

# Case Study 2

## Linux Servers Disconnecting From the Network

## **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:

Multiple Oracle servers were disconnecting from the network.

## Problem Observations:

- On several days around the same time, multiple Oracle servers were disconnecting from the network/VSWITCH
- There was an error message – The QETH device driver failed to recover an error on the device

# What the Data Showed (Configuration data)

## ESAUUSRC – User Configuration showed:

- Multiple Linux servers with two vCPUs that are not needed

```
Report: ESAUSRC      User Configuration      Ve:
Monitor initialized: 07/07/22 at 01:00:00 on 3906 serial 03FCD8  Fi:
Monitor period:      3600 seconds ( 1:00:00)      La:
```

---

UserID	ClassID	ACI Grp Name	<CP POOL> PoolName	CPU Type	<-----SHARE----->			<---CPU	
					<Normal> Rel	<--MAX--> Abs	Typ	Shre	Lim -it
.									
LaaaP	TheUsrs	.	.	IFL	40	.	.	.	1 1
LbbbT	TheUsrs	.	.	IFL	80	.	.	.	2 2
LcccT	TheUsrs	.	.	IFL	50	.	.	.	1 1
LdddT	TheUsrs	.	.	IFL	70	.	.	.	1 1
LeeeT	TheUsrs	.	.	IFL	30	.	.	.	1 1
LfffT	TheUsrs	.	.	IFL	25	.	.	.	1 1
LgggT	TheUsrs	.	.	IFL	50	.	.	.	1 1
LhhhT	TheUsrs	.	.	IFL	100	.	.	.	1 1
LjjjC	TheUsrs	.	.	CP	80	.	.	.	1 1
LkkkT	TheUsrs	.	.	IFL	10	.	.	.	1 1
LmmmP	TheUsrs	.	.	IFL	30	.	.	.	2 2
LnnnT	TheUsrs	.	.	IFL	20	.	.	.	1 1
LpppT	TheUsrs	.	.	IFL	30	.	.	.	1 1
LqqqT	TheUsrs	.	.	IFL	20	.	.	.	1 1
LrrrT	TheUsrs	.	.	IFL	35	.	.	.	1 1
LsssT	TheUsrs	.	.	IFL	15	.	.	.	1 1
LtttT	TheUsrs	.	.	IFL	25	.	.	.	1 1
LuuuP	TheUsrs	.	.	IFL	100	.	.	.	2 2
LvvvC	TheUsrs	.	.	IFL	80	.	.	.	1 1
LwwwC	TheUsrs	.	.	IFL	.	25 Abs	25.0 Sft	.	2 2
LxxxC	TheUsrs	.	.	IFL	100	.	.	.	2 2
LyyyT	TheUsrs	.	.	IFL	50	.	.	.	1 1
LzzzC	TheUsrs	.	.	IFL	100	.	.	.	2 2
L111C	TheUsrs	.	.	IFL	30	.	.	.	1 1
L222T	TheUsrs	.	.	IFL	80	.	.	.	2 2
L333T	TheUsrs	.	.	IFL	80	.	.	.	2 2
L444T	TheUsrs	.	.	IFL	50	.	.	.	1 1
L555P	TheUsrs	.	.	IFL	200	.	.	.	2 2

# What the Data Showed (Error Messages)

## ESAOPER – Operator System Log showed:

- Virtual switch failures

```
Report: ESAOPER Operator/System Log Veloc
Monitor initialized: 07/07/22 at 00:00:01 on 3906 serial 03FCD8 First
-----
01:15:17 QDIO Device Deactivate:xx2C
01:15:17 QDIO Device Deactivate:xx6C
01:16:00 L111T vcpu stopped: 0
01:16:00 L111T : VM VCPU: 00 is in stop state
01:17:45 Virtual Switch Failure: VSW3 owned by: VSW3 DTCVSW1
01:17:45 Address: xxx6
01:17:45 QDIO Device Deactivate:xxx6
01:17:45 DETACH Device BOB6 FROM System
01:18:02 Virtual Switch Failure: VSW4 owned by: VSW4 DTCVSW1
01:18:02 Address: xxx0
01:18:02 DETACH Device BOB7 FROM System
01:18:23 DETACH Device BOB8 FROM System
01:17:00 L228T vcpu started: 0
01:18:52 QDIO Device activated:xx2C
01:20:10 QDIO Device activated:xx6C
.
.
.
01:17:00 VSIMAP1206 At 01:17:00, 122-second interval exceeds active
01:17:00 interval parameter value of 60.
01:19:00 VSIMAP1206 At 01:19:00, 122-second interval exceeds active
01:19:00 interval parameter value of 60.
.
.
.
01:22:05 QDIO Device activated:xxx6
01:22:05 Virtual Switch Recovery: VSW3 owned by: VSW3 DTCVSW1
```

