),
T_ORGSKILLI__EXS               CHAR(1),
T_ORGSKILLI__RID               VARCHAR(15),
T_ORGSKILLI__STA               NUMERIC(10,0),
T_ORGSKILLI__UNQ               CHAR(1),
T_ORG_EXT_BU_ID                VARCHAR(15),
T_ORG_EXT_X__EXS               CHAR(1),
T_ORG_EXT_X__RID               VARCHAR(15),
T_ORG_EXT_X__STA               NUMERIC(10,0),
T_ORG_EXT_X__UNQ               CHAR(1),
T_ORG_EXT__EXS                 CHAR(1),
T_ORG_EXT__RID                 VARCHAR(15),
T_ORG_EXT__STA                 NUMERIC(10,0),
T_ORG_EXT__UNQ                 CHAR(1),
T_ORG_SKILL_ORG_ID             VARCHAR(15),
T_ORG_SKILL__EXS               CHAR(1),
T_ORG_SKILL__RID               VARCHAR(15),
T_ORG_SKILL__STA               NUMERIC(10,0),
T_ORG_SKILL__UNQ               CHAR(1),
XM_NAME                        VARCHAR(100),
XM_TYPE                        VARCHAR(30))
IN SIEBEL04.GGGGG001
; COMMIT;
GRANT SELECT,INSERT,UPDATE,DELETE ON EIM_ACCNT_DTL TO SSEROLE
; COMMIT;
CREATE UNIQUE INDEX EIM_ACCNT_DTL_U1 ON EIM_ACCNT_DTL
```

```
(ROW_ID, IF_ROW_BATCH_NUM)
CLUSTER USING STOGROUP STOGRP01 PRIQTY
720 SECQTY 720 DEFINE NO CLOSE YES
; COMMIT;
CREATE  INDEX EIM_ACCNT_DTL_T01 ON EIM_ACCNT_DTL
(IF_ROW_BATCH_NUM, T_DELETED_ROW_ID)
USING STOGROUP STOGRP01 PRIQTY 720 SECQTY 720 DEFINE NO CLOSE YES
; COMMIT;
CREATE  INDEX EIM_ACCNT_DTL_T02 ON EIM_ACCNT_DTL
(IF_ROW_BATCH_NUM, T_ORG_EXT__RID)
USING STOGROUP STOGRP01 PRIQTY 720 SECQTY 720 DEFINE NO CLOSE YES
; COMMIT;
CREATE  INDEX EIM_ACCNT_DTL_T03 ON EIM_ACCNT_DTL
(IF_ROW_BATCH_NUM, T_ACCNT_ATT__RID)
USING STOGROUP STOGRP01 PRIQTY 720 SECQTY 720 DEFINE NO CLOSE YES
; COMMIT;
CREATE  INDEX EIM_ACCNT_DTL_T04 ON EIM_ACCNT_DTL
(IF_ROW_BATCH_NUM, NAME, LOC, T_ORG_EXT_BU_ID)
USING STOGROUP STOGRP01 PRIQTY 720 SECQTY 720 DEFINE NO CLOSE YES
; COMMIT;
CREATE  INDEX EIM_ACCNT_DTL_T05 ON EIM_ACCNT_DTL
(IF_ROW_BATCH_NUM, T_ACCNT_ATT_PARROW, ATT_FILE_NAME, ATT_FILE_EXT)
USING STOGROUP STOGRP01 PRIQTY 720 SECQTY 720 DEFINE NO CLOSE YES
; COMMIT;
CREATE  INDEX EIM_ACCNT_DTL_T06 ON EIM_ACCNT_DTL
(IF_ROW_BATCH_NUM, T_NOTEACCNT__RID)
USING STOGROUP STOGRP01 PRIQTY 720 SECQTY 720 DEFINE NO CLOSE YES
; COMMIT;
CREATE  INDEX EIM_ACCNT_DTL_T07 ON EIM_ACCNT_DTL
(IF_ROW_BATCH_NUM, T_ORG_EXT_X__RID)
USING STOGROUP STOGRP01 PRIQTY 720 SECQTY 720 DEFINE NO CLOSE YES
; COMMIT;
CREATE  INDEX EIM_ACCNT_DTL_T08 ON EIM_ACCNT_DTL
(IF_ROW_BATCH_NUM, T_ORGEXT_XM__RID)
USING STOGROUP STOGRP01 PRIQTY 720 SECQTY 720 DEFINE NO CLOSE YES
; COMMIT;
CREATE  INDEX EIM_ACCNT_DTL_T09 ON EIM_ACCNT_DTL
(IF_ROW_BATCH_NUM, T_ORGEXT_XM_PARROW, XM_TYPE, XM_NAME)
USING STOGROUP STOGRP01 PRIQTY 720 SECQTY 720 DEFINE NO CLOSE YES
; COMMIT;
CREATE  INDEX EIM_ACCNT_DTL_T10 ON EIM_ACCNT_DTL
(IF_ROW_BATCH_NUM, T_ORG_SKILL__RID)
USING STOGROUP STOGRP01 PRIQTY 720 SECQTY 720 DEFINE NO CLOSE YES
; COMMIT;
CREATE  INDEX EIM_ACCNT_DTL_T11 ON EIM_ACCNT_DTL
(IF_ROW_BATCH_NUM, T_ORG_SKILL_ORG_ID, ORG_SKL_NAME)
USING STOGROUP STOGRP01 PRIQTY 720 SECQTY 720 DEFINE NO CLOSE YES
; COMMIT;
CREATE  INDEX EIM_ACCNT_DTL_T12 ON EIM_ACCNT_DTL
```

```
(IF_ROW_BATCH_NUM,T_ORG_SKILL_ORG_ID, ASGN_IT_TYPE_NAME,INCL_EXCL_CD)
 USING STOGROUP STOGRP01 PRIQTY 720 SECQTY 720 DEFINE NO CLOSE YES
 ; COMMIT;
 CREATE  INDEX EIM_ACCNT_DTL_T13 ON EIM_ACCNT_DTL
 (IF_ROW_BATCH_NUM, T_ORGSKILLI__RID)
 USING STOGROUP STOGRP01 PRIQTY 720 SECQTY 720 DEFINE NO CLOSE YES
 ; COMMIT;
```

Creating stored procedure objects

Here is the job we used to create the temporary database and table spaces required to enable the stored procedures for the Siebel application:

```
//CREATETP JOB (999,POK),'CREATE TP',NOTIFY=&SYSUID,          00010023
//    CLASS=A,MSGCLASS=T,TIME=1439,                            00020017
//    MSGLEVEL=(1,1)                                           00030017
//***
/*JOBPARM SYSAFF=SC04
//JOBLIB  DD DSN=DB2V610D.RUNLIB.LOAD,DISP=SHR
//       DD DSN=DSN610.SDSNLOAD,DISP=SHR
//CREATEDB EXEC PGM=IKJEFT01,DYNAMNBR=20
//SYSPRINT DD SYSOUT=*
//SYSTSPRT DD SYSOUT=*
//SYSOUT DD SYSOUT=*
//SYSUDUMP DD SYSOUT=*
//SYSTSIN DD *
  DSN S(DB2D)
  RUN PROG(DSNTIAD) PLAN(DSNTIA61)
  END
//SYSIN DD *
CREATE DATABASE SIEBELTP AS TEMP STOGROUP STOGRP01;
CREATE TABLESPACE TMPSPAC1
      IN  SIEBELTP
     USING STOGROUP STOGRP01 PRIQTY 720 SECQTY 720
      BUFFERPOOL   BP7;
CREATE TABLESPACE TMPSPAC2
      IN  SIEBELTP
     USING STOGROUP STOGRP01 PRIQTY 720 SECQTY 720
     BUFFERPOOL   BP16K11;
CREATE TABLESPACE TMPSPAC3
      IN  SIEBELTP
     USING STOGROUP STOGRP01 PRIQTY 720 SECQTY 720
     BUFFERPOOL   BP32K1;
COMMIT;
/*
//
```

E

DB2 DSNTIAUL and LOAD jobs

This appendix shows the DB2 for OS/390 DSNTIAUL and LOAD process.

A sample JOB follows, which creates a remote package for DSNTIAUL and a plan which contains the package list for the remote package. It then executes the DSNTIAUL utility to unload the data from the DB2 for NT server, edits the control dataset to change the target database names, then loads the data into the new tables. Note that you cannot use the PARMS('SQL') option with remote access.

Each table unloaded requires its own SYSRECxx DD statement number sequentially starting with xx between 00 - 99. Because of the volume of data and the fact that DSNTIAUL unloads varchar columns as fixed-length columns, there can be a lot of blank space in the load data sets. It is recommended that DFSMS-managed storage groups be used with the compression option.

```
//DSNTIAUL JOB TIAUL,MSGCLASS=H,CLASS=A,MSGLEVEL=(1,1),                 00001000
//         REGION=5M,                                                   00002000
//         USER=USRT001,PASSWORD=USRT001                                00003000
//**********************************************************************00010000
//*  NAME = BIND DSNTIAUL REMOTE                                       *00020000
//*                                                                    *00030000
//*  DESCRIPTIVE NAME = BIND DSNTIAUL ON THE REMOTE SERVER             *00040000
//*                                                                    *00070000
//*                                                                    *00120000
//*                                                                    *00130000
//**********************************************************************00270000
//*                                                                     00280000
//JOBLIB  DD  DSN=DB2A.SDSNLOAD,DISP=SHR                                00290000
//*                                                                     00300000
//*                                                                     00530000
//*  Delete the control and unload dataset if they exists               00540001
//*                                                                     00550000
//DELETE  EXEC PGM=IEFBR14                                              00551000
//DELREC00 DD DSN=V71A.SIEBEL.SYSREC00,                                 00552000
//            UNIT=SYSDA,SPACE=(1024,(10,10)),DISP=(MOD,DELETE),        00553000
//            VOL=SER=DB0005                                            00554000
//DELREC01 DD DSN=V71A.SIEBEL.SYSREC01,                                 00554102
//            UNIT=SYSDA,SPACE=(1024,(10,10)),DISP=(MOD,DELETE),        00554202
//            VOL=SER=DB0005                                            00554302
//DELPUNCH DD DSN=V71A.SIEBEL.SYSPUNCH,                                 00555000
//            UNIT=SYSDA,SPACE=(800,(15,15)),DISP=(MOD,DELETE),         00556000
//            VOL=SER=DB0005                                            00557000
//UNLOAD  EXEC PGM=IKJEFT01,DYNAMNBR=20,COND=(4,LT)                     01340000
//SYSTSPRT DD  SYSOUT=*                                                 01350000
//SYSTSIN  DD  *                                                        01360000
DSN SYSTEM(V71A)                                                        01370000
RUN  PROGRAM(DSNTIAUL) PLAN(DSNTIR71) -                                 01380002
     LIB('DB2A.TESTLIB')                                                01390000
//SYSPRINT DD SYSOUT=*                                                  01400000
//SYSUDUMP DD SYSOUT=*                                                  01410000
//SYSREC00 DD DSN=V71A.SIEBEL.SYSREC00,                                 01420000
//            UNIT=SYSDA,SPACE=(1024,(10,10)),DISP=(,CATLG),            01430000
//            VOL=SER=DB0005                                            01440000
//SYSREC01 DD DSN=V71A.SIEBEL.SYSREC01,                                 01450002
//            UNIT=SYSDA,SPACE=(1024,(10,10)),DISP=(,CATLG),            01460002
//            VOL=SER=DB0005                                            01470002
//SYSPUNCH DD DSN=V71A.SIEBEL.SYSPUNCH,                                 01480000
//            UNIT=SYSDA,SPACE=(800,(15,15)),DISP=(,CATLG),             01490000
//            VOL=SER=DB0005                                            01500000
//SYSIN    DD *                                                         01510000
 SIEBEL.TABLE                                                           01530002
 SIEBEL.TABLE2                                                          01540002
```

```
//*                                                                   01550000
//*       EDIT THE OUTPUT FROM THE PROGRAM                            01560000
//*                                                                   01570000
//EDIT    EXEC PGM=IKJEFT01,DYNAMNBR=20                               01580000
//SYSTSPRT DD  SYSOUT=*                                               01590000
//SYSTSIN  DD  *                                                      01600000
 EDIT 'V71A.SIEBEL.SYSPUNCH' DATA NONUM                               01610000
 CHANGE * 30 /SIEBEL.TABLE/USRT001.NEWTABLES/                         01620000
 CHANGE * 30 /SIEBEL.TABLE2/USRT001.NEWTABLES2/                       01630002
 TOP                                                                  01640000
 LIST * 999                                                           01650000
 END SAVE                                                             01660000
//*                                                                   01670000
//*        RUN LOAD UTILITY TO LOAD TABLES                            01680000
//*                                                                   01690000
//LOAD    EXEC DSNUPROC,PARM='V71A,DSNTEX'                            01700000
//DSNTRACE DD  SYSOUT=*                                               01720000
//SORTLIB  DD  DSN=SYS1.SORTLIB,DISP=SHR                              01730000
//SORTWK01 DD  UNIT=SYSDA,SPACE=(4000,(20,20),,,ROUND)                01740000
//SORTWK02 DD  UNIT=SYSDA,SPACE=(4000,(20,20),,,ROUND)                01750000
//SORTWK03 DD  UNIT=SYSDA,SPACE=(4000,(20,20),,,ROUND)                01760000
//SORTWK04 DD  UNIT=SYSDA,SPACE=(4000,(20,20),,,ROUND)                01770000
//SYSREC00 DD  DSN=V71A.SIEBEL.SYSREC00,                              01780000
//             DISP=(OLD,KEEP)                                        01790000
//SYSREC01 DD  DSN=V71A.SIEBEL.SYSREC01,                              01800002
//             DISP=(OLD,KEEP)                                        01810002
//SYSUT1   DD  UNIT=SYSDA,SPACE=(4000,(20,20),,,ROUND)                01820000
//SYSIN    DD  DSN=V71A.SIEBEL.SYSPUNCH,                              01830000
//             DISP=(OLD,KEEP)                                        01840000
//*                                                                   01850000
```

REXX EXEC to generate DSNTIAUL unload jobs

