

**Earned Value Management  
Practitioners Forum**  
Making Life Simpler Using SQL  
Statements in Cobra

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## Objectives

- SQL Overview
- Cobra Data Model
- SQL Command Utility
- Copy Project
- Limiting Access to SQL
- Useful Scripts
- Saving Scripts

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## SQL Overview

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## What is SQL?

- ▶ SQL stands for **Structured Query Language**
- ▶ SQL is used to communicate with a database
- ▶ ANSI has created standards for SQL so that the language is supported across database types

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## What is SQL?

- ▶ SQL statements are used to perform tasks such as to update data on or retrieve data from a database
- ▶ Are many places to learn more about SQL, such as: w3schools

<http://www.w3schools.com/sql/>

## Free SQL Training at: [www.w3schools.com/sql/](http://www.w3schools.com/sql/)

The screenshot shows the w3schools.com website. The main heading is 'SQL Tutorial'. Below it, there is a description: 'SQL is a standard language for accessing databases. Our SQL tutorial will teach you how to use SQL to access and manipulate data in: MySQL, SQL Server, Oracle, IBM, Sybase, ODBC, and other database systems.' There is a 'SQL Quiz Test' button and a 'Next Chapter' link. The page also includes a search bar and a navigation menu.

## SQL Command Utility

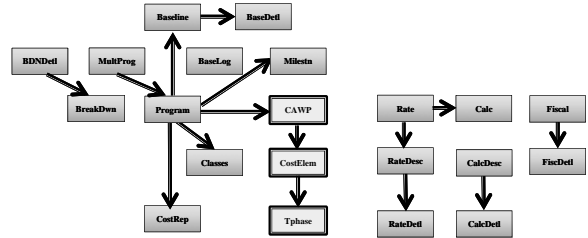
- ▶ The Cobra SQL Command Utility is a powerful export and global update utility
- ▶ Users can run SQL commands and scripts against the Cobra tables
- ▶ Basic SQL statements such as Select, Update, Delete, and Insert are supported

## SQL Commands Supported by Cobra

- ▶ Cobra supports Select, Update, Delete, and Insert statements
- ▶ Select statements copy data from tables to a view format that can be saved to Excel
- ▶ Update statements are used to update existing records in a table
- ▶ Delete statements are used to delete records from a table
- ▶ Insert statements are used to insert new records in a table

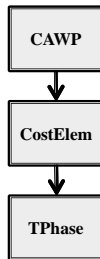
# Cobra Data Model

## Cobra Data Model

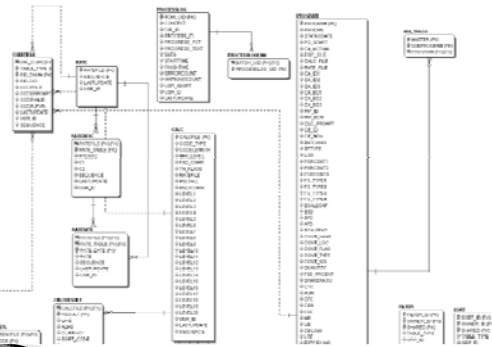


## Cobra Data Model, continued

- ▶ The CAWP, CostElem, and Tphase tables have a many-to-one relationship with each other
- ▶ Other key fields exist in the core tables; the Program and CAPWID are the minimum for returning activity data



## Cobra 5.1 ERD.jpg



## Cobra 5.1 ERD.jpg, CAWP Table



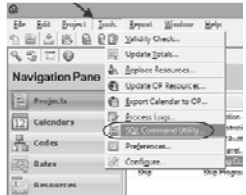
## SQL Command Utility

## SQL Scripts Provided with Cobra

- ▶ There are several sample scripts shipped with Cobra that can be found in the folder:  
C:\Program Files (x86)\Deltek\Cobra 5\Samples\Scripts
- ▶ The SQL statements shown in this presentation, unless otherwise noted, were prepared for Microsoft SQL Server
- ▶ SQL scripts for Microsoft SQL Server and for Oracle differ slightly in syntax and cannot be used interchangeably

