VistA System Monitor (VSM) 2.0

Technical Manual

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Revision History

Date	Revision	Description	Author
04/16/2018	1.3	Initial VistA System Monitor (VSM) 2.0 Technical Manual. Includes the latest monitors: • VistA Timed Collection Monitor (VTCM) • VistA Storage Monitor (VSTM) • VistA Business Event Monitor (VBEM) • VistA Message Count Monitor (VMCM) • VistA HL7 Monitor (VHLM)	EPMO CPE

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Orientation

How to Use this Manual

The purpose of this guide is to provide instructions for use and maintenance of the Veterans Health Information Systems and Technology Architecture (VistA) Capacity and Performance Engineering (CPE) VistA System Monitor (VSM) 2.0 software.

Throughout this manual, advice and instructions are offered regarding the use of the VSM software and the functionality it provides for VistA software products.

Intended Audience

The intended audience of this manual is the following stakeholders:

- **Enterprise Program Management Mode (EPMO)—**System engineers and Capacity Management personnel responsible for enterprise capacity planning and system architecture.
- **System Administrators—**System administrators and Capacity Management personnel at local and regional Department of Veterans Affairs (VA) sites who are responsible for computer management and system security on the VistA M Servers.
- **EPMO Developers—**VistA legacy development teams.
- **Product Support (PS)**.

Disclaimers

Software Disclaimer

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Documentation Disclaimer

This manual provides an overall explanation of using the VistA System Monitor (VSM) 2.0 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 (OIT) 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 1 gives a description of each of these symbols:

Table 1: Documentation Symbol Descriptions

Symbol	Description
	**NOTE / REF:** Used to inform the reader of general information including references to additional reading material.
	**CAUTION / RECOMMENDATION / 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:
  - The first three digits (prefix) of any Social Security Numbers (SSN) begin with either "**000**" or "**666**".
  - 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 VSM (KMPV) test patient and user names would be documented as follows:
    - KMPVPATIENT,ONE or KMPVUSER,ONE
    - KMPVPATIENT,TWO or KMPVUSER,TWO
    - KMPVPATIENT,THREE or KMPVUSER,THREE
    - KMPVPATIENT,14 or KMPVUSER,14
    - Etc.
- "Snapshots" of computer online displays (i.e., screen captures/dialogues) and computer source code is shown in a *non*-proportional font and may be enclosed within a box.
  - User's responses to online prompts are **bold** typeface and highlighted in yellow (e.g., **<Enter>**). The following example is a screen capture of computer dialogue, and indicates that the user should enter two question marks:

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

  - Emphasis within a dialogue box is **bold** typeface and highlighted in blue (e.g., STANDARD LISTENER: RUNNING).

- Some software code reserved/key words are **bold** typeface with alternate color font.
- 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>**.
- Author's comments are displayed in italics or as "callout" boxes.

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).

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 (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 (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 the Toolbar to navigate back and forth in the Word document when selecting 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** [DILIST] option on the **Data Dictionary Utilities** [DI DDU] 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 VSM should consult the following:

- *VistA System Monitor (VSM) Installation, Back-Out, and Rollback Guide*
- *VistA System Monitor (VSM) User Manual*
- *VistA System Monitor (VSM) 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 at: http://www.adobe.com/

VistA documentation can be downloaded from the VA Software Document Library (VDL): http://www.va.gov/vdl/

REF: See the VistA System Monitor (VSM) manuals on the VDL.

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

1 Process Overview

The Veterans Health Information Systems and Technology Architecture (VistA) System Monitor (VSM) 2.0 software is intended to collect Caché and VistA metrics related to system capacity and business usage. The package is made up of multiple collectors. The following five collectors are deployed:

- **VistA Timed Collection Monitor (VTCM)—**Collects Caché metrics at regularly scheduled intervals such that they can be used in conjunction with metrics gathered via other deployed collection tools.
- **VistA Storage Monitor (VSTM)—**Collects storage metrics for each database once daily.
- **VistA Business Event Monitor (VBEM)—**Collects Caché metrics for VistA functions (Menu Options, TaskMan Jobs and Remote Procedure Calls).
- **VistA Message Count Monitor (VMCM)—**Collects inbound and outbound Health Level Seven (HL7) and HL7 Optimized (HLO) message counts at regularly scheduled intervals.
- **VistA HL7 Monitor (VHLM)—**Collects metadata about HL7 messages (**SYNC** and **ASYNC**) as well as HLO messages.

This data is used for understanding VistA systems as they relate to the infrastructure on which they are deployed.

As a general rule, any VSM monitor follows the following process (specifics for any monitor are listed below separately):

1. Metrics are either collected on a periodic basis or aggregated to a similar time period. This allows metrics to be used in conjunction with those from other tools already being used within the VA.
2. Metrics are transferred from the VistA sites to the VSM national database via VA MailMan on a regular periodic schedule. This schedule is determined by the type of monitor, but in most cases is nightly.
3. Metrics are purged from VistA sites quickly. Under normal situations the metrics are deleted from the sites upon receipt of the acknowledgment from the VSM national database. A purge is run at the start of any VSM monitor that deletes any data older than the time period specified in the VSM CONFIGURATION (#8969) file for that monitor.

In some cases, the collection routine may need to run on each separate node of a VistA system. This is accomplished via a task in the Caché Task Manager. The Caché Task Manager executes a routine each morning immediately after midnight. This routine looks at each monitor in the VSM CONFIGURATION (#8969) file. It first checks to see if the monitor's ONOFF (#.02) field value is set to **ON**. If so, it checks to see if the monitor has an entry in its CACHE DAILY TASK (#1.03) field. This field represents the name of the collection routine for a given monitor. If there is an entry in this field then the Caché task executes the **RUN** line tag of this routine.

1.1 VistA Timed Collection Monitor (VTCM) Specific Process

1.1.1 VTCM Monitor—Starting and Stopping

1.1.1.1 Starting VTCM Monitor

To start the **VTCM** monitor, do the following:

1. Use the **VSM MANAGEMENT** menu option.
2. Choose the **STRT** action.
3. Choose **VTCM** at the monitor prompt. This does two things:
   a. Sets the ONOFF (#.02) field to **ON** in the VSM CONFIGURATION (#8969) file for the **VTCM** entry.
   b. Schedules the TaskMan task, which is responsible for transferring the metrics to the VSM national database. This TaskMan task is scheduled using the values found in the TASKMAN SCHEDULE FREQUENCY (#1.05) and TASKMAN SCHEDULE START (#1.06) fields in the VSM CONFIGURATION (#8969) file for the **VTCM** entry.

NOTE: Collection of metrics does *not* commence until the next execute of the Caché Task Manager task.

1.1.1.2 Stopping VTCM Monitor

To stop the **VTCM** monitor, do the following:

1. Use the **VSM MANAGEMENT** menu option.
2. Choose the **STOP** action.
3. Choose **VTCM** at the monitor prompt. This does two things:
   a. Sets the ONOFF (#.02) field to **OFF** in the VSM CONFIGURATION (#8969) file for the **VTCM** entry.
   b. Un-schedules the TaskMan task started in the **STRT** action.

The collector stops upon its next iteration as it checks the ONOFF (#.02) field value before each collection.

NOTE: If the collection job is stopped via the **VSM MANAGEMENT** menu option then metric collection does *not* restart until **12:01 AM** on the following day. If needed, collection can be started manually, but *must* be done on each separate node. To do this, enter the following at a programmer prompt on each node:

```
D RUN^KMPVVTCM
```

1.1.2 VTCM Metric Collection

VTCM metrics are collected via the **%ZOSVKSD** routine. This routine reads values from the following API calls:

- ##class(SYS.Stats.Dashboard).Sample()
- ##class(SYS.Stats.Routine).Sample()
- ##class(%SYSTEM.Config.SharedMemoryHeap).GetUsageSummary()
- ##class(%SYSTEM.Config.SharedMemoryHeap).FreeCount()

These calls are executed on a periodic basis as specified by the COLLECTION INTERVAL (#1.02) field in the VSM CONFIGURATION (#8969) file entry for **VTCM**. The default value is every **five** minutes.

Metrics are stored for the day in the **^KMPTMP("KMPV","VTCM"** global by day (**$H**), node and time slot.

REF: For details on file metrics, see Section 1.1.3.

The collection routine, KMPVVTCM, runs until the start of a new day (new $H value) unless the ONOFF (#.02) field value is set to **OFF** via the **VSM MANAGEMENT** menu option. Upon the next iteration of the collection process the monitor checks this value and quits if turned **OFF**. If the monitor is turned **OFF** and back **ON**, metric collection does *not* resume until the start of the next day when the Caché Task Manager starts that day's collection.

