



MEMORY ALLOCATION ON CATIA V5



3DEXPERIENCE

Version 1.0 – 3/1/2014

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Executive Summary

The administration of CAD/CAM systems is an important part of the overall ability to keep your workstations effective in delivering high performance. This paper covers some information dealing with the performance of CATIA V5, with specific interests in memory management when working with large data files.

This paper is intended for users who want to understand what affects CATIA V5 performance and what can be done to improve it. Having CATIA run with the highest performance available allows the end user to be most efficient. This paper provides information used to resolve memory allocation problems when working with large data files.

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1. Part 1 - General Information

1.1. Classification of Main Memory issues

Users while working with big data often face memory problems. This can be due to low system configuration, Operating System or wrong application settings. One can broadly classify memory issues into the following types:

1.2. Random Access Memory

Random Access Memory (usually known by its acronym, RAM) is a form of computer data storage. Today it takes the form of integrated circuits that allow the stored data to be accessed in any order (i.e., at random). The word random refers to the fact that any piece of data can be returned in a constant time, regardless of its physical location and whether or not it is related to the previous piece of data.

RAM is also called as Physical Memory or Main Memory. The more there is RAM, the more is the memory available. Hence a machine with 1 GB RAM has less physical memory than a machine with 2 GB RAM. However, increasing RAM would come at some cost.

1.3. Virtual Memory

Virtual memory is actually the sum of RAM memory and the Virtual Space defined on Hard Disk.

Physical memory is a finite resource on a computer system. Only a certain number of processes can run with predefined physical memory at a time, though many more processes may actually be ready to run or execute.

Swapping is a useful technique that enables a computer to execute programs and manipulate data files larger than main memory (RAM). The operating system copies as much data as possible into main memory, and leaves the rest on the disk. When the operating system needs data from the disk, it exchanges a portion of data (called a page or segment) in main memory with a portion of data on the disk.

Swapping is often called paging or Virtual memory.

1.4. Disk

This is the Hard Disk capacity of the machines. If the hard disk is fragmented into number of drives then each drive capacity would in turn restricts the data size to be stored into it.

1.5. Application

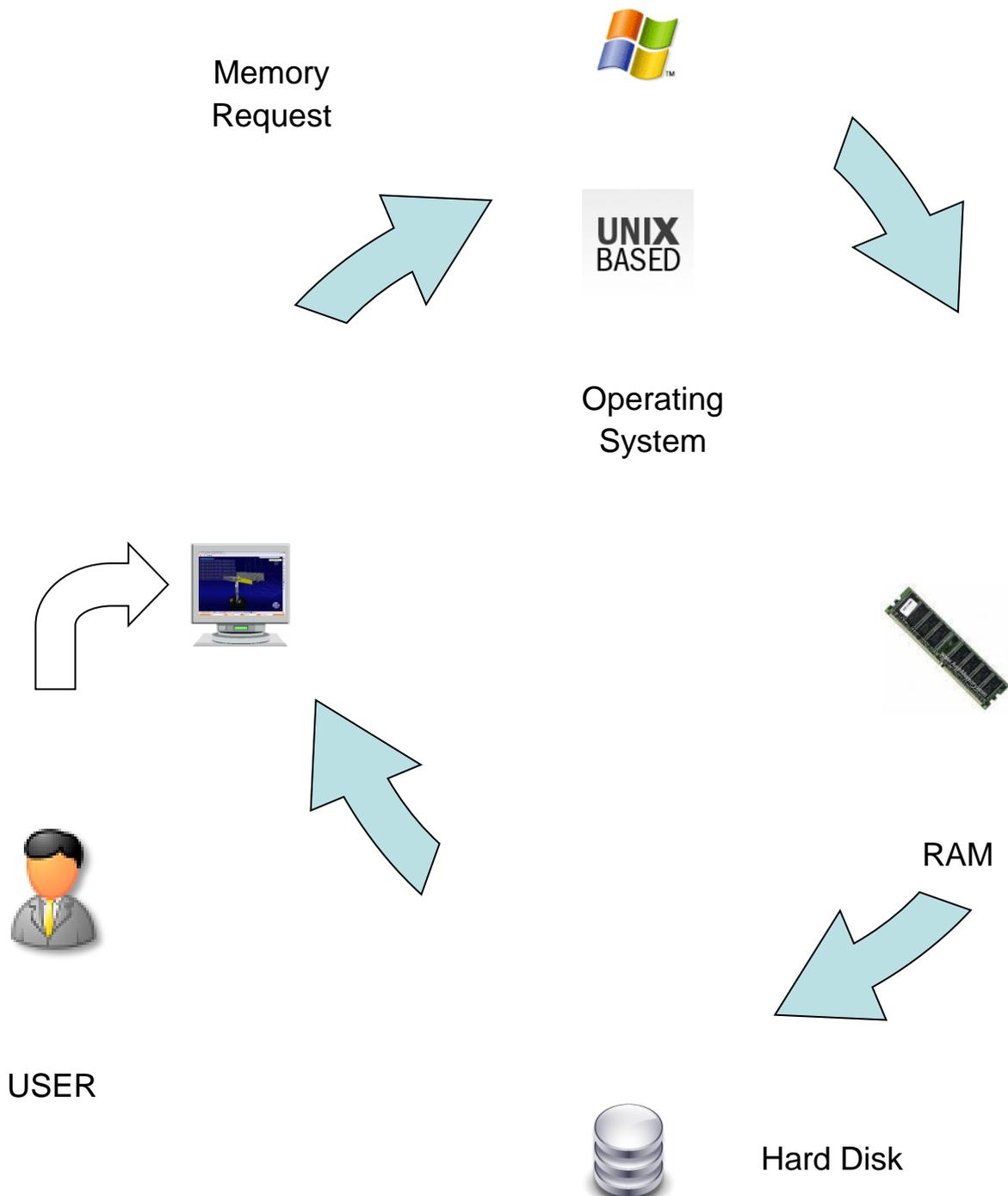
RAM, Memory Swap or Disk space depend on either hardware or Operating system. Modifying the system hardware is one way to overcome the memory problem. Another way is from the application itself. Any application or process requires memory. This memory demand could be controlled by application settings.

