

# Getting Started with CA IDMS SQL and CA IDMS Server

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## 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.



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## 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



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# Portfolio Simplification



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## 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



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## CA IDMS SQL



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## 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



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## CA IDMS SQL Components

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



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## SQL Catalog

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



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## Access Module

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

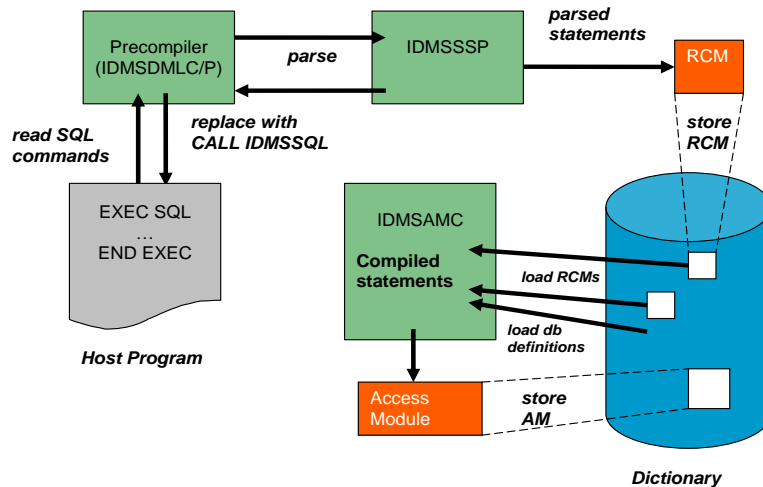


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## Creating an Access Module



## 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

## SQL Statement 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



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## 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



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## Procedure Support

- SQL Procedures
  - Invoked using 'CALL' or 'SELECT'
  - Generally return 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



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## Accessing Network Data Using SQL



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## 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;
```



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## 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



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## 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



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## 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;
```



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## Database Navigation

### Network Model



## Database Navigation

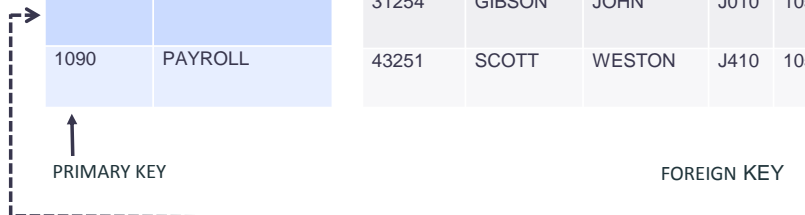
### Relational Model

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



## 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



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## CA IDMS Server



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## CA IDMS Server

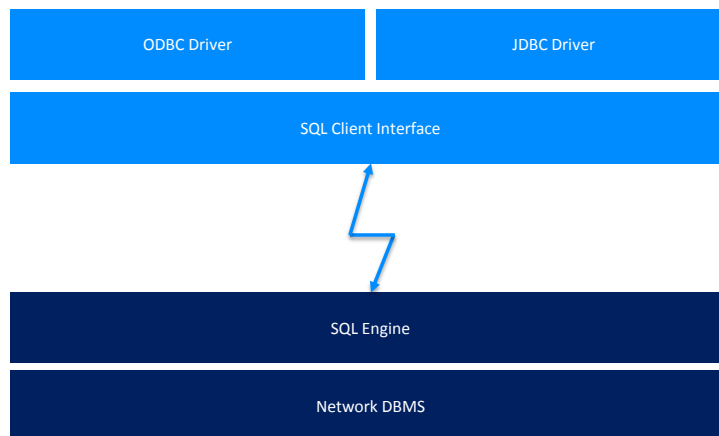
- Comprised of an:
  - ODBC Driver
  - JDBC Driver
- CA IDMS as a Server
- Access to CA IDMS databases
  - Windows
  - Any Java Platform
- Dynamic SQL



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## CA IDMS Server Architecture



