Statistical Analysis of Global Growth (SAGG) 2.0

Technical Manual

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Enterprise Systems Engineering (ESE)

Capacity and Performance Engineering (CPE)

Revision History

Documentation Revisions

Table 1 displays the revision history for this document. Revisions to the documentation are based on patches and new versions released to the field.

Table 1. Documentation revision history

Date	Revision	Description	Author
12/30/2015	4.1	Updated document based on Statistical Analysis of Global Growth *SAGG) updates based on Kernel Patch XU*8.0*568. Software: **SAGG 2.0**.	J. L. (CPE): St. Petersburg Field Office Technical Writer: T. B.
10/--/2015	4.0	This patch enables SAGG to run on Linux based systems. It also does *not* collect metrics on all volume sets. Software: **SAGG 2.0**.	J. L. (CPE): St. Petersburg Field Office
07/--/2007	3.0	Patch SAGG v2.0 updates the SAGG PROJECT package to version 2.0. This version removes support for DSM/MSM and now uses API's from the CM TOOLS package that are *not* SAGG specific. The only operating systems now supported are Cache for Windows and Cache for VMS. Other documentation updates: The KMPS-SAGG mail group is no longer in use. The KMP-CAPMAN is now used for all notifications. There are no new options, and they all work the same except for [KMPS SAGG STATUS]. This option now uses ListManager to the display is different.	Robert Kamarowski from the SAGG Development Team; Susan Strack, Oakland Office of Information Field Office (OIFO)
01/--/2005	2.0	Reformatted document to follow current ISS standards. Reviewed document and edited for the "Data Scrubbing" and the "PDF 508 Compliance" projects. **Data Scrubbing—**Changed all patient/user TEST data to conform to HSD&D standards and conventions as indicated below: The first three digits (prefix) of any Social Security Numbers (SSN) start with "000" or "666." Patient or user names are formatted as follows: KMPDPATIENT,[N] or KMPDUSER,[N] respectively, where the N is a number written out and incremented with each new entry (e.g., KMPDPATIENT, ONE, KMPDPATIENT, TWO, etc.).	Technical Writer: T. B., Oakland OIFO

Date	Revision	Description	Author
		Other personal demographic-related data (e.g., addresses, phones, IP addresses, etc.) were also changed to be generic. **PDF 508 Compliance—**The final PDF document was recreated and now supports the minimum requirements to be 508 compliant (i.e., accessibility tags, language selection, alternate text for all images/icons, fully functional Web links, successfully passed Adobe Acrobat Quick Check).	
07/--/1998	1.0	Initial Statistical Analysis of Global Growth (SAGG) 1.8 software documentation creation.	SAGG Development Team

Patch Revisions

For a complete list of patches related to this software, see the Patch Module on FORUM.

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How to Use this Manual

Throughout this manual, advice and instructions are offered regarding the use and implementation of the Statistical Analysis of Global Growth (SAGG) software and the functionality it provides for Veterans Health Information Systems and Technology Architecture (VistA) software products.

Intended Audience

The intended audience of this manual is all key stakeholders. The stakeholders include the following:

- Information Resource Management (IRM)—System administrators and Capacity Management personnel at Department of Veterans Affairs (VA) sites who are responsible for computer management and system security on the VistA M Servers.

- Product Development (PD)—VistA legacy development teams.

- Product Support (PS).

Disclaimers

Software Disclaimer

This software was developed at the Department of Veterans Affairs (VA) by employees of the Federal Government in the course of their official duties. Pursuant to title 17 Section 105 of the United States Code this software is *not* subject to copyright protection and is in the public domain. VA assumes no responsibility whatsoever for its use by other parties, and makes no guarantees, expressed or implied, about its quality, reliability, or any other characteristic. We would appreciate acknowledgement if the software is used. This software can be redistributed and/or modified freely provided that any derivative works bear some notice that they are derived from it, and any modified versions bear some notice that they have been modified.

Documentation Disclaimer

This manual provides an overall explanation of using the VistA System Monitor (VSM) 1.0 software; however, no attempt is made to explain how the overall VistA programming system is integrated and maintained. Such methods and procedures are documented elsewhere. We suggest you look at the various VA Internet and Intranet SharePoint sites and websites for a general orientation to VistA. For example, visit the Office of Information and Technology (OI&T) Product Development (PD) Intranet Website.