1.1.3 VTCM Metric Transmission

Separately, TaskMan kicks off a routine to mail the collected metrics to the VSM national database:

1. TaskMan executes the **SEND^KMPVVTCM** routine.
   a. The time of this task is set via the TASKMAN SCHEDULE START (#1.06) field in the VSM CONFIGURATION (#8969) file entry. By default it runs at **1:00 AM**. This task:
      i. Kills (deletes) any date older than the time period specified in the DAYS TO KEEP DATA (#1.01) field in the VSM CONFIGURATION (#8969) file.
      ii. Sends an informational mail message to Capacity and Performance Engineering (CPE) support for data older than 1 day but less than the kill date, and then sends/resends the data.
      iii. Sends data for prior day.
2. For each day that data is sent an entry is made in **^KMPTMP("KMPV","VTCM","DLY",$H)** with the mail message number.
3. The data for each day is deleted once an **ACK** mail message is received from the CPE server.

1.2 VistA Message Count Monitor (VMCM) Specific Process

1.2.1 VMCM Monitor—Starting and Stopping

1.2.1.1 Starting VMCM Monitor

To start the **VMCM** monitor, do the following:

1. Use the **VSM MANAGEMENT** menu option.
2. Choose the **STRT** action.
3. Choose **VMCM** at the monitor prompt. This does two things:
    a. Sets the ONOFF (#.02) field to **ON** in the VSM CONFIGURATION (#8969) file for the **VMCM** entry.
    b. Schedules the TaskMan task, which is responsible for transferring the metrics to the VSM national database. This TaskMan task is scheduled using the values found in the TASKMAN SCHEDULE FREQUENCY (#1.05) and TASKMAN SCHEDULE START (#1.06) fields in the VSM CONFIGURATION (#8969) file for the VMCM entry.

NOTE: Collection of metrics does *not* commence until the next execute of the Caché Task Manager task.

1.2.1.2 Stopping VMCM Monitor

To stop the VMCM monitor, do the following:

1. Use the **VSM MANAGEMENT** menu option.
2. Choose the **STOP** action.
3. Choose **VMCM** at the monitor prompt. This does two things:
    a. Sets the ONOFF (#.02) field to **OFF** in the VSM CONFIGURATION (#8969) file for the VMCM entry.
    b. Un-schedules the TaskMan task started in the **STRT** action.

The collector stops upon its next iteration as it checks the ONOFF (#.02) field value before each collection.

NOTE: If the collection job is stopped via the **VSM MANAGEMENT** menu option then metric collection does *not* restart until **12:01 AM** on the following day. If needed, collection can be started manually. To do this, enter the following at a programmer prompt on the **back-end** node:

```
D RUN^KMPVVMCM
```

1.2.2 VMCM Metric Collection

VMCM metrics are collected via the routine **KMPVVMCM**. This routine reads values from the **^HLCS** global. It iterates through the HL7 logical links and records messages received, messages processed, message to send and messages sent. Also, it looks at the **^HLSTATS** global to get HLO messages sent and received.

These calls are executed on a periodic basis as specified by the COLLECTION INTERVAL (#1.02) field in the VSM CONFIGURATION (#8969) file entry for **VMCM**. The default value is every **15** minutes.

Metrics are stored for the day in the **^KMPTMP("KMPV","VMCM"** global by day ($H), node, link and time slot.

REF: For details on file metrics, see Section 1.2.3.

The collection routine, **KMPVVMCM**, runs until the start of a new day (new **$H** value) unless the ONOFF (#.02) field value is set to **OFF** via the **VSM MANAGEMENT** menu option. Upon the next iteration of the collection process, the monitor checks this value and quits if turned **OFF**. If the monitor is turned **OFF** and back **ON**, metric collection does *not* resume until the start of the next day when the Caché Task Manager starts that day's collection.

1.2.3 VMCM Metric Transmission

Separately, TaskMan kicks off a routine to mail the collected metrics to the VSM national database.

1. TaskMan executes the **SEND^KMPVVMCM** routine.
   a. The time of this task is set via the TASKMAN SCHEDULE START (#1.06) field in the VSM CONFIGURATION (#8969) file entry. By default it runs at **1:30 AM**. This task:
      i. Kills (deletes) any date older than the time period specified in the DAYS TO KEEP DATA (#1.01) field in the VSM CONFIGURATION (#8969) file.
      ii. Sends an informational mail message to Capacity and Performance Engineering (CPE) support for data older than **1** day but less than the kill date, and then sends/resends the data.
      iii. Sends data for prior day.
2. For each day that data is sent an entry is made in **^KMPTMP("KMPV","VMCM","DLY",$H)** with the mail message number.
3. The data for each day is deleted once an **ACK** mail message is received from the CPE server.

1.3 VistA HL7 Monitor (VHLM) Specific Process

1.3.1 VHLM Monitor—Starting and Stopping

1.3.1.1 Starting VHLM Monitor

To start the **VHLM** monitor, do the following:

1. Use the **VSM MANAGEMENT** menu option.
2. Choose the **STRT** action.
3. Choose **VHLM** at the monitor prompt. This does two things:
   a. Sets the ONOFF (#.02) field to **ON** in the VSM CONFIGURATION (#8969) file for the **VHLM** entry.
   b. Schedules the TaskMan task, which is responsible for transferring the metrics to the VSM national database.

      This TaskMan task is scheduled using the value found in the TASKMAN SCHEDULE START (#1.06) field in the VSM CONFIGURATION (#8969) file for the **VHLM** entry.

NOTE: Collection of metrics from the previous day will begin at the next scheduled TaskMan run.

1.3.1.2 Stopping VHLM Monitor

To stop the **VHLM** monitor, do the following:

1. Use the **VSM MANAGEMENT** menu option.
2. Choose the **STOP** action.
3. Choose **VHLM** at the monitor prompt. This does two things:
   a. Sets the ONOFF (#.02) field to **OFF** in the VSM CONFIGURATION (#8969) file for the **VHLM** entry.
   b. Un-schedules the TaskMan task started in the **STRT** action.

1.3.2 VHLM Metric Collection

VHLM metrics are collected via the routine **KMPVVHLM**. This routine reads values from the following globals:

- HL7 Messages:
  - **^HL(772,**
  - **^HLMA**
- HLO Messages:
  - **^HLA**
  - **^HLB**

It extracts metadata from each HL7 and HLO message in those globals from the previous day. Metrics include the following:

- Total number of characters
- Sending application
- Receiving application
- Message protocol

However, it does *not* collect any PII/PHI data.

Messages are aggregated based on the value of the COLLECTION INTERVAL (#1.02) field in the VSM CONFIGURATION (#8969) file entry for VHLM.

Metrics are stored for the day in the **^KMPTMP("KMPV","VHLM"** global by day (**$H**), type (**SYNC/ASYNC/HLO**) and time slot.

REF: For details on file metrics, see Section 1.3.3.

TaskMan executes the collection routine, **RUN^KMPVVHLM**, once a day based on the value of the TASKMAN SCHEDULE START (#1.06) field (default **2 AM**) unless the ONOFF (#.02) field value is set to **OFF** via the **VSM MANAGEMENT** menu option. Upon the next scheduled TaskMan execution, the monitor checks this value and quits if turned **OFF**. If the monitor is turned **OFF** and back **ON**, it will

re-schedule the TaskMan task to execute at the value of the TASKMAN SCHEDULE START (#1.06) field.

1.3.3 VHLM Metric Transmission

The **KMPVVHLM** routine creates and sends a mailman message with the HL7/HLO metrics from the previous day to the VSM national database.

1. TaskMan executes the **RUN^KMPVVHLM** routine.
   a. The time of this task is set via the TASKMAN SCHEDULE START (#1.06) field in the VSM CONFIGURATION (#8969) file entry. By default it runs at **2 AM**. This task:
      i. Kills (deletes) any date older than the time period specified in the DAYS TO KEEP DATA (#1.01) field in the VSM CONFIGURATION (#8969) file.
      ii. Sends an informational mail message to Capacity and Performance Engineering (CPE) support for data older than **1** day but less than the kill date, and then sends/resends the data.
      iii. Sends data for prior day.
2. For each day that data is sent an entry is made in **^KMPTMP("KMPV","VHLM","DLY",$H)** with the mail message number.
3. The data for each day is deleted once an **ACK** mail message is received from the CPE server.

