Migrating a Cognos Powerhouse Application to a HP9000

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HP WORLD 2003
Solutions and Technology Conference & Expo

Overview

- This presentation focuses on Porting Cognos PowerHouse applications to an HP9000

- The following topics are covered:
  - Migration planning
  - The migration process
    - Tools
    - Database migration
    - Application migration
    - Data migration
  - Case Study

Problem statement

- Many organizations are running HP e3000 Cognos PowerHouse applications
  - Critical to the business process
  - Users like the applications and have used them for years

- HP e3000 is ending as a product line
  - HP e3000 & MPE will be off support in December 2006
  - The business critical functionality needs to be maintained

Problem statement

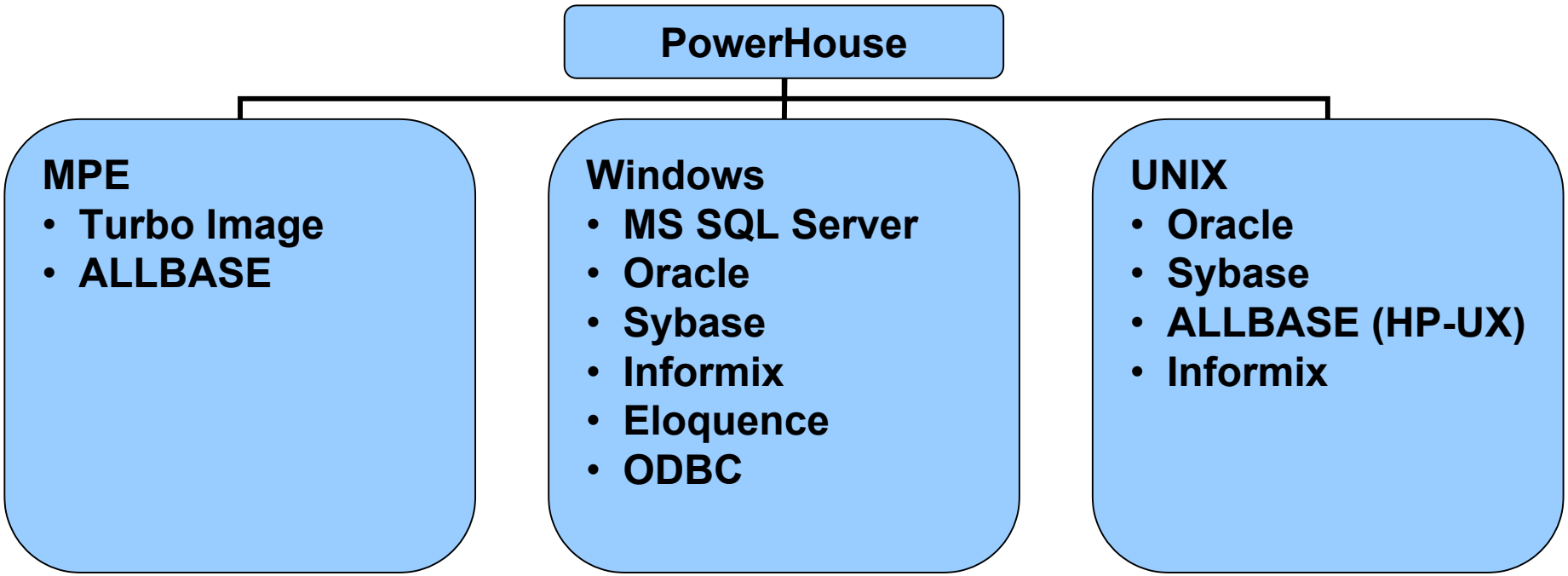
- Transition options are STAY, PORT, BUILD, or BUY
  - Stay: Continue to run the applications on the HP e3000 without support
  - Port: Move the Powerhouse applications as is to a new platform
  - Build: Re-engineer the Powerhouse applications on a new platform
  - Buy: Purchase COTS with equivalent functionality

Problem statement

- **Stay**ing on the current platform is high risk, due to lack of HP support
- Re-**build**ing the application on a new platform requires extensive effort and will create change for business users
- **Buy**ing a new application to replace the functionality of the current application will create change for business users
- **Port**ing the application can provide a lower cost, less dramatic change, and maintain application sustainability

Migration planning

- Powerhouse supported platforms and databases



Migration planning

- Step 1: Identify the target platform
  - It is advantageous to match other applications in the IT environment when choosing the target platform
  - Other HP e3000 application migration paths may drive the target platform
  - QTP and QUIZ run in both the Windows and UNIX environments
  - QUICK is supported in the UNIX environment and was just released for the Windows environment

Migration planning

- Step 2: Identify the target database tool
  - It is advantageous to match other applications in the IT environment when choosing the target database
  - Other HP e3000 application migration paths may drive the target database
  - Oracle and SQL Server are the market leaders
  - SQL Server runs only in the Windows environment
  - Eloquence is a database which offers Image emulation
    - This could help with migrating other applications
    - Cognos is compatible with Eloquence
    - Support in both UNIX and Windows environments

Migration planning

- Step 3: Identify target user interface architecture
  - Stay with the character-based screens (QUICK)
  - Move to GUI client / server screens (Axiant)
  - Move to web-based GUI screens (PowerHouse Web)
- Decision should be driven by client requirements, potential business impact

Migration planning

- Option 1: Stay with character-based screens (QUICK)
  - Advantages
    - Doesn't require many screen modifications
    - Only need to modify data element changes, then re-compile in the new environment
  - Disadvantages
    - No modern GUI look-and-feel
    - If there are many changes in the database, these screens will have to change anyway

Migration planning

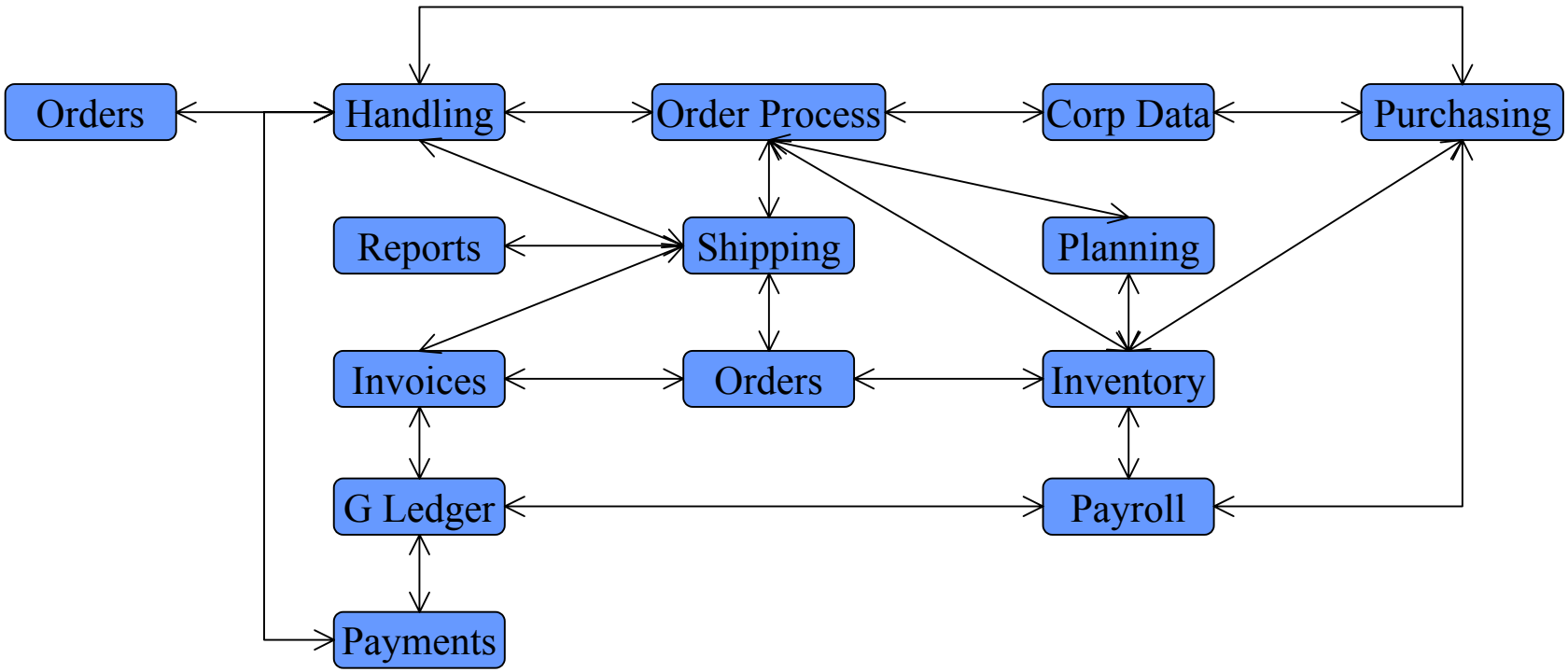
- Option 2: Move to GUI client / server screens (Axiant)
  - Advantages
    - Moves entirely to the Windows / GUI environment
  - Disadvantages
    - Requires re-design of screens
    - Must maintain the client on all users PC's

Migration planning

- Option 3: Move to web-based GUI screens (PH Web)
  - Advantages
    - Move to modern, web-based technology
    - Web server-based screen handling eliminates need for PC clients
    - Users can access GUI with web browser
  - Disadvantages
    - Must maintain web server to run the GUI
    - Must re-design and compile the screens, output is HTML

Migration planning

- Step 4: Identify application interfaces
  - Identify applications that interface with the Powerhouse application
  - If they are on the HP e3000, they will also require migration



Migration planning

- Step 5: Identify training needs
  - The current IT staff has focused on the HP e3000, MPE, and Powerhouse environment
  - Prior to the migration, the staff will need to gain the following skills:
    - Target platform OS
    - RDBMS
    - Migration Tools
  - PowerHouse skills can be leveraged

Migration Planning Summary

- Identify new platform
- Identify database tool
- Identify interface architecture
- Identify all Interfaces
- Training

Migration process

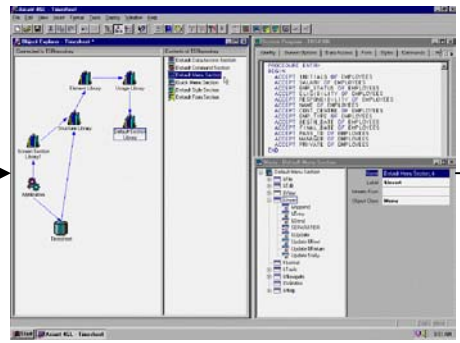
- Acquire tools and associated training
- Migrate database
- Migrate application
- Translate data

Migration example

- To illustrate the migration process, a port to the following is used:
  - Platform/OS: HP 9000
  - Database: Oracle 8.1.7 RDBMS
  - Migration tool: Axiant 3.1
  - PowerHouse version: 8.23.D7

Migration overview

- HP 3000
- Cognos Axiant
- HP9000



- PowerHouse
- Turbo Image

- Oracle 8.1.7
- PowerHouse 8.23.D7

Migration tools

- Cognos Axiant used to migrate:
  - Data dictionary
  - PowerHouse application which consists of:
    - QUICK
    - QUIZ
    - QTP
- Data migrated using PowerHouse QUIZ

Migration process

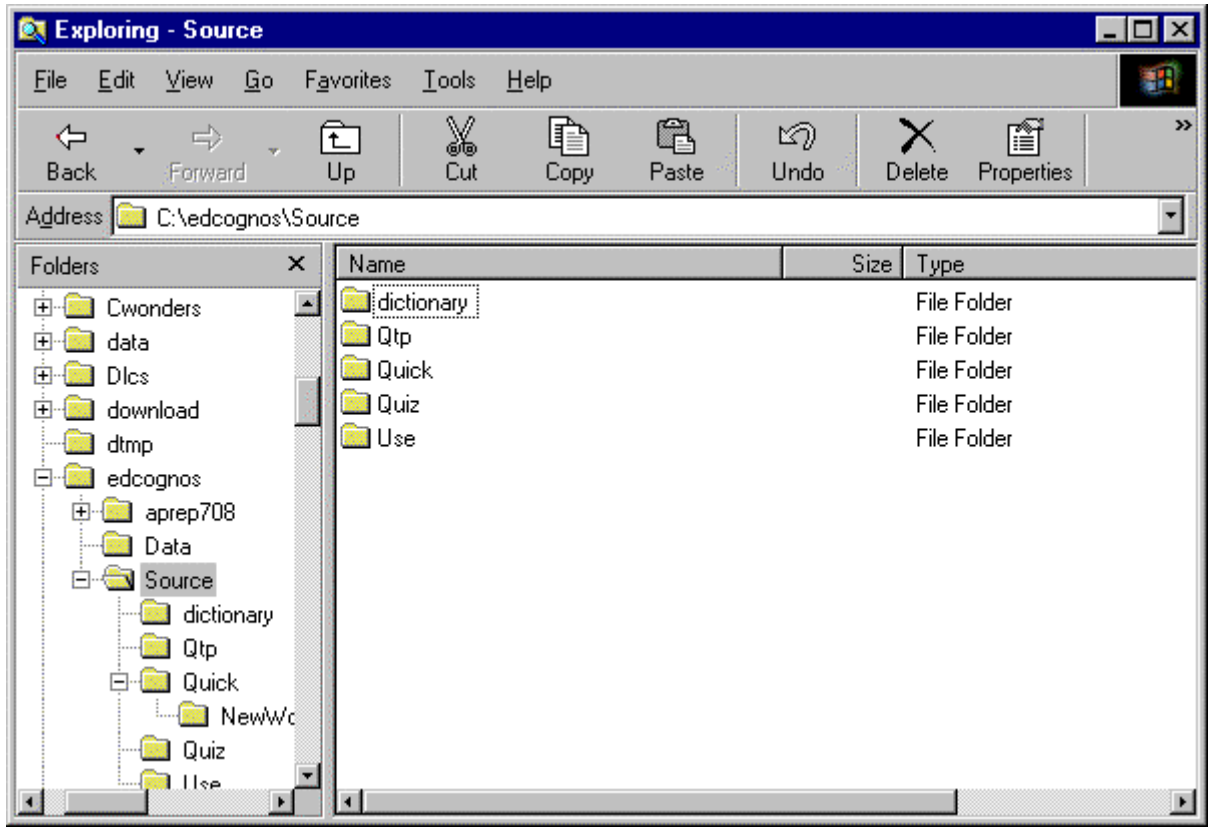
- Step 1: Install Software
  - Axiant 3.1 installed on Windows 98 server
  - PowerHouse 8.23.D7 installed on HP 9000
  - Oracle 8.1.7 installed on HP 9000

