

Getting Started with CA IDMS SQL and CA IDMS Server

Dave Dillon
CA Technologies

IUA/CA IDMS™ Technical Conference May 7-11, 2018



Abstract

With the advent of Portfolio Simplification, all customers are now entitled to use CA IDMS SQL and CA IDMS Server. CA IDMS SQL enables SQL access to existing CA IDMS databases, with no need for migration or replication. CA IDMS Server provides industry standard ODBC and JDBC interfaces that enable access to CA IDMS databases and applications from Java and Windows. Come to this session to learn how to configure and use these powerful features to leverage and extend your CA IDMS systems.



Copyright © 2018 CA. All rights reserved.



2

Agenda

- 1 PORTFOLIO SIMPLIFICATION
- 2 CA IDMS SQL
- 3 ACCESSING NETWORK DATA USING SQL
- 4 CA IDMS SERVER
- 5 INSTALLATION & CONFIGURATION
- 6 DEMO
- 7 QUESTIONS AND ANSWERS

Portfolio Simplification

Portfolio Simplification

- Provides all IDMS/DB users access to:
 - CA IDMS SQL Option
 - CA IDMS Server
 - Other good stuff
- Long awaited feature!
- Enabling technologies
 - Allow users to access their IDMS data from other platforms
- Enhance rather than Replace



Copyright © 2018 CA. All rights reserved.



CA IDMS SQL



Copyright © 2018 CA. All rights reserved.



CA IDMS SQL Capabilities

- Enabling Feature
- Define new SQL databases
- Access existing network databases
 - No conversion needed
- Compiled SQL
 - Generated by pre-compilers/generators
- Dynamic SQL
 - Client/server and web service access
- Procedure Support

Non-SQL data can be accessed from anywhere SQL DML can be issued



Copyright © 2018 CA. All rights reserved.



CA IDMS SQL Components

- Catalog to hold SQL entities
- Command Facility
 - OCF
 - BCF
- Pre-compilers
 - COBOL
 - PL/I
 - ADS/Online
- SQL Optimizer
- Runtime Engine



Copyright © 2018 CA. All rights reserved.



8

SQL Catalog

- Contains SQL entity definitions
- Dictionary database areas
 - DDLCAT
 - Schemas
 - Tables
 - Views
 - Security Definitions
 - DDLCATX
 - Indexes on DDLCAT entities
 - DDLCATLOD
 - Access modules
 - DMCL



Copyright © 2018 CA. All rights reserved.



Access Module

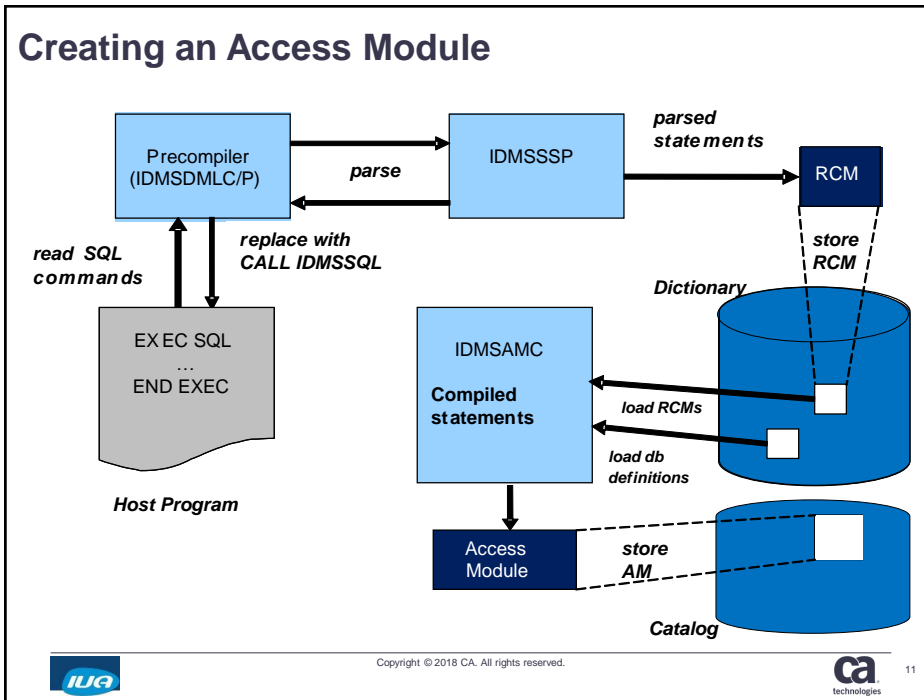
- Created by access module compiler, under:
 - OCF
 - BCF
- Contains:
 - Compiled versions of all SQL commands (RCMs)
 - RCM = Relational Command Module
 - Optimized access strategy for each command
- Is stored in the Catalog Load Area (DDLCATLOD)
- Loaded at runtime and used during program execution
- Static SQL