```
/* rexx                                           */
/* build DSNTIAUL UNLOAD jobs                     */
/* This job assumes a SMS dataclas and storclas   */
/* called BIGDATA has been defined for use in     */
/* the unload of the data. Compression and        */
/* stripping should be considered for performance */
/* and economy of DASD space.                     */
/*                                                */
/* input file is 5 columns                        */
/*     dbname tsname  owner tablename card        */
/*                                                */
/*    select dbname,tsname,creator,name,card      */
/*    from sysibm.systables                       */
/*    where   type = 't'                          */
/*      and   card > 0                            */
/*      and   creator='xxx'                       */
/*    order by 1,2,3,4                            */
/*                                                */

 trace OFF
 signal on halt
 /*   you must update these values           */
 say "enter input dataset name"
 parse upper pull inputname
 if inputname="" then inputname="SQLOUT"
 "ALLOC F(in) DA("inputname") SHR REUSE"


  "EXECIO * DISKR in (STEM list. FINIS"
  n = list.0
  do idx = 1 to n
   parse value list.idx with dbnm tsnm ownr tbnm card
   dbnm.idx   = strip(dbnm)
   tsnm.idx   = strip(tsnm)
   ownr.idx   = strip(ownr)
   tbnm.idx   = strip(tbnm)
   card.idx   = strip(card)
  end
  /*   create unload jobs                                   */
  drop cmd.             /* initialize stem variable         */
  j = 1
  k = 1
  steps = 32
  do i  = 1 to n
   ii    = right(i,4,'0')
   pp    = (card.i%20) + 100
   smsclas = "DATACLAS=BIGDATA,STORCLAS=BIGDATA,"
   units = ",3"
   if    pp > 72000  then units=",4"                  /* >400 CYL */
   if    pp >108000  then units=",5"                  /* >400 CYL */
   if k = 1 then
    do
     cmd.j ="//UNLD"ii"      JOB ,                            ";j=j+1;
     cmd.j ="//   MSGLEVEL=(1,1),MSGCLASS=H,REGION=0M,        ";j=j+1;
     cmd.j ="//   TYPRUN=HOLD,CLASS=2,                        ";j=j+1;
     cmd.j ="//   NOTIFY=&SYSUID,USER=&SYSUID,TIME=1440       ";j=j+1;
     cmd.j ="//*----------------------------------------------";j=j+1;
     cmd.j ="//JOBLIB    DD DISP=SHR,                         ";j=j+1;
     cmd.j ="//          DSN=DSN610.SDSNLOAD                  ";j=j+1;
     cmd.j ="//*                                              ";j=j+1;
    end
   cmd.j="//D"ii"   EXEC PGM=IDCAMS                           ";j=j+1;
   cmd.j="//SYSPRINT  DD SYSOUT=*                             ";j=j+1;
   cmd.j="//SYSIN     DD *                                    ";j=j+1;
   cmd.j=" DELETE (SIEBELF2.UNL"ii".SYSREC) NONVSAM           ";j=j+1;
   cmd.j=" DELETE (SIEBELF2.UNL"ii".SYSPUN) NONVSAM           ";j=j+1;
   cmd.j=" SET MAXCC=0                                        ";j=j+1;
   cmd.j="//*-------------------------------------------------";j=j+1;
   cmd.j="//*                                                 ";j=j+1;
   cmd.j="//U"ii"   EXEC PGM=IKJEFT01                         ";j=j+1;
   cmd.j="//SYSTSPRT DD SYSOUT=*                              ";j=j+1;
   cmd.j="//SYSTSIN  DD *                                     ";j=j+1;
   cmd.j=" DSN SYSTEM(xxxx)                                   ";j=j+1;
   cmd.j=" RUN  PROGRAM(DSNTIAUL) PLAN(DSNTIAUL) -            ";j=j+1;
   cmd.j="      LIB('xxxxx.xxxxx.RUNLIB.LOAD')                ";j=j+1;
   cmd.j="//SYSPRINT DD SYSOUT=*                              ";j=j+1;
   cmd.j="//SYSUDUMP DD SYSOUT=*                              ";j=j+1;
   cmd.j="//SYSREC00 DD DSN=SIEBELF2.UNL"ii".SYSREC,          ";j=j+1;
   cmd.j="//  DISP=(,CATLG),UNIT=(3390"units"),               ";j=j+1;
   cmd.j="//  "smsclas"                                       ";j=j+1;
   cmd.j="//  SPACE=(4096,("pp","pp"),RLSE)                   ";j=j+1;
   cmd.j="//SYSPUNCH DD DSN=SIEBELF2.UNL"ii".SYSPUN,          ";j=j+1;
   cmd.j="//  DISP=(,CATLG),UNIT=3390,                        ";j=j+1;
   cmd.j="//  SPACE=(TRK,(1,1),RLSE)                          ";j=j+1;
   cmd.j="//SYSIN    DD *                                     ";j=j+1;
   cmd.j="  "ownr.i"."tbnm.i"                                 ";j=j+1;
   cmd.j="//*-------------------------------------------------";j=j+1;
   cmd.j="//*                                                 ";j=j+1;
   k = k + 1
   if k > steps then
   do
    k = 1
    cmd.j="//*-E-O-J--------E-O-J--------E-O-J--------E-O-J---";j=j+1;
   end
  end /* do i = 1 to n */
```

```
 outputname = UNLOAD
 x = SYSDSN(outputname)
 if x <>ok then
   do
    say "allocating dataset"
    "ALLOC DA("outputname") DSORG(PS) UNIT(SYSDA) LRECL(80),
     BLKSIZE(4000) RECFM(F,B) SPACE(1,1) CYLINDERS"
   end
 "ALLOC F(out) DA("outputname") SHR REUSE"
 "EXECIO * DISKW out (STEM "cmd." FINIS"
 "ISPEXEC EDIT DATASET("outputname")"
 "FREE F(OUT)"
 /*   stop   reformat                                      */

halt:
 "FREE F(IN)"
 "DELSTACK"
EXIT
```

REXX EXEC to generate DB2 LOAD jobs

```
/* rexx                                           */
/* build DB2 LOAD JOBS                            */
/* input file is 5 columns                        */
/*     dbname tsname  owner tablename card        */
/*                                                */
/*    select dbname,tsname,creator,name,card      */
/*    from sysibm.systables                       */
/*    where   type = 't'                          */
/*      and   card > 0                            */
/*      and   creator='xxx'                       */
/*    order by 1,2,3,4                            */
/*                                                */
/*  edit syspunch via clist editlist and          */
/*  macro macrload in clist.fb                    */

 trace OFF
 signal on halt
 /*   you must update these values           */
 say "enter input dataset name"
 parse upper pull inputname
 if inputname="" then inputname="SQLOUT"
 "ALLOC F(in) DA("inputname") SHR REUSE"

  "EXECIO * DISKR in (STEM list. FINIS"
  n = list.0
  do idx = 1 to n
   parse value list.idx with dbnm tsnm ownr tbnm card
   dbnm.idx   = strip(dbnm)
   tsnm.idx   = strip(tsnm)
   ownr.idx   = strip(ownr)
   tbnm.idx   = strip(tbnm)
   card.idx   = strip(card)
  end
  /*   create unload jobs                                   */
  drop cmd.             /* initialize stem variable         */
  j = 1
  k = 1
  err=-1
  steps = 32
  do i  = 1 to n
   ii    = right(i,4,'0')
   if   card.i >= 0 then  pp=(card.i%100)+100
   else pp = 3600
   units = ""
   if    pp > 18000  then units=",2"                  /* >100 CYL */
   if    pp > 36000  then units=",3"                  /* >200 CYL */
   if    pp > 72000  then units=",4"                  /* >400 CYL */
   if oldts ¬= tsnm.i then k=1
   if (k = 1) then
    do
     err = err+1
     err = right(err,3,'0')
     cmd.j ="//"tsnm.i"     JOB ,                             ";j=j+1;
     cmd.j ="//   MSGLEVEL=(1,1),MSGCLASS=H,REGION=0M,        ";j=j+1;
     cmd.j ="//   TYPRUN=HOLD,CLASS=Z,                        ";j=j+1;
     cmd.j ="//   NOTIFY=INIT,USER=&SYSUID,TIME=1440          ";j=j+1;
     cmd.j ="/*JOBPARM S=*                                    ";j=j+1;
     cmd.j ="//*----------------------------------------------";j=j+1;
     cmd.j ="//JOBLIB    DD DISP=SHR,DSN=DSNT1.DT11.SDSNLOAD  ";j=j+1;
     cmd.j ="//*----------------------------------------------";j=j+1;
     cmd.j ="//*                                              ";j=j+1;
     cmd.j ="//ALLOC     EXEC PGM=IEFBR14                     ";j=j+1;
     cmd.j ="//DD1       DD DISP=(MOD,CATLG),                 ";j=j+1;
     cmd.j ="// UNIT=SYSALLDA,SPACE=(CYL,(1,1)),              ";j=j+1;
     cmd.j ="// RECFM=FB,LRECL=80,BLKSIZE=8000,               ";j=j+1;
     cmd.j ="// DSN=USERID.ERR"err"                           ";j=j+1;
     cmd.j ="//*                                              ";j=j+1;
    end
   cmd.j="//*-------------------------------------------------";j=j+1;
   cmd.j="//*                                                 ";j=j+1;
   cmd.j="//L"ii"   EXEC PGM=DSNUTILB,PARM='DT11,L"ii"'       ";j=j+1;
   cmd.j="//SYSPRINT DD SYSOUT=*                              ";j=j+1;
   cmd.j="//SYSUDUMP DD SYSOUT=*                              ";j=j+1;
   cmd.j="//UTPRINT  DD SYSOUT=*                              ";j=j+1;
   cmd.j="//DSNTRACE DD SYSOUT=*                              ";j=j+1;
   cmd.j="//SYSDISC  DD SYSOUT=*                              ";j=j+1;
   cmd.j="//SYSERR   DD DISP=(,DELETE,DELETE),                ";j=j+1;
   cmd.j="//  STORCLAS=DB2ARCH,                               ";j=j+1;
   cmd.j="//  SPACE=(CYL,(50,50)),UNIT=SYSALLDA,              ";j=j+1;
   cmd.j="//  DSN=SIEBELF2.UNL"ii".SYSERR                     ";j=j+1;
   cmd.j="//SYSMAP   DD DISP=(,DELETE,DELETE),                ";j=j+1;
   cmd.j="//  STORCLAS=DB2ARCH,                               ";j=j+1;
   cmd.j="//  SPACE=(CYL,(50,50)),UNIT=SYSALLDA,              ";j=j+1;
   cmd.j="//  DSN=SIEBELF2.UNL"ii".SYSMAP                     ";j=j+1;
   cmd.j="//SORTOUT  DD DISP=(,DELETE,DELETE),                ";j=j+1;
   cmd.j="//  STORCLAS=DB2ARCH,                               ";j=j+1;
   cmd.j="//  SPACE=(4096,("pp","pp")),UNIT=(SYSALLDA"units") ";j=j+1;
   cmd.j="//  DSN=SIEBELF2.UNL"ii".SORTOUT                    ";j=j+1;
   cmd.j="//SYSUT1   DD DISP=(,DELETE,DELETE),                ";j=j+1;
   cmd.j="//  STORCLAS=DB2ARCH,                               ";j=j+1;
   cmd.j="//  SPACE=(4096,("pp","pp")),UNIT=(SYSALLDA"units") ";j=j+1;
   cmd.j="//  DSN=SIEBELF2.UNL"ii".SYSUT1                     ";j=j+1;
   cmd.j="//SORTWK01  DD  UNIT=SYSALLDA,SPACE=(CYL,550)       ";j=j+1;
   cmd.j="//SORTWK02  DD  UNIT=SYSALLDA,SPACE=(CYL,550)       ";j=j+1;
   cmd.j="//SORTWK03  DD  UNIT=SYSALLDA,SPACE=(CYL,550)       ";j=j+1;
```

```
  cmd.j="//SORTWK04  DD  UNIT=SYSALLDA,SPACE=(CYL,550)       ";j=j+1;
  cmd.j="//SORTWK05  DD  UNIT=SYSALLDA,SPACE=(CYL,550)       ";j=j+1;
  cmd.j="//SORTWK06  DD  UNIT=SYSALLDA,SPACE=(CYL,550)       ";j=j+1;
  cmd.j="//SORTWK07  DD  UNIT=SYSALLDA,SPACE=(CYL,550)       ";j=j+1;
  cmd.j="//SORTWK08  DD  UNIT=SYSALLDA,SPACE=(CYL,550)       ";j=j+1;
  cmd.j="//SYSREC00  DD DISP=SHR,DSN=SIEBELF2.UNL"ii".SYSREC ";j=j+1;
  cmd.j="//SYSIN     DD DISP=SHR,DSN=SIEBELF2.UNL"ii".SYSPUN ";j=j+1;
  cmd.j="//         DD *                                    ";j=j+1;
  cmd.j="  REPAIR SET TABLESPACE "dbnm.i"."tsnm.i" NOCOPYPEND";j=j+1;
  cmd.j="//*-------------------------------------------------";j=j+1;
  cmd.j="//*                                                 ";j=j+1;
  cmd.j="//IF"ii"   IF (L"ii".RC>4 | L"ii".ABEND) THEN       ";j=j+1;
  cmd.j="//CK"ii"   EXEC PGM=ICEGENER                        ";j=j+1;
  cmd.j="//SYSIN    DD   DUMMY                               ";j=j+1;
  cmd.j="//SYSPRINT DD   SYSOUT=H                            ";j=j+1;
  cmd.j="//*  ---ERROR HISTORY DATASET---                    ";j=j+1;
  cmd.j="//SYSUT2   DD DISP=MOD,DSN=SIEBELF2.ERR"err"        ";j=j+1;
  cmd.j="//SYSUT1   DD *                                     ";j=j+1;
  cmd.j="L"ii"  "dbnm.i"."tsnm.i"  "ownr.i"."tbnm.i"         ";j=j+1;
  cmd.j="//   ENDIF                                          ";j=j+1;
  cmd.j="//*-------------------------------------------------";j=j+1;
  cmd.j="//*                                                 ";j=j+1;
  k = k + 1
  oldts = tsnm.i
  if k > steps then
  do
   k = 1
   cmd.j="//*-E-O-J--------E-O-J--------E-O-J--------E-O-J---";j=j+1;
  end
 end /* do i = 1 to n */

 outputname = RELOAD
 x = SYSDSN(outputname)
 if x ¬=ok then
   do
    say "allocating dataset"
    "ALLOC DA("outputname") DSORG(PS) UNIT(SYSALLDA) LRECL(80),
     BLKSIZE(4000) RECFM(F,B) SPACE(1,2) CYLINDERS"
   end
 "ALLOC F(out) DA("outputname") SHR REUSE"
 "EXECIO * DISKW out (STEM "cmd." FINIS"
 "ISPEXEC EDIT DATASET("outputname")"
 "FREE F(OUT)"
 /*   stop   reformat                                      */

halt:
 "FREE F(IN)"
 "DELSTACK"
EXIT
```

Validating object names

Table names > 18 characters

You can use the following SQL statement to search for table names that exceed 18 characters:

```
SELECT T.NAME "TABLE NAME"
,      LENGTH(T.NAME) "TBLNAMELN"
FROM S_TABLE T
WHERE T.REPOSITORY_ID = (SELECT ROW_ID FROM S_REPOSITORY
                           WHERE NAME = ''SIEBEL REPOSITORY''
                         )
AND   LENGTH(T.NAME) > 18
ORDER BY T.NAME
```

The third column points to the converted name in DB2 for OS/390.

Index names > 18 characters

You can use the following SQL statement to search for index names that exceed 18 characters:

```
SELECT T.NAME "TABLE NAME"
,      I.NAME "INDEX NAME"
,      LENGTH(I.NAME) "IDXNAMELN"
FROM S_TABLE T
```

```
,    S_INDEX I
WHERE T.ROW_ID = I.TBL_ID
AND   T.REPOSITORY_ID = (SELECT ROW_ID FROM S_REPOSITORY
                          WHERE NAME = ''SIEBEL REPOSITORY''
                        )
AND   LENGTH(I.NAME) > 18
ORDER BY T.NAME
,        I.NAME
```

Column names > 18 characters

You can use the following SQL statement to search for column names that exceed 18 characters:

```
select T.NAME "Table Name"
,      C.NAME "Column Name"
,      length(C.NAME) "ColNameLn"
from S_TABLE T
,    S_COLUMN C
where T.ROW_ID = C.TBL_ID
and   T.REPOSITORY_ID = (select ROW_ID from S_REPOSITORY
                          where NAME = ''Siebel Repository''
                        )
and   length(C.NAME) > 18
order by T.NAME
,        C.NAME
```

Index key > 255 bytes

To find the index keys exceeding 255 bytes you may use the following SQL statement:

```
SELECT T.NAME "TABLE NAME"
,      I.NAME "INDEX NAME"
,      SUM(CASE C.DATA_TYPE
             WHEN 'C' THEN C.LENGTH
             WHEN 'V' THEN C.LENGTH
             WHEN 'D' THEN 7
             WHEN 'S' THEN 7
             WHEN 'N' THEN C.LENGTH/2
             WHEN 'X' THEN 0
            END
          )   "390 LENGTH"
FROM S_TABLE T
,    S_COLUMN C
,    S_INDEX I
,    S_INDEX_COLUMN IC
WHERE T.ROW_ID = C.TBL_ID
AND   T.ROW_ID = I.TBL_ID
AND   I.ROW_ID = IC.INDEX_ID
AND   C.ROW_ID = IC.COL_ID
AND   T.REPOSITORY_ID = (SELECT ROW_ID FROM S_REPOSITORY
                          WHERE NAME = 'Siebel Repository')
GROUP BY T.NAME
,        I.NAME
HAVING SUM(CASE C.DATA_TYPE
             WHEN 'C' THEN C.LENGTH
             WHEN 'V' THEN C.LENGTH
             WHEN 'D' THEN 8
             WHEN 'S' THEN 8
             WHEN 'N' THEN C.LENGTH/2
             WHEN 'X' THEN 0
            END
          ) > 255
```

The .dat file

Example of .dat file for one table.

```
Siebel Data File V3
FILE_TYPE=000000000003
FILE_VERSION=000000000003
TotTbls=000000000001
TotRows=000000000784
TblDynA=000000000000

TABLE_NAME="S_DOC_AGREE"

NumRows=000000000784
numCols="110"
COL_NAME="ROW_ID"
COL_NAME="CREATED"
COL_NAME="CREATED_BY"
COL_NAME="LAST_UPD"
COL_NAME="LAST_UPD_BY"
COL_NAME="DCKING_NUM"
COL_NAME="MODIFICATION_NUM"
COL_NAME="CONFLICT_ID"
COL_NAME="NAME"
COL_NAME="REV_NUM"
COL_NAME="ACCNT_SRC_ID"
COL_NAME="AGREE_ADDR_ID"
COL_NAME="AGREE_CD"
COL_NAME="AGREE_NUM"
```

```
COL_NAME="AGREE_TYPE_CD"
COL_NAME="ALL_CON_FLG"
COL_NAME="ALL_PROD_FLG"
COL_NAME="AMENDMENT"
COL_NAME="APPR_BY_EMP_ID"
COL_NAME="APPR_DT"
COL_NAME="BILL_TO_ADDR_ID"
COL_NAME="BILL_TO_CON_ID"
COL_NAME="BK_AMT"
COL_NAME="BK_AMT_CURCY_CD"
COL_NAME="BK_AMT_DT"
COL_NAME="CNTR_RESP_TIME_HRS"
COL_NAME="CNTR_SRV_CAL_CD"
COL_NAME="CNTR_SRV_TYPE_CD"
COL_NAME="CNTR_SRV_TZ_CD"
COL_NAME="CON_PER_ID"
COL_NAME="CURRENT_QUOTA"
COL_NAME="CUST_DOC_STAT_CD"
COL_NAME="CUST_RFP_NUM"
COL_NAME="DESC_TEXT"
COL_NAME="DUE_DT"
COL_NAME="EFF_DATE"
COL_NAME="EFF_END_DT"
COL_NAME="EFF_START_DT"
COL_NAME="FILE_CD"
COL_NAME="FILE_NAME"
COL_NAME="INIT_QUOTA"
COL_NAME="INTEGRATION_ID"
COL_NAME="LEGAL_ADDR_ID"
COL_NAME="LEGAL_CON_ID"
COL_NAME="OPTY_ID"
COL_NAME="PAR_AGREE_ID"
COL_NAME="PAYMENT_TERM_ID"
COL_NAME="PO_AMT"
COL_NAME="PO_AMT_CURCY_CD"
COL_NAME="PO_AMT_DT"
COL_NAME="PO_NUM"
COL_NAME="PRI_LST_ID"
COL_NAME="PROC_PRIORITY_CD"
COL_NAME="PROJ_ID"
COL_NAME="PR_REP_PER_ID"
COL_NAME="RENEWABLE_FLG"
COL_NAME="REV_DT"
COL_NAME="SALES_REP_POSTN_ID"
COL_NAME="SERVICE_FLG"
COL_NAME="SHIP_TO_ADDR_ID"
COL_NAME="SHIP_TO_CON_ID"
COL_NAME="SIGNATURE_DT"
COL_NAME="SIGNATURE_NAME"
```

```
COL_NAME="STAT_CD"
COL_NAME="TARGET_OU_ID"
COL_NAME="TEMPLATE_FLG"
COL_NAME="TURN_AMT"
COL_NAME="TURN_AMT_CURCY_CD"
COL_NAME="TURN_AMT_DT"
COL_NAME="TURN_BY_DT"
COL_NAME="VALID_FLG"
COL_NAME="X_PAYFREQUENCY"
COL_NAME="X_PAYMECHANISM"
COL_NAME="X_PAYMETHOD"
COL_NAME="X_TAPEID"
COL_NAME="X_AGREE_FLG"
COL_NAME="X_CONTACT_FLG"
COL_NAME="X_SALE_FLG"
COL_NAME="ACTIVE_FLG"
COL_NAME="BL_CURCY_CD"
COL_NAME="BU_ID"
COL_NAME="DISCNT_PERCENT"
COL_NAME="EST_AMT_CURCY_CD"
COL_NAME="EST_AMT_EXCH_DT"
COL_NAME="EST_COST_AMT"
COL_NAME="EST_REVN_AMT"
COL_NAME="ORDER_ID"
COL_NAME="QUOTE_ID"
COL_NAME="RATE_LST_ID"
COL_NAME="SVC_PROVIDER_ID"
COL_NAME="X_AGENT_NAME"
COL_NAME="X_AGENT_SIGN_FLG"
COL_NAME="X_BATCH_NUMBER"
COL_NAME="X_CANCELLATION_REA"
COL_NAME="X_CONTRACT_STATUS_"
COL_NAME="X_COOL_OFF_DATE"
COL_NAME="X_CSV_FILENAME"
COL_NAME="X_DD_SIGN_DATE"
COL_NAME="X_DD_SIGN_FLG"
COL_NAME="X_DELETE_FLAG"
COL_NAME="X_ELEC_PREPAY_METE"
COL_NAME="X_GAS_PREPAY_METER"
COL_NAME="X_PHONE_AUDIT_FLG"
COL_NAME="X_RECORD_TYPE"
COL_NAME="X_SALES_ADVISOR_PI"
COL_NAME="X_SALES_CHANNEL"
COL_NAME="X_SALES_OFFICE_PIN"
COL_NAME="X_SIGN_DATE"
COL_NAME="X_SIGN_FLG"
COL_NAME="X_TIF_IMAGE_NUM"
{
ROW_ID="1+1NG+1"
CREATED="2001-05-30 15:55:55"
CREATED_BY="0-1"
LAST_UPD="2001-05-30 15:55:55"
LAST_UPD_BY="0-1"
DCKING_NUM="0.0000000"
MODIFICATION_NUM="0"
CONFLICT_ID="0"
NAME="PIA HUXHAM - 1266684751 - Electric"
REV_NUM="1.0000000"
AGREE_CD="Electric"
AGREE_NUM="1266684751"
EFF_DATE="2001-05-30 00:00:00"
STAT_CD="Validation"
TARGET_OU_ID="1+1MW+1"
VALID_FLG="Y"
X_PAYFREQUENCY="Monthly"
X_PAYMECHANISM="Direct Debit"
X_PAYMETHOD="Budget Plan 12"
ACTIVE_FLG="Y"
BU_ID="0-R9NH"
X_BATCH_NUMBER="80782704"
X_COOL_OFF_DATE="2001-06-13 00:00:00"
X_CSV_FILENAME="HUX_01_05_2001.csv"
X_ELEC_PREPAY_METE="N"
X_GAS_PREPAY_METER="N"
X_RECORD_TYPE="DSC"
X_SALES_ADVISOR_PI="A78434"
X_SALES_CHANNEL="DS APPCO"
X_SIGN_DATE="2001-04-24 00:00:00"
X_SIGN_FLG="Y"
X_TIF_IMAGE_NUM="i:\27042001\4RH16094.TIF"
}
```

G

Dataexp/FTP/DB2 Load programs and jobs

REXX procedure

```
/*REXX */
ARG DB2 TBCREATOR
IF DB2 = '' THEN DO
   SAY 'ENTER DB2 SYSTEM NAME'
   PULL DB2
END
TSSUB = 0
TSNAMES = ''
PQTYS. = ''
IF TBCREATOR = '' THEN TBCREATOR = 'SIEBEL'
TDT = 'D'SUBSTR(DATE(S),3)
CALL RXSUBCOM 'ADD', 'SQL', 'DSNREXX'
RXCD = RC
IF RXCD > 4 THEN DO
   SAY 'DB2 CONNECTION FAILED'
   SAY  RXCD 'FROM RXSUBCOM'
END

