DB Connect: Deep Dive

Beyond the basics

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DB Connect: Deep Dive Collateral

bit.ly/conf-dbx18

Our Speakers

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Q&A

- End of session in room
- After session outside of room
- DBX Office Hours at the “Foundations & Platform Booth” #12 (dates and times TBA)

DB Connect

What is DB Connect?

RDBMS and Splunk Bridge

Highlights:

- Over 5800+ installations
- Flexible
- Runs real-time
- Java based

SQL and SPL

Together for a better world

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Where do I start?

...at the beginning

- SQL > SPL
- SPL > SQL
  - Generate SQL query e.g. In-list: last_name in (‘foo’,’bar’,’baz’)
- Join: small is beautiful
- Buttercup game:
  - Games data in MySQL
  - Site web access logs in Splunk
- Better solutions may exist

SQL > SPL

SQL > SPL

Winners VS losers: who buys most?

- Context:
  - find whether a correlation exists between victories and customers' behavior
- Steps:
  - finding the number of victories per session
  - join logs on session ID
  - analyze

SQL > SPL

```
| dbxquery connection=mysql query="
        SELECT sum(gu.victory) AS victories, session_id
        FROM conf2018.user u
        JOIN conf2018.game_user gu ON gu.user_id = u.id
        JOIN conf2018.game g ON g.id = gu.game_id
        JOIN conf2018.user_session us ON us.user_id = u.id
        GROUP BY session_id"
| join session_id
        [
        search source="tutorialdata.zip:*" sourcetype=access_combined_wcookie JSESSIONID action=addtocart productId
        | rename JSESSIONID as session_id
        ]
| stats count by victories
| sort + victories
```

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SQL > SPL

Getting number of victories from DB

```
| dbxquery connection=mysql query="
        SELECT sum(gu.victory) AS victories, session_id
        FROM conf2018.user u
        JOIN conf2018.game_user gu ON gu.user_id = u.id
        JOIN conf2018.game g ON g.id = gu.game_id
        JOIN conf2018.user_session us ON us.user_id = u.id
        GROUP BY session_id"
| join session_id
        [
        search source="tutorialdata.zip:*" sourcetype=access_combined_wcookie JSESSIONID action=addtocart productId
        | rename JSESSIONID as session_id
        ]
| stats count by victories
| sort + victories
```

SQL > SPL

Join on session ID with logs

```
| dbxquery connection=mysql query="
        SELECT sum(gu.victory) AS victories, session_id
        FROM conf2018.user u
        JOIN conf2018.game_user gu ON gu.user_id = u.id
        JOIN conf2018.game g ON g.id = gu.game_id
        JOIN conf2018.user_session us ON us.user_id = u.id
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        | rename JSESSIONID as session_id
        ]
| stats count by victories
| sort + victories
```

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SQL > SPL

Analyze

```
| dbxquery connection=mysql query="
        SELECT sum(gu.victory) AS victories, session_id
        FROM conf2018.user u
        JOIN conf2018.game_user gu ON gu.user_id = u.id
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        GROUP BY session_id"
| join session_id
        [
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        | rename JSESSIONID as session_id
        ]
| stats count by victories
| sort + victories
```

SPL > SQL

Oopsie !

I forgot to write the sessions

- Context:
  - A bug prevents the sessions tracking in DB (Around 22th and 23rd of August)
  - Find missing data

Steps:

- finding all sessions from logs
- join to the user_session table
- get all missing records

SPL > SQL

```
source="tutorialdata.zip:*" sourcetype=access_combined_wcookie action=purchase productId
| dedup JSESSIONID
| fields JSESSIONID
| rename JSESSIONID as temp_table
| eval temp_table="'".temp_table."'"
| mvcombine delim="AS ID UNION SELECT " temp_table
| nomv temp_table
| eval temp_table="SELECT ".temp_table
| eval search_query="
                SELECT * FROM (".temp_table.") ids
                WHERE NOT EXISTS (
                    SELECT session_id FROM conf2018.bad_user_session us
                    WHERE us.session_id = ids.id)"
| fields search_query
| map search="dbxquery connection=mysql query=$search_query$"
```

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SPL > SQL

Finding sessions

source="tutorialdata.zip:*" sourcetype=access_combined_wcookie action=purchase productId

```
| dedup JSESSIONID
| fields JSESSIONID
| rename JSESSIONID as temp_table
| eval temp_table="'".temp_table."'"
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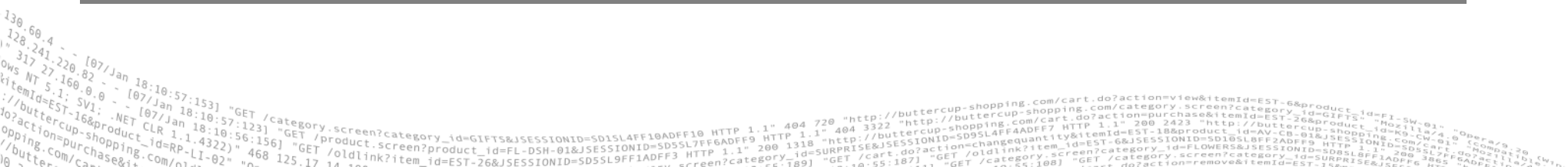

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SPL > SQL

Create a temporary table with all sessions