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## ODBC

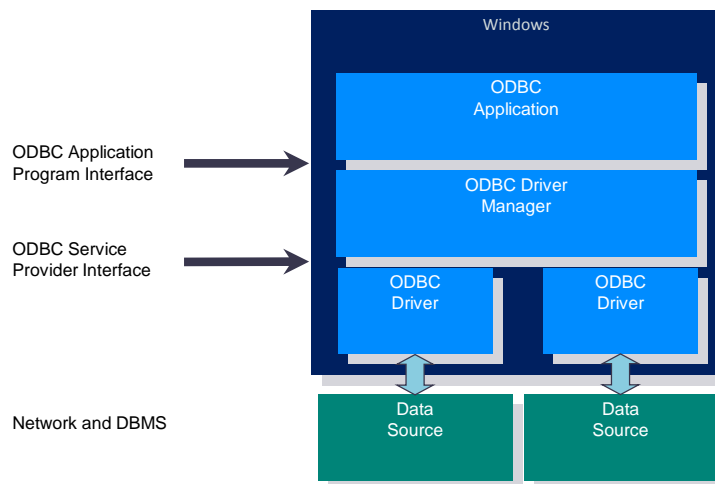
- Call Level Interface (CLI)
- Dynamic SQL
  - Interoperability
- Microsoft Windows
- ODBC.NET
- ODBC 3.5
- Wire protocol communications
- 32 and 64-bit drivers



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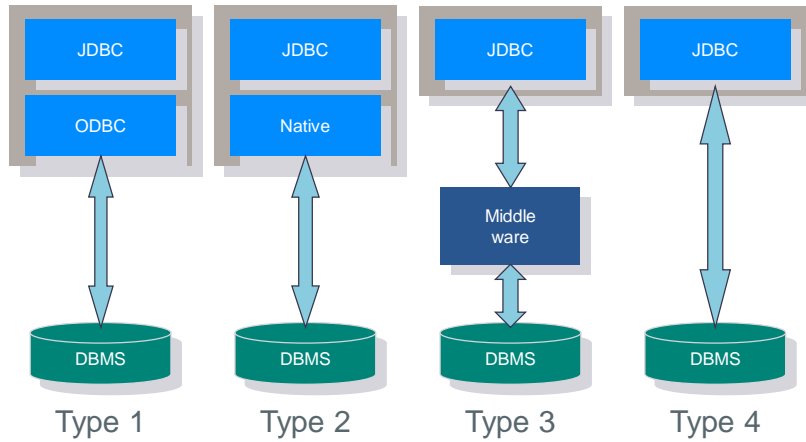
## ODBC Architecture



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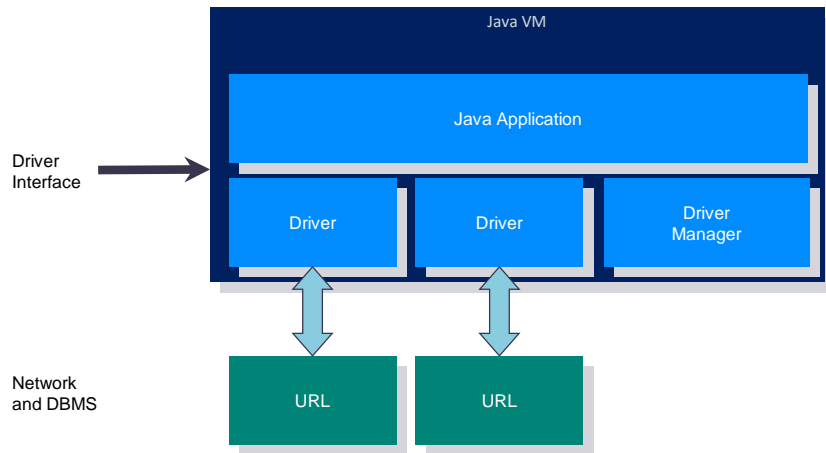
## JDBC Driver Types



