KPM Millennial Dashboard

Build Process

Enterprise Marketing, Business Analytics

12/10/2015

This document describes the process of building the KPM Millennial Dashboard.

Processing Requirements and Dependencies

Software

- PC/SAS – used to move tableau dataset into SQL Server table
- Unix/SAS – used for all processing except movement of data into SQL Server
- Tableau Desktop – Dashboard creation software
- SQL Server Management Studio 2012 – SQL Server database as back-end for dashboard
- WinTCP – ftp tableau dataset from bmgtsun6 to ETECH shared drive
- Putty – Unix login

Access

Access to the following systems is required:

- BMG
- EIW
- MDSS
- ED&A SQL Server
- Tableau Server

All tables required are BMG tables. Restricted access tables are listed below:

Table with Restricted Access	Purpose
`bmgu_bmgeth.SARA_HH_TEMP_ETH_FRACT`	Household Fractionalization Table
`bmgu_bmghh.TODD_MDSS_HH_DISP`	Household Disposition Table
`BMGU_BMGETH.WBR_HH_CUBE`	WIM cube for KPM Dashboard[1]
`bmgu_bmgeth.prod_hier_ref_sr`	Product Domain Hiearchy

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[1] We only need to reference this table if we are building the KPM dashboard cube.

Pre-Processing

MDSS Regional Hierarchy

The regional hierarchy is obtained from the MDSS view mdssprod_v.view_stores. This view is updated each month by MDSS and a snapshot is NOT kept.

The cube build process links households to stores to allow slicing by regional hierarchy for community bank households.

The current regional hierarchy is restated for all months built in the cube.

Before the cube is built, /sas/au48750/BusinessAnalytics/mdss_view_stores.sas is used to copy the latest version of mdssprod_v.view_stores from MDSS to BMG at bmgu_bmgeth.view_store_mdss. A snapshot of previous regional hierarchies are maintained in the BMG table and the current hierarchy is flagged.

/sas/au48750/BusinessAnalytics/mdss_view_stores.sas should be run on a quarterly basis according to the schedule below:

Quarter	Run mdss_view_stores.sas	Cube Build
Q1	April when March MDSS data available	May
Q2	July when June MDSS data available	August
Q3	October when September MDSS data available	November
Q4	January when December MDSS data available	February

WIM Accounts

Most of the account information in the KPM Millennial dashboard is sourced from BMG, bmgpprofile.acct_yyyymm. However, Wealth and Investment Management (WIM) accounts are sourced from the wae_d_core_v2 schema in EIW.

The program /sas/au48750/BusinessAnalytics/WIM_cube_build.sas extracts WIM account data from EIW and stores this data in the table bmgu_bmeth.wbr_hh_cube_mill.

/sas/au48750/BusinessAnalytics/WIM_cube_build.sas should be run on a quarterly basis according to the schedule below:

the schedule below:

Quarter	Run mdss_view_stores.sas	Cube Build
Q1	April when March WIM data available	May
Q2	July when June WIM data available	August
Q3	October when September WIM data available	November
Q4	January when December WIM data available	February

The program should be run for the last 3 months of the latest quarterly build (e.g. build months 201507, 201508, 201509 before 2015Q3 cube build). Alternatively, the program can be run once a month when the previous months WIM data is available.

When building Q1, check with ED&A contact in WIM about any changes needed to identify accounts in WIM for the new year.

Note: no explicit build of month13 is required here. The code takes care of building month13 when it detects December is being built.

Cube Build Process

/sas/au48750/BusinessAnalytics/millennial_cube_build.sas builds KPM metrics. It can be invoked in one of two ways:

1. Build all the metrics of the KPM Dashboard and store in the table bmgu_bmgeth.t_hh_cube_mill (the "mill" macro variable should be set to null).
2. Build a subset of the metrics (as requested and defined by our millennial business clients) and store in the table bmgu_bmgeth.t_hh_temp_cube_sr. Also, no Mortgage, Non-Mortgage Lending, or Lending household views are built with this version (the "mill" macro variable should be set to Y).

Here, we are concerned with invoking (2) which are the metrics for the KPM Millennial Dashboard cube. The building of (1) is included if there is a future project to merge the process of building both dashboards into one. A full set of the metrics is provided below. The subset of metrics built by invoking (2) are high lighted in red.

Metric	Description
AC	Total Accts openActive in month
AL	Accts closed/Lost in month
AL_HH_C	Lost Accounts from Current Households
AL_HH_L_2	Lost accounts from Attrited Households
AL_HH_L_4	Lost Accouts from Merging Household
AN	Accounts opened in Month
AN_HH_N_1	New Accts from New HHs
AN_HH_N_3	New Accts from Expanding HHs
AN_HH_P_0	New accts from Previously Existing HHs
HH_C	Households Current
HH_C_D1	Households in Domain Level 1
HH_C_D1_L2	Household Lost (Pure) in Product Domain Level 1
HH_C_D1_N0	Households Previously Existing in Product Domain Level1
HH_C_D1_N1	Households New (Pure) in Product Domain Level 1
HH_C_D2	Households in Product Domain Level 2
HH_L_2	Households Lost (Attrited)
HH_L_4	Households Lost (Merging)
HH_N_1	Households New
HH_N_3	Household New (Expanding)
HH_P_0	Households Previously Existing
XS	Cross Sell
XS_D1	Cross Sell at Product Domain Level 1

The code is taken from the ED&A BTEQ SQL script that builds the KPM Dashboard metrics. It was ported into SAS and parametized/conditionalized to add a generational dimension.[2]

The code is invoked with 4 parameters:

1. ldap_user – the ldap user id for BMG teradata
2. ldap_pwd – the password for BMG teradata
3. curr_month – yyyymm for the month to be built.
4. mill – a value of Y indicates building (2), the KPM Millennial Dashboard metrics

The code is invoked for each month. The cube is built for all months from the previous year and all months available in the current year. In addition month13 of the previous month needs to be built (e.g. curr_month would need to be set to 201413). [3]

The code is broken into 5 parts with each part implemented in a macro. This allows for debugging a particular piece of the program. Only the steps highlighted in bold are necessary to build the KPM Millennial cube.[4]

1. **%setup – Builds all the temporary tables that are then used as input into building the metrics.**

Temporary Table Name	Description	Size in GB
T_HH_TEMP_STG_yyyymm	Temporary cube for current month	1.38
T_HH_Accts_NEW	New accounts tables	0.31
T_HH_Accts	Aggregate accounts to HH level	12.48
T_HH_Accts_LOST	Lost accounts table	0.41
T_HH_ETH_PCT	HH Ethnicity Fractionalization	2.40
T_ACCTS_TEMP	All accounts	30.97
T_HH_DOM	Aggregate of accts to HH level (HH metrics)	10.90

2. **%metrics_all – Builds the metrics common to both the KPM and KPM Millennial Dashboards.**
3. %metrics_KPM – Builds only those metrics used in the KPM Dashboard. If the millennial business partners want to add a metric from the KPM Dashboard, simply move the metric from %metric_KPM to %metric_all.
4. %product_penetration – This is specific to the KPM Dashboard and only for the Mortgage, Non-Mortgage Lending, Lending view. It is not used for the KPM Millennial Dashboard.
5. **%final – Places metrics for a month into the cube, and deletes temporary tables from %setup.**

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[2] See \\DTCNAS-CASF006\C_RBG_Groups\ETECH\BusinessAnalytics\KPMMIllennialDashboard\code\cube.sh for original ED&A code.
[3] For example, to build a cube for 2015Q4, build starting from month 201313 (EOY 13) through 201512.
[4] The code automatically selects the steps needed based on the setting of the "mill" macro variable.

