Datacom: Getting started with SQL and Server

LYNETTE ELWELL | DATACOM SOFTWARE ENGINEERING

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Abstract

- If you haven't yet begun to use SQL and Server for modernization, find out how to quickly get these options active in your environment to deliver value to DBAs and applications developers. You'll learn how to make a table SQL-accessible and how our Datacom View extension lets you access tables, without conversion, that standard SQL could not.

Agenda

GETTING STARTED WITH DATACOM SQL

GETTING STARTED WITH DATACOM SERVER

GENERAL ANNOUNCEMENTS

Datacom SQL

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Topics

- Integration
- Turning it on
- Access
- Management
- Access legacy data
- Accessing SQL data from SAAT and RAAT

Integration

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Fully Integrated!

- SQL, SAAT and RAAT can all be used in the same program
- Transactions are across all types of requests
- Constraints created by SQL are enforced for SAAT and RAAT
- SQL can access all data
  - Group fields are “seen” as a single character column
    - Single dimension arrays can be defined for each element (OCCURS)
    - Multi-dimension arrays can be defined for single character column (REDEFINES)
  - You can cast numeric columns to character without conversion and use concatenate to update group columns
  - Use Datacom View for redefined data

Turning it on

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MUF Options

- **DATACOM SQL**
  - Code is there, just need to turn it on
- SQLOPTION YES,017,DATACOM,30,NO
  - 017: Default DBID for TTM (temporary tables)
  - DATACOM: Allow Datacom SQL extensions
  - 30: 30 minute timeout of LUWs
  - NO: View Security
- SQLDEFAULT 016,CASQLDEFAULT
  - Default DBID,AREA for creating tables
- VIRTUAL IXX006,250M CBS TEMP INDEX
- VIRTUAL IXX017,32M TEMP WORK INDEX FOR SQL REQUESTS
- VIRTUAL TTM017,9G TEMP WORK AREA FOR SQL REQUESTS

MUF Options

- DATETIME date[,time]
  - Specifies external format of SQL Date and Time data types
  - ISO yyyy-mm-dd hh.mm.ss (default)
  - USA mm/dd/yyyy hh:mmAM|PM
  - EUR dd.mm.yyyy hh.mm.ss
  - JIS yyyy-mm-dd hh:mm:ss
- SYSOUT 0,4M,SQL,4M,ML CLASS,ML,CBS,SQL,DD
  - Combines SQL and CBS dumps/tracing
- PROCEDURE 5K,3,16 PROCEDURE SIZE, NESTS, TCBs
  - Needed for external procedures
  - Need LOADLIB in MUF libs for program executable modules

URTs with SQL

- URT is always used to access MUF
- RAAT and SAAT (CBS) URTs specify which tables can be accessed
- SQL URT is just a stub
- In MUF, SQL creates a URT for each table
  - Closed based on plan close option at run unit or transaction end
  - PLNCLOSE=T/R
  - T – Transaction end
  - R – Run unit end
  - Default: R

Make Databases SQL Accessible

- Table not accessible until SQL-INTENT set
- Use DDUPDATE 1500 Transaction
  - SQL-INTENT: Y = yes, R = read-only

```
-USR DATACOM-INSTALL,NEWUSER
-UPG TABLE,ABC*(TEST)
1500 SQL-INTENT,Y
-END
```

- SQL NAME
  - You can set, but default is DD name with dash replaced with underscore
  - Dash means subtract in SQL

Make Databases SQL Accessible

- Must have logging activated for backout
- Unique record identifier (URI) attribute required for SQL
  - Normal data load default to URI=yes
  - For non-URI tables
    - Backup and load required to build as URI
    - May affect RAAT programs that use LOCxx followed by REDLE logic
- Catalog to CXX and data definition directory (DDD)
- Making Existing Tables SQL Accessible

Access

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Embedded SQL

- COBOL, C, PL/I, Assembler
  - Pre-process program to convert SQL statements to DBSQLE calls to MUF
  - Link batch programs with DBSBTPR URT
  - CICS uses URT020
- Ideal
- Static vs Dynamic SQL
  - Dynamic most flexible since query is compiled at execution
  - Static avoids overhead of binding at execution
- Using SQL

Interactive SQL

- Datacom Server
  - ODBC driver provides access from applications not written in Java
  - JDBC driver for applications written in Java
- Datacom DBSQLPR Utility
  - Batch utility to execute SQL statements

Management

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SQL Impact on existing production workload

- Limit execution with CBSIO resource unit per MUF request limit
  - In Datacom Server, DBSQLPR and batch plan option
  - One CBSIO is a physical I/O or accessing 100 rows
  - CBSIO=500000
- DIAGOPTION A,500000 ROWS REJECTED
  - Reports inefficient queries in SQL SYSOUT
- Increase MUF memory
  - SQL likes memory!
  - LUW_STATEMENT_LIMIT 10
    - Limit prepared statements per LUW to limit memory use

Monitor with SQL Performance Analyzer

- COMM STATUS refresh every 10 seconds
- Current Activity
  - Shows each processing step for active queries
  - Kill LUW button
  - Get SQL Optimization Report button
- Source Cache
  - Reports Datacom Server and DBSQLPR queries
  - Can limit CBSIO and execution time by query
  - Find inefficient queries
  - Use QUERYNO to tie query back to its source

Access Legacy Data

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Datacom View

```
CREATE DATACOM VIEW VLI (
    PO_NBR, LI_NBR, PART, QTY) AS
    SELECT PO_NBR, LI_NBR, PART, QTY
  FROM ORDERS
 WHERE REC_TYPE = 'L';

UPDATE ORDERS
    SET ADDR = :STREET || :CITY || :ST || :ZIP
 WHERE REC_TYPE = 'O'
   AND PO_NBR = :PO_NBR;
```

Accessing SQL Data With SAAT and RAAT

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NULL INDICATOR

- Columns are nullable unless created with NOT NULL
- Nullable columns begin with a 1-byte null indicator field
  - *(Externally it's a 2-byte binary null indicator column)*
- NULL value has null indicator = 'N'
  - Value area is blanks or zero
- Not NULL value has null indictor = ' ' (space)

SQL DATE, TIME, TIMESTAMP

- Internal format is binary
  - Example 2019-10-16 ➔ x'14130A10'
  - Hard for non-SQL, but possible to convert
- Convert character dates to SQL to use date functions
  - Example DATE(YEAR || '-' || MONTH || '-' || DAT) + 1 MONTH > CURRENT DATE

VARCHAR

- Length is 2-byte binary at front
- Use COBOL group level
  -
```
01 SQL-NAME.
   05 NAME-LENGTH   S9999 COMP.
   05 NAME          X(20).
```
- Length of zero is valid
  - This is NOT a NULL value
- The field is internally stored at maximum length – no compression
  - Value after the length is technically undefined, but Datacom sets to blanks

Customer Poll Question

- Are you currently leveraging Datacom SQL?
  - Yes in production
  - Yes in development
  - No
  - I would like to request a follow-up to further discuss

Datacom Server

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Datacom Server Components

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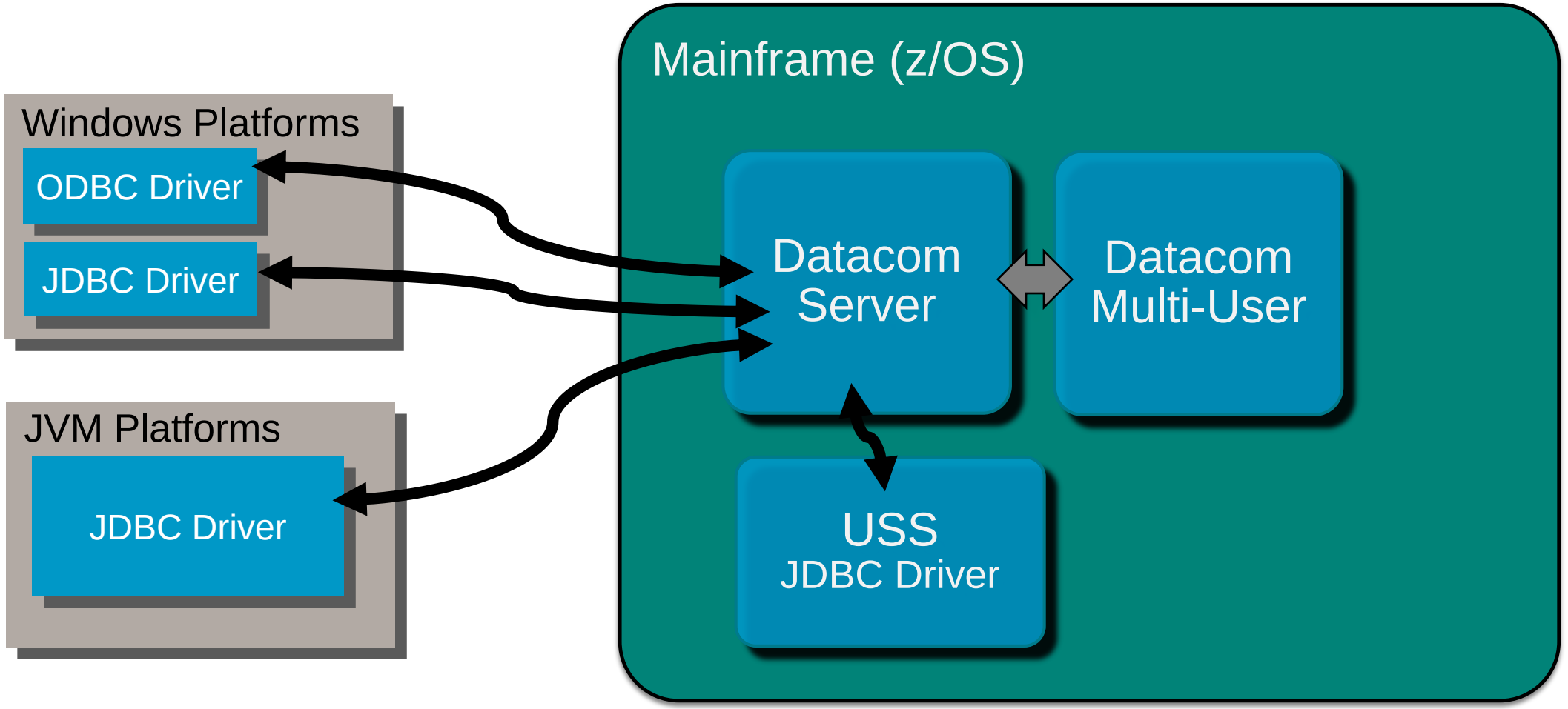
Datacom Server Components



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Datacom Server Components

- Mainframe Component (SVDBSPR)
  - Runs in separate address from Datacom Multi-User
  - Acts as a ‘conduit’ between the client drivers and the SQL engine in MUF
  - Handles communication between distributed clients and MUF
- ODBC Driver – cadcmf32.dll and/or cadcmf64.dll
  - Windows only
  - Translates client driver ‘language’ into Datacom SQL internal commands
  - “Connects” C/C++, PHP, .NET, etc applications to enterprise Datacom data
  - Performs conversion to/from EBCDIC/ASCII
- JDBC Driver – cadcjdbc.jar
  - Any operating system that supports a JVM
  - “Connects” Java, JavaScript, etc applications to enterprise Datacom data
  - Available in USS

Datacom Server Mainframe

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Datacom Server Mainframe

- Installation – SMP/E Pax similar to Datacom
- Datacom/AD 15.1 includes Datacom Server
- **MUST CHANGE Multi-User (MUF) Startup Options!**
  - MUF DBDATIN2 member or SYSIN

```
**DATACOM PRODUCTS MULTI-USER STARTUP OPTIONS * REVIEW *
 DATACOM    SQL                 Datacom/DB-SQL
 DATACOM    DQ                  CA DATAQUERY
*DATACOM    PRESSPACK           Datacom/DB PRESSPACK
 DATACOM    CICSSVCS            Datacom/CICS SERVICES
*DATACOM    VSAMT               Datacom/VSAM TRANSPARENCY
 DATACOM    DTCMSRVR            Datacom/SERVER
*DATACOM    FASTR               Datacom/FAST RESTORE
```

Datacom Server Mainframe Task (cont'd)

- YT15STRT – sample JCL member
  - Datacom/AD *hlq*.CAAXMAC – OR – *hlq*.CAASAMP(ADYTSTRT)
  - Datacom Server *hlq*.CAYTMAC
- STEPLIB or JOBLIB
  - Datacom/DB CUSLIB
  - Datacom Server LOADLIB
  - Datacom/DB LOADLIB
- SYSTCPD – TCPIP.DATA dataset - defines TCP/IP stack (site-specific)
- CEEOPTS – LE Run-time Options

  *hlq.*CAYTMAC(CEEUOPT)
- SYSIN – Startup options

Datacom Server Startup Options - SYSIN

- SERVERNAME=your_server_name
  - Token used in connection strings or data source settings
  - Uniquely identifies the Server instance/region
- APPLID=your_applid
  - (another) token used in connection strings or data source settings
  - Uniquely identifies the Server instance/region
- PLANNAME=aaaa
  - SQL plan name prefix used to ‘dynamically’ build the plan for each open connection
  - Must be unique for all Server regions attached to a Multi-User
- AUTHID=SYSUSR
  - Used as the default schema name for non-qualified table, view or procedure names
  - Must be a valid AUTHID in the Multi-User instance

Datacom Server Startup Options – cont'd

- PROTOCOL=TCP
  - Specifies the communication protocol – CCI, TCP or BOTH
  - Default: CCI
  - Suggested: TCP
- TCPIP_HOST=LOCALHOST, IP address or DNS name
  - Specifies the name of the LPAR associated with the TCPIP_PORT= number for TCP/IP transmissions
  - LOCALHOST or 0.0.0.0 allows the Server to listen on any LPAR at TCPIP_PORT
  - Recommended if PROTOCOL=BOTH or TCP
  - Ignored if PROTOCOL=CCI
- TCPIP_PORT=
  - Specifies listener port number for incoming TCP/IP traffic
  - Default: 5465
  - Consult with local Network Admin

Datacom Server Startup Options – cont'd

- DBUSERS=nn
  - Specifies the number of Datacom/DB threads dedicated to the Server
  - Review the TASKS startup parameter in Datacom MUF

```
DB01900I -  TASKS      250,45K,0,0,250,50    # OF TASKS,SIZE,0,0,XCFTASKS
```

  - Any number of non-update requests can share a thread
  - An update request locks or holds the thread
    - Threads are locked until the task issues a commit or rollback
    - Or … if the connection is closed or timed out

  - Best Practice: reserve enough threads to service the number of concurrent updates expected. Then, monitor the shutdown statistics to see if adjustments should be made.

