DB2 Data Management Software

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Chapter 3: Getting Connected to DB2 UDB

IBM DB2 Universal Database V8.1

Database Administration Certification Preparation Course

Maintained by Clara Liu

IBM Software Group

Objectives

- In this section, we will cover:
  - Setup connectivity to remote databases
    - Using discovery
    - Using access profiles
    - Manually
  - Instance Attachment vs Database Connection
  - Managing Database Connections

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Chapter 3: Getting Connected to DB2 UDB

Setup Database Connectivity

Instance Attachment vs Database Connection

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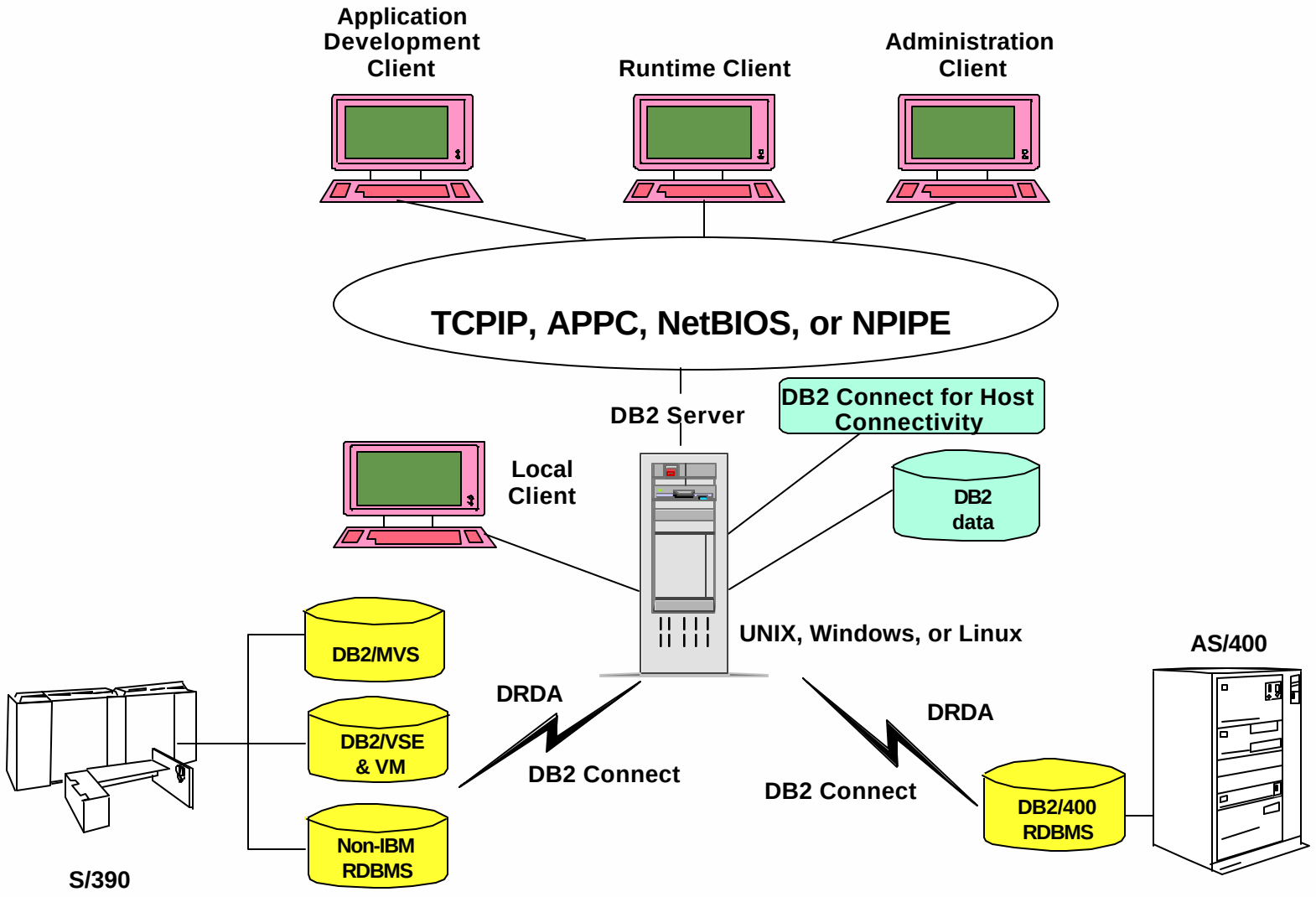
DB2 Client / Server Environment



DRDA: Distributed Relational Database Architecture

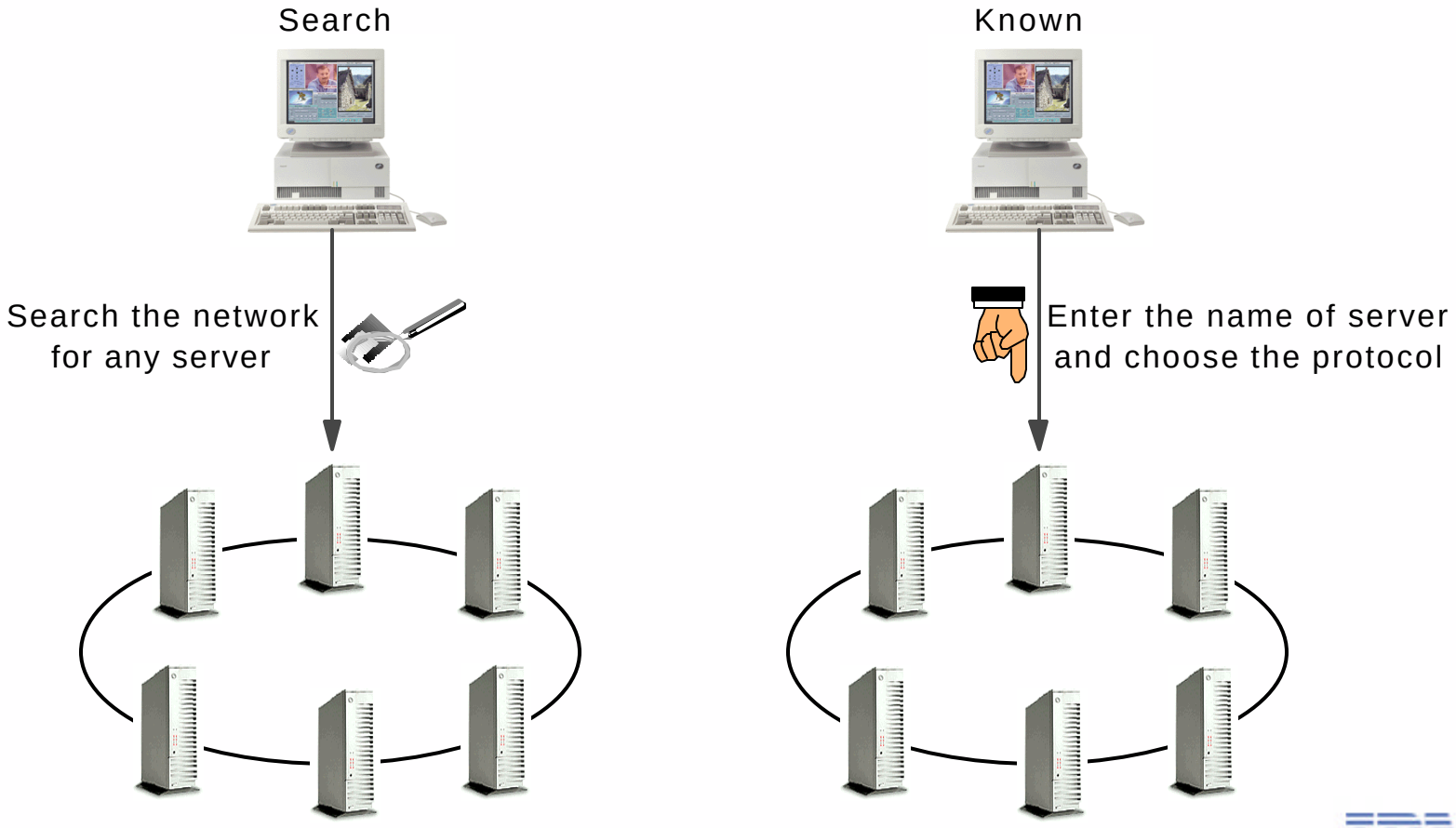
Preparing the Server for DB2 Remote Connections