2. System Memory

Whenever application is started, the application demands memory to the Operating System. So if CATIA is started, CATIA internally calculates the minimum amount of memory required to run the application (Say X MB) and requests the same to OS.

OS now approaches the RAM and checks of the available free memory and its location. Once the required amount of memory is made available to CATIA, CATIA application is launched and can be worked on. By doing so X MB of memory of RAM is now blocked by CATIA.

Following figure will be helpful to understand the memory allocation process



2.1. Memory allocation for CATIA V5

Every Operating System allocates specific amount memory for any process. The amount of this default memory depends on Operating System and can be different following the Operating System. Following table shows memory locatable to CATIA V5 CNEXT process as per different Operating Systems and addition memory that can be allocated by customization

Operating System		Default Memory Allocated for any process	Additional Memory allocation to CATIA V5	Total Memory allocation to CATIA V5
32bit Application on 32bit OS	Microsoft Windows XP	2 GB	1 GB	3 GB
	IBM AIX	1 GB	1 GB	2 GB
	Hewlett-Packard HP-UX	1.9 GB	1.1 GB	3 GB
	SUN SOLARIS	4 GB	None	4 GB
	SGI IRIX (Supported only till V5R17)	2 GB	None	2 GB
32 bit Application on 64bit OS	Microsoft Windows XP	2 GB	2 GB	4 GB
	IBM AIX	1 GB	1.25 GB	2.25 GB
	Hewlett-Packard HP-UX	NA	NA	NA
	SUN SOLARIS	NA	NA	NA
	SGI IRIX	NA	NA	NA
64 bit Application on 64bit OS	Microsoft Windows XP	8 TB*	None	8 TB*
	IBM AIX (RS6000)	16 TB*	None	16 TB*
	Hewlett-Packard HP-UX	NA	NA	NA
	SUN SOLARIS	NA	NA	NA
	SGI IRIX	NA	NA	NA

NA: Not Applicable – CATIA is not available on these OS platforms

* - There are theoretical limits. On 64 bit, the memory limit is equal to sum of RAM + swap space.

In order to allocate additional Memory, extra tunings are required in the following areas:

- From an operating system standpoint
- From a Version 5 standpoint
- Additional Operating System considerations

Refer to Program Directory path -

Installation – OS Consideration – CATIA section for additional tuning

2.2. Memory Allocation by RAM

Random Access Memory (RAM) depends on the machine configuration and can be increased by hardware modification. Memory request from RAM can further be classified as follows

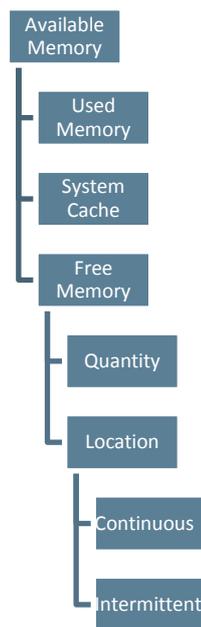


Figure 4

The physical RAM available to a process is called its working set. The System Cache is the working set of the file system. This cache is a reserved area in physical memory (RAM) where the file system stores its recently used and frequently used data. By default, the system reserves about 50 percent of physical memory for the File System Cache, but the system trims the cache if it is running out of memory.

The Free Memory is the amount of RAM memory that can be allocated for processes. As seen in figure 4 the availability of memory could be continuous or intermittent. When there are many applications or processes running, every process uses part of the RAM memory. The memory size requirement is different for different applications or processes at a particular time.

Let us assume there are 5 processes running at a particular time and they use Memory 1 to 5 respectively. The last block is of “Free Memory Available”.

Memory 1	Memory 2	Memory 3	Memory 4	Memory 5	Free Memory Available 1
-------------	-------------	-------------	-------------	-------------	----------------------------

Figure 5

When Process 2 using Memory 2 is closed, then Memory 2 becomes free and available for use by any application which demands more memory. Hence total available free memory is now:

Total available free memory = Free Memory Available 1 + Memory 2.

Let us assume that CATIA process is the 4th process running and uses Memory 4.

User running CATIA now loads big data or switches the Assembly from Visualization mode to Design mode. This additional memory requirement request is sent to OS and checks with RAM for Free memory available.