Migration process

- Step 2: Prepare and move HP e3000 source code
  - Review Dictionary
  - Retrieve all application source: QUIZ, QUICK,QTP
  - Move source to a central location for Axiant access
    - Should be network drive
    - Should have network access to HP 3000 & HP 9000

Migration process

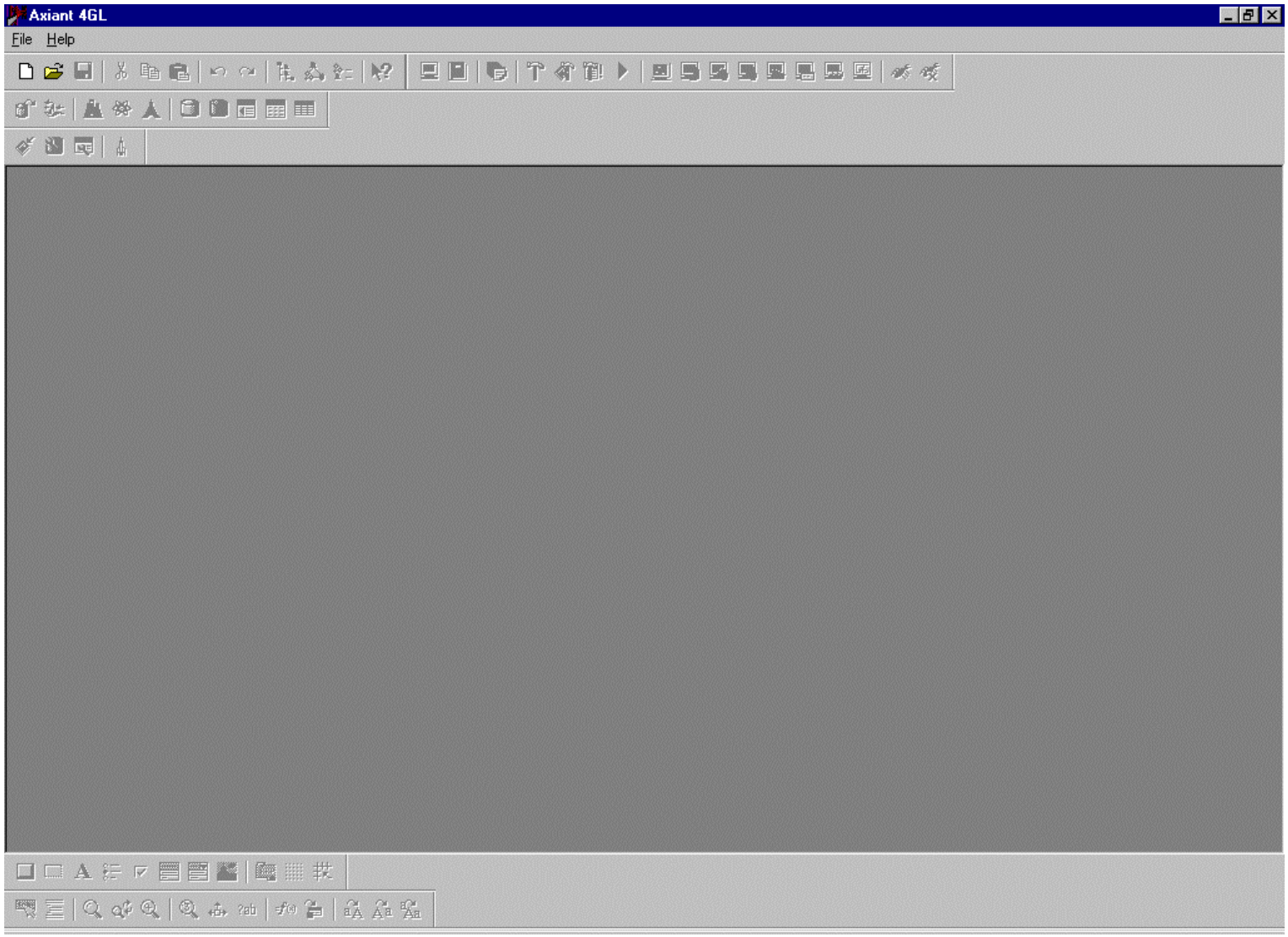
Example: Central location for HP e3000 source files



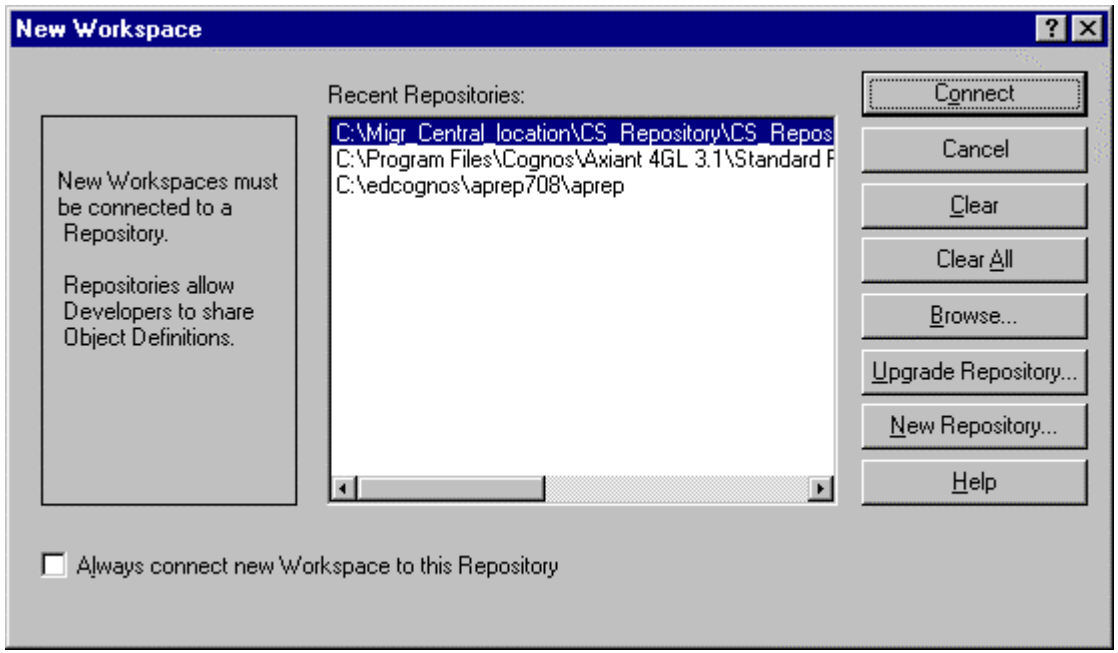
Migration process

- Step 3: Set up Axiant
  - Create a Repository (holding place for a specific project)
    - You can have multiple repositories
  - Create a migration profile, defines:
    - Where the data dictionary and source resides
    - What code has been migrated