- DBA must ensure server side communications is set up properly
- Step 1:
  - Enable the instance for communication supports, set DB2 registry variable
    - **db2set DB2COMM=TCPIP,NETBIOS**
- Step 2:
  - Set the protocol information in database manager configuration, for TCPIP:
    - **db2 update dbm cfg using svcename 50000**

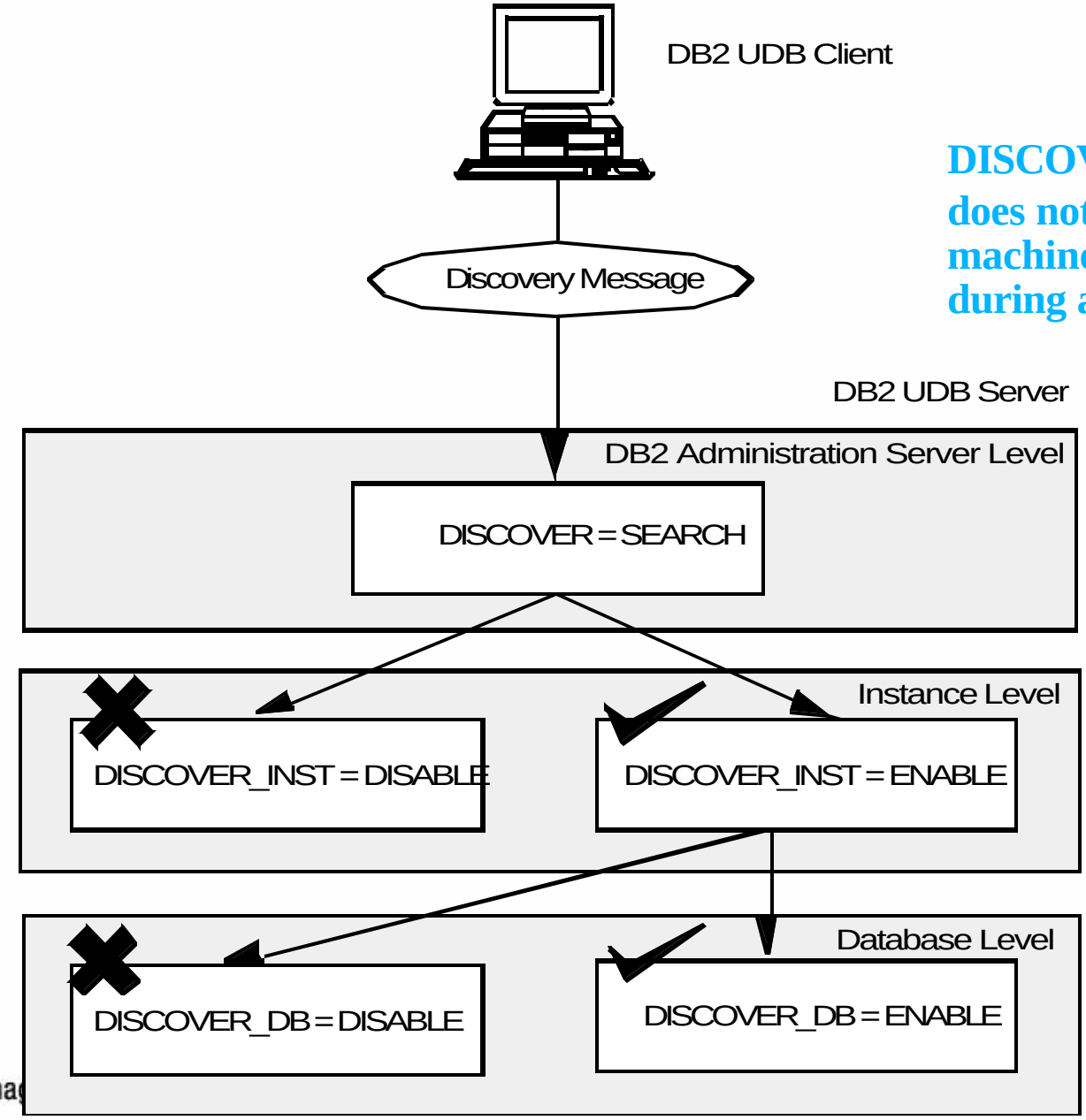
    OR
    - **db2 update dbm cfg using svcename db2icdb2**
    - Update /etc/services with the service name and port number
      - db2icdb2 50000/tcp
- Step 3:
  - **db2stop** and **db2start** instance after changes to database manager configuration

DB2 Discovery at DB2 Clients

- Search and locate DB2 servers on the network
- Two methods: **Known** and **Search**
- Requires DAS running and enabled to be discovered on the DB2 servers
- Can prevent or "hide" a server / database from being discovered