DISCLAIMER: The appearance of any external hyperlink references in this manual does *not* constitute endorsement by the Department of Veterans Affairs (VA) of this Website or the information, products, or services contained therein. The VA does *not* exercise any editorial control over the information you find at these locations. Such links are provided and are consistent with the stated purpose of this VA Intranet Service.

Documentation Conventions

This manual uses several methods to highlight different aspects of the material:

- Various symbols are used throughout the documentation to alert the reader to special information. Table 2 gives a description of each of these symbols:

Table 2. Documentation symbol/term descriptions

Symbol	Description
	NOTE/REF: Used to inform the reader of general information including references to additional reading material.
	CAUTION or DISCLAIMER: Used to caution the reader to take special notice of critical information.

- Descriptive text is presented in a proportional font (as represented by this font).

- Conventions for displaying TEST data in this document are as follows:

  o The first three digits (prefix) of any Social Security Numbers (SSN) begin with either "000" or "666".

  o Patient and user names are formatted as follows:

    – *<APPLICATION NAME/ABBREVIATION/NAMESPACE>*PATIENT,*<N>*

    – *<APPLICATION NAME/ABBREVIATION/NAMESPACE>*USER,*<N>*

  Where "*<APPLICATION NAME/ABBREVIATION/NAMESPACE>*" is defined in the Approved Application Abbreviations document and "*<N>*" represents the first name as a number spelled out or as a number value and incremented with each new entry.

  For example, in SAGG (KMPS) test patient and user names would be documented as follows:

    – KMPSPATIENT,ONE or KMPSUSER,ONE

    – KMPSPATIENT,TWO or KMPSUSER,TWO

    – KMPSPATIENT,THREE or KMPSUSER,THREE

    – KMPSPATIENT,14 or KMPSUSER,14

    – Etc.

- "Snapshots" of computer online displays (i.e., screen captures/dialogues) and computer source code is shown in a *non*-proportional font and can be enclosed within a box.

  o User's responses to online prompts are **bold** typeface and highlighted in yellow (e.g., <mark>**<Enter>**</mark>). The following example is a screen capture of computer dialogue, and indicates that the user should enter two question marks:

    ```
    Select Primary Menu option: ??
    ```

  o Emphasis within a dialogue box is **bold** typeface and highlighted in blue (e.g., <mark>STANDARD LISTENER: RUNNING</mark>).

  o Some software code reserved/key words are **bold** typeface with alternate color font.

  o References to "**<Enter>**" within these snapshots indicate that the user should press the **Enter** key on the keyboard. Other special keys are represented within **< >** angle brackets. For example, pressing the **PF1** key can be represented as pressing **<PF1>**.

  o Author's comments are displayed in italics or as "callout" boxes.

    (i) NOTE: Callout boxes refer to labels or descriptions usually enclosed within a box, which point to specific areas of a displayed image.

- This manual refers to the M programming language. Under the 1995 American National Standards Institute (ANSI) standard, M is the primary name of the MUMPS programming language, and MUMPS is considered an alternate name. This manual uses the name M.

- All uppercase is reserved for the representation of M code, variable names, or the formal name of options, field/file names, and security keys (e.g., the XUPROGMODE security key).

  (i) NOTE: Other software code (e.g., Delphi/Pascal and Java) variable names and file/folder names can be written in lower or mixed case (e.g., CamelCase).

Documentation Navigation

This document uses Microsoft® Word's built-in navigation for internal hyperlinks. To add **Back** and **Forward** navigation buttons to the toolbar, do the following:

1. Right-click anywhere on the customizable Toolbar in Word (*not* the Ribbon section).

2. Select **Customize Quick Access Toolbar** from the secondary menu.

3. Select the drop-down arrow in the "**Choose commands from:**" box.

4. Select **All Commands** from the displayed list.

5. Scroll through the command list in the left column until you see the **Back** command (green circle with arrow pointing left).

6. Select/Highlight the **Back** command and select **Add** to add it to your customized toolbar.

7. Scroll through the command list in the left column until you see the **Forward** command (green circle with arrow pointing right).