Copyright © 2018 CA. All rights reserved.



10



Dynamic SQL

- SQL statements are compiled and executed immediately on the fly
- Used in:
 - Command Facilities
 - OCF
 - BCF
 - ODBC
 - CA IDMS Visual DBA
 - JDBC
 - JCF (Java Command Facility)
- Overhead of AM compilation can be mitigated using SQL Statement Caching

Dynamic SQL Caching

- For dynamical SQL statements, the result of compilation is saved in the cache
- Avoid recompilation when same SQL statement executed
- Particularly useful for Web-Based (ODBC/JDBC) applications
- Access Module generation can be costly

- Controlled in SYSGEN:

ADD SQL CACHE

FOR 100 STATEMENTS

DEFAULT CACHING IS ON

EXCEPT CONNECT TO ().

- Controlled locally for individual session using SET SESSION
- Local Batch jobs can use SQL_CACHE_ENTRIES in SYSIDMS



Copyright © 2018 CA. All rights reserved.



Procedure Support

- Procedures allow you to associate a program with a Table definition
- Two Types
 - SQL Procedures
 - Table Procedures
- Can be used to overcome problems accessing Network Databases using SQL
- Procedure programs can issue both Network DML and SQL statements



Copyright © 2018 CA. All rights reserved.



Procedure Support

- SQL Procedures
 - Invoked using 'CALL' or 'SELECT'
 - Generally return 0 or 1 row
 - Can be written in COBOL, PL/I, Assembler, SQL Procedure Language, ADS/Online
- Table Procedures
 - Invoked using 'SELECT', 'INSERT', 'UPDATE', or 'DELETE'
 - Can return an entire result set
 - Can be written in COBOL, PL/I, Assembler
 - Can be generated (in COBOL) using SQL Quick Bridge

Accessing Network Data Using SQL

Access to Network Records

In One Easy Step!

- Within one of the Command Facilities:

```
CREATE SCHEMA EMPSQL
FOR NONSQL SCHEMA
SYSDICT.EMPSCHM VERSION 100
DBNAME EMPDEMO;
```

- Schema definition (only) stored in SQL Catalog

- And now...

```
SELECT * FROM EMPSQL.EMPLOYEE;
```



Copyright © 2018 CA. All rights reserved.



Access to Network Records

Voila!

```
OCF 19.0 IDMS NO ERRORS 1/400 TECHDC60
SELECT * FROM EMPSQL.EMPLOYEE;
```

EMP_ID_0415	EMP_FIRST_NAME_0415	EMP_LAST_NAME_0415	EMP_STREET_0415
23	DAVE	HEARN	12 EAST SPEEN ST
329	PHINEAS	FINN	79 HIGH ST
48	NANCY	TERNER	14 TYPO TERR
371	BETH	CLOUD	3456 PINKY LN
20	CAROL	JACOBI	555 JAKAS DR
81	TOM	FITZHUGH	450 THRUWAY ST



Copyright © 2018 CA. All rights reserved.



CA IDMS SQL Relational to Network Mapping

<u>SQL</u>		<u>Network</u>	
Table	• Identically named	Record	• Via SCHEMA
Row	• Equivalent	Record occurrence	• Equivalent
Column	• Automatically renamed	Element	• Except ODO, redefines, ...
Referential constraint	• Partial mapping	Set	• Lack of foreign keys



Copyright © 2018 CA. All rights reserved.