Discovery Example



DISCOVER=DISABLE does not allow the machine to be seen during a client search

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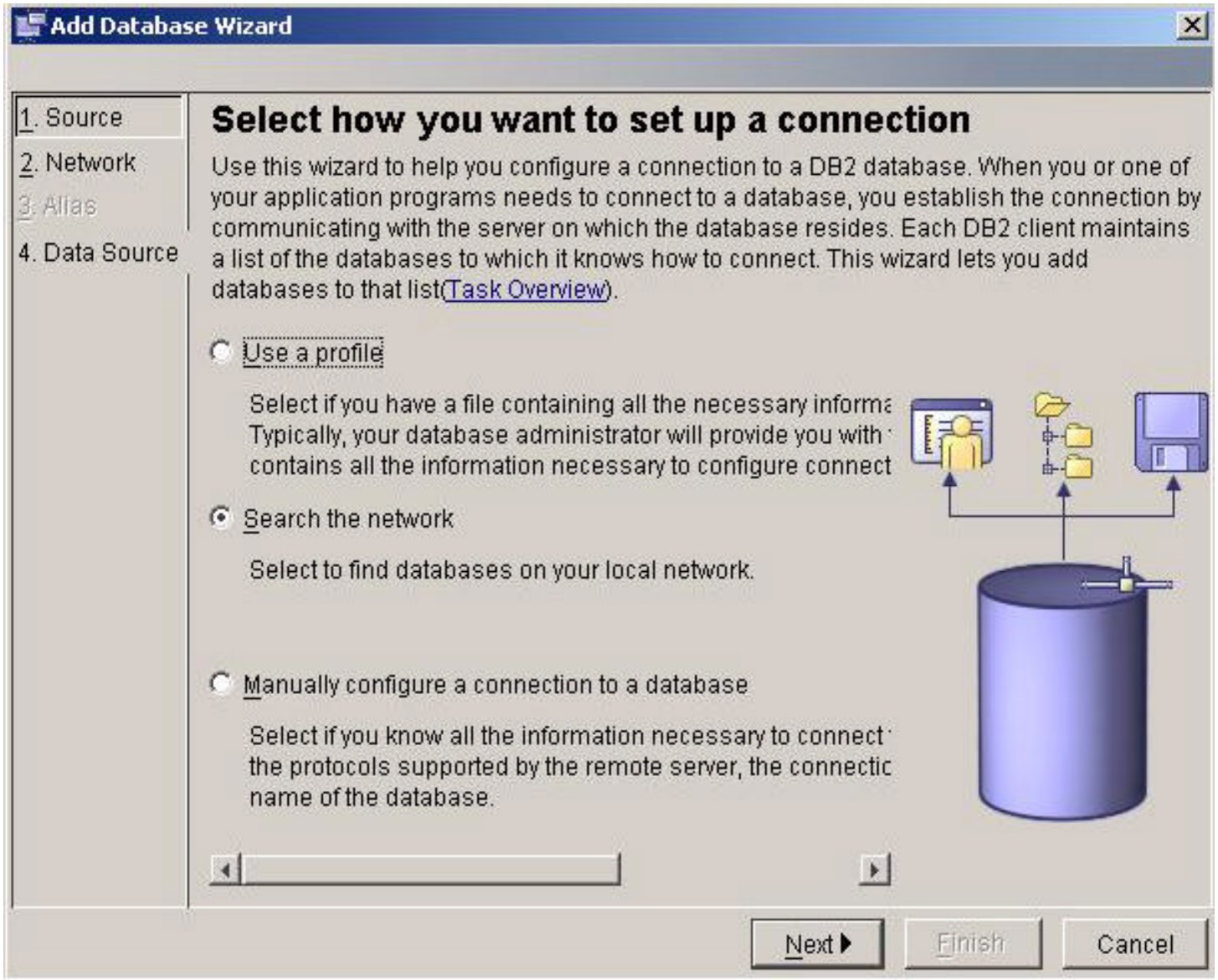
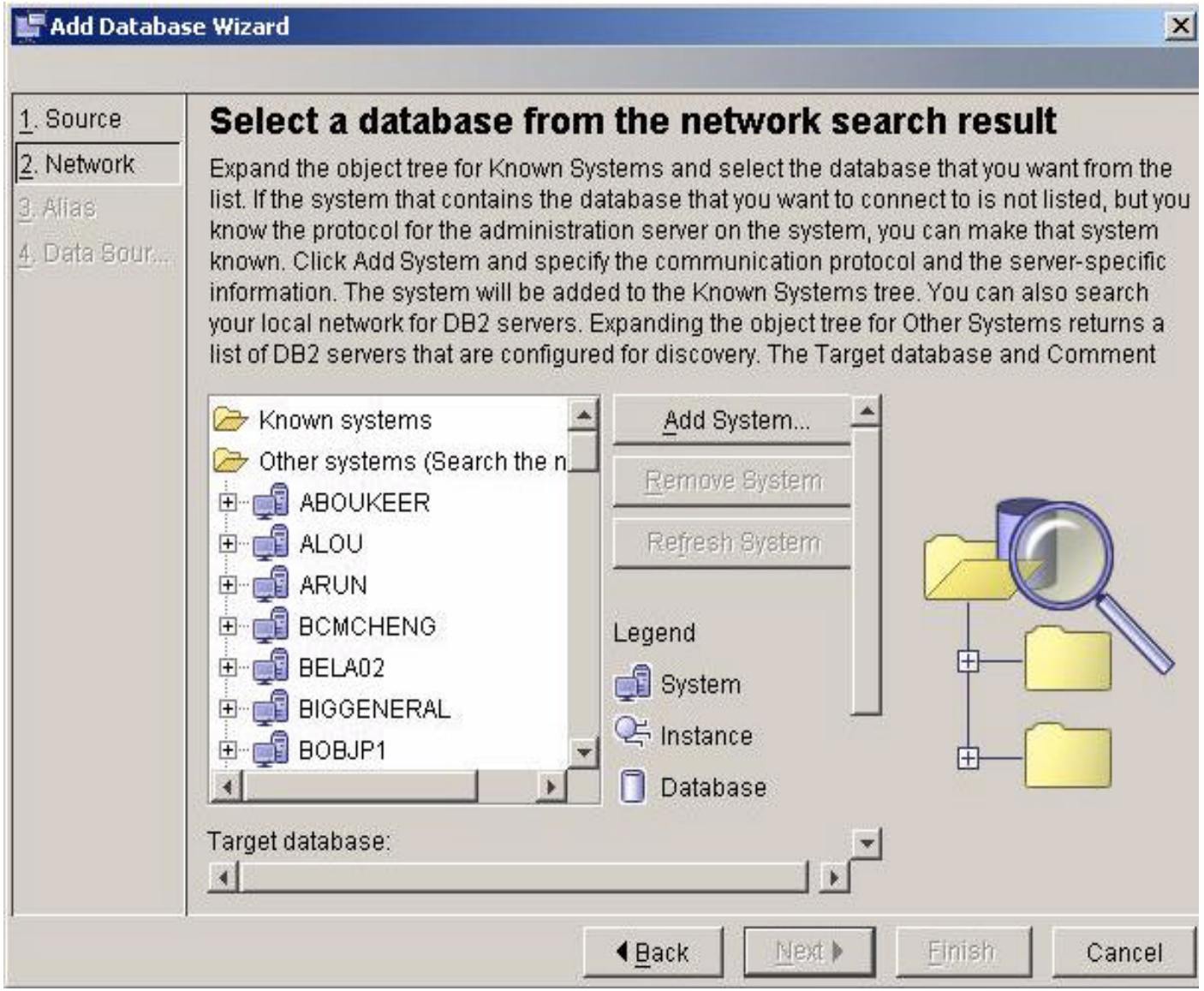
Use of DB2 Configuration Assistant