# What the Data Showed (Utilization Data)

## ESALPARS – Logical Partition Analysis Summary showed:

- The %Assigned Total at the time of the issue was 100% or close to 100%

```

Report: ESALPARS Logical Partition Summary Velocity Software Corporate ZMAP 5.1.4 07/11/22 Pg
Monitor initialized: 07/07/22 at 01:00:00 on 3906 serial 03FCD8 First record analyzed: 07/07/22 01:00:00
-----
Time <--Complex--> <-----Logical Partition-----> <-Assigned Shares----> <LPAR Capping> Entit
Phys Dispatch Virt CPU <%Assigned> <---LPAR---> <VCPU Pct> Wait <-Thread-> On/ Capping CPU C
CPUs Slice Name Nbr CPUs Type Total Ovhd Weight Pct /SYS /CPU Comp Idle cnt Off Value -----
-----
07/07/22
01:13:00 11 Dynamic Totals: 00 16 IFL 398.7 0.3 1135 100
XXX4 03 2 IFL 178.2 0.0 60 44.4 22.2 88.9 No 0 2 No . 1.78
01:14:00 11 Dynamic Totals: 00 16 IFL 398.0 0.3 1135 100
XXX4 03 2 IFL 177.4 0.0 60 44.4 22.2 88.9 No 0 2 No . 1.78
01:15:00 11 Dynamic Totals: 00 16 IFL 391.5 1.1 1135 100
XXX4 03 2 IFL 179.9 0.1 60 44.4 22.2 88.9 No 0 2 No . 1.78
01:16:00 11 Dynamic Totals: 00 16 IFL 399.3 0.2 1135 100
XXX4 03 2 IFL 176.7 0.0 60 44.4 22.2 88.9 No 0 2 No . 1.78
01:17:00 11 Dynamic Totals: 00 16 IFL 399.6 0.2 1135 100
XXX4 03 2 IFL 176.5 0.0 60 44.4 22.2 88.9 No 0 2 No . 1.78
01:19:00 11 Dynamic Totals: 00 16 IFL 399.9 0.1 1135 100
XXX4 03 2 IFL 176.4 0.0 60 44.4 22.2 88.9 No 0 2 No . 1.78
01:21:00 11 Dynamic Totals: 00 16 IFL 400.0 0.1 1135 100
XXX4 03 2 IFL 176.2 0.0 60 44.4 22.2 88.9 No 0 2 No . 1.78
01:22:00 11 Dynamic Totals: 00 16 IFL 400.0 0.1 1135 100
XXX4 03 2 IFL 175.8 0.0 60 44.4 22.2 88.9 No 0 2 No . 1.78
*****Summary*****
Average: 11 Dynamic Totals: 00 16 IFL 394.2 0.8 1135 100
XXX4 03 2 IFL 167.7 0.5 60 44.4 22.2 88.9 No 29.08 2 No . 1.78

```

## ESALPARS – Logical Partition Analysis Summary – Cont.:

- There are four total IFL processors shared over the 16 virtual processors (from the previous page)
- During the time of the issue, the 4 total IFL Processor busy was close to 100%

```
Totals by Processor type:
<-----CPU-----> <-Shared Processor busy->
Type Count Ded shared Total Logical Ovhd Mgmt
-----
CP      3    0     3  245.8   241.3  1.7  2.7
IFL     4    0     4  395.0   393.4  0.8  0.8
ICF     3    3     0    0.0     0     0  0.0
ZIIP    1    0     1  11.9   11.5  0.1  0.3
```

