Introduction

This document is intended to assist sites with optimizing the RPMS. Additional documentation is available at the CSMT website: http://intranetftp.ihs.gov/pub/RPMS_ROLL_OUT/.

Perform a complete backup using the document **Critical Backup Files** technical document before proceeding with the optimization. The server recommendations should be met before you optimize.

Journal Settings

1. Enter the **Primary Journal Directory** field.
2. Enter the **Secondary Journal Directory** field. (The entry should match the **Primary Journal Directory**. See Figure 1).

   > **Note**: In the event of a process runaway, only one directory will get full and result in a <FILEFULL> error. Extracting data is time consuming if not caught early.

3. Set the **Freeze on error** field to **YES**.
4. Verify sufficient diskspace for Journal files to accommodate **After this many days** entry.
5. Log into the Management Portal and go to the **Journal Settings**:

   System Administration >> **Configuration** >> **System Configuration** >> **Journal Settings**

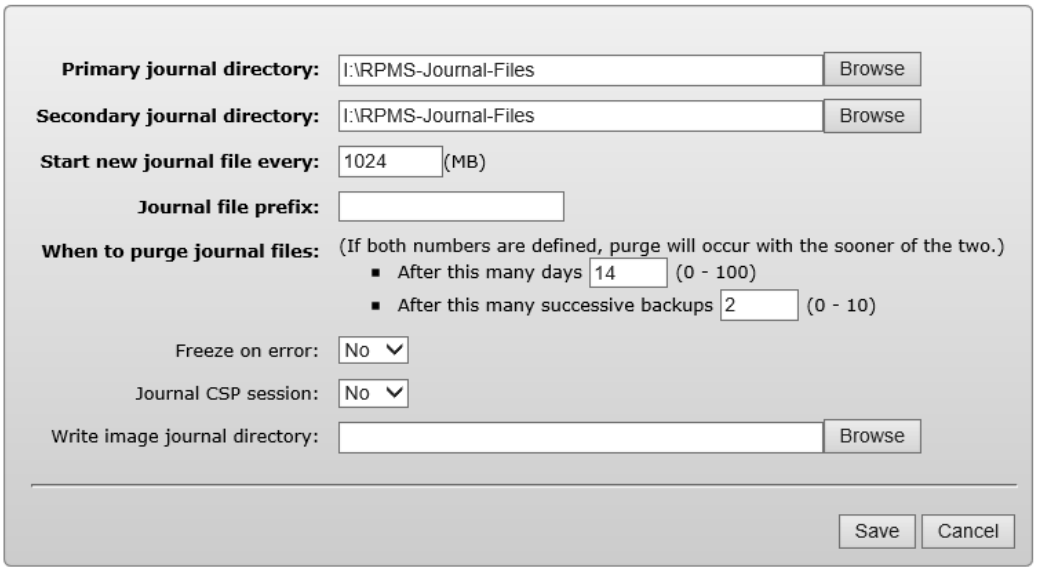

Figure 1: Journal settings

Memory and Startup

1. Enter the **Memory Allocated for Routine Cache (MB)**: **1023**.

   > **Note**: This is the maximum value you can enter, otherwise the system will not recognize large pages and it will revert to small pages (noted in the console log).

2. Enter the **Memory Allocated for 8KB Database Cache (MB):** _____ (see calculations in Table 1)
3. Enter the **Maximum per Process Memory (KB)**: **262144**.
4. Log into the Management Portal and go to the **Journal Settings**:

   System Administration >> **Configuration** >> **System Configuration** >> **Memory and Startup**

