

**Paper SAS1788-2015**  
**BI-on-BI for SAS® Visual Analytics**  
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## **ABSTRACT**

SAS® Visual Analytics is deployed by many customers. IT departments are tasked with efficiently managing the server resources, achieving maximum usage of resources, optimizing availability, and managing costs. Business users expect the system to be available when needed and to perform to their expectations. Business executives who sponsor business intelligence (BI) and analytical projects like to see that their decision to support and finance the project meets business requirements. Business executives also like to know how different people in the organization are using SAS Visual Analytics. With the release of SAS Visual Analytics 7.1, new functionality is available to support the memory management of the SAS® LASR™ Analytic Server. Also, new, out-of-the-box usage and audit reporting is available. This paper covers BI-on-BI for SAS Visual Analytics. We discuss resource management, data compression, and out-of-the-box usage reporting of SAS Visual Analytics. Key product capabilities are demonstrated.

## **INTRODUCTION**

Business Intelligence (BI) is a combination of technologies and business processes for managing, monitoring, and decision making in any enterprise. Business managers invest lots of money and time in installing sophisticated BI systems and have high expectations on the use and effectiveness of these BI systems. Measuring the effectiveness of BI systems is very important in assessing how the BI systems are used today and evaluating the investment that might be needed in the future.

Having a quantitative insight on the usage and performance of the BI system will help IT managers to understand, plan, and budget the right resources to support BI in their company. More often, IT managers depend on the general sizing estimates, general projections on the usage, and their gut. It is more guess work than analytic work.

BI-on-BI will help your IT managers plan and be pro-active. By measuring the key usage patterns of the BI systems in the company, managers can predict the needs and workloads of the BI system and hence plan accordingly. They can be proactive, rather than reactive, in their support of the business community.

BI-on-BI should help rationalize the business needs and the BI investment made. The important way to rationalize the BI initiative is to measure how BI supports the key performance indicators and strategic business initiatives of the company.

In this paper and presentation, I would like to share the insights and information provided in the out-of-the-box reports from SAS Visual Analytics, in line with the BI-on-BI requirements. I will also provide information on additional data from the platform that can be used to build the reports and dashboards that will help you get the usage metrics that you need.

SAS® Visual Analytics with the 7.1 release provides some out-of-the-box data and a report for administrators. The purpose of this multi-page report is to give some level of BI-on-BI for administrators. This report is the first step toward providing measurable metrics on the use of SAS Visual Analytics in the customer enterprise. In an upcoming release of SAS Visual Analytics, a new set of reports are planned that would complement the Administrators Overview report that was introduced in earlier releases. Another report that will be added in in the upcoming release is based on the relationship data. It presents lineage relationship information between reports, explorations, tables, and stored processes. These are the fundamental components of SAS Visual Analytics, and the relationship information helps the system administrator to understand the impact of these components on each other. For example, you can see the how many reports and which reports in which a given table is used.

## METRICS USED FOR BI-ON-BI

The metrics that an organization would like to capture for the purpose of BI-on-BI is subjective and specific to the organization's needs and the insights the organization is interested in. I will provide some common metrics that will be a good starting point for this process. My recommendation is based on the approach that efficiency is related to access to system resources and the creation of reports and exploration, whereas effectiveness is related to the use of the content.

Metrics for monitoring efficiency:

- Number of reports created by users. Gives you the volume of usage.
- Number of explorations
- How often reports and explorations are modified
- What are the most accessed data sets
- How much memory is used

Metrics for monitoring the effectiveness:

- How often people use the reports through Mobile and web viewer?
- How often reports are printed?
- Which components of SAS Visual Analytics are most used and by whom? Is it exploration or reports or data preparation or mobile access?
- Which tables are used most often?
- What is each user using the system for?
- What type and size of tables are loaded?

## GETTING STARTED

When SAS Visual Analytics is first deployed, the data collection is not enabled. Some companies might be interested in this system reporting, and some might not. It is your choice as a customer to enable the data collection and to report on the data. The process to enable this data collection is documented in the *SAS® Visual Analytics: Administration Guide*.