As shown in figure 4, amount of free memory is found along with its location. Now the OS finds there are 2 locations where the free memory is available viz Free Memory Available1 and Memory 2 (Refer figure 5) Here, there are 3 possibilities to using the free memory:

- a. Memory 2
- b. Free Memory Available 1
- c. Memory 2 + Free Memory Available 1

The selection of free memory depends on the OS memory allocation management.

This explains why there can be difference in performance for different OS.

For example, if the size of Memory 2 block is 100MB and the memory requirement is of 80MB, then some OS will:

1. use 80MB of Memory 2 block and keep the remaining 20MB free for other programs or;
2. use all 100MB of Memory 2 thereby blocking 20MB unnecessarily (this is the case with UNIX workstations).

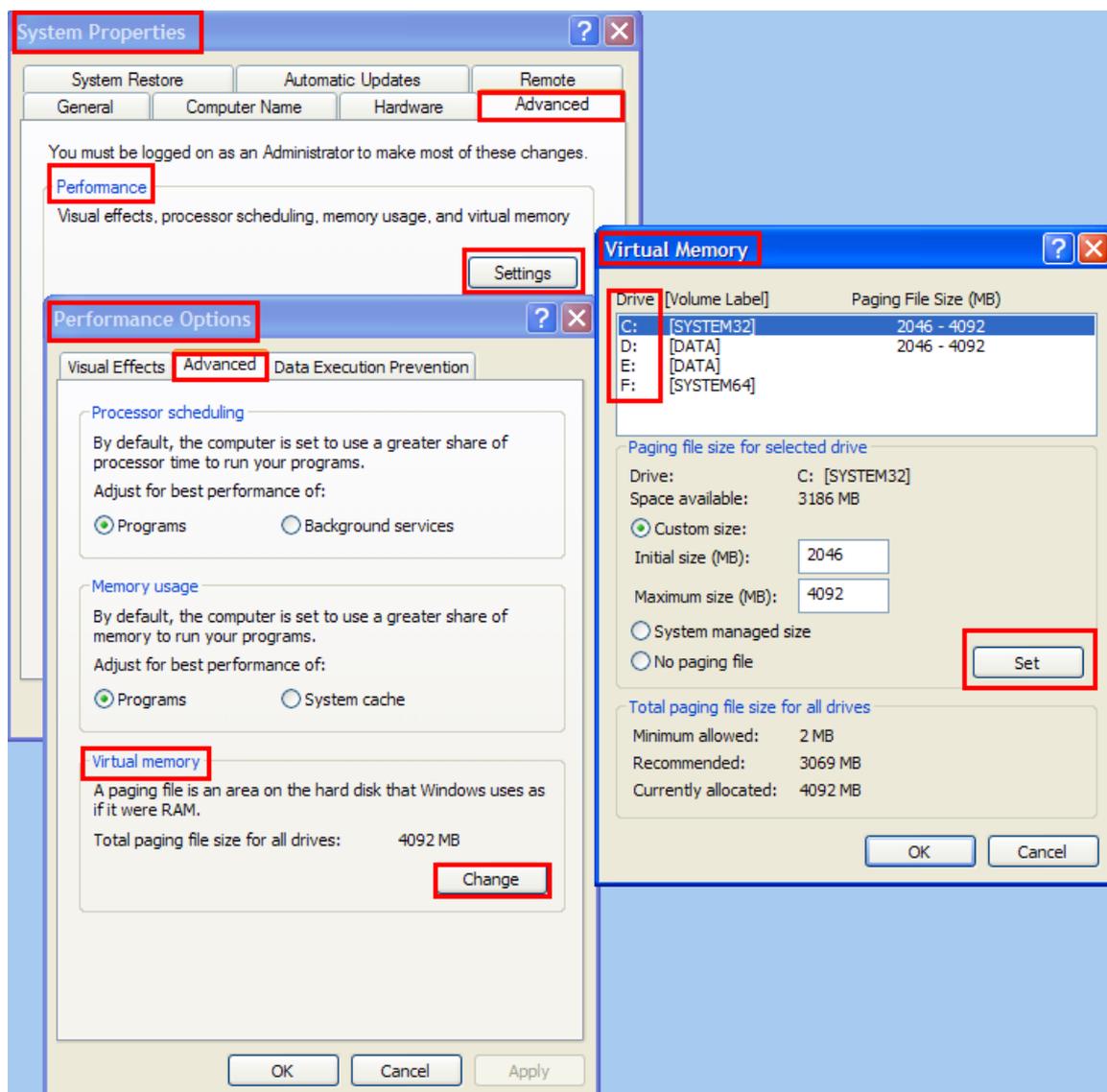
2.3. Memory Allocation by Virtual Memory

If the needs of a process exceed the amount of available RAM, that is, if the process is not able to store all of its code and frequently-used data in physical memory, some of the information must be stored elsewhere, usually on disk (as virtual memory). This causes an increase in the amount of disk activity, which slows down the server.

Virtual memory makes it easy for several processes to share memory. All memory access is made via page tables and each process has its own separate page table. User can set the amount of virtual memory.