No Need to Create a new Database

- Every network record automatically appears as a table

EMPLOYEE			
415	F	120	CALC
EMP-ID-0415			
EMP-DEMO-REGION			

OBTAIN CALC becomes

```
SELECT * FROM
EMPSQL.EMPLOYEE
WHERE "EMP_ID_0415" = 9771;
```



Copyright © 2018 CA. All rights reserved.



Database Navigation

Network Model



Database Navigation

Relational Model

Department Table

DEPT_ID	DEPT_NAME
1001	SALES
1010	HUMAN RES
1050	ACCOUNTING
1090	PAYROLL

Employee Table

EMP_ID	E_LNAME	E_FNAME	JOB	DEPT
12345	CLEMENS	SAMUEL	J200	1010
21343	MCGEE	AGNES	J001	1001
31254	GIBSON	JOHN	J010	1050
43251	SCOTT	WESTON	J410	1050

↑
PRIMARY KEY

↓
FOREIGN KEY

SQL Access to Non-SQL Data

Where Set-Name

- Use the Set Specification as part of the WHERE clause
- Causes Set to be Navigated to Facilitate Join of Tables
- Improves the Efficiency of Join Operations
- CA IDMS Extension to the SQL Standard
- Example:

```
SELECT * FROM EMPSQL.DEPARTMENT,  
EMPSQL.EMPLOYEE  
WHERE "DEPT-EMPLOYEE"
```

CA IDMS Server

CA IDMS Server

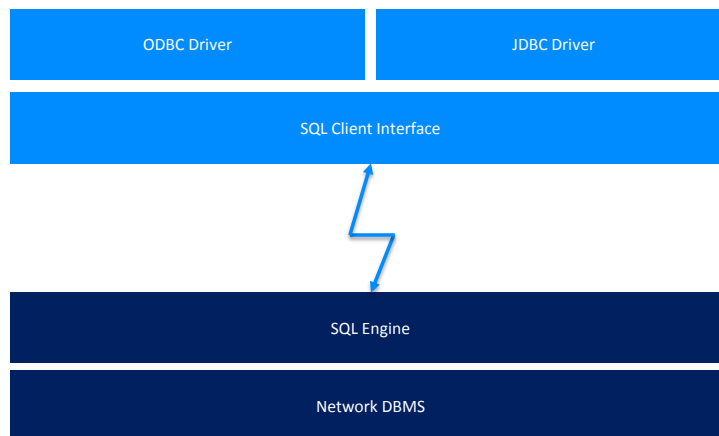
- Comprised of an:
 - ODBC Driver
 - JDBC Driver
- CA IDMS as a Server
- Access to CA IDMS databases
 - Windows
 - Any Java Platform
- Dynamic SQL



Copyright © 2018 CA. All rights reserved.



CA IDMS Server Architecture



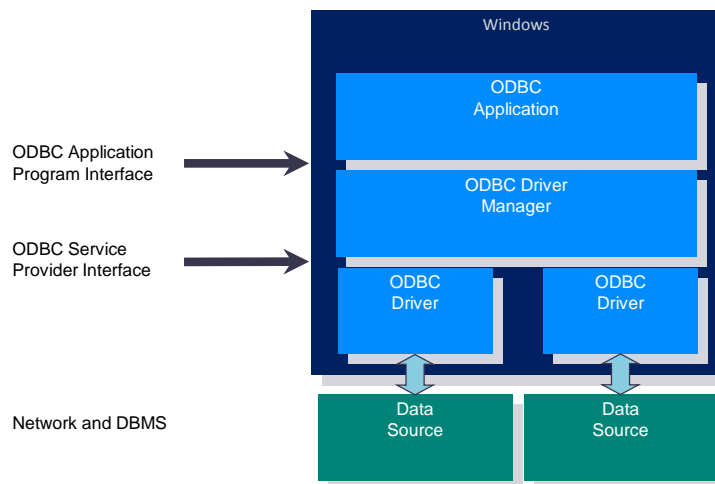
Copyright © 2018 CA. All rights reserved.