Datacom Server Sample Startup JCL & Options

```
//YT15STRT JOB (125401000),'SERVER 15.0',
//     CLASS=A,MSGCLASS=X,MSGLEVEL=(1,1),NOTIFY=&SYSUID
//DBSERVER EXEC  PGM=SVDBSPR,REGION=0M
//STEPLIB  DD DISP=SHR,DSN=DTCOMC.MUFC.V151.CUSLIB
//         DD DISP=SHR,DSN=DCMQA.DBSRV150.DEV.CAYTLOAD
//         DD DISP=SHR,DSN=DTCOMC.TEAMC.CABDLOAD
//SYSTCPD  DD DISP=SHR,DSN=PIT.ZPDT.TCPIP.DATA(DATAZM1D)
//SYSPRINT DD SYSOUT=*
//CEEOPTS  DD DISP=SHR,DSN=DCMQA.DBSRV150.DEV.CAYTMAC(CEEUOPT)
//SYSIN  DD  *
SERVERNAME=SV15_MUFSTRTS
APPLID=SV15_MUFSTRTS
PLANNAME=MUFS
AUTHID=SYSUSR
DBUSERS=10
PROTOCOL=BOTH
TCPIP_HOST=0.0.0.0
TCPIP_PORT=5465
LOGON=NO
//
```

Datacom Server Sample Output

```
DSV00077I-CA Datacom Server Version 15.0 Program Messages
Current Date:   09/18/2019
Current Time:   18:32:33:62

DSV00038I-Input parameters received:
     SERVERNAME=SV15_MUFSTRTS
     APPLID=SV15_MUFSTRTS
     PLANNAME=MUFS
     AUTHID=SYSUSR
     DBUSERS=10
     PROTOCOL=BOTH
     TCPIP_HOST=0.0.0.0
     TCPIP_PORT=5465
     LOGON=NO
```

Datacom Server Architecture

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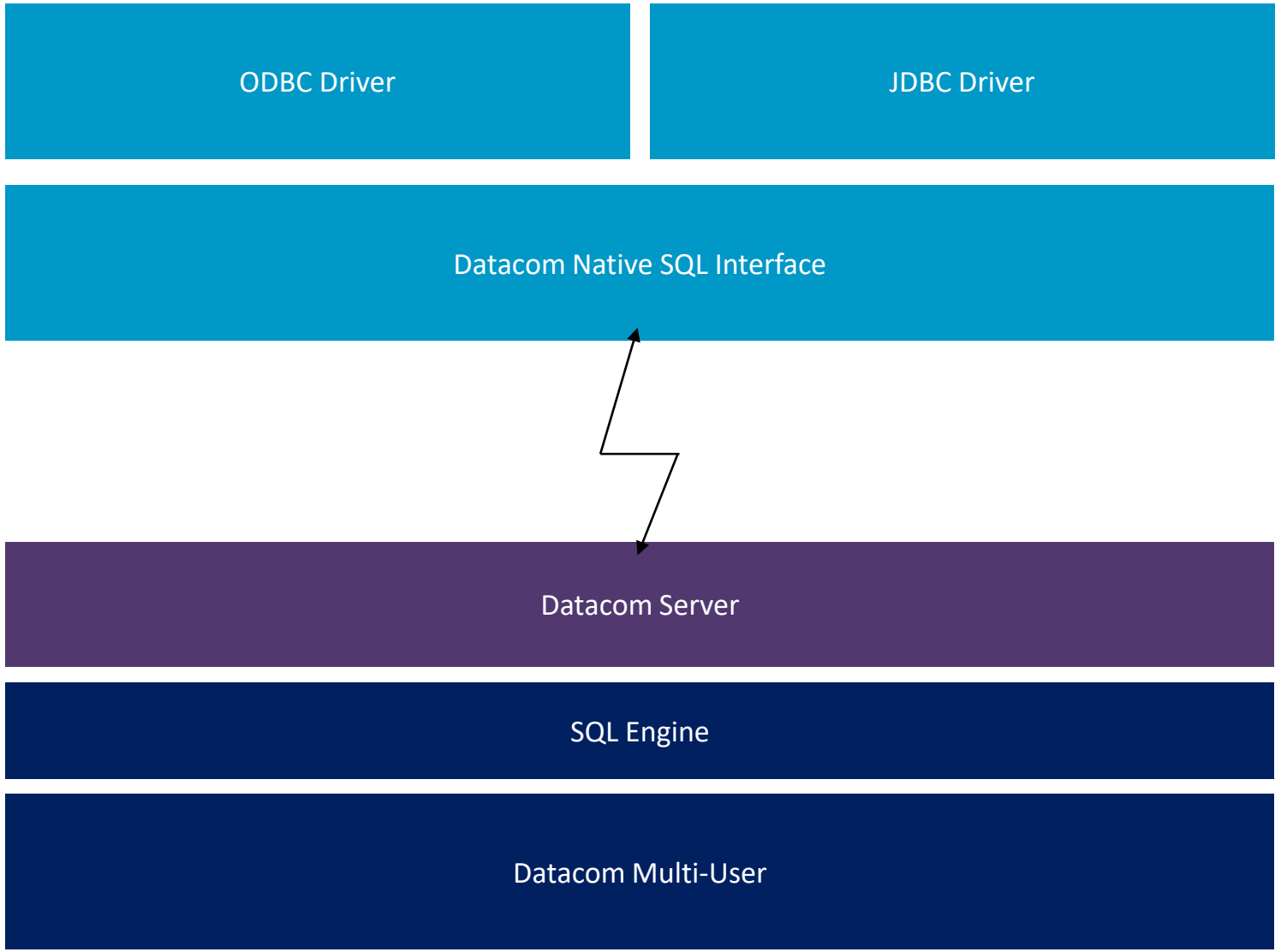
Datacom Server Basic Architecture



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Datacom Server ODBC Driver

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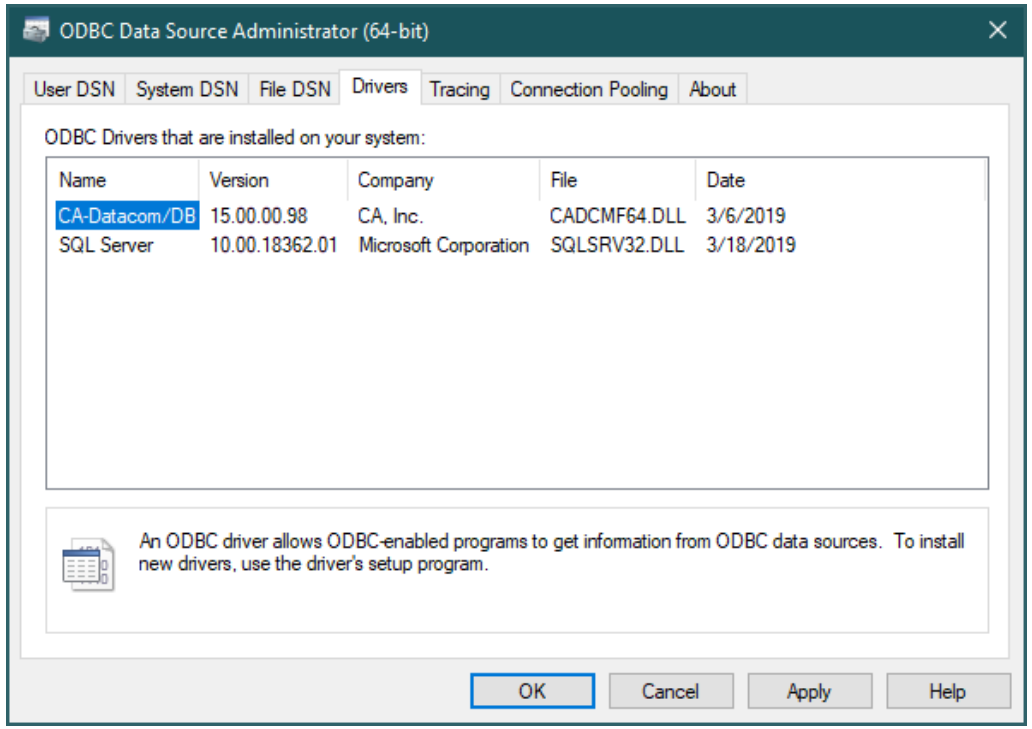
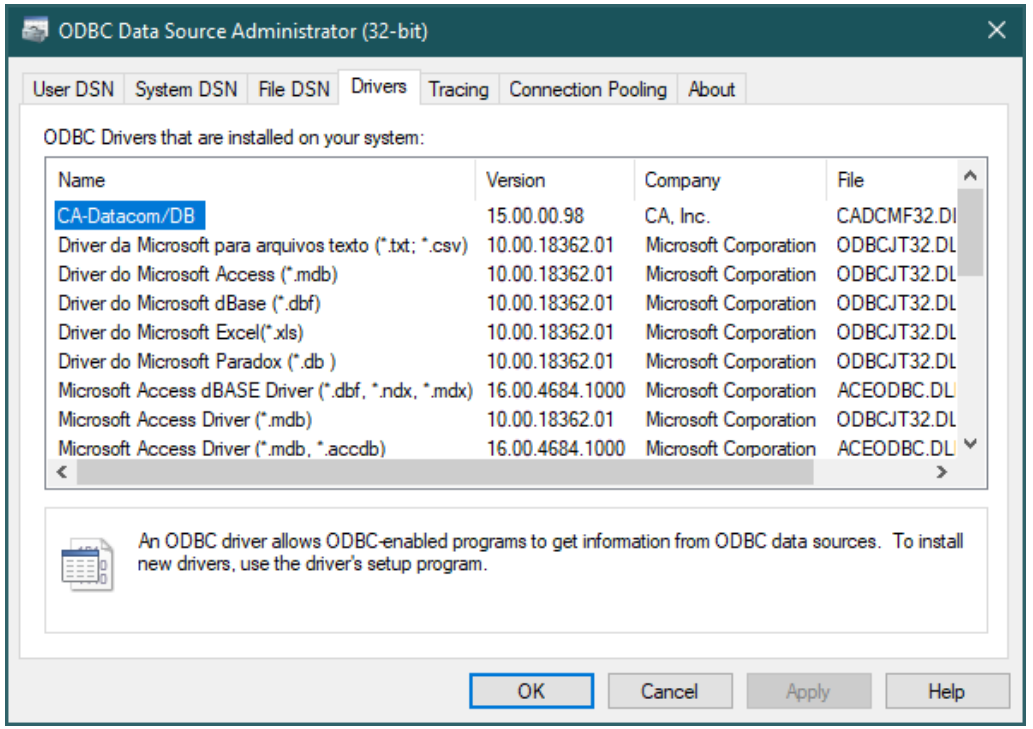
Datacom Server ODBC Driver

- Windows only
- ODBC 3.8 Compliant
- Supports both 32-bit (x86) and 64-bit (x64) platforms and applications
  - Installed with separate installers
  - Both can be installed on the same Windows machine
  - 64-bit installed in c:\Program Files\CA-DatacomServer
  - 32-bit installed in c:\Program Files (x86)\CA-DatacomServer
- Communication Protocols
  - CCI – Common Communication Interface – CA-ENF
  - TCP/IP – sent directly to the Server Mainframe Region
- Requires an ODBC Data Source

Datacom Server ODBC Data Source Setup

- (Microsoft) ODBC Data Source Administrator (odbcad32.exe)
- Search for ‘ODBC’ in Windows search box
- ODBC Data Sources (32-bit) and (64-bit)





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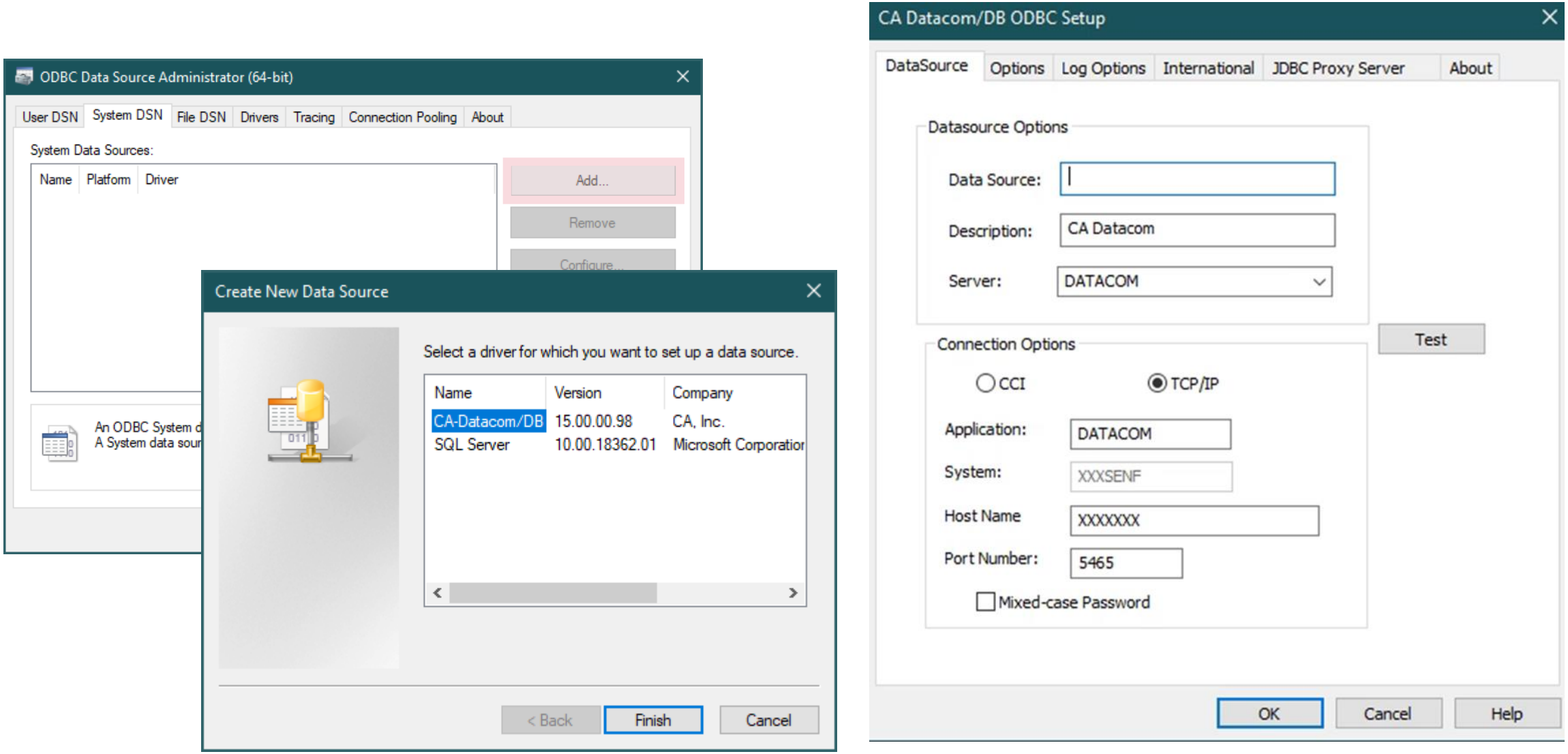
Datacom Server ODBC Data Source Setup – cont'd