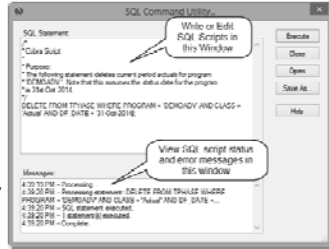
## Accessing the SQL Command Utility

- ▶ Select Tools > SQL Command Utility from the main menu in Cobra



## SQL Command Utility

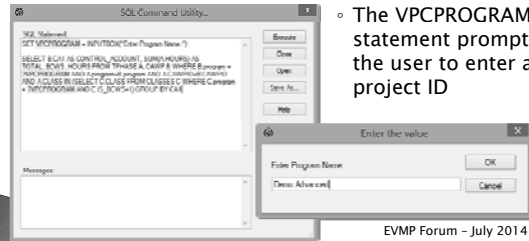
- ▶ The SQL Command Utility has two windows; the top section to view/edit SQL scripts and the bottom to display the results of the script once it has been run



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## Entering SQL Commands

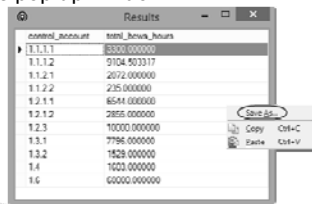
- ▶ Multiple statements can be entered in the utility
  - Highlight one statement to run it
  - Highlight none to run them all in the order they appear
- The VPCPROGRAM statement prompts the user to enter a project ID



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## SQL Statement Results

- ▶ The output from the previous SQL statement will appear as shown
  - The output can be saved to a .xls or .csv file by right clicking on the results and selecting "Save As" from the pop up window



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## Make a Copy of Your Project

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## File Save As

- ▶ Most of the SQL scripts shown in this presentation will not affect your project
- ▶ However, please, any time you attempt to make a change to a project using SQL, first make a copy of the project
  - With the project open, select File, Save As from the main menu

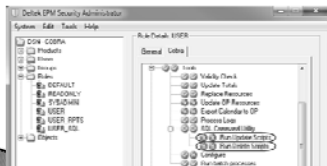
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## Limiting Access to SQL

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## Limiting Access to SQL Command Utility

- ▶ Access to the SQL Command Utility should be limited to Select statements for most users
- ▶ This is accomplished through Role settings in the EPM Security Administrator
  - Specifically, the ability to Update and Delete scripts should be disabled for most users



- With the settings set as shown, users will still be able to run Select statements

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## Limited Access to Update and Delete Scripts

- ▶ In some instances you may need to allow users limited access to Update and/or Delete scripts
  - For example, one site I support creates a new project each month
  - This site has hundreds of batch files they use each month to prepare CAM notebook reports
  - It was an incredibly time consuming task to replace the project name each month in the batch reports
  - The solution to this issue was to enable some users to run Update scripts to set the program value in the BATCHREP table to the new project name

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## Limited Update Script Access

- ▶ A Custom Menu was set up to execute the following script:
  - UPDATE BATCHREP SET PROGRAM = ?PROGRAM WHERE OWNER\_ID = 'LOVETTE' OR OWNER\_ID = 'CARRT' OR OWNER\_ID = 'WILLIAMSONB'
- ▶ A new Role was created that allowed users to perform Update scripts but denied access to the SQL Command Utility



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## Useful Scripts

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## Milestone Status List

- ▶ The following script could be used to create a milestone status list

```
SELECT a.CA1, a.CA2, a.WP, a.DESCRIP, b.MS_NO, b.DESCRIP, b.WEIGHT,
b.SFD, b.AFD, b.FLAG, b.PC_COMP, a.PMT FROM COBRA!CAWP a,
COBRA!MILESTN b where a.WP<>' ' and a.PROGRAM='PMB0814' and
a.PMT='B' and a.PROGRAM=b.PROGRAM and a.CAWPID=b.CAWPID
ORDER BY a.CA1, a.CA2, a.WP, b.MS_NO
```