The data set is automatically loaded to the EVDATA library and can be accessed from the Administrator interface. See Figure 1.

Table	Location	Description	Status	Rows	Columns	Size	Compression
AUDIT_M...	/Shared D...	Auto load...	●	510,799	21	1.19 GB	
ADVERSE	/Shared D...	Adverse	●	21	7	2.09 KB	
ALERT_I...	/Shared D...	Alert inves...	●	479	40	1.29 MB	
ALL_ENE...	/Shared D...	All Enemi...	●	51	21	9.19 KB	
AMAZON_...	/Shared D...	Amazon R...	●	1,830	12	19.00 MB	
AMAZON...	/Shared D...	Amazon r...	●	25	4	2.00 KB	
BANKING...	/Shared D...	Murall Ba...	●	3,551,116	36	1.39 GB	
BASE_EN...	/Shared D...	Base Ene...	●	29	16	4.09 KB	
BEDBRE...	/Shared D...	Quebec g...	●	43	9	9.09 KB	
BILL_V...	/Shared D...	Telco_bill...	●	6	8	532.0 b...	
BIRTHNA...	/Shared D...	Baby Na...	●	1,758,730	4	67.00 MB	
BIRTHNA...	/Shared D...	Baby Na...	●	5,459,281	5	250.00 MB	
BLOGDIL...	/Shared D...	Blog Dilber...	●	672	2	21.00 KB	
BLOGGCM	/Shared D...	Blog GCM	●	494	2	15.00 KB	

Figure 1 SAS Visual Analytics Admin Interface with AUDIT\_VISUALANALYTICS Data Set

The out-of-the-box reports in SAS Visual Analytics 7.1 are accessible from the Administrator interface. You need Administrator permissions to view these reports. This restriction is by design. The usage data contains information about the tables, reports, exploration, and users. Hence, this information is sensitive to the company, and we recommend not to make available to all the SAS Visual Analytics general users.

Reuse of the reports and data is possible. Administrators can duplicate the report and save it in a different location with permissions for many others to see the report. Even the data can be appended with other data sources to augment the data given by SAS out-of-the-box to expand the reporting on SAS Visual Analytics usage.

SAS encourages SAS Visual Analytics administrators to duplicate the data and enrich them with other data that will be of value to them.

## OVERVIEW OF VISUAL ANALYTICS USAGE

The Top Usage section of the out-of-the box report gives you a top user's overview of the usage of SAS Visual Analytics as seen in Figure 2. You can monitor the most active users on this installation of SAS Visual Analytics based on how often they log in. You can also see what are the most accessed tables and reports.

As shown in Figure 2, using the parameter input, you can choose to see the top 5, 10, or 20 users of the system. This gives the administrator the flexibility to look at the usage based on the ranking.