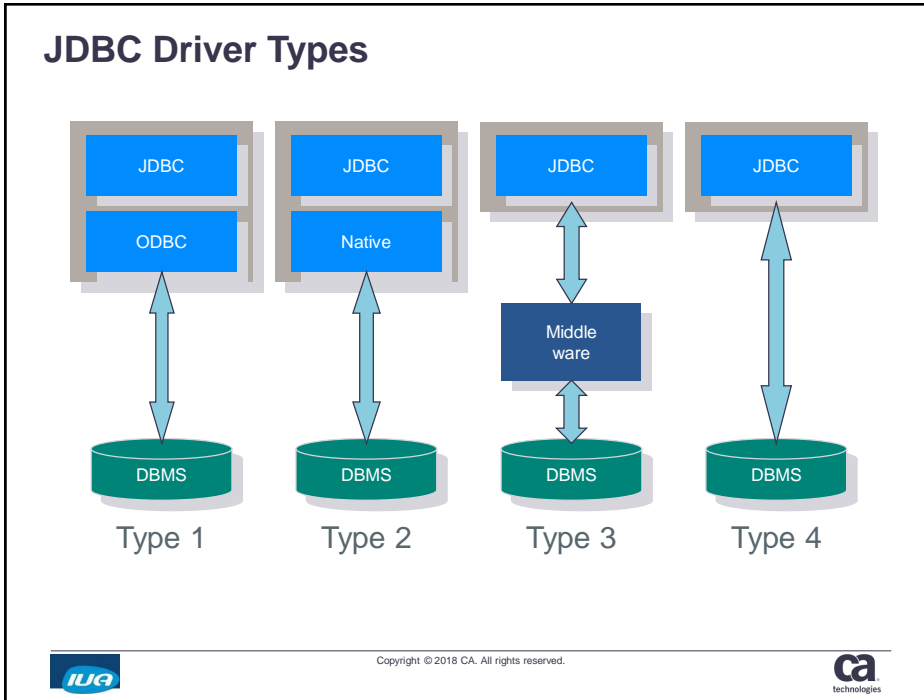


ODBC

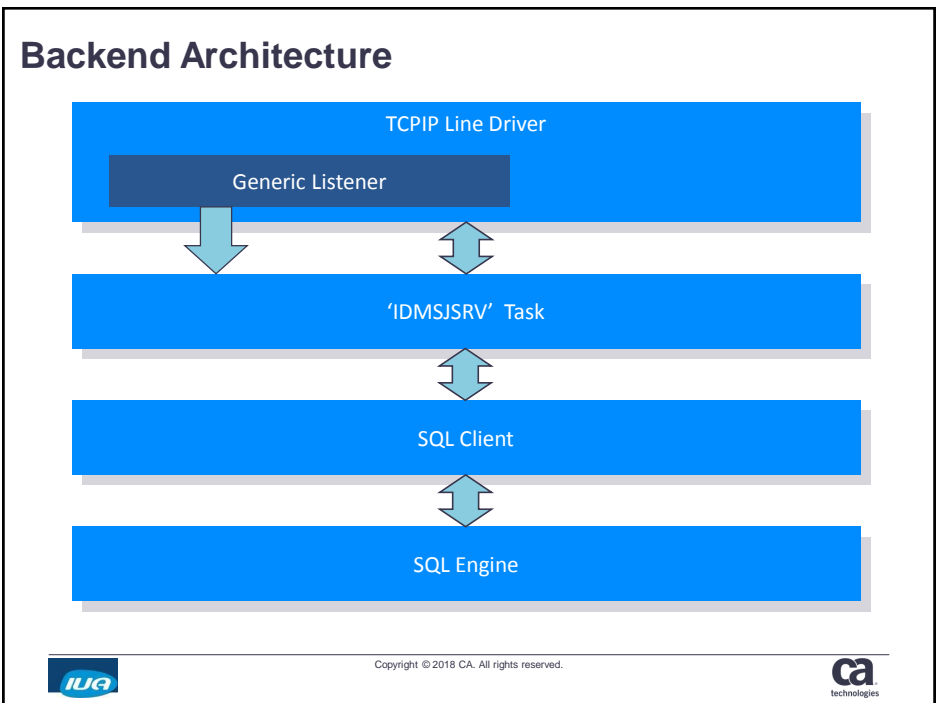
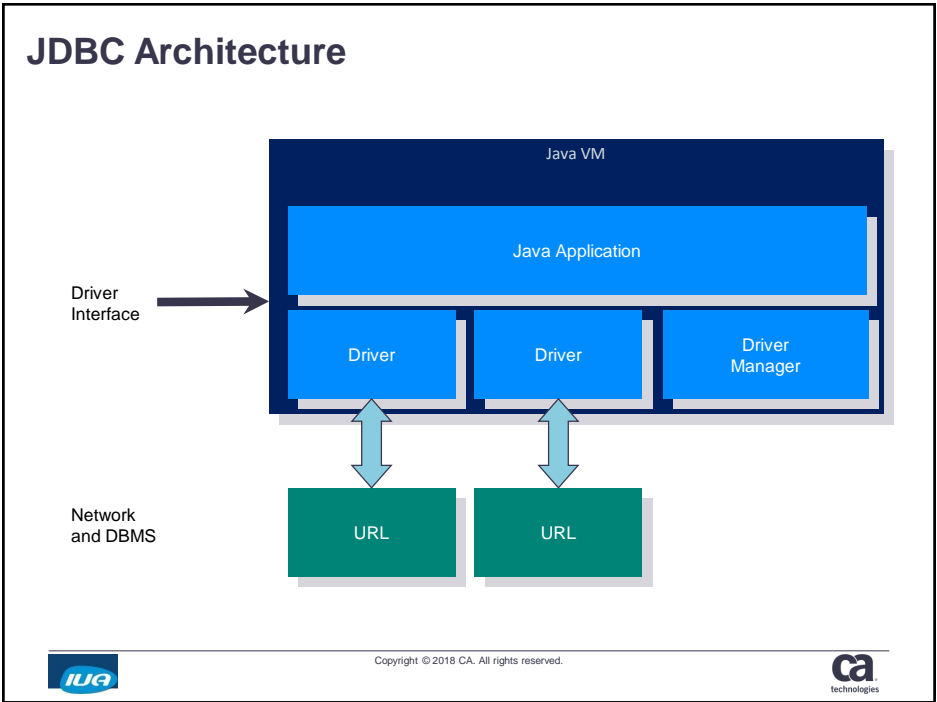
- Call Level Interface (CLI)
- Dynamic SQL
 - Interoperability
- Microsoft Windows
- ODBC.NET
- ODBC 3.5
- Wire protocol communications
- 32 and 64-bit drivers

ODBC Architecture



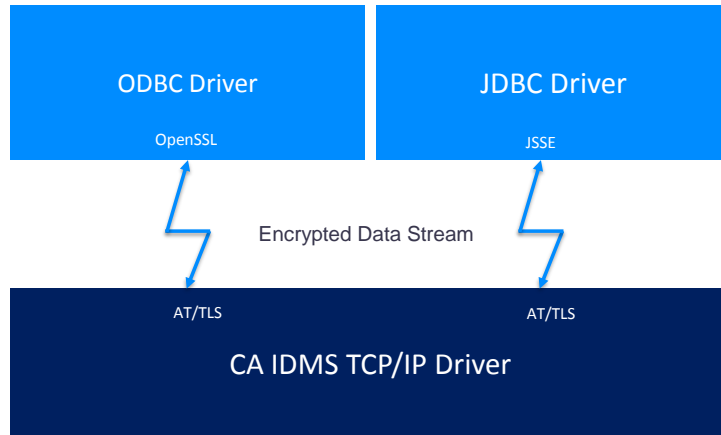


- ### CA IDMS JDBC Driver
- Call Level Interface (CLI)
 - JDBC 4.0
 - “Universal” driver
 - Types 2, 3, 4
 - Type 2 Driver
 - 32-BIT & 64 BIT
 - Type 3 Driver
 - Middleware runs on Windows or USS
 - Type 4 JDBC Driver
 - Direct connection from JDBC driver to CV
 - Distributed XA transactions
- Copyright © 2018 CA. All rights reserved.