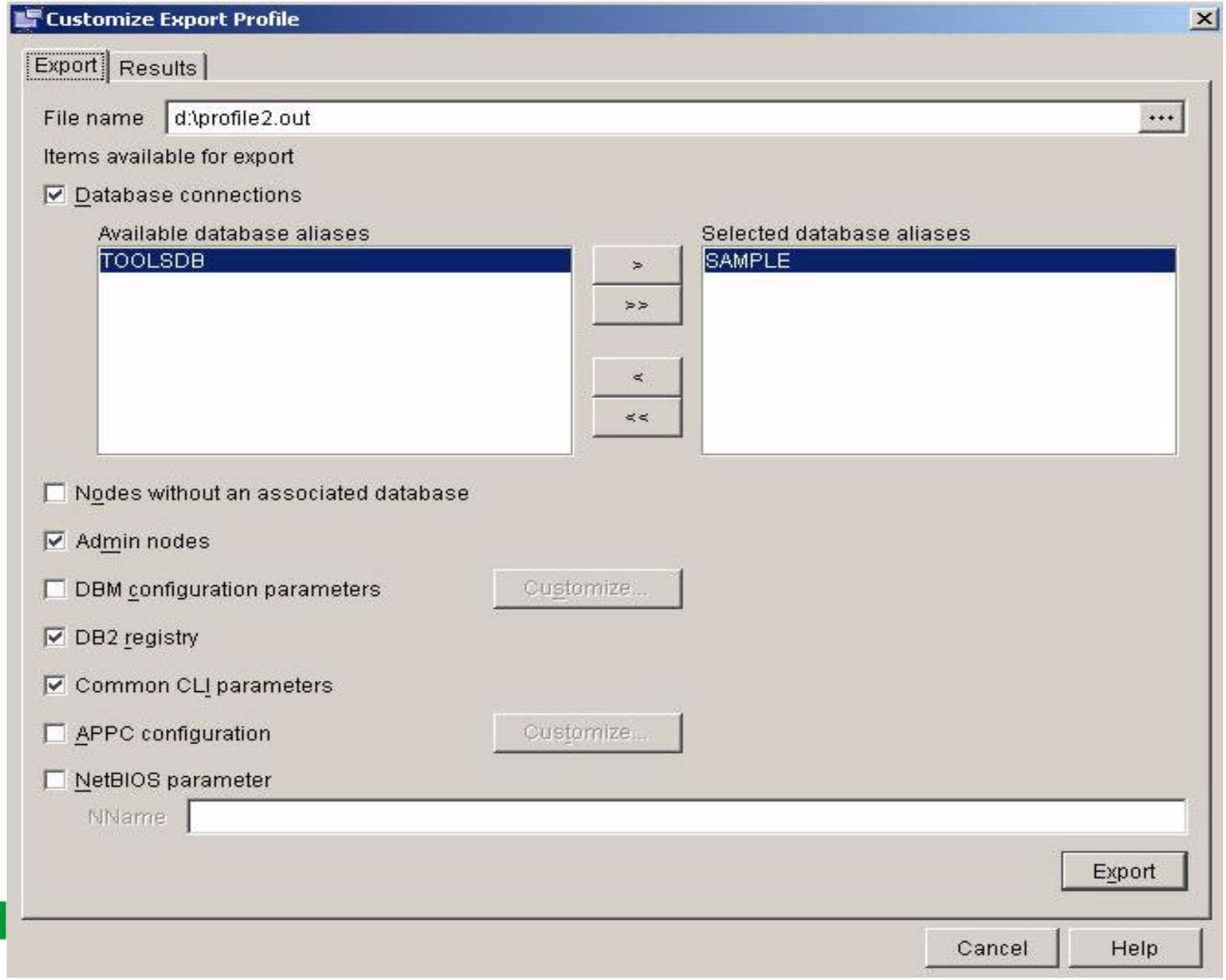
Use of DB2 Configuration Assistant



Using Access Profiles

- Assist with automation of client configuration
- Access profiles contain the information that a client needs to catalog databases on a DB2 UDB server
- Two types of Access Profiles:
  - Server Access Profile generated on a UDB server
    - Information about all instances/databases on the server
  - Client Access Profile generated on a client
    - Used to copy the client's catalog information to a number of other clients