As a validation check, after a month is built the overall counts for metrics are compared against the metrics in the KPM dashboard cube. For example, the query below can be used to compare community bank counts of the KPM Millennial cube with that of ED&A's KPM cube.[5]

```sql
select
'Mill New Mill' as cube_type,
sum(case when metric = 'AC'   then cnt end) as AC,
sum(case when metric = 'AL'    then cnt end) as AL,
sum(case when metric = 'AL_HH_C'   then cnt end) as AL_HH_C,
sum(case when metric = 'AL_HH_L_2'   then cnt end) as AL_HH_L_2,
sum(case when metric = 'AL_HH_L_4'   then cnt end) as AL_HH_L_4,
sum(case when metric = 'AN'   then cnt end) as AN,
sum(case when metric = 'AN_HH_N_3'   then cnt end) as AN_HH_N_3,
sum(case when metric = 'AN_HH_N_1'   then cnt end) as AN_HH_N_1,
sum(case when metric = 'AN_HH_P_0'   then cnt end) as AN_HH_P_0,
sum(case when metric = 'HH_C'    then cnt end) as HH_C,
sum(case when metric = 'HH_C_D1'   then cnt end) as HH_C_D1,
sum(case when metric = 'HH_C_D1_L2'   then cnt end) as HH_C_D1_L2,
sum(case when metric = 'HH_C_D1_N0'   then cnt end) as HH_C_D1_N0,
sum(case when metric = 'HH_C_D1_N1'   then cnt end) as HH_C_D1_N1,
sum(case when metric = 'HH_C_D2'   then cnt end) as HH_C_D2,
sum(case when metric = 'HH_N_1'    then cnt end) as HH_N_1,
sum(case when metric = 'HH_N_3'    then cnt end) as HH_N_3,
sum(case when metric = 'XS'    then cnt end) as XS,
sum(case when metric = 'XS_D1'     then cnt end) as XS_D1,
sum(case when metric = 'HH_L_2' then cnt else 0 end) as HH_L_2,
sum(case when metric = 'HH_L_4' then cnt else 0 end) as HH_L_4,
sum(case when metric = 'HH_P_0' then cnt else 0 end) as HH_P_0,
sum(case when metric = 'PP'    then cnt end) as PP,
sum(case when metric = 'PP_D1'    then cnt end) as PP_D1
from bmgu_bmgeth.T_HH_CUBE_MILL
--from bmgu_temp.T_HH_TEMP_STG_SR201509_a613454
where asof_yyyymm = 201509
AND HH_CATEGORY in ('BR','BM') /* Community Bank */
--AND HH_CATEGORY in ('BR','BM','NBR','NBM') /* All retail */
--AND HH_CATEGORY in ('WIM') /* This is Wealth for KPM Millennial */
and domain_level1 <> 'LENDING'

group by 1

union

select
'KPM' as cube_type,
sum(case when metric = 'AC'   then cnt end) as AC,
sum(case when metric = 'AL'    then cnt end) as AL,
sum(case when metric = 'AL_HH_C'   then cnt end) as AL_HH_C,
sum(case when metric = 'AL_HH_L_2'   then cnt end) as AL_HH_L_2,
sum(case when metric = 'AL_HH_L_4'   then cnt end) as AL_HH_L_4,
sum(case when metric = 'AN'   then cnt end) as AN,
sum(case when metric = 'AN_HH_N_3'   then cnt end) as AN_HH_N_3,
sum(case when metric = 'AN_HH_N_1'   then cnt end) as AN_HH_N_1,
```

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[5] Note: WIM counts will be different. The process for obtaining Millennial WIM accounts is different—requires an additional join to obtain age.

```sql
sum(case when metric = 'AN_HH_P_0'   then cnt end) as AN_HH_P_0,
sum(case when metric = 'HH_C'      then cnt end) as HH_C,
sum(case when metric = 'HH_C_D1'    then cnt end) as HH_C_D1,
sum(case when metric = 'HH_C_D1_L2'   then cnt end) as HH_C_D1_L2,
sum(case when metric = 'HH_C_D1_N0'   then cnt end) as HH_C_D1_N0,
sum(case when metric = 'HH_C_D1_N1'   then cnt end) as HH_C_D1_N1,
sum(case when metric = 'HH_C_D2'    then cnt end) as HH_C_D2,
sum(case when metric = 'HH_N_1'     then cnt end) as HH_N_1,
sum(case when metric = 'HH_N_3'     then cnt end) as HH_N_3,
sum(case when metric = 'XS'       then cnt end) as XS,
sum(case when metric = 'XS_D1'     then cnt end) as XS_D1,
sum(case when metric = 'HH_L_2' then cnt else 0 end) as HH_L_2,
sum(case when metric = 'HH_L_4' then cnt else 0 end) as HH_L_4,
sum(case when metric = 'HH_P_0' then cnt else 0 end) as HH_P_0,
sum(case when metric = 'PP'      then cnt end) as PP,
sum(case when metric = 'PP_D1'     then cnt end) as PP_D1
from bmgu_bmgeth.T_HH_TEMP_CUBE_SR
where asof_yyyymm = 201509
AND HH_CATEGORY in ('BR','BM')
--AND HH_CATEGORY in ('BR','BM','NBR','NBM')
--AND HH_CATEGORY in ('WBR') /* Wealth in KPM */
--AND HH_CATEGORY in ('NML','MOR','LEN')
and domain_level1 <> 'LENDING'

group by 1

;
```

Post-Processing Data Preparation

After the KPM Millennial is built, it can be queried for analysis. However, addition data preparation is require for presentation to business users. This additional data prepartion is performed in the SAS program:

/sas/AU48750/BusinessAnalutics/KPMMillennialDashboard/code/millennial_post_processing.sas

Located on bmgtsun6.

Data are presented to users in a Tableau dashboard and Pivot tables.

Derived Metrics

Year-over-Year household and account metrics were requested by the business users. These metrics are created in the "%Step2" macro within the program.

Data Prepare for Tableau

The KPM Millennial Dashboard only presents information for the current year. However, there is a need for metrics in the prior year:

- XS, HH_C, HH_P_0, HH_L_2, HH_N_1 can be displayed for the prior 4 months. If a user selects January of the current year, we need to have these metrics for October, November, and December of the prior year.
- HH_C, AC, AL, AN can be displayed for end of the prior year. We need to include month 13 of the prior year for these metrics.

A data set that includes all the relevant information for a Tableau dashboard is created in the "%Step3" macro. The data set is stored in:

/sas/AU48750/BusinessAnalutics/KPMMillennialDashboard/data/tableau.sas7bdat

Data Prepare for Pivots

Pivot tables are created so the business users can easily extract data for presentations.[6] However, because of the row limitations of Excel, additional preparation of the data is required:

- Data is summarized at 3 regional levels
- Data is summarized at 2 levels of generation ("Unknown" is removed)

In addition, there is preparation for cross-sell and product penetration pivot tables.

Pivot table preparation is performed in "%Step4" of the SAS program. The resulting output of this step is an Excel file for each metric, for both the prior and current year. The Excel files are create in:

/sas/AU48750/BusinessAnalutics/KPMMillennialDashboard/data

on bmgtsun6.

Dashboard Publishing

SQL Server Data Preparation

SQL Server is used as the data back-end for the Dashoard.

The tableau SAS data set at:

/sas/AU48750/BusinessAnalutics/KPMMillennialDashboard/data/tableau.sas7bdat

on bmgtsun6 is copied to the ETECH share drive at:

\\DTCNAS-CASF006\C_RBG_Groups\ETECH\BusinessAnalytics\KPMMIllennialDashboard\data\ tableau.sas7bdat

This is an intermediary step to move to SQL Server.[7] SQL Server is used as the back-end data store for Tableau. The loading of data from the ETECH share drive to the Development SQL Server is performed with the PC/SAS program at:

[\\DTCNAS-CASF006\C_RBG_Groups\ETECH\BusinessAnalytics\KPMMIllennialDashboard\code\SQLServerLoad.sas](#)[8]

The query_cube table in the DS_MILL database on EDDEDASQL103\EDA103D is overwritten during the load process. The loading can take several hours.

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[6] Pivot tables were provided to the business users before the Tableau Dashboard was developed.

[7] At this time, the moving of data from bmgtsun9 to SQL Server, within SAS, had not been worked out. See Appendix C for a start on how to set up an ODBC connection from Unix.

[8] You will need to set up and ODBC connection to SQL Server to run this program. See Appendix B.