- ▶ The output would look like:

CA1	CA2	WP	DESCRIP	MS_NO	MS_DESCRIP	WEIGHT	SFD	AFD	FLAG	PC_COMP	PMT
1	1	1	Project Work Plan (WP) for Expedient Equipment Renewal	1	Plan Work Plan	35	2011-03-25	2011-03-25			
1	1	2	Project Work Plan (WP) for Expedient Equipment Renewal	2	Defn Complete	35	2011-03-25	2011-03-25			
1	1	3	Project Work Plan (WP) for Expedient Equipment Renewal	3	Review Complete	100	2011-03-25	2011-03-25			
1	1	4	Project Work Plan (WP) for Expedient Equipment Renewal	4	Final	20	2011-03-25	2011-03-25			
1	1	5	Project Work Plan (WP) for Expedient Equipment Renewal	5	Defn Complete	35	2011-03-25	2011-03-25			
1	1	6	Project Work Plan (WP) for Expedient Equipment Renewal	6	Review Complete	100	2011-03-25	2011-03-25			
1	1	7	Project Work Plan (WP) for Expedient Equipment Renewal	7	Final	20	2011-03-25	2011-03-25			
1	1	8	Project Work Plan (WP) for Expedient Equipment Renewal	8	Defn Complete	35	2011-03-25	2011-03-25			
1	1	9	Project Work Plan (WP) for Expedient Equipment Renewal	9	Review Complete	100	2011-03-25	2011-03-25			
1	1	10	Project Work Plan (WP) for Expedient Equipment Renewal	10	Final	20	2011-03-25	2011-03-25			
1	1	11	Project Work Plan (WP) for Expedient Equipment Renewal	11	Defn Complete	35	2011-03-25	2011-03-25			
1	1	12	Project Work Plan (WP) for Expedient Equipment Renewal	12	Review Complete	100	2011-03-25	2011-03-25			
1	1	13	Project Work Plan (WP) for Expedient Equipment Renewal	13	Final	20	2011-03-25	2011-03-25			
1	1	14	Project Work Plan (WP) for Expedient Equipment Renewal	14	Defn Complete	35	2011-03-25	2011-03-25			
1	1	15	Project Work Plan (WP) for Expedient Equipment Renewal	15	Review Complete	100	2011-03-25	2011-03-25			
1	1	16	Project Work Plan (WP) for Expedient Equipment Renewal	16	Final	20	2011-03-25	2011-03-25			
1	1	17	Project Work Plan (WP) for Expedient Equipment Renewal	17	Defn Complete	35	2011-03-25	2011-03-25			
1	1	18	Project Work Plan (WP) for Expedient Equipment Renewal	18	Review Complete	100	2011-03-25	2011-03-25			
1	1	19	Project Work Plan (WP) for Expedient Equipment Renewal	19	Final	20	2011-03-25	2011-03-25			
1	1	20	Project Work Plan (WP) for Expedient Equipment Renewal	20	Defn Complete	35	2011-03-25	2011-03-25			

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## Export / Import Notes

- ▶ The following script exports all of the note fields attached to a project
  - The notes can be edited in Excel and then re-imported using the Integration Wizard as Project data

```
SELECT DIR_ID, CA1, CA2, CA3, WP, NOTE_TEXT, CAT_ID FROM
CAWP INNER JOIN COB_NTX ON CAWPID = FK_ID INNER JOIN
COB_CAT ON CAT_UID = ROW_ID WHERE CONTEXT IN ('CA',
'WP') AND DIR_ID = 'Demo Advanced'
```