Let us take an example of **WINDOWS** -

Virtual memory can be set by **System properties** option as shown below



Similarly, virtual memory can be set on other OS like **AIX**, **HP-UX** and so on with commands like **ulimit**

NOTE: It is recommended that the size of virtual memory is equal to or greater than the physical memory RAM. It will ensure that when there is a CRASH all the data from RAM can be moved to virtual memory and there is no data loss.

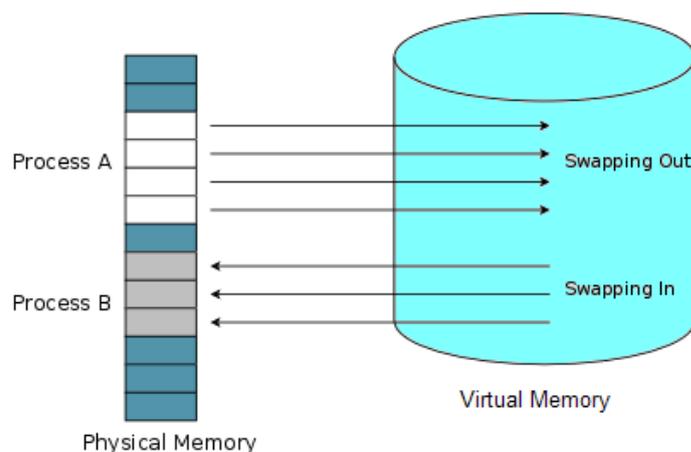
2.4. Memory Allocation methods (Paging/swapping)

2.4.1. Swapping

Swapping is when a process is completely put out of Physical memory to Swap Space when memory is required for some other process.

If a process needs to bring a virtual page into physical memory and there are no free physical pages available, the operating system must make room for this page by discarding another page from physical memory.

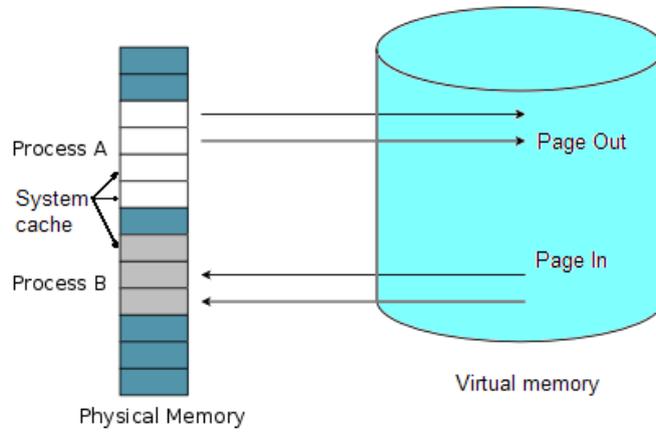
If the page to be discarded from physical memory came from an image or data file and has not been written too, then the page does not need to be saved. Instead, it can be discarded and if the process needs that page again it can be brought back into memory from the image or data file.



2.4.2. Paging

Paging is when only a part of this process is put out of the physical memory to the secondary storage, with some part of the process still in physical memory. Since it is only the pages being swapped in and out this operation is called paging.

Most virtual memory systems enable programs to use virtual address ranges which in total exceed the amount of real memory (RAM). To do this they use disk files to save virtual memory pages which are not currently active, and restore them to real memory when they are needed.



3. Memory Monitoring Tools and Commands

Operating System	Memory monitoring Tools/Commands	Description
Window	Task Manager	Provides information about performance and running applications, processes and CPU usage, commit charge and memory
	Perfmon	Provide logs with respect to time for processes, memory usage, page faults, CPU
AIX	filemon	Performance statistics for files, logical/physical volumes and virtual memory segments
	lsps	Statistics about paging space
	pagesize	Displays system page size
	ps	Display status of current processes
	iostat	Statistics for ttys, disks and cpu
	svmon	Captures a snapshot of the current contents of both real and virtual memory
	tprof	Detailed profile of CPU usage by an application
	vmstat	Statistics about virtual memory and cpu/hard disk usage
	sar	System Activity Recorder
	netpmon	Performance statistics for CPU usage, network device-driver I/O, socket calls, and NFS
	df -k	Disk usage
	swap -l	Shows the swap space on disk
	swap -s	Shows the combination of non-reserved physical memory and swap space on disk
	nmon	Provides views of a system's activity and resource consumption
HP-UX	top	Provides views of a system's activity and resource consumption
	vmstat	Statistics about virtual memory and cpu/hard disk usage
	df -k	Disk usage

SUN Solaris	vmstat	Statistics about virtual memory and cpu/hard disk usage
	iostat	Statistics for ttys, disks and cpu
	df -k	Disk usage
	swap -l	Shows the swap space on disk
	swap -s	Shows the combination of non-reserved physical memory and swap space on disk
	prstat	Provides views of a system's activity and resource consumption
SGI IRIX	osview	Statistics about virtual memory and cpu/hard disk usage
	df -k	Disk usage
	swap -l	Shows the swap space on disk
	swap -s	Shows the combination of non-reserved physical memory and swap space on disk