The last part of the data preparation process is to normalize the table query_cube. The normalization scripts can be run under SQL Server Management Studio 2012 and are found at:

\\DTCNAS-CASF006\C_RBG_Groups\ETECH\BusinessAnalytics\KPMMIllennialDashboard\code\SQLScripts.txt

The scripts create a base table, ETH_CUBE_yyyyQq and five dimenision tables:

- DIM_DOMAIN_yyyyQq – product domains at 2 levels
- DIM_ETHNIC_yyyyQq – ethnicities
- DIM_GEN_yyyyQq – generation: Millennial, Non-Millennial, Unknown
- DIM_VIEW_yyyyQq – household view: All Retail, Community Bank, or WIM
- DIM_ORG_yyyyQq – region hierarchy at 4 levels

So that data for previous quarters can be remained, the tables should be named with the year and quarter. If a current quarter needs to be rebuilt (after publishing), a "_Vv" should be appended to the table names to maintain versions. This is shown in the screenshot below:
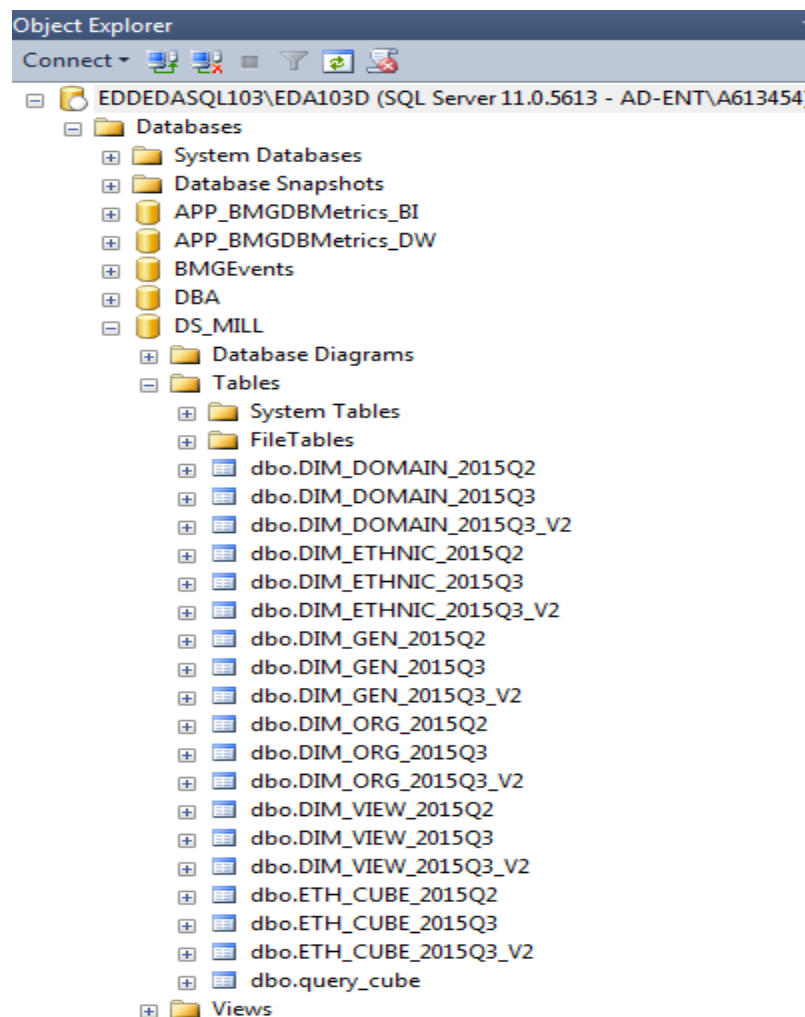
Note: if you received the following error when running SQLScripts.txt:

Msg 9002, Level 17, State 4, Line 1
The transaction log for database 'DS_MILL' is full due to 'ACTIVE_TRANSACTION'.

Contact Augustine Selvaraj, the DBA to repair the transaction log.

Tableau Workbook Modifications

Tableau workbook development is performed in the SQL Server Development Environment, EDDEDASQL103\EDA103D.

To create the dashboard for the quarter, make a copy of the previous quarter's Tableau workbook. The Tableau workbooks can be found on the ETECH shared drive at:

\\DTCNAS-CASF006\C_RBG_Groups\ETECH\BusinessAnalytics\KPMMIllennialDashboard\Tableau

In this example, copy KPM_Millennial_2015_Q2.twb to KPM_Millennial_2015_Q3.twb.

Open KPM_Millennial_2015_Q3.twb, and edit the data source to point to the Q3 tables on the development SQL Server. Start with Data->DIM_DATE+ (Diverse)->Edit Data Source... as shown below:
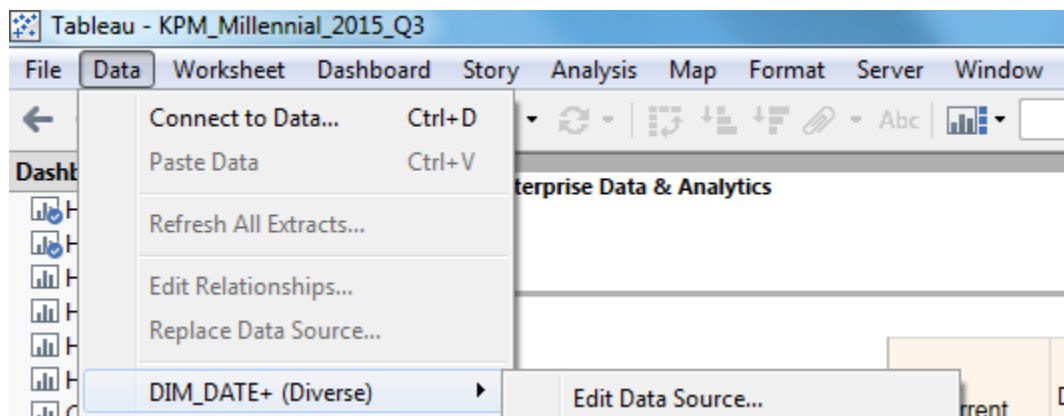
This will bring you to the screen below:
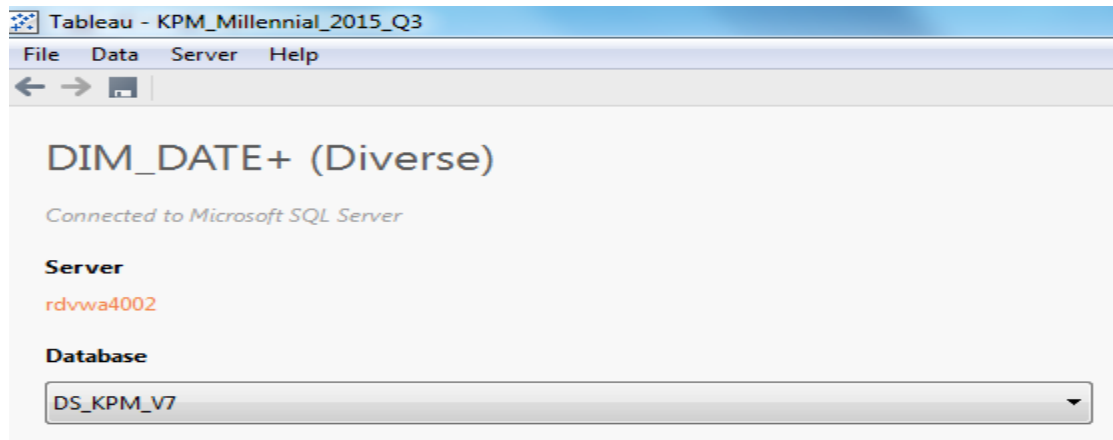
Clicking on the server name above (rdvwa4002 in this example) will bring you to the screen below. Change the server name to EDDEDASQL103\EDA103D using Windows Authentication.
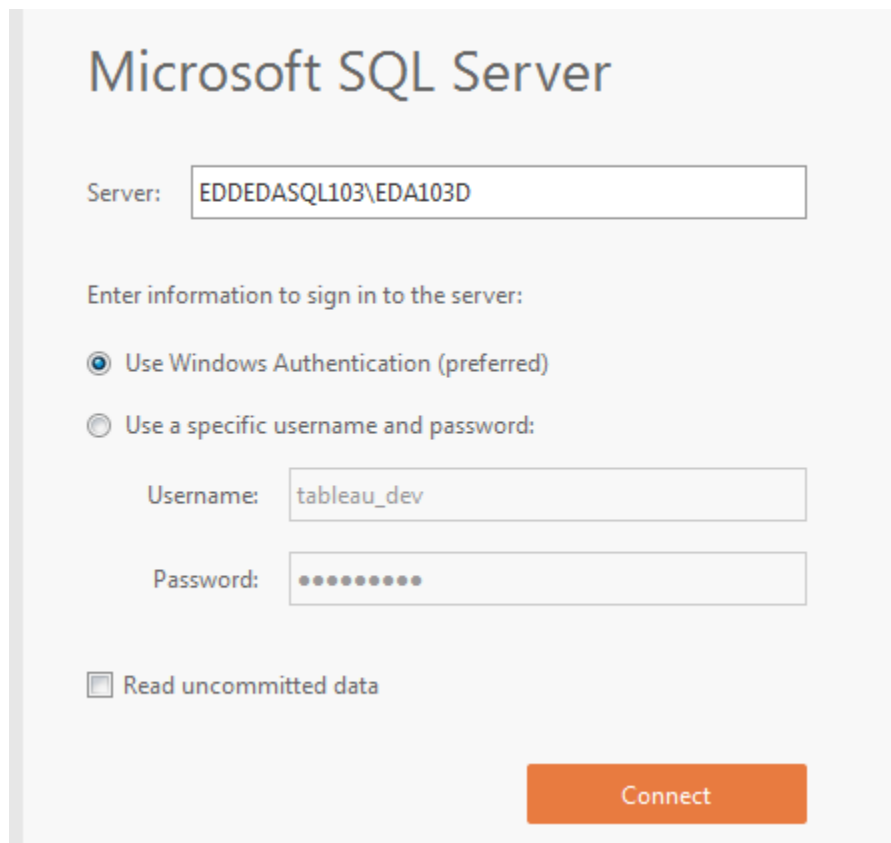
From the Database drop down menu, select DS_MILL as the database, remove the Q2 tables and replace with the Q3 tables as shown below:

Table

Enter table name

⊞	DIM_DOMAIN_2015Q2
⊞	DIM_DOMAIN_2015Q3
⊞	DIM_ETHNIC_2015Q2
⊞	DIM_ETHNIC_2015Q3
⊞	DIM_GEN_2015Q2
⊞	DIM_GEN_2015Q3
⊞	DIM_ORG_2015Q2
⊞	DIM_ORG_2015Q3
⊞	DIM_VIEW_2015Q2
⊞	DIM_VIEW_2015Q3
⊞	ETH_CUBE_2015Q2
⊞	ETH_CUBE_2015Q3
⊞	query_cube

DIM_DATE+ (Diverse)

Connected to Microsoft SQL Server

Server
EDDEDASQL103\EDA103D

Database
DS_MILL

Table
Enter table name

⊞	DIM_DOMAIN_2015Q2
⊞	DIM_DOMAIN_2015Q3
⊞	DIM_ETHNIC_2015Q2
⊞	DIM_ETHNIC_2015Q3
⊞	DIM_GEN_2015Q2
⊞	DIM_GEN_2015Q3
⊞	DIM_ORG_2015Q2
⊞	DIM_ORG_2015Q3
⊞	DIM_VIEW_2015Q2
⊞	DIM_VIEW_2015Q3
⊞	ETH_CUBE_2015Q2
⊞	ETH_CUBE_2015Q3

ETH_CUBE_2015Q3 —○○— DIM_DOMAIN_2015Q3
—○○— DIM_ETHNIC_2015Q3
—○○— DIM_GEN_2015Q3
—○○— DIM_ORG_2015Q3
—○○— DIM_VIEW_2015Q3
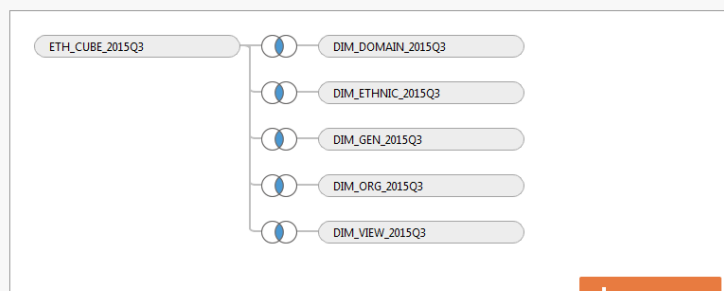
Copy   Go to Worksheet

Domain Id (Dim Domain 2015Q3)	Domain Level1	Domain Level2	Ethnic Id (Dim Ethnic 2015Q3)	Ethnicit
# DIM_DOMAIN_2015Q3	Abc DIM_DOMAIN_2...	Abc DIM_DOMAIN_2...	# DIM_ETHNIC_2015Q3	Abc DIM

After adding the Q3 tables as shown above, click on "Go To Workbook" and select any sheet. Under "Parameters", right-click the "Month" parameter and select "Edit".
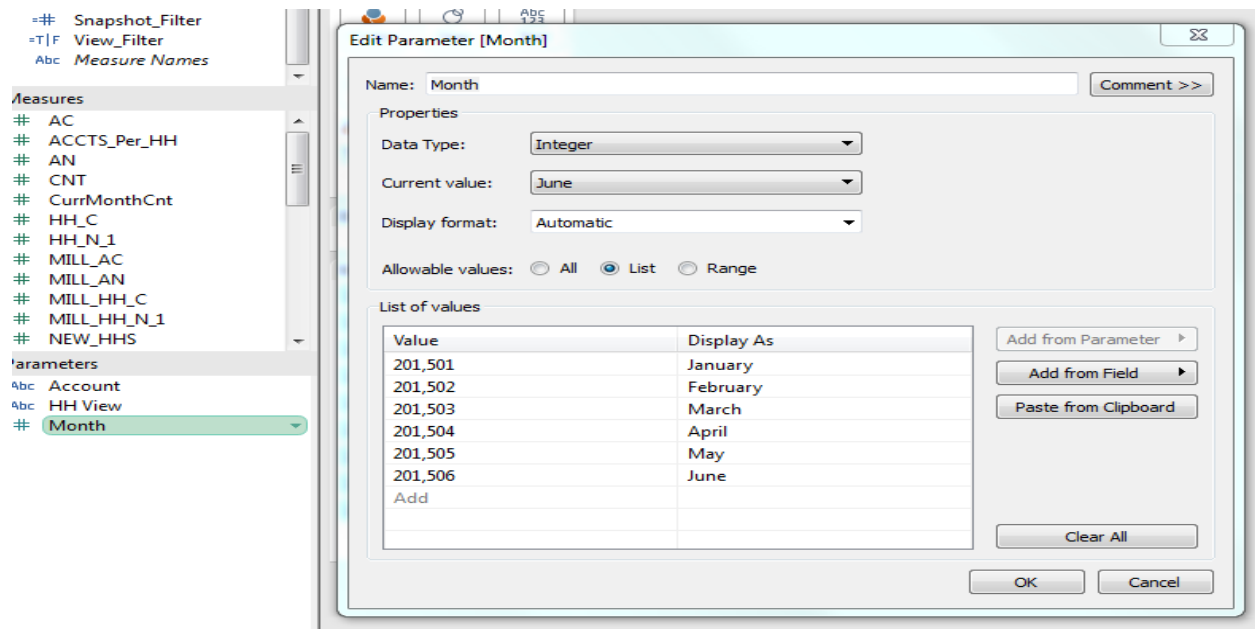
Add the next 3 months to the list of values and set the "Current Value" drop down to the latest month.

Edit Parameter [Month]

Name: Month

Properties

Data Type: Integer

Current value: September

Display format: Automatic

Allowable values: ○ All ● List ○ Range

List of values

Value	Display As
201,501	January
201,502	February
201,503	March
201,504	April
201,505	May
201,506	June
201,507	July
201,508	August
201,509	September

Add from Parameter ▶
Add from Field ▶
Paste from Clipboard
Clear All
OK   Cancel

Measures
AC
ACCTS_Per_HH
AN
CNT
CurrMonthCnt
HH_C
HH_N_1
MILL_AC
MILL_AN
MILL_HH_C
MILL_HH_N_1
NEW_HHS

Parameters
Abc Account
Abc HH View
Month

Columns ▼ Asof Yyyymm ▼

Rows Ethnicity

	EOY 14	201509
African American	3,988,809	4,016,325
Asian American	1,968,755	1,994,079
Hispanic	6,599,773	6,790,125
Other DS	517,365	525,367
Caucasian	24,620,845	24,347,872
Unknown	1,817,186	1,658,624
Grand Total	39,512,732	39,332,391

Edit Aliases [Asof Yyyymm]

Member	Has Alias	Value (Alias)
201410	*	Oct 14
201411	*	Nov 14
201412	*	Dec 14
201413	*	EOY 14
201501	*	Jan 15
201502	*	Feb 15
201503	*	Mar 15
201504	*	Apr 15
201505	*	May 15
201506	*	Jun 15
201507		201507
201508		201508
201509		201509

OK
Cancel
Clear Aliases

Tableau Dashboard Publishing

Tableau workbook development is performed on the SQL Server Development Environment, EDDEDASQL103\EDA103D.