Secure Communications

TLS Support



Installation & Configuration

Mainframe Software Installation

- CA IDMS installs all code with base software
- LMP Key Processing Remains the same
 - Customers will need to contact support to obtain required keys
 - CA IDMS 19.0 enhancement RO96807 enables all new options
- CA IDMS Server Client software downloads from CSO
- Update your PINT module (RHDCPINT)



Copyright © 2018 CA. All rights reserved.



Installing CA IDMS SQL

- Catalog Creation
 - May already be there if either:
 - CA IDMS Visual DBA already in use
 - SQL Web Connect installed
- May also want to install SQL Demo Database
- Can perform 'Add-On' install using either:
 - CAISAG - Standard IDMS Install Program
 - CSM - Chorus Software Manager (GUI Tool)



Copyright © 2018 CA. All rights reserved.



Add-On Install using CAISAG

- To Designate an Add-on Install:
 - Set ADDPROD parameter to 'YES'
 - Set CA-IDMS/DB-SQL parameter to 'INSTALL'
- To Direct the Updating of the RHDCPINT module
 - Specify 'YES' for 'CA IDMS SQL Option'
 - Specify 'YES' for 'CA IDMS Server'
- New Variables:
 - ADDSYS SQL – Governs creation of System Catalog
 - ADDQDEMO – Governs creation of SQL Demo DB
 - BEGINMEM – Governs member name prefix



Copyright © 2018 CA. All rights reserved.



Add-On Install using CAISAG

- SQL Jobstreams Created:
 - SQL05 - Allocates SQL catalog and Demo DB files
 - SQL08 - Builds the new SQL catalog
 - SQL10 - Formats and populates the SQL catalog
 - SQL15 - Builds, formats & populates SQL Demo DB
- See Docops Topics:
 - "Installing the CA IDMS SQL Component"
 - "SQL Usage"



Copyright © 2018 CA. All rights reserved.



Add-On Install using CSM

Chorus Software Manager

- Same options/parms as described in CAISAG
- Documented within the GUI
- 'Add-On installation' is referred-to as an 'Update installation'
- Automatically updates your:
 - Global DMCL
 - Database Name Table (DBTB)



Copyright © 2018 CA. All rights reserved.



CA IDMS Server

Mainframe Configuration

- SYSGEN 'Listener' Definition

```
ADD PTERM TCPJSRV
TYPE IS LISTENER
PORT IS 3760
TASK IS RHDCNP3J
IN LINE TCPIP
PARM IS 'TASK=IDMSJSRV' .

ADD LTERM TCLJSRV
PTERM IS TCPJSRV.
```



Copyright © 2018 CA. All rights reserved.



CA IDMS Server

Client Software Acquisition and Installation

- “Download Center” page on CA Support Online:
 - <https://support.ca.com/>
 - Filter on Product “CA IDMS Server Option MVS”
 - Select Item:
 - “IDMS SRVR CD ZIP FILE ESD ONLY” (Release 17.0)
- Perform “Typical” Install
 - 32-bit ODBC Driver
 - 64-bit ODBC Driver



Copyright © 2018 CA. All rights reserved.



Client Configuration

CA IDMS Server ODBC Administrator

Data Source Server Log Options SSL International JDBC Server About

Options

Data Source:

Dictionary:

Server:

Default Schema:

Program Name:

Advanced Options



Copyright © 2018 CA. All rights reserved.



Client Configuration

The screenshot shows the 'CA IDMS Server ODBC Administrator' dialog box with the 'Server' tab selected. The 'Options' section contains a 'Name' field with 'My IDMS CV' and a 'Delete' button. The 'Node Name' field is empty. The 'Connection Options' section has 'Communications Protocol' with radio buttons for 'IDMS' (selected) and 'OCI', and an 'SSL' checkbox. The 'Host Name' field contains 'USILCA31', the 'Port' field contains '3760', and the 'Wait Timeout' field contains '30'. The 'Advanced Options' section has 'Current' and 'System' buttons. At the bottom are 'OK', 'Cancel', 'Apply', and 'Help' buttons.