Reference Knowledge Article

QA00000000038 – “nmon” Tool for AIX performance management

4. Parameters to monitor

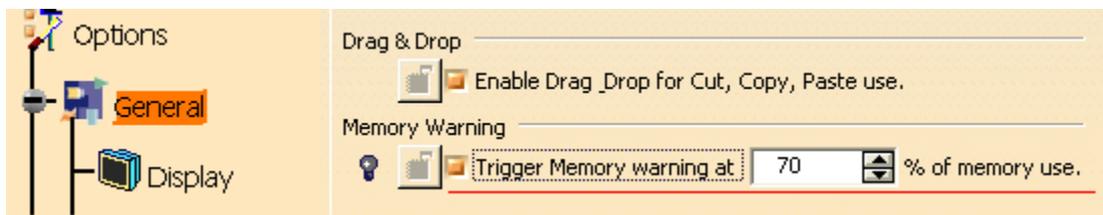
Operating system	Parameters	Description
Windows XP	Available Memory	RAM memory available
	Virtual Memory	Virtual Memory size
	System Cache	RAM memory used as cache
	Memory\ Cache Faults/sec	How often data sought in the File System Cache is not found
	Page Faults	How often system needs to retrieve files from somewhere other than system cache
	CPU	CPU usage for system or process
	PPID	Process ID
AIX/HP-UX/SUN/SGI	Real Memory	Status of used and free real memory
	Virtual Memory	Status of virtual memory
	CPU	CPU load information
	Page	Size, location and activity status
	Faults	How often the system needs to do extra work to retrieve files from somewhere other than the real memory

5. Part 2 - Memory Allocation Diagnosis

Many users come across various problems while working with applications. Sometimes, it is hard to find the exact reason of these problems. When a system is running on low or insufficient memory, some warnings are issued or symptoms can be found. Below, are some Memory Allocation Warnings/Symptoms:

5.1. Physical Memory limit reached

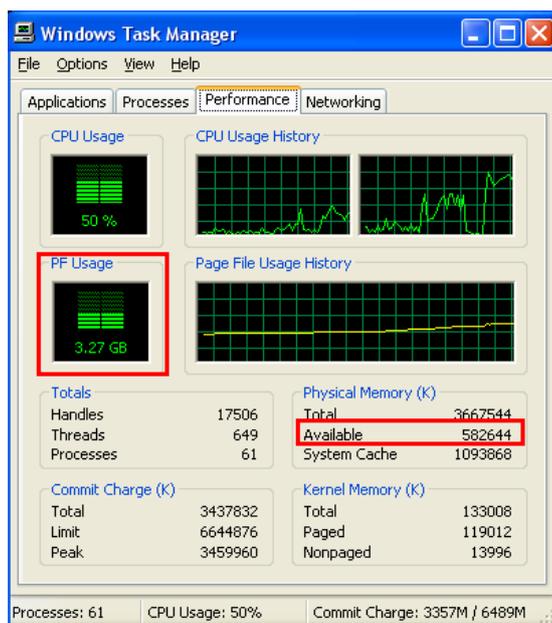
Memory Warning: Warning message appears as per the trigger set by user in CATIA user settings (Tools – Options – General – Memory Warning)



This popup warns that because the amount of remaining memory is becoming low, user should save your data and exit the session:



CATIA session seems to be frozen and user cannot use any command in CATIA. Monitoring the system process (on windows) shows less Available Physical Memory and High System Cache



Monitoring the VMSize of processes in Task Manager gives information about Virtual Memory used by the process. In the below picture it can be seen that the CNEXT process (of CATIA) has the highest VMSize which is around 1.2GB. A High VMSize for a process indicates a memory issue.

The screenshot shows the Windows Task Manager Processes tab. A table lists several processes with their Mem Usage, Page Faults, and VM Size. The VM Size for CNEXT.exe is highlighted with a red box.

Image Name	Mem Usage	Page Faults	VM Size
CNEXT.exe	968,780 K	479,501	1,221,252 K
OUTLOOK.EXE	56,692 K	1,232,461	192,268 K
iexplore.exe	1,380 K	328,604	74,800 K
firefox.exe	51,968 K	771,312	70,332 K
DSXTools.exe	57,732 K	339,650	63,572 K
communicator.exe	14,096 K	514,726	49,432 K
WINWORD.EXE	7,760 K	127,197	45,540 K
java.exe	12,732 K	75,416	39,548 K
iexplore.exe	2,644 K	94,518	36,984 K
sqlservr.exe	49,192 K	30,338	36,948 K

NOTE: VM Size is only available on Windows XP 32/64 bits. Regarding Vista refer to QA00000002869 - How to know/measure the size of CNEXT process on Windows?