8. Select/Highlight the **Forward** command and select **Add** to add it to the customized toolbar.

9. Select **OK**.

You can now use these **Back** and **Forward** command buttons in your Toolbar to navigate back and forth in your Word document when clicking on hyperlinks within the document.

NOTE: This is a one-time setup and is automatically available in any other Word document once you install it on the Toolbar.

How to Obtain Technical Information Online

Exported VistA M Server-based software file, routine, and global documentation can be generated using Kernel, MailMan, and VA FileMan utilities.

NOTE: Methods of obtaining specific technical information online is indicated where applicable under the appropriate section.

Help at Prompts

VistA M Server-based software provides online help and commonly used system default prompts. Users are encouraged to enter question marks at any response prompt. At the end of the help display, you are immediately returned to the point from which you started. This is an easy way to learn about any aspect of VistA M Server-based software.

Obtaining Data Dictionary Listings

Technical information about VistA M Server-based files and the fields in files is stored in data dictionaries (DD). You can use the List File Attributes option on the Data Dictionary Utilities menu in VA FileMan to print formatted data dictionaries.

REF: For details about obtaining data dictionaries and about the formats available, see the "List File Attributes" section in the "File Management" section in the *VA FileMan Advanced User Manual*.

Assumptions

This manual is written with the assumption that the reader is familiar with the following:

- VistA computing environment:
  - Kernel—VistA M Server software
  - VA FileMan data structures and terminology—VistA M Server software
- Microsoft® Windows environment
- M programming language

Reference Materials

Readers who wish to learn more about the Statistical Analysis of Global Growth (SAGG) software should consult the following:

- *Statistical Analysis of Global Growth (SAGG) Installation Guide*
- *Statistical Analysis of Global Growth (SAGG) User Manual*
- *Statistical Analysis of Global Growth (SAGG) Technical Manual* (this manual)
- Capacity and Performance Engineering (CPE) website (for more information on CPE services).

This site contains other information and provides links to additional documentation.

VistA documentation is made available online in Microsoft® Word format and in Adobe® Acrobat Portable Document Format (PDF). The PDF documents *must* be read using the Adobe® Acrobat Reader, which is freely distributed by Adobe® Systems Incorporated.

VistA documentation can be downloaded from the VA Software Document Library (VDL).

REF: See the Statistical Analysis of Global Growth (SAGG) manuals on the VDL.

VistA documentation and software can also be downloaded from the Product Support (PS) Anonymous Directories.

1 Introduction

This distribution contains the Statistical Analysis of Global Growth (SAGG) 2.0 software. This version of the software can be installed over any previous versions of SAGG without any adverse problems. The current version of the software is compatible with all current operating system platforms at the medical centers and has minimal impact on the Information Resource Management (IRM) support staff. This software operates on Caché for Windows and Caché for VMS system platforms.

The Veterans Health Administration (VHA) developed the Statistical Analysis of Global Growth (SAGG) software in order to obtain more accurate information regarding the current and future Veterans Health Information Systems and Technology Architecture (VistA) database growth rates at the VA Medical Centers (VAMCs).

SAGG is a fully automated support tool developed by the Capacity Planning (CP) team, which entails the monthly capture of global database, software, and file size information from participating sites.

Installing the SAGG software creates the collection process mechanism and other necessary components of the software. The fully automated data collection cycle entails capturing all production global, software, and file specifics at the site into a temporary ^XTMP("KMPS") collection global. Once collected, the information is converted into an electronic mail message that is automatically transferred via network mail and merged into a CP National Database. The temporary collection global is then deleted from the site's system. The site also receives a summary of the global statistical data in the form of an electronic turn-around message.

2 Implementation and Maintenance

After the initial setup procedures are performed as detailed in the patch description for KMPS*2*0, the collection process basically operates transparent to IRM with minimal impact on system resources. The software uses the Kernel supplied TaskMan utility to schedule the initial global collection cycle, and it is then rescheduled to capture on a regular monthly basis. The monthly time frame for data accumulation was chosen in order to enhance global, software, and file trend analysis.