ADDRESS SQL 'CONNECT' DB2
RXCD = RC
IF RXCD > 4 THEN DO
```

```
   SAY 'DB2 CONNECTION FAILED'
   SAY RXCD 'FROM DSNALI'
END
"EXECIO 1 DISKR COUNTS("
RCD = RC
DO WHILE RCD = 0
   CALL PROCESS_COUNTS
   "EXECIO 1 DISKR COUNTS("
   RCD = RC
END
"EXECIO 1 DISKR COUNTS(FINIS"
DO SUB = 1 TO WORDS(TSNAMES)
   PRIQTY = PQTYS.SUB
   IF PRIQTY < 1 THEN PRIQTY = 1
   SECQTY = PRIQTY % 10
   IF SECQTY < 1 THEN SECQTY = 1
   QUEUE 'ALTER TABLESPACE 'WORD(TSNAMES,SUB)
   QUEUE 'PRIQTY 'PRIQTY 'SECQTY 'SECQTY';'
   "EXECIO "QUEUED()" DISKW ALTERS("
END
"EXECIO "QUEUED()" DISKW ALTERS(FINIS"
ADDRESS SQL 'DISCONNECT' DB2
EXIT
PROCESS_COUNTS:
   PULL COUNTS
   TBNAME = WORD(COUNTS,1)
   ROWS = WORD(COUNTS,2)
   SEL = "SELECT A.TSNAME,A.DBNAME,A.RECLENGTH,B.PGSIZE "
   SEL = SEL "FROM SYSIBM.SYSTABLES A,SYSIBM.SYSTABLESPACE B"
   SEL = SEL " WHERE A.NAME = '"TBNAME"'"
   SEL = SEL " AND A.CREATOR = '"TBCREATOR"'"
   SEL = SEL " AND A.DBNAME = B.DBNAME"
   SEL = SEL " AND A.TSNAME = B.NAME"
   CSR = 'C1'
   SNUM = 'S1'
   CALL OPEN_CURSOR
   ADDRESS SQL
   "EXECSQL FETCH C1 INTO :TSNAME,:DBNAME,:RECLENGTH,:PGSIZE"
   IF SQLCODE/=0 THEN DO
      SAY 'SQLCODE 'SQLCODE 'FOR 'TBCREATOR'.'TBNAME
      SAY SEL
      EXIT 16
   END
   COUNT = 0
   JNUM = 0
   MNUM = 0
   DO WHILE SQLCODE = 0
      ADDRESS TSO
      SAY TBNAME
      BYTES_LEFT = (1024 * PGSIZE) - 22
      RPAGE = BYTES_LEFT % RECLENGTH
      IF RPAGE > 255 THEN RPAGE = 255
      PFREE = RPAGE % 10
      RPAGE = RPAGE - PFREE
      NUMPAGES = ROWS % RPAGE
      NUMSP_PAGES = NUMPAGES % 4800
      NUMPAGES = NUMPAGES + NUMSP_PAGES
      PRIQTY = NUMPAGES * PGSIZE
      TSN = STRIP(DBNAME)'.'STRIP(TSNAME)
      FND = 'N'
      FPOS = WORDPOS(TSN,TSNAMES)
      IF FPOS = 0 THEN DO
         TSSUB = TSSUB + 1
         PQTYS.TSSUB = PRIQTY
         TSNAMES = TSNAMES TSN
      END
      ELSE ,
      PQTYS.FPOS = PQTYS.FPOS + PRIQTY
      ADDRESS SQL
      "EXECSQL FETCH C1 INTO :TSNAME,:DBNAME,:RECLENGTH,:PGSIZE"
      IF SQLCODE/=0 & SQLCODE ^= 100 THEN DO
         SAY 'SQLCODE 'SQLCODE
         EXIT 16
      END
   END
   ADDRESS SQL
   "EXECSQL CLOSE "CSR
RETURN
OPEN_CURSOR:
   ADDRESS SQL
   "EXECSQL DECLARE "CSR" CURSOR FOR "SNUM
   IF SQLCODE/=0 THEN DO
      SAY 'SQLCODE 'SQLCODE
      EXIT 16
   END
   ADDRESS SQL
   "EXECSQL PREPARE "SNUM" FROM :SEL"
   IF SQLCODE/=0 THEN DO
      SAY 'SQLCODE 'SQLCODE
      EXIT 16
   END
   ADDRESS SQL
   "EXECSQL OPEN "CSR
   IF SQLCODE/=0 THEN DO
      SAY  'SQLCODE 'SQLCODE
      EXIT 16
   END
RETURN
```

JCL to run the REXX procedure

```
//FLETCHPE JOB  (541),'PAUL FLETCHER',CLASS=A,MSGCLASS=H,NOTIFY=FLETCHP
//*
//* THIS JOB WILL RUN THE SIEBEL SIZING REXX
//*
//SIEBSIZE EXEC PGM=IKJEFT01,DYNAMNBR=180,REGION=0M
//*
//STEPLIB  DD DSN=SYS2.DB2.V610.SDSNLOAD,DISP=SHR
//SYSEXEC  DD DSN=FLETCHP.MASTER.REXX,DISP=SHR
//SYSIN    DD *
/*
//SYSTSPRT DD SYSOUT=*
//SYSOUT   DD SYSOUT=*
//COUNTS   DD  DSN=FLETCHP.SIEBL.COUNTSX,DISP=SHR
//ALTERS   DD  DSN=FLETCHP.DB2.INPUT(SIEBALTS),DISP=SHR
//SYSUDUMP DD SYSOUT=*
//SYSTSIN  DD *
SIEBSIZE ISC1 SIEBL
/*
```

PLFSIEBL COBOL program

```
IDENTIFICATION DIVISION.
      *************************

       PROGRAM-ID.           PLFSIEBL.

       AUTHOR.               PAUL FLETCHER.



       ENVIRONMENT DIVISION.
      **********************

       CONFIGURATION SECTION.
      ***********************
       SOURCE-COMPUTER.
           IBM-370.

       INPUT-OUTPUT SECTION.
      **********************

       FILE-CONTROL.

           SELECT INPUT-FILE
                 ASSIGN UT-S-SIEBELIN
                  FILE STATUS IS WG-SIEBEL-FILE-STATUS.


           SELECT OUTPUT-FILE
                 ASSIGN UT-S-DDSEQ01W
                  FILE STATUS IS WG-SIEBEL-FILE-STATUS.


           SELECT LOADCDS-FILE
                 ASSIGN UT-S-LOADCDS
                  FILE STATUS IS WG-SIEBEL-FILE-STATUS.


       I-O-CONTROL.
           APPLY WRITE-ONLY OUTPUT-FILE.


       DATA DIVISION.
      ***************

       FILE SECTION.
      **************
```

```
******************************************************************
*
******************************************************************

 FD    INPUT-FILE
       LABEL RECORDS ARE STANDARD
       RECORDING MODE IS F
       BLOCK CONTAINS 0
       DATA RECORDS IS SIEBEL-REC.

 01  SIEBEL-REC                 PIC X(80).


 FD    OUTPUT-FILE
       LABEL RECORDS ARE STANDARD
       RECORDING MODE IS V
       RECORD IS VARYING IN SIZE
           DEPENDING ON W400-OUT-LEN
       BLOCK CONTAINS 0
       DATA RECORDS IS SIEBEL-OUT.

 01  SIEBEL-OUT.
     03  SIEBEL-BYTE            PIC X OCCURS 32714
           DEPENDING ON W400-OUT-LEN.

 FD    LOADCDS-FILE
       LABEL RECORDS ARE STANDARD
       RECORDING MODE IS F
       BLOCK CONTAINS 0
       DATA RECORDS IS SIEBEL-REC.

 01  LOADCDS-REC                 PIC X(80).


 WORKING-STORAGE SECTION.
*************************

*
*   GENERAL WORKING STORAGE

 01  FILLER                          PIC XXX   VALUE 'WG-'.
 01  FILLER.
     03  W100-SHORT-MSG      PIC  X(24).
     03  W100-LONG-MSG       PIC  X(400).
     03  W100-SELECT         PIC X(8) VALUE 'SELECT  '.
     03  W100-ISPLINK        PIC X(8) VALUE 'ISPLINK '.
     03  W100-CMD-LEN        PIC S9(9) COMP VALUE +21.
     03  W100-ADDRESS        PIC S9(9) COMP.
     03  W100-CMD.
```

```
        05 FILLER   PIC  X(12)  VALUE 'CMD(DB2SPRX '.
        05 W100-HEX-ADDRESS  PIC  X(8).
        05 FILLER   PIC  X      VALUE ')'.
    03  W200-SQLCODE                PIC -9(4).
01  W400-OUTPUT-AREA.
    03  W400-OUT-LEN            PIC 9(8) COMP VALUE 132.
    03  W400-OUTPUT-REC.
    05  W400-OUTPUT-BYTE      PIC X
                OCCURS 32714 DEPENDING ON W400-OUT-LEN.

01  WD-DB2-CONNECT.

    03  WD-FUNCTION                 PIC X(12).
    03  WD-SSNAME                   PIC X(4) VALUE 'ISC1'.
    03  WD-TERMCB                   PIC X(4).
    03  WD-STARTCB                  PIC X(4).
    03  WD-RIBPTR                   PIC X(4).
    03  WD-RET-CODE                 PIC S9(8) COMP.
    03  WD-REASCODE                 PIC S9(8) COMP.
    03  WD-PLAN                     PIC X(8) VALUE 'PLFSIEBL'.
    03  WD-TERMOP                   PIC X(4) VALUE 'SYNC'.

01  WG-GENERAL-STORAGE.
    03  WG-TSO-PARM1                   PIC S9(9) COMP VALUE +0.
    03  WG-TSO-RETCODE                 PIC S9(8) COMP VALUE +0.
    03  WG-TSO-REASCODE                PIC S9(8) COMP VALUE +0.
    03  WG-TSO-ABENDCODE               PIC S9(8) COMP VALUE +0.
    03  WG-TSO-CPPL-ADDR               PIC S9(8) COMP VALUE +0.
    03  WG-MAX-RECLENGTH               PIC S9(4) COMP VALUE +0.
    03  WG-INDVAR                      PIC S9(4) COMP.
    03  WG-SIEBEL-RECORD               PIC X(80).
    03  WG-SIEBEL-BUFF                 PIC X(80).
    03  WG-PDS-NAME                 PIC X(50).
    03  WG-PDS-NAME-LEN             PIC S9(3) COMP-3 VALUE +0.
    03  WG-DIV-ZERO                 PIC S9(3) COMP-3 VALUE +0.
    03  WG-COLFOUND                 PIC X VALUE 'N'.
    03  WG-COLUMN-TYPE              PIC X(8).
    88  VARIABLE-COLUMN        VALUES
               'VARCHAR',
               'LONGVAR',
               'VARG',
               'LONGVARG'.
    03  WG-REC-COUNT              PIC S9(17) COMP-3 VALUE +0.
    03  WG-RECS-WRITTEN           PIC S9(17) COMP-3 VALUE +0.
    03  WG-SUB2                     PIC S9(4) COMP VALUE +0.
    03  WG-SUB3                     PIC S9(8) COMP VALUE +0.
    03  WG-SUB                      PIC S9(4) COMP VALUE +0.
    03  WG-COLSUB                   PIC S9(4) COMP VALUE +0.
    03  WG-COLNUM                   PIC S9(3) COMP-3 VALUE +0.
```

```
03  WG-COLNAM                   PIC X(18).
03  WG-LOAD-TYPE                PIC X(8).
03  WG-BUFF-POS                 PIC S9(4) COMP VALUE +0.
03  WG-NEGATIVE                 PIC X.
03  WG-REC-POS                  PIC S9(4) COMP VALUE +0.
03  WG-NUM-COLS                 PIC 9(3).
03  WG-NUM-TABLES               PIC S9(4) COMP VALUE +0.
03  WG-NUM-TABR REDEFINES WG-NUM-TABLES PIC XX.
03  WG-NUM-ROWS                 PIC S9(8) COMP VALUE +0.
03  WG-NUM-ROWR REDEFINES WG-NUM-ROWS PIC XXXX.
03  WG-HEX                      PIC S9(4) COMP VALUE +0.
03  WG-HEX-R   REDEFINES WG-HEX PIC XX.
03  WG-WLEN                     PIC S9(4) COMP VALUE +0.
03  WG-TOT-LEN                  PIC S9(4) COMP VALUE +0.
03  WG-TBCREATOR-LEN            PIC S9(3) COMP-3 VALUE +0.
03  WG-TBCREATOR                PIC X(8).
03  WG-LEN-LEFT                 PIC S9(4) COMP VALUE +0.
03  WG-DEC-LEFT                 PIC S9(3) COMP-3 VALUE +0.
03  WG-DEC-RIGHT                PIC S9(3) COMP-3 VALUE +0.
03  WG-DEC-LEN                  PIC S9(3) COMP-3 VALUE +0.
03  WG-TEMP                     PIC S9(3) COMP-3 VALUE +0.
03  WG-LEN                      PIC S9(4) COMP VALUE +0.
03  WG-LEN-R   REDEFINES WG-LEN PIC XX.
03  WG-HEX-SUB2  PIC X(4)
       VALUE X'FFFFF001'.
03  WG-START                    PIC S9(4) COMP VALUE +0.
03  WG-NEXT                     PIC X.
03  WG-END                      PIC S9(4) COMP VALUE +0.
03  WG-EOF                      PIC X VALUE 'N'.
03  WG-SIEBEL-FILE-STATUS       PIC XX.
03  WG-SIEBEL-VSAM-STATUS.
    05  WG-VSAM-RETURN-CODE     PIC 99 COMP.
    05  WG-VSAM-COMPON-CODE     PIC 9 COMP.
    05  WG-VSAM-REASON-CODE     PIC 999 COMP.
03  WG-LOAD-CARD                PIC X(80).
03  WG-TSNAME                   PIC X(8).
03  WG-TSNAME-LEN               PIC S9(3) COMP-3 VALUE 0.
03  WG-RECLENGTH                PIC S9(4) COMP.
03  WG-RECLENGTH-R REDEFINES WG-RECLENGTH PIC XX.
03  WG-DEC-POS                  PIC S9(3) COMP-3.
03  WG-DEC-STORE                PIC S9(4) COMP.
03  WG-DEC-STORE-R REDEFINES WG-DEC-STORE.
    05  WG-DECSTORE1            PIC X.
    05  WG-DECSTORE2            PIC X.
03  WG-DEC-MOVE                 PIC S9(4) COMP.
03  WG-DEC-MOVE-R REDEFINES WG-DEC-MOVE.
    05  WG-DECM1                PIC X.
    05  WG-DECM2                PIC X.
03  WG-DBNAME                   PIC X(8).
```

```
    03  WG-OBID                     PIC S9(4) COMP.
    03  WG-OBID-R REDEFINES WG-OBID PIC XX.
    03  WG-ROWNUM                   PIC S9(4) COMP VALUE +0.
    03  WG-ROWNUM-R REDEFINES WG-ROWNUM.
        05  FILLER                  PIC X.
        05  WG-ROWNUM2              PIC X.
    03  WG-PGSIZE                   PIC S9(4) COMP.
    03  WG-ROWS-PER-PAGE            PIC S9(3) COMP-3.
    03  WG-DB2-DSNAME.
        49  WG-DB2-DSN-LEN          PIC S9(4) COMP.
        49  WG-DB2-DSN              PIC X(52).
    03  WG-TOT-COLS                 PIC S9(3) COMP-3.
    03  WG-NUM-TSNAMES              PIC S9(3) COMP-3 VALUE +0.
    03  WG-TSNAMES     OCCURS 750   PIC X(8).
    03  WG-COL-XLAT    OCCURS 750   PIC S9(4) COMP.
    03  WG-COL-DETAILS OCCURS 750.
        05  WG-COLNAME              PIC X(18).
        05  WG-COLNAME-LEN          PIC S9(4) COMP.
        05  WG-COLTYPE              PIC X(8).
        05  WG-COLLENGTH            PIC S9(4) COMP.
        05  WG-SCALE                PIC S9(4) COMP.
        05  WG-NULLS                PIC X.
        05  WG-COL-IN-USE           PIC X.
        05  WG-START-DISPL          PIC S9(4) COMP.