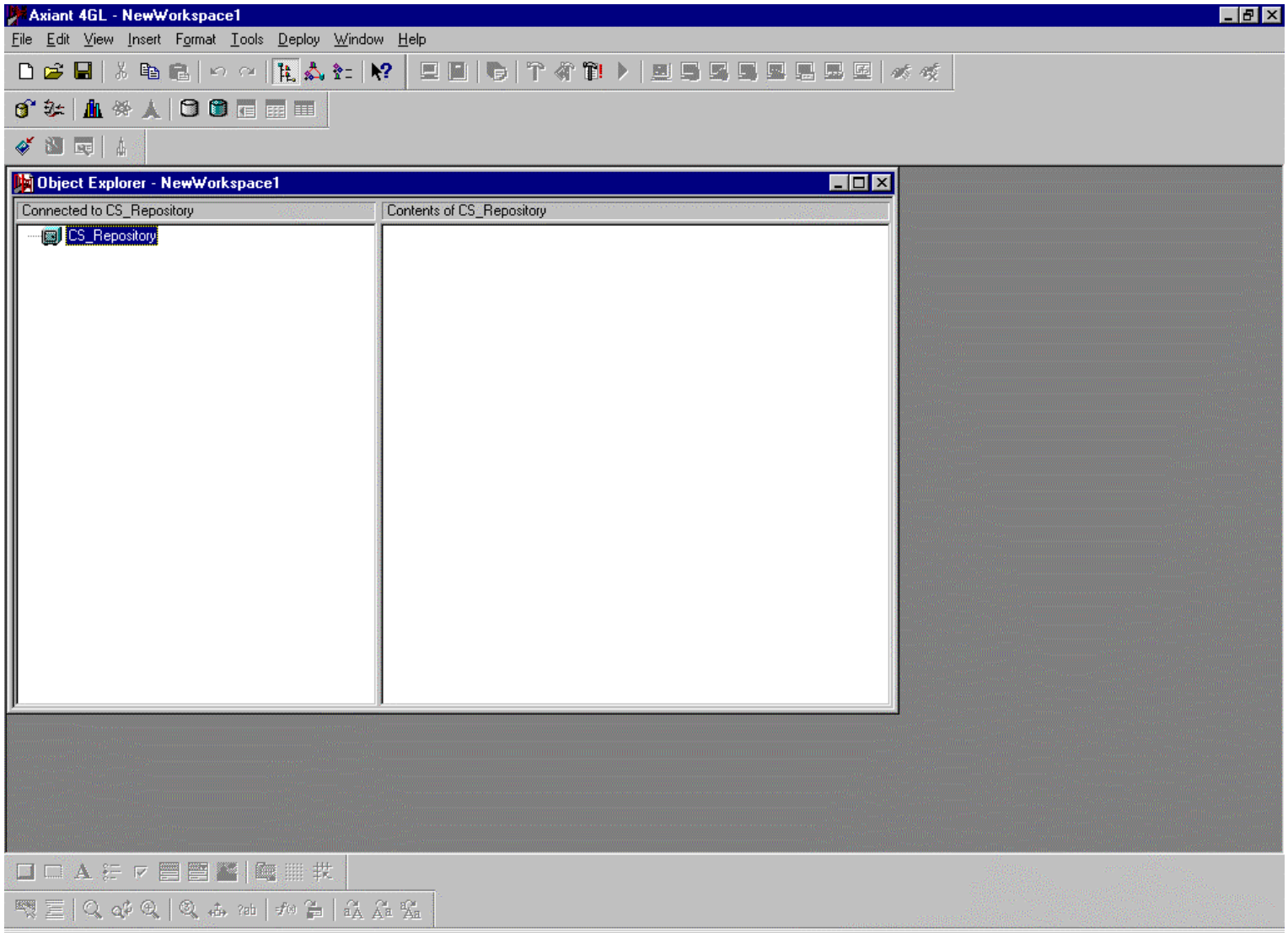
Initial Axiant screen



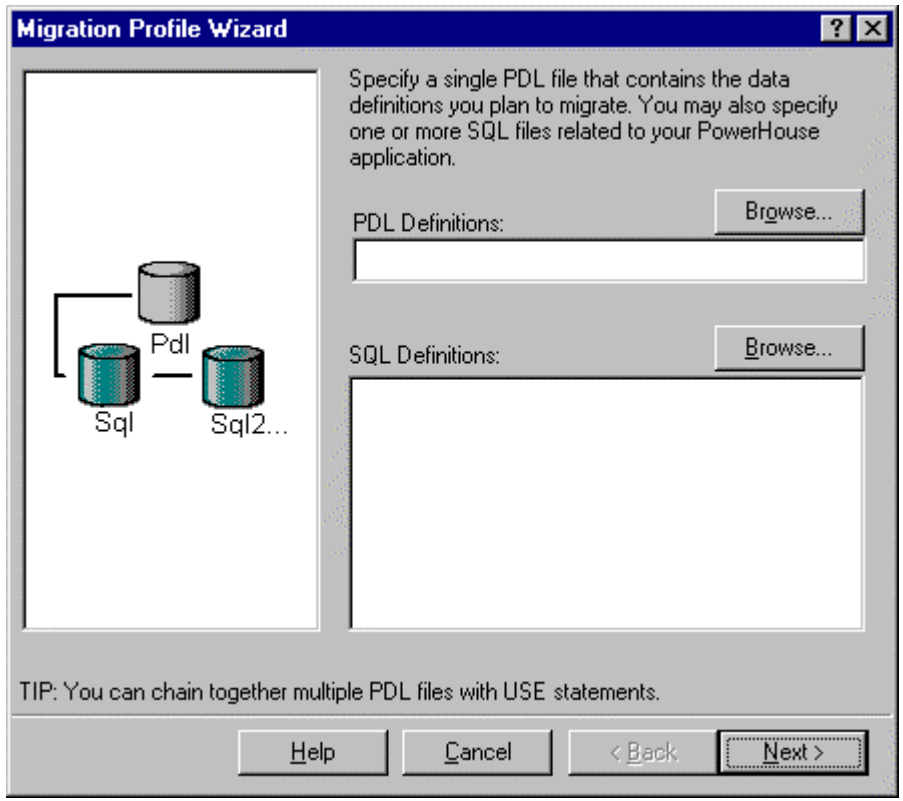
Connecting to a Repository



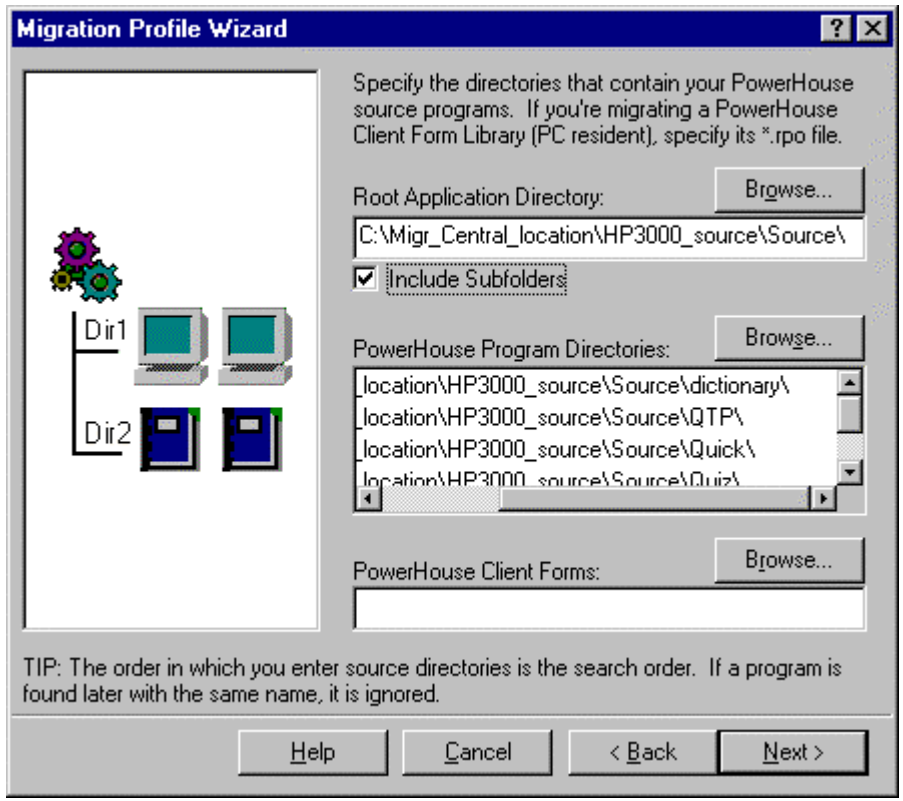
Initial Repository



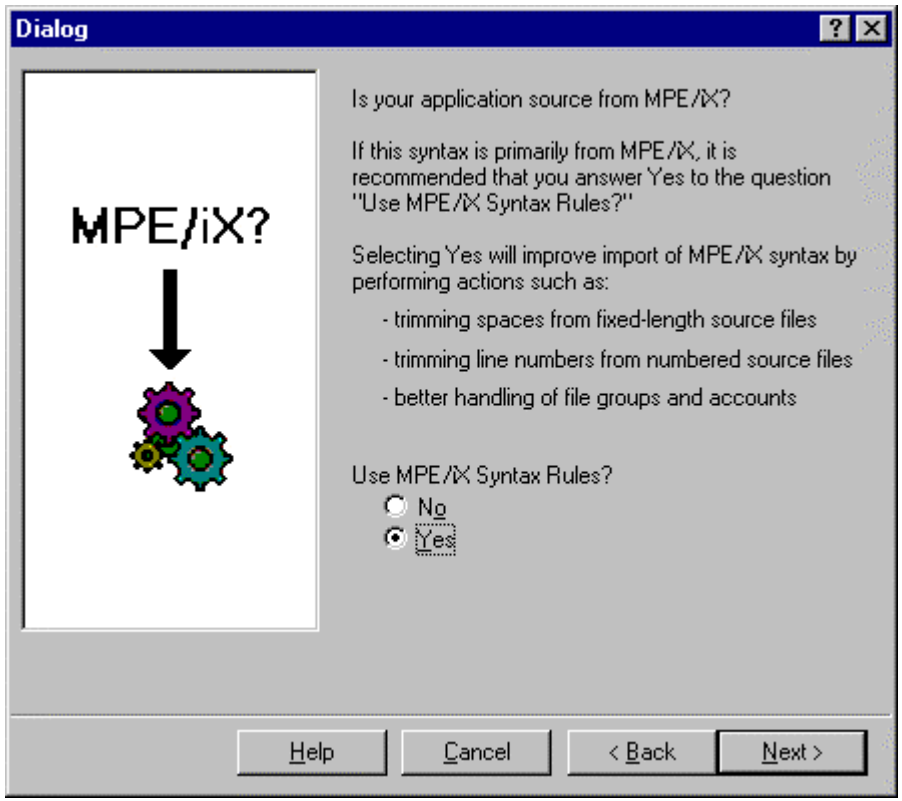
Create a migration profile



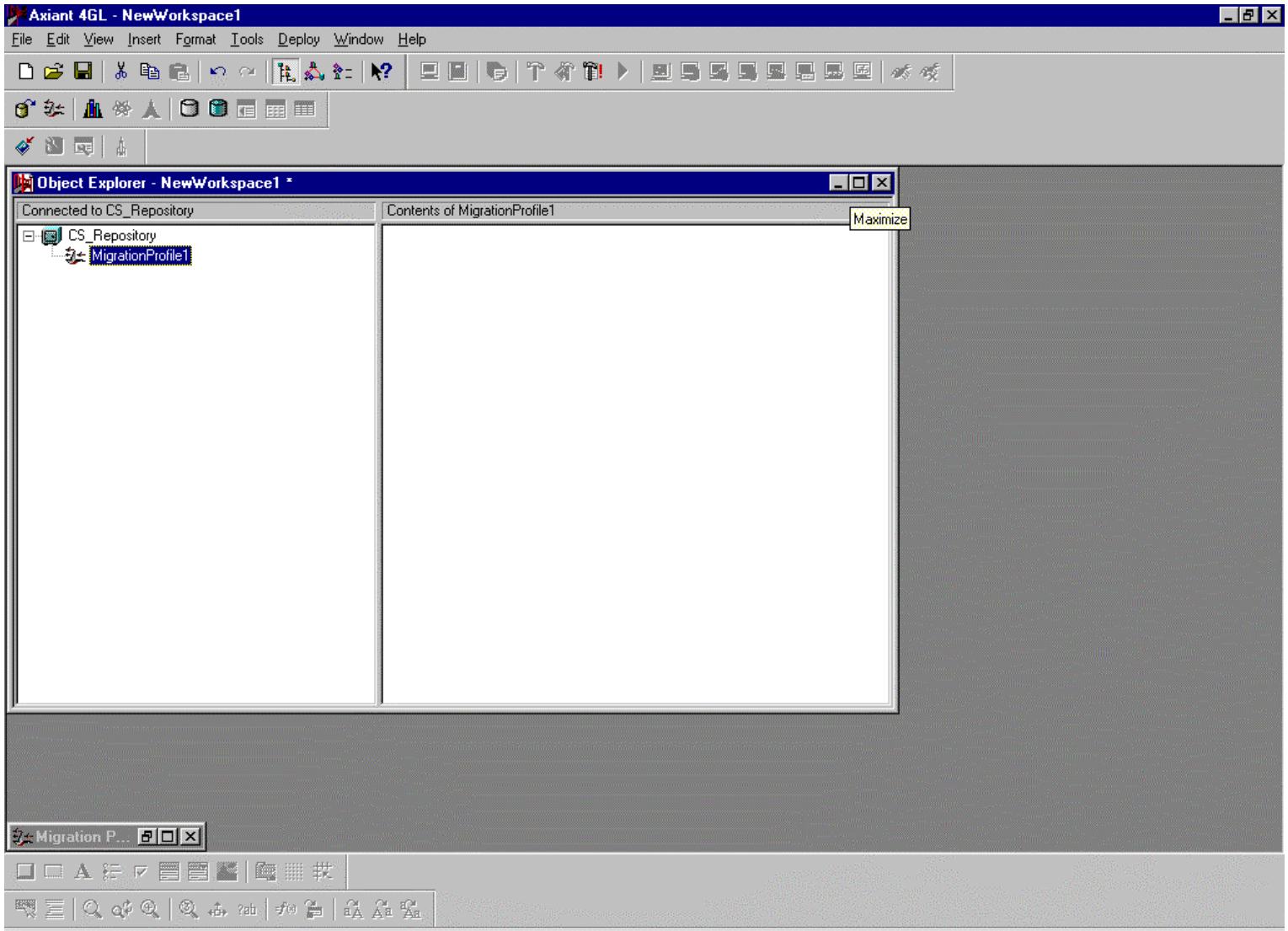
Migration profile has source locations



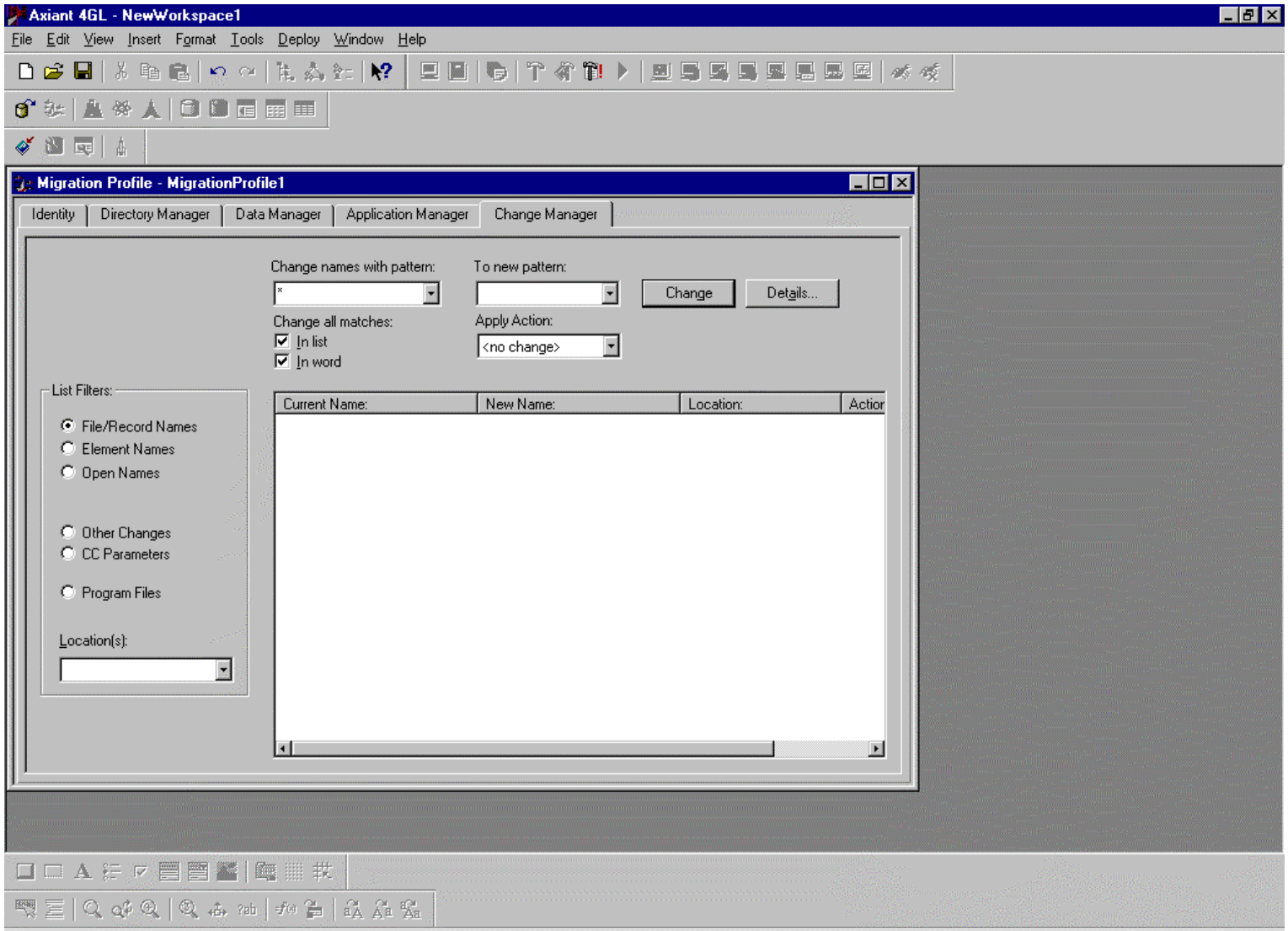
Migration Profile set up cont.