Abend trace (generated in the CATTemp directory) file contains some information related to the memory usage, such as “malloc failed...”. In the Stack Trace of Abend trace the memory percentage more than 70-80% also indicates memory exhaustion problem. Refer the image below:

```

[MEMORY INFO]
Size of process   : 1816,79 Mo( 1905045504 )
Physical memory  : 4095,11 Mo( 4294037504 )
Avail physical mem : 213,97 Mo( 224366592 )
Paging disks     : 8000 Mo( 4093640704 )
Total page space  : 4096,00 Mo( 4294967295 )
Avail page space  : 4096,00 Mo( 4294967295 )
Avail address Space: 2279,08 Mo( 2389790720 )
Memory allocatable : 2279,0820 Mo( 2389790720 )
Memory load      : 94 %
Stack size       : 1,00 Mo( 1048576 )
Stack used       : 0,05 Mo( 49152 )
Security Block   = OFF
Number of failed allocs = 2

[ERROR]

first_error
Error message    = Memory access violation
Error class      = CATSystemError

```

Sometimes CATIA crashes without any Abend trace. In this case CATIA session info file (generated in the CATTemp directory) analysis shows the memory usage.

```

!-----!
! CATIA SESSION INFORMATIONS FILE !
!-----!

[IDENTIFICATION]
V5 level           = V5R18SP2HF17
Build-No          = 03-12-2008.15.04
User name         = bgj
Host name         = BGJ32PLP
Operating system  = Windows_NT
OS version        = 5.1
Date session      = 2008/07/15 10:12:42
Date current      = 2008/07/15 10:12:42
Duration          = 0:0:0
Recovery          = ON

[Operating System Level]
Level             = Microsoft Windows NT 5.1 (Build 2600) Service Pack 2

[Processors]
Cpu model        = Intel x86 Family Model 6 Stepping 2

[INITIAL MEMORY INFO]
Size of process   : 50.93 Mo( 53407744 )
Physical memory   : 2046.09 Mo( 2145476608 )
Avail physical mem : 549.13 Mo( 575799296 )
Paging disks     : 8184 Mo( 4286578688 )
Total page space  : 4096.00 Mo( 4294967295 )
Avail page space  : 4096.00 Mo( 4294967295 )
Avail address Space: 1996.94 Mo( 2093944832 )
Memory allocatable : 1996.9414 Mo( 2093944832 )
Memory load      : 73 %
Stack size       : 1.00 Mo( 1048576 )
Stack used       : 0.02 Mo( 24576 )

```

In Windows, Memory\ Page Faults and Memory\ Page Reads counters help to relate the fault rate of the cache to the fault rate in the system as a whole. The ratio of Memory\ Cache Faults to Memory\ Page Faults indicates the proportion of faults occurring in the cache, as opposed to the working sets of processes. A high rate of cache faults can indicate a memory shortage

Monitoring the memory usage log created by memory monitoring tools. Refer to memory monitoring tools section for more information

5.2. Swap Activity

User needs to use memory monitoring tools to check the swap/paging activity status. Whenever the size of physical memory is less to carry the workload, system moves part of or complete process data to virtual memory. This activity can be monitored by Cache faults or Page faults.

A **hit** is recorded when requested files are found in the cache (physical memory). A **miss** or **fault** is recorded when requested files are not found. Misses and faults indicate how often the system needs to do extra work to retrieve files from somewhere else than the cache (physical memory).

1. A high rate of Page fault indicates inefficient use of memory allocation. If the system is not able to lower the page fault rate to an acceptable level, then system is having less memory and it is time to add more memory.
2. On UNIX user can use `df -k`, `swap -l` and `swap -s` commands to know the swap size and the swap percentage used.

```
# swap -l
swapfile      dev  swaplo blocks  free
/dev/dsk/clt0d0s1  32,73    16 16800560 16800560
# swap -s
total: 70280k bytes allocated + 5944k reserved = 76224k used, 11825232k available
```

```
# df -k
Filesystem      kbytes  used  avail capacity  Mounted on
/dev/dsk/clt0d0s0 20675881 19631200 837923 96% /
/devices        0         0         0 0% /devices
ctfs            0         0         0 0% /system/contract
proc           0         0         0 0% /proc
mnttab         0         0         0 0% /etc/mnttab
swap          11824184   1024 11823160 1% /etc/svc/volatile
objfs         0         0         0 0% /system/object
fd            0         0         0 0% /dev/fd
swap          11823472    312 11823160 1% /tmp
swap          11823208    48 11823160 1% /var/run
/dev/dsk/clt1d0s3 41311843 37146976 3751749 91% /DS
```

By using system monitoring tools like perfmon on windows or nmon on AIX user can find Elapsed time Vs CPU time.

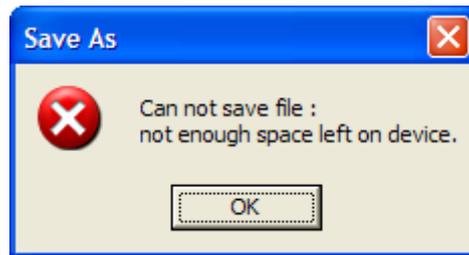
CPU time is the time for which the CPU was busy executing the task. It does not take into account the time spent in waiting for I/O (disk IO or network IO). Since I/O operations, such as reading files from disk, are performed by the OS, these operations may involve noticeable amount of time in waiting for I/O subsystems to complete their operations. This waiting time will be included in the elapsed time, but not the CPU time. Hence, CPU time is usually less than the elapsed time. Large difference between elapsed time and CPU time, with

less/constant IO activity means swapping leading to performance degradation and memory swap.