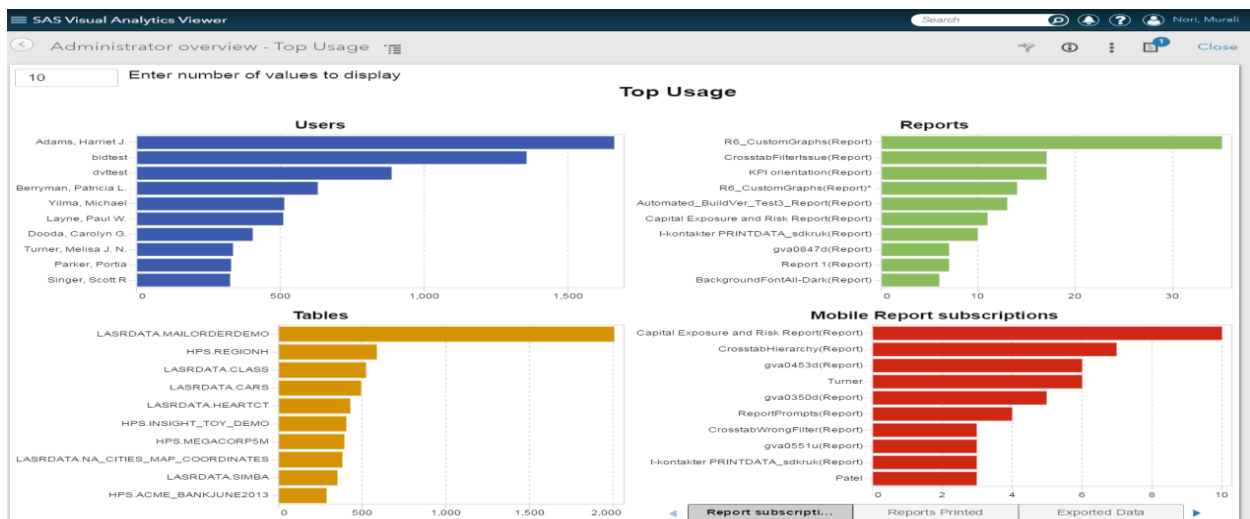


Figure 2: Top Usage in SAS Visual Analytics Out-of-the-Box Administrator Overview Report

## COMPONENTS USAGE

In the Visual Analytics section of the report as seen in Figure 3, you can see the usage by component or function.

By components, I am referring to the design, explore, and prepare data interfaces of SAS Visual Analytics. You can select a day and analyze the usage of designer, explorer, data preparation, web viewer mobile, Add-In for Microsoft, and SAS® Enterprise Guide. The bar chart gives you the component usage sorted in descending order. Using the component, you can filter to see what specific component of SAS Visual Analytics that users are mostly using.

These insights are important to know how the business community is actually using the functionality in SAS Visual Analytics and which users are using it. Often, IT managers have no idea of what functionality is most used in the BI product. With this insight, IT managers can be proactive in their planning of system resources to support the activities that are actually used.