1.4 VistA Storage Monitor (VSTM) Specific Process

1.4.1 VSTM Monitor—Starting and Stopping

1.4.1.1 Starting VSTM Monitor

To start the **VSTM** monitor, do the following:

1. Use the **VSM MANAGEMENT** menu option.
2. Choose the **STRT** action.
3. Choose **VSTM** at the monitor prompt. This does two things:
   a. Sets the ONOFF (#.02) field to **ON** in the VSM CONFIGURATION (#8969) file for the **VSTM** entry.
   b. Schedules the TaskMan task, which is responsible for transferring the metrics to the VSM national database. This TaskMan task is scheduled using the values found in the TASKMAN SCHEDULE FREQUENCY (#1.05) and TASKMAN SCHEDULE START (#1.06) fields in the VSM CONFIGURATION (#8969) file for the **VSTM** entry.

NOTE: Collection of metrics does *not* commence until the next execute of the Caché Task Manager task.

1.4.1.2 Stopping VSTM Monitor

To stop the **VSTM** monitor, do the following:

1. Use the **VSM MANAGEMENT** menu option.
2. Choose the **STOP** action.
3. Choose **VSTM** at the monitor prompt. This does two things:
   a. Sets the ONOFF (#.02) field to **OFF** in the VSM CONFIGURATION (#8969) file for the **VSTM** entry.
   b. Un-schedules the TaskMan task started in the **STRT** action.

The collector stops upon its next iteration as it checks the ONOFF (#.02) field value before each collection.

NOTE: The **VSTM** collector runs only one time per day when started by the Caché Task Manager **KMPVRUN** task. Collections begin on the day following the day the monitor is turned **ON**. The actual collection occurs twice a month – on the **15th** and **last** day of each month.

1.4.2 VSTM Metric Collection

VSTM metrics are collected via the **KMPVVSTM** routine. This routine executes a portion the **%FreeCnt** routine logic to collect storage metrics for each database.

Metrics are collected on the **15th** and **last** day of the month and stored for the day in the **^KMPTMP("KMPV","VSTM"** global by day (**$H**) and node.

REF: For details on file metrics, see Section 1.4.3.

The collection routine, **KMPVVSTM**, runs once upon being started by the Caché Task Manager if the ONOFF (#.02) field value is set to **ON**.

1.4.3 VSTM Metric Transmission

Separately, TaskMan kicks off a routine to mail the collected metrics to the VSM national database.

1. TaskMan executes the **SEND^KMPVVSTM** routine.
   a. The time of this task is set via the TASKMAN SCHEDULE START (#1.06) field in the VSM CONFIGURATION (#8969) file entry. By default it runs at **1 AM**. This task:
      i. Kills (deletes) any date older than the time period specified in the DAYS TO KEEP DATA (#1.01) field in the VSM CONFIGURATION (#8969) file.
      ii. Sends an informational mail message to CPE support for data older than 1 day but less than the kill date, and then sends/resends the data.
      iii. Sends data for prior day.
2. For each day that data is sent an entry is made in **^KMPTMP("KMPV","VSTM","DLY",$H)** with the mail message number.
3. The data for each day is deleted once an **ACK** mail message is received from the CPE server.

1.5 VistA Business Event (VBEM) Specific Process

1.5.1 VBEM Monitor—Starting and Stopping

1.5.1.1 Starting VBEM Monitor

To start the **VBEM** monitor, do the following:

1. Use the **VSM MANAGEMENT** menu option.
2. Choose the **STRT** action.
3. Choose **VBEM** at the monitor prompt. This does two things:
   a. Sets the ONOFF (#.02) field to **ON** in the VSM CONFIGURATION (#8969) file for the **VBEM** entry.
   b. Schedules the TaskMan task, which is responsible for transferring the metrics to the VSM national database. This TaskMan task is scheduled using the values found in the TASKMAN SCHEDULE FREQUENCY (#1.05) and TASKMAN SCHEDULE START (#1.06) fields in the VSM CONFIGURATION (#8969) file for the **VBEM** entry.

NOTE: The collection of **VBEM** metrics begins immediately.

1.5.1.2 Stopping VBEM Monitor

To stop the **VBEM** monitor, do the following:

1. Use the **VSM MANAGEMENT** menu option.
2. Choose the **STOP** action.
3. Choose **VBEM** at the monitor prompt. This does two things:
   a. Sets the ONOFF (#.02) field to **OFF** in the VSM CONFIGURATION (#8969) file for the **VBEM** entry.
   b. Un-schedules the TaskMan task started in the **STRT** action.

The collector stops immediately.

1.5.2 VBEM Metric Collection

VBEM metrics are collected via the **KMPVBETR** routine. This routine reads the following values on a periodic basis as specified by the COLLECTION INTERVAL (#1.02) field in the VSM CONFIGURATION (#8969) file entry for **VBEM**:

- CPU
- Lines
- Commands
- GloRefs

The default value is every **15** minutes.

Metrics are stored for the day in the **^KMPTMP("KMPV","VBEM"** global by day (**$H**), node and time slot.

REF: For details on file metrics, see Section 1.5.3.

The metric collection starts/stops immediately based on the ON/OFF switch in the **VSM MANAGEMENT** menu option.

1.5.3 VBEM Metric Transmission

Separately, TaskMan kicks off a routine to mail the collected metrics to the VSM national database:

1. TaskMan executes the **EN^KMPVBETR** routine.
   a. The time of this task is set via the TASKMAN SCHEDULE START (#1.06) field in the VSM CONFIGURATION (#8969) file entry. By default it runs at **1 AM**. This task:
      i. Kills (deletes) any date older than the time period specified in the DAYS TO KEEP DATA (#1.01) field in the VSM CONFIGURATION (#8969) file.
      ii. Sends an informational mail message to Capacity and Performance Engineering (CPE) support for data older than **1** day but less than the kill date, and then sends/resends the data.
      iii. Sends data for prior day.
2. For each day that data is sent an entry is made in **^KMPTMP("KMPV","VBEM","DLY",$H)** with the mail message number.
3. The data for each day is deleted once an **ACK** mail message is received from the CPE server.

2 Files

This section lists the files associated with the VistA System Monitor (VSM) application. The files are:

- VSM CONFIGURATION (#8969) File; Global: ^KMPV(8969
- VSM MONITOR DEFAULTS (#8969.02) File; Global: ^KMPV(8969.02
- VSM CACHE TASK LOG (#8969.03) File; Global: ^KMPV(8969.03
- ^KMPTMP("KMPV"—Temporary Data Storage:
  - VTCM Usage of ^KMPTMP
  - VSTM Usage of ^KMPTMP
  - VMCM Usage of ^KMPTMP
  - VHLM Usage of ^KMPTMP (SYNC/ASYNC)
  - VHLM Usage of ^KMPTMP (HLO)
  - VBEM Usage of ^KMPTMP

2.1 VSM CONFIGURATION (#8969) File; Global: ^KMPV(8969

2.1.1 Data Dictionary

Figure 1: VSM CONFIGURATION (#8969) File—Data Dictionary

```
CROSS REFERENCED BY: MONITOR KEY(B)

^KMPV(8969,D0,0)= (#.01) MONITOR KEY [1F] ^ (#.02) ONOFF [2S] ^ (#.03) FULL NAME
[3F] ^
(#.04) VERSION [4N] ^ (#.05) VERSION INSTALL DATE [5D] ^
^KMPV(8969,D0,1)= (#1.01) DAYS TO KEEP DATA [1N] ^ (#1.02) COLLECTION INTERVAL [2N]
^
(#1.03) CACHE DAILY TASK [3F] ^ (#1.04) ALLOW TEST SYSTEM [4S] ^
(#1.05) TASKMAN SCHEDULE FREQUENCY [5F] ^ (#1.06) TASKMAN SCHEDULE START [6F] ^
(#1.07) TASKMAN OPTION [7F] ^
^KMPV(8969,D0,2)= (#2.01) LAST START TIME [1D] ^ (#2.02) LAST STOP TIME [2D] ^
^KMPV(8969,D0,2)= (#2.03) LAST RUN TIME [3N] ^
^KMPV(8969,D0,3)= (#3.01) NATIONAL DATA EMAIL ADDRESS [1F] ^
(#3.02) NATIONAL SUPPORT EMAIL ADDRESS [2F] ^
 (#3.03) VSM CFG EMAIL ADDRESS [3F] ^ (#3.04) LOCAL SUPPORT EMAIL ADDRESS [4F] ^
```

2.1.2 VSM CONFIGURATION (#8969) File—Field Descriptions

Table 2: VSM CONFIGURATION (#8969) File—Field Descriptions

Field Name	Field Number	Description
MONITOR KEY	8969, .01	**Two** to **four** Letter acronym used to identify specific monitor.
ONOFF	8969, .02	Flag used to stop or continue monitor collection.
FULL NAME	8969, .03	Descriptive name for specific monitor. Usually related to the Monitor Key. For example, VTCM = VistA Timed Collection Monitor.
VERSION	8969, .04	Current version of VSM software.

