

VELOCITY
SOFTWARE

Performance Analysis Flowchart

Velocity Software Inc.
196-D Castro Street
Mountain View CA 94041
650-964-8867

Velocity Software GmbH
Max-Joseph-Str. 5
D-68167 Mannheim
Germany
+49 (0)621 373844

Barton Robinson,
[*barton@velocitysoftware.com*](mailto:barton@velocitysoftware.com)
If you can't measure it, I'm just not interested...

Copyright © 2019 Velocity Software, Inc. All Rights Reserved. Other products and company names mentioned herein may be trademarks of their respective owners.

“z” is:

- Very large,
- Very complex and
- Very well instrumented
- TECHNOLOGY KEEPS CHANGING...

The challenge?

What challenge, it is all there!

- 200 zmon panels (with menus)
- 150 zmap reports (with table of contents)
- 3400 unique variables

Few companies have full time performance analysts.

The challenge – when running high utilization....

- Performance problems are visible,
- “z” applications are often impacted by other applications

My challenge

- Provide a flowchart to resolve problems quickly
- Describe the few panels/reports needed to solve any specific problem

This flowchart is based on decades of analysis

z/VM Platform, source: Monitor (95+ reports)

*Performance Summary (4)

ESAHDR ESATUNE ESASSUM ESASUM

*Transaction Activity (5)

ESAUCLA **ESAXACT** ESARATE ESACLAS
ESAEXCP

*User Activity (21)

ESASRVC ESASRV1 **ESAU SRC** ESAUSR1
ESAUSR2 ESAUSR3 ESAUSR4 ESAUSR5
ESAUSP2 **ESAUSP3** ESAUSP4
ESAUSCP **ESAUSP5**
ESAUSTR **ESAUSPG** ESAUSEK ESAWKLD
ESAUSRQ ESASCED ESAACCT **ESAPOOL**

*Processor Subsystem (26)

ESACPUU **ESACPUA** ESACPUS **ESASMT**
ESADIAG ESAINS ESALCK1 ESALCK2
ESAMFC ESAMFCA ESAMFCC ESACPUV
ESACPU1 ESACPU2 **ESADIA2**
ESAIUCV ESAIUC2 ESAIUER
ESALPARC ESALPAR ESALPARS
ESAPLDV ESAIOP ESACRYPT ESACRY2

*Storage Subsystem (11)

ESASTRC ESASTOR **ESASTR1** ESASTR2
ESASTR3 ESAME **ESAVDSK**
ESAFREE ESADCSS **ESAASPC** ESASXS

*Paging Subsystem (5)

ESAPSPC ESAPAGE **ESABLKP** ESAXSTO
ESAPSDV

*Input/Output Subsystem (18)

ESADEV1 ESADEV2 ESADSD1 **ESADSD2**
ESADSD6 ESAIOAS ESACHNC ESACHAN
ESACHNH
ESADSDC **ESADSD5** ESAMDC
ESA3495 ESASCSI ESASCS2
ESASEEK **ESAFCP** **ESADEV**

*Virtual NETWORK Reporting (7)

ESAQDIO ESAQDI2 **ESANIC**
ESAVSWC ESAVSW ESAVSW2
ESAOSA

*Operational Logging

ESAOPER

- z/VM “traditional” Applications (Source: APPLMON)

- (33 reports currently?)

***Shared File System (7)**

ESASFS1 ESASFS2 ESASFS3 ESASFS4
ESASFS5 ESASFS6 ESASFS7

***Byte File System (2)**

ESABFS1 ESABFS2 ESABFS3

***CMS Multitasking (1)**

ESAMTSK

***Web Serving Reports (8)**

ESAWEB1 ESAWEB2 ESAWEB3 ESAWEB4
ESAVWS1 ESAVWS2 ESAVWS3 ESAVWS4

***TCPIP Reporting (15)**

ESATCPC ESATCPI ESATCP1 ESATCP2
ESATCP3 ESATCP4
ESATCP5 ESATCP6 ESATCP7 ESATCP8
ESATCPP ESATCPS ESATCPA ESATCPU ESATFTP

Network: Source: snmp - VERY efficient, really!

- Network: mib ii (first available, from any snmp enabled server

ESATCPC **ESATCP1** **ESATCP2** ESATCP3 **ESATCP4**

- Microsoft servers: Host mib

ESAHST1 ESAHST2 ESAHST3 ESAHST4 ESAHSTA

- Linux servers: UCD mib

ESAUCD1 **ESAUCD2** ESAUCD3 **ESAUCD4** ESAUCDD

- More Linux: Velocity mib

ESALNXD ESALNXS ESALNXR **ESALNXP** ESALNXA

ESALNXC **ESALNXF** ESALNXU ESALNXV

ESALNXM ESALNXUP

- Linux Application “vendor” mibs

ESAJVM ESAORAC ESAORAG ESAORAS ESAORAW

ESAGPFN ESAGPFF ESAGPFF ESAGPFD ESAGPFS (Version 5, zvps)

ESAMNG1 ESAMNG2 ESAMNG3 ESAMNG4 ESAMNG5 (Version 5, zvps)

ESADOCK1 ESADOCK2 ESASSC (Version 5, zVPS)

- VSE mibs: IBM, Velocity

ESAVSEC ESAVSES ESAVSEP ESAVSEJ

ESAVSEP ESAVSEJ

The 25 “z/VM” Reports you need in the order you need them

Configuration: ESAHDR

System (z/VM LPAR) Load: ESASSUM

Wait states: ESAXACT

Virtual machine Config: ESAUSRC

CPU:

- LPAR Summary: ESALPARS
- CPU Consumer: ESAUSP2
- Linux Consumer: ESALNXP
- Linux Processor: ESALNXS
- CPU Cache: ESAMFC

Storage

- z/VM Requirements: ESASTR1
- User Storage: ESAUSPG
- Linux Storage: ESAUCD2
- VDISK for swap: ESAVDSK

Paging

- Configuration: ESAPSDV
- Loads by user: ESAUSPG

DASD

- Configuration: ESADSD1
- Rates: ESADSD2
- CACHE: ESADSD5
- FCP: **ESAFCP**
- EDEV: **ESAEDEV**

Network

- Configuration: ESATCPI
- Network management: ESATCP1/2/4
- OSA: ESAOSA/NIC/VSW

Analysis starts with “is there a problem?”

- Describe the problem (what user(s), what time)