# What the Data Showed (Utilization Data)

## ESAXACT – Transaction Delay Analysis showed:

- Multiple servers were waiting on CPU

```

Report: ESAXACT      Transaction Delay Analysis      Velocity Software C
Monitor initialized: 07/07/22 at 01:00:00 on 3906 serial      First record analyz
-----
                                <-----Percent non-dormant (Wait states)----->
UserID  <-Samples->
/Class  Total  In Q Run Sim CPU SIO Pag SVM SVM SVM  CF Idl I/O Pag Ldg Oth Lst Elig
-----
*****Totals*****
System:  3306  2340  7.7  1.1  34  0 0.0  0  0 0.1 0.1  57 0.1  .  .  0  0  0
Hi-Freq: 237K  145K  8.0  1.9  31  0.0 0.0  0  0.8 0.1 0.3  59 0.1  0.0 0.0 0.1  0  0
*****User Summary*****
LaaaT   3598  3598  43  6.9  40  0 0.1  0  0  0  0  10 0.2  0  0  0  0  0
LbbbT   3598  3598  41  4.5  36  0 0.1  0  0  0  0  19  0  0  0  0.1  0  0
LcccT   7196  7196  15  2.9  44  0 0.0  0  0  0  0  38 0.1  0  0  0.0  0  0
LdddT   3598  3598  20  1.9  43  0 0.2  0  0  0  0  35 0.2  0.0  0  0  0  0
LeeeT   3598  3598  18  0.1  32  0 0.4  0  0  0  0  50 0.0  0  0  0  0  0
LfffC   7196  7196  8.3  0.7  21  0 0.0  0  0  0  0  70 0.2  0  0.0  0  0  0
LgggT   3598  3588  15  2.1  44  0  0  0  0  0  3.6  34 0.1  0  0  1.8  0  0
LhhhT   7196  7196  5.3  2.3  42  0.0 0.0  0  0  0  0.3  49 0.4  0.0 0.0 0.0  0  0
LjjjC   3598  3598  11  1.1  36  0 0.1  0  0  0  0  51 0.1  0  0  0  0  0
LkkkT   7196  7196  3.6  0.1  26  0  0  0  0  0  0  70  0  0  0  0  0  0
LmmmmT  3598  3598  10  2.0  40  0 0.2  0  0  0  0  47 0.1  0  0  0  0  0
LnnnC   3598  3598  10  6.4  34  0 0.1  0  0  0  0  48 0.4  0  0  0.0  0  0
LpppC   3598  3598  8.3  1.9  46  0  0  0  0  0  0  43 0.2  0  0  0  0  0
    
```