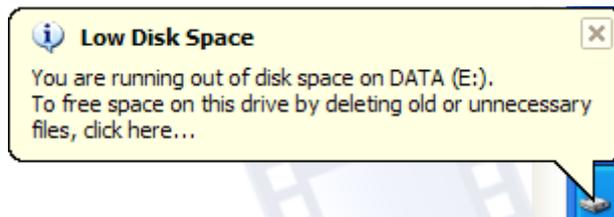
5.3. Disk limit reached

On Windows, user can come across the following warnings:

While saving data user gets a warning message concerning the saving of data to disk.



Operating system gives a warning message concerning Low Disk Space.



If user is having disk monitoring tools like **corn**, **CacheBoost** then by administrating the log/report generated, the user can control the free disk space requirement.

6. Part 3. Best practices

6.1. Memory limit reached

1.1 Check if the hardware and software configuration used are certified by Dassault Systemes.

Using a certified workstation is one way to make sure that the application works correctly. Dassault Systemes tests different hardware for their products. Depending on these test results, Dassault Systemes maintains a Hardware and a Software Certification list that is certified as being capable of running CATIA V5. Using hardware from this certification list will result in the best and optimized performance.

Each workstation on the certification list specifies the workstation's model, its processor and clock speed, graphics adapter with driver level, and certification date. This list also has information on derived configurations which are supported.

<http://www.3ds.com/support/workstations-peripherals/>

<http://www.3ds.com/implementation/technology/windows/certified-workstations-list/>

1.2 If user faces any performance or CPU loop issues, check the size of memory that can be allocated for each process. This depends on the operating system. If the process is running with default system settings of memory allocation then:

- Increase the memory allocation for process by System and CATIA V5 tuning. Refer to program directory for additional memory setting to a CNEXT process.
- Make use of virtual memory, this will share the load of the physical memory. It is recommended that the size of virtual memory is equal to or greater than the physical memory size.
- Check the number of processes running and their memory usage. Unnecessary processes running can be closed.
- Processes consuming more memory and running for long time gather residual memory (cache memory) which may not be necessary. It is recommended to close such application and restart.
- Increase the RAM size. For example use 3 GB RAM instead of 2 GB.

6.2. Swap

2.1 A high rate of page faults indicates a memory shortage.

2.2 By default the page size is 4KB. However, the user can increase the size of the page up to 16MB. This will provide more memory for the process information paged in.

2.3 If the available swap memory is low, then user can increase the virtual memory to provide more swap space.

2.4 Even after increasing the page size and swap space, the available swap memory is still low; then it means that the system memory limit is reached. In this case user can move from 32 bit OS to 64 bit OS.

6.3. Disk full

3.1 Check the disk size in explorer and remove the unnecessary data from the disk to create more free space on disk.

3.2 Make use of all the system storage disks/volumes.

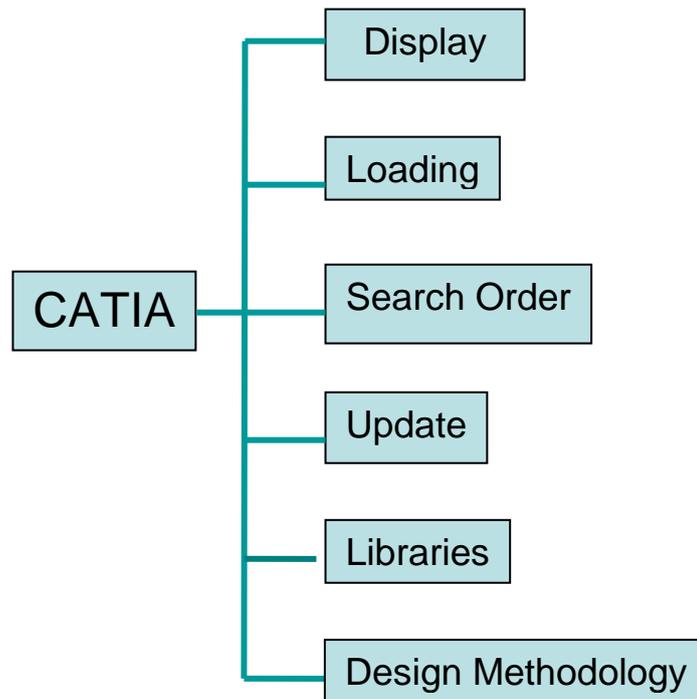
3.3 Add some more storage disk.

3.4 Use disk monitoring tools to ensure that sufficient disk space is available.

3.5. Disk defragmentation should be done, it can increase the disk free space.

6.4. General CATIA practices for less Memory

It is the application which requests for memory to the system. Hence users should use CATIA in most efficient way so that the memory demand for CATIA is optimized. Following picture gives a broad idea about CATIA memory requirement parameters.



6.4.1. Display

With the power of 3D visualization, it is easy to view and share design. 3D Visualization would involve many parameters. One would like to visualize objects in 3D rendered format. While other might like to see the same in wireframe. One would like to visualize objects with best quality while other might compromise with the quality but would like to see the whole content.

Thus, displaying an object would involve different options like Quality, Precision, Selection, Pre-selection, Rendered, Not-Rendered etc... Each of these parameters will consume Memory in turn and ask CATIA to demand excess Memory from OS.