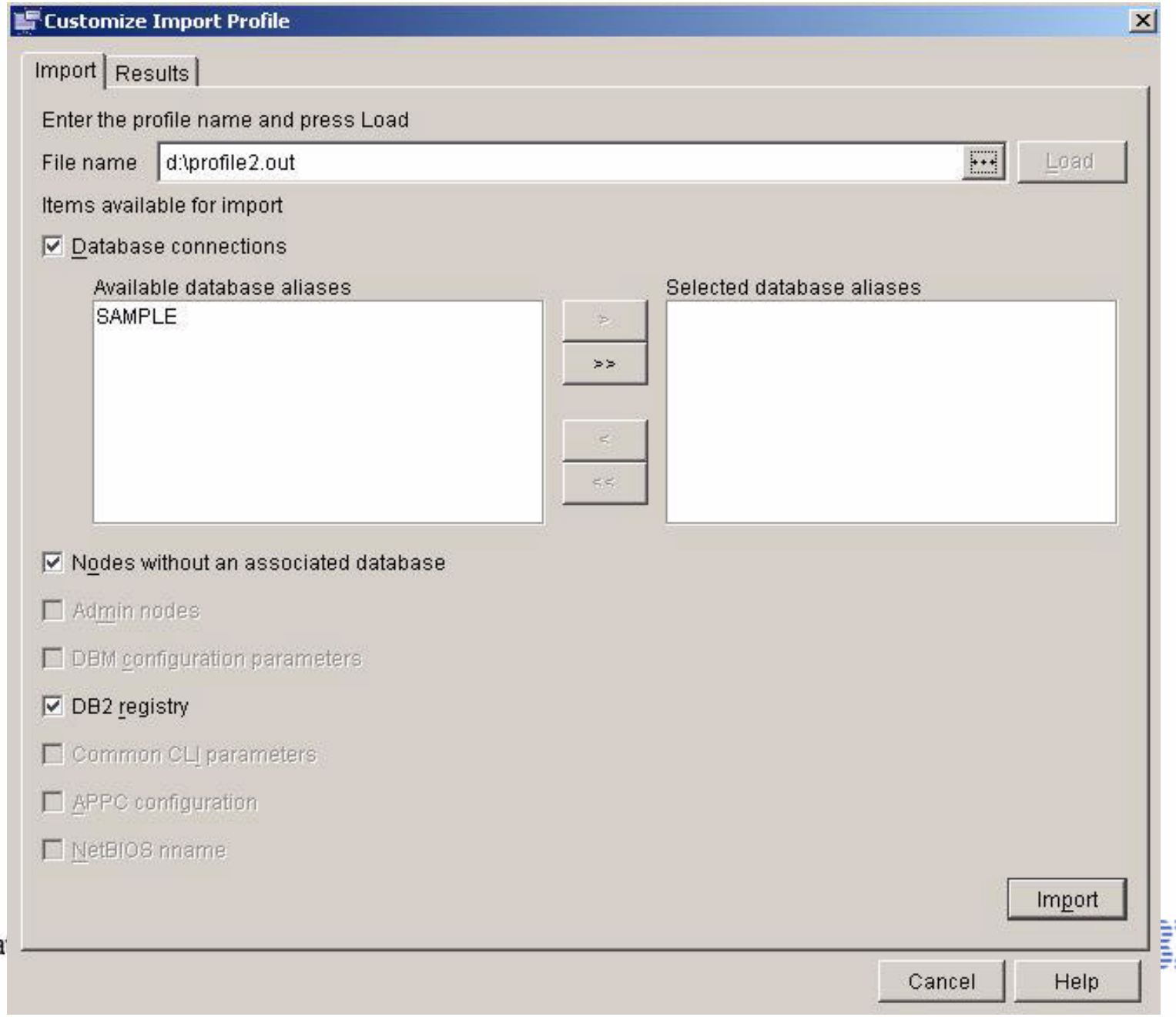
Exporting Access Profile



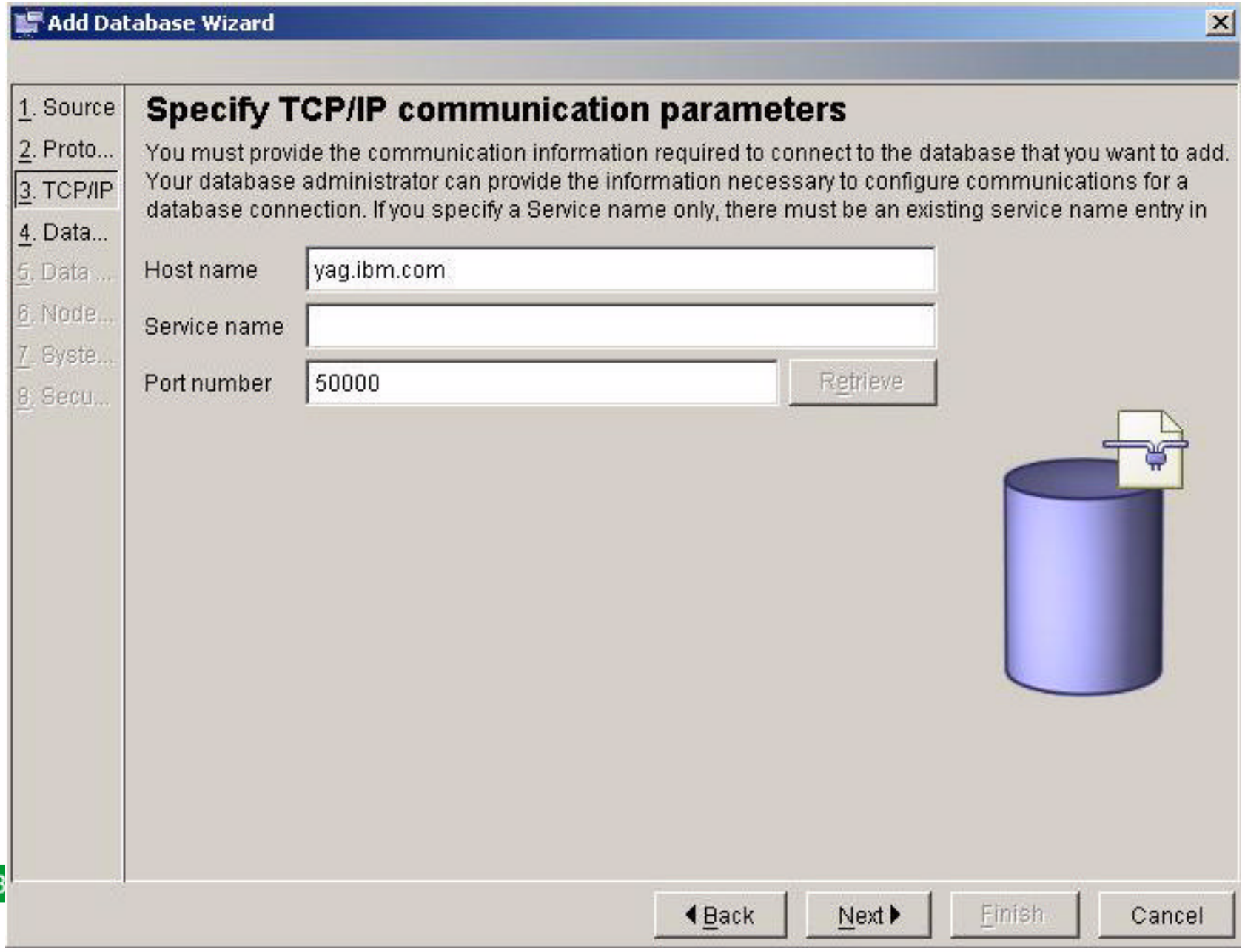
Example of Access Profile

```
[FILE_DESCRIPTION]
APPLICATION=DB2/NT 8.1.0
FILE_CONTENT=DB2 CCA Exported Data Sources
FILE_TYPE=CommonServer
FILE_FORMAT_VERSION=2.0
Platform=5
DB2SYSTEM=CLARALIU
Instance=DB2

[REGISTRY_GLOBAL]
DB2_GRP_LOOKUP=LOCAL
DB2INSTDEF=DB2

[REGISTRY_LOCAL]
DB2ACCOUNTNAME=CLARALIU\db2admin
DB2INSTOWNER=CLARALIU
DB2PORTRANGE=60000:60003
DB2_GRP_LOOKUP=LOCAL
DB2COMM=TCPIP

[INST>DB2]
instance_name=DB2
NodeType=4
ServerType=DB2NT
Authentication=SERVER
DB2COMM=TCPIP

[DB>!LOCAL:SAMPLE]
Dir_entry_type=INDIRECT
Drive=C:\DB2
DBName=SAMPLE
```

Importing Access Profile



Manual Client/Server Configuration



Configure Client Connectivity via Commands

- Catalog NODE
  - Catalog each instance on DB2 UDB Server
  - Specific command for each supported communication protocol
  - Examples:
    - **CATALOG TCPIP NODE mynode REMOTE server1 SERVER 50000**
    - **CATALOG NETBIOS NODE jeremy REMOTE N01FCBE3 ADAPTER 0**
- Catalog DATABASE
  - Catalogs each database on DB2 UDB Server and instance
  - Works for local and remote databases
  - Example:
    - **CATALOG DATABASE sample AS mysamp AT NODE mynode**
- Catalog DCS DATABASE
  - Database Connection Service (DCS)
  - Catalogs DRDA databases on OS/390, AS/400, or VM,VSE
  - These databases are accessed through an Application Requester (AR), such as DB2 Connect
  - Having a DCS directory entry with a database name matching a database name in the system database directory invokes the AR to forward SQL requests to the host server
  - Example:
    - **CATALOG DCS DATABASE db1 AS dsn_db_1**

Cataloging the remote DAS

- Facilitates remote node (instance) administration
- Required for full remote instance abstraction
- ALWAYS assumes port 523

- CATALOG ADMIN TCPIP NODE <node alias> REMOTE <hostname>

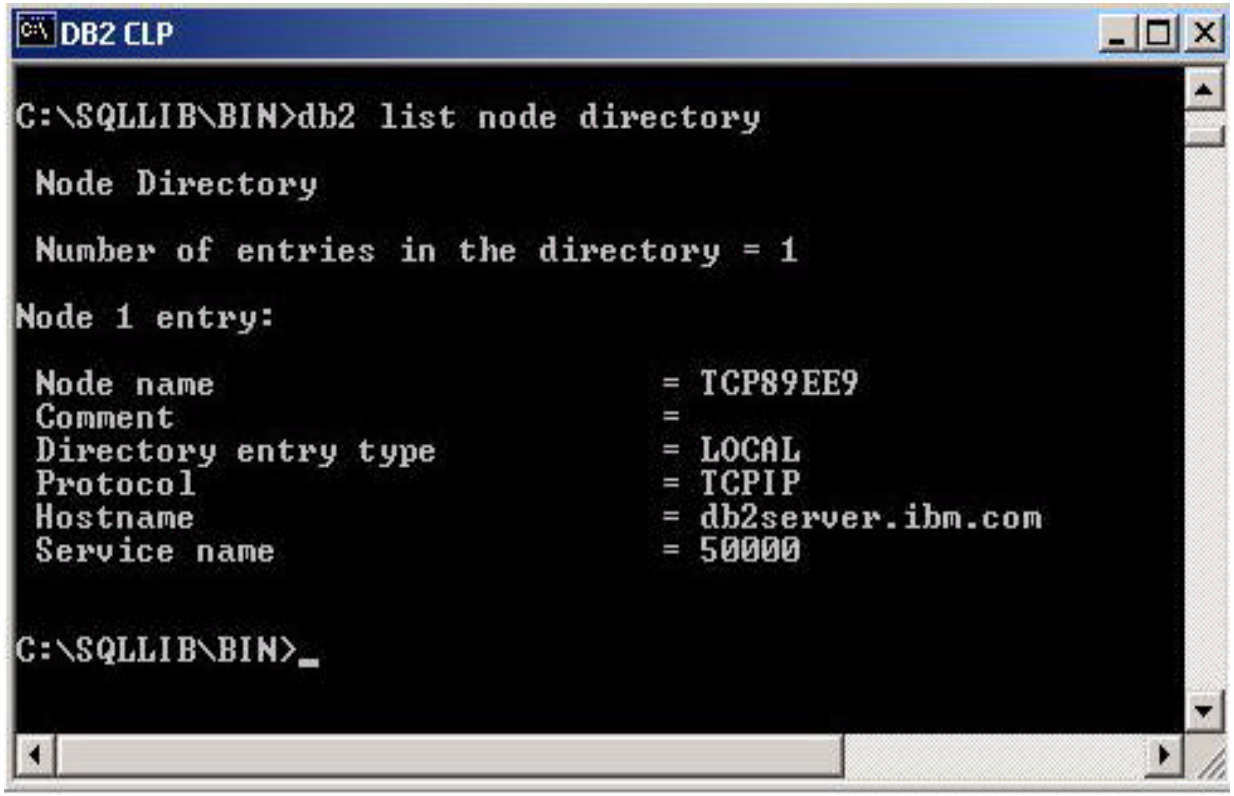
- Example:
  - **CATALOG ADMIN TCPIP NODE zeus REMOTE zeus.mycompany.com**

List of CATALOG Commands

- CATALOG APPC NODE ...
  - APPC - Advanced Program to Program Communications protocol
- CATALOG APPN NODE ...
- CATALOG DATABASE ...
- CATALOG DCS DATABASE ...
- CATALOG LDAP DATABASE ...
- CATALOG LDAP NODE ...
- CATALOG LOCAL NODE ...
- CATALOG NAMED PIPE NODE ...
- CATALOG ODBC DATA SOURCE ...
- CATALOG TCPIP NODE ...