2.1 Implementation and System Requirements

2.1.1 Software Dependencies

This distribution of the original Statistical Analysis of Global Growth (SAGG) software Version 2.0, Patch KMPS*2*0, was dependent on Patches KMPD*2.0*6 and XU*8.0*456. Patch KMPS*2*0 is a Kernel Installation and Distribution System (KIDS) software release. SAGG Installation Instructions can be found in the description for Patch KMPS*2*0, located on the Patch Module (i.e., Patch User Menu [A1AE USER]) on FOURM.

2.1.2 Upgrading from a Previous Version of SAGG Related to Patch XU*8.0*456

CAUTION: If your site is upgrading from a previous version of SAGG, Patch XU*8.0*456 *must* be installed for SAGG 2.0 to work with Caché 5.2.

2.1.3 Virgin Installations of SAGG Related to Patch XU*8.0*456

CAUTION: If your site is installing SAGG for the first time, Patch XU*8.0*456 *must* be installed for the SAGG Master Background Task Option [KMPS SAGG REPORT] to work.

2.1.4 Namespace

Capacity Planning (CP) has been given the KMP* namespace for both routines and globals. The SAGG software uses the KMPS namespace for its routines and global.

2.2 Maintenance

Information throughout this manual is meant to help IRM in the maintenance of the software. The discussion that follows covers the options available to assist IRM in that maintenance.

The SAGG software monitors *all* volume sets.

The SAGG software uses the KMP-CAPMAN mail group for distribution of reports and error messages.

The accuracy of the global information from the site is dependent on the SAGG Master Background Task option [KMPS SAGG REPORT] running every 28 days. IRM staff should ensure that the background task is scheduled to run by reviewing the Check SAGG Environment option [KMPS SAGG STATUS]. If

necessary, the background task can be rescheduled with the Schedule/Unschedule Options option [XUTM SCHEDULE] located under the Taskman Management menu.

3 Globals

lists the SAGG 2.0 software globals:

Table 3. SAGG global information

Global	Description
KMPS	This global contains data for the SAGG PROJECT file (#8970.1). This global only contains the SAGG PROJECT file (#8970.1) and is minimal in size. Therefore, this global does *not* grow large. The global should be journaled and translated, if the operating system supports these functions. **Journaling:** Mandatory.
XTMP("KMPS")	The ^XTMP global is the storage location for inter-process temporary data. The SAGG software uses the ^XTMP("KMPS") sub-node to temporarily store global, software, and file data during the collection cycle. The contents of this sub-node are deleted after completion of the collection cycle. **Per *Kernel V. 8.0 Technical Manual*:** The ^XTMP global should *not* be journaled. However, the ^XTMP global should be translated, if the operating system supports this function. **Journaling:** *Not* recommended.

3.1 Files

lists the SAGG 2.0 software files:

Table 4. SAGG file list

File Number	File Name	Global	File Description
8970.1	SAGG PROJECT	^KMPS(8970.1	This file contains the location information for the temporary ^XTMP global and the names of all production volume sets on the system. No data comes with the file.

3.2 Templates

The SAGG 2.0 software does *not* contain any templates.

4 Routines

lists the SAGG 2.0 software routines:

Table 5. SAGG routine list

Name	Description
KMPSGE	Master collection routine that is invoked through the TaskMan scheduling options. This routine coordinates the collection of global, software, and file data; then, it sends the collected data to the Capacity Planning (CP) National Database. ℹ️ **NOTE:** This routine has been updated to be compatible with Caché 5.2.
KMPSLK	Routine that permits the capture of specific VistA software and file data including system configuration information. ℹ️ **NOTE:** This routine has been updated to be compatible with Caché 5.2.
KMPSUTL	A utility routine that provides several management functions. ℹ️ **NOTE:** This routine has been updated to be compatible with Caché 5.2.
KMPSUTL1	A utility routine that provides several management functions. ℹ️ **NOTE:** This routine has been updated to be compatible with Caché 5.2.