```
source="tutorialdata.zip:*" sourcetype=access_combined_wcookie action=purchase productId
| dedup JSESSIONID
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                    SELECT session_id FROM conf2018.bad_user_session us
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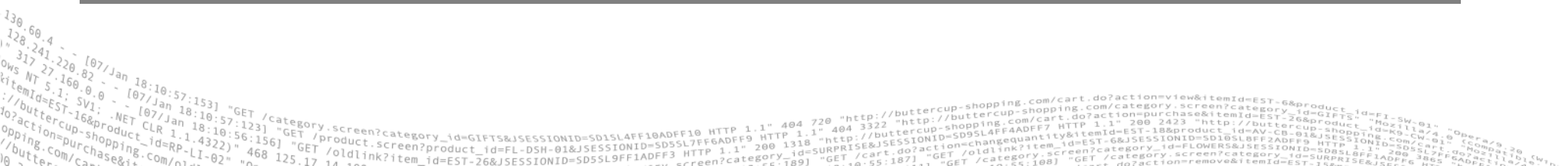
```



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SPL > SQL

Build anti-join query

```
source="tutorialdata.zip:*" sourcetype=access_combined_wcookie action=purchase productId
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| eval temp_table="'".temp_table."'"
| mvcombine delim="AS ID UNION SELECT " temp_table
| nomv temp_table
| eval temp_table="SELECT ".temp_table
| eval search_query="
        SELECT * FROM (".temp_table.") ids
        WHERE NOT EXISTS (
            SELECT session_id FROM conf2018.bad_user_session us
            WHERE us.session_id = ids.id)"
| fields search_query
| map search="dbxquery connection=mysql query=$search_query$"
```

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SPL > SQL

Inject the query into SPL and run it

```
source="tutorialdata.zip:*" sourcetype=access_combined_wcookie action=purchase productId
| dedup JSESSIONID
| fields JSESSIONID
| rename JSESSIONID as temp_table
| eval temp_table="'".temp_table."'"
| mvcombine delim="AS ID UNION SELECT " temp_table
| nomv temp_table
| eval temp_table="SELECT ".temp_table
| eval search_query="
                    SELECT * FROM (".temp_table.") ids
                   WHERE NOT EXISTS (
                       SELECT session_id FROM conf2018.bad_user_session us
                       WHERE us.session_id = ids.id)"
| fields search_query
| map search="dbxquery connection=mysql query=$search_query$"
```

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Stored procedures

When a simple query is not enough

DBX and Queries

This is where the subtitle goes

DBX Input

- Single Query ONLY
- Returns results
- Can’t call a stored procedure directly. (or maybe you can?)

dbxquery

- Single statement: SELECT, INSERT, UPDATE or DELETE
- Can also call a stored procedure with parameters

What is a SQL Query?

A Single Select Statement

Single

```
SELECT column_name_1, column_name_2
  FROM table_name
 WHERE column_name_3 = 'ABC'
```

Single

```
SELECT column_name_1, column_name_2
  FROM table_name
 WHERE column_name_3 > ?
 ORDER BY column_name_3 ASC
```

Compound With DDL

```
CREATE TABLE my_temp_table;

INSERT INTO my_temp_table
SELECT *
  FROM some_other_table;

-- manipulate my_temp_table

SELECT *
  FROM my_temp_table;

DROP TABLE my_temp_table;
```

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Why and How

Why

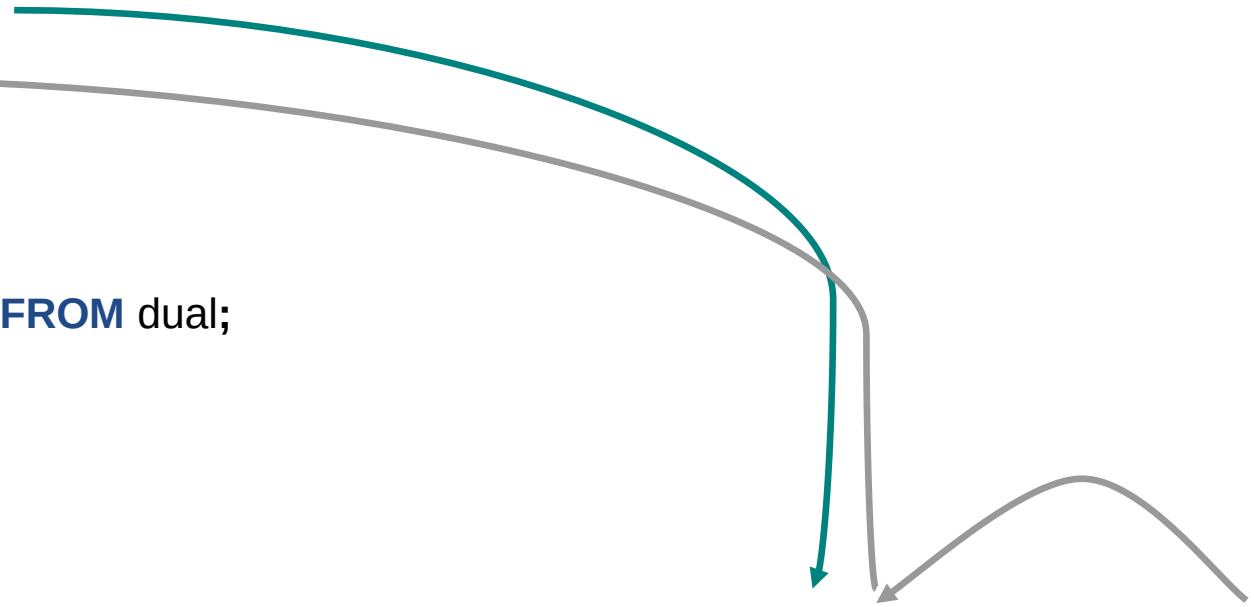
- Compound statements
- Deletes
- Temp tables
- DDL

Oracle Example 1

DB Connect Doc > dbxquery command

Oracle PL/SQL