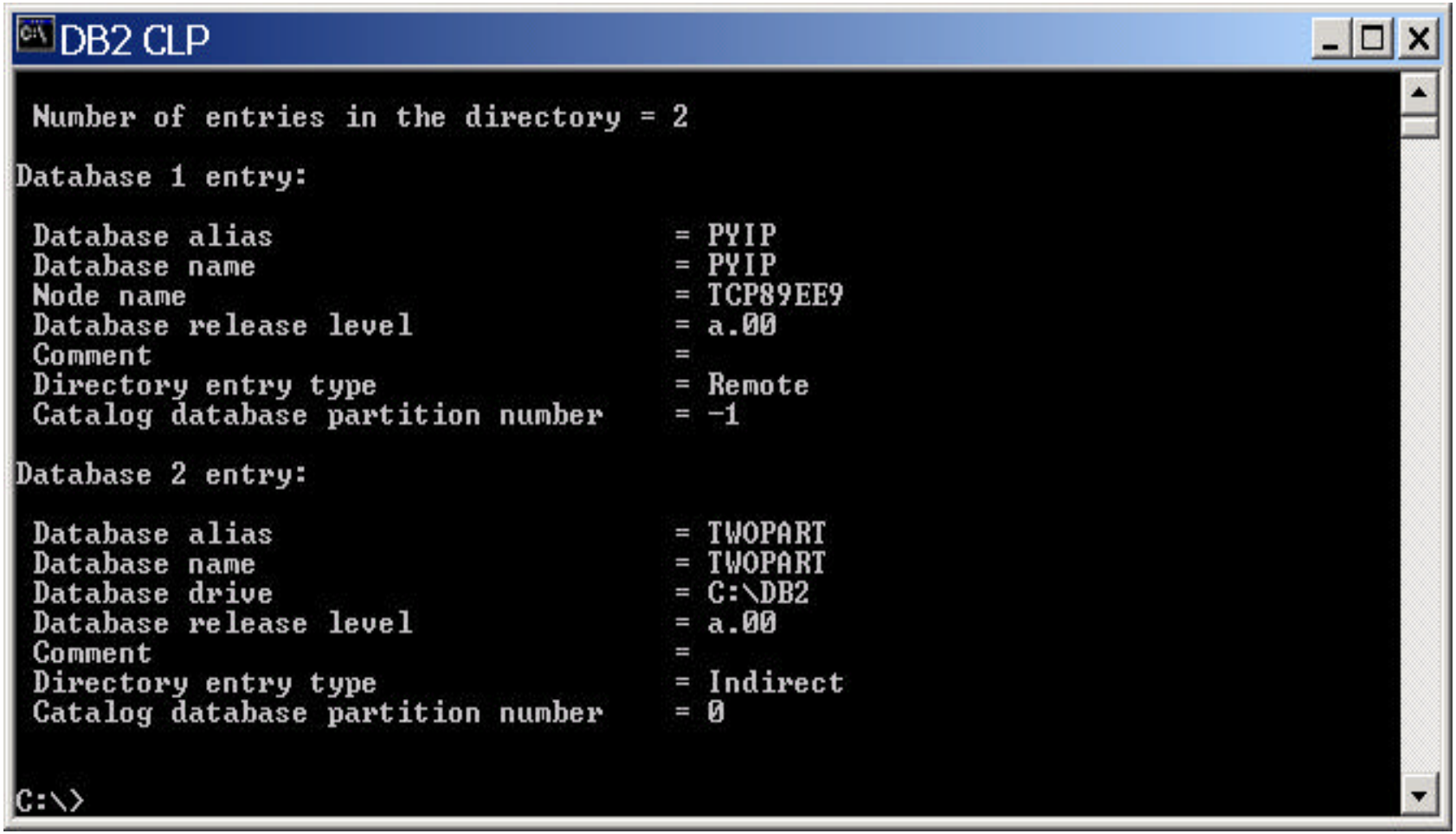
The Node Directory

- LIST NODE DIRECTORY



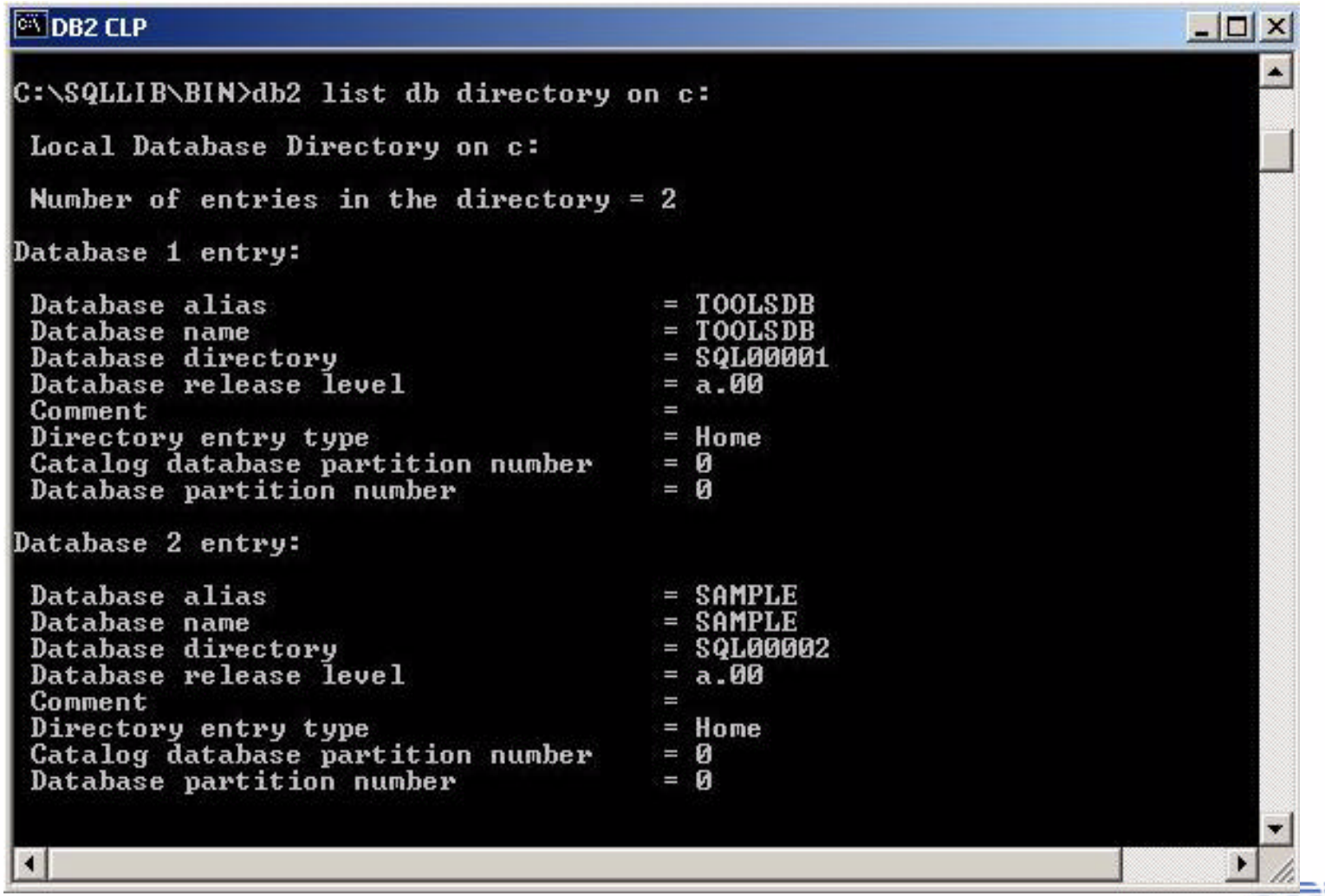
The Database Directory

- LIST DATABASE DIRECTORY



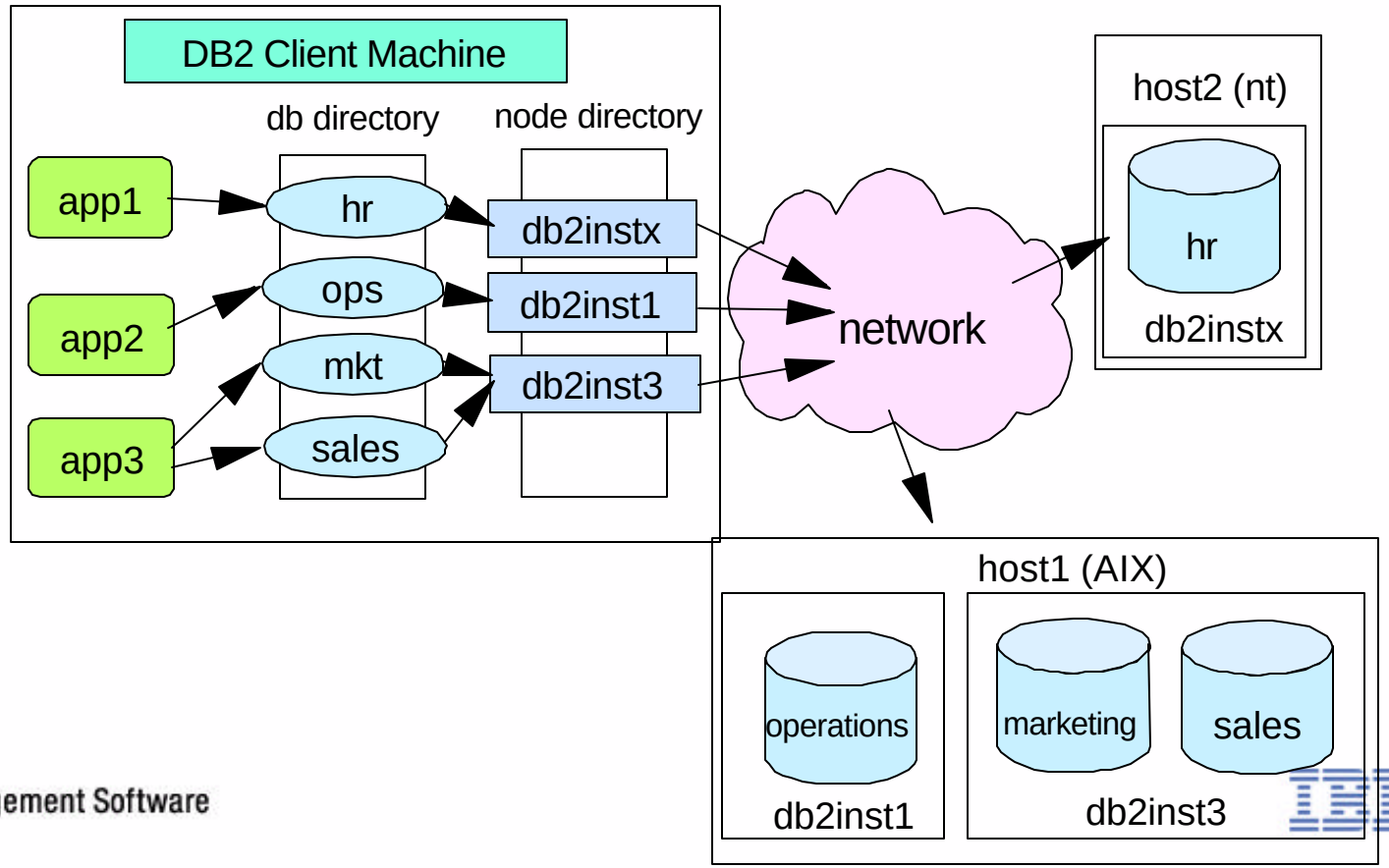
The Database Directory

- Obtain list of local databases created on a drive or mount point
- LIST DB DIRECTORY ON c:



DB2 Client Connectivity

- All databases appear LOCAL to applications
- Node and DB directories abstract away real location of database
- Each remote database points to a node
- Each node points to an remote instance
- Platform transparent



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Setup Database Connectivity

Instance Attachment vs Database Connection

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Instance Attachment vs Database Connection