System Configuration

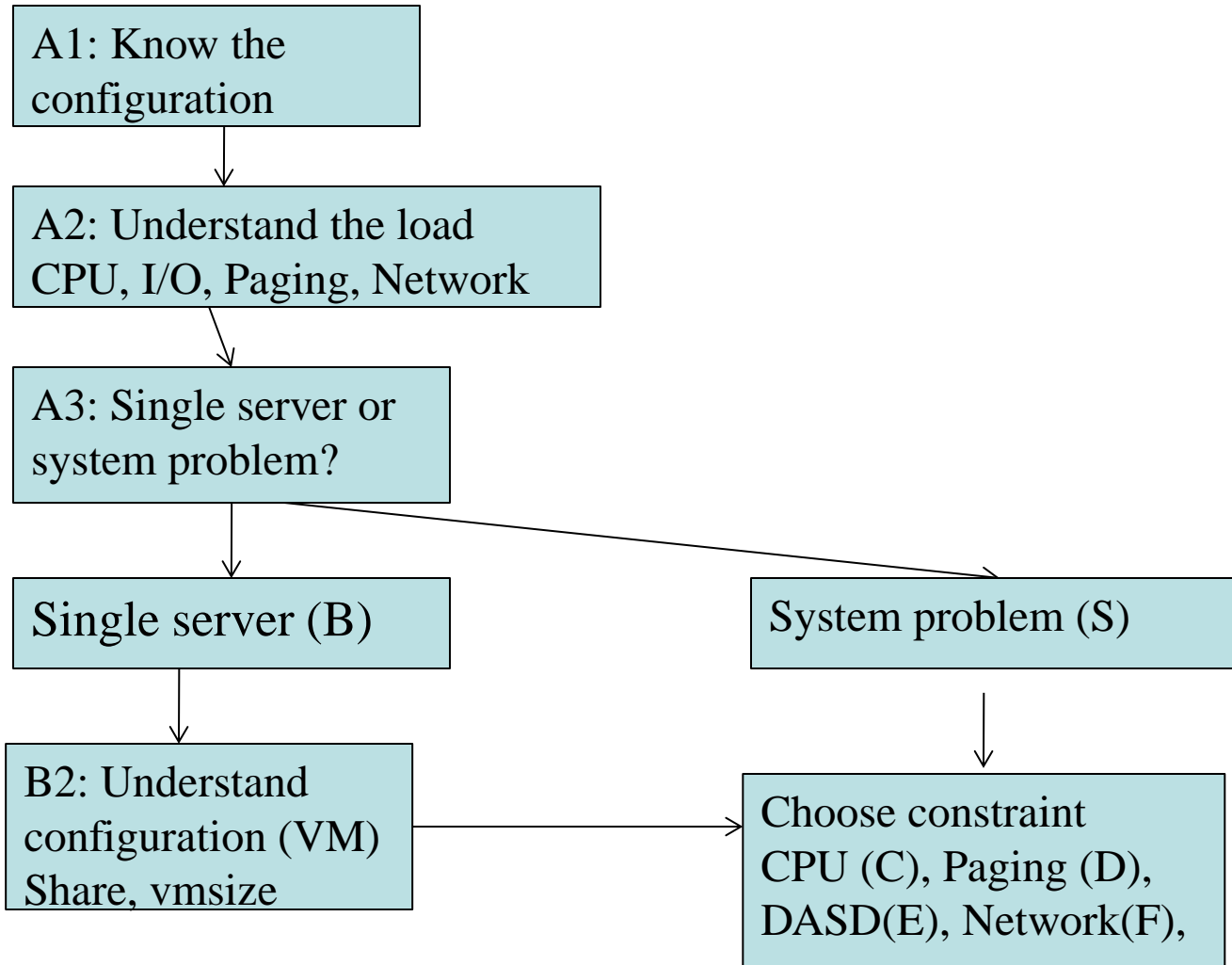
- Processor model, cpu type
- Number of processors, storage size
- SMT support