# What the Data Showed (Utilization Data)

## ESANIC – Virtual NIC Activity showed:

- The network lock information (wait times) rose from zero
- The rate of discards during the problem period rose from zero

```

Report: ESANIC Virtual NIC Activity Report Velocity Software Corporate ZMAP 5.1.4 07/11/22
Monitor initialized: 07/07/22 at 01:00:00 on 3906 serial 03FCDS First record analyzed: 07/07/22 01:00:00
-----
Date/Time Virtual Virt NIC Tranp <---network lock requests-----> <-stack-> <-bytes-> <-----Packets per Second----->
Userid LanName Devc BASE /type <---Per Second-> waits/sec wait </second> </Second> <-Rate--> <Discard> <InError>
Ntwrk send recv send recv time rqst dfrd Sent Rcvd Sent Rcvd Sent Rcvd Sent Rcvd
-----
01:16:00
LaaaT VSW3 0380 0380 01/02 110.2 110 51.7 0 0 0 0 0 0 460K 6288 310 79.1 0 110 0 0
LbbbT VSW3 0380 0380 01/02 178.6 179 41.7 0 0 0 0 0 0 741K 10K 502 128 0 80.2 0 0
LcccT VSW3 0380 0380 01/02 8.6 8.6 110 0 0 0 0 0 0 598 14K 8.6 174 0 0 0 0
LdddT VSW3 0380 0380 01/02 313.8 314 39.6 0 0 0 0 0 0 97K 5760 376 72.3 0 132 0 0
LeeeP VSW4 0360 0360 02/02 4.5 4.4 2.7 0 0.0 0.1 0 0 0 2026 765 6.5 5.9 0 0.1 0 0
LfffT VSW4 0360 0360 02/02 3.4 3.3 8.0 0 0 0 0.1 0 0 0 899 1136 3.9 19.2 0 0 0 0
LgggT VSW4 0360 0360 02/02 12.5 12.4 5.5 0 0.0 0.1 0 0 0 4719 2853 15.6 10.2 0 0 0 0
LhhhT VSW4 0360 0360 02/02 2.9 2.8 4.1 0 0.0 0.1 0 0 0 417 733 2.9 6.8 0 0.2 0 0
LbbbT VSW4 0360 0360 02/02 1.1 1.0 2.3 0 0.0 0.2 0 0 0 272 2117 2.2 29.0 0 0 0 0
LjjjT VSW4 0360 0360 02/02 1.3 1.2 1.6 0 0.0 0.1 0 0 0 190 316 1.4 4.3 0 0 0 0
LkkkT VSW4 0360 0360 02/02 19.3 19.2 13.0 0 0.0 0.2 0 0 0 5232 3930 21.2 16.0 0 0.0 0 0
Lmmml VSW4 0360 0360 02/02 8.7 8.6 3.2 0 0 0 0.2 0 0 0 2503 1366 10.9 11.2 0 0 0 0
LnnnT VSW4 0360 0360 02/02 7.2 7.2 0.5 0 0 0 0.1 0 0 0 2676 1047 9.8 10.6 0 0 0 0
LpppT VSW4 0360 0360 02/02 7.1 7.0 2.8 0 0 0 0.2 0 0 0 2002 963 8.6 8.8 0 0 0 0
LqqqC VSW4 0360 0360 02/02 8.8 8.6 5.9 0 0 0 0.3 0 0 0 1342 1256 8.9 8.6 0 0 0 0
LrrrT VSW4 0360 0360 02/02 18.8 18.7 7.9 0 0.0 0.1 0 0 0 6551 3606 25.0 14.0 0 0.9 0 0
LsssC VSW4 0360 0360 02/02 8.2 8.2 13.9 0 0.0 0.0 0 0 0 1737 2449 8.8 28.8 0 1.0 0 0
LtttT VSW4 0360 0360 02/02 6.0 6.0 3.6 0 0.0 0.2 0 0 0 3421 2481 6.8 5.9 0 0 0 0
LuuuT VSW4 0360 0360 02/02 3.7 3.7 4.1 0 0.0 0.1 0 0 0 736 639 3.9 7.2 0 0 0 0
LvvpP VSW4 0360 0360 02/02 30.5 30.5 17.7 0.0 0.0 0.2 0 0 0 7056 5568 31.5 24.1 0 0.3 0 0
LwwwT VSW4 0360 0360 02/02 15.5 15.5 9.7 0 0.0 0.2 0 0 0 2285 1641 16.0 12.5 0 0.1 0 0
LxxxT VSW4 0360 0360 02/02 7.8 7.8 5.4 0 0.0 0.1 0 0 0 1214 908 8.1 7.1 0 0 0 0
LyyyT VSW3 0380 0380 01/02 3.8 3.8 53.5 0 0 0 0 0 0 270 6201 3.8 75.9 0 94.3 0 0
LqqqC VSW3 0380 0380 01/02 4.0 4.0 69.9 0 0 0 0 0 0 292 6291 4.2 77.2 0 89.6 0 0
LzzzC VSW3 0380 0380 01/02 3.8 3.8 48.4 0 0 0 0 0 0 286 11K 4.7 141 0 30.9 0 0
01:17:00
LaaaT VSW3 0380 0380 01/02 156.8 157 60.7 0 0 0 0 0 0 873K 7782 588 98.1 0 64.3 0 0
LbbbT VSW3 0380 0380 01/02 319.8 320 71.9 0 0 0 0 0 0 955K 11K 647 136 5.3 75.5 0 0
LcccT VSW3 0380 0380 01/02 7.8 7.8 80.1 0 0 0 0 0 0 405 11K 6.1 130 4.5 0 0 0
LdddT VSW3 0380 0380 01/02 2.0 2.0 32.5 0 0 0 0 0 0 20K 4271 13.3 53.2 0 64.9 0 0
LhhhT VSW3 0380 0380 01/02 4.7 4.7 72.7 0 0 0 0 0 0 301 2986 4.3 35.6 1.0 92.8 0 0
LqqqC VSW3 0380 0380 01/02 2.7 2.7 60.7 0 0 0 0 0 0 192 3102 2.8 37.8 0 87.9 0 0
    
```

# What the Data Showed (Utilization Data)

## ESAPLDV – Processor Local Dispatch Vector Activity showed:

- The dispatch rate during the problem period was suddenly extremely high

```

Report: ESAPLDV Processor Local Dispatch Vector Activity Velocity Software Corporate ZMAP 5.1.4 07/11/22
Monitor initialized: 07/07/22 at 01:00:00 on 3906 serial 03FCDE First record analyzed: 07/07/22 01:00:00
    
```