ED&A procedures require the movement of the DS_MILL database to the SQL Server Test environment, EDUEDASQL103\EDA103U. Once the workbook is tested it is then moved to the SQL Server Production
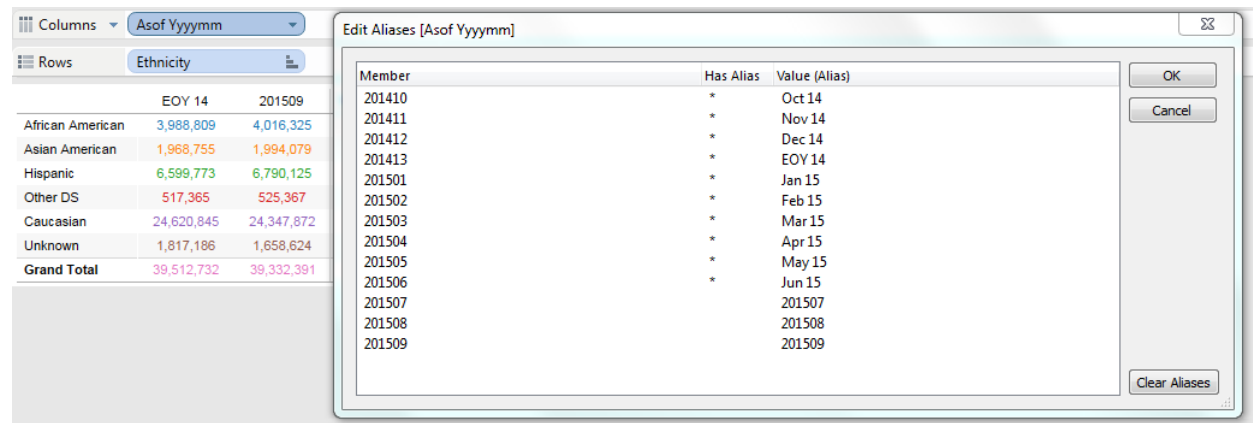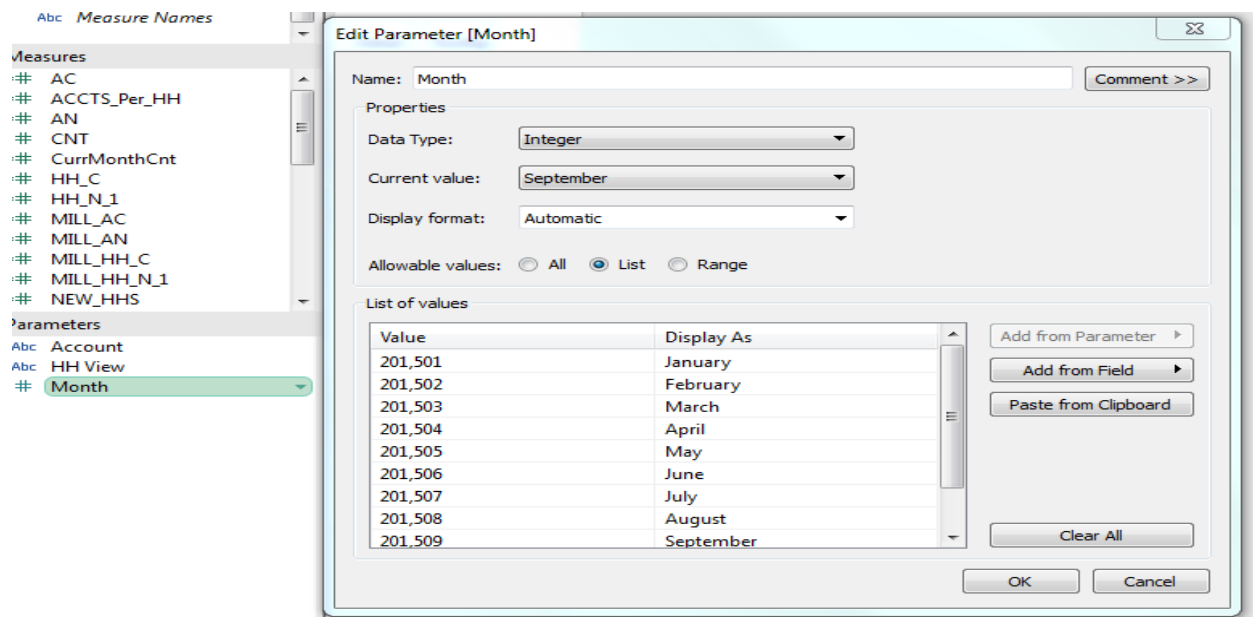
environment, EDPEDASQLI103\EDA103P an ED&A database administrator is contacted for the movement of the DS_MILL database between SQL Server environments.[9]

When you open up the Tableau workbook to change the connection to the Production server, make sure you connection using an application ID, or Username, of "tableau" (shown below). "tableau" is an application ID that is used in publishing to allow a viewer of the dashboard to excute queries to the SQL Server production environment via this ID. This ID and password is embedded in the published workbook.[10] This ID is also used in the publication of the KPM and KPI[11] dashboards.
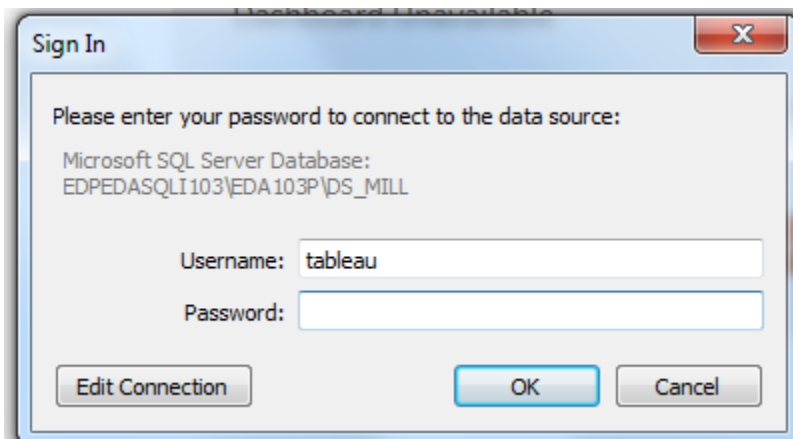
Once in the SQL Server Production environment, the Tableau workbook can be published to the Tableau server.

To publish, first select Server->Publish Workbook... The following dioalogue box pops up to sign into the Tableau server.
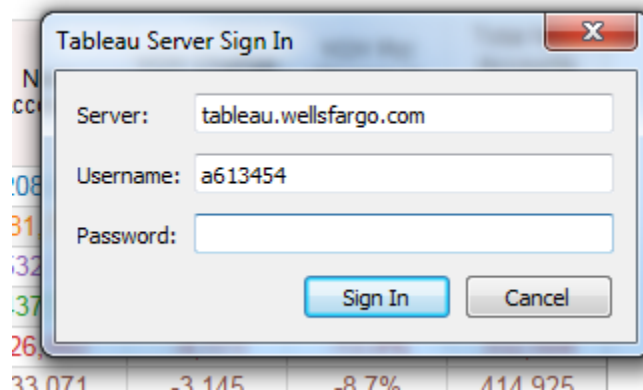
After signing, the following publishing dialogue box pops up. Assign a name that will be identified on the server. Check the dashboard views to publish (on the right).