Migration profile setup complete



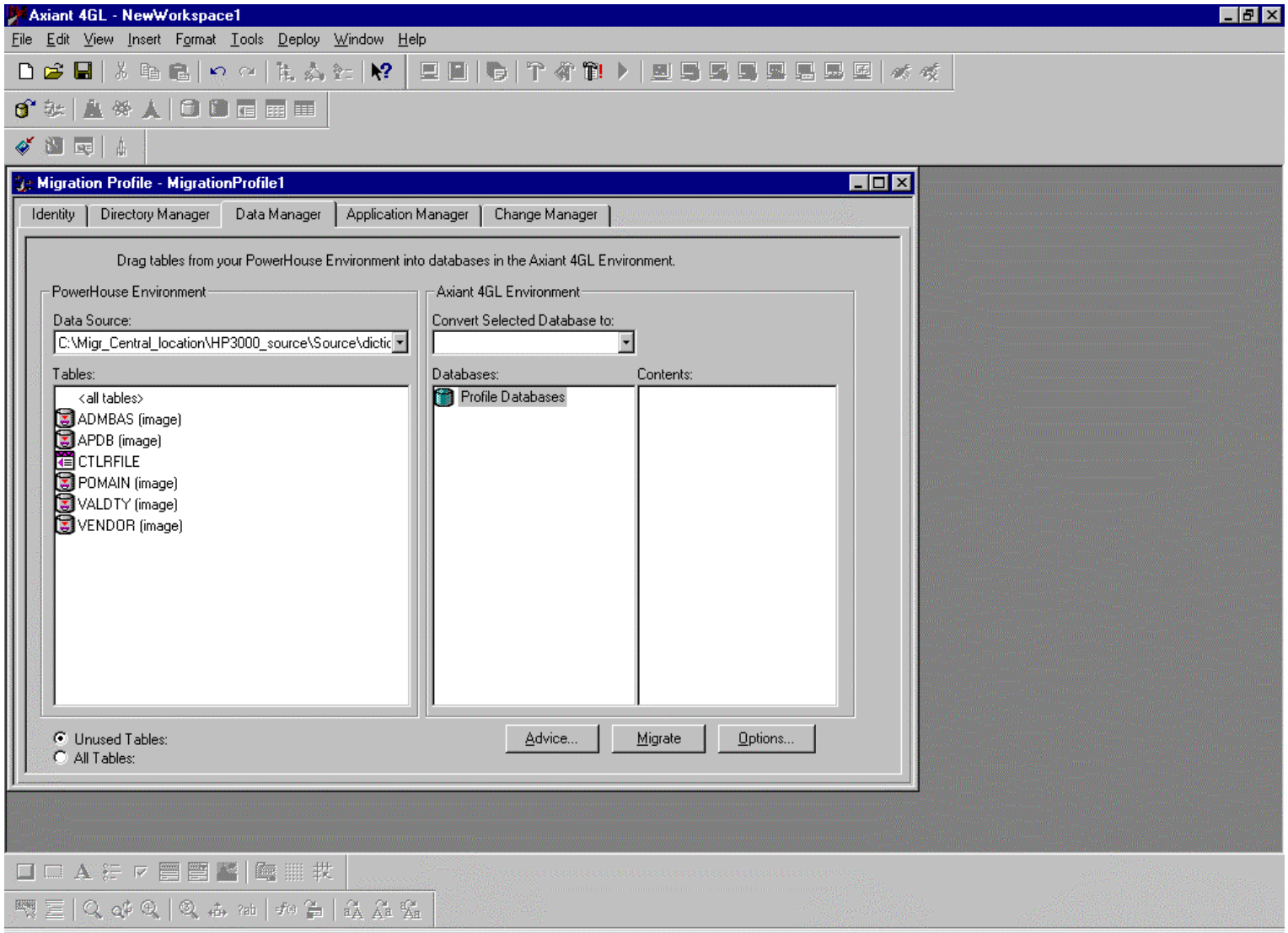
Migration profile



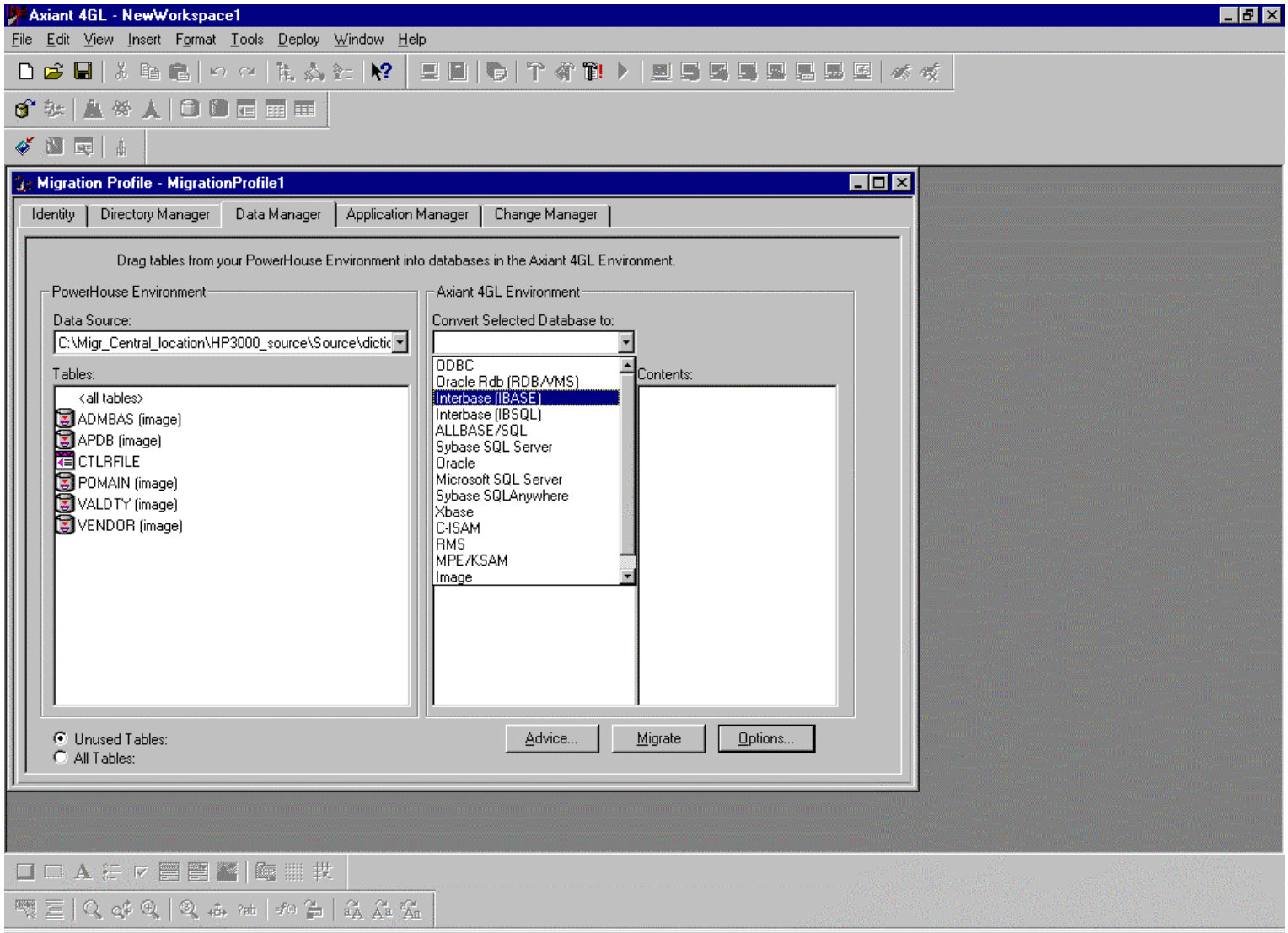
Migration process

- Step 4: Data Dictionary migration
  - Migrate the dictionary by opening the migration profile
    - Access dictionary
    - Making changes to dataset names, elements using the change manager in the profile
    - Press the migration button
  - Possible migration errors:
    - Arrays
    - Warnings about indexes
  - Migration can continue with warnings