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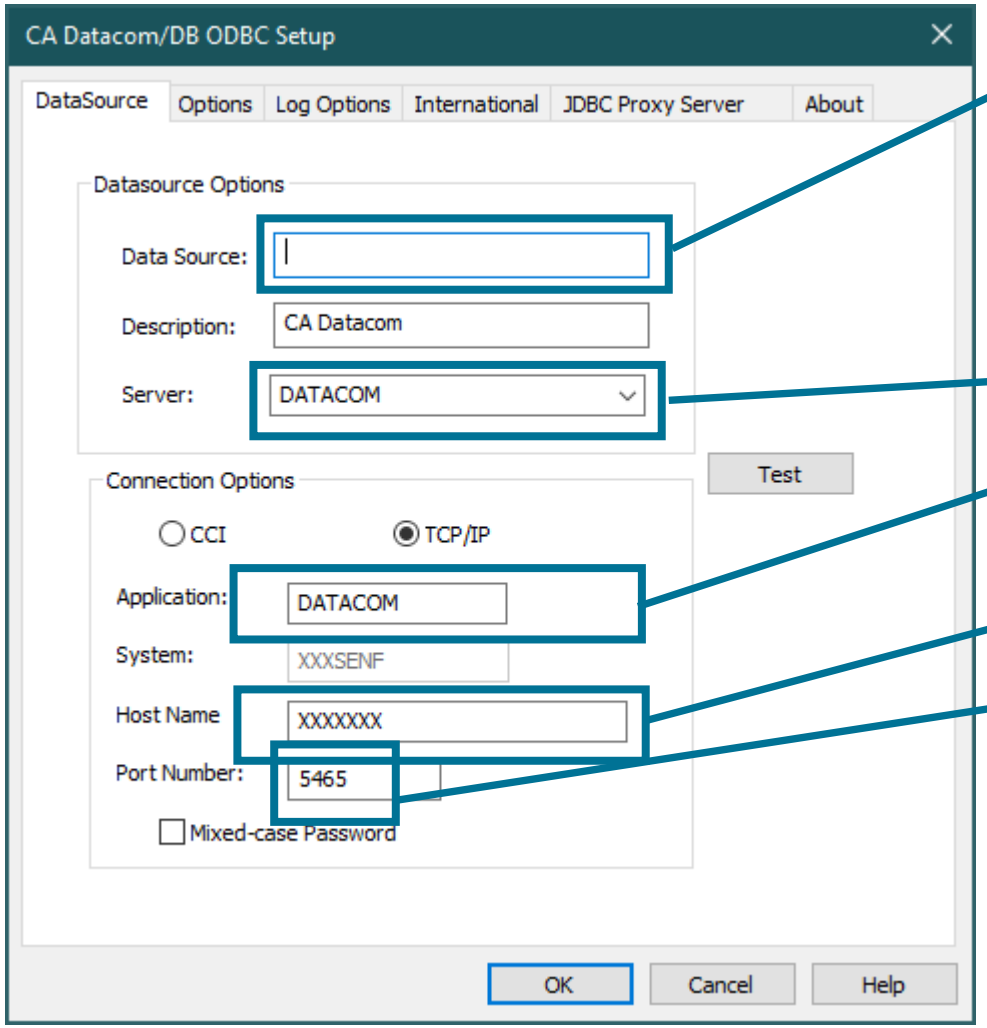
Datacom Server ODBC Data Source Setup – cont'd



Your_Data_Source_Name

```
DSV00077I-CA Datacom Server Version 15.0 Program Messages
Current Date:   09/18/2019
Current Time:   18:32:33:62

DSV00038I-Input parameters received:
     SERVERNAME=SV15_MUFSTRTS
     APPLID=SV15_MUFSTRTS
     PLANNAME=MUFS
     AUTHID=SYSUSR
     DBUSERS=10
     PROTOCOL=BOTH
     TCPIP_HOST=0.0.0.0
     TCPIP_PORT=5465
     LOGON=NO
```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Datacom Server JDBC Driver

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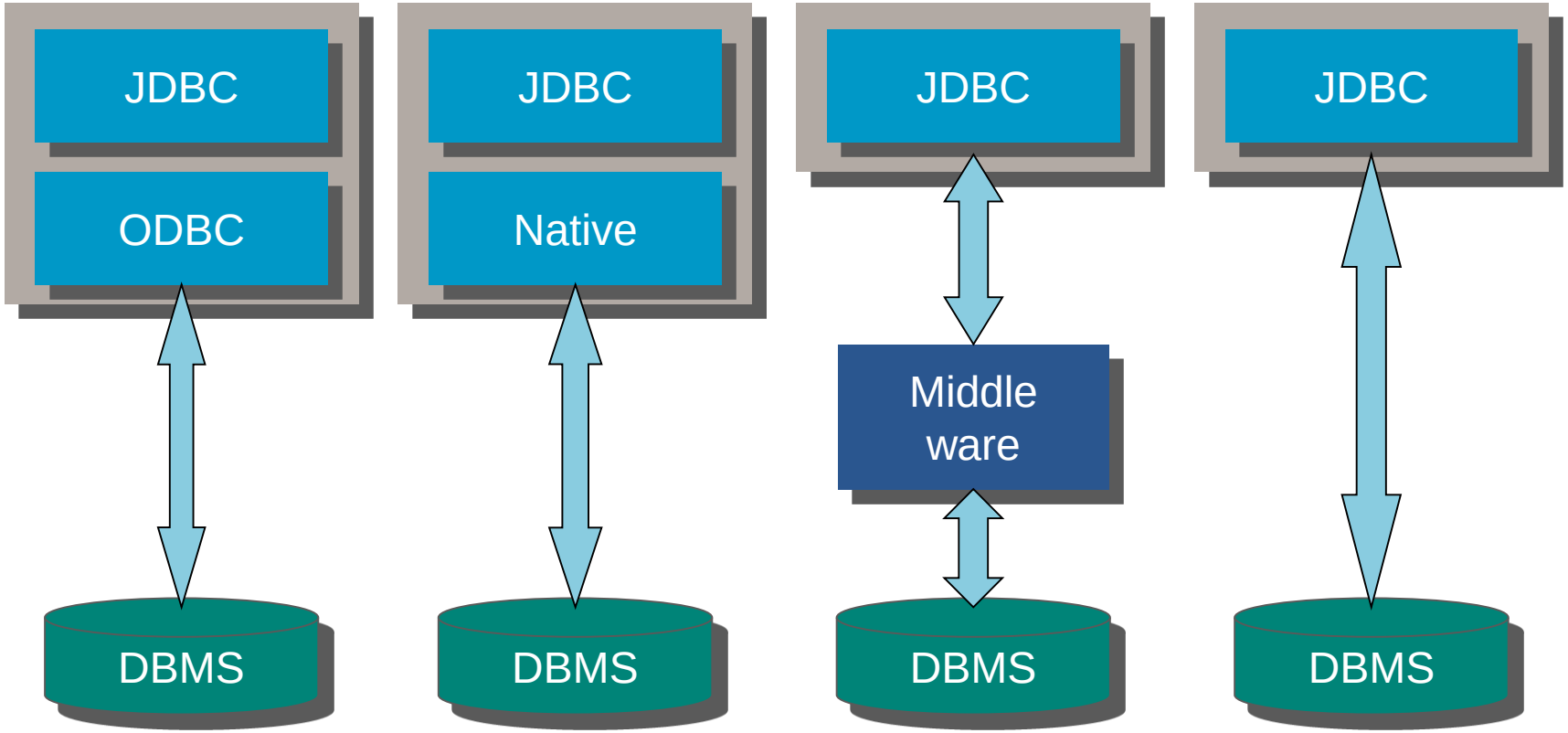
JDBC Driver Connection Types



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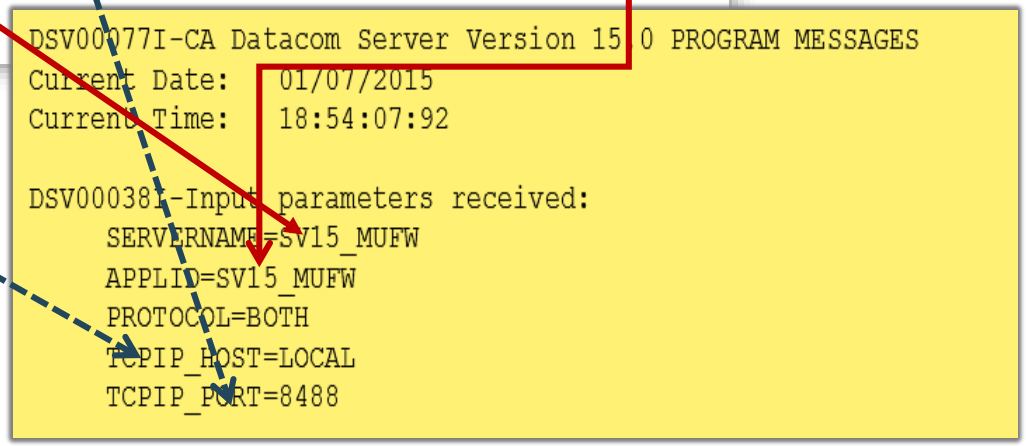
Datacom Server JDBC Driver – cadcjdbc.jar

- JDBC 4.0 compliant
- “Universal” driver
  - Types 2, 3, 4
- All client platforms that support Java
  - Windows
  - z/OS USS
  - Linux(x86, z/Series)
  - Other Unix type platforms
- Uses connection URLs (Universal Resource Locator) to connect and communicate with Datacom Server

Datacom Server JDBC Type 2 Driver Connection - URL

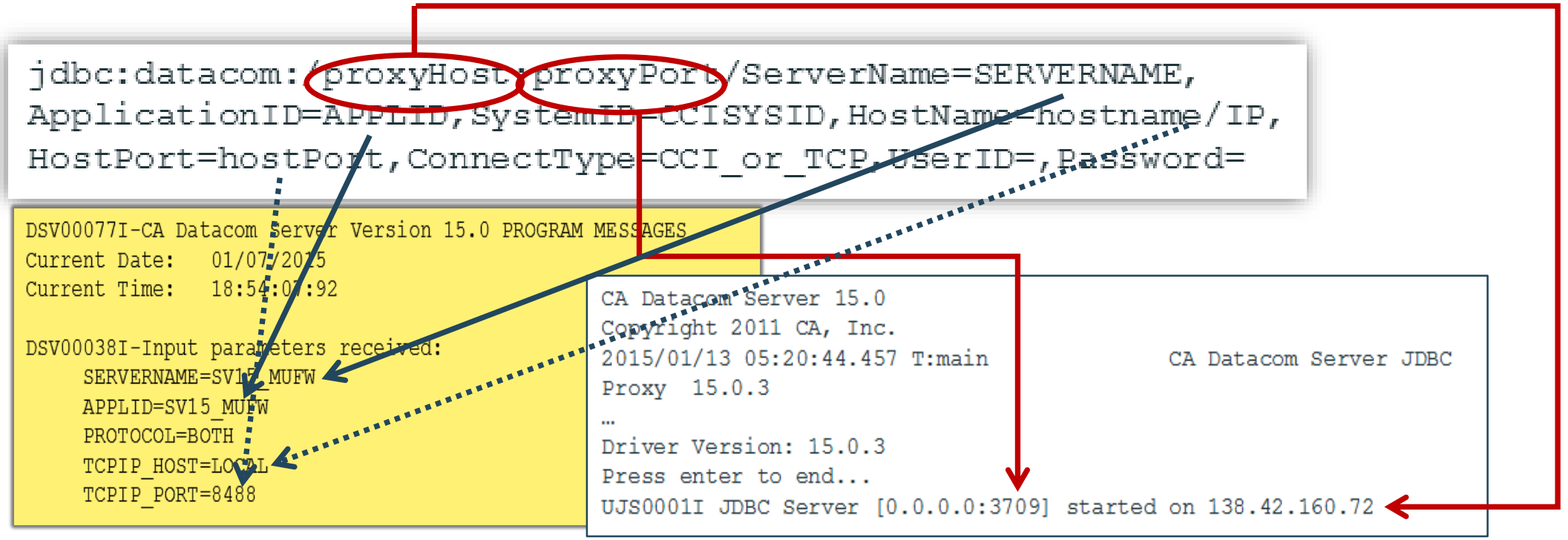
- Requires Datacom Server native interface
  - Windows and z/OS USS, only – not valid on Linux platforms
- General Syntax:

```
jdbc:datacom:/ServerName=SERVERNAME,SystemID=CCISYSID,ApplicationID=APPLID,
HostName=ipAddress_or_hostName,HostPort=hostPort,UserID=userid,Password=pswd,
ConnectType=CCI_or_TCP,trace=0|1|2|3
```



Datacom Server JDBC Type 3 Connection - URL

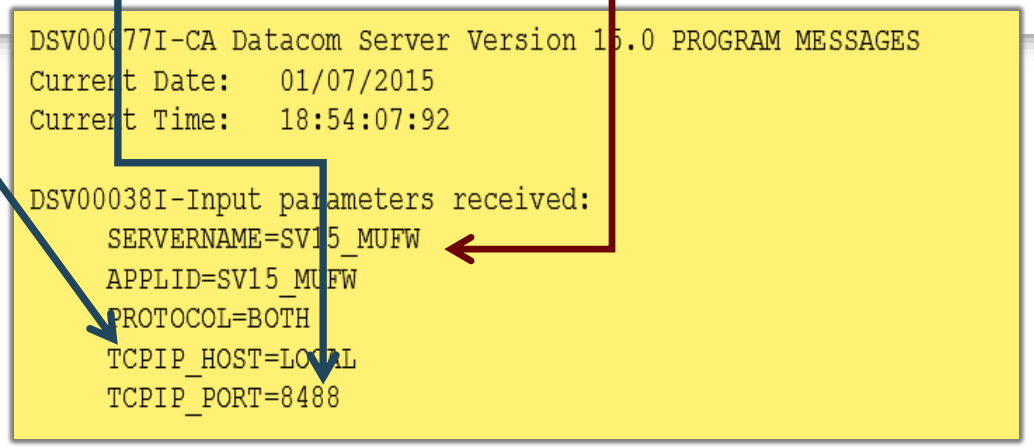
- Requires a JDBC Proxy on Windows or USS (Middleware)
- Linux Platforms – x86 or z/Series
- General Syntax:



Datacom Server JDBC Type 4 Connection - URL

- Type 4 – Requires TCP/IP - not valid with PROTOCOL=CCI
- Pure Java - Supported on all Java platforms
- Direct Connection to Datacom Server Mainframe region
- General Syntax:

```
jdbc:datacom://TCPIP_HOST:TCPIP_PORT/ServerName=SERVERNAME,UserID=,
Password=,trace=0|1|2|3
```



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Customer Poll Question

- Are you currently leveraging Datacom Server?
  - Yes in production
  - Yes in development
  - No
  - I would like to request a follow-up to further discuss

Resources

- Microsoft ODBC Specification
  https://docs.microsoft.com/en-us/sql/odbc/microsoft-open-database-connectivity-odbc?view=sql-server-2017
- IBM ODBC Specification:
  https://www.ibm.com/support/knowledgecenter/en/SSEPEK_11.0.0/odbc/src/tpc/db2z_hdapi.html
- JDBC Specification:
  https://docs.oracle.com/javase/8/docs/technotes/guides/jdbc/

- Lynette.Elwell@Broadcom.com

Session Questions

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General Announcements

Mainframe Technical Exchange
October 5-7, 2021

- Connect virtually with peers and Mainframe technical experts
- Over 140 technical education, product update and ideas sessions
- No registration fee! Open to all Broadcom customers
- **REGISTER TODAY: http://bit.ly/2021TechExchange**

AIOps

DevOps

Infrastructure Management

Security

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Mainframe Technical Exchange

Must See Datacom Sessions!