Loads on the system subsystems

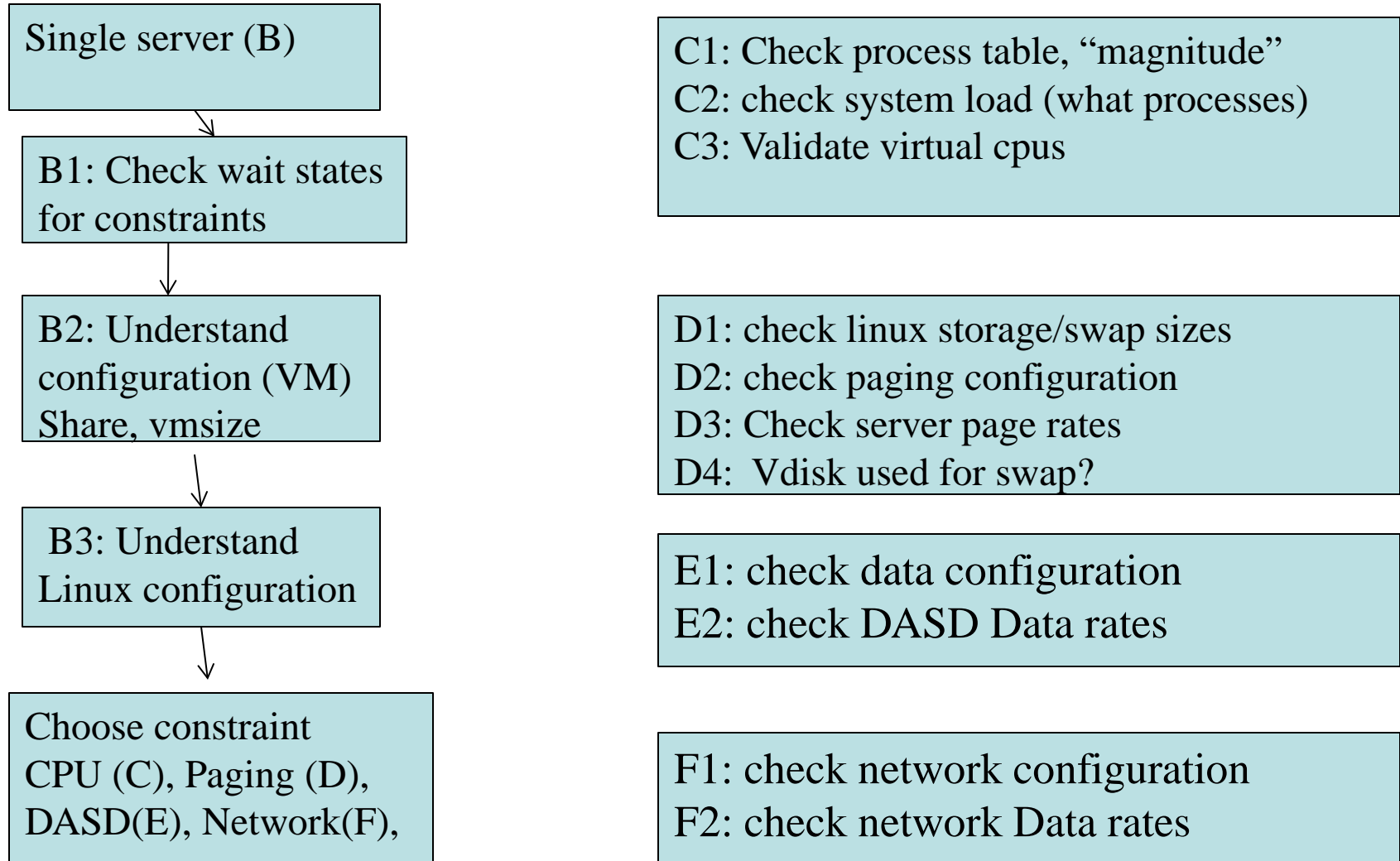
Wait states for those impacted

Subsystem Analysis

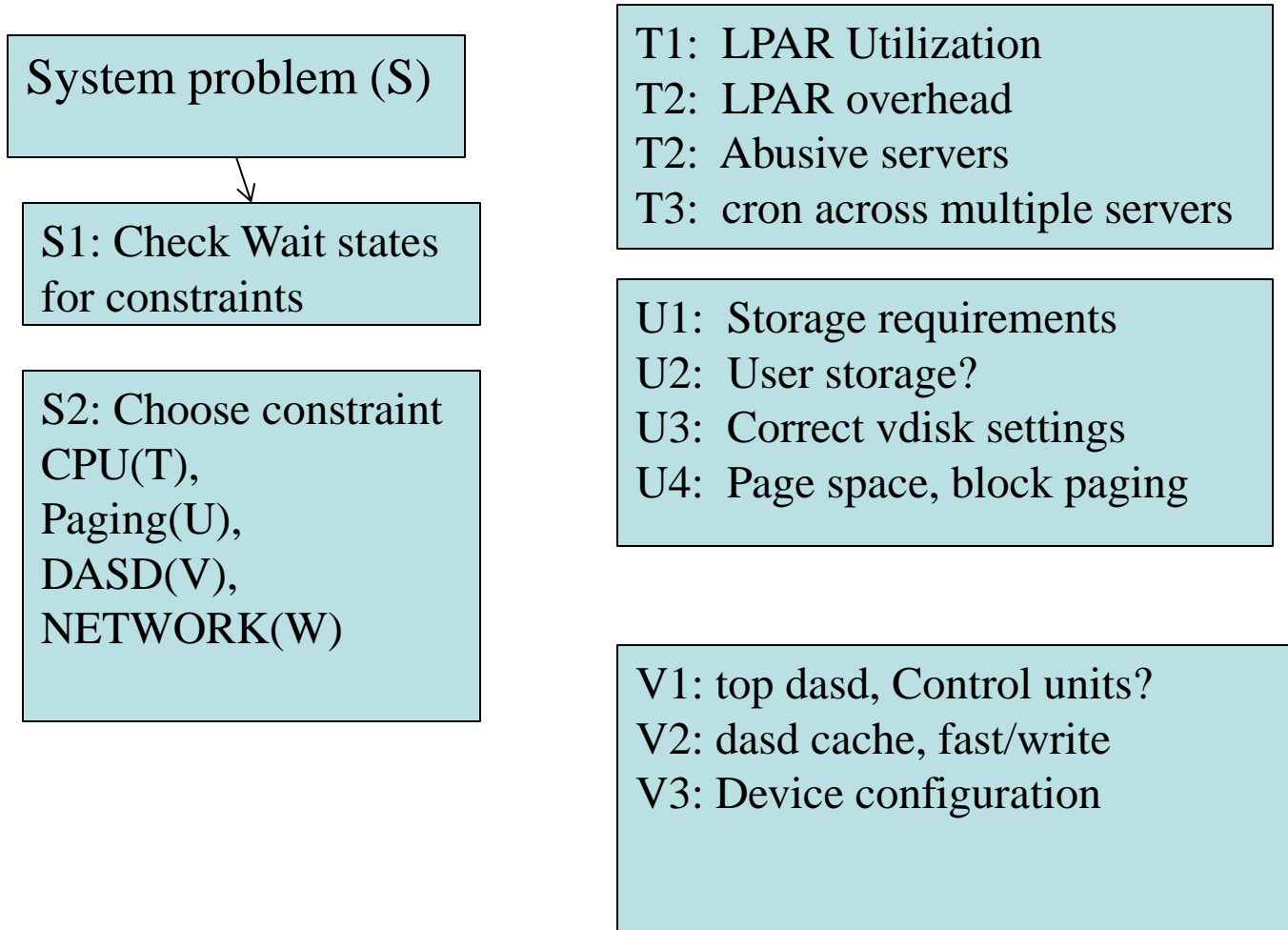
- DASD, Storage, Paging, Processor, Network



The Single user Analysis Flow Chart



The System wide Analysis Flow Chart



A1: Configuration:	ESAHDR	
A2: System Load:	ESASSUM / ESAMAIN	
B1: Check wait states:	ESAXACT	
B2: Virtual machine config:	ESAUSRC / ESAUSR1	
B3: Linux configuration:	ESALNXS	
C1: Process table:	ESALNXC	E1: Data configuration: ESAUSEK
C2: Process Load:	ESALNXP	ESAQDIO
C3: Validate Virtual CPUs:	ESAUSP2	E2: DASD Rates: ESADSD2
D1: Linux Storage:	ESAUCD2	F1: Network configuraiton: ESATCPI
D2: Paging configuration:	ESAPSDV	F2: Network data rates: ESATCP1/2/4
D3: Server Paging Rate:	ESAUSPG	F3: Vswitch users: ESANIC
D4: VDISK for swap:	ESAASPC	F4: Vswitch traffic: ESAVSW
		F5: OSA traffice: ESAOSA

S1: Wait states: ESAXACT

T1: Lpar utilization (ESALPARS)

T2: LPAR overhead (ESALPAR)

T3: Abusive Server ESAUSP2 / ESAUSR2

T4: Cron across servers: ESALNXP

U1: Storage requirements: ESASTR1

U2 User Storage: ESAUSPG

U3 VDISK Storage : ESAVDSK / ESAASPC

U4: page configuration: ESAPSDV

U5: Page space: ESAPSDV/ESABLKP

U6: Expanded storage: ESAXSTO

V1: top dasd? Control units: ESADSD2

V2: dasd cache, fast/write: ESADSD5

V3: Device configuration: ESADSD1

Know the configuration: ESAHDR

```
Report: ESAHDR          z/VM Monitor Analysis
Monitor period:        3600 seconds ( 1:00:00)
-----
z/VM Version: 5          Release 4.0 SLU 1002
TOD clock at termination                09:49:16
Abend code of last termination
TOD clock at last IPL:                  12/26/10 09:49:40
System Operator:                        OPERATOR
Time zone adjustment from GMT:          -7 hours

System Identifier                        ZVM2
Checkpoint/Warmstart Volumes            V2RES1/V2RES1
Machine Model/Type          z10E:2097/710
System Sequence Code                    00000000000D2655
Processor 0 model/serial      2097-710 /072655 Mast
Processor 1 model/serial      2097-710 /072655
Processor 2 model/serial      2097-710 /072655
Processor 3 model/serial      2097-710 /072655
Processor 4 model/serial      2097-710 /072655

ESAME (Memory Extension) Nucleus in use
Power of processor in terms of service Units: 32989
ESA/370 hardware installed
Operating on IFL Processor(s)
Channel Path Measurement Facility(CPMF) Extended is inst

Main Storage installed (MB):          70656
Main Storage Generated (MB):         70656
Expanded Storage installed (MB):     17152
Expanded Storage for CP (MB):        17152
Number of users in monitor file:        90
Number of DASD in monitor file:         530
Number of non-DASD in monitor file:     2
```

Common configuration problems

- IFLs?
- Real Storage
- Release significant
- Master processor significant

Report: ESAHDR z/VM Monitor Analysis
Monitor initialized: 08/29/18 at 20:00:35 on 2827
Monitor period: 3600 seconds (1:00:00)

ZMAP Release 4.4.0.0
History Source 4.3.4.0
Monitor file created: 08/29/18 20:00:35

z/VM Version: 6 Release 4.0 SLU 1601
TOD clock at last IPL: 01/21/18 01:10:34
System Operator: OPERATOR
Time zone adjustment from GMT: -4 hours

System Identifier VML1
Checkpoint/Warmstart Volumes LV1RES/LV1RES
Machine Model/Type EC12:2827/702

Apar installed: VM65918 VSW Aggreg Load Balance
Apar installed: VM65925 NICDEF Security Controls
Apar installed: VM65942 Add user diagnose tables
Apar installed: VM65943 eav minidisks (large)
Apar installed: VM65985 System Hang with mdc on
Apar installed: VM65988 Processor Scalability
Apar installed: VM66026 HYPERPAV/PAV/ZHPF Monitr
Apar installed: VM66063 High PR/SM LPAR Mgt Time
Apar installed: VM66083 Wait, CUWait monitor rec

System Sequence Code 00000000000469C7
Processor 0 model/serial 2827-702 /0669C7 Master
Processor 1 model/serial 2827-702 /0669C7

Power of processor in terms of service Units: 73394
Operating on IFL Processor(s)
Channel Path Measurement Facility(CPMF) Extended is installed

Common configuration problems

- IFLs?
- Real Storage
- Release significant
- Master processor significant

Report: ESAHDR z/VM Monitor Analysis
Monitor initialized: 08/29/18 at 20:00:35 on 2827
Monitor period: 3600 seconds (1:00:00)