01  W700-IKJEFTSR                   PIC X(8) VALUE 'IKJEFTSR'.
01  W700-IKJEFTSR-P1                PIC S9(8) COMP VALUE +65541.
01  W700-IKJEFTSR-CMD-LEN           PIC S9(8) COMP VALUE +0.
01  W700-IKJEFTSR-RETCODE           PIC S9(8) COMP VALUE +0.
01  W700-IKJEFTSR-REASCODE          PIC S9(8) COMP VALUE +0.
01  W700-IKJEFTSR-ABNDCODE          PIC S9(8) COMP VALUE +0.
01  W700-TSO-COMMAND                PIC X(180).

01  WX-PARM1.
    03  WX-LEN                      PIC S9(4) COMP VALUE 4.
    03  WX-CODE                     PIC S9(8) COMP.

01  WX-PARM2.
    03  WX-HEX-DISPLAY              PIC X(8).



      EXEC SQL
       INCLUDE SYSTABLE
      END-EXEC.

      EXEC SQL
       INCLUDE SYSCOLS
      END-EXEC.
```

```
       EXEC SQL
        INCLUDE SQLCA
       END-EXEC.

     EXEC SQL
          DECLARE SYSCOLS CURSOR FOR
          SELECT A.NAME,A.COLTYPE,
          A.LENGTH,A.SCALE,A.NULLS,B.DBNAME,B.OBID,
          B.TSNAME,B.RECLENGTH
          FROM SYSIBM.SYSCOLUMNS A,
               SYSIBM.SYSTABLES B
          WHERE A.TBCREATOR = :WSYS-TBCREATOR
          AND   A.TBNAME = :WSYS-TBNAME
          AND B.NAME = A.TBNAME
          AND B.CREATOR = A.TBCREATOR
          ORDER BY COLNO
     END-EXEC.



 LINKAGE SECTION.
*****************

 01  PARM-INPUT                        PIC X(80).

 PROCEDURE DIVISION USING PARM-INPUT.
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 A000-MAINLINE SECTION.
     ACCEPT PARM-INPUT.
     CALL 'IKJTSOEV' USING WG-TSO-PARM1
                           WG-TSO-RETCODE
                           WG-TSO-REASCODE
                           WG-TSO-ABENDCODE
                           WG-TSO-CPPL-ADDR.
     IF WG-TSO-RETCODE NOT = 0
     AND WG-TSO-RETCODE NOT = 24
         DISPLAY 'RETCODE FROM IKJTSOEV = ' WG-TSO-RETCODE
         GOBACK
     END-IF.
     DISPLAY 'PARM = ' PARM-INPUT.
     PERFORM A100-GET-NEXT-WORD.
     PERFORM UNTIL WG-WLEN = 0
        IF PARM-INPUT (WG-START:WG-WLEN) = 'DB2ID'
           PERFORM A100-GET-NEXT-WORD
```

```
      MOVE PARM-INPUT (WG-START:WG-WLEN) TO WD-SSNAME
   ELSE
   IF PARM-INPUT (WG-START:WG-WLEN) = 'LOAD'
      PERFORM A100-GET-NEXT-WORD
      MOVE PARM-INPUT (WG-START:WG-WLEN) TO WG-LOAD-TYPE
   ELSE
   IF PARM-INPUT (WG-START:WG-WLEN) = 'CREATOR'
      PERFORM A100-GET-NEXT-WORD
      MOVE PARM-INPUT (WG-START:WG-WLEN) TO WSYS-TBCREATOR
                                           WG-TBCREATOR
      MOVE WG-WLEN TO WG-TBCREATOR-LEN
   END-IF
   END-IF
   END-IF
   PERFORM A100-GET-NEXT-WORD
END-PERFORM.
PERFORM X700-DB2-CONNECT.
OPEN INPUT INPUT-FILE.
IF WG-SIEBEL-FILE-STATUS > '09'
   DISPLAY 'SIEBEL FILE OPEN ERROR ' WG-SIEBEL-FILE-STATUS
   GOBACK
END-IF.
PERFORM R000-READ.
MOVE WG-SIEBEL-BUFF TO WG-SIEBEL-RECORD
MOVE WG-SIEBEL-RECORD (41:2) TO WG-NUM-TABR
DISPLAY 'NUMBER OF TABLES ' WG-NUM-TABLES
MOVE 53 TO WG-BUFF-POS
PERFORM WG-NUM-TABLES TIMES
   MOVE 0 TO WG-RECS-WRITTEN
   PERFORM E000-GET-LENGTH
   PERFORM E100-GET-DATA
   MOVE 1 TO WG-SUB
   MOVE WG-LEN TO W-NAME-LEN
   ADD WG-LEN TO WG-SUB
   GIVING WG-END
   PERFORM X100-CONVERT-TO-EBCDIC
   MOVE WG-LEN TO WSYS-TBNAME-LEN
   MOVE WG-SIEBEL-RECORD (1:WG-LEN)
      TO WSYS-TBNAME-TEXT
   DISPLAY WSYS-TBNAME-TEXT
   PERFORM B100-GET-TABLE-DETAILS
   MOVE 6 TO WG-LEN
   PERFORM E100-GET-DATA
   MOVE WG-SIEBEL-RECORD (3:4)
   TO WG-NUM-ROWR
   DISPLAY 'WG-NUM-ROWS = ' WG-NUM-ROWS
   PERFORM E000-GET-LENGTH
   PERFORM E100-GET-DATA
   MOVE 1 TO WG-SUB
```

```
        SUBTRACT 1 FROM WG-END
        PERFORM X100-CONVERT-TO-EBCDIC
        MOVE WG-SIEBEL-RECORD (1:WG-LEN)
        TO WG-NUM-COLS
        DISPLAY 'WG-NUM-COLS = ' WG-NUM-COLS
        MOVE 0 TO WG-COLNUM
        PERFORM C000-PROCESS-COLNAMES WG-NUM-COLS TIMES
        PERFORM X200-ALLOCATE-FILE
        PERFORM D000-PROCESS-DATA WG-NUM-ROWS TIMES
        CLOSE OUTPUT-FILE
        DISPLAY 'RECORDS WRITTEN =' WG-RECS-WRITTEN
        MOVE 8 TO WG-LEN
        PERFORM E100-GET-DATA
     END-PERFORM.
     CLOSE INPUT-FILE.
     PERFORM X800-DB2-DISCONNECT
     GOBACK.

 A100-GET-NEXT-WORD.
**********************

     ADD 1 TO WG-SUB3.
     PERFORM VARYING WG-SUB3 FROM WG-SUB3 BY 1
        UNTIL PARM-INPUT (WG-SUB3:1) NOT = SPACE
        OR WG-SUB3 > 80
     END-PERFORM.
     IF WG-SUB3 > 80
        MOVE 0 TO WG-WLEN
     ELSE
        MOVE WG-SUB3 TO WG-START
        ADD 1 TO WG-SUB3
        PERFORM VARYING WG-SUB3 FROM WG-SUB3 BY 1
           UNTIL PARM-INPUT (WG-SUB3:1) = SPACE
           OR WG-SUB3 > 80
        END-PERFORM
        SUBTRACT WG-START FROM WG-SUB3 GIVING WG-WLEN
     END-IF.
     DISPLAY PARM-INPUT (WG-START:WG-WLEN).


 B100-GET-TABLE-DETAILS SECTION.
     EXEC SQL
          OPEN SYSCOLS
     END-EXEC.
     IF SQLCODE NOT = 0
        MOVE SQLCODE TO W200-SQLCODE
        MOVE 'OPEN SYSCOLS FAILURE' TO W100-SHORT-MSG
        MOVE 'SQLCODE ' TO W100-LONG-MSG
        MOVE W200-SQLCODE TO W100-LONG-MSG (13:8)
```

```
   DISPLAY W100-SHORT-MSG
   DISPLAY W100-LONG-MSG
   GOBACK
END-IF.
EXEC SQL
     FETCH SYSCOLS INTO
     :WSYS-NAME,:WSYS-COLTYPE,
     :WSYS-LENGTH,:WSYS-SCALE,:WSYS-NULLS,
     :W-DBNAME,:W-OBID,
     :W-TSNAME,:W-RECLENGTH
END-EXEC.
IF SQLCODE NOT = 0
   MOVE SQLCODE TO W200-SQLCODE
   MOVE 'FETCH SYSCOLS FAILURE' TO W100-SHORT-MSG
   MOVE 'SQLCODE ' TO W100-LONG-MSG
   MOVE W200-SQLCODE TO W100-LONG-MSG (13:8)
   DISPLAY W100-SHORT-MSG
   DISPLAY W100-LONG-MSG
   GOBACK
END-IF.
MOVE 0 TO WG-SUB.
MOVE 7 TO WG-START-DISPL (1)
PERFORM UNTIL SQLCODE NOT = 0
   ADD 1 TO WG-SUB
   MOVE WSYS-NAME-TEXT (1:WSYS-NAME-LEN)
      TO WG-COLNAME (WG-SUB)
   MOVE WSYS-NAME-LEN
      TO WG-COLNAME-LEN (WG-SUB)
   MOVE WSYS-COLTYPE TO WG-COLTYPE (WG-SUB)
   IF WSYS-COLTYPE = 'DECIMAL'
      DIVIDE WSYS-LENGTH BY 2 GIVING WSYS-LENGTH
      ADD 1 TO WSYS-LENGTH
       GIVING WSYS-LENGTH
   END-IF
   MOVE WSYS-LENGTH TO WG-COLLENGTH (WG-SUB)
   MOVE WSYS-SCALE TO WG-SCALE (WG-SUB)
   MOVE WSYS-NULLS TO WG-NULLS (WG-SUB)
   ADD 1 TO WG-SUB GIVING WG-SUB2
   ADD WSYS-LENGTH TO WG-START-DISPL (WG-SUB)
   GIVING WG-START-DISPL (WG-SUB2)
   IF WG-NULLS (WG-SUB) = 'Y'
      ADD 1 TO WG-START-DISPL (WG-SUB2)
   END-IF
   MOVE WSYS-COLTYPE TO WG-COLUMN-TYPE
   IF VARIABLE-COLUMN
      ADD 2 TO WG-START-DISPL (WG-SUB2)
   END-IF
   IF WG-SUB = 1
      MOVE W-DBNAME TO WG-DBNAME
      MOVE W-OBID TO WG-OBID
      MOVE X'02' TO W400-OUTPUT-REC (1:1)
      MOVE W-TSNAME TO WG-TSNAME
      PERFORM VARYING WG-TSNAME-LEN FROM 8 BY -1
      UNTIL WG-TSNAME (WG-TSNAME-LEN:1) NOT = SPACE
      END-PERFORM
      MOVE WG-OBID-R TO W400-OUTPUT-REC (4:2)
   END-IF
   EXEC SQL
        FETCH SYSCOLS INTO
        :WSYS-NAME,:WSYS-COLTYPE,
        :WSYS-LENGTH,:WSYS-SCALE,:WSYS-NULLS,
        :W-DBNAME,:W-OBID,
        :W-TSNAME,:W-RECLENGTH
   END-EXEC
   IF SQLCODE NOT = 0
   AND SQLCODE NOT = 100
      MOVE SQLCODE TO W200-SQLCODE
      MOVE 'FETCH SYSCOLS FAILURE' TO W100-SHORT-MSG
      MOVE 'SQLCODE ' TO W100-LONG-MSG
      MOVE W200-SQLCODE TO W100-LONG-MSG (13:8)
      DISPLAY W100-SHORT-MSG
      DISPLAY W100-LONG-MSG
      GOBACK
   END-IF
END-PERFORM.
EXEC SQL
     CLOSE SYSCOLS
END-EXEC.
IF SQLCODE NOT = 0
   MOVE SQLCODE TO W200-SQLCODE
   MOVE 'CLOSE SYSCOLS FAILURE' TO W100-SHORT-MSG
   MOVE 'SQLCODE ' TO W100-LONG-MSG
   MOVE W200-SQLCODE TO W100-LONG-MSG (13:8)
   DISPLAY W100-SHORT-MSG
   DISPLAY W100-LONG-MSG
   GOBACK
END-IF.
SUBTRACT 1 FROM WG-START-DISPL (WG-SUB2)
GIVING WG-RECLENGTH
MOVE WG-RECLENGTH TO WG-RECLENGTH
                     W400-OUT-LEN
MOVE WG-RECLENGTH-R TO W400-OUTPUT-REC (2:2)
MOVE WG-SUB TO WG-TOT-COLS.
EXEC SQL
     SELECT PGSIZE INTO :WG-PGSIZE
     FROM SYSIBM.SYSTABLESPACE
     WHERE DBNAME = :W-DBNAME
     AND NAME = :W-TSNAME
```

```
    END-EXEC.
    IF SQLCODE NOT = 0
       MOVE SQLCODE TO W200-SQLCODE
       MOVE 'SELECT SYSTSPACE FAILURE' TO W100-SHORT-MSG
       MOVE 'SQLCODE ' TO W100-LONG-MSG
       MOVE W200-SQLCODE TO W100-LONG-MSG (13:8)
       DISPLAY W100-SHORT-MSG
       DISPLAY W100-LONG-MSG
       GOBACK
    END-IF.
    MULTIPLY WG-PGSIZE BY 1024 GIVING WG-PGSIZE.
    DIVIDE WG-PGSIZE BY WG-RECLENGTH
    GIVING WG-ROWS-PER-PAGE.