- **Tuesday October 5 @ 12:00pm (ET):** ***"Datacom New Features"*** (Dale Russell, Product Owner; Emelda Peter, Datacom Software Engineer; Dick Williamson, Datacom Software Engineer)
- **Tuesday October 5 @ 1:00pm (ET):** ***"Datacom Framework for 24x7 Utilities"*** (Kevin Shuma, Director of Engineering)
- **Wednesday, October 6 @ 8:00am (ET):** ***"VS Code integration with IDMS and Datacom"*** (Teri Schnitt, IDMS Software Engineer; Lukas Zima, DevOps Product Owner
- **Wednesday, October 6 @ 10:00am (ET):** ***"Datacom REST API Overview and Benefits"*** (Jacob Huerta, Datacom Software Engineer)
- **Wednesday, October 6 @ 12:00pm (ET):** ***"Security in the Datacom World"*** (Robert Floarian, Datacom Software Engineer)
- **Thursday, October 7 @ 8:00am (ET):** ***"Datacom Systems Performance"*** (Owen Williams, Redcentric PLC; Kevin Shuma, Director of Engineering)
- **Thursday, October 7 @ 10:00am (ET):** ***"Datacom and IBM Media Manager"*** (Joe Lynn, Datacom Software Engineer)

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Mainframe Technical Exchange

Calling all Customers!!

- "***Datacom User Experience***" on Thursday, October 7 @ 12:00pm (ET).

- Customer feedback and direction is invaluable to our overall strategic direction. We are interested in hearing your voice and providing us with insight based on real-life experiences and requirements. Please join us for an interactive user experience (UX) session where we look to you – our customers – to assist in shaping the future of our products.

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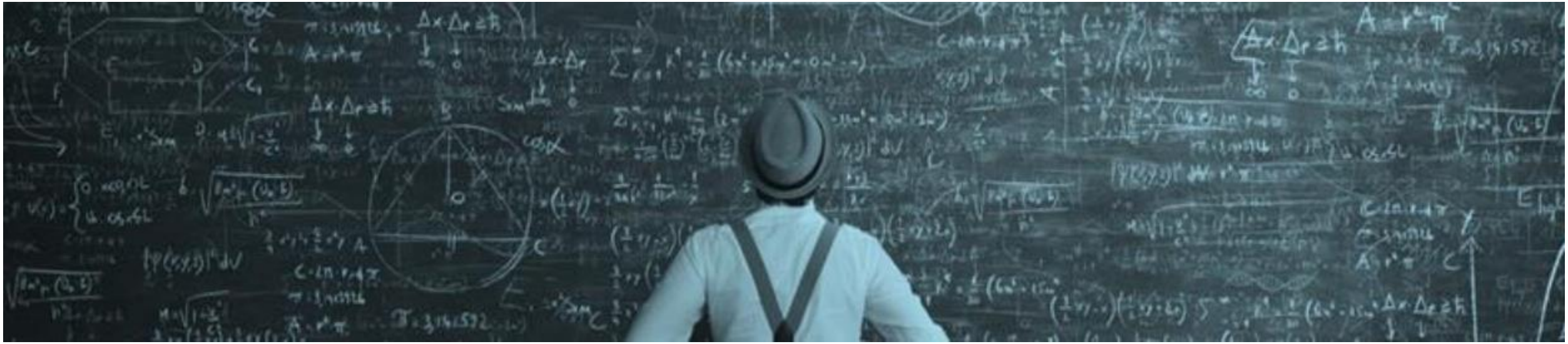
Partnering with You – How you Can Get Involved

We're Interested In Your Thoughts



Join us on our **journey** to achieve our ongoing **vision**, we are **actively seeking feedback and suggestions from our customers**. We want to hear your voice!

- Submit your ideas on CA Datacom/CADRE communities.broadcom.com
- Vote and comment on ideas that are important to you

- Join our validation program to influence our product direction
  - End-of-Sprint review meetings
  - Early access to new features and enhancements

- Attend our monthly webcasts – check out the Communities site for upcoming sessions
  - 2nd Thursday each month

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Final Questions

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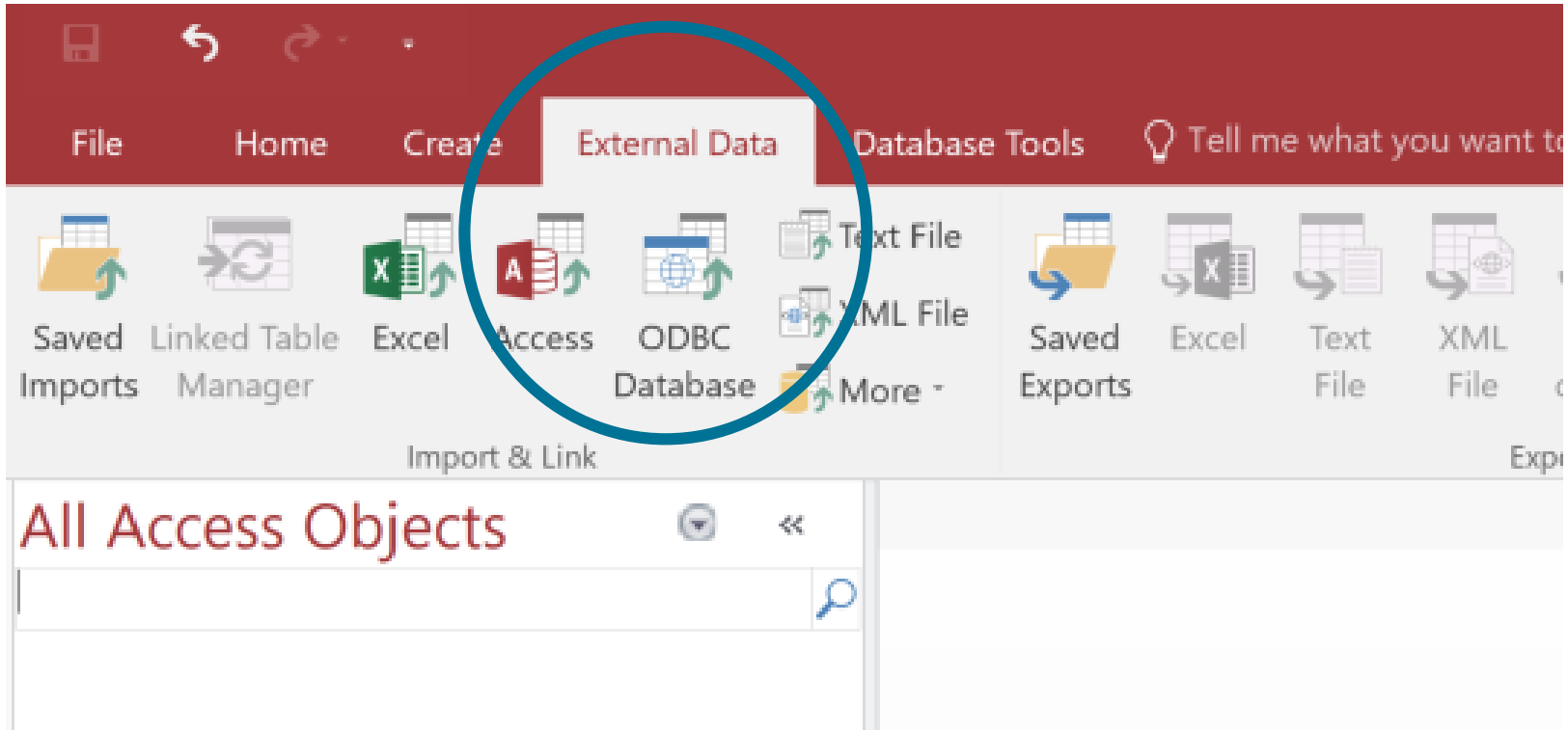
Thank You

Appendix

Using Microsoft Access and Datacom Server as a Front-end to Datacom

Create a linked table

1. Open the Access database you want to link or create a new one
2. On the **External Data** tab, choose **ODBC Database**



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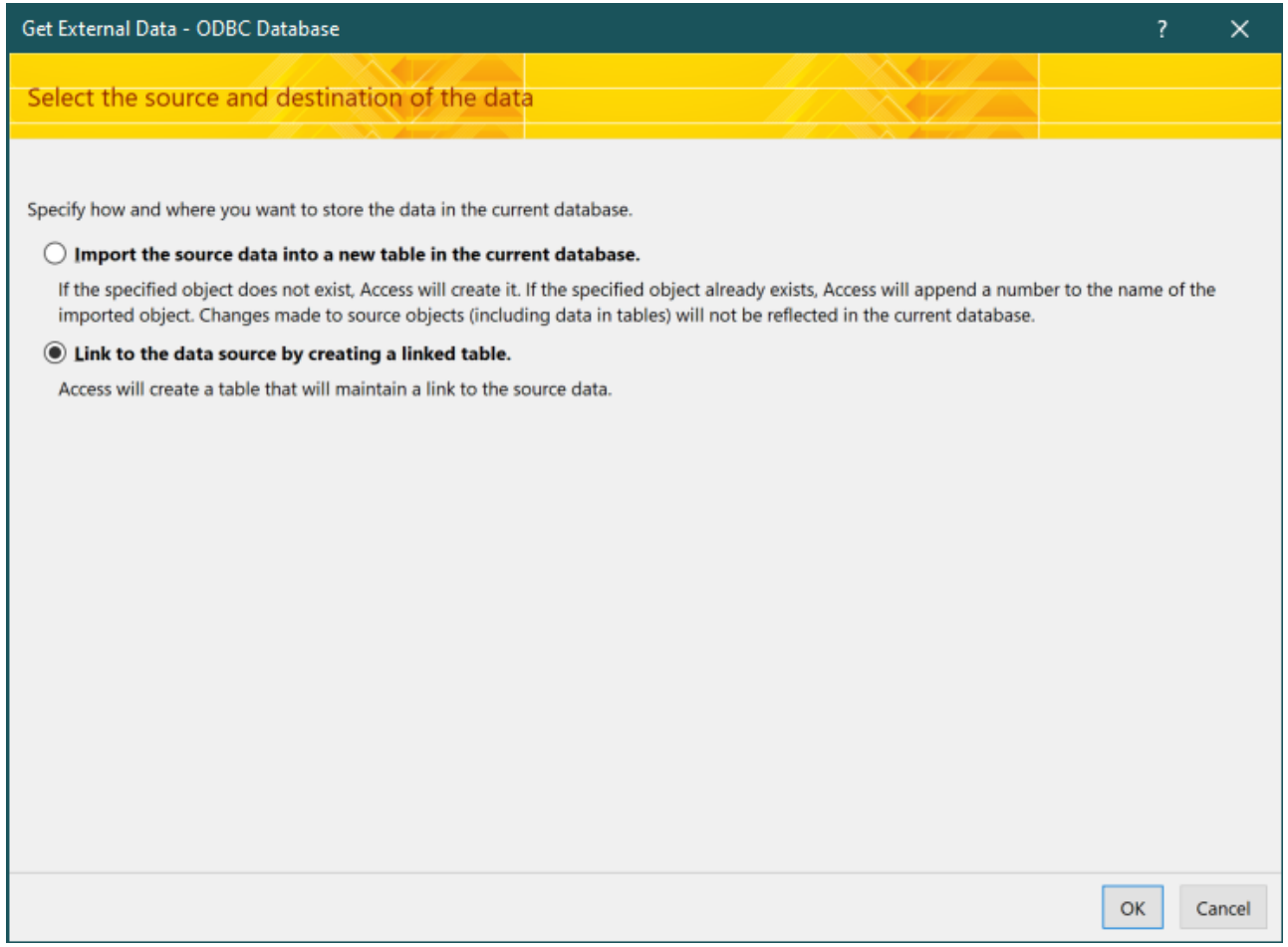
Using Microsoft Access and Datacom Server as a Front-end to Datacom

3. In the **Get External Data** dialog box, choose **Link to the data source by creating a linked table** and click **OK**