Demo

Demo

- Create SQL Schema
- Test Access to Network Data using OCF
- Define ODBC Data Source
- Test Connection & Test SELECT issued above
- Test JDBC Access using JCF



Copyright © 2018 CA. All rights reserved.



Summary

- Portfolio Simplification gives you the tools you need
- Simple Installation
- Simple Configuration
- Easy to provide Web access to your CA IDMS Network Databases



Copyright © 2018 CA. All rights reserved.



FOR INFORMATION PURPOSES ONLY

Terms of this Presentation

This presentation was based on current information and resource allocations as of May 2018 and is subject to change or withdrawal by CA at any time without notice. Notwithstanding anything in this presentation to the contrary, this presentation shall not serve to (i) affect the rights and/or obligations of CA or its licensees under any existing or future written license agreement or services agreement relating to any CA software product; or (ii) amend any product documentation or specifications for any CA software product. The development, release and timing of any features or functionality described

in this presentation remain at CA's sole discretion. Notwithstanding anything in this presentation to the contrary, upon the general availability of any future CA product release referenced in this presentation, CA will make such release available (i)

for sale to new licensees of such product; and (ii) to existing licensees of such product on a when and if-available basis as part of CA maintenance and support, and in the form of a regularly scheduled major product release. Such releases may be made available to current licensees of such product who are current subscribers to CA maintenance and support on a when and

if-available basis. In the event of a conflict between the terms of this paragraph and any other information contained in this presentation, the terms of this paragraph shall govern.

Certain information in this presentation may outline CA's general product direction. All information in this presentation is for your informational purposes only and may not be incorporated into any contract. CA assumes no responsibility for the accuracy or completeness of the information. To the extent permitted by applicable law, CA provides this presentation "as is" without warranty of any kind, including without limitation, any implied warranties or merchantability, fitness for a particular purpose, or non-infringement. In no event will CA be liable for any loss or damage, direct or indirect, from the use of this document, including, without limitation, lost profits, lost investment, business interruption, goodwill, or lost data, even if CA is expressly advised in advance of the possibility of such damages. CA confidential and proprietary. No unauthorized copying or distribution permitted.



Copyright © 2018 CA. All rights reserved.



Questions & Answers

Please Complete a Session Evaluation Form

- The number for this session is **A01**
- After completing your session evaluation form, place it in the envelope at the front of the room

The form is titled "IUA / CA IDMS Technical Conference Session Evaluation Form" and includes the IUA and CA logos. It contains the following sections:

- Session Number:** A01
- Name (Optional):**
- Session Title:**
- Rate the overall session:** A table with columns for "Fair", "Good", and "Excellent", each with a rating scale from 1 to 5.
- Rate the speaker's preparation and knowledge of the subject covered:** A table with columns for "Strongly Disagree", "Disagree", "Neutral", "Agree", and "Strongly Agree", each with a rating scale from 1 to 5.
- Comments:** A text area for providing feedback.
- Rate the session met my expectations:** A table with columns for "Strongly Disagree", "Disagree", "Neutral", "Agree", and "Strongly Agree", each with a rating scale from 1 to 5.
- Comments:** A text area for providing feedback.
- Rate the material is related to my current job:** A table with columns for "Strongly Disagree", "Disagree", "Neutral", "Agree", and "Strongly Agree", each with a rating scale from 1 to 5.
- Comments:** A text area for providing feedback.
- Overall assessment for session to be changed:** A table with columns for "Strongly Disagree", "Disagree", "Neutral", "Agree", and "Strongly Agree", each with a rating scale from 1 to 5.
- Comments:** A text area for providing feedback.
- Rate the session length was appropriate for the content:** A table with columns for "Strongly Disagree", "Disagree", "Neutral", "Agree", and "Strongly Agree", each with a rating scale from 1 to 5.
- Comments:** A text area for providing feedback.
- This session would be useful as a website:** A table with columns for "Strongly Disagree", "Disagree", "Neutral", "Agree", and "Strongly Agree", each with a rating scale from 1 to 5.
- Comments:** A text area for providing feedback.
- General Comments:** A series of horizontal lines for additional feedback.