Time	<---Load--->			CPU	<VMDBK Moves/sec>		<-----PLDV Lengths----->				Dispatcher Long Paths	<-CPU Steals from Other CPUs-> <-From Nesting Levels (/sec)->						
	Actv	In Q	/sec		Steals	To Master	Avg	Max	Mstr	MstrMax		%Empty	Same	NL1	NL2	NL3	NL4	NL5
01:16:00	43	41.0	0.5	0	33.6	0.3	0	0.0	0	1.8	0	9562.7	33.6	0	0	0	0	0
				1	33.2	0	0	0.0	.	.	0	16614.2	33.2	0	0	0	0	0
				2	39.1	0	0	20.3	.	.	0	69624.5	39.1	0	0	0	0	0
				3	41.1	0	0	20.4	.	.	0	20874.5	41.1	0	0	0	0	0
System:					147.0	0.3	0	40.8	.	.	0	116675.8	147	0	0	0	0	0
01:17:00	37	40.0	0.6	0	31.6	0.6	0	0.0	0	1.8	0	61488.6	31.6	0	0	0	0	0
				1	31.6	0	0	0.0	.	.	0	38082.6	31.6	0	0	0	0	0
				2	36.0	0	0	23.4	.	.	0	11892.1	36.0	0	0	0	0	0
				3	37.2	0	0	23.4	.	.	0	24317.3	37.2	0	0	0	0	0
System:					136.5	0.6	0	46.9	.	.	0	135780.4	136	0	0	0	0	0
01:19:00	43	43.0	0.6	0	32.5	0.9	0	0.1	0	1.8	0	96738.4	32.5	0	0	0	0	0
				1	34.2	0	0	0.1	.	.	0	53972.1	34.2	0	0	0	0	0
				2	34.8	0	0	23.4	.	.	0	35320.3	34.8	0	0	0	0	0
				3	33.7	0	0	23.4	.	.	0	44696.5	33.7	0	0	0	0	0
System:					135.2	0.9	0	47.0	.	.	0	230727.3	135	0	0	0	0	0
01:21:00	42	40.0	0.6	0	30.3	0.9	0	0.1	0	1.8	0	37784.0	30.3	0	0	0	0	0
				1	30.2	0	0	0.1	.	.	0	75857.8	30.2	0	0	0	0	0
				2	36.9	0	0	23.6	.	.	0	50984.8	36.9	0	0	0	0	0
				3	38.5	0	0	23.6	.	.	0	51062.0	38.5	0	0	0	0	0
System:					135.9	0.9	0	47.3	.	.	0	215688.6	136	0	0	0	0	0
01:22:00	37	40.0	0.5	0	33.3	2.6	0	0.1	0	1.8	0	1593.2	33.3	0	0	0	0	0
				1	32.0	0	0	0.1	.	.	0	1442.6	32.0	0	0	0	0	0
				2	39.6	0	0	23.9	.	.	0	685.5	39.6	0	0	0	0	0
				3	39.7	0	0	23.9	.	.	0	772.7	39.7	0	0	0	0	0
System:					144.6	2.6	0	47.9	.	.	0	4493.9	145	0	0	0	0	0