```
CREATE OR REPLACE PROCEDURE test_orasp_1(
  p_ref_cursor  OUT SYS_REFCURSOR,
  p_var_in          IN  VARCHAR)
AS
BEGIN
 OPEN p_ref_cursor FOR
 SELECT 'you passed-in: '|| p_var_in out_var FROM dual;
END test_orasp_1;
```



Splunk SPL

```
| dbxquery connection=splunk_test procedure="{call test_orasp_1(?,?) }" params="foo"
```

Demo Stored Procedures

- Return Input
- Filter a query
- Compound Statement

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Demo: Stored Procedures

Return Input
Filter a query
Compound Statement

Oracle Example 2

Can be used as an input

Implementation Details

Oracle

- **PL/SQL Package Contains**
  - **A “type” that represents an array of rows (basically a table)**
  - **Pipelined Table Function**
    - **Returns rows as the “type” defined above**
    - **Can contain DML and DDL as long as it has “pragma autonomous_transaction”**

Splunk

- **Query the table function instead of a table**
- **Can be from an input or dbxquery**

Oracle Example 2

Oracle PL/SQL

```
-- package specification
  TYPE sample_data_tbl is table of sample_data%ROWTYPE;
-- package body
-- ...
 function get_sample_data(p_min_id IN NUMBER) return sample_data_tbl
 PIPELINED as
          cursor sample_data_cur is
            SELECT * FROM sample_data where id > p_min_id order by id asc;
 begin
          for current_row in sample_data_cur loop
            pipe row(current_row);
          end loop;
 end get_sample_data;
```

Oracle Example 2

SQL for Splunk Input

Batch

```
SELECT *
 FROM TABLE(sample_pkg.get_sample_data(0))
ORDER by id asc;
```

Rising Column

```
SELECT *
 FROM TABLE(sample_pkg.get_sample_data(?))
ORDER by id asc;
```

Demo: Pipelined Table Function

Input “Queries” a function that can perform other procedural operations then returns rows

Thank You

Don't forget to rate this session in the .conf18 mobile app

Q&A

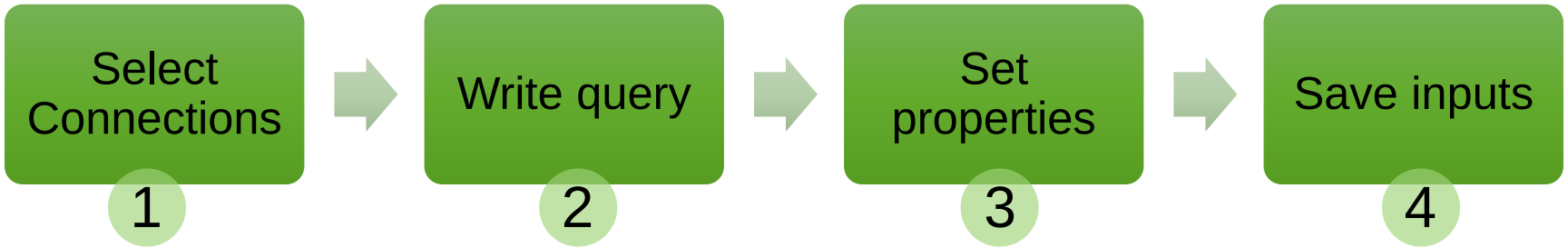
- End of session in room
- After session outside of room
- DBX Office Hours at the “Foundations & Platform Booth” #12 (dates and times TBA)

Additional Content

Input Bulk Operations

One query to Many Inputs

- Time saver
  - Create or edit many similar inputs at the same time
- Flexible
  - Input can still be edited individually



Input templates

A better version of cookies mix

- Pre-made inputs
- 3 fields unique to each input
  - Connection
  - Input name
  - Index