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[9] After Jan 1, 2016, ED&A's policies have changed. It will requrie a PAC2000 ticket to move the databases.
[10] _____ of ED&A is a potential resource for Tableau publishing issues.
[11] See _____ for KPI dashboard.
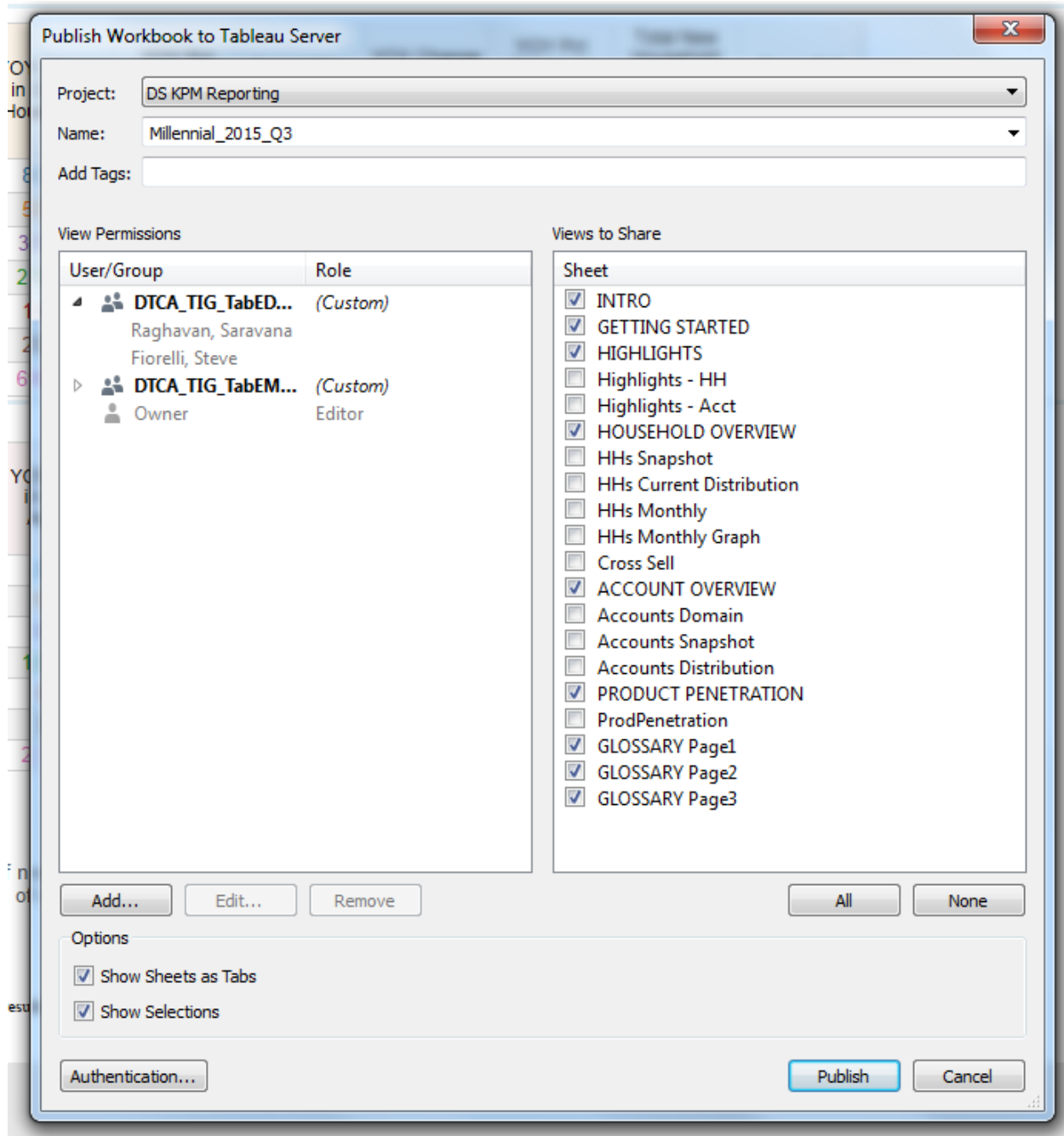
The Authentication button refers to authenticating queries back to the SQL Server production system. There is a common SQL Server user ID, tableau, that is used for queries. Authentication should occur with the tableau user password.
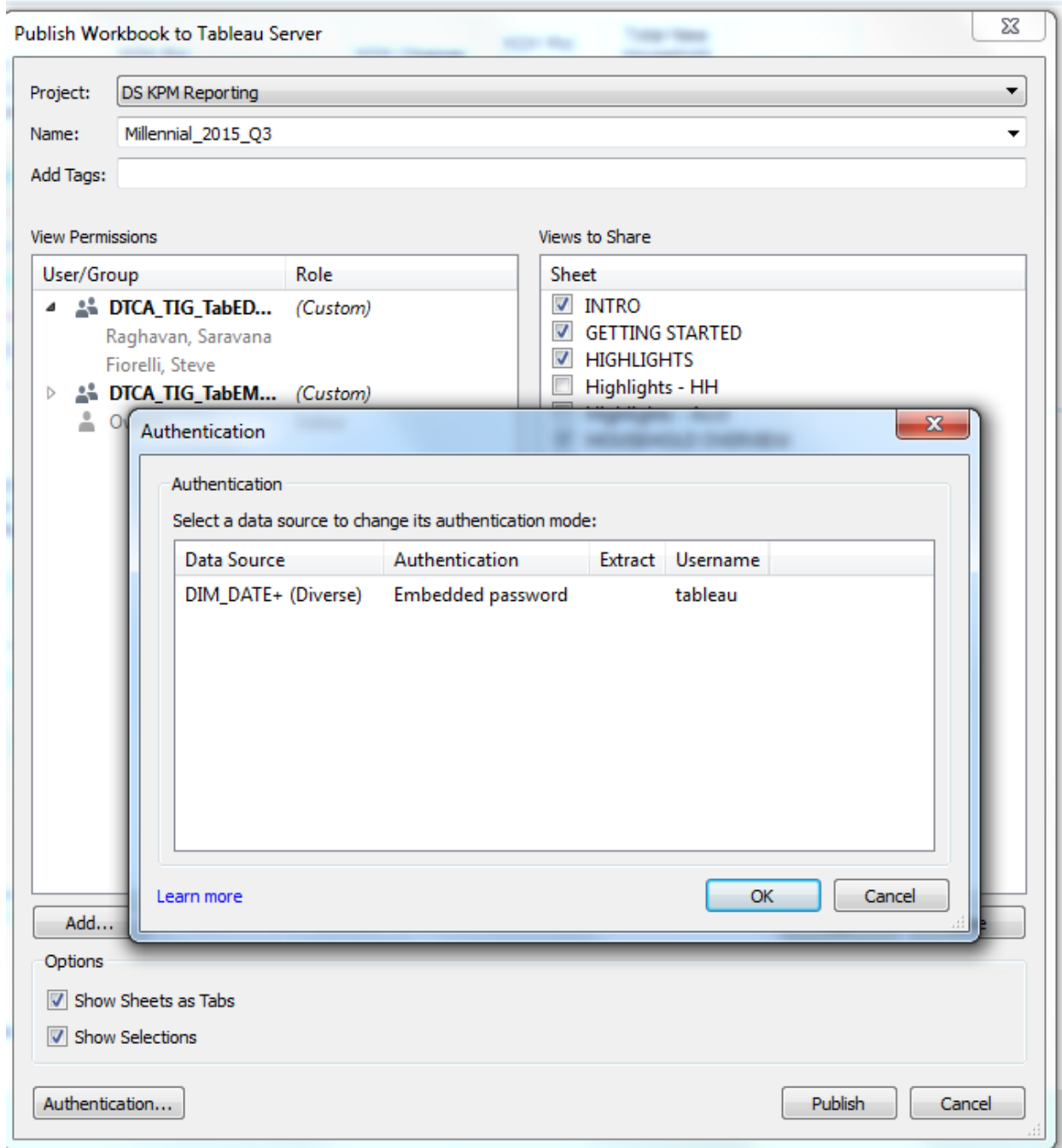
At this point, clicking the Publish button will write (or over-write) the workbook to the server.

To view workbooks you have access to on the server, go to:

https://tableau.wellsfargo.com/#/workbooks

The current KPM Millennial Dashboard (2015Q3) can be viewed at:

https://tableau.wellsfargo.com/#/views/Millennial_2015_Q3/INTRO?:iid=1

Requested enhancements to the Tableau Dashboard

Business users have requested enhancements to the Dashboard. These requested enhances are outlined in Appendix D.

Pivot Table Publishing

Excel files are produce as output to data preparation post-processing with the SAS program

/sas/AU48750/BusinessAnalutics/KPMMillennialDashboard/code/millennial_post_processing.sas

On bmgtsun6.

With WinSCP, copy all the Excel files in:

/sas/AU48750/BusinessAnalutics/KPMMillennialDashboard/data

To the ETECH share drive at:

\\DTCNAS-CASF006\C_RBG_Groups\ETECH\BusinessAnalytics\KPMMIllennialDashboard\InputSpreadsheets

Each spreadsheet copied will have a corresponding pivot table in:

\\DTCNAS-CASF006\C_RBG_Groups\ETECH\BusinessAnalytics\KPMMIllennialDashboard\OutputReports

There are 31 input spreadsheets and 31 pivot tables:

- 14 metrics for the previous year. Move input spreadsheets with the suffix of _2014.xlsx into pivot tables with the suffix _2014Q4.xlsm. Overall counts for the previous year metrics do not change with the quarter being process for the current year. However, the regional hiearchy will change, and the prior year's counts are to be restated with the current hierarchy.
- 14 metrics for the current year. Rename the pviot tables for the current year to reflect the current quarter being processed (e.g. _2015Q3.xlsm renamed to _2015Q4.xlsm when 2015Q4 is being processed).
- 3 derived metrics for the current year (HH_C_YOY, HH_N_!_YOY, HH_N_1_YOYTOT). Mapping the same as for current year.
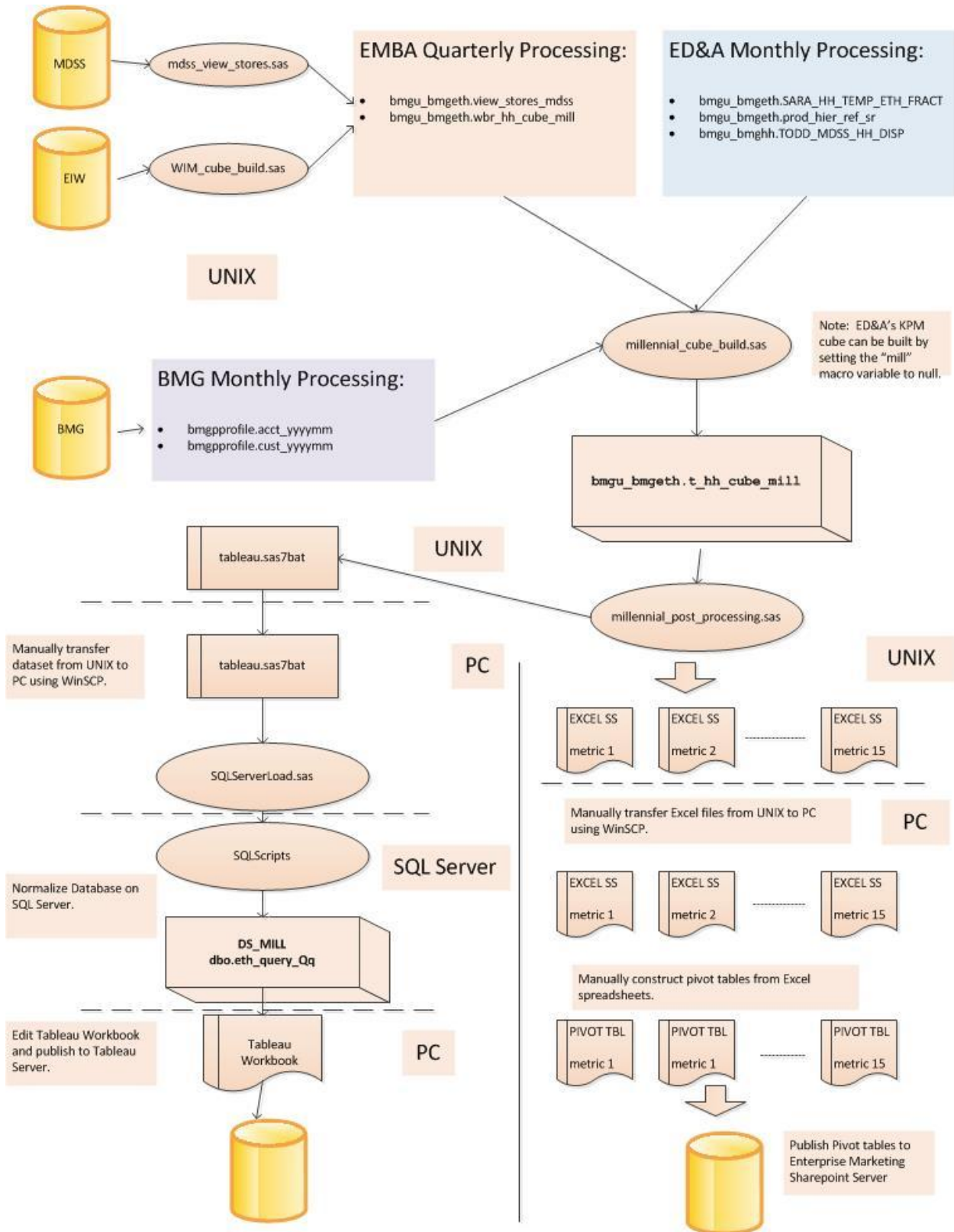
The input spreadsheet is copied into the data (hidden) tab of the pivot table. The only exception to this copying is with product penetration (PP). The data from the PP input spreadsheet is to be copied into three pivot table data tabs by the household view (All Retail, Community Bank, and WIM).

The pivot table is protected with the password "alec". Unprotect the sheet, change the data source to the data tab. Make sure EOY for the prior year is in the leftmost column. And reprotect the sheet with the password "alec". There is a notes page in each pivot table for any important issues to note.

After all 33 pivot tables are created, upload them to the Millennial Marketing sharepoint site at:

http://em.wellsfargo.com/em/diverse%20growth%20segments/DS%20Team/MillennialWorkspace/CoreTeamOnly/Pages/default.aspx

Appendix A – Build Process Overview

Appendix B – SQL Server ODBC Connection

To run SQLServerLoad.sas from your PC, you will need to set up an ODBC connection to ED&A's SQL Server development environment. Use the 32-bit ODBC adminstration to set up a connection similar to the one below. In the program, you will need to set "dsn=" within the libname statement to be equivalent to the "Data Source Name" you create below.
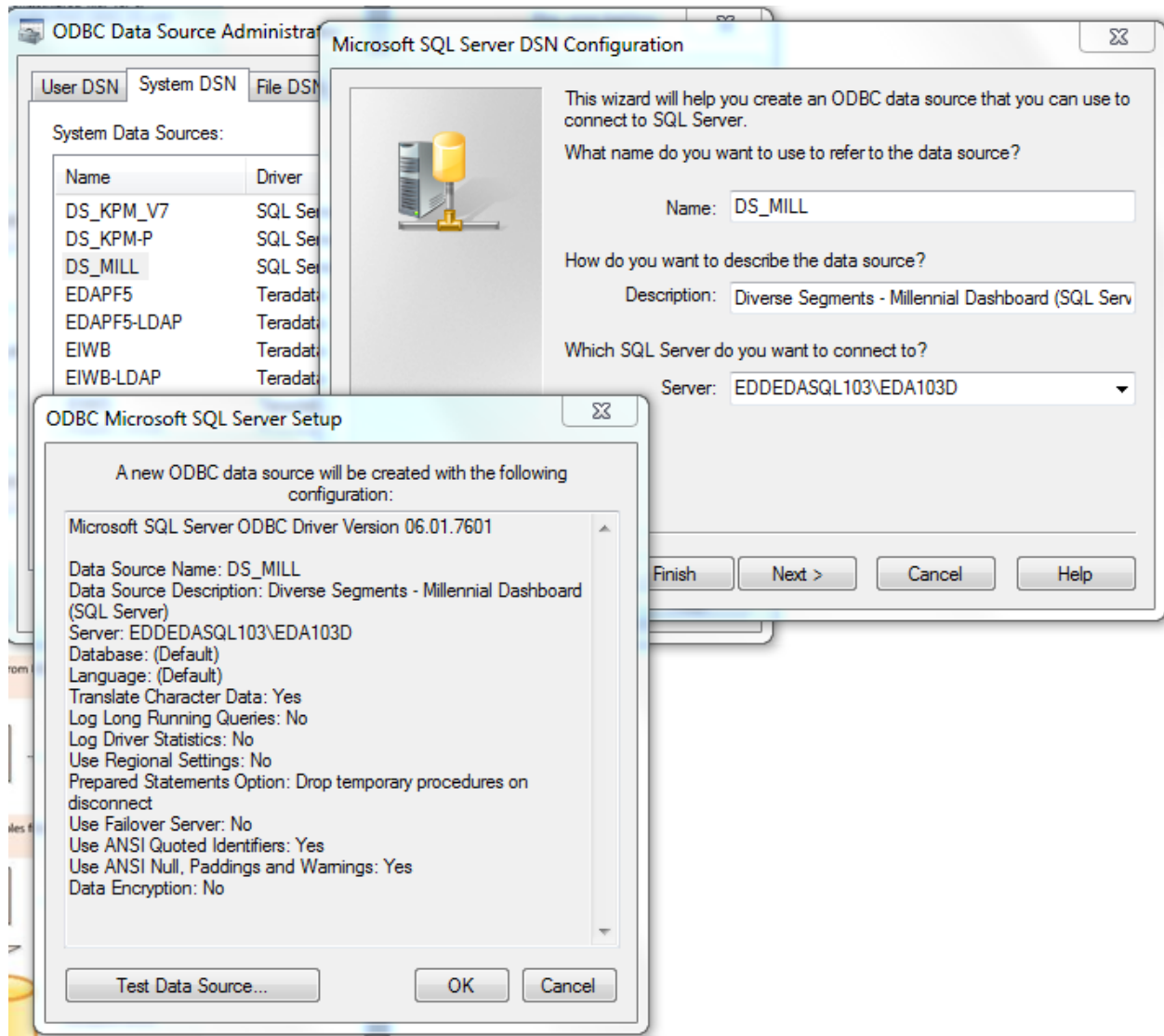
Appendix C – Setup to SQL Server from Unix

In your home directory create an odbc.ini file with an entry for the Data Source Name (DSN) you want to connect to. An example odbc.ini file is shown below. [DS_KPM] is the entry for a DSN called DS_KPM (you will need to fill in the password).

```
[DS_KPM]
Driver=Easysoft ODBC-SQL Server
Description=Easysoft SQL Server ODBC driver
Server=rdvwa4002.ent.wfb.bank.corp
Port=1433
Database=DS_KPM
User=tableau_dev
Password=xxxxx
Mars_Connection=No
Logging=No
LogFile=
QuotedId=Yes
AnsiNPW=Yes
Language=
Version7=No
ClientLB=No
Failover_Partner=
VarMaxAsLong=No
DisguiseWide=No
DisguiseLong=No
DisguiseGuid=No
Trusted_Connection=No
Trusted_Domain=
IPv6=No
```