- INSTANCE ATTACHMENT
  - create/drop databases
  - get/update/reset database manager and database configuration file
  - database monitor
  - backup/restore/roll forward database
  - force application
- DATABASE CONNECTION
  - DML, DDL, DCL
  - precompile/bind applications
  - load/export/import

ATTACH and CONNECT Commands

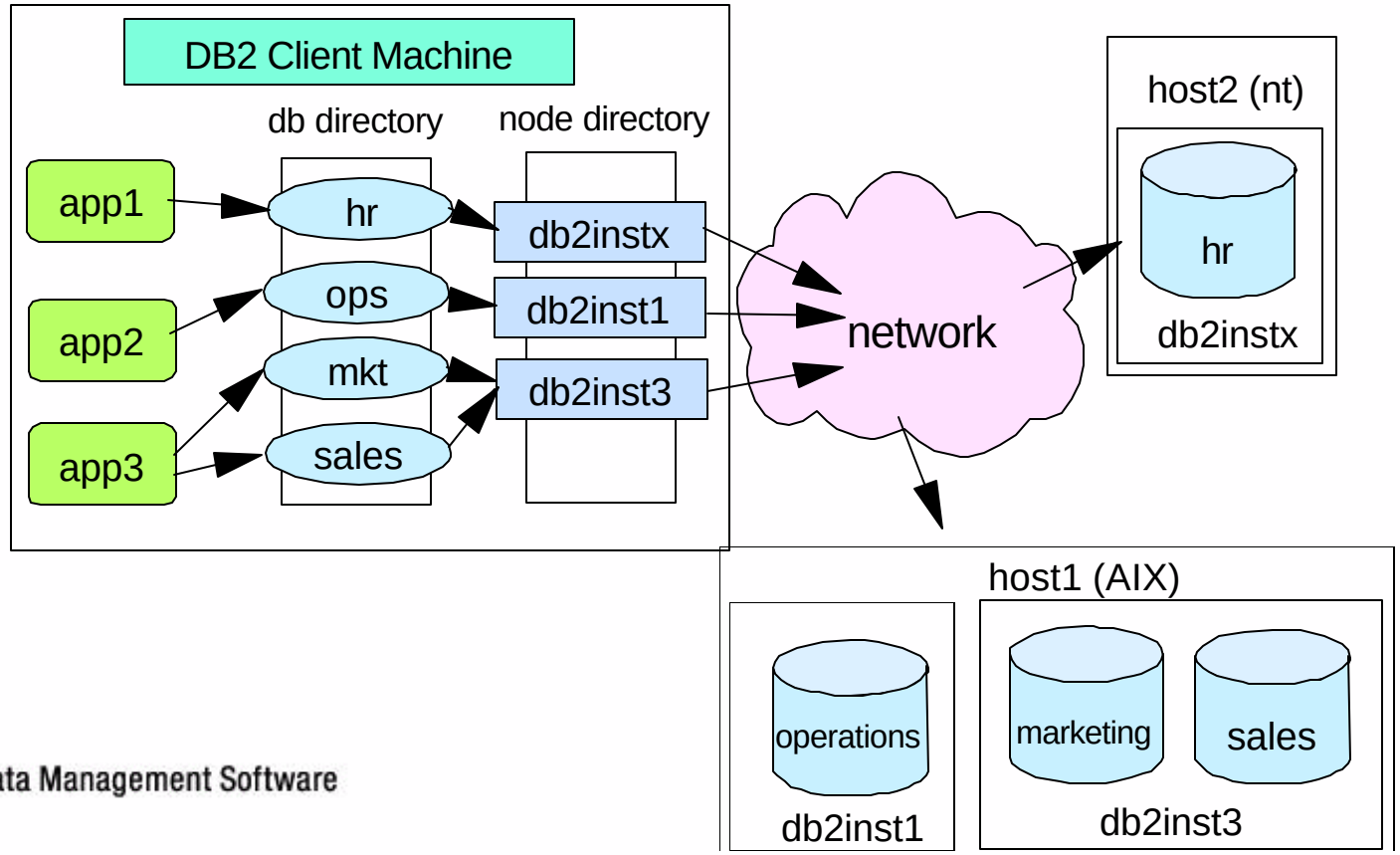
- INSTANCE ATTACHMENT
  - Implicit:
    - **DB2INSTANCE= <instance name>**
    - Environment Variable
  - Explicit:
    - **ATTACH TO nodename [USER ... USING...]**
    - Nodename is important
- DATABASE CONNECTION
  - Implicit:
    - DB2 Profile variable,set with **db2set** command
    - **db2set DB2DBDFT=<database name>**
  - Explicit:
    - **CONNECT TO db-alias [USER ... USING... CHANGE PASSWORD]**