In order to meet these requirements CATIA provides different displays. Hence it is very necessary to modify the settings in order to reduce the CATIA Memory demand.

6.4.2. Loading

With identical CATSettings, opening small data will require less memory than opening large data. Sometimes, a data user might be interested only in small part of large design, whereas other user might need to view whole design.

In order to meet such user requirements, CATIA provides different data loading settings. To open big data user, should use CACHE mode where data is loaded in visualization mode and not in design mode and thus reduce the demand for memory. To keep the data at predefined location CATIA provided DLNAME option. One should use these settings effectively so as to reduce the CATIA Memory demand.

6.4.3. Search order

In some industries, the data might be located locally or on server. Data might be located at one central location or split into many different locations. One data might be linked to many other data at different locations.

In order to meet such user requirements, CATIA provides different search order settings for linked documents and their locations. It makes sense to load only those data which are needed to reduce the memory demand.

6.4.4. Update

Updating a small design will require less memory than a big design having too many features. Industrial designs are usually big and cannot be avoided. Many designs need modifications to be done from time to time. These modifications could be few or many. Updating all the designs would require more memory than a single feature. Hence updating 100 features will demand more memory than updating 5 features.

CATIA provides manual and automatic update options. User can control the update of number of features and thus reducing the CATIA Memory demand.

6.4.5. Libraries

CATIA has many workbenches, each specifically designed to a particular activity. Use of these workbenches need to load certain reference libraries. Loading these libraries will ask for more memory. Hence, it is necessary to load only necessary libraries.

CATIA provides settings for selecting and loading necessary libraries. Using these options would help in controlling the memory demand.

6.4.6. Design Methodology

Apart from CATIA settings, it is also important that good design methodology is adapted for designing. Use of Boolean operations, Copy Paste As Result With Link options, Creating small CATParts and using Assembly design to create final component, using Assembly design features like Assembly pocket, creating fillet on one edge at a time would improve the design and update process in turn helping to reduce the memory demand.

6.4.7. CATIA Design methods for Memory Benefits

- Always clean the data by CATUA before saving. Running CATDUA with FGM_1 rule will remove fat geometry thereby reducing the CATPart size. Also, other CATDUA rules will remove unnecessary links and geometries helping to reduce data size and solve link issues.
- Use CATDUA, Assembly upgrade for upgrading old data to new CATIA level.
- Users using large database should make sure that all the data are migrated to same CATIA level.
- It is advisable to use same CATIA level throughout the organization.
- Centralize data storage. User should keep the data referencing one project at single location. Use of DLNAME is recommended option forcing the users to save the data at same location.
- For using large assembly data, make use of CACHE mode. Partial loading of data will need less memory.
- While working with large data, load only necessary components and parts in design mode. Do not switch all the big assembly into design mode. Doing this would increase the memory demand.
- Creating small size data is always advisable. However, the industrial scenarios demand complex and big design. A user has to modify his design methodology for the same. Create simple geometries in a Body and then Boolean them to get the final design. Use of Boolean operation will eliminate generic naming dependency thus helping process update.
- Creation of dress up features should be carefully looked at. For example, user can select 3 edges to create a fillet or user can create 3 fillets with one edge each. If the geometry is simple like cube then selecting 3 edges at a time will not have much impact. However if the geometry is complex then complex algorithm will be called to find the solution. Complex algorithm may involve many relimitation, untwist mechanism, multi solutions or even fillet failure. Using fillets on simple geometry is advisable. Same is true for other dress up features.

- Make use of technological result functionality in part design for creating drafting of threads.
- Make use of Pattern features for repeating the geometry.
- For design requiring repetitive design of complex shape, user should take advantage of UDF. This will replace large numbers of features by single UDF.
- Users tend to create whole design in one single part. This increases data size and update time. Use of assembly design features like hole, pocket is recommended.
- Update of parts or assembly consumes memory. As CATIA tend to store intermediate update results in memory. Hence updating a big data will ask for more memory. It is advised to make use of Paste Special As Result With Link option to paste the final geometry into new CATPart. Use this CATPart for downstream applications like drafting, analysis or manufacturing. Copy pasting data into solid will require less memory and hence the data size will be small.
- Make use of skeleton design to reference all depending components or part. This will avoid design loops and hence synchronization problems.
- It is recommended to make use of publication to avoid unnecessary geometry links getting created.
- In Assembly, constraints should also be given to publications. Replacing components will work better in this situation.
- Make use of catalogs to standardize the designs so that all users work with a similar design for common parts and thereby promoting simple designs and methods.
- In case of sheet metal flange creation, create flanges on smaller edges and not on longer edges.
- Delete unwanted design feature from CATPart to reduce the data size.
- In manufacturing, make use of batch mode video reply or use for video reply from last saved result option.

7. Related Documentation

For additional information, refer to the following Q&As from our Knowledge Base:

KA QA00000001285 for CATIA Tools Options settings

KA QA00000002457 for reading session and Abend trace file

KA QA00000002869 to know/measure the size of CNEXT process on Windows

8. Document History

Document Revision	Date	Revised By	Changes/Notes
0.0	Jan 2009	A3R	Original
1.0	Mar 2014	A3R	Updated to new template

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