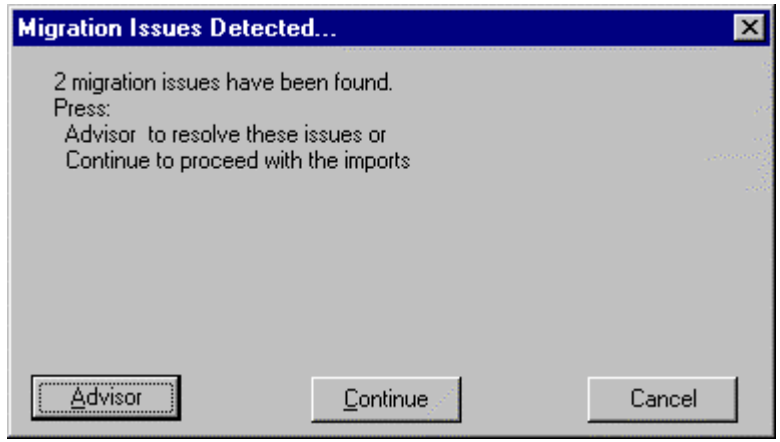
Data Dictionary migration



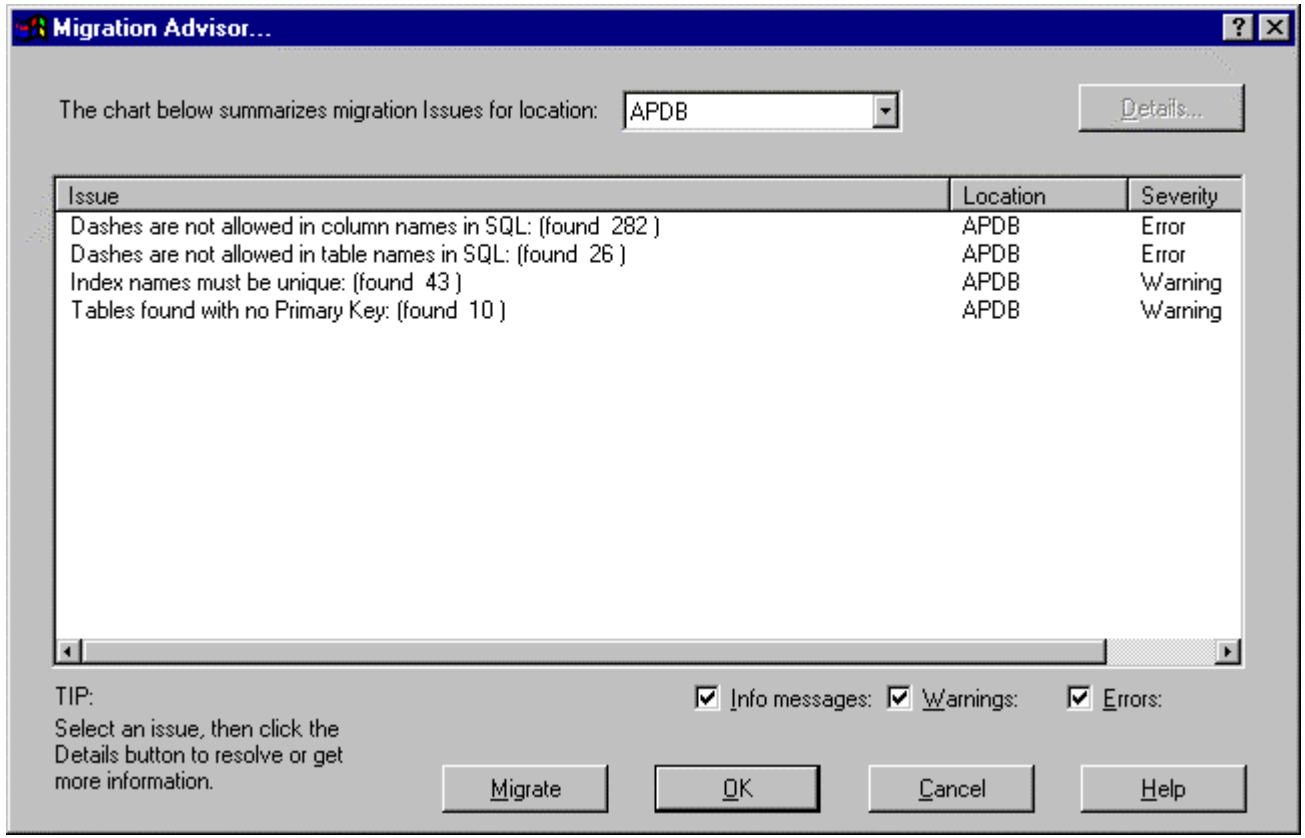
Convert to new source



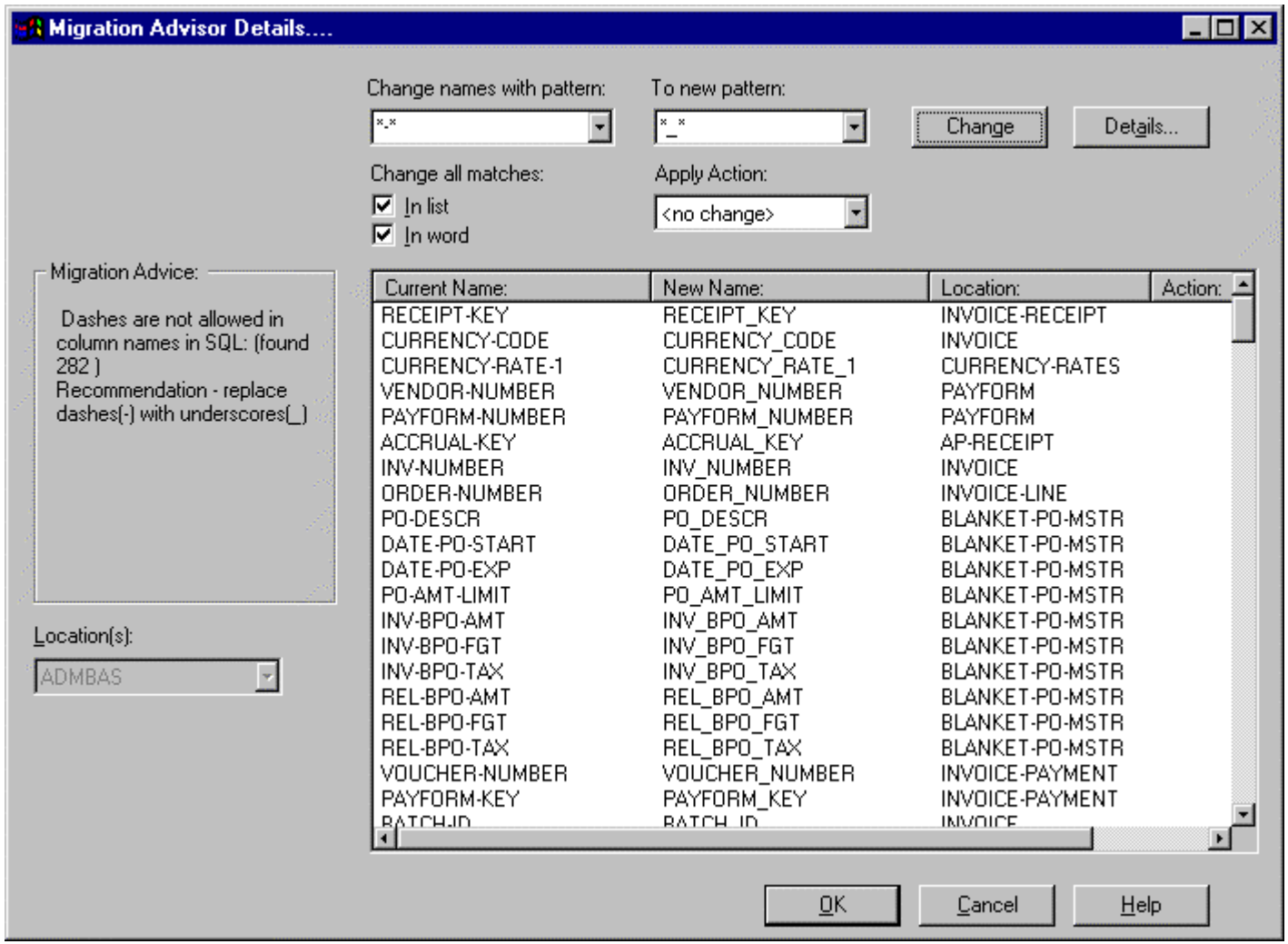
Migration – sample errors



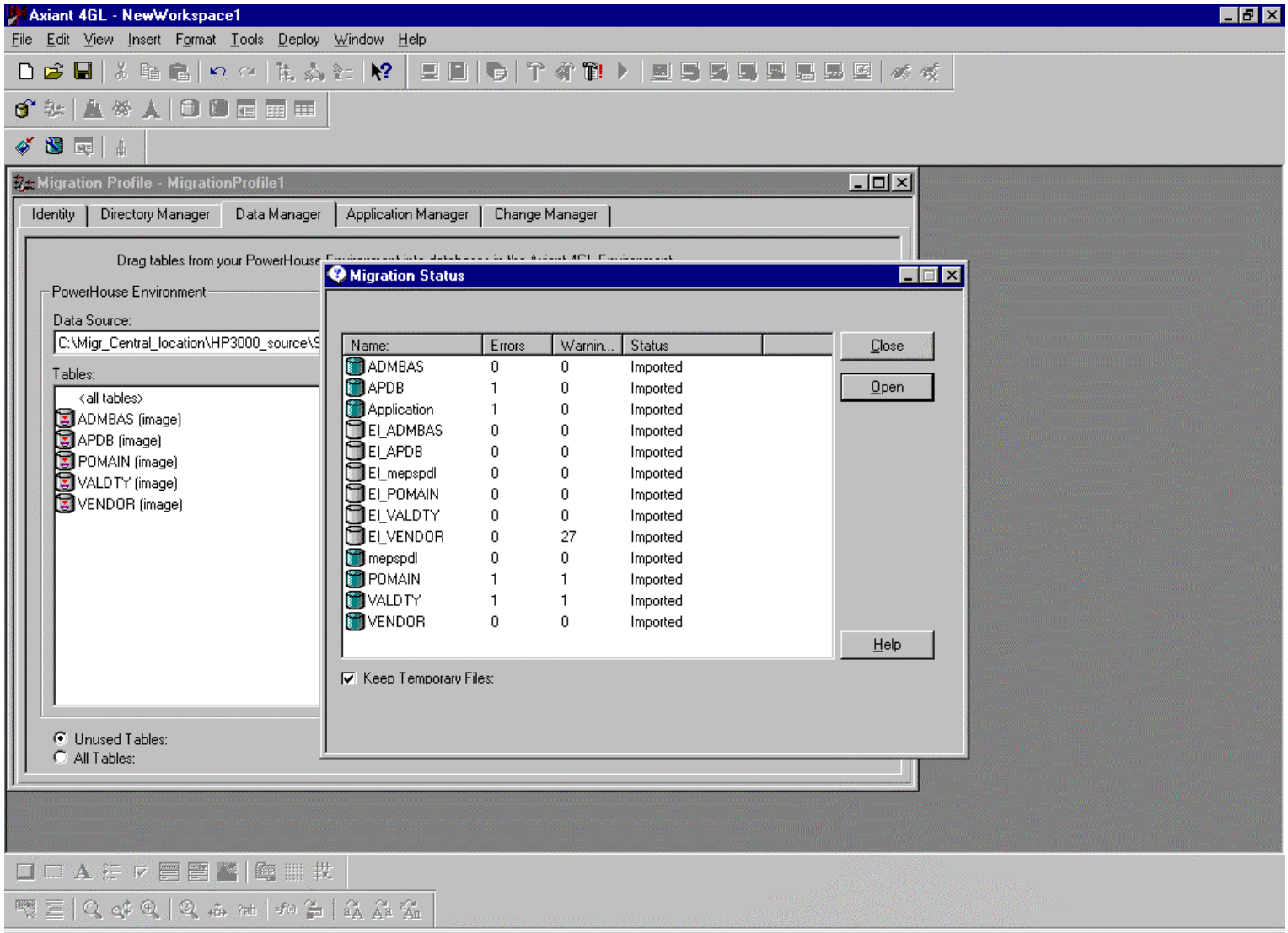
Migration: Sample errors



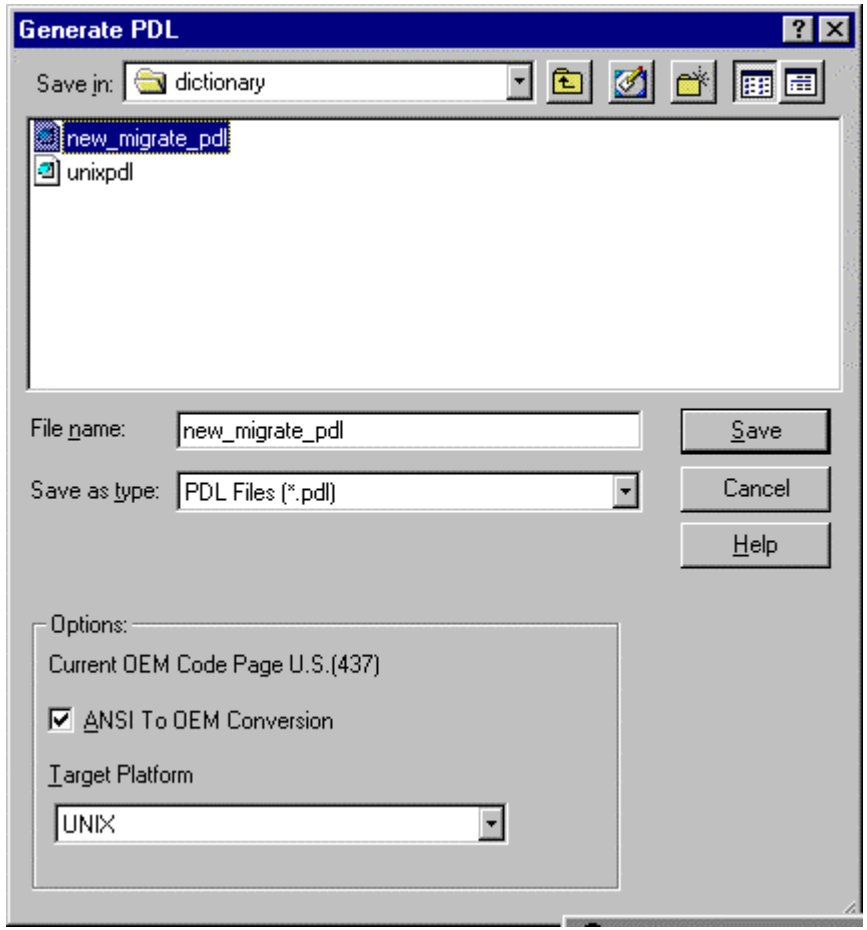
Migration changes



Migrated data dictionary



Generate a PDL



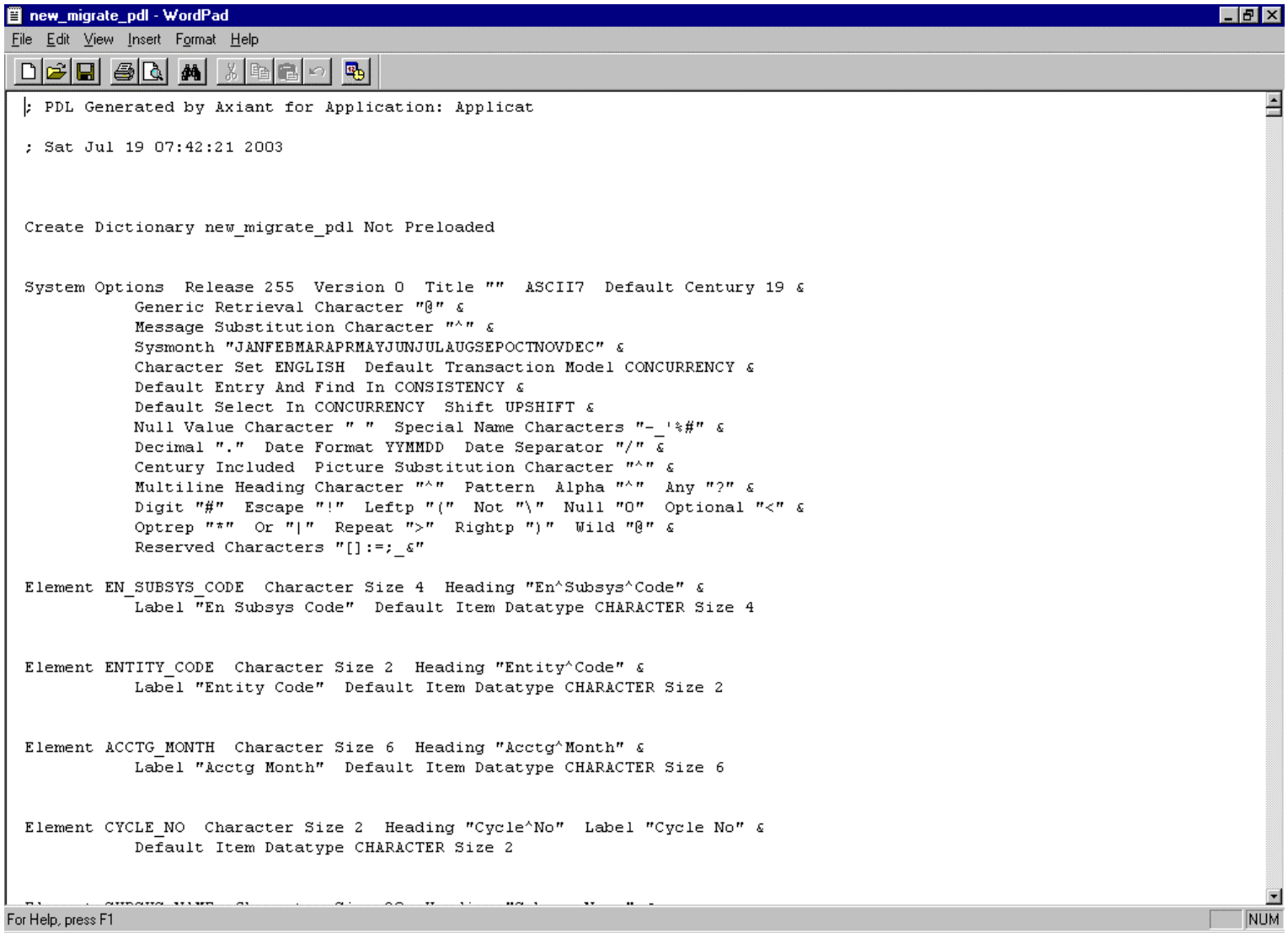
Migration process

- Data Dictionary Issues
  - Change naming conventions since they may differ
    - Dashes not acceptable in some/all RDBMS
  - Need to address arrays, substructures and redefines

Migration process

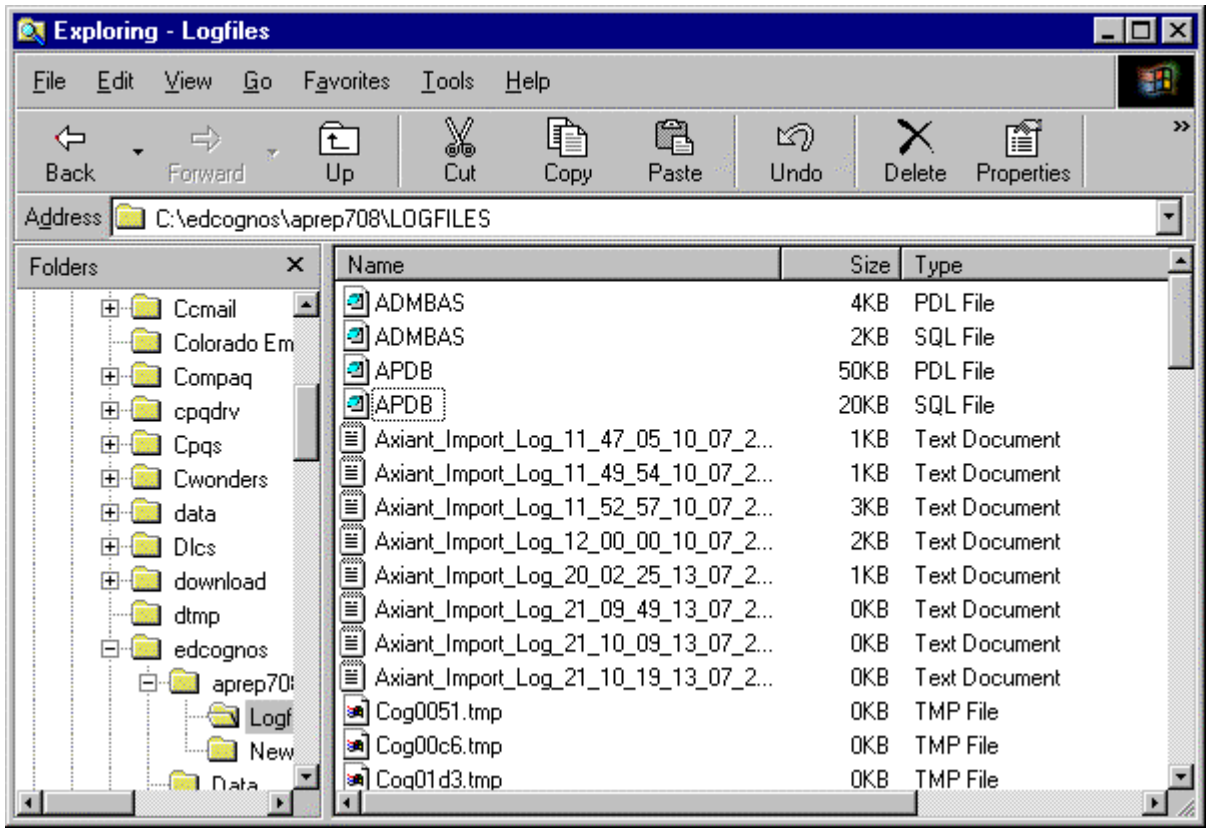
- Migration output can consist of
  - Code for new PDL dictionary
  - Code for SQL
  - Modified code that matches new SQL layout