C000-PROCESS-COLNAMES SECTION.
    PERFORM E000-GET-LENGTH
    PERFORM E100-GET-DATA
    MOVE 1 TO WG-SUB.
    MOVE WG-LEN TO WG-END.
    PERFORM X100-CONVERT-TO-EBCDIC.
    MOVE 'N' TO WG-COLFOUND.
    ADD 1 TO WG-COLNUM.
    PERFORM VARYING WG-COLSUB FROM 1 BY 1
    UNTIL WG-COLFOUND = 'Y' OR WG-COLSUB > WG-TOT-COLS
       IF WG-LEN > 18
          DISPLAY '**** ERROR '
             WG-SIEBEL-RECORD (1:WG-LEN)
             ' GREATER THAN 18 CHARACTERS'
          MOVE 18 TO WG-LEN
       END-IF
       IF WG-LEN = WG-COLNAME-LEN (WG-COLSUB)
       AND WG-SIEBEL-RECORD (1:WG-LEN) =
           WG-COLNAME (WG-COLSUB)
          MOVE 'Y' TO WG-COLFOUND
                      WG-COL-IN-USE (WG-COLSUB)
          DISPLAY WG-SIEBEL-RECORD (1:WG-LEN) ' FOUND'
          MOVE WG-COLSUB TO WG-COL-XLAT (WG-COLNUM)
       END-IF
    END-PERFORM
    IF WG-COLFOUND = 'N'
       DISPLAY 'COLUMN NAME ' WG-SIEBEL-RECORD (1:WG-LEN)
       ' NOT FOUND IN DB2 DEFINITION OF TABLE' WSYS-TBNAME
       GOBACK
    END-IF.


D000-PROCESS-DATA SECTION.
    SUBTRACT WG-BUFF-POS FROM 81 GIVING WG-END
    IF WG-END = 0
```

```
       PERFORM R000-READ
       MOVE 3 TO WG-BUFF-POS
    ELSE
    IF WG-END = 1
       PERFORM R000-READ
       MOVE 2 TO WG-BUFF-POS
    ELSE
    IF WG-END = 2
       PERFORM R000-READ
       MOVE 1 TO WG-BUFF-POS
    ELSE
       ADD 2 TO WG-BUFF-POS
    END-IF
    END-IF
    END-IF.
    PERFORM D100-PROCESS-COLUMNS VARYING WG-SUB FROM 1 BY 1
    UNTIL WG-SUB > WG-NUM-COLS.
    PERFORM VARYING WG-SUB2 FROM 1 BY 1
    UNTIL WG-SUB2 > WG-TOT-COLS
       IF WG-COL-IN-USE (WG-SUB2) NOT = 'Y'
          MOVE -1 TO WG-LEN
          PERFORM D200-MOVE-DATA
       END-IF
    END-PERFORM
    ADD 1 TO WG-ROWNUM.
    IF WG-ROWNUM > WG-ROWS-PER-PAGE
       MOVE 1 TO WG-ROWNUM
    END-IF
    MOVE WG-ROWNUM2 TO W400-OUTPUT-REC (6:1)
    WRITE SIEBEL-OUT FROM W400-OUTPUT-REC
    IF WG-SIEBEL-FILE-STATUS > '00'
       DISPLAY 'SIEBEL WRITE ERROR ' WG-SIEBEL-FILE-STATUS
       GOBACK
    END-IF.
    ADD 1 TO WG-RECS-WRITTEN.


D100-PROCESS-COLUMNS SECTION.
    MOVE WG-COL-XLAT (WG-SUB) TO WG-SUB2
    PERFORM E000-GET-LENGTH.
    PERFORM D200-MOVE-DATA.

D200-MOVE-DATA SECTION.
    MOVE WG-START-DISPL (WG-SUB2) TO WG-SUB3.
    MOVE WG-COLTYPE (WG-SUB2) TO WG-COLUMN-TYPE.
    IF VARIABLE-COLUMN
       IF WG-LEN = -1
          MOVE 1 TO WG-LEN
          MOVE WG-LEN-R TO W400-OUTPUT-REC (WG-SUB3:2)
          ADD 2 TO WG-SUB3
          MOVE HIGH-VALUES TO W400-OUTPUT-REC (WG-SUB3:1)
          ADD 1 TO WG-SUB3
          MOVE WG-COLLENGTH (WG-SUB2) TO WG-LEN
          MOVE LOW-VALUES TO W400-OUTPUT-REC (WG-SUB3:WG-LEN)
       ELSE
          IF WG-NULLS (WG-SUB2) = 'Y'
             ADD 1 TO WG-LEN
          END-IF
          MOVE WG-LEN-R TO W400-OUTPUT-REC (WG-SUB3:2)
          ADD 2 TO WG-SUB3
          IF WG-NULLS (WG-SUB2) = 'Y'
             MOVE LOW-VALUES TO W400-OUTPUT-REC (WG-SUB3:1)
             ADD 1 TO WG-SUB3
             SUBTRACT 1 FROM WG-LEN
          END-IF
          PERFORM D800-MOVE-CHAR
       END-IF
    ELSE
    IF WG-COLUMN-TYPE = 'CHAR'
       IF WG-LEN = -1
          MOVE HIGH-VALUES TO W400-OUTPUT-REC (WG-SUB3:1)
          ADD 1 TO WG-SUB3
          MOVE WG-COLLENGTH (WG-SUB2) TO WG-LEN
          MOVE LOW-VALUES TO W400-OUTPUT-REC (WG-SUB3:WG-LEN)
       ELSE
          IF WG-NULLS (WG-SUB2) = 'Y'
             MOVE LOW-VALUES TO W400-OUTPUT-REC (WG-SUB3:1)
             ADD 1 TO WG-SUB3
          END-IF
          PERFORM D800-MOVE-CHAR
       END-IF
    ELSE
    IF WG-COLUMN-TYPE = 'DECIMAL'
       PERFORM D300-DECIMAL-COLUMN
    ELSE
    IF WG-COLUMN-TYPE = 'TIMESTMP'
       PERFORM D400-TIMESTAMP-COLUMN
    END-IF
    END-IF
    END-IF
    END-IF.

D300-DECIMAL-COLUMN SECTION.
       IF WG-LEN = -1
          MOVE HIGH-VALUES TO W400-OUTPUT-REC (WG-SUB3:1)
          ADD 1 TO WG-SUB3
          MOVE WG-COLLENGTH (WG-SUB2) TO WG-LEN
          DIVIDE WG-LEN BY 2
```

```
   GIVING WG-LEN
   ADD 1 TO WG-LEN
   MOVE LOW-VALUES TO W400-OUTPUT-REC (WG-SUB3:WG-LEN)
ELSE
   PERFORM E100-GET-DATA
   IF WG-NULLS (WG-SUB2) = 'Y'
      MOVE LOW-VALUES TO W400-OUTPUT-REC (WG-SUB3:1)
      ADD 1 TO WG-SUB3
   END-IF
   MULTIPLY WG-COLLENGTH (WG-SUB2) BY 2
   GIVING WG-DEC-LEN
   PERFORM VARYING WG-DEC-POS FROM 1
   BY 1 UNTIL WG-SIEBEL-RECORD (WG-DEC-POS:1) = X'2E'
   OR WG-DEC-POS > WG-LEN
   END-PERFORM
   IF WG-DEC-POS > WG-LEN
      MOVE WG-LEN TO WG-DEC-LEFT
      MOVE 0 TO WG-DEC-RIGHT
   ELSE
      SUBTRACT WG-DEC-POS FROM WG-LEN
      GIVING WG-DEC-RIGHT
      SUBTRACT 1 FROM WG-DEC-POS
      GIVING WG-DEC-LEFT
   END-IF
   SUBTRACT WG-SCALE (WG-SUB2) FROM WG-DEC-LEN
   GIVING WG-TEMP
   SUBTRACT WG-DEC-LEFT FROM WG-TEMP
   GIVING WG-START
   ADD 1 TO WG-START
   MOVE 1 TO WG-REC-POS
   IF WG-SIEBEL-RECORD (1:1) = X'2D'
      MOVE 208 TO WG-DEC-MOVE
   ELSE
      MOVE 240 TO WG-DEC-MOVE
   END-IF
   MOVE '2' TO WG-NEXT
   PERFORM VARYING WG-DEC-POS FROM 2 BY 1
   UNTIL WG-DEC-POS > WG-DEC-LEN
      IF WG-SIEBEL-RECORD (WG-REC-POS:1) = X'2E'
         ADD 1 TO WG-START
                  WG-REC-POS
      ELSE
      IF WG-SIEBEL-RECORD (WG-REC-POS:1) = X'2D'
         ADD 1 TO WG-START
                  WG-REC-POS
      ELSE
      IF WG-NEXT = '1'
         IF WG-START = WG-DEC-POS
            MOVE WG-SIEBEL-RECORD (WG-REC-POS:1)
```

```
                   TO WG-DECM2
                   SUBTRACT 48 FROM WG-DEC-MOVE
                   MULTIPLY WG-DEC-MOVE BY 16
                   GIVING WG-DEC-MOVE
                   ADD 1 TO WG-START
                            WG-REC-POS
                END-IF
                MOVE '2' TO WG-NEXT
             ELSE
                IF WG-START = WG-DEC-POS
                   MOVE WG-SIEBEL-RECORD (WG-REC-POS:1)
                   TO WG-DECSTORE2
                   ADD 1 TO WG-REC-POS
                   SUBTRACT 48 FROM WG-DEC-STORE
                   ADD WG-DEC-STORE TO WG-DEC-MOVE
                   ADD 1 TO WG-START
                END-IF
                MOVE WG-DECM2
                     TO W400-OUTPUT-REC (WG-SUB3:1)
                ADD 1 TO WG-SUB3
                MOVE '1' TO WG-NEXT
                MOVE 0 TO WG-DEC-MOVE
                          WG-DEC-STORE
             END-IF
             END-IF
             END-IF
          END-PERFORM
       END-IF.


D400-TIMESTAMP-COLUMN SECTION.
       IF WG-LEN = -1
          MOVE HIGH-VALUES TO W400-OUTPUT-REC (WG-SUB3:1)
          ADD 1 TO WG-SUB3
          MOVE WG-COLLENGTH (WG-SUB2) TO WG-LEN
          MOVE LOW-VALUES TO W400-OUTPUT-REC (WG-SUB3:WG-LEN)
       ELSE
          MOVE 0 TO WG-DEC-MOVE
          PERFORM E100-GET-DATA
          IF WG-NULLS (WG-SUB2) = 'Y'
             MOVE LOW-VALUES TO W400-OUTPUT-REC (WG-SUB3:1)
             ADD 1 TO WG-SUB3
          END-IF
          MOVE 1 TO WG-NEXT
          PERFORM VARYING WG-DEC-POS FROM 1 BY 1
          UNTIL WG-DEC-POS > WG-LEN
             IF WG-SIEBEL-RECORD (WG-DEC-POS:1) = X'2D'
                MOVE WG-NEXT TO WG-NEXT
             ELSE
             IF WG-SIEBEL-RECORD (WG-DEC-POS:1) = X'20'
                MOVE WG-NEXT TO WG-NEXT
             ELSE
             IF WG-SIEBEL-RECORD (WG-DEC-POS:1) = X'2E'
                MOVE WG-NEXT TO WG-NEXT
             ELSE
             IF WG-SIEBEL-RECORD (WG-DEC-POS:1) = X'3A'
                MOVE WG-NEXT TO WG-NEXT
             ELSE
             IF WG-NEXT = '1'
                MOVE 0 TO WG-DEC-MOVE
                MOVE WG-SIEBEL-RECORD (WG-DEC-POS:1)
                   TO WG-DECM2
                SUBTRACT 48 FROM WG-DEC-MOVE
                MULTIPLY WG-DEC-MOVE BY 16
                GIVING WG-DEC-MOVE
                MOVE '2' TO WG-NEXT
             ELSE
                MOVE 0 TO WG-DEC-STORE
                MOVE WG-SIEBEL-RECORD (WG-DEC-POS:1)
                   TO WG-DECSTORE2
                SUBTRACT 48 FROM WG-DEC-MOVE
                MOVE '1' TO WG-NEXT
                ADD WG-DEC-STORE TO WG-DEC-MOVE
                MOVE WG-DECM2
                     TO W400-OUTPUT-REC (WG-SUB3:1)
                ADD 1 TO WG-SUB3
             END-IF
             END-IF
             END-IF
             END-IF
             END-IF
          END-PERFORM
          IF WG-NEXT = '2'
             MOVE WG-DECM2
                  TO W400-OUTPUT-REC (WG-SUB3:1)
             ADD 1 TO WG-SUB3
          END-IF
          IF WG-LEN = 19
             MOVE LOW-VALUES TO W400-OUTPUT-REC (WG-SUB3:3)
             ADD 3 TO WG-SUB3
          END-IF
       END-IF.