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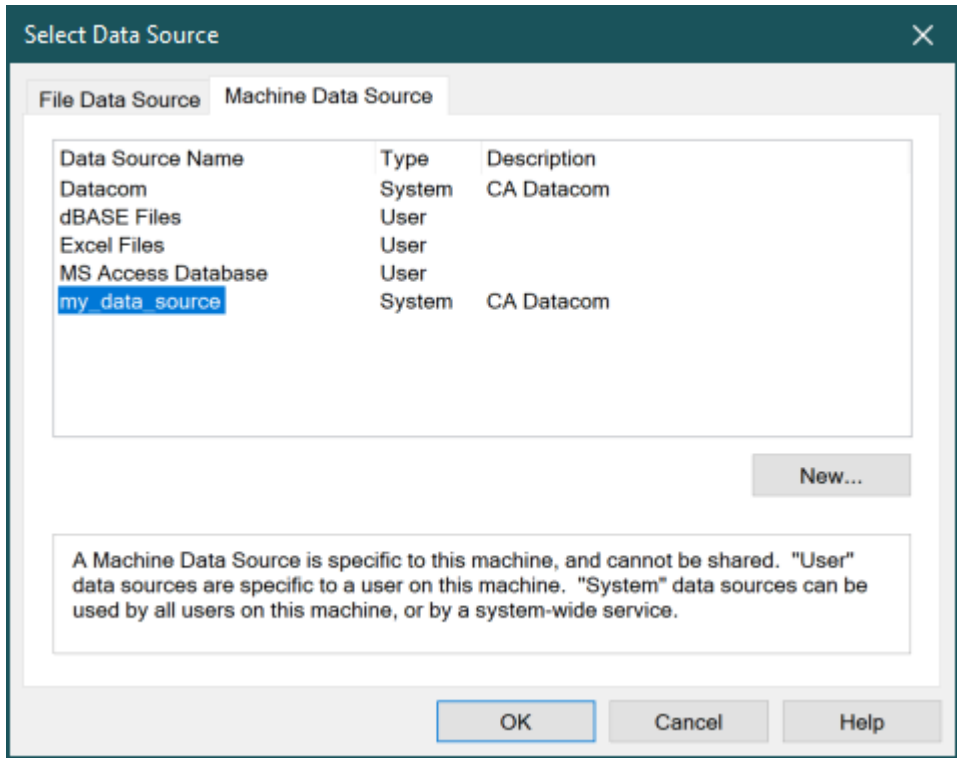
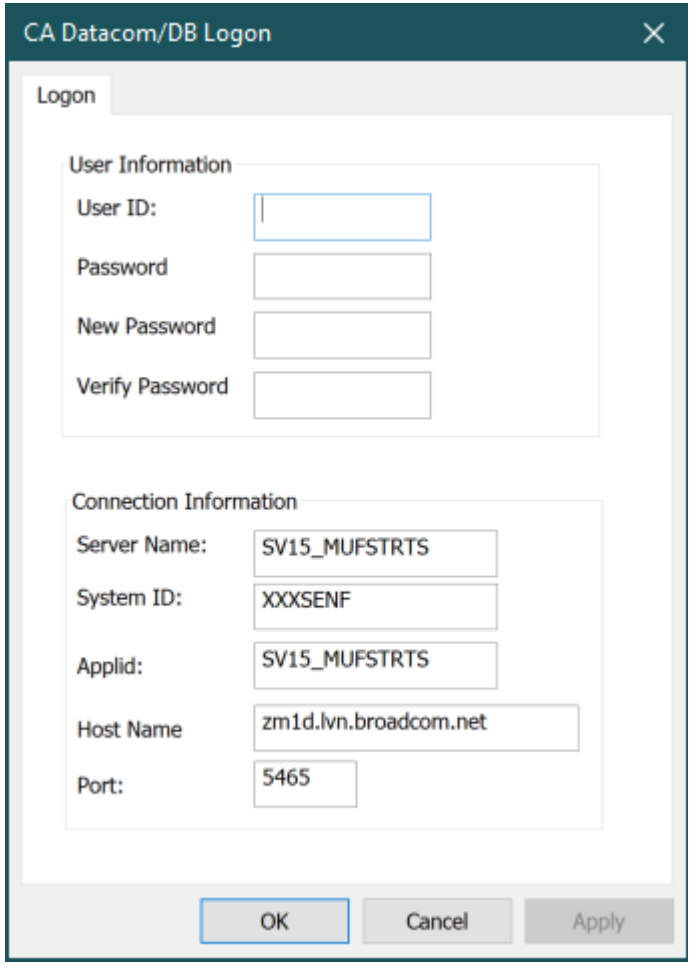
Using MS Access and Datacom Server as a Front-end to Datacom

4. In the **Select Data Source** dialog box, click the **Machine Data Source** tab, then double-click the Datacom Server ODBC DSN you wish to use. Provide logon credentials if needed.





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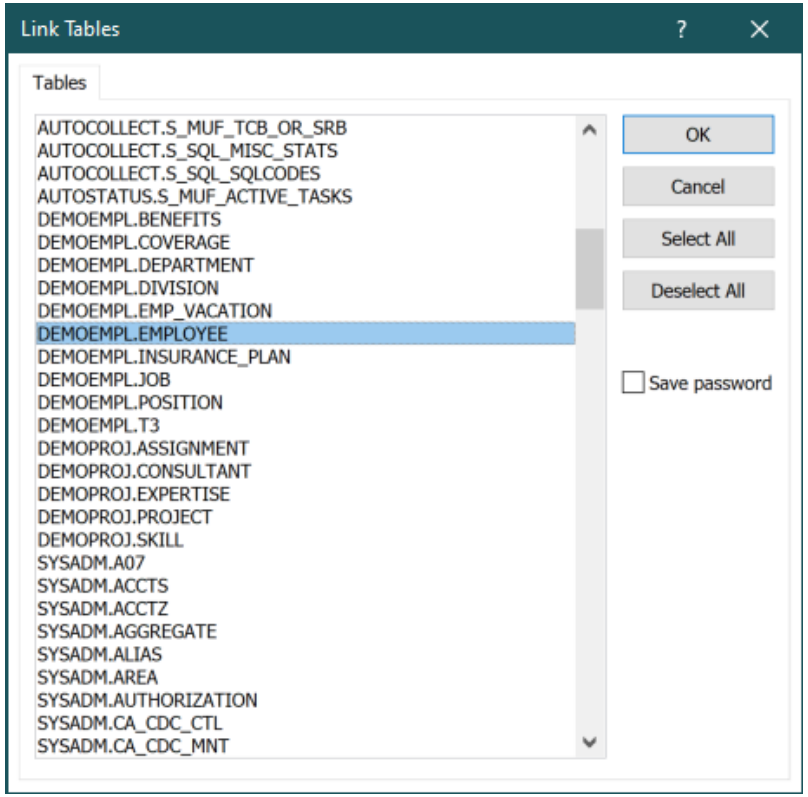
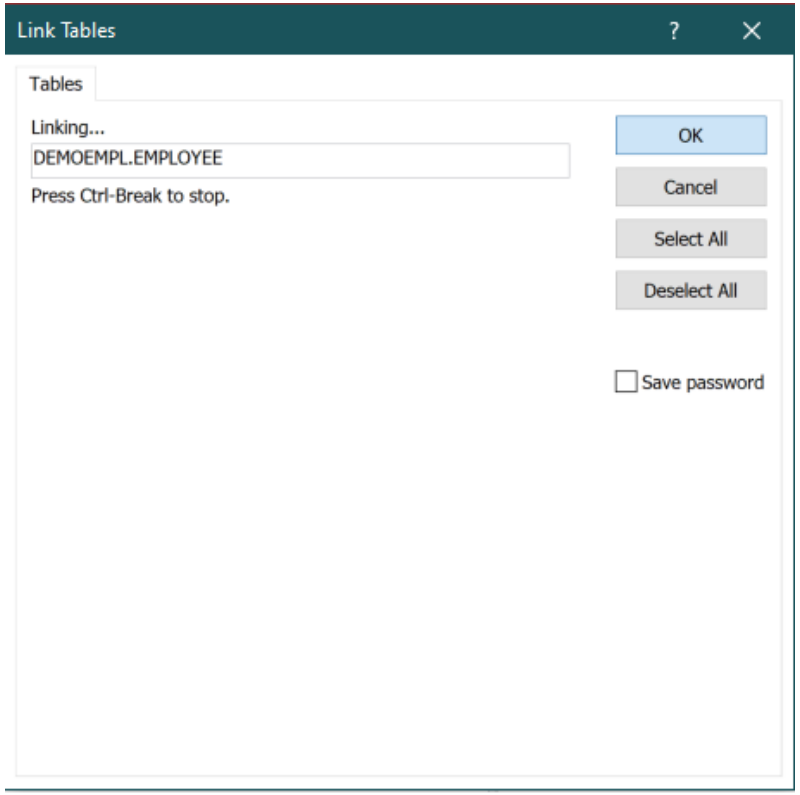
Using MS Access and Datacom Server as a Front-end to Datacom

5. MS Access connects to Datacom Server and returns a list of Datacom tables. Choose the table(s) you wish to link and click OK.





6. If MS Access is unable to determine the unique record identifier automatically, it will ask you to choose a column or combination of columns which uniquely identify each row.

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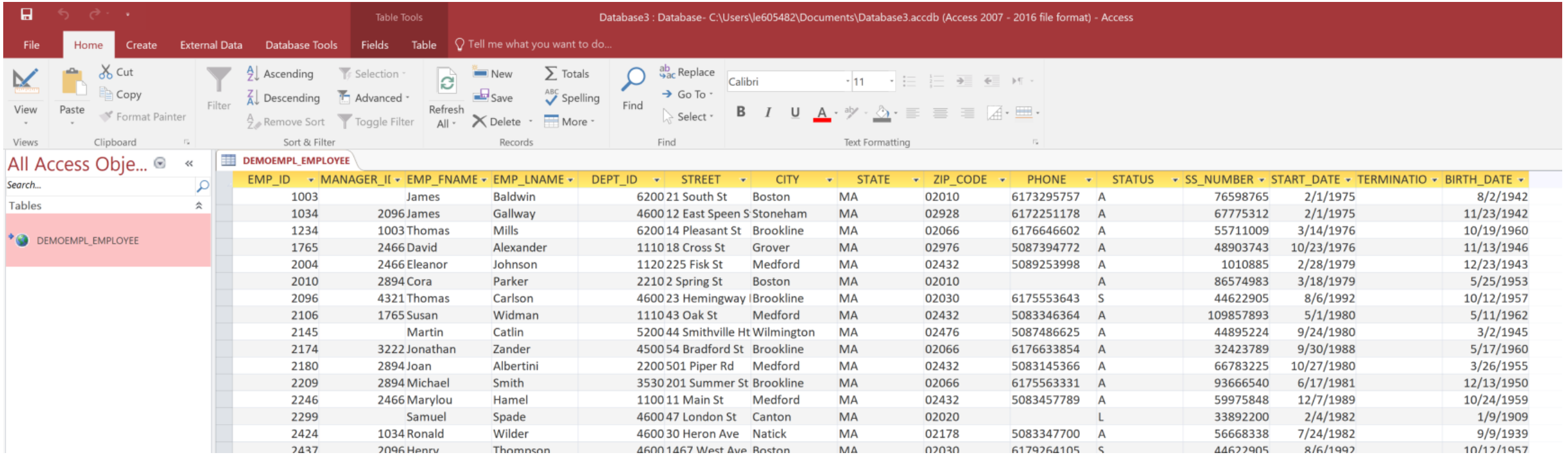
Using MS Access and Datacom Server as a Front-end to Datacom

Once the process is complete, you can build interfaces and queries on the linked tables as you would for any Access database.



EMP_ID	MANAGER_II	EMP_FNAME	EMP_LNAME	DEPT_ID	STREET	CITY	STATE	ZIP_CODE	PHONE	STATUS	SS_NUMBER	START_DATE	TERMINATIO	BIRTH_DATE
1003		James	Baldwin	6200	21 South St	Boston	MA	02010	6173295757	A	76598765	2/1/1975		8/2/1942
1034	2096	James	Gallway	4600	12 East Speen S	Stoneham	MA	02928	6172251178	A	67775312	2/1/1975		11/23/1942
1234	1003	Thomas	Mills	6200	14 Pleasant St	Brookline	MA	02066	6176646602	A	55711009	3/14/1976		10/19/1960
1765	2466	David	Alexander	1110	18 Cross St	Grover	MA	02976	5087394772	A	48903743	10/23/1976		11/13/1946
2004	2466	Eleanor	Johnson	1120	225 Fisk St	Medford	MA	02432	5089253998	A	1010885	2/28/1979		12/23/1943
2010	2894	Cora	Parker	2210	2 Spring St	Boston	MA	02010		A	86574983	3/18/1979		5/25/1953
2096	4321	Thomas	Carlson	4600	23 Hemingway	Brookline	MA	02030	6175553643	S	44622905	8/6/1992		10/12/1957
2106	1765	Susan	Widman	1110	43 Oak St	Medford	MA	02432	5083346364	A	109857893	5/1/1980		5/11/1962
2145		Martin	Catlin	5200	44 Smithville Ht	Wilmington	MA	02476	5087486625	A	44895224	9/24/1980		3/2/1945
2174	3222	Jonathan	Zander	4500	54 Bradford St	Brookline	MA	02066	6176633854	A	32423789	9/30/1988		5/17/1960
2180	2894	Joan	Albertini	2200	501 Piper Rd	Medford	MA	02432	5083145366	A	66783225	10/27/1980		3/26/1955
2209	2894	Michael	Smith	3530	201 Summer St	Brookline	MA	02066	6175563331	A	93666540	6/17/1981		12/13/1950
2246	2466	Marylou	Hamel	1100	11 Main St	Medford	MA	02432	5083457789	A	59975848	12/7/1989		10/24/1959
2299		Samuel	Spade	4600	47 London St	Canton	MA	02020		L	33892200	2/4/1982		1/9/1909
2424	1034	Ronald	Wilder	4600	30 Heron Ave	Natick	MA	02178	5083347700	A	56668338	7/24/1982		9/9/1939
2437	2096	Henry	Thompson	4600	1467 West Ave	Boston	MA	02030	6179264105	S	44622905	8/6/1992		10/12/1957