Totals by Processor type:

```
<-----CPU-----> <-Shared Processor busy>
Type Count Ded shared total assigned Ovhd Mgmt
-----
CP      2    0     2 165.4    162.7  1.6  2.8
IFL   4  4     0  0.0     0  0  0.0
ICF     2    1     1 100.4     99.8  0.0  0.6
ZIIP    1    0     1   6.1      5.6  0.2  0.5
```

Number of logical partitions defined: 20

Main Storage installed (MB): 147456

Main Storage Generated (MB): 147456

Horizontal/Vertical Scheduling Configuration IFL CPUs

Confidence Percent5F

Algorithm 02

Confidence 5A

Algorithm 01

Max parked CPUs 64

Fudge CPU Factor 6.000

Horizontal capacity1.000

Max CPUs 0

Number of users in monitor file: 151

Number of DASD in monitor file: 1944

Number of non-DASD in monitor file: 6

Common configuration problems

- IFLs?
- Real Storage
- Release significant
- Master processor significant

Know the overall loads: ESASSUM / ESAMAIN

Report: ESASSUM Subsystem Activity
Monitor initialized: 08/29/18 at 20:00:35 on 2827

Time	<---Users---> <-avg number->			Transactions Per	Avg. Resp	<Processor> Utilization	Storage (MB) Fixed	Active	<-Paging--> <pages/sec>	XStore	DASD	<---> <-DAS Rate
	On	Actv	In Q	Minute	Minute	Total	Virt.	User	Resid.			
08/29/18												
20:01:35	48	31	35.0	27.0	0.404	200	193	162.2	143708	0	931	381
20:02:35	48	31	34.0	31.0	0.222	200	192	162.2	143706	0	165	168
20:03:35	48	37	35.0	29.0	0.202	199	191	162.2	143717	0	272	124
20:04:35	48	33	35.0	31.0	0.236	200	193	162.3	143709	0	29	99
20:05:35	48	35	35.0	30.0	0.013	200	190	162.2	143711	0	118	120
20:06:35	49	39	35.0	34.0	0.266	200	188	162.2	143721	0	175	164
20:07:35	49	31	35.0	32.0	0.206	200	188	162.2	143708	0	40	103

Look for Spikes, dramatic changes, what time? (20:01 is worst?)

- Processor
- Storage for users
- Page rates
- DASD I/O rates
- (Transactions are for traditional workloads)

13
14
18
67
20
98

Wait states provide options for improvement

- Sample user status once per second, once per minute
- (900 samples per vcpu per 15 minute period)

Wait state (queue) analysis -> where to focus

- Running / CPU Wait -> CPU Subsystem
- Simulation wait (master processor) -> CPU Subsystem
- Page wait -> Paging/Storage subsystems
- Asynchronous i/o, page -> DASD subsystem

Normal idle wait states

- TCPIP, Linux: test idle
- Traditional servers: SVM (service machine wait)
- Traditional users: idle (not in queue)

Two types of Wait states are provided by virtual machine

- Monitor frequency: once per minute (**Not interesting**)
- High Frequency (Hi-Freq): once per second (**Interesting**)
 - (60 samples per 1 minute per virtual cpu)

Shown by:

- Summarized for all users (**start here**)
- Summarized for user classes (grouped by installation)
- Servers
- Top users

User class analysis -> where to focus

- Set up user classes FIRST!
- Group Test vs Product
- Group application by application
- Group support servers vs production

Wait States: ESAXACT

Report: ESAXACT Transaction Delay Analysis Veloc
 Monitor initialized: 04/15/11 at 10:00:00 on 2097 serial 72655 First

```

-----
<-----Percent non-dormant (Wait states)-----
UserID  <-Samples->          E-  D-  T-      Tst <Asynch>
/Class  Total  In Q Run Sim CPU SIO Pag SVM SVM SVM  CF Idl I/O Pag Ldg
-----
04/15/11
11:00:00 1335 1011 4.0 0.2 0.6  0 0.5  0  0 0.1  0  91 0.1  .  .
Hi-Freq: 116K 59208 4.2 0.0 1.9 0.0 0.3  0 7.9 0.1 0.0  89 0.4 0.1 0.2
***Key User Analysis***
RSCS      893    1    0    0    0    0    0    0    0    0    0    0    0    0    0
RSCSDNS   893    8    0    0    0    0    0    0    0    99 100  0    0    0    0
TCPIP     893   285  0.4  0  2.5  0    0    0    0    0    0    0    97  0    0    0
***User Class Analysis***
*Servers 12502   822  0.7  0.1  1.0  0.2  0    0    17  4.5  0    93  0    0    0
*System  1786   1437  0.1  0.1  1.1  0  0.2  0    0    0    0    92  0.1  0  0.7
*ITM     1786   911  1.5  0.1  2.2  0  0.5  0    0    0    0    78  0.4  0.1  0.2
*SOA     35720 31695 7.0  0.0  2.2  0  0.3  0    0    0    0.1  88  0.6  0.0  0.1
*ITM     36613 23570 1.1  0.0  1.7  0  0.3  0    0    0    0    91  0.1  0.2  0.4
*TheUsrs 24111   480  0.2  0.8  1.3  0  0.6  0    26  5.2  0    91  0.2  0  0.2
***Top User Analysis***
LN XUWA01  893   893   71    0  2.8  0  0.1  0    0    0    0    24  1.7  0.4  0
LN XUWA03 1786 1786   28  0.2  5.5  0  1.2  0    0    0  0.6  57  7.2  0.1  0.1
LN XUWA02 1786 1786   27  0.1  3.6  0  0.1  0    0    0  0.4  69  0.1  0  0.1
LN XQWA01 1786 1786  4.0  0  2.2  0  0    0    0    0    0    94  0.1  0    0
LN XDWA02 1786 1786  6.0  0  2.2  0  0.2  0    0    0    0    91  0.1  0    0
LN XDWA04 1786 1786  4.1  0  2.9  0  0    0    0    0    0    93  0    0  0.1
V2TPSP02  179   179  35  0  6.1  0  0    0    0    0    0    59  0    0    0
LN XDWA03 1192 1192  2.0  0  1.8  0  0    0    0    0    0    95  0.6  0.1  0
LN XTWA04 2864 2818  1.6  0  1.6  0  0    0    0    0    0    97  0    0    0
LN XUWA15 1190 1165  2.1  0.1  1.4  0  0    0    0    0    0    96  0    0    0
  
```

Wait States: ESAXACT

Report: ESAXACT Transaction Delay Analysis Velocity S
 Monitor initialized: 08/29/18 at 20:00:35 on 2827 serial 0669C7 First reco

```

-----
<-----Percent non-dormant (Wait states)-----
UserID  <-Samples->
/Class  Total  In Q  Run Sim  CPU  SIO  Pag  SVM  SVM  SVM  CF  Tst <Asynch>
-----  -----  -----  -----  -----  -----  -----  -----  -----  -----  -----  -----  -----  -----  -----  -----
08/29/18
20:01:35      48    35  5.7   0  40   0   0   0   0   0   0   54   0   .   .   0
Hi-Freq:  3720  2114  5.4  0.0  41   0  0.7   0  2.8  0.0   0   52   0  0.2  0.7  0.0
***Key User Analysis ***
TCPIP        60    55   0   0  3.6   0   0   0   0   0   0   96   0   0   0   0
***User Class Analysis***
Servers      600     3   0  33   0   0   0   0   0   0   0   67   0   0   0   0
Velocity    600    15  6.7   0  6.7   0   0   0   0   0   0   87   0   0   0   0
*Prod      1860  1860  5.8   0  45   0  0.4   0   0   0   0   49   0   0  0.1  0.1
*Util       120   120   0   0  15   0   0   0   0   0   0   85   0   0   0   0
TheUsrs     480    61  10   0  15   0  11   0  21  1.6   0   36   0  6.6  20   0
***Top User Analysis***
L24BP       120   120  18   0  77   0   0   0   0   0   0   5.0   0   0   0   0
L233P       120   120  18   0  74   0   0   0   0   0   0   7.5   0   0   0  0.8
L200P       120   120  10   0  80   0  4.2   0   0   0   0   5.8   0   0   0   0
L239P       120   120  6.7   0  51   0   0   0   0   0   0   43   0   0   0   0
L203P       120   120  5.0   0  75   0  0.8   0   0   0   0   19   0   0   0   0
L20BP       120   120  4.2   0  38   0   0   0   0   0   0   58   0   0   0   0
L244P       120   120  3.3   0  28   0   0   0   0   0   0   69   0   0   0   0
L208P       120   120  3.3   0  51   0   0   0   0   0   0   46   0   0   0   0
L20DP       120   120  13   0  44   0   0   0   0   0   0   43   0   0   0   0
L224P       120   120  4.2   0  27   0   0   0   0   0   0   69   0   0   0   0
  