5 Key Variables

Table 6 lists the SAGG 2.0 software key variables:

Table 6. SAGG key variables

Name	Description
KMPSMGR	The name of the MGR UCI as determined by the ^%ZOSF("MGR") variable.
KMPSPROD	The name of the Production UCI as determined by the ^%ZOSF("PROD") variable.
KMPSSITE	The station number of the site as determined by $P($$SITE^VASITE(),U,3).
KMPSX1	The type of M platform as determined by the ^%ZOSF("OS") variable.
NUM	The current date in M internal format as given by the +$H system variable.

6 Exported Options

6.1 SAGG Project Manager Menu

The KMPS SAGG MANAGER menu [KMPS SAGG MANAGER] is located under the Capacity Planning menu [XTCM MAIN]. The XTCM MAIN menu can be assigned to the IRM staff members who support this software and other capacity planning tasks. The SAGG Project Manager Menu contains the following options:

Figure 1. SAGG Project Manager Menu options

```
SAGG Project Manager Menu                              [KMPS SAGG MANAGER]
    Check SAGG Environment                             [KMPS SAGG STATUS]
    Stop SAGG Collection                                 [KMPS SAGG STOP]
```

6.1.1 Stop SAGG Collection Option

The Stop SAGG Collection option [KMPS SAGG STOP] informs the SAGG software collection routines to begin an orderly shutdown process. Each collection routine stops after reaching an appropriate break point.

6.1.2 Check SAGG Environment Option

The Check SAGG Environment option [KMPS SAGG STATUS] checks the environment of the SAGG (Statistical analysis of Global Growth) Project. In addition to providing information regarding the SAGG collection routines, this option checks the status of SAGG patch installation at the site.

6.2 Options *Without* Parents

The following option does *not* appear on any menu:

6.2.1 SAGG Master Background Task Option

The SAGG Master Background Task option [KMPS SAGG REPORT] is *not* assigned to any menu. This option is scheduled through TaskMan to start the SAGG software's master collection routine in the background. This option should be rescheduled with the Schedule/Unschedule Options option [XUTM SCHEDULE] under the Taskman Management menu for every 28 days to ensure same day-of-week collection cycles. If this option does *not* execute properly, a warning message is sent to the KMP-CAPMAN mail group.

6.3 Menu/Option Assignment

The KMPS SAGG MANAGER menu is located under the Capacity Planning menu [XTCM MAIN]. The XTCM MAIN menu can be assigned to the IRM staff members who support this software and other capacity planning tasks.

6.4 Protocols

The SAGG 2.0 software does *not* export any protocols.

7 Archiving and Purging

7.1 Archiving

The SAGG 2.0 software contains the SAGG PROJECT file (#8970.1). This file is minimal in size and does *not* experience any growth. Since the SAGG software maintains minimal data at the site, archiving functions are *not* necessary and are *not* provided.

7.2 Purging

The SAGG 2.0 software contains the SAGG PROJECT file (#8970.1). This file is minimal in size and does *not* experience any growth. Global data information is accumulated into the ^XTMP("KMPS") global and is killed after uploading to a mail message, which is forwarded to the Capacity Planning (CP) National Database. Since the SAGG software maintains minimal data at the site, purging functions are *not* necessary and are *not* provided.

8 Callable Routines

The SAGG 2.0 software does *not* provide any callable entry points that are available for general use.

9 External Relations

The SAGG 2.0 software relies on the following external VistA software to run effectively:

Table 7. SAGG-required VistA software

Software	Minimum Version Needed	Patch Information
Kernel	8.0	Fully patched
VA FileMan	22.0 (or higher)	Fully patched
MailMan	7.1 (or higher)	Fully patched

SAGG 2.0 uses Kernel %ZOSVKS-namespaced routines that use system specific calls. The Kernel %ZOSVKS-namespaced routines were introduced with the issuance of Kernel Patch XU*8.0*90.

All operating system interfaces on which the SAGG software is dependent have been encapsulated into the Kernel %ZOSVKS-namespaced routines. The %ZOSVKS* routines contain code that enables use of the VIEW command and $VIEW function to get information from the operating system.

9.1 DBA Approvals and Database Integration Agreements

The Database Administrator (DBA) maintains a list of Database Integration Agreements (IAs) or mutual agreements between software developers allowing the use of internal entry points or other software-specific features that are *not* available to the general programming public.

The SAGG 2.0 software is *not* dependent on any agreements.