# What the Data Showed (Utilization Data)

## ESACPUA – CPU Utilization Analysis (Part 2) showed:

- There were a high amount of spin locks during the time of the issue
- It shows 4 threads (SMT on, 2 vCPUs), 2 100% busy

```

Report: ESACPUA      CPU Utilization Analysis      Velocity Software Corp
Monitor initialized: 07/07/22 at 01:00:00 on 3906 serial 03FCD8      First record analyzed:
-----
<----Load---->      <CPU percents><--Internal (per second)--> SIGP <--Spin Locks-->
<-Usrs--> Tran      Totl Ovrhead Diag Inst      SIE Fast Page Rate Proc ms/ rate
Time      Actv In Q /sec CPU Util  Usr Sys  nose  Sim intrcp path fault /sec Pct spin /sec
-----
01:19:00      43 43.0  0.6  0   100 3.1 3.6  95K  95K  96427 0.08 232.5  0 0.01 0.00 117.0
              1   100 1.7 1.6  53K  53K  53716 9.01 164.1 0.0 0.00 0.00  98.4
              2   76.4 1.2 1.0  35K  35K  35157 0.02 144.4 0.0 0.18 0.03  55.07
              3   76.4 1.4 1.4  44K  44K  44524 0.08  0.9  0.0 0.17 0.03  65.27
System:
              353 7.5 7.6 227K 228K 229824 9.20 542.0 0.0 0.37 0.01 335.7
-----
01:21:00      42 40.0  0.6  0   100 1.3 2.1  37K  37K  37745 0.05  3.6  0 0.03 0.00  2852
              1   100 2.5 2.4  75K  75K  75839 0.16  4.8  0.0 0.02 0.00  548.3
              2   76.1 1.9 1.8  51K  51K  50966 0.02  7.1  0.0 0.57 0.03  198.9
              3   76.1 1.8 1.8  51K  51K  51003 0.05  1.5  0.0 0.40 0.02  223.3
System:
              352 7.5 8.1 213K 214K 215552 0.28 17.1 0.0 1.02 0.00  3823
-----
01:22:00      37 40.0  0.5  0   100 0.5 1.2  55.3  516 1756.0 0.08  60.5  0 0.00 0.00  6.236
              1   100 0.5 0.3  45.2  443 1626.9 0.13  56.5  0.0 0.00 0.00  7.003
              2   75.7 0.2 0.2  149  303  622.8 0.05  17.4  0.0 0.15 0.31  4.702
              3   75.7 0.3 0.2  26.9  341  807.9 0.10  56.9  0.0 0.13 0.28  4.652
System:
              352 4.0 3.7 165 3049 11306 0.43 219.9 3.0 0.01 0.00 281.9
-----
01:23:00      37 42.0  0.4  0   100 1.4 1.8  60.6  986 3989.1 0.07  90.3  0.8 0.00 0.00  85.82
              1   100 1.2 0.8  36.6  817 3580.2 0.05  47.0  1.8 0.00 0.00  82.28
              2   76.1 0.6 0.5  38.2  389 1536.0 0.13  45.1  0.2 0.00 0.00  55.17
              3   76.1 0.8 0.6  30.1  857 2200.7 0.18  37.5  0.2 0.00 0.00  58.60
System:
              352 4.0 3.7 165 3049 11306 0.43 219.9 3.0 0.01 0.00 281.9
    
```

# What the Data Showed (Utilization Data)

## ESAUSR3 – User Resource Utilization showed:

- The dispatch rates for TheUsrs group (containing the Linux servers)
- The dispatch rate during the problem period was suddenly extremely high

```
Report: ESAUSR3      User Resource Utilization - Part 2  Velocity Software Corp  ZMAP 5.1.
Monitor initialized: 07/07/22 at 01:00:00 on 390rst record analyzed: 07/07/22 01:00:00
```

UserID	DASD I/O	DASD Block I/O	Mdisk Cache Hits	Virt Disk I/O	Cache Hit Pct	<Transfers> IUCV	<---Messages Queued---> VMCF	<Message> <Errors--> IUCV	<Dispatch> <Rate/Sec> VMCF	<Rate/Sec> Disp	<Rate/Sec> Waits				
07/07/22															
01:16:00	24742	0	6	100	0.4	5680	6	0	19	0	1	0	0	115K	115K
TheUsrs	24662	0	0	100	0.4	32	0	0	0	0	0	0	0	115K	115K
-----															
01:17:00	19247	0	33	1089	5.5	3412	6	0	19	0	1	0	0	134K	134K
TheUsrs	19169	0	0	1089	5.4	152	0	0	0	0	0	0	0	134K	134K
-----															
01:18 - data missing															
-----															
01:19:00	12105	0	16	764	6.1	6365	12	9	19	0	1	0	0	230K	230K
TheUsrs	12037	0	0	764	6.0	87	0	9	0	0	0	0	0	230K	230K
-----															
01:21:00	14040	0	12	299	2.2	6371	12	14	19	0	1	0	0	216K	216K
TheUsrs	13986	0	0	299	2.1	55	0	14	0	0	0	0	0	215K	215K

# What the Data Showed (Utilization Data)

## ESADIAG – User Resource Utilization showed:

- The amount of DIAG 44 instructions
- The rate during the problem was suddenly extremely high

Report: **ESADIAG** Diagnose Rate Report Velocity Software Corporate ZMAP 5.1.4  
 Monitor initialized: 07/07/22 at 01:00:00 on 3906 serial 03FCDS First record analyzed: 07/07/22 01:00:00