Field Name	Field Number	Description
INSTALL DATE	8969, .05	Date current version of software was installed.
DAYS TO KEEP DATA	8969, 1.01	Number of days that unsent data is allowed to remain in **^KMPTMP("KMPV"** before the purge routine kills it. Limited to **3-7** days. Data older than this value is deleted; regardless of the reason it has *not* been sent to the national database, in order to assure global does *not* grow unchecked.
COLLECTION INTERVAL	8969, 1.02	The number in minutes used to gather or aggregate metrics. Monitors that collect metrics on a periodic basis use this value to wait between collections. Monitors that collect data continuously use this value for aggregation of metrics.
CACHE DAILY TASK	8969, 1.03	The name of the routine, if applicable, to start each days collection. The Caché Task Manager calls the **RUN** line tag of this routine at the start of every day. This allows collection tasks to run on each node of a VistA system: **front-end** and **back-end**.
ALLOW TEST SYSTEM	8969, 1.04	If set to **YES** this allows the monitors to run on test systems. Otherwise monitors exit if the current UCI is *not* set as **PROD** per **^%ZOSF("UCI")**.
TASKMAN SCHEDULE FREQUENCY	8969, 1.05	The value used to automatically reschedule the TaskMan tasks (e.g., **1D** or **1W**).
TASKMAN SCHEDULE START	8969, 1.06	The time each monitor's TaskMan task should be scheduled. (e.g., **T+1@0001**).
TASKMAN OPTION	8969, 1.07	The OPTION (#19) file entry used by TaskMan to schedule the daily background jobs.
LAST START TIME	8969, 2.01	Time last TaskMan task was started for a specific monitor.
LAST STOP TIME	8969, 2.02	Time last TaskMan task completed for a specific monitor.
LAST RUN TIME	8969, 2.03	Time in seconds from start to completion of most recent run for a specific monitor TaskMan task.
NATIONAL DATA EMAIL ADDRESS	8969, 3.01	Email address used to send metric data to the national Capacity and Performance Engineering (CPE) database.
NATIONAL SUPPORT EMAIL ADDRESS	8969, 3.02	Email address used to send messages to the CPE VistA CP mail group.
VSM CFG EMAIL ADDRESS	8969, 3.03	Email address used to send data other than daily metrics to CPE national database.
LOCAL SUPPORT EMAIL ADDRESS	8969, 3.04	Optional email address for local support personnel. If present, any email that would be sent to the national support group also goes to the local support group.

2.2 VSM MONITOR DEFAULTS (#8969.02) File; Global: ^KMPV(8969.02

2.2.1 Data Dictionary

Figure 2: VSM MONITOR DEFAULTS (#8969.02) File—Data Dictionary

```
CROSS REFERENCED BY: MONITOR KEY(B)

^KMPV(8969.02,D0,0)= (#.01) MONITOR KEY [1F] ^ (#.02) DAYS TO KEEP DATA [2N] ^
(#.03) COLLECTION INTERVAL [3N] ^ (#.04) CACHE DAILY TASK [4F] ^
(#.05) ALLOW TEST SYSTEM [5S] ^ (#.06) TASKMAN SCHEDULE FREQUENCY [6F] ^
(#.07) TASKMAN SCHEDULE START [7F] ^ (#.08) TASKMAN OPTION [8F] ^
KMPV(8969.02,D0,1)= (#1.01) NATIONAL DATA EMAIL ADDRESS [1F] ^
(#1.02) NATIONAL SUPPORT EMAIL ADDRESS [2F] ^ (#1.03) VSM CFG EMAIL ADDRESS [3F] ^
```

2.2.2 Field Descriptions

Table 3: VSM MONITOR DEFAULTS (#8969.02) File—Field Descriptions

Field Name	Field Number	Description
MONITOR KEY	8969.02, .01	**Two** to **four** letter acronyms used to identify specific monitor.
DAYS TO KEEP DATA	8969.02, .02	Number of days that unsent data is allowed to remain in **^KMPTMP("KMPV"** before the purge routine kills it. Limited to **3-7** days. Data older than this value is deleted; regardless of the reason it has *not* been sent to the national database, in order to assure global does *not* grow unchecked.
COLLECTION INTERVAL	8969.02, .03	The number in minutes used to gather or aggregate metrics. Monitors that collect metrics on a periodic basis use this value to wait between collections. Monitors that collect data continuously use this value for aggregation of metrics.
CACHE DAILY TASK	8969.02, .04	The name of the routine, if applicable, to start each days collection. The Caché Task Manager calls the **RUN** line tag of this routine at the start of every day. This allows collection tasks to run on each node of a VistA system: **front-end** and **back-end**.
ALLOW TEST SYSTEM	8969.02, .05	If set to **YES** this allows the monitors to run on test systems. Otherwise monitors exit if the current UCI is *not* set as **PROD** per **^%ZOSF("UCI")**.
TASKMAN SCHEDULE FREQUENCY	8969.02, .06	The value used to automatically reschedule the TaskMan tasks. (e.g., **1D** or **1W**).
TASKMAN SCHEDULE START	8969.02, .07	The time each monitor's TaskMan task should be scheduled. (e.g., **T+1@0001**).
TASKMAN OPTION	8969.02, .08	The OPTION (#19) file entry used by TaskMan to schedule the daily background jobs.
NATIONAL DATA EMAIL	8969.02, 1.01	Email address used to send metric data to the national CPE database.

Field Name	Field Number	Description
ADDRESS		
NATIONAL SUPPORT EMAIL ADDRESS	8969.02, 1.02	Email address used to send messages to the CPE VistA CP mail group.
VSM CFG EMAIL ADDRESS	8969.02, 1.03	Email address used to send data other than daily metrics to CPE national database.

2.3 VSM CACHE TASK LOG (#8969.03) File; Global: ^KMPV(8969.03

2.3.1 Data Dictionary

Figure 3: VSM CACHE TASK LOG (#8969.03) File—Data Dictionary

```
CROSS REFERENCED BY: DATE(B)

INDEXED BY:    DATE & NODE (C)

^KMPV(8969.03,D0,0)= (#.01) DATE [1D] ^ (#.02) NODE [2F] ^ (#.03) VTCM RUNTIME [3D]
^
(#.04) VSTM RUNTIME [4D] ^ (#.05) VMCM RUNTIME [5D]
```

2.3.2 Field Descriptions

Table 4: VSM CACHE TASK LOG (#8969.03) File—Field Descriptions

Field Name	Field Number	Description
DATE	8969.03, .01	Run date for specific monitor as started from The Caché Task Manager.
NODE	8969.03, .02	Specific node on which collection routine was run.
VTCM RUNTIME	8969.03, .03	Time the **VistA Timed Collection Monitor (VTCM)** was started in VA FileMan date/time format.
VSTM RUNTIME	8969.03, .04	Time the **VistA Storage Monitor (VSTM)** was started in VA FileMan date/time format.
VMCM RUNTIME	8969.03, .05	Time the **VistA Message Count Monitor (VMCM)** was started in VA FileMan date/time format.

2.4 ^KMPTMP("KMPV"—Temporary Data Storage

^KMPTMP is a temporary global used by multiple KMP packages including KMPV – VistA System Manager.

CAUTION: This global is *not* in VA FileMan format and should *not* be journaled.

The following sections document how the VSM monitors use this global.