D800-MOVE-CHAR SECTION.
    MOVE WG-LEN TO WG-TOT-LEN
    SUBTRACT WG-BUFF-POS FROM 81
    GIVING WG-LEN
    IF WG-TOT-LEN NOT > WG-LEN
```

```
       MOVE WG-SIEBEL-BUFF (WG-BUFF-POS:WG-TOT-LEN)
         TO W400-OUTPUT-REC (WG-SUB3:WG-TOT-LEN)
       ADD WG-TOT-LEN TO WG-BUFF-POS
    ELSE
       MOVE WG-SIEBEL-BUFF (WG-BUFF-POS:WG-LEN)
         TO W400-OUTPUT-REC (WG-SUB3:WG-LEN)
       ADD WG-LEN TO WG-SUB3
       MOVE WG-TOT-LEN TO WG-LEN-LEFT
       SUBTRACT WG-LEN FROM WG-LEN-LEFT
       PERFORM R000-READ
       MOVE 1 TO WG-BUFF-POS
       PERFORM UNTIL WG-LEN-LEFT < 1
          SUBTRACT WG-BUFF-POS FROM 81
          GIVING WG-LEN
          IF WG-LEN-LEFT NOT > WG-LEN
             MOVE WG-SIEBEL-BUFF (WG-BUFF-POS:WG-LEN-LEFT)
               TO W400-OUTPUT-REC (WG-SUB3:WG-LEN-LEFT)
             ADD WG-LEN-LEFT TO WG-BUFF-POS
                                WG-SUB3
             SUBTRACT WG-LEN-LEFT FROM WG-LEN-LEFT
          ELSE
             MOVE WG-SIEBEL-BUFF (WG-BUFF-POS:WG-LEN)
               TO W400-OUTPUT-REC (WG-SUB3:WG-LEN)
             ADD WG-LEN TO WG-SUB3
             SUBTRACT WG-LEN FROM WG-LEN-LEFT
             PERFORM R000-READ
          END-IF
       END-PERFORM
       SUBTRACT WG-TOT-LEN FROM WG-COLLENGTH (WG-SUB2)
       GIVING WG-LEN
       ADD 1 TO WG-LEN
       MOVE LOW-VALUES TO W400-OUTPUT-REC (WG-SUB3:WG-LEN)
       ADD 1 TO WG-SUB3
    END-IF.

E000-GET-LENGTH SECTION.
    SUBTRACT WG-BUFF-POS FROM 80 GIVING WG-END.
    IF WG-END < 0
       PERFORM R000-READ
       MOVE WG-SIEBEL-BUFF (1:2) TO WG-LEN-R
       MOVE 3 TO WG-BUFF-POS
    ELSE
    IF WG-END = 0
       MOVE WG-SIEBEL-BUFF (80:1) TO WG-SIEBEL-RECORD
       PERFORM R000-READ
       MOVE WG-SIEBEL-BUFF (1:1) TO WG-SIEBEL-RECORD(2:1)
       MOVE WG-SIEBEL-RECORD (1:2) TO WG-LEN-R
       MOVE 2 TO WG-BUFF-POS
    ELSE
    IF WG-END = 1
       MOVE WG-SIEBEL-BUFF (79:2) TO WG-SIEBEL-RECORD
       PERFORM R000-READ
       MOVE WG-SIEBEL-RECORD (1:2) TO WG-LEN-R
       MOVE 1 TO WG-BUFF-POS
    ELSE
       MOVE WG-SIEBEL-BUFF (WG-BUFF-POS:2) TO WG-SIEBEL-RECORD
       MOVE WG-SIEBEL-RECORD (1:2) TO WG-LEN-R
       ADD 2 TO WG-BUFF-POS
    END-IF
    END-IF
    END-IF.


E100-GET-DATA SECTION.
    SUBTRACT WG-BUFF-POS FROM 81 GIVING WG-END.
    IF WG-LEN < WG-END
       MOVE WG-SIEBEL-BUFF (WG-BUFF-POS:WG-LEN)
       TO WG-SIEBEL-RECORD
       ADD WG-LEN TO WG-BUFF-POS
       GIVING WG-BUFF-POS
    ELSE
       MOVE WG-SIEBEL-BUFF (WG-BUFF-POS:WG-END)
       TO WG-SIEBEL-RECORD
       PERFORM R000-READ
       ADD 1 TO WG-END GIVING WG-START
       SUBTRACT WG-END FROM WG-LEN GIVING WG-END
       MOVE WG-SIEBEL-BUFF (1:WG-END)
       TO WG-SIEBEL-RECORD (WG-START:WG-END)
       ADD 1 TO WG-END
       GIVING WG-BUFF-POS
    END-IF.

R000-READ SECTION.
    READ INPUT-FILE INTO WG-SIEBEL-BUFF
    AT END MOVE 'Y' TO WG-EOF.
    ADD 1 TO WG-REC-COUNT.

X100-CONVERT-TO-EBCDIC SECTION.
    MOVE 0 TO WG-HEX.
    PERFORM VARYING WG-SUB FROM WG-SUB BY 1
    UNTIL WG-SUB > WG-END
       MOVE WG-SIEBEL-RECORD (WG-SUB:1) TO WG-HEX-R (2:1)
       IF WG-HEX > 47 AND WG-HEX < 58
          ADD 192 TO WG-HEX
       ELSE
       IF WG-HEX > 96 AND WG-HEX < 106
          ADD 96 TO WG-HEX
       ELSE
       IF WG-HEX > 105 AND WG-HEX < 115
          ADD 103 TO WG-HEX
       ELSE
       IF WG-HEX > 114 AND WG-HEX < 123
          ADD 111 TO WG-HEX
       ELSE
       IF WG-HEX > 64 AND WG-HEX < 74
          ADD 128 TO WG-HEX
       ELSE
       IF WG-HEX > 73 AND WG-HEX < 83
          ADD 135 TO WG-HEX
       ELSE
       IF WG-HEX > 82 AND WG-HEX < 91
          ADD 143 TO WG-HEX
       ELSE
       IF WG-HEX = 95
          ADD 14 TO WG-HEX
       END-IF
       END-IF
       END-IF
       END-IF
       END-IF
       END-IF
       END-IF
       END-IF
       MOVE WG-HEX-R (2:1) TO WG-SIEBEL-RECORD (WG-SUB:1)
    END-PERFORM.

X200-ALLOCATE-FILE SECTION.
    MOVE 'FREE F(DDSEQ01W)' TO W700-TSO-COMMAND
    MOVE 16
       TO  W700-IKJEFTSR-CMD-LEN
    DISPLAY W700-TSO-COMMAND (1:W700-IKJEFTSR-CMD-LEN)
    CALL W700-IKJEFTSR USING W700-IKJEFTSR-P1
                             W700-TSO-COMMAND
                             W700-IKJEFTSR-CMD-LEN
                             W700-IKJEFTSR-RETCODE
                             W700-IKJEFTSR-REASCODE
                             W700-IKJEFTSR-ABNDCODE
       MOVE 'FREE F(LOADCDS)' TO W700-TSO-COMMAND
       MOVE 15
          TO  W700-IKJEFTSR-CMD-LEN
       DISPLAY W700-TSO-COMMAND (1:W700-IKJEFTSR-CMD-LEN)
       CALL W700-IKJEFTSR USING W700-IKJEFTSR-P1
                                W700-TSO-COMMAND
                                W700-IKJEFTSR-CMD-LEN
                                W700-IKJEFTSR-RETCODE
                                W700-IKJEFTSR-REASCODE
                                W700-IKJEFTSR-ABNDCODE
```

```
PERFORM VARYING WG-SUB FROM 1 BY 1
UNTIL WG-SUB > WG-NUM-TSNAMES
OR WG-TSNAMES (WG-SUB) = WG-TSNAME
END-PERFORM.
IF WG-SUB > WG-NUM-TSNAMES
   MOVE WG-TSNAME TO WG-TSNAMES (WG-SUB)
   PERFORM X300-ALLOC-NEWFILES
   ADD 1 TO WG-NUM-TSNAMES
ELSE
   MOVE 'ALLOC F(DDSEQ01W) DA(' TO W700-TSO-COMMAND
   MOVE WG-TSNAME (1:WG-TSNAME-LEN)
   TO W700-TSO-COMMAND (22:WG-TSNAME-LEN)
   MOVE 22
      TO  W700-IKJEFTSR-CMD-LEN
   ADD WG-TSNAME-LEN
      TO  W700-IKJEFTSR-CMD-LEN
   MOVE '.LOADFILE) MOD'
   TO W700-TSO-COMMAND (W700-IKJEFTSR-CMD-LEN:14)
   ADD 15 TO W700-IKJEFTSR-CMD-LEN
   DISPLAY W700-TSO-COMMAND (1:W700-IKJEFTSR-CMD-LEN)
   CALL W700-IKJEFTSR USING W700-IKJEFTSR-P1
                            W700-TSO-COMMAND
                            W700-IKJEFTSR-CMD-LEN
                            W700-IKJEFTSR-RETCODE
                            W700-IKJEFTSR-REASCODE
                            W700-IKJEFTSR-ABNDCODE
   OPEN OUTPUT OUTPUT-FILE
   DISPLAY 'OPEN EXECUTED'
   MOVE 'ALLOC F(LOADCDS) DA(' TO W700-TSO-COMMAND
   MOVE WG-TSNAME (1:WG-TSNAME-LEN)
   TO W700-TSO-COMMAND (21:WG-TSNAME-LEN)
   MOVE 21
      TO  W700-IKJEFTSR-CMD-LEN
   ADD WG-TSNAME-LEN
      TO  W700-IKJEFTSR-CMD-LEN
   MOVE '.LOADCDS) MOD'
   TO W700-TSO-COMMAND (W700-IKJEFTSR-CMD-LEN:14)
   ADD 14 TO W700-IKJEFTSR-CMD-LEN
   DISPLAY W700-TSO-COMMAND (1:W700-IKJEFTSR-CMD-LEN)
   CALL W700-IKJEFTSR USING W700-IKJEFTSR-P1
                            W700-TSO-COMMAND
                            W700-IKJEFTSR-CMD-LEN
                            W700-IKJEFTSR-RETCODE
                            W700-IKJEFTSR-REASCODE
                            W700-IKJEFTSR-ABNDCODE
   OPEN OUTPUT LOADCDS-FILE
   MOVE 'INTO TABLE '
   TO WG-LOAD-CARD
   MOVE WG-TBCREATOR TO WG-LOAD-CARD (12:WG-TBCREATOR-LEN)
```

```
       MOVE 12 TO WG-WLEN
       ADD WG-TBCREATOR-LEN TO WG-WLEN
       MOVE '.' TO WG-LOAD-CARD (WG-WLEN:1)
       ADD 1 TO WG-WLEN
       MOVE WSYS-TBNAME-TEXT (1:WSYS-TBNAME-LEN)
       TO WG-LOAD-CARD (WG-WLEN:WSYS-TBNAME-LEN)
       ADD WSYS-TBNAME-LEN TO WG-WLEN
       WRITE LOADCDS-REC FROM WG-LOAD-CARD
       CLOSE LOADCDS-FILE
    END-IF.

X300-ALLOC-NEWFILES SECTION.
    MOVE 'ALLOC F(DDSEQ01W) DA(' TO W700-TSO-COMMAND.
    MOVE WG-TSNAME (1:WG-TSNAME-LEN)
    TO W700-TSO-COMMAND (22:WG-TSNAME-LEN).
    MOVE 22
       TO  W700-IKJEFTSR-CMD-LEN
    ADD WG-TSNAME-LEN
       TO  W700-IKJEFTSR-CMD-LEN
    MOVE '.LOADFILE) NEW'
    TO W700-TSO-COMMAND (W700-IKJEFTSR-CMD-LEN:14).
    ADD 15 TO W700-IKJEFTSR-CMD-LEN
    MOVE ' LRECL(32718) BLKSIZE(32722) CYLINDERS SPACE(10,5)'
    TO W700-TSO-COMMAND (W700-IKJEFTSR-CMD-LEN:50)
    ADD 50 TO W700-IKJEFTSR-CMD-LEN
    MOVE ' RECFM(V B) BUFNO(20)'
    TO W700-TSO-COMMAND (W700-IKJEFTSR-CMD-LEN:11)
    ADD 21 TO W700-IKJEFTSR-CMD-LEN
    DISPLAY W700-TSO-COMMAND (1:W700-IKJEFTSR-CMD-LEN)
    CALL W700-IKJEFTSR USING W700-IKJEFTSR-P1
                             W700-TSO-COMMAND
                             W700-IKJEFTSR-CMD-LEN
                             W700-IKJEFTSR-RETCODE
                             W700-IKJEFTSR-REASCODE
                             W700-IKJEFTSR-ABNDCODE.

    IF RETURN-CODE NOT = 0
       DISPLAY 'RETURN-CODE ' RETURN-CODE
       DISPLAY 'ERROR CALLING REXX CODE'
       ' RETCODE '   W700-IKJEFTSR-RETCODE
       ' ABEND CODE '   W700-IKJEFTSR-ABNDCODE
       ' REASON ' W700-IKJEFTSR-REASCODE
       GOBACK
    END-IF.
    DISPLAY 'FILE ALLOCATED'
    OPEN OUTPUT OUTPUT-FILE.
    DISPLAY 'OPEN EXECUTED'
    IF WG-SIEBEL-FILE-STATUS > '00'
       DISPLAY 'SIEBEL OPEN ERROR ' WG-SIEBEL-FILE-STATUS
```

```
   GOBACK
END-IF.
MOVE 'DELETE '
TO W700-TSO-COMMAND
MOVE WG-TSNAME (1:WG-TSNAME-LEN)
TO W700-TSO-COMMAND (8:WG-TSNAME-LEN).
MOVE 8
   TO  W700-IKJEFTSR-CMD-LEN
ADD WG-TSNAME-LEN
   TO  W700-IKJEFTSR-CMD-LEN
MOVE '.LOADCDS'
TO W700-TSO-COMMAND (W700-IKJEFTSR-CMD-LEN:8).
ADD 8 TO W700-IKJEFTSR-CMD-LEN
DISPLAY W700-TSO-COMMAND (1:W700-IKJEFTSR-CMD-LEN)
CALL W700-IKJEFTSR USING W700-IKJEFTSR-P1
                         W700-TSO-COMMAND
                         W700-IKJEFTSR-CMD-LEN
                         W700-IKJEFTSR-RETCODE
                         W700-IKJEFTSR-REASCODE
                         W700-IKJEFTSR-ABNDCODE.