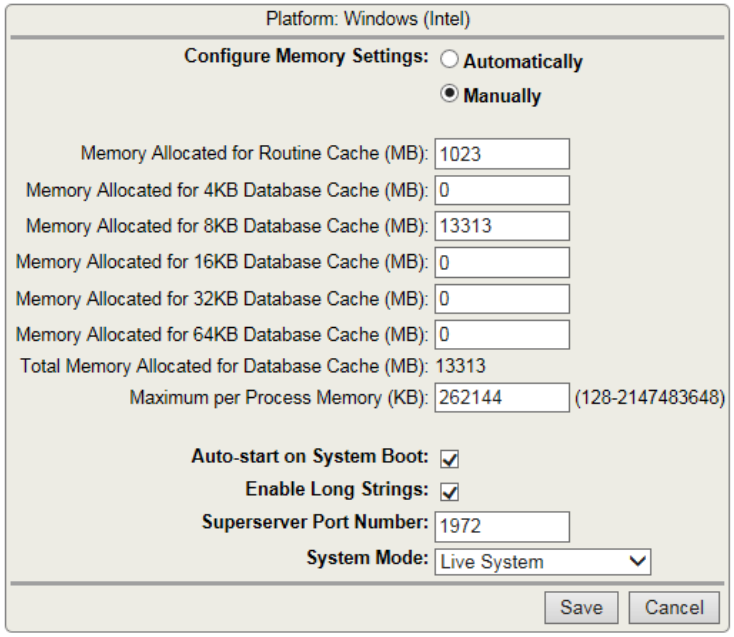

Figure 2: Memory and Startup settings

   a. Based on the number of RAM, enter the number using the 8KB Database Cache column.

Table 1: 8KB Database Cache values

Number of RAM	8KB Database Cache (MB)	GB (estimate)
16	4711	5
24	7578	7
40	13313	13
48	16180	16
56	19047	19
64	21914	21
72	24782	24
80	27649	27
96	33383	32

b. Calculation of the numbers for the 8KB Database Cache entries:

35% of System RAM minus 1023, in Megabytes

Example: 16GB RAM (16x1024) .35 – 1023 = 4711

Advanced Memory Settings

1. Select **Edit** and enter the value for **ZFSIZE**: **125,000**.
2. Select **Edit** and enter the value for **ZFSTRING**: **32,000**.

> **Note**: ZFSIZE (Maximum Heap Size) and ZFSTRING (Maximum String Size) are used for output parameters in a callout function using $ZF. Various applications use string and heap, e.g., Immunization and TCH Forecaster.

3. Select **Edit** and enter new value for **gmheap** (value is in Kilobytes).
   a. Single Processor

   Run the command below in the %SYS namespace:

   %SYS>**W $SYSTEM.Config.SharedMemoryHeap.RecommendedSize()**

   What is the output number? _____ Add 2048KB =_____ new value.

   b. Multiple Processors

   Enter the gmheap value based on the number of processors on the server. The computer properties have the system information.

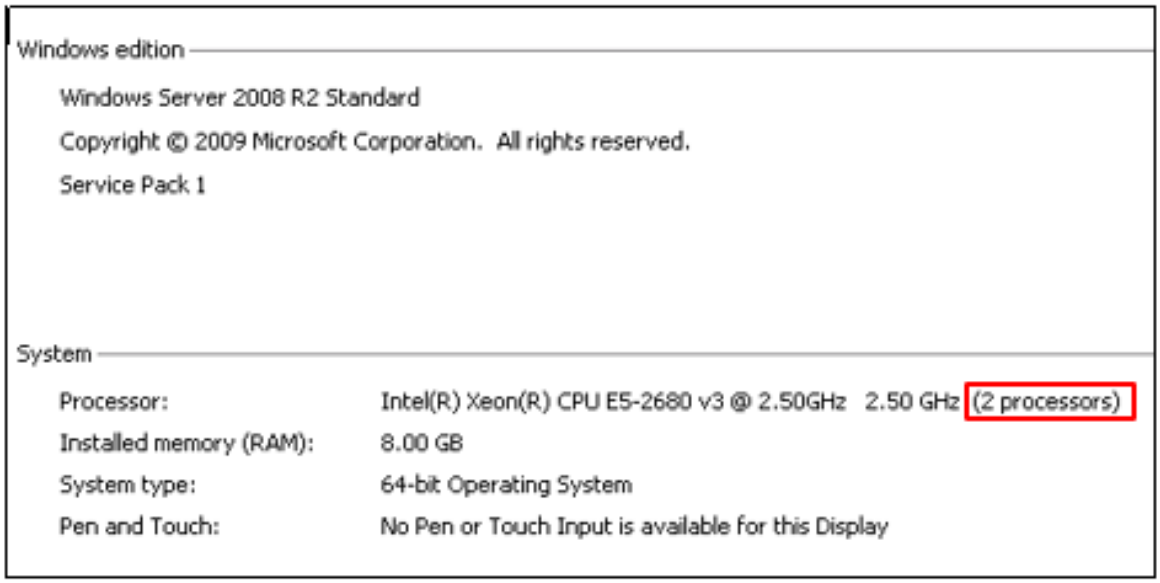

Figure 3: Computer properties

Based on the number of processors, enter the gmheap value in the Management Portal.