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## Export / Import Notes

Program	CA	WP	note_text	CA_ID
Demo Advanced	1.1.1.1	1400	The integration with the different frame designs will require extra communication. The designers	Flats
Demo Advanced	1.1.1.2	1400		<Default>
Demo Advanced	1.1.1.2	1400	The designers are proposing a new full mixture. The concrete effects of the new mixture is in	Risks
Demo Advanced	1.1.1.2	1400		<Default>
Demo Advanced	1.1.1.2	1400		<Default>
Demo Advanced	1.1.1.2	1400		<Default>
Demo Advanced	1.1.2.1	1600	We have a left handed pile. All ergonomic testing must be performed with both right and left ha	Risks
Demo Advanced	1.1.1.1	1400		<Default>
Demo Advanced	1.1.1.1	1400	The integration with the different frame designs will require extra communication. The designers	Risks
Demo Advanced	1.1.1.2	1400		<Default>
Demo Advanced	1.1.1.2	1400	The designers are proposing a new full mixture. The concrete effects of the new mixture is in	Risks
Demo Advanced	1.1.1.2	1400		<Default>
Demo Advanced	1.1.1.2	1400		<Default>
Demo Advanced	1.1.1.2	1400		<Default>
Demo Advanced	1.1.2.1	1600	We have a left handed pile. All ergonomic testing must be performed with both right and left ha	Risks
Demo Advanced	1.1.2.1	1600	The proposal calls for all experiments to fit into 3 cubic feet. The Prefabricated building material	Risks
Demo Advanced	1.1.2.2	1600	The proposal calls for all experiments to fit into 3 cubic feet. The Prefabricated building material	Risks
Demo Advanced	1.1.2.2	1600		<Default>

## Change the Level Where Actuals are Loaded

- ▶ When a new project is created, the user can specify whether actuals are captured at the CA or WP level
  - As soon as actuals are imported into a project, this setting can no longer be changed within the Cobra menus
- ▶ The following script changes the actuals level to CA
 

```
UPDATE PROGRAM SET CA_ACTUAL='C' WHERE PROGRAM='xxx'
```
- ▶ The following script changes the actuals level to WP
 

```
UPDATE PROGRAM SET CA_ACTUAL='W' WHERE PROGRAM='xxx'
```

## Change the Level Where Actuals are Loaded

- ▶ With this type of SQL script you do not expect physical output, but do expect Cobra to tell you that the script ran successfully



## Export Resource Assignments

- ▶ There is no function within Cobra to export resource assignments for editing, if you want to also change the WP start and/or finish dates at the same time
  - However, it is possible to create export files using SQL statements
  - In the following example both a CA/WP file and a resource file will be created
    - These can be combined into one file if you are using a more recent build of Cobra v5
  - These files can then be imported into Cobra using the Integration Wizard after updates have been made to them



## Export Resource Assignments, continued

▶ This statement creates the CA/WP file:

```
SELECT CA1, CA2, CA3, WP,
RTRIM(CA1)+RTRIM(CA2)+RTRIM(CA3)+WP AS ID, DESCRIP, SSD,
SFD FROM COBRA!CAWP WHERE PROGRAM = 'Demo Advanced'
AND WP <> ''
```

▶ This statement creates the resource file:

```
SELECT RTRIM(C.CA1) + RTRIM(C.CA2) + RTRIM(C.CA3) +
RTRIM(C.WP) AS ID, T.CECODE, [LEVEL] = CASE WHEN
T.[HOURS] <> 0 THEN T.[HOURS] ELSE T.DIRECT END,
T.DF_DATE AS START, T.DF_DATE AS FINISH FROM CAWP C,
TPHASE T WHERE C.CAWPID=T.CAWPID AND C.PROGRAM =
'Demo Advanced' AND T.CLASS = 'Budget'
```

▶ *Note:* for large projects, additional conditioning may be added to reduce the number of records