For local instances only

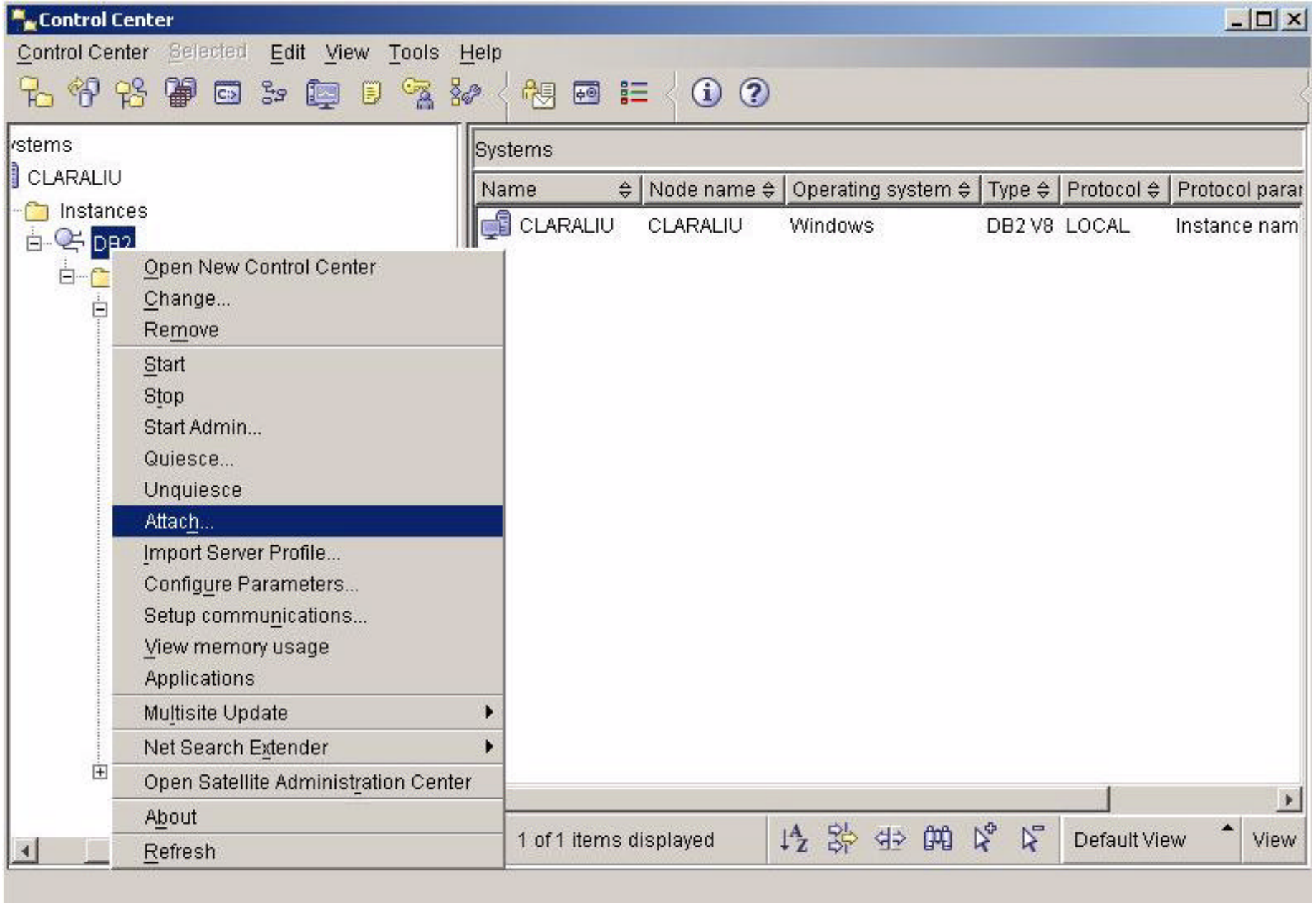
For local and remote instances

Remote Adminstration - ATTACH

- Attach to a node that has been cataloged in the DB2 node directory
- For example:
  - **ATTACH TO db2instx USER db2admin USING passwd**
  - **RESTORE DATABASE hr FROM /db2/backup REPLACE EXISTING**
  - **DETACH**
- User ID and password are required if the node is a remote node



Attach to an instance using DB2 Control Center



Connect to a Database

- Connect to a database that has been cataloged in the DB2 database directory
- Example:
  - **CONNECT TO sample USER db2admin USING passwd**
  - **INSERT INTO testtab VALUES (1, 'DB2')**
  - **CONNECT RESET**
- User ID and password are required if database is on a remote server

- To find out currently connected database, use one of the following commands:
  - **GET CONNECTION STATE**

```
                Database Connection State

 Connection state          = Connectable and Connected
 Connection mode           = SHARE
 Local database alias = SAMPLE
 Database name             = SAMPLE
```

  - **VALUES CURRENT SERVER**

```
1
----------
TOOLSDB
1 record(s) selected.
```

Special Register

Some Useful Commands

- LIST APPLICATIONS [SHOW DETAIL]
  - Shows all current connections made to any databases defined within an instance

```
Auth Id  Application         Appl.      Application Id                          DB          # of
         Name                Handle                                             Name        Agents
-------- ------------------- ---------- -------------------------------------- ----------- ----------
CLARALIU db2bp.exe           7          *LOCAL.DB2.00E000150926                SAMPLE      1
CLARALIU db2bp.exe           6          *LOCAL.DB2.00F1C0150335                SAMPLE      1
DB2ADMIN db2dasstm.exe       5          *LOCAL.DB2.005A40134734                TOOLSDB     1
DB2ADMIN db2dasstm.exe       4          *LOCAL.DB2.005A40134733                TOOLSDB     1
```

- FORCE APPLICATION ALL
  - Disconnect all connections made to any databases defined within an instance
- FORCE APPLICATION (h1 [,h2,..hn])
  - Selectively disconnect applications by the application handle identifier
- GET INSTANCE
  - retrieve your current instance context

```
The current database manager instance is:  DB2
```