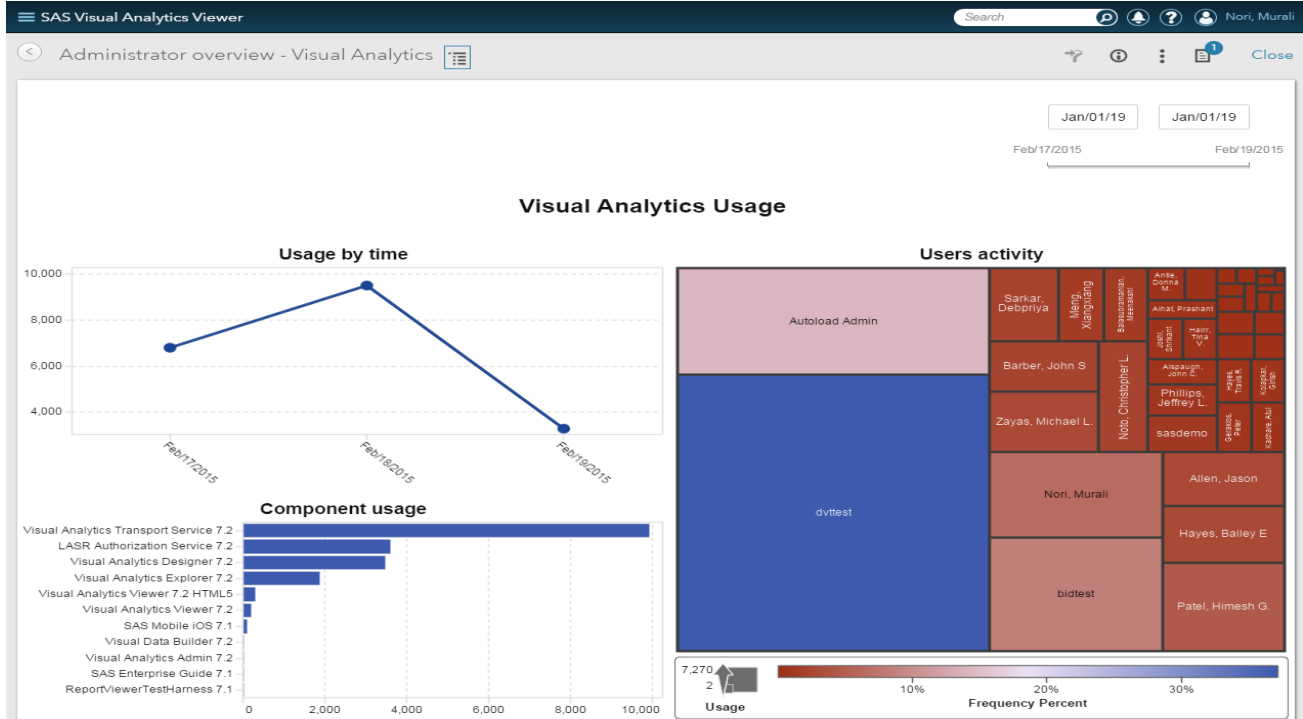
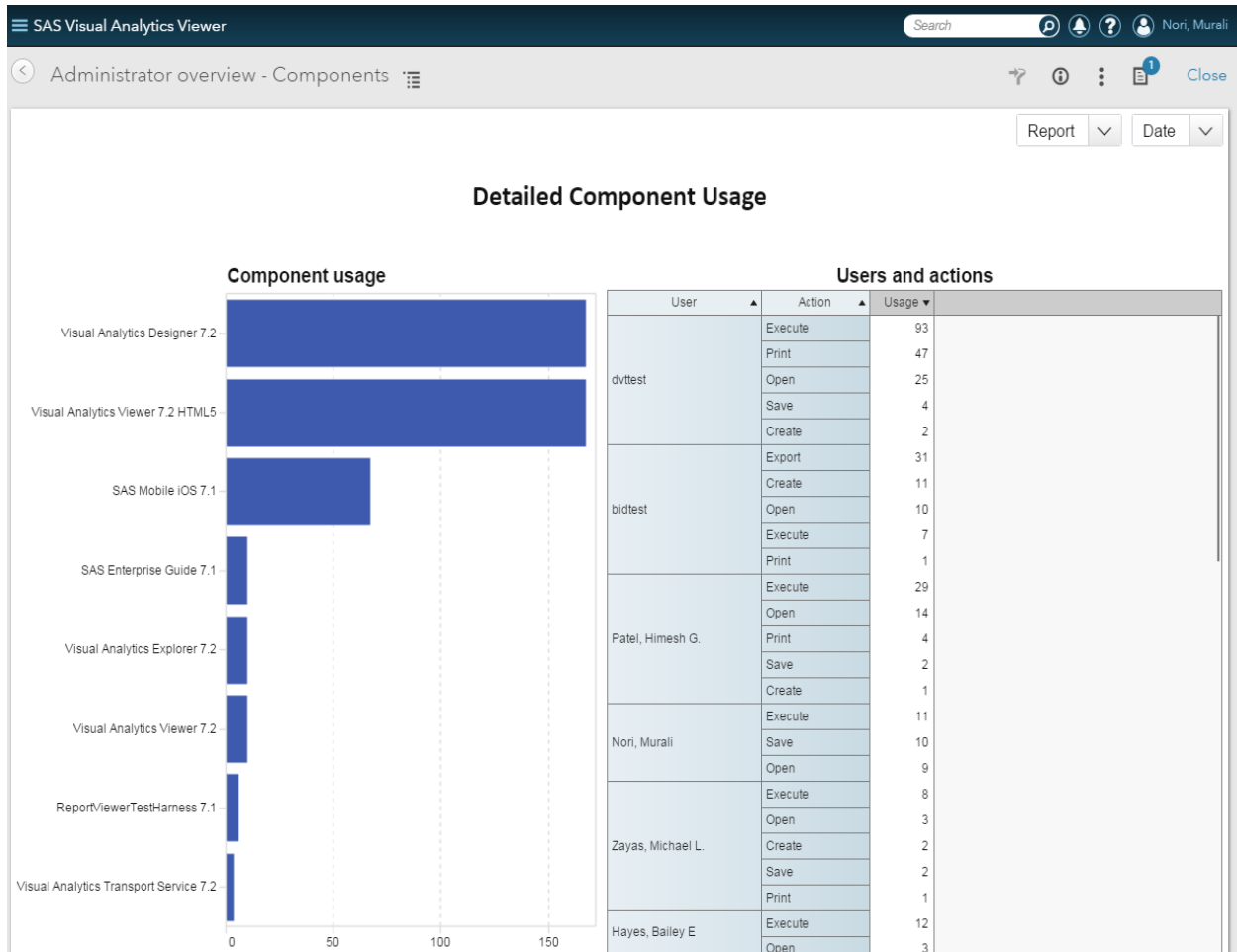