Date /Time	CPU <--Total-->		-----Diagnose Counts per Second-----															
	<Diags/Sec> User	IBM	DIAG: Rate	DIAG:Rate	DIAG: Rate	DIAG: Rate	DIAG: Rate	DIAG: Rate	DIAG: Rate	DIAG: Rate	DIAG: Rate	DIAG: Rate	DIAG: Rate	DIAG: Rate	DIAG: Rate	DIAG: Rate		
07/07/22																		
01:16:00	0	7381	000C: 0.1	0024: 0.0	0044: 7354	005C: 0	0068: 0.0	009C: 20.1	00A4: 1.3									
	1	14657	000C: 0	0024: 0	0044: 14K	005C: 0	0068: 0	009C: 170	00A4: 0									
	2	68079	000C: 0.0	0024: 0	0044: 68K	005C: 0.0	0068: 0.1	009C: 30.5	00A4: 0									
	3	19679	000C: 0	0024: 0	0044: 20K	005C: 0	0068: 0	009C: 41.7	00A4: 0									
01:17:00	0	57705	0024: 0.0	0040: 0.0	0044: 58K	0064: 0.0	0068: 0.0	009C: 20.4	00A4: 1.1									
	1	36436	0024: 0	0040: 0	0044: 36K	0064: 0	0068: 0.0	009C: 166	00A4: 0.1									
	2	10198	0024: 0	0040: 0	0044: 10K	0064: 0	0068: 0	009C: 92.8	00A4: 0									
	3	22992	0024: 0	0040: 0	0044: 23K	0064: 0	0068: 0.0	009C: 18.1	00A4: 0									
01:19:00	0	95197	0008: 0.0	000C: 0	0024: 0.1	0044: 95K	005C: 0.0	0068: 0.0	009C: 11.4									
	1	53125	0008: 0	000C: 0	0024: 0	0044: 53K	005C: 0	0068: 0.0	009C: 3.9									
	2	34665	0008: 0.0	000C: 0.0	0024: 0	0044: 35K	005C: 0.0	0068: 0	009C: 10.1									
	3	44118	0008: 0	000C: 0	0024: 0	0044: 44K	005C: 0	0068: 0.0	009C: 15.6									
01:21:00	0	36983	0008: 0.0	000C: 0.1	0024: 0.1	0044: 37K	005C: 0.0	0068: 0.0	009C: 13.2									
	1	74968	0008: 0	000C: 0	0024: 0	0044: 75K	005C: 0	0068: 0.0	009C: 21.6									
	2	50531	0008: 0	000C: 0.0	0024: 0	0044: 51K	005C: 0	0068: 0.0	009C: 5.3									
	3	50666	0008: 0	000C: 0	0024: 0	0044: 51K	005C: 0	0068: 0	009C: 82.2									
01:22:00	0	55.3	0024: 0.0	0044: 0.0	005C: 0.6	0068: 0.0	0098: 0.1	009C: 36.3	00A4: 0.8									
	1	45.2	0024: 0	0044: 0	005C: 0	0068: 0.1	0098: 0	009C: 29.4	00A4: 0									
	2	149.0	0024: 0	0044: 0	005C: 0	0068: 0	0098: 0	009C: 141	00A4: 0									
	3	26.9	0024: 0	0044: 0	005C: 0	0068: 0.0	0098: 0	009C: 23.6	00A4: 0									

## Performance Enhancement Suggestions:

### 1 – Add another engine

- The affected LPAR had only two IFL's running
  - Each IFL was running 95-100%
  - This caused the top Linux servers to wait on CPU

## Performance Enhancement Suggestions:

### 2 – Change the engine count for the Linux servers

- Each of the Linux servers has two vCPUs
  - Only one vCPU is needed per server
  - Having two vCPUs per server caused unnecessary cache contention
  - Possibly update the SHARE for each server, if needed



## Performance Enhancement Suggestions:

### 3 – Upgrade Linux servers to change DIAG 44 to DIAG 9C

- The Linux server group was doing a large amount of DIAG 44 instructions for locking - (Shown on ESADIAG and ESAPLDV)
  - Older Linux systems use DIAG 44 – those systems need to be upgraded to take advantage of DIAG 9C
  - DIAG 9C is a much more efficient and safe way to do locking



## What the customer reported:

- Several of the Linux servers that were doing DIAG 44 instructions were decommissioned
- A third IFL was added to the LPAR
- No more issues were reported