2.4.1 VTCM Usage of ^KMPTMP

Figure 4: VTCM Usage of ^KMPTMP

```
^KMPTMP("KMPV","VTCM","DLY",$H) = MSG Number until ACK rec'd
     $H: Internal format for date
     MSG Number: The number of the MailMan message that sent this day's data. Node
will be deleted upon receipt of ACK from the VSM national server

^KMPTMP("KMPV","VTCM","DLY",$H,Node,TimeSlot)=DATA
$H: Internal format for date
Node: Name of node from which the data was collected
TimeSlot: $H time format representing the time interval of the collected data (data
is aggregated to number of seconds for the configured COLLECTION INTERVAL).
Ex.  900 is 15 minutes after midnight - or 00:15AM
     1800 is 30 minutes after midnight - or 00:30AM
     85800 is 1430 minutes past midnight - or 11:30PM
DATA: "^" delimited string containing collected metric values.
Global References ^ Global References Per Second ^ Global Sets and Kills ^ Logical
Block
Requests ^ Physical Block Reads ^ Physical Block Writes ^ Processes ^ Routine
Commands ^ Routine Lines ^ Routine References ^ SMH Memory Used ^ SMH PageUsed ^
CSP Sessions ^ Cache Efficiency ^ ECP Client Bytes Per Second ^ ECP Server Bytes
Per Second ^ Paging ^ Page Space ^ Physical Memory

^KMPTMP("KMPV","VTCM","TRANSMIT" -- runtime only node used to pass data to MailMan
```

2.4.2 VSTM Usage of ^KMPTMP

Figure 5: VSTM Usage of ^KMPTMP

```
^KMPTMP("KMPV","VSTM","DLY",$H) = MSG Number until ACK rec'd
     $H: Internal format for date
     MSG Number: The number of the MailMan message that sent this day's data. Node
will be
deleted upon receipt of ACK from the VSM national server

^KMPTMP("KMPV","VSTM","DLY",$H,Node,Database)=DATA
$H: Internal format for date
Node: Name of node from which the data was collected
Database: Name of the Caché database. (ex: mgr, vaa, cache, rou, etc.)

DATA: "^" delimited string containing collected metric values.
Max Size ^ Size ^ Available ^ %Free ^ Disk Free

^KMPTMP("KMPV","VSTM","TRANSMIT" -- runtime only node used to pass data to MailMan
```

2.4.3 VMCM Usage of ^KMPTMP

Figure 6: VMCM Usage of ^KMPTMP

```
^KMPTMP("KMPV","VMCM","DLY",$H) = MSG Number until ACK rec'd
     $H: Internal format for date
     MSG Number: The number of the MailMan message that sent this day’s data. Node
will be deleted upon receipt of ACK from the VSM national server

^KMPTMP("KMPV","VMCM","DLY",$H,Node,LinkName:LinkType,TimeSlot)=DATA
$H: Internal format for date
Node: Name of node from which the data was collected
LinkName: The name of the logical link (or “HLO” for HLO message counts)
LinkType: The type of the logical link (or an empty string for HLO)
TimeSlot: $H time format representing the time interval of the collected data (data
is aggregated to number of seconds for the configured COLLECTION INTERVAL).
Ex.  900 is 15 minutes after midnight - or 00:15AM
     1800 is 30 minutes after midnight - or 00:30AM
     85800 is 1430 minutes past midnight - or 11:30PM
DATA: “^” delimited string containing collected metric values.
Messages Received ^ Messages Processed ^ Messages To Send ^ Messages Sent ^ Link
State

^KMPTMP("KMPV","VMCM","TRANSMIT" -- runtime only node used to pass data to MailMan
```

2.4.4 VHLM Usage of ^KMPTMP (SYNC/ASYNC)

Figure 7: VHLM Usage of ^KMPTMP (SYNC/ASYNC)

```
^KMPTMP("KMPV","VHLM","DLY",$H) = MSG Number until ACK rec'd
     $H: Internal format for date
     MSG Number: The number of the MailMan message that sent this day’s data. Node
will be deleted upon receipt of ACK from the VSM national server

^KMPTMP("KMPV","VHLM","DLY",$H,Type,TimeSlot,TransmissionType,Priority,HeaderType,L
ogicalLink,SubscriberProtocol,EventProtocol,MessageType,EventType,SendingApplicatio
n,ReceivingApplication,SendingSite,ReceivingSite)=DATA
$H: Internal format for date
Type: “SYNC” or “ASYNC”
TimeSlot: $H time format representing the time interval of the collected data (data
is aggregated to number of seconds for the configured COLLECTION INTERVAL).
Ex.  0 is midnight - or 00:00:00
     43200 is noon - or 12:00:00
TransmissionType: “I” = incoming, “O” = outgoing
Priority: “I” = immediate, “D” = deferred
HeaderType: “M” = single message, “B” = batch of messages, “F” = file of batches
LogicalLink: The link that will be used to transmit this message over.
SubscriberProtocol: The protocol related to this message.
EventProtocol: This is the event type from the HL7 standard.
MessageType: This is the message type from the HL7 standard.
EventType: This is the event type from the HL7 standard.
SendingApplication: The application that is sending the message.
ReceivingApplication: The application that is receiving this message.
SendingSite: The site sending the HL7 message.
ReceivingSite: The site receiving the HL7 message.
DATA: “^” delimited string containing collected metric values.
MessageCount ^ TotalCharacters ^ EventCount ^ TransmissionTime ^ CATime ^ AATime

^KMPTMP("KMPV","VHLM","TRANSMIT" -- runtime only node used to pass data to MailMan
```

2.4.5 VHLM Usage of ^KMPTMP (HLO)

Figure 8: VHLM Usage of ^KMPTMP (HLO)

```
^KMPTMP("KMPV","VHLM","DLY",$H) = MSG Number until ACK rec'd
     $H: Internal format for date
     MSG Number: The number of the MailMan message that sent this day’s data. Node
will be deleted upon receipt of ACK from the VSM national server

^KMPTMP("KMPV","VHLM","DLY",$H,Type,TimeSlot,SyncType,HLOType,Direction,MessageType
,EventType,LogicalLink,Queue,SendingApplication,SendingSite,ReceivingApplication,Re
ceivingSite)=DATA
$H: Internal format for date
Type: “HLO”
TimeSlot: $H time format representing the time interval of the collected data (data
is aggregated to number of seconds for the configured COLLECTION INTERVAL).
Ex.  0 is midnight - or 00:00:00
     43200 is noon - or 12:00:00
SyncType: “SYNCH” or “ASYNC”
HLOType: “PRIME” or “ACK”
Direction: “I” = incoming, “O” = outgoing
MessageType: The three character message type.
EventType: The three character event type.
LogicalLink: The link that will be used to transmit this message over.
Queue: The queue on which the message is placed.
SendingApplication: The application that is sending the message.
SendingSite: The site sending the HL7 message.
ReceivingApplication: The application that is receiving this message.
ReceivingSite: The site receiving the HL7 message.
DATA: “^” delimited string containing collected metric values.
MessageCount ^ TotalCharacters

^KMPTMP("KMPV","VHLM","TRANSMIT" -- runtime only node used to pass data to MailMan
```

2.4.6 VBEM Usage of ^KMPTMP

Figure 9: VBEM Usage of ^KMPTMP

```
^KMPTMP("KMPV","VBEM","DLY",$H) = MSG Number until ACK rec'd
     $H: Internal format for date
     MSG Number: The number of the MailMan message that sent this day's data. Node
will be deleted upon receipt of ACK from the VSM national server

^KMPTMP("KMPV","VBEM","DLY",$H,Node,TimeSlot)=DATA
$H: Internal format for date
Node: Name of node from which the data was collected
TimeSlot: $H time format representing the time interval of the collected data (data
is aggregated to number of seconds for the configured COLLECTION INTERVAL).
Ex.  900 is 15 minutes after midnight - or 00:15AM
     1800 is 30 minutes after midnight - or 00:30AM
     85800 is 1430 minutes past midnight - or 11:30PM
DATA: "^" delimited string containing collected metric values.
Global References ^ Global References Per Second ^ Global Sets and Kills ^ Logical
Block
Requests ^ Physical Block Reads ^ Physical Block Writes ^ Processes ^ Routine
Commands ^ Routine Lines ^ Routine References ^ SMH Memory Used ^ SMH PageUsed ^
CSP Sessions ^ Cache Efficiency ^ ECP Client Bytes Per Second ^ ECP Server Bytes
Per Second ^ Paging ^ Page Space ^ Physical Memory

^KMPTMP("KMPV","VBEM","TRANSMIT" -- runtime only node used to pass data to MailMan
```

3 Routines

This section lists the routines and line tags for VistA System Monitor (VSM) monitors. The routines include:

- VistA Timed Collection Monitor (VTCM) Specific Routines
- VistA Message Count Monitor (VMCM) Specific Routines
- VistA HL7 Monitor (VHLM) Specific Routines
- VistA Storage Monitor (VSTM) Specific Routines
- VistA Business Event Monitor (VBEM) Specific Routines
- VSM Utility Routines

3.1 VistA Timed Collection Monitor (VTCM) Specific Routines

Table 5: VTCM Routines

Routine	Line Tag	Description
KMPVVTCM	**Collect Caché Metrics for the VistA Timed Collection Monitor**	
	RUN	Collect metrics per configured interval and store in **^KMPTMP("KMPV","VTCM","DLY"**. Called via the Caché Task Manager.
	SEND	Format daily metric data to for VA MailMan transmission.
	TRANSMIT	Transmit daily data to the VSM national server.