Figure 3 Visual Analytics Usage Section of the Administrator Overview Report

In the Components section of Figure 4, you can choose a component like Designer, Explorer, Data Preparation and see what different activities users are trying to do within that component. Since the crosstab is sorted by top users, you can see what the top users are doing in terms of creating, opening, saving, running a query, or printing the reports.

This insight is useful in computing what the major activities of the users are performing in each component of SAS Visual Analytics.



**Figure 4 Components Section of the Administrator Overview Report**

## DATA USAGE

The most important aspect of any BI system is the data. The IT managers and the administrators spend a lot of time in organizing data that is loaded for the users by the IT or loaded by the business users as part of the self-service activity. The management of data also plays an important part in the performance tuning of the system.

In the LASR Servers section of the report as seen in Figure 5, you can see the most used tables by LASR Analytic Server by date.

In SAS Visual Analytics, administrators can define different LASR Analytic Servers and load different tables for each LASR Analytic Server. This is one approach to organizing the departments of functional groups within an organization.

This insight is useful in proactively planning the system resources for each functional group for good performance and managing the data life cycle. If you see a particular LASR Analytic Server being overloaded with many tables or tables of a big size, you can plan to compress some of the tables or unload some of the less frequently used tables. As an administrator, you can be proactive rather than reactive.

Figure 5 shows the relationship of the LASR server to the tables loaded to the server. This gives the information on the usages and table volume for the LASR server.