```

User Configuration: ESAUSRC

Report: ESAUSRC User Configuration Velocity Software Corporate ESAMAP 4
 Monitor initialized: 04/15/11 at 10:00:00 on 2097 serial 72655 First record analyzed: 04/15/11 10:00:
 Monitor period: 3600 seconds (1:00:00) Last record: 04/15/11 11:00

UserID	ClassID	Account Code	ACI Grp Name	CPU Type	<-----SHARE----->				CPU Cnt	<Status>				<-MDC>		<-Storage->		
					<Normal> Rel	Abs	<--MAX--> Typ	Shre		Lim -it	<Modes> VM	STG	SVM	QDSP	FS	INS	NO	NO	<-VM size-> Dflt	Max
LNXDMS2A	*ITM	27482	.	IFL	200	.	.	.	.	2	ESA	V=V	N	N	N	N	2.0G	2.0G
LNXDPA02	*System	75113	.	IFL	200	.	.	.	.	2	ESA	V=V	N	N	N	N	512M	512M
LNXDWA01	*SOA	03817	.	IFL	400	.	.	.	.	2	ESA	V=V	N	N	N	N	6.0G	6.0G
LNXDWA02	*SOA	03817	.	IFL	200	.	.	.	.	2	ESA	V=V	N	N	N	N	4.0G	4.0G
LNXDWA03	*SOA	03817	.	IFL	200	.	.	.	.	2	ESA	V=V	N	N	N	N	2.0G	2.0G
LNXDWA04	*SOA	03817	.	IFL	200	.	.	.	.	2	ESA	V=V	N	N	N	N	7.0G	7.0G
LNXDWA11	*SOA	03817	.	IFL	200	.	.	.	.	2	ESA	V=V	N	N	N	N	8.0G	8.0G
LNXQWA01	*SOA	03817	.	IFL	200	.	.	.	.	2	ESA	V=V	N	N	N	N	7.0G	7.0G
LNXQWA02	*SOA	03817	.	IFL	200	.	.	.	.	2	ESA	V=V	N	N	N	N	2.0G	2.0G
LNXQWA03	*SOA	03817	.	IFL	200	.	.	.	.	2	ESA	V=V	N	N	N	N	2.0G	2.0G
LNXQWA04	*SOA	03817	.	IFL	200	.	.	.	.	2	ESA	V=V	N	N	N	N	2.0G	2.0G
LNXTWA04	*SOA	03817	.	IFL	400	.	.	.	.	4	ESA	V=V	N	N	N	N	5.0G	5.0G
LN XUWA01	*SOA	03817	.	IFL	100	.	.	.	.	1	ESA	V=V	N	N	N	N	12G	12G

Look for “Interesting configurations”

- Large relative shares / absolute shares
- CPU Counts, **matching shares (100 Rel / vcpu)**
- CPU Type (IFL, CP)
- Virtual machine storage sizes (too large?, largest?)

User Configuration: ESAUSRC

Report: ESAUSRC User Configuration Velocity Software Corporate ZMAP 4.4.0
 Monitor initialized: 08/29/18 at 20:00:35 on 2827 serial 0669C7 First record analyzed: 08/29/18 20:00:35
 Monitor period: 3600 seconds (1:00:00) Last record: 08/29/18 21:00:35

UserID	ClassID	Account Code	ACI Grp Name	<CP POOL> CPU PoolName Type	<-----SHARE----->				<---CPU--->			<Status>			<MDC>		<Storage>	
					<Normal> Rel	Abs	Typ	Shre	Lim -it	<Count> Def	On	Mode	SVM	Dsp	FS	INS	Dflt	Max
DISKACNT	Servers	10	.	. IFL	100	.	.	.	.	1	1	ESA	N	N	N	N	32M	32M
DTCVSW1	TheUsrs	DTCVSW1	.	. IFL	3000	.	.	.	.	1	1	ESA	N	Y	N	N	128M	128M
DTCVSW2	TheUsrs	DTCVSW2	.	. IFL	3000	.	.	.	.	1	1	ESA	N	Y	N	N	128M	128M
EREP	Servers	EREP	.	. IFL	100	.	.	.	.	1	1	ESA	N	N	N	N	32M	32M
FTPSEERVE	Servers	FTPSEERVE	.	. IFL	100	.	.	.	.	1	1	XC	N	Y	N	N	32M	32M
L10CU	*Util	L10CU	.	. IFL	100	.	.	.	.	2	2	ESA	N	N	N	N	16G	16G
L20BP	*Prod	L20BP	.	. IFL	100	.	.	.	.	2	1	ESA	N	N	N	N	12G	12G
L20DP	*Prod	L20DP	.	. IFL	200	.	.	.	.	2	2	ESA	N	N	N	N	8.0G	8.0G
L200P	*Prod	L200P	.	. IFL	200	.	.	.	.	2	2	ESA	N	N	N	N	10G	10G
L203P	*Prod	L203P	.	. IFL	120	.	.	.	.	2	2							
L203P	*Prod	L203P	.	. IFL	120	.	.	.	.	2	2	ESA	N	N	N	N	6.0G	6.0G
L208P	*Prod	L208P	.	. IFL	200	.	.	.	.	2	2	ESA	N	N	N	N	6.0G	6.0G
L215P	*Prod	L215P	.	. IFL	.	8	Abs	8.0	Hrd	2	2	ESA	N	N	N	N	8.0G	8.0G
L216P	*Prod	L216P	.	. IFL	100	.	.	.	.	1	1	ESA	N	N	N	N	4.0G	4.0G
L222P	*Prod	L222P	.	. IFL	100	.	.	.	.	2	2	ESA	N	N	N	N	6.0G	6.0G

Look for "Interesting configurations"

- Large relative shares / absolute shares
- CPU Counts, **matching shares (100 Rel / vcpu)**
- CPU Type (IFL, CP)
- Virtual machine storage sizes (too large?, largest?)