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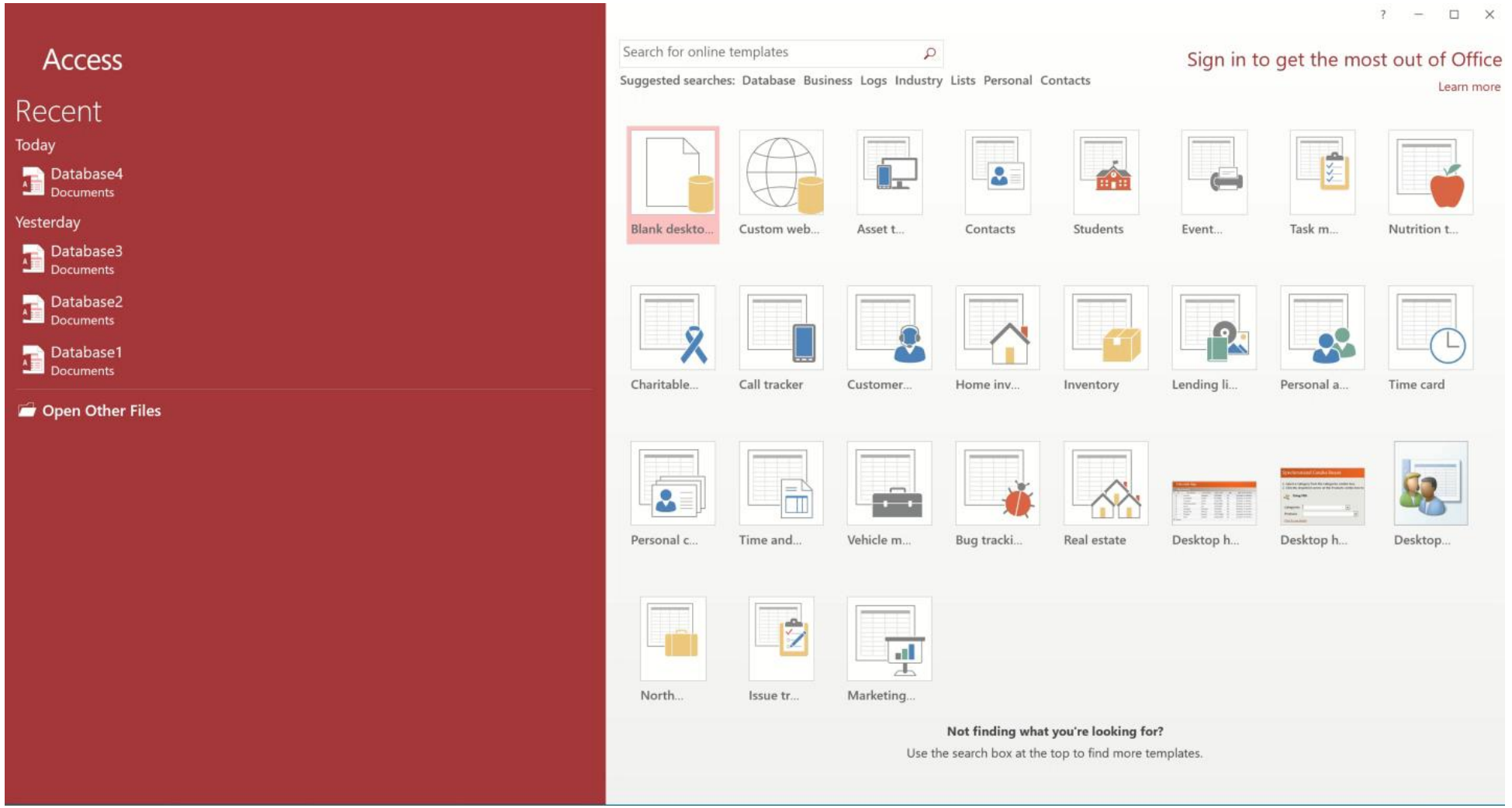
Demo - Using MS Access and Datacom Server as a Front-end to Datacom



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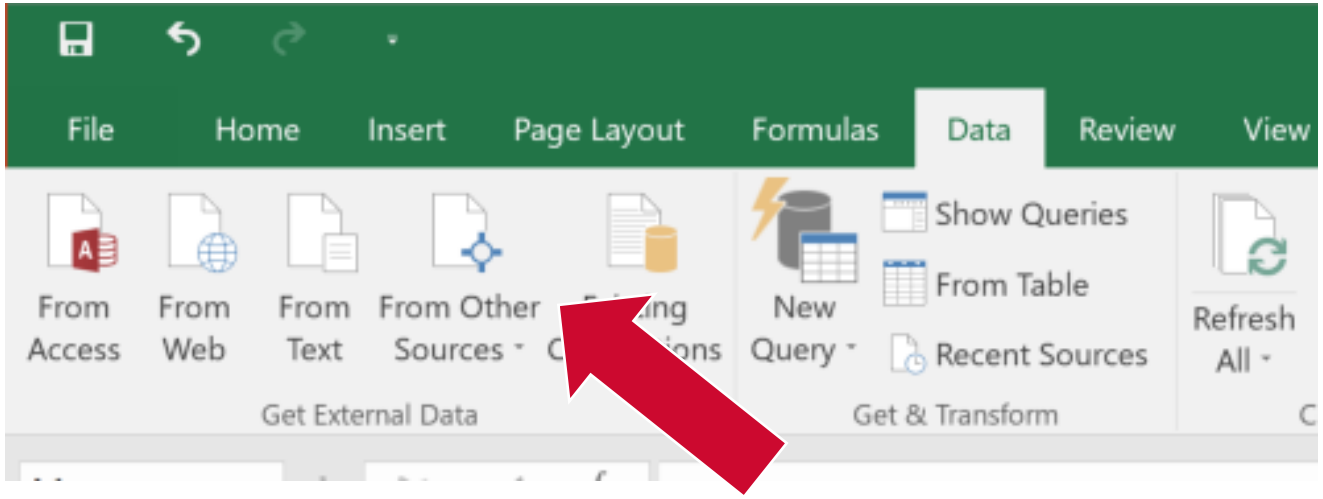
Using MS Excel with Datacom Server

1. Click the Data tab. In the Get External Data group, choose From Other Sources



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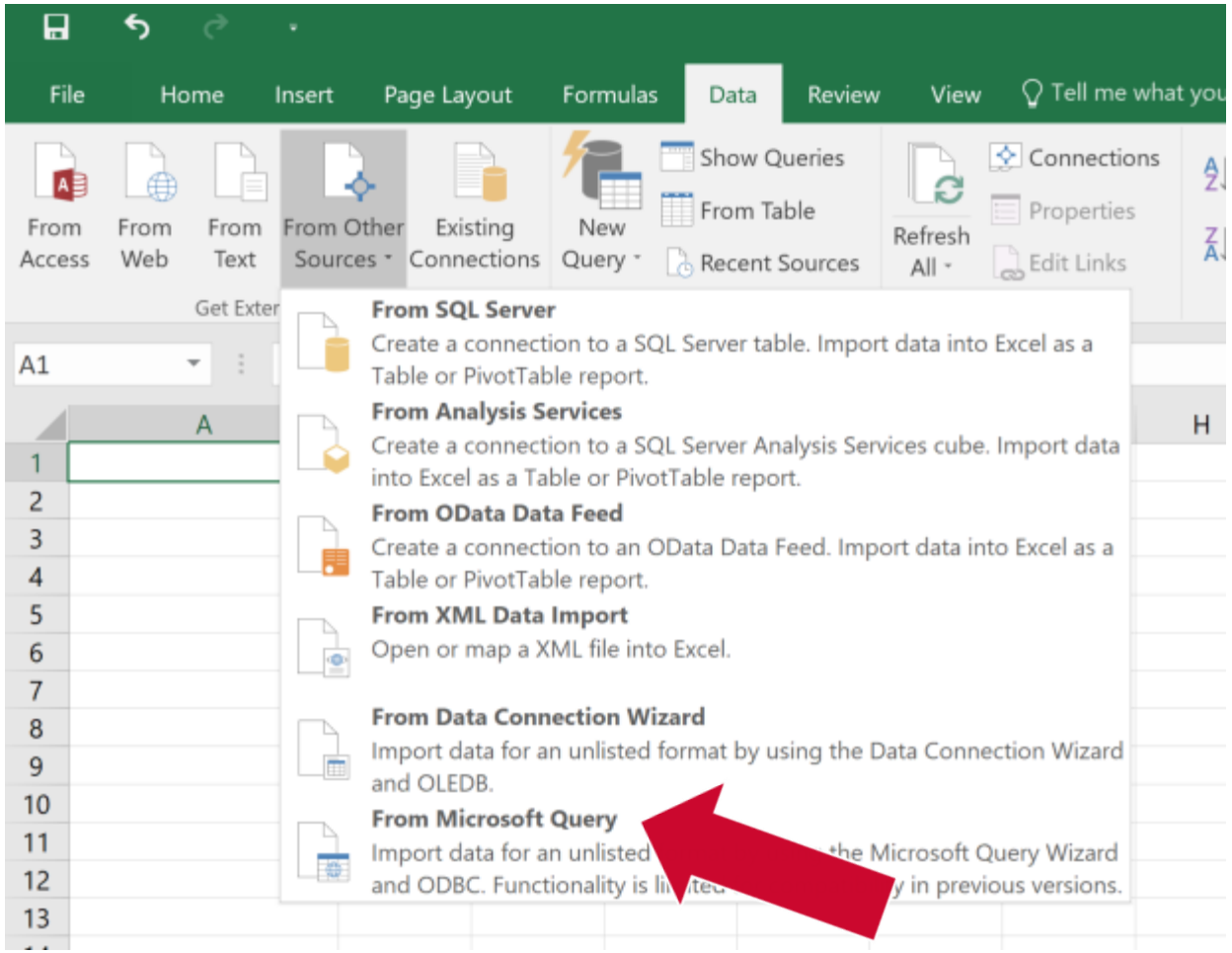
Using MS Excel with Datacom Server - cont'd

2. Choose From Microsoft Query



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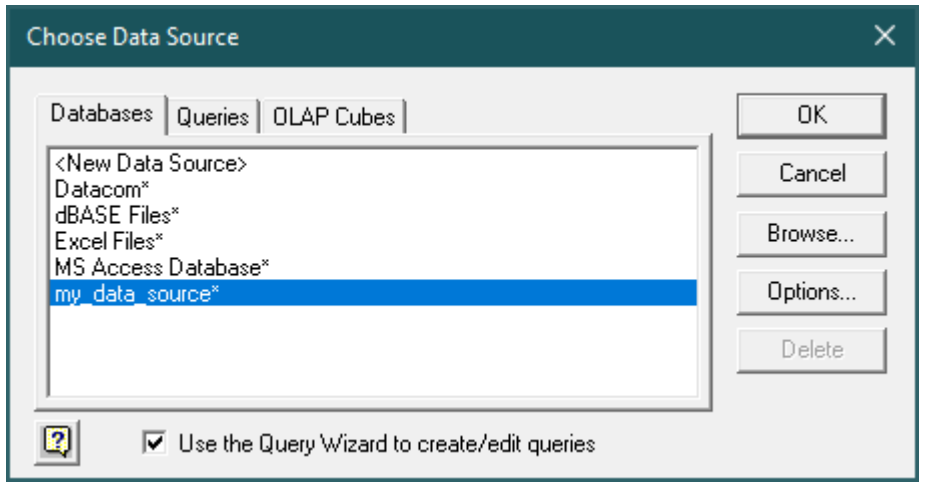
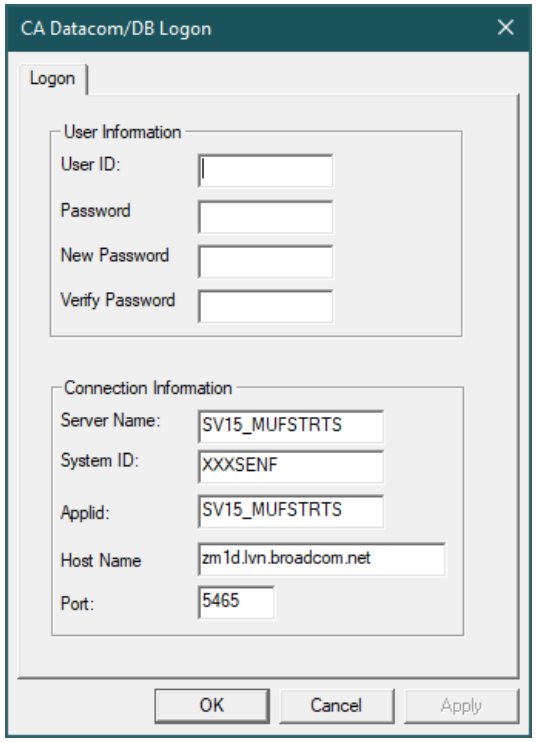
Using MS Excel with Datacom Server - cont'd

3. When the Choose Data Source panel appears, select the Server ODBC data source you wish to use to make a connection.
4. Enter your credentials when the logon panel appears.





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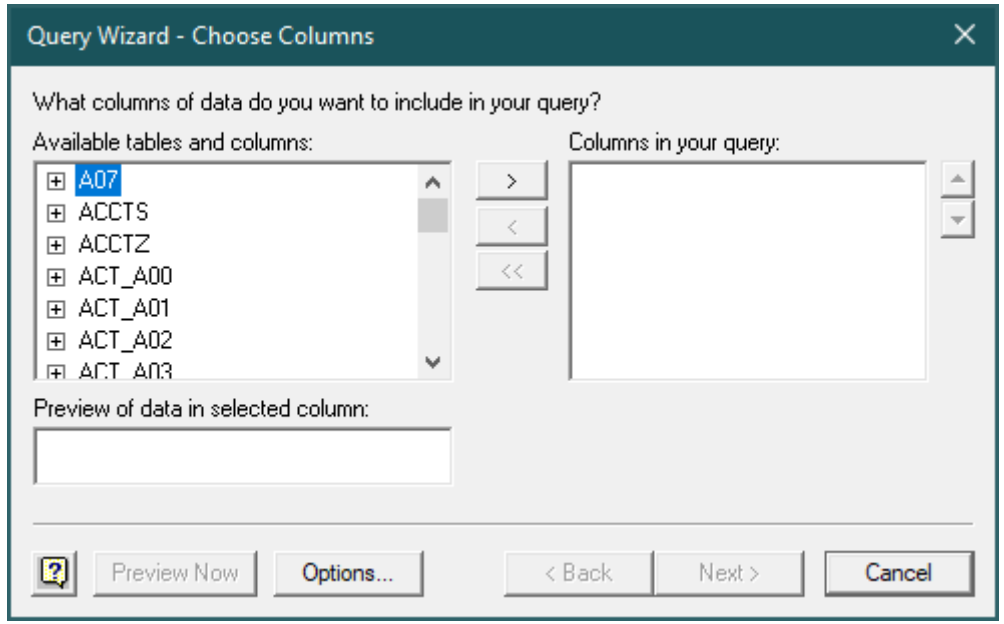
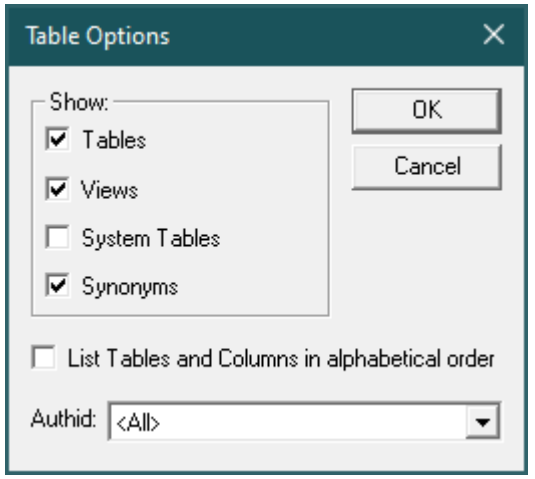
Using MS Excel with Datacom Server - cont'd

5. A table list appears. Optionally, click the Options button to filter the table list by Authid/Schema name, tables, views, synonyms, etc.