Table 2: Processor and gmheap values

Number of Processors	gmheap (in KB)
2	131072
3	196608
4	262144
5	327680
6	393216
7	458752
8	524288
9	589824
10	655360

4. Select **Edit** and enter the new value for **locksiz** (values are in bytes).

   Locksiz cannot be greater than gmheap.

   Locksiz default value is 1179648.

   Start at **2097152** bytes and it can grow by **1048576** bytes (1024 KB) as needed:

> **Note**: Recommendations from the Intersystems Cache Additional configuration setting reference.

Table 3: Locksiz values

Locksiz (bytes)	In KB
1179648	1152
2097152	2048

Locksiz (bytes)	+ 1048576 (bytes)	In KB
2097152	3145728	3072
3145729	4194304	4096
4194304	5242880	5120
5242880	6291456	6144
6291456	7340032	7168
7340032	8388608	8192
8388608	9437184	9216

5. Restart the gmheap and locksiz updates as the issue reoccurs.

Compatibility Settings

1. Values for False/True

   0 = False

   1 = True

2. Enter the following Compatibility Values:

   DisconnectErr: False

   > **Note**: How Cache responds to a disconnect of the principal I/O device. False - the process exits without reporting an error to the application when a disconnect is detected.

   FileMode: True

   > **Note**: Create a file if it does not exist when called with Write or Read/Write. True - if a file is opened for writing that does not exist, a new file is created.

   GlobalKillEnabled: True

   > **Note**: True – a KILL of an unsubscripted global is allowed, so you can kill all subscripts of a global with a single kill instead of killing them individually.

OpenMode: 1

Note:	1 – for Read/Write

SetZEOF: True

Note:	True – Cache sets the special variables $ZEOF to indicate that you have reached the end of the file.

3. Log into the Management Portal and go to the **Advance Memory Settings**:

   System Administration >> **Configuration** >> **Additional Settings** >> **Compatibility**

Setting	Value		
AsyncDisconnectErr	false	Edit	Help
AsynchError	true	Edit	Help
BreakMode	true	Edit	Help
CollectResourceStats	false	Edit	Help
DisconnectErr	false	Edit	Help
FileMode	true	Edit	Help
GlobalKillEnabled	true	Edit	Help
IEEEError	true	Edit	Help
LineRecall	true	Edit	Help
LogRollback	false	Edit	Help
MVDefined	false	Edit	Help
NodeNameInPid	false	Edit	Help
NullSubscripts	false	Edit	Help
OldZU5	false	Edit	Help
OpenMode	0	Edit	Help
PopError	false	Edit	Help
RefInKind	false	Edit	Help
ScientificNotation	true	Edit	Help
SetZEOF	false	Edit	Help
ShutDownLogErrors	false	Edit	Help
StopID	false	Edit	Help
SwitchOSdir	false	Edit	Help
SynchCommit	false	Edit	Help
TelnetNUL	false	Edit	Help
TruncateOverflow	false	Edit	Help
Undefined	0	Edit	Help
UseNagleAlgorithm	false	Edit	Help
ViewPastData	false	Edit	Help
ZDateNull	false	Edit	Help
ZaMode	false	Edit	Help

Figure 4: Compatibility values

TaskMan Site Parameter

1. From the Programmer Mode enter the following:

```
DEHR>D P^DI
Select OPTION: ENTER OR EDIT FILE ENTRIES
INPUT TO WHAT FILE:  TASKMAN SITE PARAMETERS
EDIT WHICH FIELD: ALL//  <<accept the default
Select TASKMAN SITE PARAMETERS BOX-VOLUME PAIR:  <<enter ? to see entry
Enter the set PAIR
```