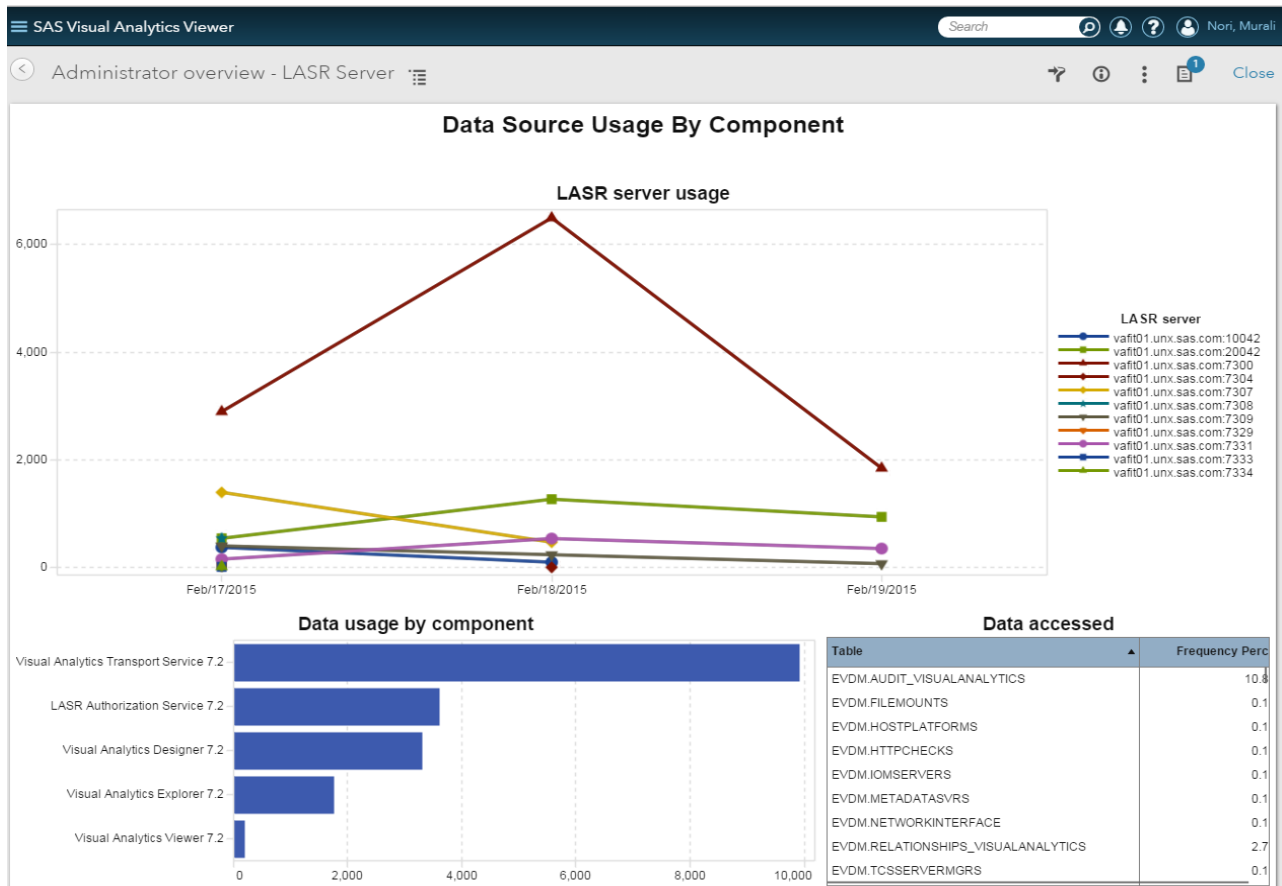


Figure 5 LASR Server Section of the Administrator Overview Report

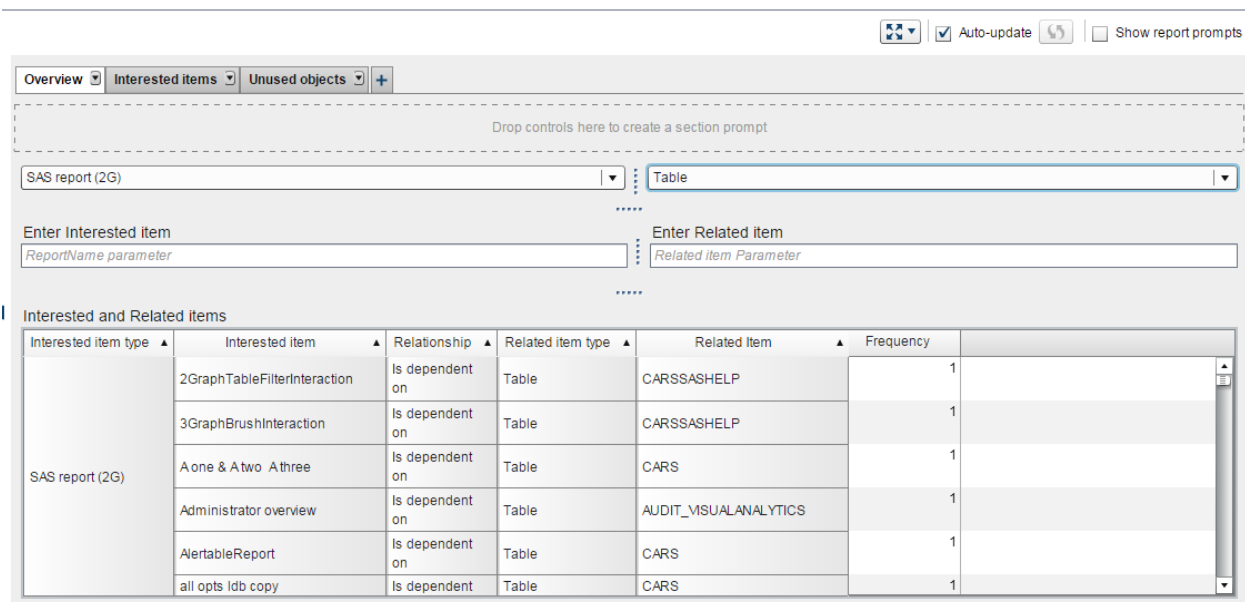
## RELATIONSHIP REPORT

In an upcoming release of SAS Visual Analytics, SAS is introducing a new report based on the relationships between the reports, exploration, tables, and Stored Process. The purpose of this report is to provide administrators some lineage information on which tables are used in a report. For a given table, what the columns are available? What tables are in an exploration?

Administrators can also use the relationship report to find what reports are using a given table. See Figure 6. This helps administrators to know if a table is used in reports before they decide to remove the table from the system.

It is also possible to look for the most used or interesting items. And to find out which are the less used items.

Administrators can find what the most used reports are, using the word cloud, and they can use the bar chart and table to find what tables are used in these reports and what the locations of the tables are.



**Figure 6 Relationship Report**

### **Setting Memory Size Limits on Tables in a LASR Analytic Server**

In SAS Visual Analytics 7.1, a new feature is added to set data size limits on a LASR Analytic Server. See Figure 7. Using this new capability, SAS Visual Analytics administrators can set the maximum memory size for a given LASR Analytic Server instance. For example, if the Table Limit is set to 500MB on the LASR Analytic Server, the total memory for all the tables put together on this LASR cannot exceed 500MB.

Using the information from the out-of-the-box report, the administrator can see which LASR Analytic Servers are most used and set the memory limits accordingly. The memory limits will ensure that the LASR Analytic Server instance will not take over the entire grid memory and bring the system to a poorly performing state. In other words, the LASR always have some memory that will help it function well for all users.

### **Compression on Tables**

In SAS Visual Analytics 7.1, table compression is added. See Figure 7. This allows the compression of data that is loaded to the LASR Analytic Server. Data compression helps in reducing the overall memory required for data.

Compression has affects performance and certain actions. When a user does exploration like forecasting or a decision tree, the analytics need to run on compressed data. This increases the overall response time compared to running on uncompressed data. The high-level guideline for compression is to select tables that are more often used for reporting actions and not for analytical explorations.

Using the information from the out-of-the-box report, the administrator can see which tables can be compressed. In Figure 7, in the Status column, the green dot with an outer green circle, represents a tables with is compressed.