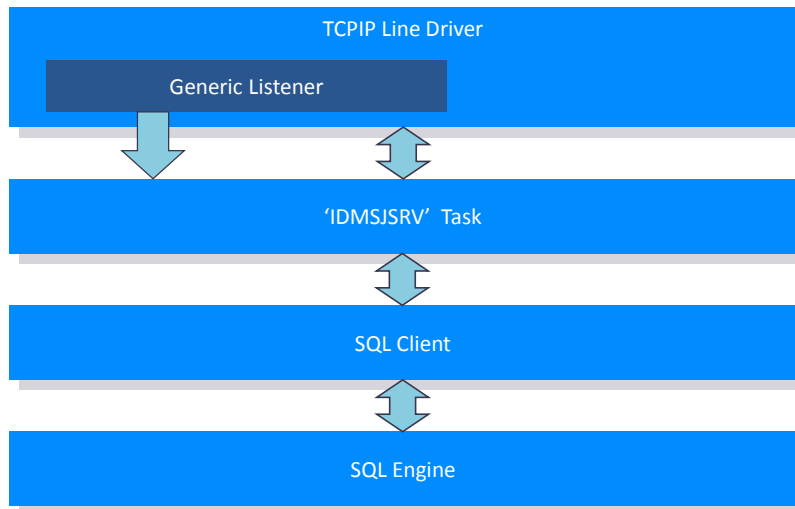
## CA IDMS JDBC Driver

- 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

## JDBC Architecture



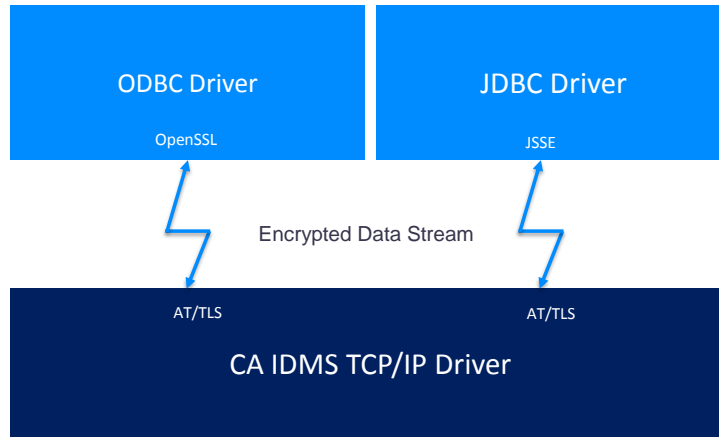
## Backend Architecture





## 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 RHDCPINT



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## 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)



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## 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



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## 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 Topic "Installing the CA IDMS SQL"



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## 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'



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## CA IDMS Server

Mainframe Configuration

- SYSGEN 'Listener' Definition

```
ADD PTERM TCPJSRV
  TYPE IS LISTENER
  PORT IS 37nn
  TASK IS RHDCNP3J
  IN LINE TCPIP
  PARM IS 'TASK=IDMSJSRV' .
```

```
ADD LTERM TCLJSRV
  PTERM IS TCPJSRV.
```



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## 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



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## Client Configuration

CA IDMS Server ODBC Administrator

Data Source | Server | Log Options | SSL | International | JDBC Server | About

Options

Data Source: My Data Source Test

Dictionary: SYSDICT

Server: My IDMS CV

Default Schema:

Program Name: IDMSODBC

Advanced Options

Current System

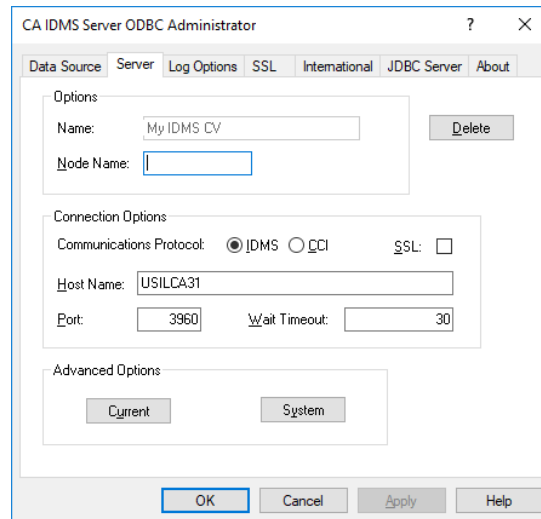
OK Cancel Apply Help



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## Client Configuration



CA IDMS Server ODBC Administrator

Options

Name: My IDMS CV Delete

Node Name:

Connection Options

Communications Protocol: ☒ IDMS ☐ OCI SSL: ☐

Host Name: USILCA31

Port: 3960 Wait Timeout: 30

Advanced Options

Current System

OK Cancel Apply Help

## 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



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## Summary

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



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Rate the overall session:

	Not	Good	Excellent
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
The speaker was prepared and knowledgeable of the subject matter	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Comments:					
The session met my expectations	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Comments:					
The speaker is reliable in my opinion	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Comments:					
I would recommend this session to a colleague	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Comments:					
The session length was appropriate for the content	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
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