Migration Process



Migration process

Example: Generated SQL to Build New Tables



The Migration Process

Example: Generated SQL to Build New Tables

Apdb - Notepad

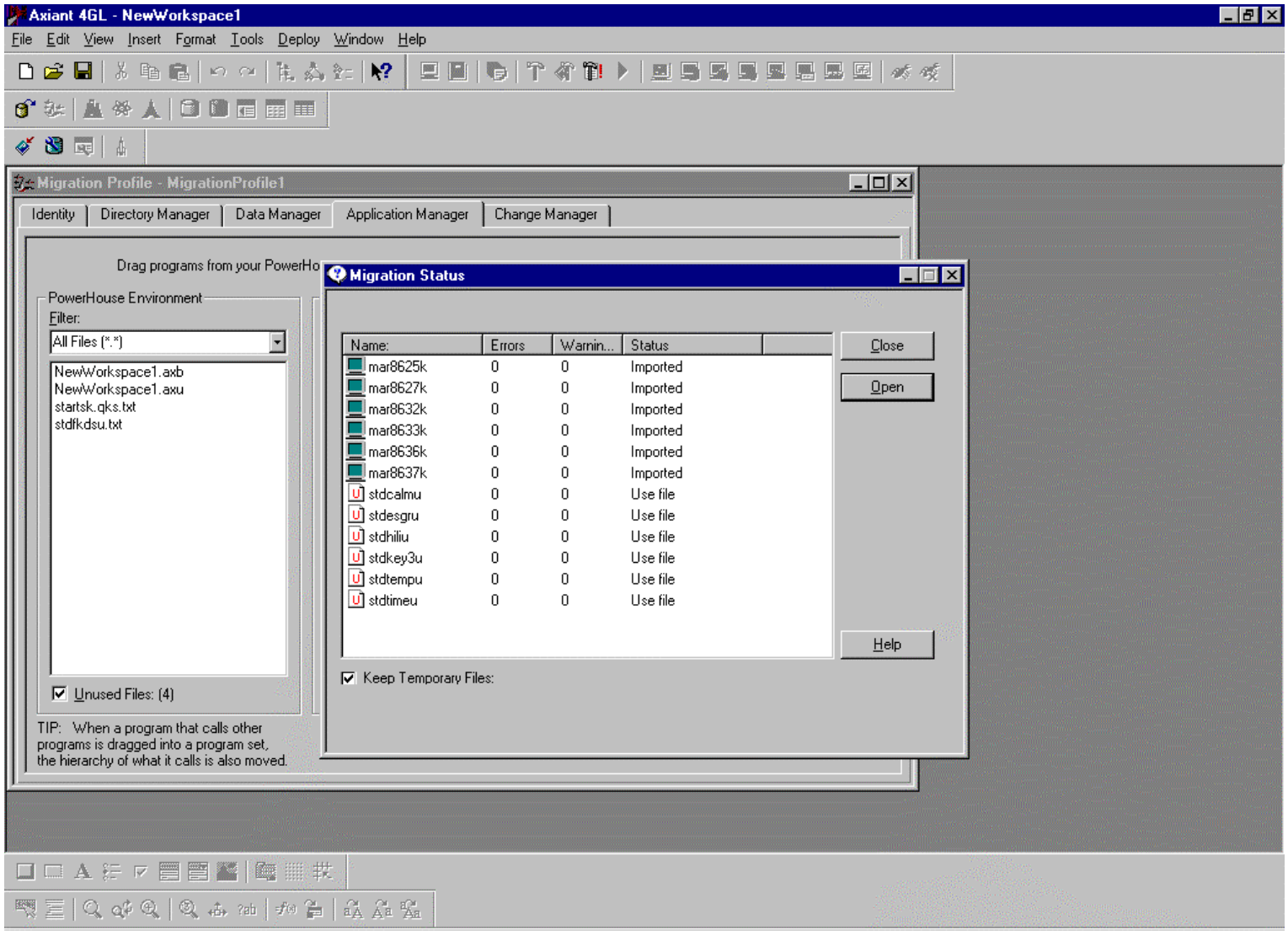
File Edit Search Help

```
Create Table AP_RECEIPT
(
    ACCRUAL_KEY Char(26) NOT NULL,
    ORDER_NUMBER Char(10) NOT NULL,
    PART_NUMBER Char(16) NOT NULL,
    RECEIPT_KEY Char(10) NOT NULL,
    RECEIPT_NUMBER Char(8) NOT NULL,
    VENDOR_NUMBER Char(8) NOT NULL,
    MATCH_KEY_VALUE Char(12) NOT NULL,
    ACCRUAL_COUNT Integer NOT NULL,
    ACCTG_MONTH_ACL Char(6) NOT NULL,
    ACCTG_MONTH_DAC Char(6) NOT NULL,
    ASSET_NUMBER Char(10) NOT NULL,
    CONTROLLER Char(2) NOT NULL,
    CUR_UNIT_COST Decimal(10) NOT NULL,
    DATE_ACCRUED Char(8) NOT NULL,
    DATE_DEACCRUED Char(8) NOT NULL,
    DATE_DISABLED Char(8) NOT NULL,
    DATE_RECEIVE Char(8) NOT NULL,
    DATE_TIME_RCP Decimal(15) NOT NULL,
    DESCRIPTION Char(16) NOT NULL,
    EMPLOYEE_NUMBER Char(8) NOT NULL,
    NET_ACCRUAL_ADJ Decimal NOT NULL,
    ORDER_DATE Char(8) NOT NULL,
    ORDER_ITEM Char(2) NOT NULL,
    ORDER_QTY Decimal NOT NULL,
    ORDER_UNIT_PRC Decimal NOT NULL,
    PROJECT_NUMBER Char(10) NOT NULL,
    QTY_ACCRUED Decimal NOT NULL,
    QTY_MATCH_RCPT Decimal NOT NULL,
```

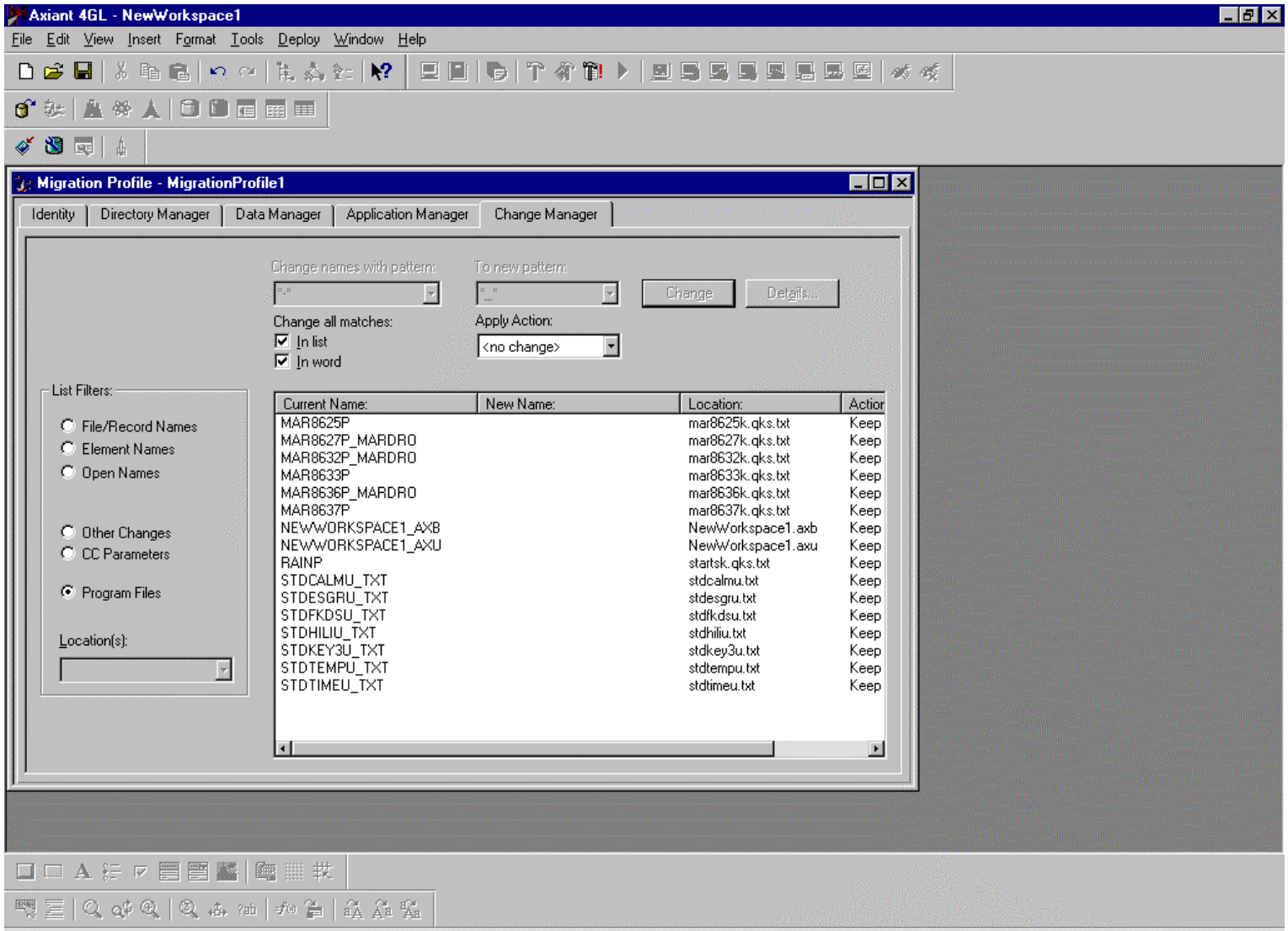
Migration process

- Step 5: Migrate the application
  - Axiant provides automated functionality to migrate the application source code
  - Axiant makes common changes to source code based on the migration profile
  - The resulting migrated source code is placed back into a new location in the repository
- Then manually change remaining migration items
  - Verify Temps and Defines