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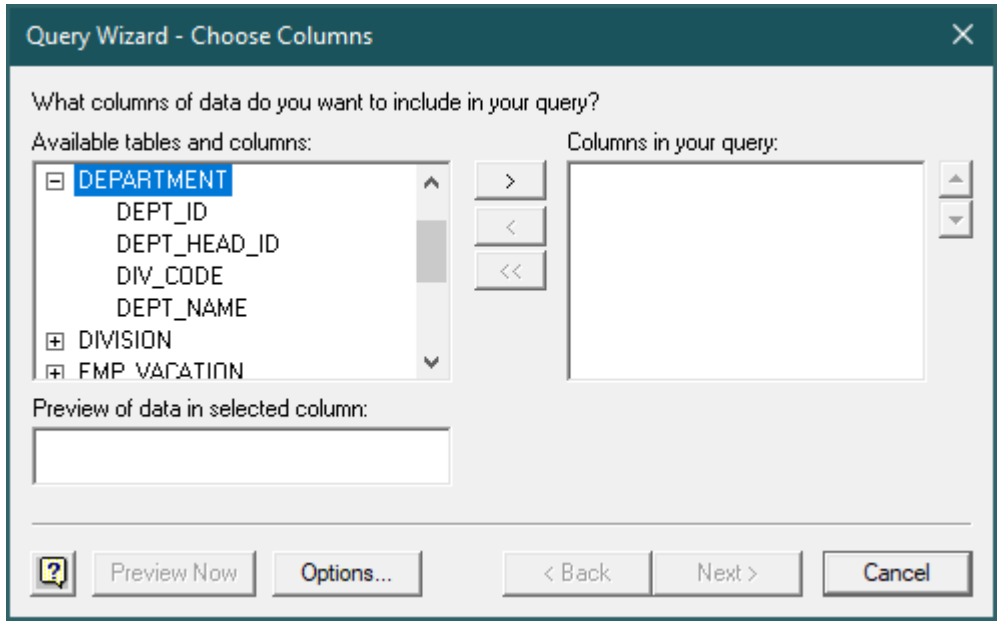
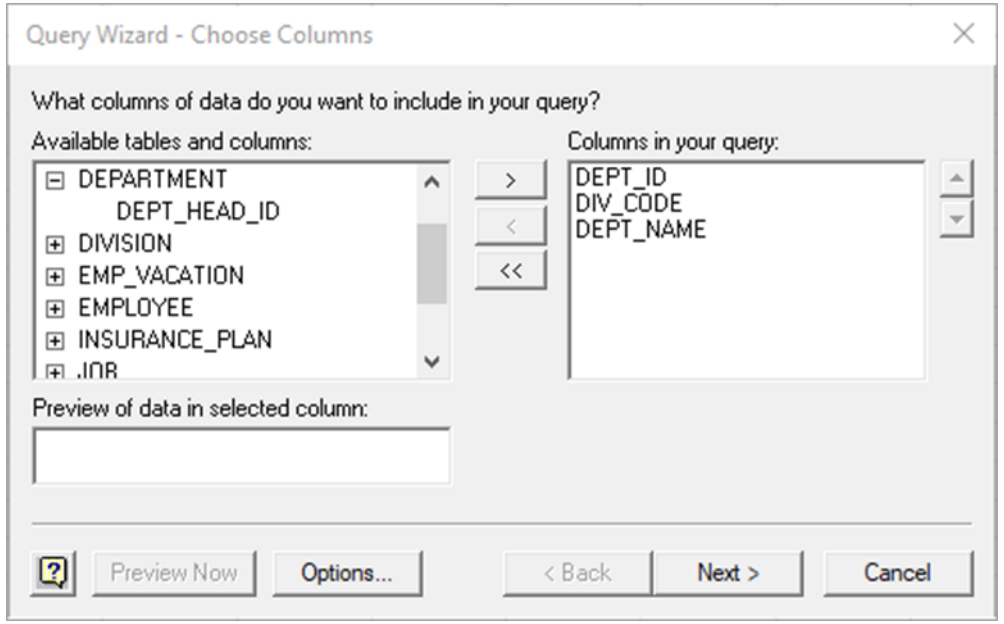
Using MS Excel with Datacom Server - cont'd

6. Click the + to the left of the desired table to expand the column list
7. Choose the columns for the query and click the right arrow to add them
8. Click next to proceed.





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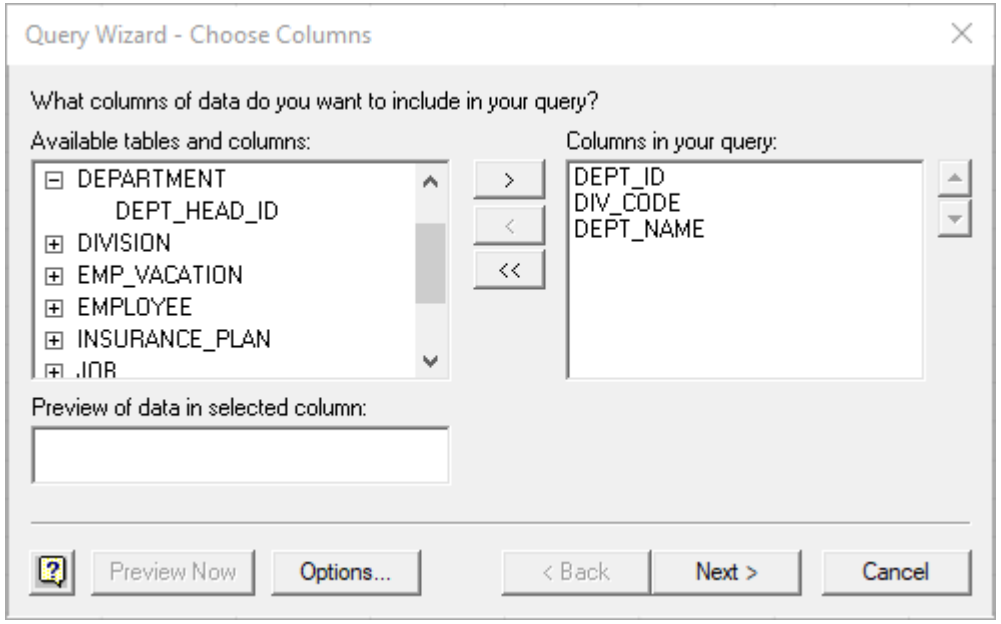
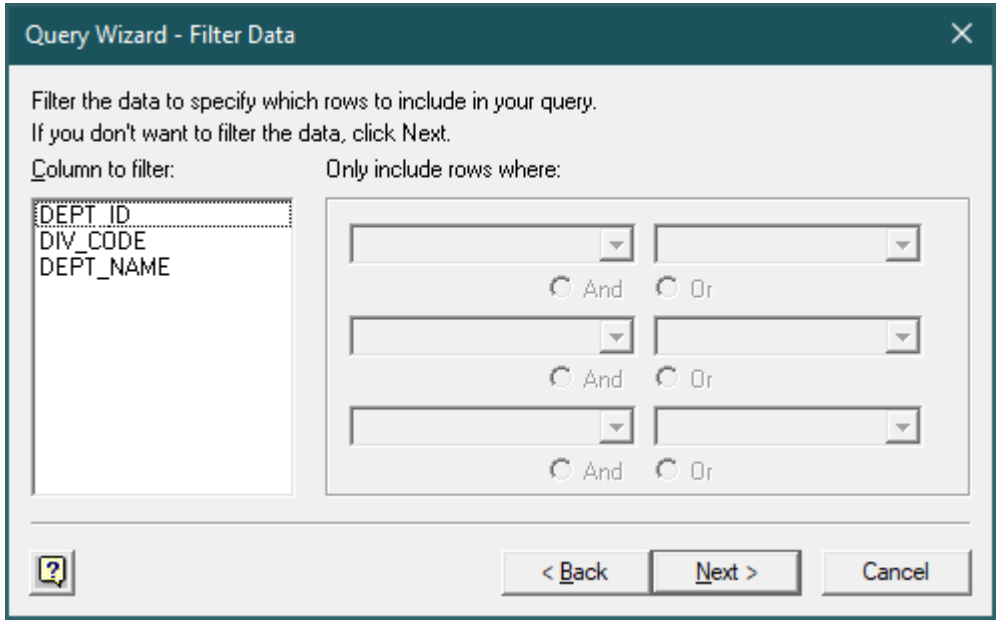
Using MS Excel with Datacom Server - cont'd

8. The Query Wizard – Filter Data panel allows you to build a WHERE clause to filter the data.





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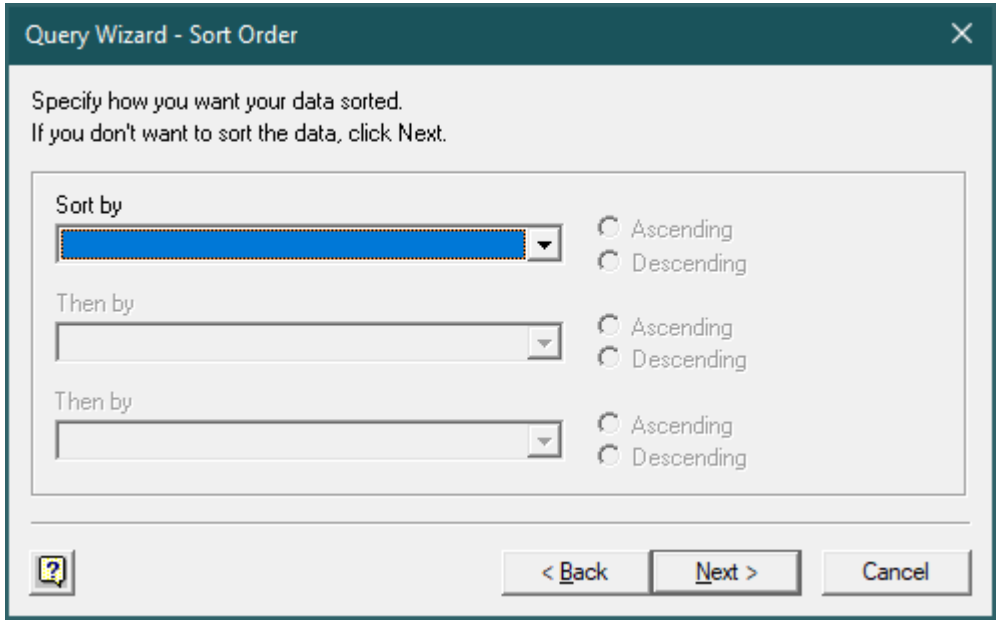
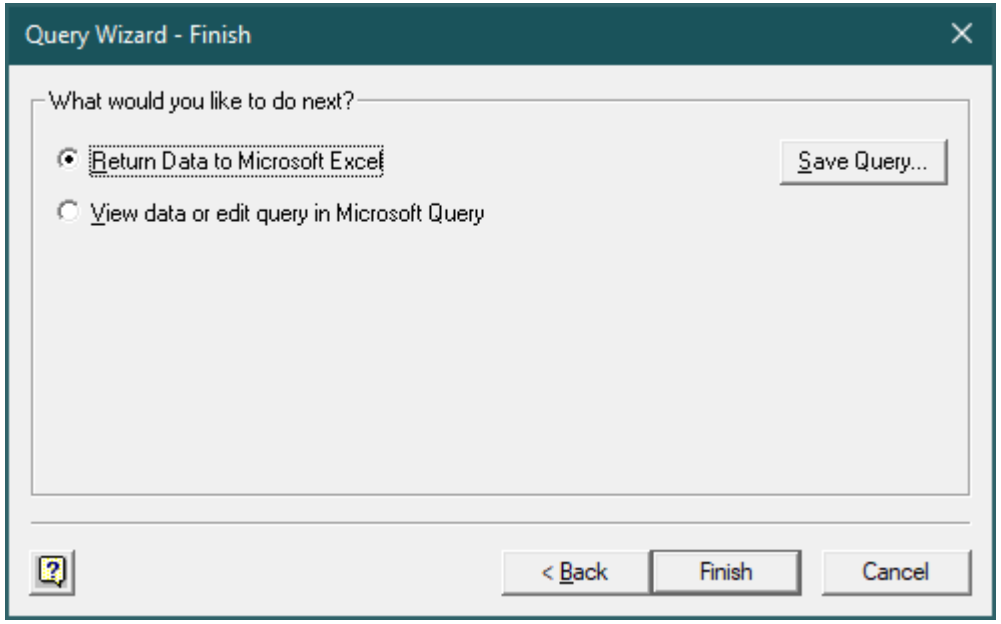
Using MS Excel with Datacom Server - cont'd

10. The Query Wizard – Sort Order panel allows you to enter sort options.
11. Click Next to proceed.
12. The Query Wizard – Finish panel allows you to save the query, return the data to MS Excel immediately or open Microsoft Query to further edit the query.