MOVE 'ALLOC F(LOADCDS) DA(' TO W700-TSO-COMMAND.
MOVE WG-TSNAME (1:WG-TSNAME-LEN)
TO W700-TSO-COMMAND (22:WG-TSNAME-LEN).
MOVE 22
   TO  W700-IKJEFTSR-CMD-LEN
ADD WG-TSNAME-LEN
   TO  W700-IKJEFTSR-CMD-LEN
MOVE '.LOADCDS) NEW'
TO W700-TSO-COMMAND (W700-IKJEFTSR-CMD-LEN:14).
ADD 14 TO W700-IKJEFTSR-CMD-LEN
MOVE ' LRECL(80) BLKSIZE(3200) TRACKS SPACE(1,1)'
TO W700-TSO-COMMAND (W700-IKJEFTSR-CMD-LEN:50)
ADD 50 TO W700-IKJEFTSR-CMD-LEN
MOVE ' RECFM(F B)'
TO W700-TSO-COMMAND (W700-IKJEFTSR-CMD-LEN:11)
ADD 11 TO W700-IKJEFTSR-CMD-LEN
DISPLAY W700-TSO-COMMAND (1:W700-IKJEFTSR-CMD-LEN)
CALL W700-IKJEFTSR USING W700-IKJEFTSR-P1
                         W700-TSO-COMMAND
                         W700-IKJEFTSR-CMD-LEN
                         W700-IKJEFTSR-RETCODE
                         W700-IKJEFTSR-REASCODE
                         W700-IKJEFTSR-ABNDCODE.

IF RETURN-CODE NOT = 0
   DISPLAY 'RETURN-CODE ' RETURN-CODE
   DISPLAY 'ERROR CALLING REXX CODE'
   ' RETCODE '   W700-IKJEFTSR-RETCODE
```

```
              ' ABEND CODE '   W700-IKJEFTSR-ABNDCODE
              ' REASON ' W700-IKJEFTSR-REASCODE
              GOBACK
           END-IF.
           DISPLAY 'FILE ALLOCATED'
           OPEN OUTPUT LOADCDS-FILE.
           DISPLAY 'OPEN EXECUTED'
           IF WG-SIEBEL-FILE-STATUS > '00'
              DISPLAY 'LOADCDS OPEN ERROR ' WG-SIEBEL-FILE-STATUS
              GOBACK
           END-IF.
           IF WG-LOAD-TYPE = 'REPLACE'
              MOVE 'LOAD RESUME NO REPLACE ' TO WG-LOAD-CARD
           ELSE
              MOVE 'LOAD RESUME ' TO WG-LOAD-CARD
           END-IF
           WRITE LOADCDS-REC FROM WG-LOAD-CARD
           MOVE 'STATISTICS TABLE(ALL) INDEX(ALL) UPDATE ALL'
           TO WG-LOAD-CARD
           WRITE LOADCDS-REC FROM WG-LOAD-CARD
           MOVE 'LOG NO FORMAT UNLOAD ASCII '
           TO WG-LOAD-CARD
           WRITE LOADCDS-REC FROM WG-LOAD-CARD
           MOVE 'INTO TABLE '
           TO WG-LOAD-CARD
           MOVE WG-TBCREATOR TO WG-LOAD-CARD (12:WG-TBCREATOR-LEN)
           MOVE 12 TO WG-WLEN
           ADD WG-TBCREATOR-LEN TO WG-WLEN
           MOVE '.' TO WG-LOAD-CARD (WG-WLEN:1)
           ADD 1 TO WG-WLEN
           MOVE WSYS-TBNAME-TEXT (1:WSYS-TBNAME-LEN)
           TO WG-LOAD-CARD (WG-WLEN:WSYS-TBNAME-LEN)
           ADD WSYS-TBNAME-LEN TO WG-WLEN
           WRITE LOADCDS-REC FROM WG-LOAD-CARD
           CLOSE LOADCDS-FILE
           IF WG-SIEBEL-FILE-STATUS > '00'
              DISPLAY 'LOADCDS WRITE ERROR ' WG-SIEBEL-FILE-STATUS
              GOBACK
           END-IF.

       X700-DB2-CONNECT SECTION.
      ******************
      *****************************************************************
      ***  CONNECT TO DB2                                           ***
      *****************************************************************
           MOVE 'CONNECT' TO WD-FUNCTION.
           MOVE SPACES TO WD-TERMCB
                          WD-STARTCB
                          WD-RIBPTR.
```

```
     CALL 'DSNALI' USING WD-FUNCTION
                         WD-SSNAME
                         WD-TERMCB
                         WD-STARTCB
                         WD-RIBPTR
                         WD-RET-CODE
                         WD-REASCODE.
     IF WD-RET-CODE = 200
        NEXT SENTENCE
     ELSE
     IF WD-RET-CODE NOT = 0
*       IF WD-RET-CODE = 200
*          PERFORM X800-DB2-DISCONNECT
*       END-IF
        MOVE WD-REASCODE TO WX-CODE
        CALL 'PLFDISPX' USING WX-PARM1
                               WX-PARM2
        MOVE SQLCODE TO W200-SQLCODE
        MOVE 'CAF CONNECT FAILURE' TO W100-SHORT-MSG
        MOVE 'REASON CODE ' TO W100-LONG-MSG
        MOVE WX-HEX-DISPLAY TO W100-LONG-MSG (13:8)
        DISPLAY W100-SHORT-MSG
        DISPLAY W100-LONG-MSG
        GOBACK
     END-IF.

     MOVE 'OPEN' TO WD-FUNCTION.
     CALL 'DSNALI' USING WD-FUNCTION
                         WD-SSNAME
                         WD-PLAN
                         WD-RET-CODE
                         WD-REASCODE.
     IF WD-RET-CODE = 200
        NEXT SENTENCE
     ELSE
     IF WD-RET-CODE NOT = 0
        MOVE WD-REASCODE TO WX-CODE
        CALL 'PLFDISPX' USING WX-PARM1
                               WX-PARM2
        MOVE SQLCODE TO W200-SQLCODE
        MOVE 'CAF OPEN FAILURE' TO W100-SHORT-MSG
        MOVE 'REASON CODE ' TO W100-LONG-MSG
        MOVE WX-HEX-DISPLAY TO W100-LONG-MSG (13:8)
        DISPLAY W100-SHORT-MSG
        DISPLAY W100-LONG-MSG
        GOBACK
     END-IF
     END-IF.
```

```
***

 X700-CONNECT-EXIT.
     EXIT.


 X800-DB2-DISCONNECT SECTION.
******************
*****************************************************************
***  DISCONNECT                                               ***
*****************************************************************

     MOVE 'CLOSE' TO WD-FUNCTION.
     MOVE 'SYNC' TO WD-TERMOP.
     CALL 'DSNALI' USING WD-FUNCTION
                         WD-TERMOP
                         WD-RET-CODE
                         WD-REASCODE.
     IF WD-RET-CODE NOT = 0
        MOVE WD-REASCODE TO WX-CODE
        CALL 'PLFDISPX' USING WX-PARM1
                               WX-PARM2
        MOVE SQLCODE TO W200-SQLCODE
        MOVE 'CAF CLOSE FAILURE' TO W100-SHORT-MSG
        MOVE 'REASON CODE ' TO W100-LONG-MSG
        MOVE WX-HEX-DISPLAY TO W100-LONG-MSG (13:8)
        DISPLAY W100-SHORT-MSG
        DISPLAY W100-LONG-MSG
     END-IF.

     MOVE 'DISCONNECT' TO WD-FUNCTION.
     CALL 'DSNALI' USING WD-FUNCTION
                         WD-RET-CODE
                         WD-REASCODE.
     IF WD-RET-CODE NOT = 0
        MOVE WD-REASCODE TO WX-CODE
        CALL 'PLFDISPX' USING WX-PARM1
                               WX-PARM2
        MOVE SQLCODE TO W200-SQLCODE
        MOVE 'CAF DISCONNECT FAILURE' TO W100-SHORT-MSG
        MOVE 'REASON CODE ' TO W100-LONG-MSG
        MOVE WX-HEX-DISPLAY TO W100-LONG-MSG (13:8)
        DISPLAY W100-SHORT-MSG
        DISPLAY W100-LONG-MSG
     END-IF.


 X800-DISCONNECT-EXIT.
     EXIT.
```

JCL to run the PLFSIEBL program

```
//FLETCHPA JOB (946),PAUL,MSGCLASS=H,NOTIFY=FLETCHP
//PLFSIEBL EXEC PGM=PLFSIEBL,REGION=0M
//*************************************************************
//*                                                           *
//*************************************************************
//STEPLIB  DD DISP=SHR,DSN=SYS2.DB2.V610.SDSNLOAD
00012000
//         DD DISP=SHR,DSN=FLETCHP.MASTER.LOAD
//         DD DISP=SHR,DSN=SYS1.LPALIB
//SIEBELIN DD DISP=SHR,DSN=FLETCHP.DATAEXP.FILE
//SYSPRINT DD SYSOUT=*
//SYSOUT   DD SYSOUT=*
//SYSUDUMP DD SYSOUT=*
//SYSABEND DD SYSOUT=*
//SYSABOUT DD SYSOUT=*
//SYSTSPRT DD SYSOUT=*
//SYSIN    DD *
DB2ID ISC1 LOAD REPLACE CREATOR SIEBL
/*
```

The SYSIN DD contains details essential to the running of the program. They must all be on one line, and are grouped in pairs—but the pairs can be in any order.

The first pair is DB2ID ISC1. It is used to allow the program to use Call Attach to connect to DB2 system ISC1.

If LOAD REPLACE is specified, then the program will generate LOAD REPLACE cards. If LOAD RESUME is specified, then LOAD RESUME cards will be generated.

The final pair is CREATOR SIEBEL. This gives the name of the table owner for the SIEBEL tables. It is used to obtain the column names for each table and to generate the Load cards.

Notice that no output files are specified in the JCL; instead, each file is dynamically created by the program.

- The load cards will be in a file called tablespacename.LOADCDS.
- The load files will be called tablespacename.LOADFILE.

Both of these files are prefixed with the userid of the job submitter.

JCL to run the DB2 LOAD utility

```
//FLETCHP7 JOB  (541),'PAUL FLETCHER',MSGCLASS=H,
//          NOTIFY=FLETCHP
//*
//* LOAD THE DATA
//*
//*
//LOAD    EXEC DSNUPROC,SYSTEM=ISC1,UID=FLETCHP7,
//        COND=(8,LT)
//*
//STEPLIB  DD DSN=SYS2.DB2.V610.ISC.SDSNLOAD,DISP=SHR
//SYSUT1   DD SPACE=(CYL,(100,10)),UNIT=SYSDA
//SORTOUT  DD SPACE=(CYL,(100,10)),UNIT=SYSDA
//SYSREC   DD DISP=SHR,DSN=FLETCHP.FFFFF001.LOADFILE
//SYSIN    DD DISP=SHR,DSN=FLETCHP.FFFFF001.LOADCDS
//SYSABEND DD SYSOUT=*
//SYSUDUMP DD SYSOUT=*
//
```

Related publications

The publications listed in this section are considered particularly suitable for a more detailed discussion of the topics covered in this redbook.

IBM Redbooks

For information on ordering these publications see "How to get IBM Redbooks" on page 208.

- *Siebel 2000 Database Implementation on OS/390 Using NT Siebel Servers,* SG24-5953
- *Implementing Siebel eBusiness Applications with DB2 UDB on AIX/NT,* SG24-6211
- *DB2 UDB Server for OS/390 and z/OS Version 7 - Presentation Guide*, SG24-6121

Other resources

These publications are also relevant as further information sources:

- *Siebel Server Installation Guide,* Version 6.2*,* available on Siebel Bookshelf
- *Installing Siebel 2000 On Microsoft Windows NT 4.0 Using IBM's DB2 UDB 6.1,* SWG CECI Bulletin*,* available at:

  `http://integration.raleigh.ibm.com/CPITWeb/CPITWeb.nsf/Main?OpenPage`
- *DB2 UDB for OS/390 and z/OS Utility Guide and Reference Version 7*, SC26-9945

Referenced Web sites

These Web sites are also relevant as further information sources:

- `ftp://ftp.software.ibm.com/ps/products/db2/fixes/english-us/siebel/siebel2000/nt/FP6s`
- `ftp://ftp.software.ibm.com/ps/products/db2/fixes/english-us/siebel/siebel2000/nt/FP6s/wr21223s.zip`
- `http://www.microsoft.com/ntserver/nts/downloads/recommended/sp5/128bitX86/`
- `http://www.adobe.com/products/acrobat/readstep.html`
- `http://integration.raleigh.ibm.com/CPITWeb/CPITWeb.nsf Business+Intelligence?OpenView`

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IBM Redbooks

Migrating Siebel Database from DB2/Oracle for NT to DB2 for OS/390

(0.2”spine)
0.17”<->0.473”
90<->249 pages

Migrating Siebel Database from DB2/Oracle for NT to DB2 for OS/390

DB2 for NT to DB2 for OS/390

Oracle for NT to DB2 for NT

Oracle for NT to DB2 for OS/390

This IBM Redbook will help you migrate the Siebel 2000 V6.2.1 database from:

- DB2 for NT V6 to DB2 for OS/390 V6
- Oracle for NT V8.1.6 to DB2 for NT V6
- Oracle for NT V8.1.6 to DB2 for OS/390 V6

The book describes the migration experiences gained while migrating a Siebel 2000 database at the IBM ITSO Poughkeepsie Center in New York, and at the IBM Hursley Laboratory in the UK.

It provides an overview of Siebel architecture, and introduces the migration methodology needed to move the Siebel database from a DB2/Oracle for NT platform to a DB2 for OS/390 platform. It offers a step-by-step description of the database migration process, and discusses in detail the different methods of moving data from one platform to the other.

This redbook will be especially useful for those migrating the Siebel database for the first time.

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