Top down:

- CEC / LPAR
- LPAR / z/VM
- Virtual machine
- Linux process

CPU Capture ratio 100% down to process

LPAR Configuration: ESALPARS

Report: ESALPARS Logical Partition Summary Velocity Softw
Monitor initialized: 08/29/18 at 20:00:35 on 2827 serial 0669C7 First record a

```
-----  
      <--Complex--> <-----Logical Partition-----> <-Assigned Shares----  
      Phys Dispatch      Virt CPU <%Assigned> <----LPAR--> <VCPU Pct  
Time      CPUs      Slice Name      Nbr CPUs Type Total  Ovhd  Weight  Pct  /SYS  /CPU  
-----  
08/29/18  
  
20:01:35      9  Dynamic Totals:      00      12  CP      198.7      0.9      1480      100  
                VML1      06      2  IFL      200.0      0.0      Ded      22.2      0      0  
                VML3      02      2  IFL      200.1      0.0      Ded      22.2      0      0  
                CER2      18      2  CP        8.9      0.1        60      4.1      2.03      4.05  
                CER2      18      1  ZIP        1.1      0.0       100      6.2      6.21      6.21  
                ESN1      19      2  CP       13.4      0.1       105      7.1      3.55      7.09  
                ESN1      19      1  ZIP        0.1      0.0       485     30.1     30.1     30.1  
                ICF11     1E      1  ICF       99.4      0.0       Ded     11.1      0      0  
                ICF12     0D      1  ICF       49.9      0.0        10     50.0     50.0     50.0  
                ICF13     1F      1  ICF       50.0      0.0        10     50.0     50.0     50.0  
                PRD1      11      2  CP      100.3      0.1      666     45.0     22.5     45.0  
                PRD1      11      1  ZIP        0.8      0.0       530     32.9     32.9     32.9  
                PRD3      1B      2  CP       61.7      0.3       433     29.3     14.6     29.3  
                PRD3      1B      1  ZIP        2.0      0.1       345     21.4     21.4     21.4
```

Look for “Shared processors”

- IFLs shared between LPARs (none)
- Check weights
- Assigned pct/CPU > 100 ??? -> excess share?
- First LPAR is “us”, z/vm where data collected

LPAR Configuration: ESALPARS

Report: ESALPARS Logical Partition Summary
Monitor initialized: 08/29/18 at 20:00:35 on 2827

Totals by Processor type:

<-----CPU-----> <-**Shared** Processor busy->

Type Count Ded shared Total Logical Ovhd Mgmt

CP 2 0 2 200.0 197.7 0.9 1.3
IFL 4 4 0 0.0 0 0 0.0
ICF 2 1 1 100.5 99.9 0.0 0.6
ZIIP 1 0 1 4.9 4.4 0.1 0.4

Look for “Shared processors”

- Know capacity
- Dedicated show up as 100% “assigned”
- Detail is on ESALPAR

Already Know the overall local LPAR load: ESASSUM / ESAMAIN

Report: ESASSUM Subsystem Activity Velocity Software Corporate ZMAP 4.4.0 08/31/18 Page 34
 Monitor initialized: 08/29/18 at 20:00:35 on 2827 serial 0669C7 First record analyzed: 08/29/18 20:00:35

Time	<---Users--->			Transactions		<Processor>		Storage (MB)		<-Paging-->		<-----I/O----->			<MiniDisk>		Spool	Communications	Captur
	<-avg number->			Per	Avg.	Utilization	Fixed	Active	<pages/sec>		<-DASD-->		Other	<-Cache-->		Page	<-per second->		Ratio
	On	Actv	In Q	Minute	Resp	Total	Virt.	User	Resid.	XStore	DASD	Rate	Resp	Rate	%Hit	Rate	IUCV	VMCF	(pct)
08/29/18																			
20:01:35	48	31	35.0	27.0	0.404	200	193	162.2	143708	0	931	381	1.6	1.1	3.4	56.9	0	453	0 100.00
20:02:35	48	31	34.0	31.0	0.222	200	192	162.2	143706	0	165	168	0.4	1.2	0.6	51.4	0	362	0 100.00
20:03:35	48	37	35.0	29.0	0.202	199	191	162.2	143717	0	272	124	0.5	1.1	0.4	38.1	0	341	0 100.00

Report: ESASSUM Subsystem Activity Velocity Software Corporate ZMAP

Time	<---Users--->			Transactions		<Processor>		Storage (MB)		<-Paging-->		<-----I/O----->			<MiniDisk>	
	<-avg number->			Per	Avg.	Utilization	Fixed	Active	<pages/sec>		<-DASD-->		Other	<-Cache-->		
	On	Actv	In Q	Minute	Resp	Total	Virt.	User	Resid.	XStore	DASD	Rate	Resp	Rate	%Hit	
20:01:35	48	31	35.0	27.0	0.404	200	193	162.2	143708	0	931	381	1.6	1.1	3.4	56.9
20:02:35	48	31	34.0	31.0	0.222	200	192	162.2	143706	0	165	168	0.4	1.2	0.6	51.4
20:03:35	48	37	35.0	29.0	0.202	199	191	162.2	143717	0	272	124	0.5	1.1	0.4	38.1
20:04:35	48	33	35.0	31.0	0.236	200	193	162.3	143709	0	29	99	0.2	1.2	0.8	52.2
20:05:35	48	35	35.0	30.0	0.013	200	190	162.2	143711	0	118	120	0.3	1.1	0.4	36.4
20:06:35	49	39	35.0	34.0	0.266	200	188	162.2	143721	0	175	164	0.6	2.4	6.0	19.8
20:07:35	49	31	35.0	32.0	0.206	200	188	162.2	143708	0	40	103	0.2	1.1	0.4	36.4

Look for Spikes, dramatic changes, what time?

- Processor (Also, ESACPUU, ESACPUA)
- Validate capture ratio

LPAR Overhead - 2: ESALPARS

Report: ESALPARS Logical Partition Summary

Totals by Processor type:

```
<-----CPU-----> <-Shared Processor busy->
Type Count Ded shared Total Logical Ovhd Mgmt
-----
CP      1   0    1   21.8    21.7  0.1  0.1
IFL     11  0   11  180.1   167.6  5.4  7.1
ICF     3   2    1  100.0    99.6  0.0  0.3
ZIIP    2   0    2    0.0     0.0  0.0  0.0
```

Screen: ESALPMGS Velocity Software ESAMON 5.1

1 of 1 Physical CPU Utilization by CPU Type CPU TOTALS

```
      CPU <- Count -> <--- Shared Processor Busy --->
Time   Type Tot Ded Shr %CPU Total Assign Ovhd Mgmt
-----
13:01:00 IFL   2  0  2  63.2  126.3  125.5  0.4  0.9
        CP    2  0  2  85.6  171.2  170.9  0.2  0.3
```

Look for processor type busy

- IFLs shared between LPARs (4 LPARs)
- TOTAL IFL Busy: 167% out of 1100
- Check overheads – high overhead result of too many vcpu
 - Logical overhead part of LPAR assigned
 - Physical overhead is CEC Management

LPAR Overhead - 3: ESALPAR

Report: ESALPAR Logical Partiti
 Monitor initialized: 04/15/11 at 10:

 Physical CPU Management time

CPU	Percent	Type
0	3.838	CP
1	4.412	CP
2	3.134	CP
3	2.222	CP
4	4.429	CP
5	3.924	CP
11	0.132	ZAP
13	0.068	ZAP
14	0.311	ZAP
15	1.070	ZIIP
17	1.391	ZIIP
18	0.945	ZIIP
19	1.298	IFL
24	0.121	ZAP
30	3.111	CP
33	0.408	ZAP
37	0.293	ZAP
40	1.903	IFL
41	1.786	IFL
42	1.687	IFL
43	1.161	IFL
44	1.176	IFL
45	1.158	IFL
46	1.178	IFL

Look for processor overhead

- CPs shared between LPARs (13 LPARs)
- TOTAL IFL Busy: 167% out of 1100
- Check overheads – high overhead result of too many vcpu
 - Total CP Utilization $835 / 900 = 93\%$

ESALPARS

Totals by Processor type:

Type	Count	Ded	shared	Total	Logical	Ovhd	Mgmt
CP	9	0	9	835.8	779.4	12.5	31.4
ZAP	9	2	7	214.8	208.9	1.5	2.9
IFL	31	0	31	1778.5	1669.4	28.4	52.2
ICF	3	0	3	300.2	292.4	0.2	7.3
ZIIP	6	0	6	328.8	311.5	4.2	9.0