## Export Resource Assignments

▶ Results from first script:

ca1	ca2	ca3	wp	id	descrip	sfd	sst
1.1.1.1	1400	03	1.1.1.140003	Hing Design	2007-06-01T00:00:00	2007-10-15T00:00:00	
1.1.1.1	1400	03	1.1.1.140003	Heat Shell4 Design	2007-06-01T00:00:00	2007-07-13T00:00:00	
1.1.1.2	1400	01	1.1.1.214001	Fuel Design	2007-06-01T00:00:00	2007-07-17T00:00:00	
1.1.1.2	1400	02	1.1.1.214002	Ignition Design	2007-06-01T00:00:00	2007-07-19T00:00:00	
1.1.1.2	1400	03	1.1.1.214003	Regulator Design	2007-06-15T00:00:00	2007-10-15T00:00:00	
1.1.1.2	1400	04	1.1.1.214004	Receiver Release Design	2007-06-15T00:00:00	2008-01-15T00:00:00	
1.1.2.1	1800	01	1.1.2.118001	Control Room	2007-10-19T00:00:00	2008-04-15T00:00:00	
1.1.2.1	1800	02	1.1.2.118002	Exercises/Room	2007-10-19T00:00:00	2008-04-15T00:00:00	
1.1.2.1	1800	03	1.1.2.118003	Sleeping Quarters	2008-01-19T00:00:00	2008-04-15T00:00:00	
1.1.2.1	1800	04	1.1.2.118004	Cargo Bay	2008-02-19T00:00:00	2008-04-15T00:00:00	

▶ Results from second script:

id	cecode	level	start	finish
1.1.1.140001	DRAFT	163.200000	2007-06-30T00:00:00	2007-06-30T00:00:00
1.1.1.140001	TECH	204.650000	2007-06-30T00:00:00	2007-06-30T00:00:00
1.1.1.140001	TECH	195.250000	2007-07-12T00:00:00	2007-07-12T00:00:00
1.1.1.140001	MANAGE	81.850000	2007-06-30T00:00:00	2007-06-30T00:00:00
1.1.1.140001	SENG	178.900000	2007-06-30T00:00:00	2007-06-30T00:00:00
1.1.1.140001	MANAGE	78.140000	2007-07-12T00:00:00	2007-07-12T00:00:00
1.1.1.140001	SENG	170.900000	2007-07-12T00:00:00	2007-07-12T00:00:00
1.1.1.140001	MANAGE	78.140000	2011-07-12T00:00:00	2011-07-12T00:00:00
1.1.1.140001	DRAFT	163.200000	2011-06-30T00:00:00	2011-06-30T00:00:00
1.1.1.140001	EVAPPT	166.200000	2011-07-12T00:00:00	2011-07-12T00:00:00

## Adding or Removing Project Security

- ▶ Project security is set up in Cobra on a project by project basis
- ▶ For sites which have dozens or hundreds of projects, changing user access to "Read Only" can be an enormous task
  - This is sometimes necessary when the Central Project Controls group is performing processes which effect all projects
  - Each project has to be manually opened and each user's access changed to "Read Only"
- ▶ The following SQL scripts automate this process
- ▶ These scripts were prepared for Oracle and may need to be rewritten to work with MS SQL

## Adding or Removing Project Security, continued

- ▶ The following script locks out user write access on all projects that begin with the characters "EM"

```
UPDATE WST_ACL ACL SET ACL.READONLY=1 where
(ACL.READONLY=0) AND (ACL.USER_ID <> ' ') AND ACL.DIR_UID in
(select DIR.DIR_UID from WST_DIR DIR WHERE DIR.TABLE_TYPE
='PROGRAM' AND SUBSTR(DIR.DIR_ID,1,2)='EM')
```

- ▶ The following script gives users write access on all projects that begin with the characters "EM"

```
UPDATE WST_ACL ACL SET ACL.READONLY=0 where
(ACL.READONLY=1) AND (ACL.USER_ID <> ' ') AND ACL.DIR_UID in
(select DIR.DIR_UID from WST_DIR DIR WHERE DIR.TABLE_TYPE
='PROGRAM' AND SUBSTR(DIR.DIR_ID,1,2)='EM')
```