2. Update the following fields:

> **Note**: Working with Veterans Affairs (VA), the following recommendations below were made: new configurations compliment Ensemble. The previous settings were from the Micronetics MSM settings.

```
 Select TASKMAN SITE PARAMETERS BOX-VOLUME PAIR:   XXXX:ENSEMBLE
BOX-VOLUME PAIR:   XXXX:ENSEMBLE
LOG TASKS?:   NO
DEFAULT TASK PRIORITY:  7// @  <<Delete
TASK PARTITION SIZE:  175// @  <<Delete
SUBMANAGER RETENTION TIME:  20    (in seconds)
TASKMAN JOB LIMIT:  1495
TASKMAN HANG BETWEEN NEW JOBS:  0
MODE OF TASKMAN:  GENERAL PROCESSOR
OUT OF SERVICE:  NO
MIN SUBMANAGER CNT: 10
Auto Delete Tasks:  Yes
Manager Startup Delay:  10
```

TaskMan Task Schedule

1. Run the following to capture **Task** fields.

```
DEHR>D P^DI
SELECT OPTION: PRINT FILE ENTRIES
OUTPUT FROM WHAT FILE: OPTION SCHEDULING
SORT BY: NUMBER//
START WITH NAME: FIRST//
WITHIN NAME, SORT BY:
FIRST PRINT FIELD:  .01  NAME
THEN PRINT FIELD:  2     QUEUED TO RUN AT WHAT TIME
THEN PRINT FIELD:  3     DEVICE FOR QUEUED JOB OUTPUT
THEN PRINT FIELD:  5     QUEUED TO RUN ON VOLUME SET
THEN PRINT FIELD:  6     RESCHEDULING FREQUENCY
THEN PRINT FIELD:  9     SPECIAL QUEUEING
THEN PRINT FIELD:
HEADING (S/C): OPTION SCHEDULING LIST REPLACE
STORE PRINT LOGIC IN TEMPLATE:
DEVICE:  0;200;1000
```

2. Limit using "Startup Persistent" and "Persistent" in Special Queueing. These will slow down the system by utilizing CPU resources.
3. The recommended OIT Schedule can be found in the *TaskMan System and Application Tasks* document:

ftp://ftp.ihs.gov/pubs/rpms-training/RPMS Administrator Bootcamp/Taskman-application-system-parameter-settings-508-v2.pdf.

Stagger the tasks so that they do not overlap.

TaskMan Monitor

1. Check for IO Device listings. If there are devices listed, resolve it.

```
Checking Taskman.      Current $H=64853, 39622          (Jul 24,  2018@11:00:22)
                        RUN NODE =64853, 39615          (Jul 24,  2018@11:00:15)

Taskman is current..
Checking the Status List:
   Node          weight  status      time          $J
DEHR: TRAINING           RUN      T@11:00:15     4460          Main Loop

Checking the Schedule List:
     Taskman has 16 tasks scheduled.
     None of them are overdue.

Checking the IO Lists: Last TM scan:  1 sec,
     There are no tasks waiting for devices.

Checking the Job List:
     There are no tasking waiting for partitions.

Checking the Task List:
     There are 2 tasks currently running.
Checking Sub-Managers:
     On node DEHR:TRAINING there are 10 free Sub-Manager(s).  Status:  Run

Enter Monitor action: UPDATE//
```

Kernel System Parameter

1. From the Programmer Mode enter the following:

```
DEHR>D P^DI
Select OPTION: ENTER OR EDIT FILE ENTRIES
INPUT TO WHAT FILE: TASKMAN SITE PARAMETERS// KERNEL SYSTEM PARAMETERS
EDIT WHICH FIELD: ALL//
   Select KERNEL SYSTEM PARAMETERS DOMAIN NAME:  `1
```

2. Update or confirm MAX SIGNON ALLOWED.

```
MAX SIGNON ALLOWED: 1500
```

3. In the event the system meets the TASKMAN JOB LIMIT in TaskMan Site Parameter, this will allow five users to get onto the system to troubleshoot. This is based on the Intersystem license.

Error Trap

Check error traps and the dash board for high processes.

Review Software Installed on the Server.

1. Dragon Speak, Anti-Virus/Security Suites, monitoring software, etc.
2. Security scans can cause the listeners to shut down. Schedule them after peak hours.
3. Schedule MS Updates after peak hours. Manually reboot the server.
   a. Stop TaskMan.
   b. Stop Ensemble.
   c. Reboot the server.

RPMS Server Recommendation

1. Industry server Life Cycle is five years.
2. Separating the EHR Repository and IIS server is recommended.
3. If Optimizing RPMS does not resolve the slowness issues, replacing the server may resolve it.