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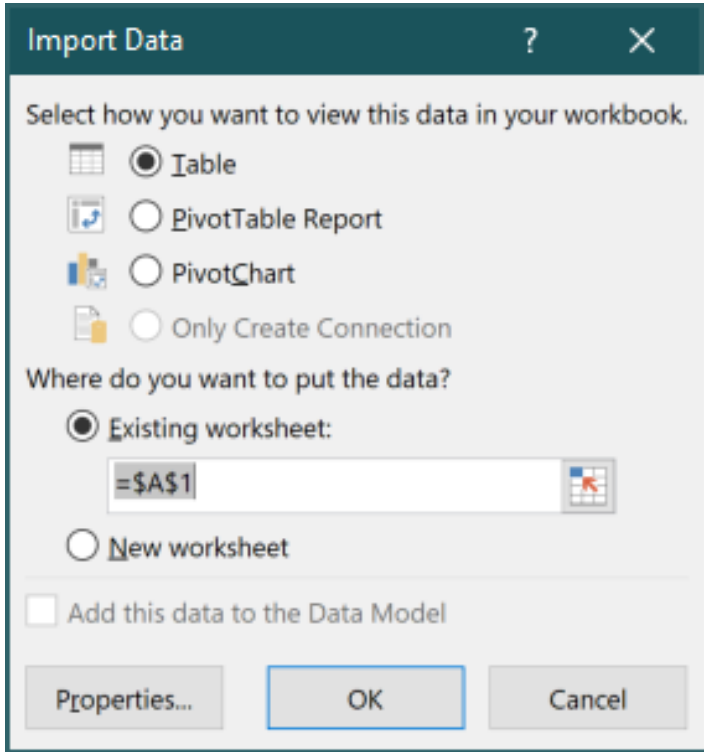
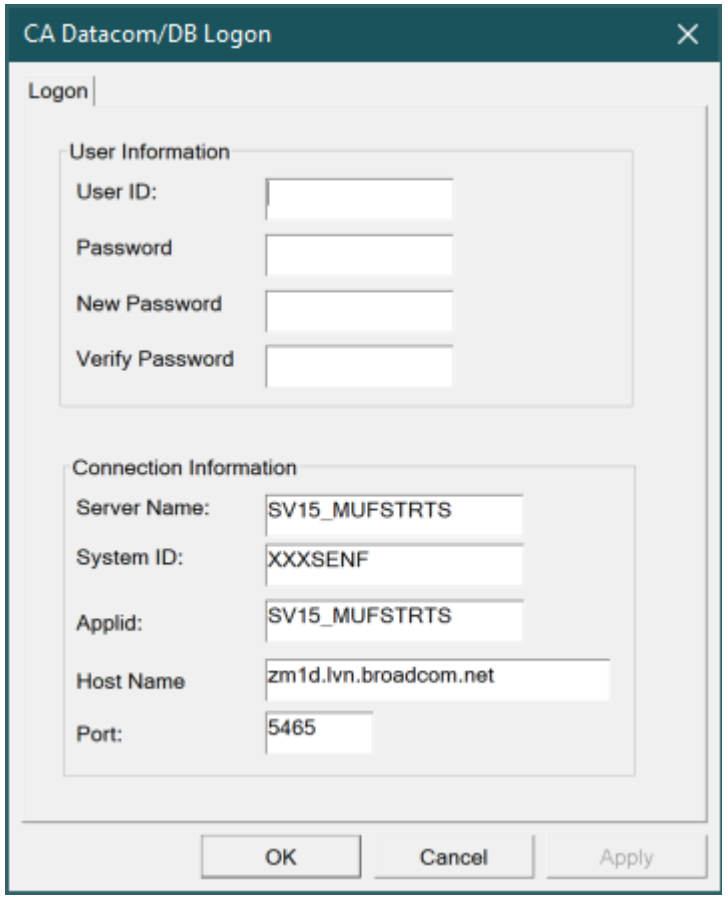
Using MS Excel with Datacom Server - cont'd

13. The Import Data panel allows you to choose how to view the data.
14. MS Query opens a new connection to the database to retrieve the data. Again. Enter your credentials in the Datacom Logon panel.





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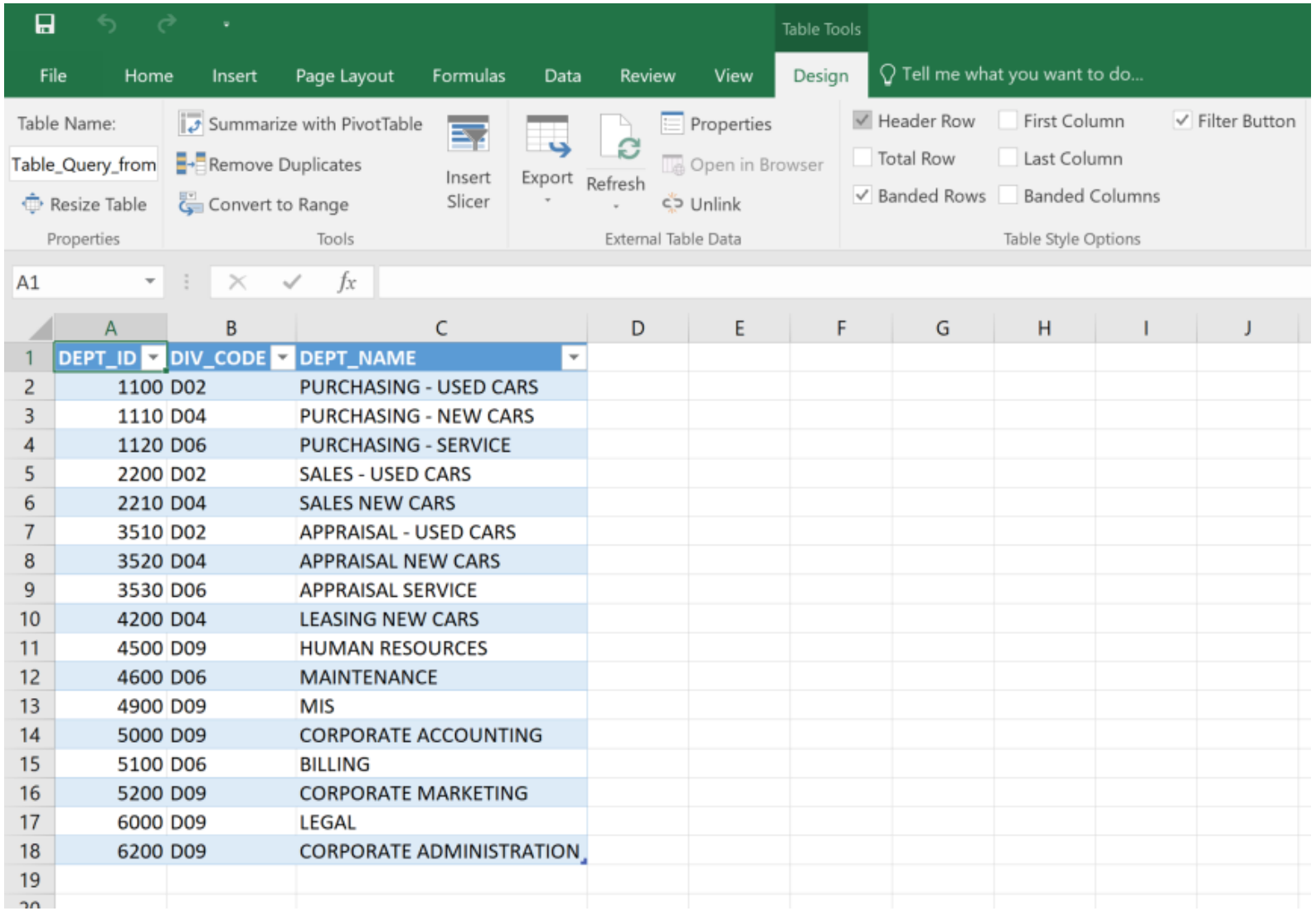
Using MS Excel with Datacom Server - cont'd



	A	B	C	D	E	F	G	H	I	J
1	DEPT_ID	DIV_CODE	DEPT_NAME							
2	1100	D02	PURCHASING - USED CARS							
3	1110	D04	PURCHASING - NEW CARS							
4	1120	D06	PURCHASING - SERVICE							
5	2200	D02	SALES - USED CARS							
6	2210	D04	SALES NEW CARS							
7	3510	D02	APPRAISAL - USED CARS							
8	3520	D04	APPRAISAL NEW CARS							
9	3530	D06	APPRAISAL SERVICE							
10	4200	D04	LEASING NEW CARS							
11	4500	D09	HUMAN RESOURCES							
12	4600	D06	MAINTENANCE							
13	4900	D09	MIS							
14	5000	D09	CORPORATE ACCOUNTING							
15	5100	D06	BILLING							
16	5200	D09	CORPORATE MARKETING							
17	6000	D09	LEGAL							
18	6200	D09	CORPORATE ADMINISTRATION							
19										

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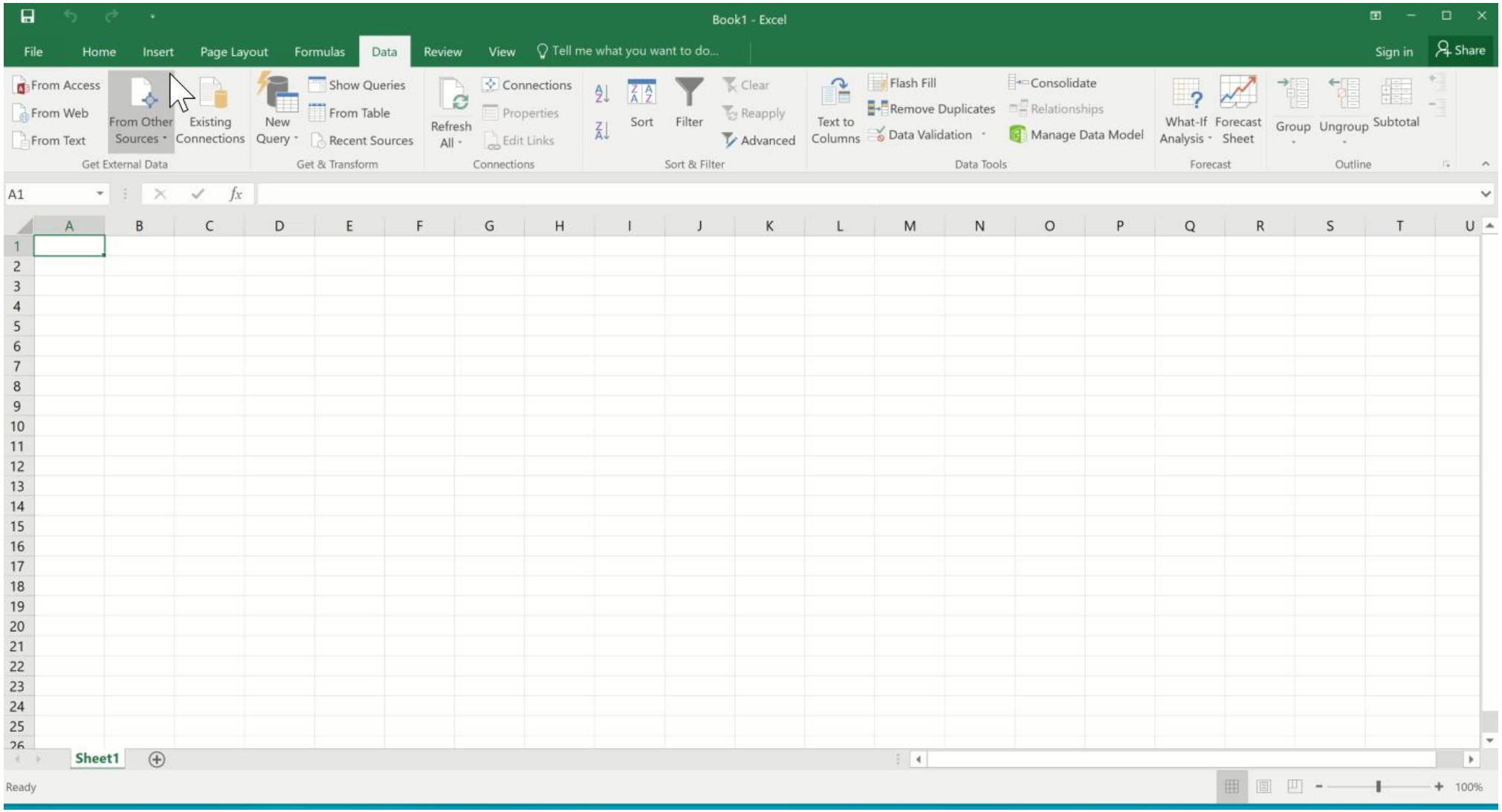
Demo: Using MS Excel with Datacom Server



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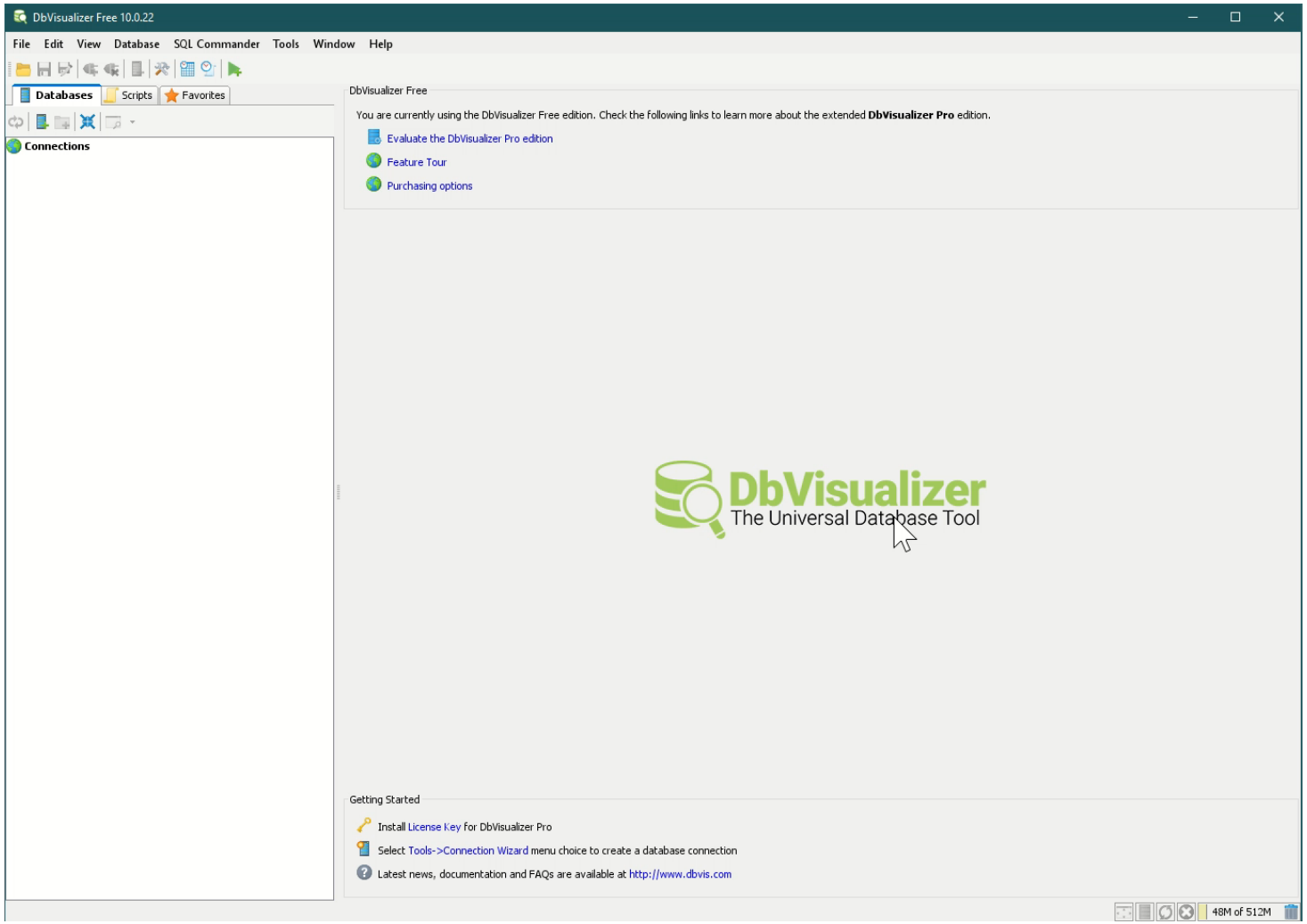
Demo - Using DbVisualizer with Datacom Server



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