## Opening and Closing CAs and WPs

- ▶ At times changes may need to be made to closed CAs or WPs
  - The following statement can be used to temporarily open closed CAs and WPs
  - The flags should be reversed once the changes are complete

**UPDATE COBRA!CAWP SET FLAG = 'O' WHERE FLAG = 'C' AND PROGRAM = 'IPMB1011'**

- When FLAG is blank, the CA/WP hasn't started
- When FLAG = 'O', the CA/WP is open
- When FLAG = 'C', the CA/WP is closed
- Any other character will be ignored by Cobra

## Renaming Code Field Values

- ▶ The following script can be used to rename all of the code field assignments for a particular value

**UPDATE COBRA!CAWP SET C3 = 'PRIOR\_COST' WHERE C3 = 'REPLAN' AND PROGRAM = 'PMB1011'**

- *Note:*
  - The code field values (C1, C2, C3, ... C9) are addressed in the same way whether it is a CA code or a WP code
  - C1 can address the first code at the CA level and the first code at the WP level
  - It is important, therefore, to never attach the same code file to the same code value at different levels of the project

## Code File Select Script

- ▶ The format of the following script can be used to examine any code file and the codes assigned to it
  - In this example, we're looking at the Demo Advanced project's WBS file

**SELECT BREAKFILE, CODE, CODEDESC, D1, D2 FROM BDNDETL WHERE BREAKFILE ='Demo Adv WBS'**

## Code File Select Script

Breakfile	code	codeDesc	d1	d2
Demo Adv WBS	1	Space Shuttle		
Demo Adv WBS	1.1	Design		
Demo Adv WBS	1.1.1	Exterior		
Demo Adv WBS	1.1.1.1	Structural	HUVEL	HOUSTON
Demo Adv WBS	1.1.1.2	Propulsion	JONES	HOUSTON
Demo Adv WBS	1.1.2	Interior		
Demo Adv WBS	1.1.2.1	Ergonomics	SMITH	ATLANTA
Demo Adv WBS	1.1.2.2	Experiments	SMITH	ATLANTA
Demo Adv WBS	1.2	Flight Preparations		
Demo Adv WBS	1.2.1	Flight Course	SPENCER	ORLANDO
Demo Adv WBS	1.2.1.1	Landing	SPENCER	ORLANDO

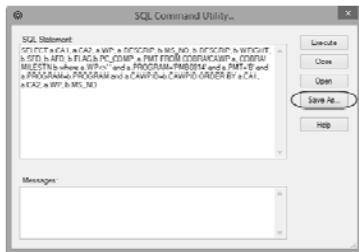
## Saving Scripts

## How To Save Your Script

- ▶ Once you've spent time creating a unique SQL script, it's always a good idea to save a copy of the script for later use
- ▶ Do not save these in the C:\Program Files (x86)\Deltek\Cobra 5 folder as these files can be overwritten when a new release of Cobra is loaded
- ▶ If the scripts are to be shared with others, save them to a network folder everyone can access

## Saving Your SQL Scripts

- ▶ Select the Save As button on the SQL Command Utility dialog box



## Saving Your SQL Scripts

- ▶ Navigate to the folder where you will save your scripts
- ▶ Enter a descriptive name in the "File name" window and then click on the Save button



- The file can be saved with either a .sql or .txt file extension
- An advantage of the .sql extension is that these scripts can be run from the Custom Menu

## Retrieving Saved SQL Scripts

- ▶ To retrieve a saved SQL script, click on the Open button in the SQL Command Utility



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## Retrieving Saved SQL Scripts

- ▶ Navigate to the location of the saved SQL script, select the script, and click on Open



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## Retrieving Saved SQL Scripts

- ▶ The saved script will now appear in the SQL Statement window from which you can modify and/or execute the script



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## Questions?

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