Consumers within LPAR: ESAUSP2

Report: ESAUSP2 User Resource Rate Report Velocity Software C

```

-----
      <---CPU time--> <---Main Storage (pages)-----> <-----Paging (pages)----->
UserID <(Percent)> T:V <Resident> Lock <-----WSS-----> <---Allocated---> <Pgs/Secnd>
/Class  Total  Virt  Rat  Totl Activ  -ed Totl Activ  Avg Total ExStg  Disk  Read Write
-----
08/29/18
20:01:35 196.6 192.8 1.0  37M 36.8M 6065  42M 41.9M 872K   23M      0   23M 454.7 443.1
  ***Key User Analysis ***
TCP/IP    0.29  0.14 2.1 1639  1639  671  968 968.0  968  3174      0  3174      0      0
  ***User Class Analysis***
Servers   0.01  0.00 2.2  563 212.0    4  629 211.0   21 14476      0 14476      0      0
Velocity  0.75  0.68 1.1 6491  3705    2 6575  3702  370  9040      0  9040      0      0
*Prod    188.3 185.2 1.0  36M 36.5M 4624  42M 41.6M   2M   22M      0   22M   54.4 395.8
*Util    1.83  1.78 1.0  50K 50484  238  54K 53913  54K  263K      0  263K    0.1  1.6
TheUsrs  5.37  5.07 1.1 235K  235K  526 237K  237K  30K  443K      0  443K  400.3 45.6
  ***Top User Analysis***
L24BP    30.45 30.37 1.0  6.5M 6548K  238  7.1M 7078K   7M 3187K      0 3187K    0.0 46.6
L233P    30.04 29.58 1.0  3.7M 3738K  287  4.5M 4486K   4M 2295K      0 2295K    6.4 18.3
L200P    28.25 28.01 1.0  2.2M 2174K  497  2.6M 2610K   3M 1990K      0 1990K   15.8  3.0
L239P    16.68 16.35 1.0  5.7M 5685K  287  6.8M 6822K   7M 1276K      0 1276K    0.2 57.9
L203P    13.92 13.74 1.0  1.4M 1405K  312  1.6M 1573K   2M  889K      0  889K   11.6  9.2
L20BP    12.91 12.83 1.0  3.1M 3121K  239  3.1M 3146K   3M    1      0    1      0      0
  
```

Look for consumers, in percent of cpu

- By class (Prod)
- Abusive servers (not really)?
- Correct per expected? Not a performance question

Linux Process Load: ESALNXP

Report: ESALNXP LINUX HOST Process Statistics Report Velocity Software Corporate ZMAP 4.4.0 08/
Monitor initialized: 08/29/18 at 20:00:35 on 2827 serial 0669C7 First record analyzed: 08/29/18 20:00:35

node/ Name	<-Process Ident->			<-----CPU Percents----->							<-----Storage Metrics (MB)----->											
	ID	PPID	GRP	Nice	PRTY	Valu	Valu	Tot	sys	user	syst	usrt	Size	RSS	Peak	Swap	Data	Stk	EXEC	Lib	Lck	PTbl
L233P	0	0	0	0	0	29.1	4.25	21.0	1.08	2.75		3M	559K	3.1M	0.14	7438	94.2	72K	7K	950	1874	
init	1	1	1	0	20	2.99	0	0.02	0.55	2.43		2	1	2.4	0	0.19	0.1	0.0	2.0	0	0.01	
ksoftirq	3	2	0	0	20	0.12	0.12	0	0	0		0	0	0	0	0	0	0	0	0	0	
udevd	403	1	403	-4	16	0.13	0.02	0	0.06	0.05		3	1	3.1	0	0.57	0.1	0.1	2.0	0	0.01	
timestam	3769	1	2724	0	20	0.26	0.03	0.10	0.08	0.05		4	2	4.3	0	1.23	0.1	0.6	2.2	0	0.01	
ohasd.bi	6293	1	6293	0	20	0.27	0.06	0.21	0	0		317	72	381	0	218	0.3	30.8	65	0	0.32	
oraroota	7002	1	7002	0	20	0.14	0.03	0.11	0	0		402	57	466	0	323	0.1	10.6	65	0	0.28	
oraagent	7065	1	7065	0	20	0.13	0.02	0.11	0	0		268	40	327	0	189	0.2	10.7	65	0	0.22	
evmd.bin	7083	1	7083	0	20	0.29	0.03	0.26	0	0		300	30	364	0	221	0.1	1.4	65	0	0.17	
gipcd.bi	7126	1	7126	0	20	0.45	0.18	0.27	0	0		239	32	302	0	151	0.1	0.5	65	0	0.16	
ocssd.bi	7202	1	7202	0	-100	0.40	0.14	0.26	0	0		286	164	350	0	207	0.1	1.7	65	286	0.34	
octssd.b	7638	1	7638	0	20	0.18	0.03	0.14	0	0		236	27	300	0	159	0.1	0.3	65	0	0.15	
crsd.bin	7687	1	7687	0	20	0.45	0.06	0.39	0	0		350	74	410	0	241	0.3	30.7	65	0	0.36	
oraagent	7743	1	7743	0	20	0.30	0.05	0.19	0.03	0.03		359	56	359	0	280	0.2	10.7	65	0	0.27	
oraroota	7752	1	7752	0	20	0.22	0.03	0.19	0	0		321	31	321	0	242	0.1	10.6	65	0	0.18	
asm_vktm	8298	1	8298	0	-2	0.13	0.06	0.06	0	0		1348	19	1348	0	3.65	0.1	237	18	0	0.41	
asm_dia0	8330	1	8330	0	20	0.13	0.02	0.11	0	0		1363	42	1363	0	18.1	0.2	237	18	0	0.50	
oraagent	8997	1	8997	0	20	0.16	0.03	0.13	0	0		249	35	292	0	170	0.2	10.7	65	0	0.20	
ora_v																						0.1 261 18 0 0.44

Look for processes within Linux, in percent of cpu

- By relevant server (L233P)
- Correct? Relevant? Cron? Init?

Top down:

- z/VM
- Virtual machines
- VDISK / MDC / Address Space
- Linux server
- Linux process

CPU Capture ratio 100% down to server

Storage Utilization: ESASTR1

Report: ESASTR1 Main Storage Analysis Velocity Software Corporate ESAMAP 4.1.1 01/21/
Monitor initialized: 04/15/11 at 10:00:00 on 2097 serial 72655 First record analyzed: 04/15/11 10:00:00

Time	Users		Pages													
	Loggd On	System Storage	Fixed Store	Non-Pgble	Free Stor	Frame Table	<Available>		System ExSpc	User Resdnt	NSS/DCSS Resident	<-AddSpace>		VDISK Rsdnt	<MDC> Rsdnt	Diag 98
10:15:00	89	18088K	2252	3691	700	141K	79	1032	4710	17577K	4771	226K	0	26852	81157	1126
10:30:00	89	18088K	2252	3683	700	141K	89	1193	4686	17594K	4769	226K	0	30182	61307	1126
10:45:00	89	18088K	2252	3583	700	141K	78	1050	4681	17614K	4769	225K	0	46189	25812	1126
11:00:00	89	18088K	2252	3455	700	141K	82	1062	4688	17448K	4775	223K	0	237K	1418	1126

Total storage analysis (in pages)

- MDC? 300mb? SET MDC MAX/MIN
- VDISK Spike (1gb) ? Which server?
- User resident should be large percent