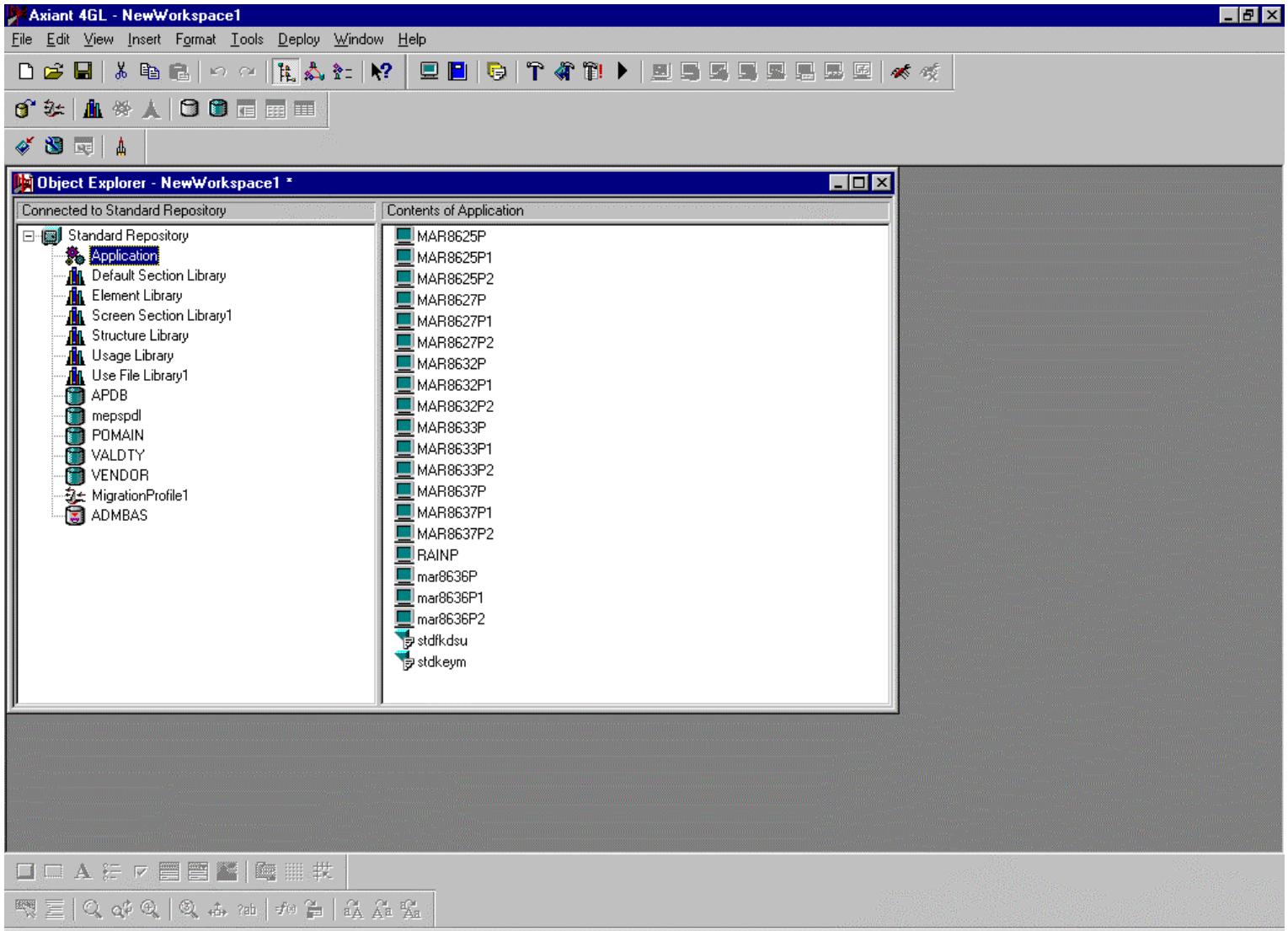
Migration Process



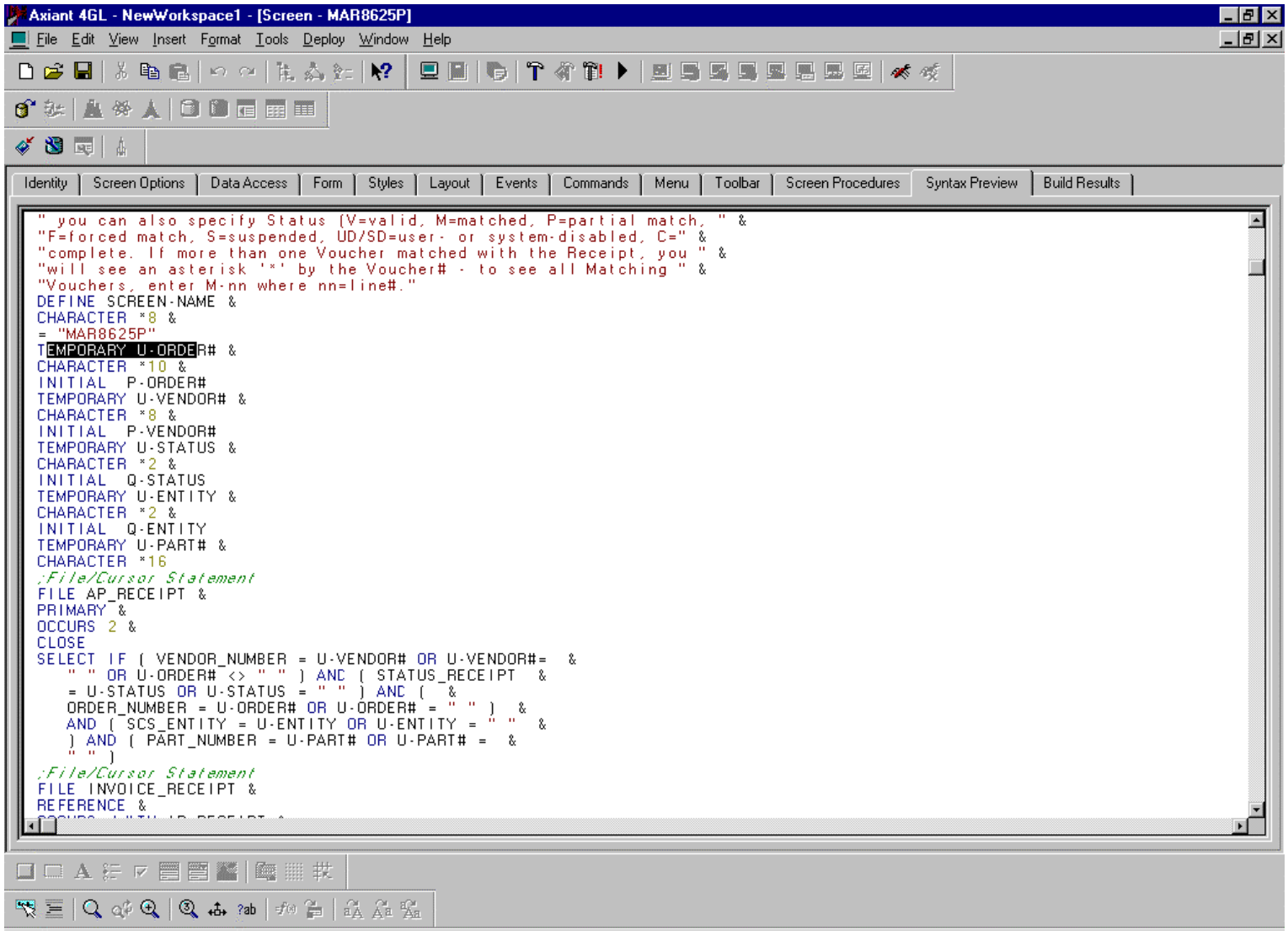
Migration Process



Migration Process



Migration Process



Migration Process

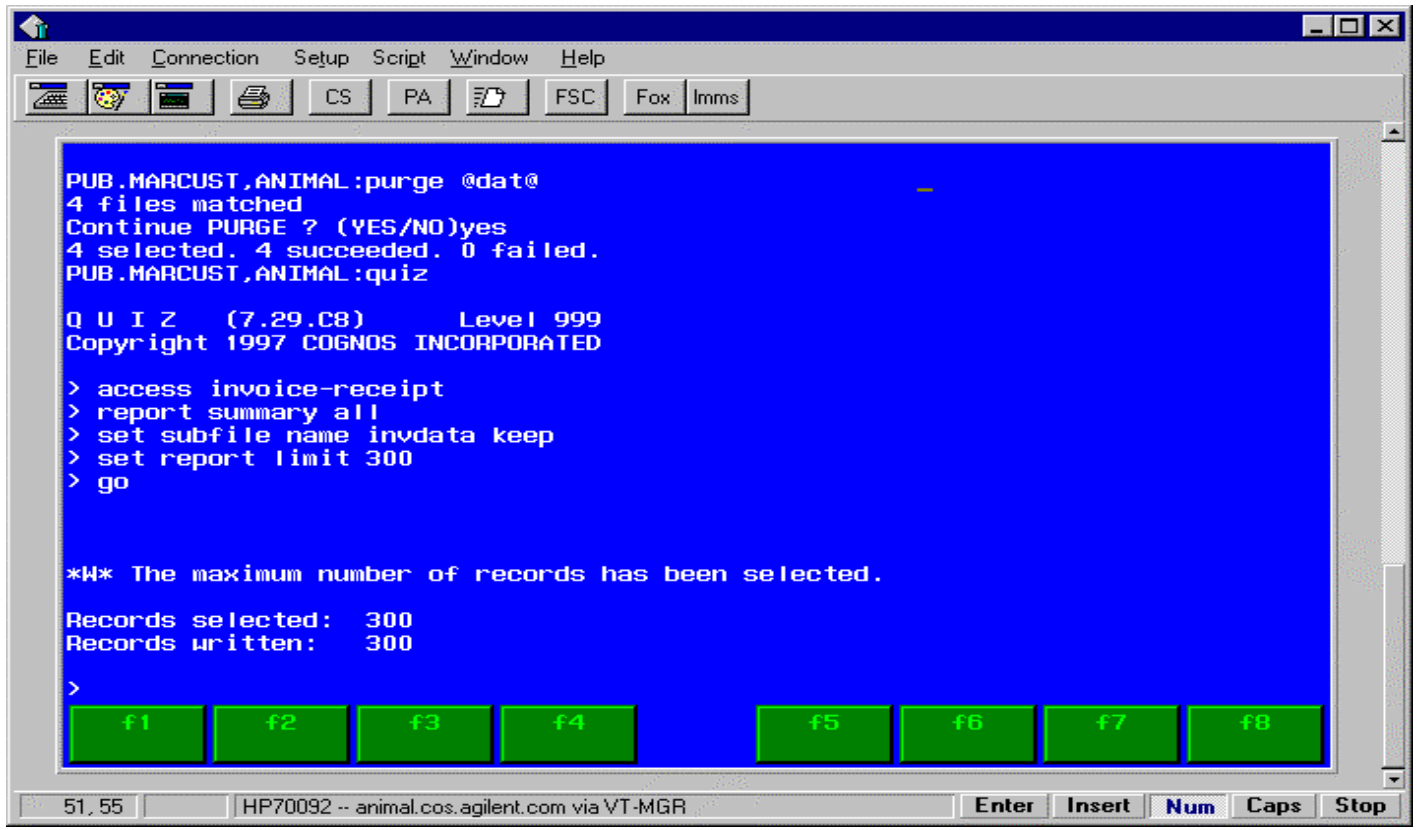
- Application Migration Issues
  - Temps and Defines are not in migration profile
    - Change “-” to “_” for all temps

Migration process

- Step 6 - Data migration
  - Extracted data using QUIZ on HP e3000
  - Create Subfile

Migration process

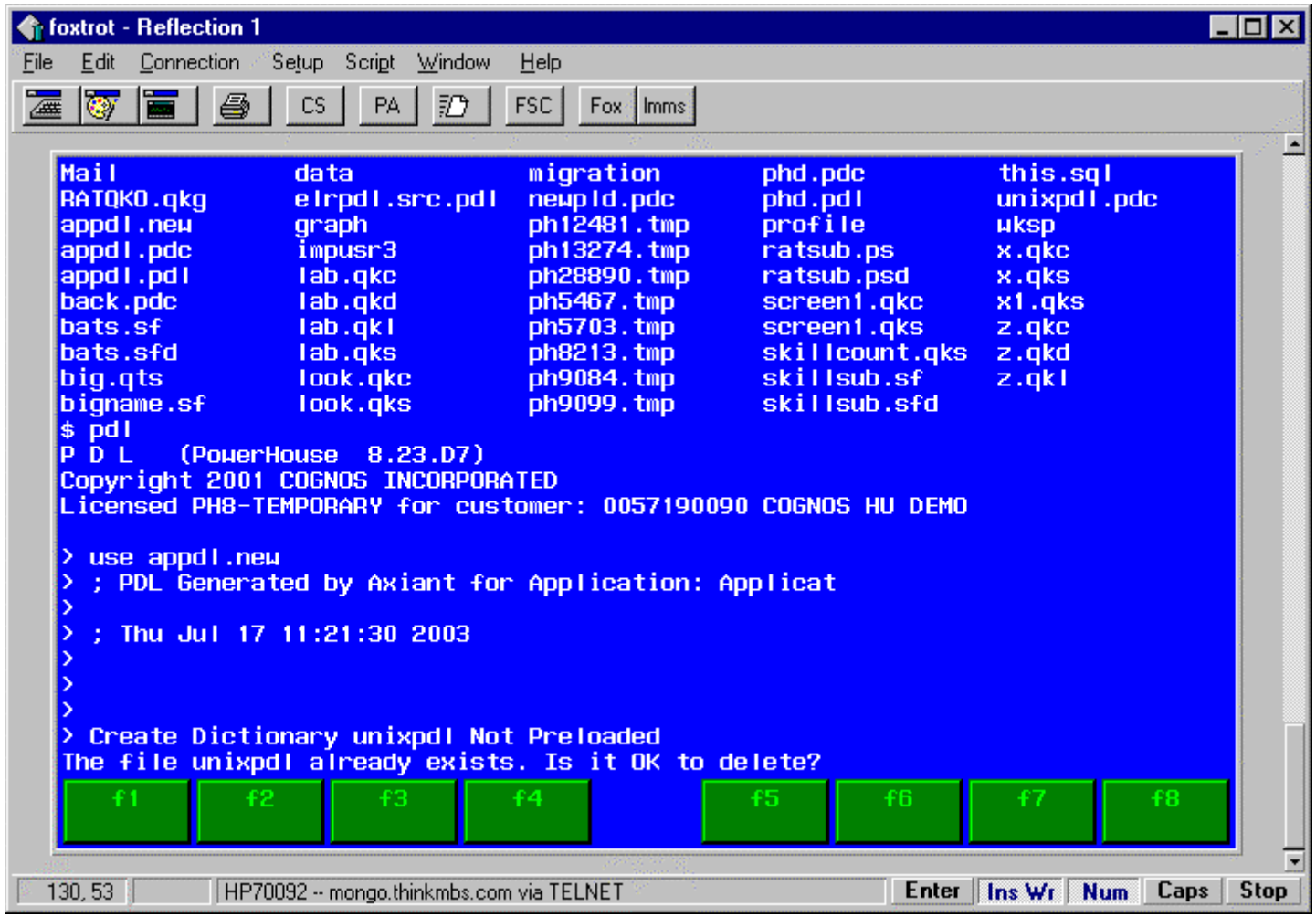
Example: QUIZ to Migrate Data



Migration process

- Step 7 - Move Source and Data to New Server
  - You can FTP
  - Do transfers with your emulator
  - Cut and Paste