3.2 VistA Message Count Monitor (VMCM) Specific Routines

Table 6: VMCM Routines

Routine	Line Tag	Description
KMPVVMCM	**Collect Caché Metrics for the VistA Message Count Monitor**	
	RUN	Collect metrics per configured interval and store in **^KMPTMP("KMPV","VMCM","DLY"**. Called via the Caché Task Manager.
	SEND	Format daily metric data to for VA MailMan transmission.
	TRANSMIT	Transmit daily data to the VSM national server.

3.3 VistA HL7 Monitor (VHLM) Specific Routines

Table 7: VHLM Routines

Routine	Line Tag	Description
KMPVVHLM	**Collect Caché Metrics for the VistA HL7 Monitor**	
	RUN	Collect metrics once per day and store in **^KMPTMP("KMPV","VHLM","DLY"**. Scheduled by VistA Task Manager.
	COLLECT	Collect metrics for the previous day by calling **AGGRAGAT** and **PREPARE**.
	AGGRAGAT	Aggregate the previous day's HL7/HLO metrics based on metadata.
	PREPARE	Format daily metric data for VA MailMan transmission.

Routine	Line Tag	Description
	TRANSMIT	Transmit daily data to the VSM national server.

3.4 VistA Storage Monitor (VSTM) Specific Routines

Table 8: VSTM Routines

Routine	Line Tag	Description
KMPVVSTM	**Collect Caché Metrics for the VistA Timed Collection Monitor**	
	RUN	Entry point. Determines if metrics should be collected for that day.
	METRICS	Collect metrics per configured interval and store in **^KMPTMP("KMPV","VSTM","DLY"**. Called via the Caché Task Manager.
	SEND	Format daily metric data to for VA MailMan transmission.
	TRANSMIT	Transmit daily data to the VSM national server.

3.5 VistA Business Event Monitor (VBEM) Specific Routines

Table 9: VBEM Routines

Routine	Line Tag	Description
KMPVBETR	**Collect Caché Metrics for the VistA Business Event Monitor**	
	EN	Collect metrics per configured interval and store in **^KMPTMP("KMPV","VBEM","DLY"**. Called via the Caché Task Manager. Format daily metric data to for MailMan transmission.
	TRANSMIT	Transmit daily data to the VSM national server.
	TASKSTOP	Clean-up code if task Stopped via TaskMan

3.6 VSM Utility Routines

Table 10: VSM Utility Routines

Routine	Line Tag	Description
KMPVCSRV	**VSM Server Routine for VistA Functions**	
	EN	Server routine entry point.
	ACK	Receive acknowledge VSM receipt of **VTCM** data – delete from local node.
	GETSTAT	Returns current status of VSM.

Routine	Line Tag	Description
	RESEND	Resend data for one or more monitors.
	SETCFG()	Change VSM configuration via national server change request.
	KMPUPDEF	Update VSM MONITOR DEFAULTS (#8969.02) file. Optionally, apply defaults to VSM CONFIGURATION (#8969) file.
	CTMLOG	Returns the run history recorded in the VSM CACHE TASK LOG (#8969.03) file.
KMPVCCFG	**VSM Configuration Functions**	
	CFGARR(KMPVMKEY,KMPVCFG, KMPVFLAG	Return configuration by monitor in array.
	GETDEF(KMPVMKEY,KMPVDEF, KMPVFLAG)	Return default configuration in array.
	CFGSTR(KMPVMKEY,KMPVFLAG)	Return configuration in **^** delimited string.
	GETVAL(KMPVMKEY,KMPVFLD, KMPVFILE,KMPVFLAG)	Retrieve value from VSM CONFIGURATION (#8969) or VSM MONITOR DEFAULTS (#8969.02) files.
	SETONE(KMPVMKEY,KMPVFNAM, KMPVNVAL,KMPVERR,KMPVLOG)	Set a value into the VSM CONFIGURATION (#8969) file.
	SETVALS(KMPVMKEY,KMPVFVAL, KMPVERR,KMPVLOG)	Set multiple values into the VSM CONFIGURATION (#8969) file.
	RESTCFG(KMPVMKEY)	Restore default configuration to VSM CONFIGURATION (#8969) file.
	STRSTP(KMPVMKEY,KMPVSTIME)	Record run time values.
	SYSCFG()	Return system configuration values.
	MONSTAT(KMPVTEXT)	Return status information for all configured monitors.
	USERNAME(KMPVDUZ)	Return users name from **DUZ**.
	PROD()	Return "**Prod**" if production; otherwise, return "**Test**".
KMPVCBG	**VSM Background Utility Functions**	
	MONLIST(KMPVML)	Return list of configured Monitors.
	STARTMON(KMPVMKEY)	Schedule transmission task in TaskMan and set ONOFF (#.02) field to **ON**.
	STOPMON(KMPVMKEY)	Un-schedule transmission task in TaskMan and set ONOFF (#.02) field to **OFF**.
	RESCH(KMPVMKEY,KMPVERR)	Reschedule transmission task in TaskMan.
	DESCH(KMPVMKEY,KMPVERR)	De-schedule transmission task in TaskMan.
	CANMESS(MTYPE,KMPVMKEY, KMPVSITE,KMPVD)	Repeatable, configured mail messages.

Routine	Line Tag	Description
	SUPMSG(KMPVTEXT)	Send email to national and local support mail groups.
	DBAMSG(KMPVTEXT)	Send email to local support mail group.
	CFGMSG(KMPVRQNAM)	Send configuration data to update Location Table at National VSM Database.
	PURGEDLY(KMPVMKEY)	Purge any data older than VSM CONFIURATION (#8969) file specifies.
	KMPVTSK(NAMESPACE)	Creates a task in the Caché Task Manager to start the VSM collection driver each day. Passing no namespace attempts to **$ZDEFNSP**.
KMPVLM	**List Manager Functions**	
	EN	Main entry point for **VSM MANAGEMENT** menu option.
	HDR	Header Code.
	INIT	Initialize variables and list array.
	BUILD	Build array with collector status information.
	STARTMON	Supports List Manager protocol **STRT Start Monitor**.
	STOPMON	Supports List Manager protocol **STOP Stop Monitor**.
	VIEWCFG	Supports List Manager protocol **VIEW View CFG**.
	EDITCFG	Supports List Manager protocol **EDIT Edit CFG**.
	RESTCFG	Supports List Manager protocol **REST Restore CFG**
	KILL(KMPVMKEY)	Supports List Manager protocol **DEL Delete Data**.
	PICKMON()	Supports selection of Monitor Type for List Manager functions.
	REFRESH	Refresh display.
	HELP	Help code.
	EXIT	Exit code.
	EXPND	Expand code.
KMPVRUN	**VSM Caché Task Manager Driver**	
	RUN	Loop VSM CONFIGURATION (#8969) file and run collection routine for monitors set to **ON**.
	CLEANUP	Purge old data in VSM CACHE TASK LOG

Routine	Line Tag	Description
		(#8969.03) file and release lock.
	ERR	Error trap as routine is called from Caché Task Manage.
KMPVPST2	**Post Install Routine for KMP*4.0*0**	
		Creates entries in the VSM CONFIGURATION (#8969) and VSM MONITOR DEFAULT (#8969.02) files.

4 Exported Options

This section lists the options in the OPTION (#19) file exported with VistA System Monitor (VSM).

4.1 KMPV VSM MANAGEMENT Menu Option

Figure 10: KMPV VSM MANAGEMENT Menu Option

```
NAME: KMPV VSM MANAGEMENT                MENU TEXT: VSM MANAGEMENT
TYPE: run routine                      CREATOR: L,J
LOCK: KMPVOPS                          ROUTINE: EN^KMPVLM
UPPERCASE MENU TEXT: VSM MANAGEMENT
```

4.2 KMPV VTCM DATA TRANSMISSION Option

Figure 11: KMPV VTCM DATA TRANSMISSION Option

```
NAME: KMPV VTCM DATA TRANSMISSION       MENU TEXT: KMPV VTCM DATA TRANSMISSION

TYPE: run routine                      CREATOR: L,J
DESCRIPTION:   Daily background job to send VTCM metrics to national database.
This job should be scheduled to run during non-peak hours.
ROUTINE: SEND^KMPVVTCM                 SCHEDULING RECOMMENDED: YES
KEEP FROM DELETING: Yes      UPPERCASE MENU TEXT: KMPV VTCM DATA TRANSMISSION
```

4.3 KMPV VMCM DATA TRANSMISSION Option

Figure 12: KMPV VMCM DATA TRANSMISSION Option

```
NAME: KMPV VMCM DATA TRANSMISSION       MENU TEXT: KMPV VMCM DATA TRANSMISSION

TYPE: run routine                      CREATOR: L,J
DESCRIPTION:   Daily background job to send VMCM metrics to national database.
This job should be scheduled to run during non-peak hours.
ROUTINE: SEND^KMPVVMCM                 SCHEDULING RECOMMENDED: YES
KEEP FROM DELETING: Yes      UPPERCASE MENU TEXT: KMPV VMCM DATA TRANSMISSION
```