10 Internal Relations

All options in the SAGG 2.0 software under the SAGG Project Manager Menu [KMPS SAGG MANAGER] can function independently. Only the Schedule/Unschedule Options option [XUTM SCHEDULE] under the Taskman Management menu can invoke the SAGG Master Background Task option [KMPS SAGG REPORT].

10.1 Relationship of SAGG Software with Kernel

SAGG 2.0 uses Kernel %ZOSVKS-namespaced routines that use system specific calls. The Kernel %ZOSVKS-namespaced routines were introduced with the issuance of Kernel Patch XU*8.0*90.

10.2 Namespace

The SAGG 2.0 software has been assigned the KMPS namespace.

Additionally, this version of SAGG uses Kernel %ZOSVKS-namespaced routines that use system-specific calls. The Kernel %ZOSVKS-namespaced routines were introduced with the issuance of Kernel Patch XU*8.0*90.

11 Software-wide Variables

The SAGG 2.0 software does *not* employ the use of any software-wide variables.

REF: For the key variables that are employed within this software, see the "Key Variables" section.

12 SAC Exemptions

The SAGG 2.0 software does *not* employ any exemptions from the Programming Standards and Conventions (SAC). Also, SAGG 2.0 uses Kernel %ZOSVKS-namespaced routines that use system-specific calls. The Kernel %ZOSVKS-namespaced routines were introduced with the issuance of Kernel Patch XU*8.0*90.

13 Security

13.1 Keys

The SAGG 2.0 software does *not* distribute any security keys.

13.2 VA FileMan File Protection

Table 8 describes the VA FileMan file protection for the SAGG 2.0 software.

Table 8. SAGG file protection

#	Name	DD	RD	WR	DEL	LAYGO
8970.1	SAGG PROJECT	@				

Glossary

Table 9. Statistical Analysis of Global Growth (SAGG) glossary terms

Term	Description
BLOCK	A unit of measure of the size of the disk used by both the operating system and M platforms.
CAPACITY PLANNING	The process of assessing a system's capacity and evaluating its efficiency relative to workload in an attempt to optimize system performance.
COLLECTION CYCLE	Occurs when the SAGG background task begins obtaining data regarding the size and efficiency of the globals on the monitored volume sets. Additionally, software and file information is collected. Normally, a site should schedule the collection cycle for every 28 days.
COMPLEXITY LEVEL	A ranking order for sites based on calculated workload needs. Four levels exist with 1 being the largest and 4 being the smallest type facility.
DATA BLOCK	A component of the global tree-structure that is used by the M platform to contain the actual information.
DATABASE	A set of information, consisting of at least one file, which is specific for a given purpose. The VistA database is composed of a number of VA FileMan files.
DISK MODEL RANK	A ranking order for sites based on calculated disk capacity needs.
GLOBAL	Tree-structured system of nodes containing common data. M platforms store data on the disk in the form of global arrays. A global is composed of both pointer and data blocks.
GLOBAL EFFICIENCY	Determines the amount of space used within the entire block structure of a particular global. A higher efficiency indicates that the global is compacted and, therefore, using less disk space.
GLOBAL SIZE	Determines the amount of pointer and data blocks used by a particular global.
MAP	Composed of subunits called blocks. A map consists of 400 blocks.
MODEL RANK	A ranking order for sites based on calculated VistA workload needs.
POINTER BLOCK	A component of the global tree-structure that is used by the M platform to find the location of data blocks.
SAGG	Statistical Analysis of Global Growth. A fully automated support tool developed by the Capacity Planning (CP) team, which entails the monthly capture of global, database, software, and file size information from participating sites.
SESSION NUMBER	Timestamp of when the collection cycle was run. The session number is defined from the +$H system variable.
TURN-AROUND MESSAGE	The mail message that is returned to the KMP-CAPMAN mail group detailing the database and global growth over the previous reported

Term	Description
	session.
ZEROTH NODE	The number of file entries is stored within the zeroth node of VistA software files. This information is used to determine software file growth statistics.

REF: For a list of commonly used terms and definitions, see the OI&T Master Glossary VA Intranet Website.

For a list of commonly used acronyms, see the VA Acronym Lookup Intranet Website.

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