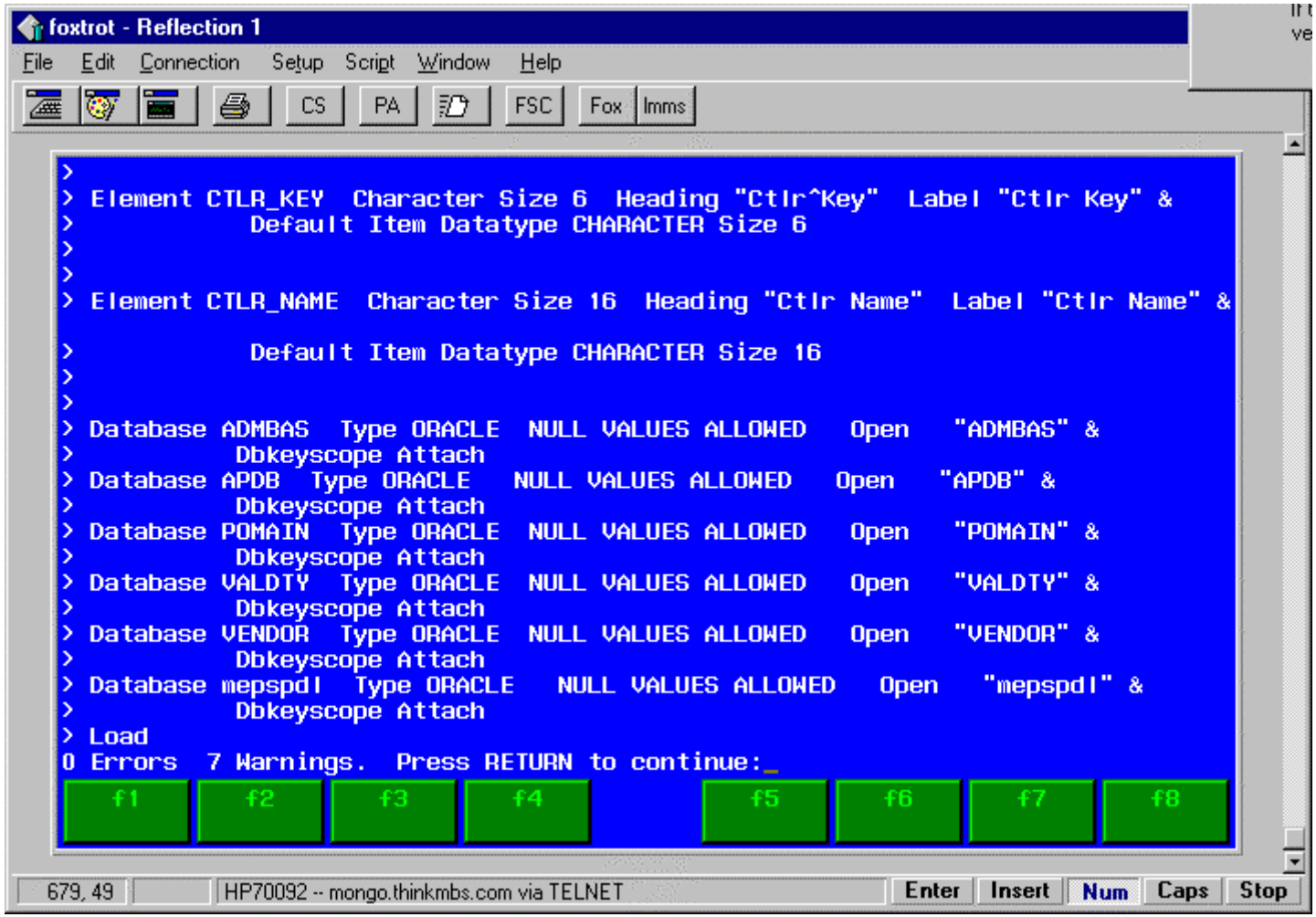
Migration Process



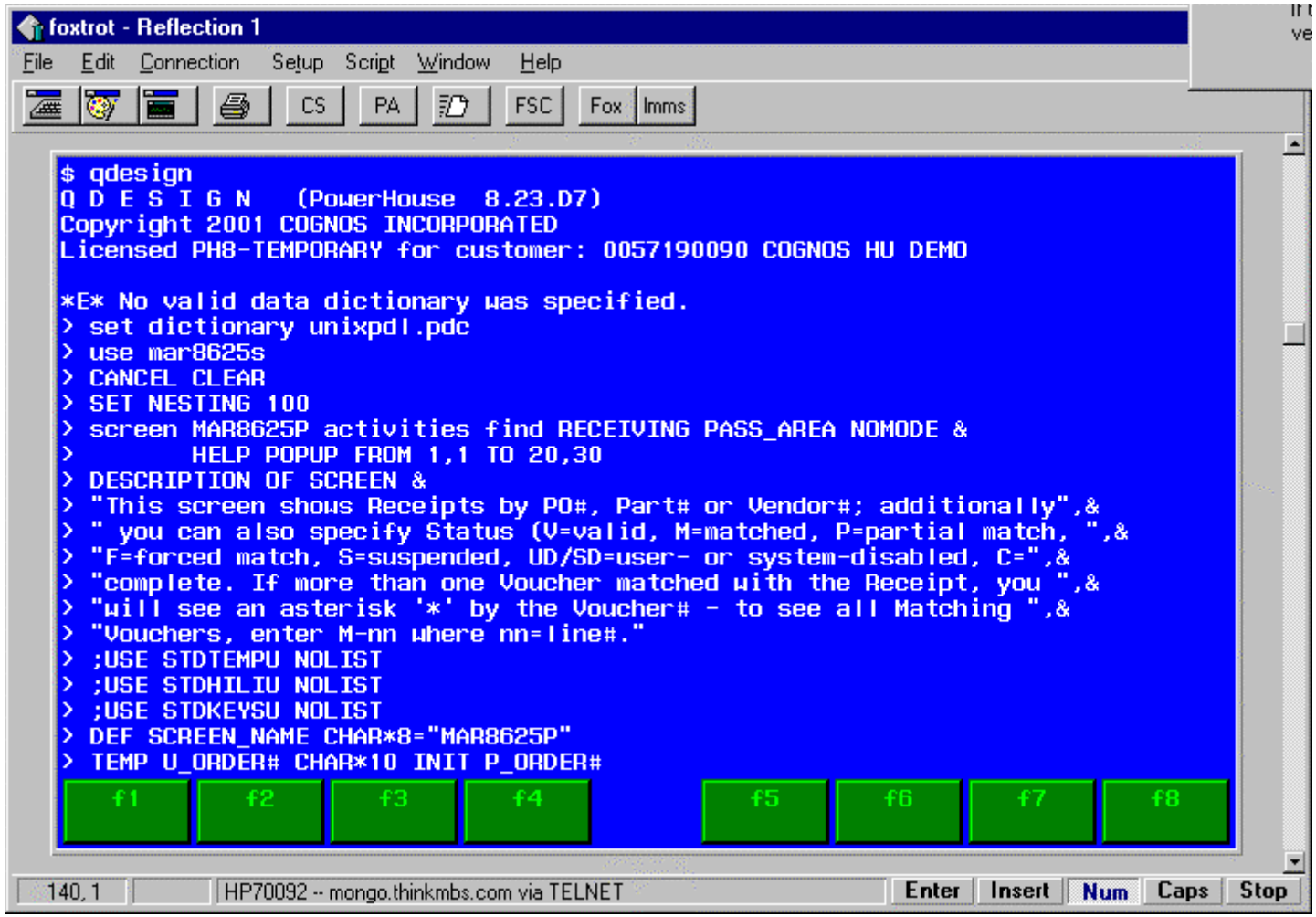
Migration process

- Step 8 – Load new test system
  - Run PDL to create a dictionary
  - Qdesign to recompile all Quick screens
  - Recompile run time Quiz
  - Recompile run time QTP
  - Load Data

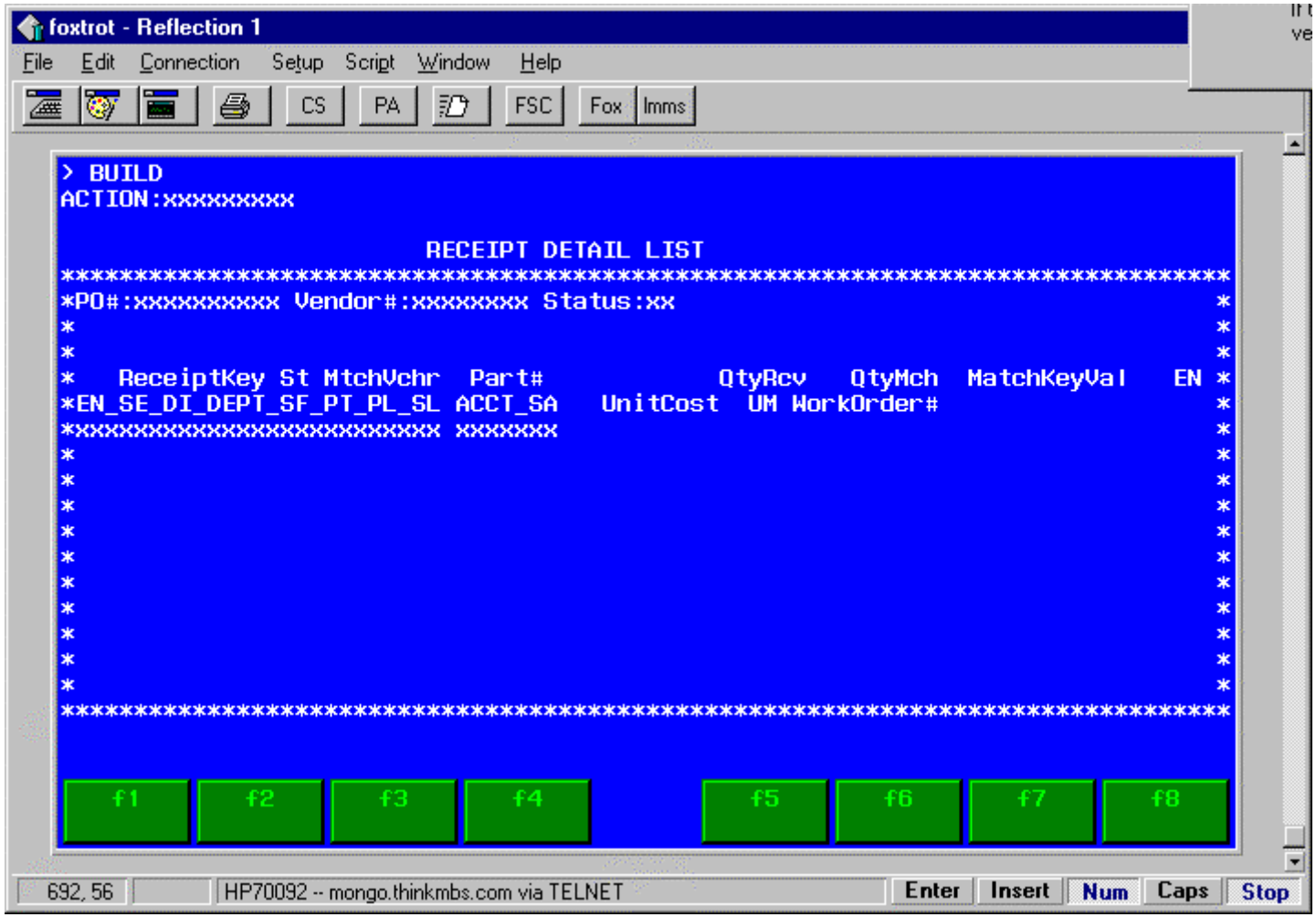
Migration Process



Migration Process



Migration Process



Migration process

- Step 9 - Test application and data dictionary
  - Dictionary
  - Powerhouse application
  - RDBMS and data
  - Unit testing

- Make changes and retest

Migration Process

- Step 10 - Move to Production
  - Set up Production Environment
    - Hardware
    - Install Software
    - Set up Database
  - Load Data
  - Move application and dictionary
  - Test
  - Go Live

Case study: Problem statement

- MBS was asked to create an approach and then migrate a Cognos application for a large manufacturing company
- The application was a manufacturing data warehouse, providing a wide variety of reporting
- The application contained 350,000 lines of Cognos PowerHouse code, running against an ALLBASE database
- There were many ALLBASE SQL/C and C++ user interface routines that needed to be migrated as well
- The target environment was Oracle on an HP9000, based on corporate standard

Case study: Analysis

- The client's greatest concerns were performance, reliability, and data integrity
- MBS evaluated two major migration alternatives:
  - Re-write the Cognos PowerHouse code using Oracle Development Tools (such as Oracle Forms, Oracle Reports, and PL/SQL)
  - Port the Cognos source code to a new platform
- MBS prototyped each approach

Case study: Findings

- Cognos PowerHouse source code could be tuned to meet the client's performance needs.
- Porting Cognos PowerHouse source code would require very few changes -> lower cost migration
- Re-writing Cognos PowerHouse data load routines (25% of the application) in Oracle tools would provide greater efficiency in the data loading; the Oracle tools are optimized for loading data into an Oracle database
- A total re-write of the source code would require too large of an effort for no functional gain.

Case study: Migration

- MBS ported the Cognos PowerHouse source code to the HP9000 / Oracle environment
- MBS re-wrote the data loading routines in Oracle PL/SQL, stored in the database
- MBS re-wrote the SQL/C source code into PRO/C (Oracle's C with embedded SQL product), because SQL/C would not run with Oracle
- MBS re-wrote the C++ into web-based Oracle Forms, since C++ source code could not be found

Case study: Lessons learned #1

- Issue: Cognos Access statements forced the use of hidden sub-queries, preventing Oracle optimizer from executing the query quickly
- Fix: Use the 'this cursor is' statement to place the required SQL directly in the Cognos source code. The SQL could then be written to be executed quickly by the Oracle optimizer
- Result: Run time was reduced by 33% from the original production system

Case study: Lessons learned #2

- Issue: The migrated data converted single space values to a true 'NULL' in Oracle. This caused many issues in the source code function
- Fix: Changed all NULL values in the Oracle database back to the single space using SQL Loader, rather than addressing the many places in the source code that assumed a single space meant NULL
- Result: Level of effort was saved by not making extensive changes to the source code

Case study: Lessons learned #3

- Issue: ALLBASE stored fractions of seconds in their date / time fields, which was more resolution than in the target database

- Fix: Trimmed the fractional seconds when loading the data

Case study: Lessons learned #4

- Issue: Imported data had padded spaces at the end of character data. These padded spaces were loaded into Cognos data structures, preventing some source code from working

- Fix: Loaded the data into the VARCHAR data type in Cognos instead of CHAR. This eliminated the padded spaces.

Case study: Summary

- Porting the Cognos source code was a good approach for this project
- Performance was not only maintained, but also improved with SQL tuning
- The new data loading routines worked well in the new environment
- Data issues, especially regarding NULL and spaces, were the prominent issues
- The system worked well in production use on the new platform
- The migration took five months to complete

Conclusion

- Cognos applications are portable to multiple open platforms
- Key focus areas when migrating are:
  - Platform choice
  - Interfacing applications
  - Data
  - Performance
- **Port** is a good option for migrating Cognos applications as part of your overall migration strategy

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