4.4 KMPV VHLM DATA TRANSMISSION Option

Figure 13: KMPV VHLM DATA TRANSMISSION Option

```
NAME: KMPV VHLM DATA TRANSMISSION       MENU TEXT: KMPV VHLM DATA TRANSMISSION

TYPE: run routine                      CREATOR: L,J
DESCRIPTION:   Daily background job to send VHLM metrics to national database.
This job should be scheduled to run during non-peak hours.
ROUTINE: RUN^KMPVVHLM                 SCHEDULING RECOMMENDED: YES
KEEP FROM DELETING: Yes      UPPERCASE MENU TEXT: KMPV VHLM DATA TRANSMISSION
```

4.5 KMPV VSTM DATA TRANSMISSION Option

Figure 14: KMPV VSTM DATA TRANSMISSION Option

```
NAME: KMPV VSTM DATA TRANSMISSION          MENU TEXT: KMPV VSTM DATA TRANSMISSION

TYPE: run routine                        CREATOR: L,J
PACKAGE: CAPACITY MANAGEMENT - VSM
DESCRIPTION:   Background job to send VSTM metrics to national database. This
job should be scheduled to run during non-peak hours.
ROUTINE: SEND^KMPVVSTM                   SCHEDULING RECOMMENDED: YES
KEEP FROM DELETING: Yes
UPPERCASE MENU TEXT: KMPV VSTM DATA TRANSMISSION
```

4.6 KMPV VBEM DATA TRANSMISSION Option

Figure 15: KMPV VBEM DATA TRANSMISSION Option

```
NAME: KMPV VBEM DATA TRANSMISSION          MENU TEXT: KMPV VBEM DATA TRANSMISSION

TYPE: run routine                        CREATOR: L,J
DESCRIPTION:   Daily background job to send VBEM metrics to national database.
This job should be scheduled to run during non-peak hours.
ROUTINE: EN^KMPVBETR                   SCHEDULING RECOMMENDED: YES
KEEP FROM DELETING: Yes      UPPERCASE MENU TEXT: KMPV VBEM DATA TRANSMISSION
```

4.7 KMPV-CLIENT-SRV Option

Figure 16: KMPV-CLIENT-SRV Option

```
NAME: KMPV-CLIENT-SRV                      MENU TEXT: KMPV-CLIENT-SRV
TYPE: server                             CREATOR: L,J
ROUTINE: KMPVCSRV                        SERVER ACTION: RUN IMMEDIATELY
SERVER MAIL GROUP: CPE-CP-SUPPORT
SUPRESS BULLETIN: NO (DEFAULT) SEND A BULLETIN
UPPERCASE MENU TEXT: KMPV-CLIENT-SRV
```

4.8 KMPV MANAGEMENT MENU

For details on this menu, see Section 8.2.3.

5 Archiving

Data is removed nightly from the sites. There are no special archiving procedures required with the VistA System Monitor (VSM) 2.0 software.

6 Application Programming Interfaces (APIs)

There are no VSM callable routines, entry points, or Application Programming Interfaces (APIs) that can be called by other software.

7 External Relationships

7.1 Caché Task Manager

Table 11 details the parameters used to enter the task in the Caché Task Manager to start the VSM monitors on each node. This is created by running the **KMPVTSK** line tag of the **KMPVCBG** routine. The person running this line tag/routine *must* have either of the following roles:

- **%All**
- **%Manager**

Table 11: Caché Task Manager Task Values

Field	Entry
Task Name:	**KMPVRUN**
Description:	**Start VSM Collection Drivers**
Namespace to run task in:	**Default routine namespace** - usually **3**-letter site acronym (e.g., CTX for Central Texas)
Task type:	**RunLegacyTask**
ExecuteCode:	**D RUN^KMPVRUN**
Task priority:	**Priority Normal**
Run task as this user:	**Username** of person setting up task
Open output file when task is running?	**No**
Output file:	**Leave blank**
Reschedule task after system restart?	**Yes**

The task should be scheduled to run once daily at **1:00 AM**.

7.2 Dependencies

7.2.1 Packages

VSM is dependent on the following legacy VistA software:

Table 12: VSM Required Packages

Software	Version	Patch Information
Kernel	8.0	Fully patched
Kernel Toolkit	7.3	Fully patched
VA FileMan	22.2	Fully patched
MailMan	8.0	Fully patched

8 Internal Relationships

This section lists entries in various VistA files necessary for the operation of VistA System Monitor (VSM).

8.1 LIST TEMPLATE (#409.61) File

8.1.1 KMPV MANAGEMENT List Template

Figure 17: KMPV MANAGEMENT List Template

```
NAME: KMPV MANAGEMENT                    TYPE OF LIST: PROTOCOL
RIGHT MARGIN: 80                        TOP MARGIN: 9
     BOTTOM MARGIN: 13                      OK TO TRANSPORT?: NOT OK
     USE CURSOR CONTROL: YES                PROTOCOL MENU: KMPV MANAGEMENT MENU
     SCREEN TITLE: VSM MANAGEMENT           ALLOWABLE NUMBER OF ACTIONS: 2
     AUTOMATIC DEFAULTS: YES                HIDDEN ACTION MENU: VALM HIDDEN ACTIONS
ITEM NAME: Monitor                       COLUMN: 2
     WIDTH: 8                               DISPLAY TEXT: Monitor
ITEM NAME: Status                        COLUMN: 12
     WIDTH: 6                               DISPLAY TEXT: Status
     DEFAULT VIDEO ATTRIBUTES: R
ITEM NAME: LastTransmission              COLUMN: 20
     WIDTH: 20                              DISPLAY TEXT: Last Transmission
ITEM NAME: DLY                           COLUMN: 42
     WIDTH: 5                               DISPLAY TEXT: DLY
     DEFAULT VIDEO ATTRIBUTES: B
ITEM NAME: COMP                          COLUMN: 49
     WIDTH: 5                               DISPLAY TEXT: COMP
     DEFAULT VIDEO ATTRIBUTES: B
ITEM NAME: NextTransmission              COLUMN: 56
     WIDTH: 20                              DISPLAY TEXT: Next Transmission
ITEM NAME: Monitor                       COLUMN: 2
     WIDTH: 8                               DISPLAY TEXT: Monitor
ITEM NAME: Status                        COLUMN: 12
     WIDTH: 6                               DISPLAY TEXT: Status
     DEFAULT VIDEO ATTRIBUTES: R
ITEM NAME: LastTransmission              COLUMN: 20
     WIDTH: 20                              DISPLAY TEXT: Last Transmission
ITEM NAME: DLY                           COLUMN: 42
     WIDTH: 5                               DISPLAY TEXT: DLY
     DEFAULT VIDEO ATTRIBUTES: B
ITEM NAME: COMP                          COLUMN: 49
     WIDTH: 5                               DISPLAY TEXT: COMP
     DEFAULT VIDEO ATTRIBUTES: B
ITEM NAME: NextTransmission              COLUMN: 56
     WIDTH: 20                              DISPLAY TEXT: Next Transmission
     DEFAULT VIDEO ATTRIBUTES: R
EXIT CODE: D EXIT^KMPVLM                HEADER CODE: D HDR^KMPVLM
HELP CODE: D HELP^KMPVLM                ENTRY CODE: D INIT^KMPVLM
```

8.2 PROTOCOL (#101) File

8.2.1 KMPV DELETE DATA Protocol

Figure 18: KMPV DELETE DATA Protocol

```
NAME: KMPV DELETE DATA                    ITEM TEXT: Delete Data
TYPE: action                            CREATOR: L,J
ENTRY ACTION: D KILL^KMPVLM             TIMESTAMP: 63419,42385
```

8.2.2 KMPV EDIT CFG Protocol

Figure 19: KMPV EDIT CFG Protocol

```
NAME: KMPV EDIT CFG                       ITEM TEXT: Edit CFG
TYPE: action                            CREATOR: L,J
ENTRY ACTION: D EDITCFG^KMPVLM          TIMESTAMP: 63417,36668
```

8.2.3 KMPV MANAGEMENT MENU Protocols

The following protocols on the KMPV MANAGEMENT MENU (Figure 20) are stored in the PROTOCOL (#101) file:

Figure 20: KMPV MANAGEMENT MENU

```
NAME: KMPV MANAGEMENT MENU                ITEM TEXT: KMPV MANAGEMENT MENU
TYPE: menu                              CREATOR: L,J
COLUMN WIDTH: 26                        MNEMONIC WIDTH: 6
ITEM: KMPV START MONITOR                  MNEMONIC: STRT
SEQUENCE: 1
ITEM: KMPV STOP MONITOR                   MNEMONIC: STOP
SEQUENCE: 2
ITEM: KMPV VIEW CFG                       MNEMONIC: VIEW
SEQUENCE: 3
ITEM: KMPV DELETE DATA                    MNEMONIC: DEL
SEQUENCE: 6
ITEM: KMPV RESTORE CFG                    MNEMONIC: REST
SEQUENCE: 5
ITEM: KMPV EDIT CFG                       MNEMONIC: EDIT
SEQUENCE: 4

HEADER: D SHOW^VALM                     MENU PROMPT: Select Action
TIMESTAMP: 63452,46698
```

8.2.4 KMPV RESTORE CFG Protocol

Figure 21: KMPV RESTORE CFG Protocol

```
NAME: KMPV RESTORE CFG                    ITEM TEXT: Restore CFG
TYPE: action                            CREATOR: L,J
ENTRY ACTION: D RESTCFG^KMPVLM          TIMESTAMP: 63417,35298
```

8.2.5 KMPV START MONITOR Protocol

Figure 22: KMPV START MONITOR Protocol

```
NAME: KMPV START MONITOR                ITEM TEXT: Start Monitor
TYPE: action                          CREATOR: L,J
ENTRY ACTION: D STARTMON^KMPVLM       TIMESTAMP: 63417,37931
```

8.2.6 KMPV STOP MONITOR Protocol

Figure 23: KMPV STOP MONITOR Protocol

```
NAME: KMPV STOP MONITOR                 ITEM TEXT: Stop Monitor
TYPE: action                          CREATOR: L,J
ENTRY ACTION: D STOPMON^KMPVLM        TIMESTAMP: 63417,37989
```

8.2.7 KMPV VIEW CFG Protocol

Figure 24: KMPV VIEW CFG Protocol

```
NAME: KMPV VIEW CFG                     ITEM TEXT: View CFG
TYPE: action                          CREATOR: L,J
ENTRY ACTION: D VIEWCFG^KMPVLM        TIMESTAMP: 63417,38175
```

8.3 FORM (#.403) File

8.3.1 KMPV EDIT CONFIGURATION Form

Figure 25: KMPV EDIT CONFIGURATION Form

```
NAME: KMPV EDIT CONFIGURATION           READ ACCESS: @
WRITE ACCESS: @                       CREATOR: 520791172
DATE CREATED: OCT 14, 2014@14:28      DATE LAST USED: OCT 31, 2014@12:04
PRIMARY FILE: 8969                    DISPLAY ONLY: NO
FORM ONLY: NO                         COMPILED: YES
PAGE NUMBER: 1                          PAGE COORDINATE: 1,1
PAGE NAME: Page 1
BLOCK NAME: KMPV EDIT CFG               BLOCK ORDER: 1
BLOCK COORDINATE: 1,1                 TYPE OF BLOCK: EDIT
BLOCK NAME: KMPV EDIT TITLE             BLOCK ORDER: 2
BLOCK COORDINATE: 16,1                TYPE OF BLOCK: DISPLAY
```

8.3.2 KMPV VIEW CONFIGURATION Form

Figure 26: KMPV VIEW CONFIGURATION Form

```
NAME: KMPV VIEW CONFIGURATION              READ ACCESS: @
WRITE ACCESS: @                          CREATOR: 520791172
DATE CREATED: OCT 15, 2014@08:48         DATE LAST USED: OCT 31, 2014@12:03
PRIMARY FILE: 8969                       DISPLAY ONLY: YES
FORM ONLY: NO                            COMPILED: YES
PAGE NUMBER: 1                             PAGE COORDINATE: 1,1
PAGE NAME: Page 1
BLOCK NAME: KMPV VIEW CFG                  BLOCK ORDER: 1
BLOCK COORDINATE: 1,1                    TYPE OF BLOCK: DISPLAY
BLOCK NAME: KMPV VIEW TITLE                BLOCK ORDER: 2
BLOCK COORDINATE: 16,1                   TYPE OF BLOCK: DISPLAY
```

8.3.3 Database Integration Agreements (IAs)

Figure 27: VSM Database Integration Agreements (IAs)

```
This version of VSM software is dependent on the following Integration Agreements
IA#:  NAME-COMPONENTS:                                                  USAGE:
-----  ----------------                                                 ------
10097 %ZOSV-GETENV, $$OS, $$VERSION                                    SUPPORTED
10112 VASITE-$$SITE                                                    SUPPORTED
10060 NEW PERSON FILE                                                  SUPPORTED
1966  DBIA1966                                                         SUBSCRIPTION
2734  MESSAGE & MAILBOX UTILITIES API-$$NETNAME                        SUPPORTED
10073 MAILMAN: MESSAGE BODY ACCESS, INCLUDING SERVERS-REC              SUPPORTED
4440  DBIA4440                                                         SUPPORTED
6877  READ ACCESS TO HL7 MESSAGE TEXT FILE FOR CAPACITY PLANNING       PRIVATE
6878  READ ACCESS TO FILE 773 FOR CAPACITY PLANNING                    PRIVATE
6882  READ ACCESS TO HLO MESSAGE BODY FILE FOR CAPACITY PLANNING       PRIVATE
6883  READ ACCESS TO HLO MESSAGES FILE FOR CAPACITY PLANNING           PRIVATE
6247  DIRECT KMPV READ TO KMPTMP                                       PRIVATE
```

9 Global Variables

There are no VSM global variables.

10 Security

10.1 Mail Group

Optionally, sites can enter a local email address in the **Edit CFG** action under the **VSM MANAGEMENT** menu option. The local support mail group receives the same informational email messages that go to national support mail group.

NOTE: There are no VSM bulletins or alerts.

10.2 Remote Systems

Data collected includes only system metrics. None of the following data is collected:

- Personal Identification Information (PII)
- Personal Health Information (PHI)
- Patient, clinician, or financial data collected

Examples of data collected include:

- Number of global **READ**s/**WRITE**s per time period.
- Amount of storage space used by the system in question.

Data transmissions:

- **VTCM** data is sent to the CPE national database on a nightly basis.
- **VMCM** data is sent to the CPE national database on a nightly basis.
- **VHLM** data is sent to the CPE national database on a nightly basis.
- **VSTM** data is transmitted on the **15th** and **last** day of each month. This data is transmitted using standard VA MailMan messages.
- **VBEM** data is sent to the CPE national database on a nightly basis.

Receipt of data is confirmed with a MailMan message sent in response. This message triggers the site to delete the data at the site.

10.3 Archiving

For VSM archiving information, see Section 5, "Archiving."

10.4 Interfacing

VSM software operates on standard VistA software and hardware.

10.5 Electronic Signatures

VSM does *not* use electronic signatures.

10.6 Security Menus and Options

VSM does *not* distribute any security menus or options.

10.7 Security Keys

The KMPVOPS security key is needed to access the **VSM MANAGEMENT** menu option. This security key should only be given to those who manage VSM.

Figure 28: KMPVOPS Security Key

```
NAME: KMPVOPS                          DESCRIPTIVE NAME: VSM OPERATIONS LOCK
```

10.8 File Security

For a list of files exported with VSM, see Section 2, "Files."

10.9 References

For a list of document and other references, see the "Reference Materials" section.

11 Troubleshooting

There are no known issues or anomalies related to the VistA System Monitor (VSM) 2.0 software.

11.1 Operational Support

This software is intended to run automatically in the background and should require no operational support under normal operations. However, for those times where support is needed there are two mechanisms within this package to provide such functionality:

- Local Operational Support: There is a List Manager Application installed with this package that allows the local support staff to:
  - Start and stop monitors
  - View operational parameters
  - Configure operational parameters
  - Delete all locally stored data in case of emergency

  REF: These actions are documented in Section 2, "VSM Operation" section in the *VistA System Monitor (VSM) User Manual*.
- National CPE Support: Additionally, this software has the capability to receive requests for the same functions via MailMan messages from the CPE VSM Support group.

11.2 VA Enterprise Service Desk (ESD) Support

For Information Technology (IT) support 24 hours a day, 365 days a year call the VA Enterprise Service Desk:

- Phone: **855-673-4357** or **888-326-6780**
- Information Technology Service Management (ITSM) Tool—**ServiceNow** site: https://vaww.oit.va.gov/projects/itsm/
- Enter an **Incident** or **Request** ticket in ITSM **ServiceNow** system via the **YourIT** shortcut on your workstation.