

Case Study 7

Master Processor Issue

Velocity Software solves performance problems.

- **As a valued customer, we want to pass this knowledge on to you.**
- **The following is a case study of a solved real-life performance issue.**
- **This case study will show:**
 - **The problem as reported by users**
 - **The problem observations**
 - **What was found in the Velocity Software data**
 - **What was suggested to the customer**
 - **If provided, follow up from the customer**

The Problem:

Users were experiencing slow response times.

Problem Observations:

- None (yet).

What the Data Showed (Utilization data)

ESAXACT – Logical Partition Analysis showed:

Report: **ESAXACT** Transaction Analysis Velocity Software, Inc.

<-----Percent non-dormant----->																		
UserID	<-Samples->																	
/Class	Total	In	Q Run	Sim	CPU	SIO	Pg	SVM	SVM	SVM	CF	Idl	I/O	Ldg	Oth	Lst	Pct	Elig
System:	5936	149	5.4	34	8.7	0	3	0	0	6.0	2	36	4.7	.	0	.	0	
Hi-Freq:	176K	7057	2.0	17	2.8	0	1	0	3.8	4.2	49	17	3.1	0	0	.	0	
***Resource use by User Class																		
*Servers	3720	568	3.0	29	4.2	0	0	0	21	6.9	1	28	7.6	0	0	.	0	
*Keys	1080	490	1.6	0.6	6.7	0	0	0	16	19	1	43	13	0	0	.	0	
*TheUsrs	172K	6108	1.9	16	2.6	0	1	0	1.2	3.0	57	14	2.5	0	0	.	0	

- Sim wait is high
- CPU wait is high

This is where the problem showed up. Sim wait always points to the Master processor.

What the Data Showed (Utilization data)

ESASUM – Subsystem Activity showed:

Report: ESASSUM Subsystem Activity Velocity Software, Inc.

```
-----
      <---Users---> Transactions <Processor> Storage (MB) <-Paging--> <-----I/O-----> <MiniDisk> Spool
      <-avg number->      Per  Avg. Utilization Fixed Active <pages/sec> <-DASD--> Other <-Cache--> Page
Time      On Actv In Q Minute  Resp Total Virt.  User Resid. XStore DASD Rate Resp  Rate  Rate %Hit Rate
-----
08:00:08 1479  244 34.3 1310.1 0.603  124    87  36.9 192.0   888  451  641 15.4   40 687.9 49.3   36
08:01:08 1500  248 46.0 1260.9 0.543  147   110  37.3 192.7   904  494  732 20.1   37 881.6 53.9   32
*****Summary*****
Average: 1483  245 37.3 1297.8 0.589  130    93  37.0 192.1   892  461  664 16.7   39 736.4 50.7   35
```

At first glance, there is no problem with CPU capacity. The system is running less than 50% busy (130 out of 300% average or 147 at its peak – there are 3 CPUs on this LPAR for 300%).

What the Data Showed (Configuration data)

ESAHDR – System Configuration showed:

```
Report: ESAHDR          z/VM Monitor Analysis    Velocity Software Corporate

System Sequence Code          0000000000040F78
Processor 0 model/serial      8562-A02 /040F78 Master
Processor 1 model/serial      8562-A02 /040F78
Processor 2 model/serial      8562-A02 /040F78
```

Looking at the configuration report, the Master processor is on CPU 0.

What the Data Showed (Utilization data)

ESACPUU – CPU Utilization Analysis:

Report: ESACPUU CPU Interval Analysis Velocity Software, Inc.

	<----Load---->				<-----CPU (percentages)----->					<---Internal (per second)--->					
	<-Users->			Tran		Total	Emul	User	Sys	Idle	Diag-	Inst.	SIE	Fast	Page
Time	Actv	In	Q	/sec	CPU	util	time	ovrhd	ovrhd	time	nose	sim.	intrcp	path	fault
08:00:08	244	34.3	24.6	0		48.5	27.3	16.7	4.5	9.9	1449	1478	1753	0	18
				1		35.9	28.8	5.2	1.9	11.8	818	599	716	0	9
				2		39.5	31.4	5.9	2.2	13.5	902	682	815	0	11
System:						124.0	87.4	27.9	8.7	35.3	3170	2758	3284	0	37
08:01:08	248	46.0	24.0	0		53.6	32.5	16.7	4.4	7.1	1557	1588	1806	0	24
				1		44.6	37.2	5.4	1.9	6.5	843	594	685	0	11
				2		48.8	40.2	6.4	2.2	7.4	903	704	817	0	12
System:						147.0	109.9	28.5	8.6	21.0	3303	2886	3308	0	48

- The Master processor (0) has higher utilization
- The other two processors are less busy
- Total utilization for all three processors doesn't look bad.

Looking at the data, it doesn't seem like there should be a CPU wait issue.

What the Data Showed (Configuration/Utilization data)

ESALPAR – Logical Partition Analysis showed:

Report: ESALPAR Logical Partition Analysis Velocity Software, Inc.

<-----Load-----> <--Complex--> <--Logical--> <-----Logical Processor----->															
<--Users-->		Tran	Phys	Dispatch	<--Partition-->	VCPU	<%Assigned>		Cap-	Wait					
				Slice	Name	No.	Addr	Total	Ovhd	Weight	ped	Comp			
08:02:08	244	34.3	24.6	3	Dynamic	CMS2	1	0	58.7	0.2	155	No	Yes		
								1	47.8	0.1	155	No	Yes		
								2	53.2	0.1	155	No	Yes		
					LPAR		159.7	0.4							
					SWCF	2	0	36.6	0.1	130	No	Yes			
							1	43.0	0.1	130	No	Yes			
							2	46.7	0.1	130	No	Yes			
					LPAR		126.3	0.3							
					CMS8	3	0	9.1	0.1	15	No	Yes			
							1	4.6	0.2	15	No	Yes			
LPAR		13.7					0.3								
							299.6								
Total Logical Partition busy:															
Total Physical Management time: 0.366															

CMS2 LPAR:

- It has 3 CPs
- The LPAR weight is 155
- Therefore, each of the vCPUs is only entitled to 50% of one real CPU.
- The Master vCPU is constrained at 58%
- The LPAR is using over its entitlement (159)
- The box is at capacity (299)

Performance Enhancement Suggestions:

- 1 – Lower the vCPU count for the CMS2 LPAR from 3 to 2.
 - Since both of the other vCPUs were not over 50% utilization (over time), one of them can be removed to give the Master processor more processing ability.
 - If the weight of the LPAR stays the same (155), with two vCPUs, each would have 77% (155/200) instead of 51% (155/300).

Performance Enhancement Suggestions:

2 – The box was at full capacity for all three LPARs (ESALPAR). Another physical CPU would be helpful (if possible).

- This would help with CPU wait, but not necessarily Sim wait.