The isql application can be used to verify that you can connect to SQL Server from UNIX through an ODBC connection. You will need to add the path to isql within your login.profile as shown below (/users/apps/easysoft/unixODBC/bin):

```
PATH=/sas-bin/SAS_9.1/sasexe:$PATH:/usr/local/bin:/users/apps/easysoft/unixODBC/bin
```

A sample connection to the DS_KPM database on the SQL Server system is shown below:

```
rdstd4001.wellsfargo.com - PuTTY

$ isql -v DS_KPM
+---------------------------------------+
| Connected!                            |
|                                       |
| sql-statement                         |
| help [tablename]                      |
| quit                                  |
|                                       |
+---------------------------------------+
SQL> select top 10 * from dbo.eth_cube
+--------------------+------------+--------+-------+-------+-----------+-----------+-------
---+----------+------------+
| CNT                | METRIC     | DATE_ID| ORG_ID| HH_ID | ETHNIC_ID| BUSCONS_ID| DOMAIN
_ID| ASSIGN_ID| view_id   |
+--------------------+------------+--------+-------+-------+-----------+-----------+-------
---+----------+------------+
| 1347.83            | AC         | 0      | 1     | 0     | 0         | 0         | 0
| 0        | 200        |
| 1347.83            | AC         | 0      | 1     | 0     | 0         | 0         | 0
| 0        | 300        |
| 1347.83            | AC         | 0      | 1     | 0     | 0         | 0         | 200
| 0        | 200        |
| 1347.83            | AC         | 0      | 1     | 0     | 0         | 0         | 300
| 0        | 300        |
| 9491.90            | AC         | 0      | 1     | 1     | 0         | 0         | 0
| 0        | 200        |
| 9491.90            | AC         | 0      | 1     | 1     | 0         | 0         | 0
| 0        | 300        |
| 9491.90            | AC         | 0      | 1     | 1     | 0         | 0         | 200
| 0        | 200        |
| 9491.90            | AC         | 0      | 1     | 1     | 0         | 0         | 300
| 0        | 300        |
| 332.85             | AC         | 0      | 1     | 4     | 0         | 0         | 0
| 0        | 300        |
| 332.85             | AC         | 0      | 1     | 4     | 0         | 0         | 300
| 0        | 300        |
+--------------------+------------+--------+-------+-------+-----------+-----------+-------
---+----------+------------+
SQLRowCount returns -1
10 rows fetched
SQL>
```

At the time of this writing, using an ODBC connection on Unix with SAS had not been determined. The
following are instructions from BMG SAS Administration concerning ODBC in SAS Unix:

From: BMG SAS ADMIN
Sent: Wednesday, September 09, 2015 11:05 AM
To: Fiorelli, Steve
Cc: BMG SAS ADMIN
Subject: RE: BMG Support Ticket ID #3115

Hi Steve,

Here are the instructions on how to connect to a Microsoft SQL Server database from bmgtsun6. The database needs to be in either "server authentication" mode or "mixed authentication" mode and the account you use must be an internal SQL Server account, not an AD account.

These are the things that need to be set up by you in order to make this work:
- -an .odbc.ini file in your home directory with a connection entry for the MS SQL Server DB
- -the Easysoft SQL Server drivers in your LD_LIBRARY_PATH
- -the correct SAS syntax

Example .odbc.ini:

[database_name]
Server=servername.wellsfargo.com
Driver=/users/apps/easysoft/sqlserver/lib/libessqlsrv.so
Description=Description_of_Database
Address=servername.wellsfargo.com
Trusted_Domain=
Trusted_Connection=0
Port=11005
AlternateServers=
AnsiNPW=Yes
ConnectionRetryCount=0
ConnectionRetryDelay=3
Database=databasename
LoadBalancing=0
LogonID=
Password=
QuotedId=1
ReportCodePageConversionErrors=0
LOGFILE=
LOGGING=No

Easysoft paths in the shell's LD_LIBRARY_PATH environment variable:

LD_LIBRARY_PATH=/users/apps/easysoft/unixODBC/lib:/users/apps/easysoft/sqlser ver/lib:/users/apps/easysoft/lib:$LD_LIBRARY_PATH

export LD_LIBRARY_PATH

Example SAS code:

proc sql;

connect to ODBC (user=username password='XXXXXXXX' dsn='DBNAME');
select * from connection to odbc
  (select getdate());
  disconnect from odbc;

quit ;

Appendix D – Requested Dashboard Enhancements

Our business partners have asked for a number of enhancements to the KPM Millennial Dashboard.

1. Means for showing if a product is under/over index when comparing Millennials vs Non-Millennials. Create a new tab of the dashboard that provides a ratio of product pentration of products—Millennials/Non-Millennials. Use a color pallette to show the deviation from 1. This is not a must requirement.
2. On the "Household Overview" tab, HH acquisition and attrition counts are displayed (see bleow). Would like to change display or add a display that shows acquisition and attrition as a percentage of portfolio.
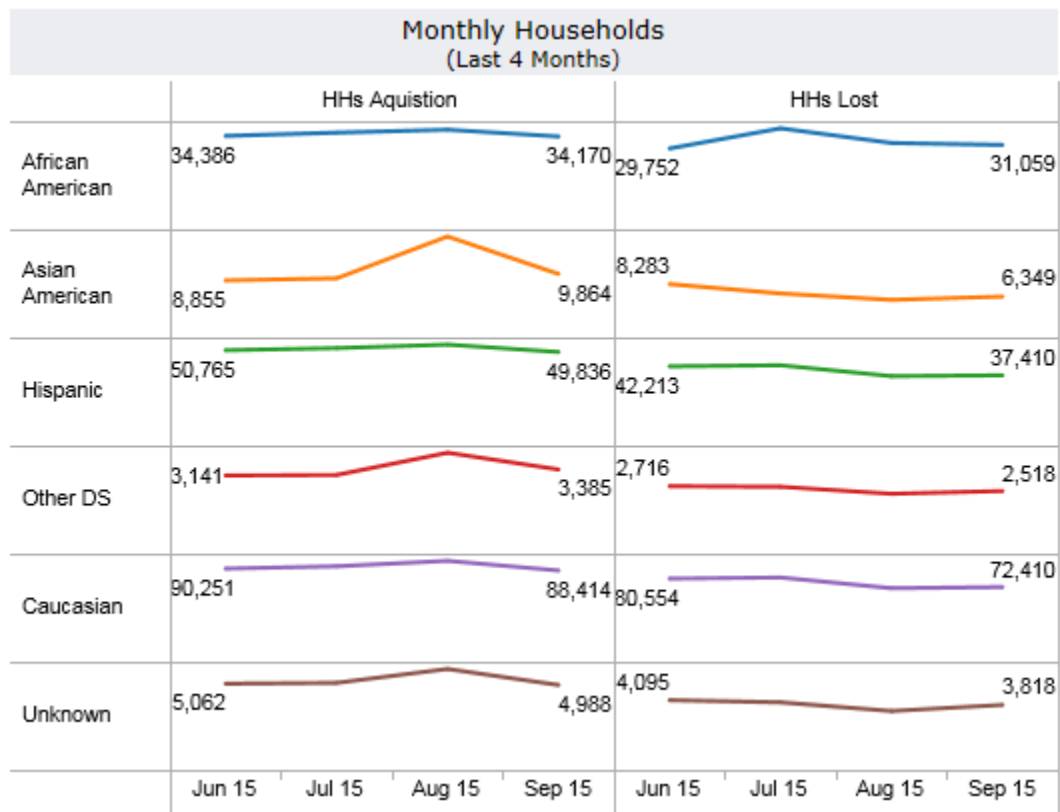
3. In the "Household Snapshot" graphic of the "Houshold Overview" tab and the "Account Snapshot" graphic of the "Account Overview" tab (below), would like to see Millennial and Non-Millennial numbers side by side.

Household Overview, September 2015

Household Snapshot			
	EOY 14	Sep 15	YTD Growth
African American	894,783	960,405	65,622
Asian American	462,075	503,469	41,394
Hispanic	1,759,974		174,265
Other DS	126,209		11,759
Caucasian	4,146,508		234,509
Unknown	207,646	222,934	15,288
Grand Total	7,597,195	8,140,032	542,837

Ethnicity:
HHs: 15,676
% of Total HHs:

Accounts-Current Overview, September 2015

Accounts-Current Snapshot			
	EOY 14	Sep 15	YTD Growth
African American	4,386,959	4,647,769	260,811
Asian American	3,052,168	3,224,628	172,459
Caucasian	22,068,837	22,607,637	538,801
Hispanic	11,226,660	12,100,840	874,180
Other DS	797,558	839,682	42,124
Unknown	1,203,351	1,235,184	31,833
Grand Total	42,735,533	44,655,740	1,920,208

20M

10M

0M