File View LASR Tools Help 57% Sign Out

LASR Servers \* LASR Tables \*

Get status as tab is initialized Cancel Table Search

Table	Status	Size	Location	Server	Loaded	Description
ORDERS_10MILL_ZH		169.32 MB	/SAS Projects/NLS/LASR/VAFIT/zh/Libraries/BIRD Chinese LASR on V...	BIRD Chinese LASR on VAFIT	03/31/15 05:31 AM	(中文) [host:port] Orders with 10 M
TAB_TAB分隔表_U8		1.90 KB	/SAS Projects/NLS/VAA/Current Release/u8/Tables - 簡體中文表/U8/V...	VAA72 Manual LASR Server - 簡體中文表/U8/V...	03/31/15 05:26 AM	Auto loaded March 31, 2015 5:26
CVP引擎测试		579.41 KB	/SAS Projects/NLS/VAA/Current Release/u8/Tables - 簡體中文表/U8/V...	VAA72 Manual LASR Server - 簡體中文表/U8/V...	03/31/15 05:19 AM	Auto loaded March 31, 2015 5:19
CLASS_U8		15.51 KB	/SAS Projects/NLS/VAA/Current Release/u8/Tables - 簡體中文表/U8/V...	VAA72 Manual LASR Server - 簡體中文表/U8/V...	03/31/15 05:23 AM	Auto loaded March 31, 2015 5:23
CARS_EN		13.28 MB	/SAS Projects/NLS/VAA/Current Release/u8/Tables - 簡體中文表/U8/V...	VAA72 Manual LASR Server - 簡體中文表/U8/V...	03/31/15 05:19 AM	Auto loaded March 31, 2015 5:19
WORLDCOMBINED_ZT		1.34 MB	/SAS Projects/NLS/LASR/VAFIT/zh/Libraries/BIRD Traditional Chinese ...	BIRD Traditional Chinese LASR on VAFIT	03/31/15 05:30 AM	(繁体) [host:port] Geo Data and Lo
PRDSALE_ZT		22.72 KB	/SAS Projects/NLS/LASR/VAFIT/zh/Libraries/BIRD Traditional Chinese ...	BIRD Traditional Chinese LASR on VAFIT	03/31/15 05:30 AM	(繁体) [host:port] Products Sales
CLASS_ZT		661.00 bytes	/SAS Projects/NLS/LASR/VAFIT/zh/Libraries/BIRD Traditional Chinese ...	BIRD Traditional Chinese LASR on VAFIT	03/31/15 05:30 AM	(繁体) [host:port] Student Data
班级_ZH		665.00 bytes	/SAS Projects/NLS/LASR/VAFIT/zh/Libraries/BIRD Chinese LASR on V...	BIRD Chinese LASR on VAFIT	03/31/15 05:34 AM	(中文) [host:port] Student Data with
WORLDCOMBINED_ZH		1.31 MB	/SAS Projects/NLS/LASR/VAFIT/zh/Libraries/BIRD Chinese LASR on V...	BIRD Chinese LASR on VAFIT	03/31/15 05:32 AM	(中文) [host:port] Geo Data and Lo
NFLPLAYERSALARIES20...		64.98 KB	/SAS Projects/NLS/LASR/VAFIT/zh/Libraries/BIRD Chinese LASR on V...	BIRD Chinese LASR on VAFIT	03/31/15 05:31 AM	(中文) [host:port] 2009 NFL Player
MAILORDERDEMO_ZH		236.89 KB	/SAS Projects/NLS/LASR/VAFIT/zh/Libraries/BIRD Chinese LASR on V...	BIRD Chinese LASR on VAFIT	03/31/15 05:31 AM	(中文) [host:port] Mail Order Data [
LINKS_ZH		75.09 MB	/SAS Projects/NLS/LASR/VAFIT/zh/Libraries/BIRD Chinese LASR on V...	BIRD Chinese LASR on VAFIT	03/31/15 05:31 AM	(中文) [host:port] Links
HEARTCT_ZH		125.26 KB	/SAS Projects/NLS/LASR/VAFIT/zh/Libraries/BIRD Chinese LASR on V...	BIRD Chinese LASR on VAFIT	03/31/15 05:31 AM	(中文) [host:port] Framingham Hea

Figure 7 LASR Tables Tab which shows compressed tables

## CONCLUSION

The ability to measure the efficiency and effectiveness of the BI system helps IT managers understand and effectively plan the use of BI in their enterprise. SAS Visual Analytics provides some out-of-the-box reporting that facilitates this task for IT managers. These reports might not display all the exhaustive information for BI-on-BI but will help the process by providing some important usage metrics.

## RESOURCES

Lucas, Dan, and Brandon Kirk. 2014. "Auditing an Enterprise SAS® Visual Analytics 6.2 Environment with SAS® Tools: From the SAS® IT Perspective." *Proceedings of the SAS Global Forum 2014 Conference*. Cary, NC: SAS Institute Inc.

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SAS Institute Inc. *SAS® LASR™ Analytic Server: Administration Guide*. Cary, NC: SAS Institute, Inc.

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<http://supportprod.unx.sas.com/documentation/solutions/va/71/en/vaag.pdf>.

## **CONTACT INFORMATION**

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