   The recommendations below are for the RPMS server, excluding EHR and IIS servers. If EHR and IIS servers are on the RPMS server, double/triple the amount of RAM.

   Windows 2008 R2

   - Minimum 80 GB RAM
   - 2 x 1 TB HDD/SSD (over a five-year period)
   - All Microsoft Updates
   - Ensemble 2012.2.5.962.0.13037 (Windows 64-bit version)
   - 2 Hot spares (disk drive)

   AIX 7.1

   - Minimum 80 GB RAM
   - 2 x 1 TB disk space (over a five-year period)
   - Ensemble 2012.2.5.962.0.13037 (AIX 64-bit version)
   - Hot spares (disk drive)

   Windows 2008 R2 (VM Environment)

   - Minimum 80 GB RAM
   - 2 x 1 TB HDD /SSD
   - All Microsoft Updates
   - Ensemble 2012.2.5.962.0.13037 (Windows 64-bit version)

AIX 7.1 (VM Environment)

- Minimum 80 GB RAM
- 2 x 1 TB disk space
- Ensemble 2012.2.5.962.0.13037 (AIX 64-bit version)

4. The disk performance input/output operations per second and response time are the common performance measures for storage devices. Block size amount of data transferred during a single IO operation. Disk latency, the delay between a request for data and the return of the data, is critical to the performance of the system. With this said, RPMS and all the systems attached are retrieving data from the database(s) simultaneously; this takes an abundance of resources on the back end.
5. RPMS Environment diagram:

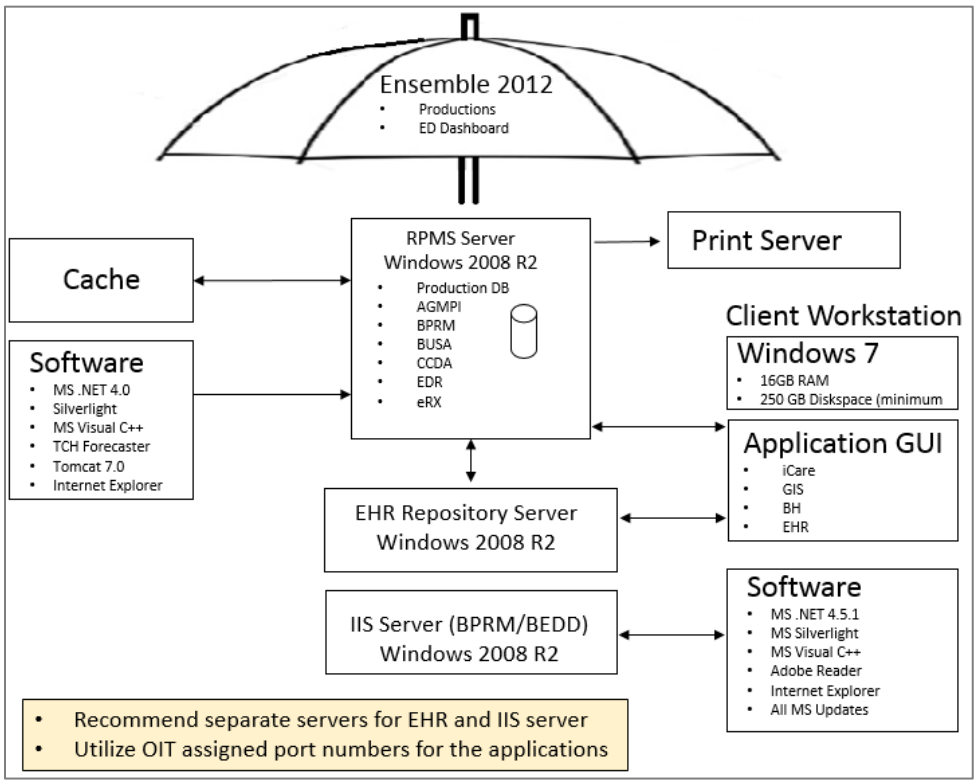

Figure 5: RPMS Environment diagram

Contact Information

If you have any questions or comments regarding this distribution, please contact the OIT Help Desk (IHS).

Phone: (888) 830-7280 (toll free)

Web: http://www.ihs.gov/helpdesk/

Email: support@ihs.gov