Storage Utilization: ESASTR1

Report: ESASTR1 Main Storage Analysis Velocity Software Corporate ZMAP 4.4.0 08/31/18 Pg 4
 Monitor initialized: 08/29/18 at 20:00:35 on 2827 serial 0669C7 First record analyzed: 08/29/18 20:00:35

Users <-----MegaBytes-----> Over																	
Time	Loggd On	System Storage	Fixed Store	Non-Pgble	Free Stor	Frame Table	<Available> <2gb >2gb	System ExSpC	User Resdnt	NSS/DCSS Resident	<-AddSpace> System User	VDISK Rsdnt	<MDC> Rsdnt	Diag 98	Commit Ratio	Capt-Ratio	
08/29/18																	
20:01:35	48	147456	0	163	4	1152	2 255	43	143720	27	1589	0	395	0	18	1.387	0.998
20:02:35	48	147456	0	163	5	1152	2 256	43	143718	27	1589	0	396	0	18	1.387	0.998
20:03:35	48	147456	0	163	4	1152	2 256	43	143718	27	1589	0	396	0	18	1.387	0.998

Report: ESASTR1 Main Storage Analysis Velocity Software Corporate ZMAP 4.4.0 08/31/18
 Monitor initialized: 08/29/18 at 20:00:35 on 2827 serial 0669C7 First record analyzed: 08/29/18 20:00:35

Users <-----MegaBytes----->																
Time	Loggd On	System Storage	Fixed Store	Non-Pgble	Free Stor	Frame Table	<Available> <2gb >2gb	System ExSpC	User Resdnt	NSS/DCSS Resident	<-AddSpace> System User	VDISK Rsdnt	<MDC> Rsdnt			
08/29/18																
20:01:35	48	147456	0	163	4	1152	2 255	43	143720	27	1589	0	395	0		
20:02:35	48	147456	0	163	5	1152	2 256	43	143718	27	1589	0	396	0		
20:03:35	48	147456	0	163	4	1152	2 256	43	143718	27	1589	0	396	0		
20:04:35	48	147456	0	163	4	1152	2 259	43	143715	27	1589	0	396	0		
20:05:35	48	147456	0	163	4	1152	2 256	43	143718	27	1589	0	396	0		
20:06:35	49	147456	0	163	4	1152	2 256	43	143721	27	1589	0	393	0		
20:07												1589	0	393	0	
20:08												1589	0	392	0	
20:09												1589	0	392	0	
20:10												1589	0	392	0	
20:11												1589	0	392	0	

Total storage analysis (in pages)

- MDC? SET MDC MAX/MIN (ZVPS uses MDC)
- VDISK use? Which server?
- User resident should be large percent

Virtual Machine Storage : ESAUSPG

Report: ESAUSPG User Storage Analysis Velocity Software Corporate
 Monitor initialized: 04/15/11 at 10:00:00 on 2097 serial 72655 First record analyzed: 04/1

UserID /Class	<---Storage occupancy in pages--->				<--Main Storage page			Read/Write-->		Pages	<Address	
	<---Main Storage---> Total	>2gb	<2GB	<---Paging---> Xstor	<-Page Writes to:--> DASD	Xsto	Disk	Migr	<Page Reads:> Xstor	Disk	Moved <2GB	<pages R VirtDisk
11:00:00	17448K	16943K	504640	4346K	8891K	1120K	352582	320630	822546	149628	0	237286
Top User Analysis												
LN XUWA01	2889K	2798K	90725	65398	258675	10999	112	0	5390	13806	0	0
LN XUWA03	3848K	3762K	85186	63975	8378	21875	277	0	221201	6714	0	223173
LN XUWA02	685385	648345	37040	296256	84613	36427	2443	0	22943	1983	0	0
LN XQWA01	1246K	1218K	28190	541178	51075	35529	2727	0	14094	2787	0	1428
LN XDWA02	713091	672702	40388	56215	148406	16314	649	0	451	1828	0	0
LN XDWA04	1152K	1120K	31859	592756	96720	13708	63725	63261	1189	942	0	0
LN XDWA03	330601	324021	6581	4194	39207	3926	5601	5345	120	734	0	8
LN XTWA04	883228	860363	22865	90734	129722	7768	31	0	182	66	0	1889
LN XUWA15	693689	664995	28694	53516	137150	10556	1382	0	553	457	0	0

Total storage analysis (in pages, new “megabyte” option)

- Largest consumer(s) resident storage
- Largest consumer - which virtual disk?
- VDISK Spike (1gb) ? Which server?

Virtual Machine Storage : ESAUSPG

Report: ESAUSPG User Storage Analysis Velocity Software Corporate ZMAP 4.4.0 08
 Monitor initialized: 08/29/18 at 20:00:35 on 2827 serial 0669C7 First record analyzed: 08/29/18 20:00:35

UserID /Class	<--Storage Occupancy in MegaBytes-->				<--Main Storage page Read/Write-->					Pages	Page	<Address Spaces-->			
	<---Main Storage--->	<---Paging--->	<---Page Writes to:-->	<Page Reads:>	Moved	Faults	<MegaB Resident>								
	Total	>2gb	<2GB	Xstor	DASD	Xsto	Disk	Migr	Xstor	Disk	<2GB			VirtDisk	AddSpce
08/29/18															
20:01:35	143720	141862	1857	0	88145	0	26584	0	0	27283	0	41610	395	0	0
***Key User Analysis ***															
TCPIP	6	6	0	0	12	0	0	0	0	0	0	252	0	0	0
User Class Analysis															
Servers	2	2	0	0	57	0	0	0	0	0	0	348	0	0	0
Velocity	25	25	1	0	35	0	0	0	0	0	0	3191	0	0	0
*Prod	142570	140729	1841	0	85284	0	23749	0	0	3261	0	14196	395	0	0
*Util	197	195	3	0	1027	0	97	0	0	4	0	846	0	0	0
TheUsrs	919	906	12	0	1730	0	2738	0	0	24018	0	22777	0	0	0
Top User Analysis															
L24BP	25578	25247	331	0	12451	0	2798	0	0	1	0	96	1	0	0
L233P	14602	14413	189	0	8964	0	1097	0	0	383	0	436	0	0	0
L200P	8491	8382	110	0	7773	0	179	0	0	948	0	2527	0	0	0

Total storage analysis (in pages, new “megabyte” option)

- Largest consumer(s) resident storage
- Largest consumer - which virtual disk?
- VDISK Spike (1gb) ? Which server?

Virtual Machine Storage : ESAUSPG

```

<-Storage Occupancy in MegaBytes-> <--Main Storage page Read/Write--> Pages Page <Address Spaces-
UserID <---Main Storage---> <---Paging---> <-Page Writes to:--> <Page Reads:> Moved Faults <MegaB Resident>
/Class Total >2gb <2GB Xstor DASD Xsto Disk Migr Xstor Disk <2GB VirtDisk AddSpce
-----
*****User Summary*****
L24BP 25552 25222 330 0 12473 0 11364 0 0 1563 0 1247 1 0
L233P 14568 14380 188 0 8977 0 5845 0 0 1028 0 8267 0 0
L20BP 12266 12110 157 0 0 0 0 0 0 0 0 34054 5 0
L203P 5493 5422 71 0 3468 0 2606 0 0 4670 0 13644 11 0
L23BP 5476 5405 71 0 3485 0 1347 0 0 7885 0 19404 38 0
L200P 8504 8394 110 0 7773 0 1904 0 0 6203 0 17463 0 0
L239P 22283 21995 288 0 5013 0 13806 0 0 4079 0 23939 0 0
L244P 9876 9749 128 0 9853 0 10761 0 0 1526 0 2976 0 0
L20DP 6888 6799 89 0 4310 0 12507 0 0 753 0 7263 0 0
L208P 5687 5614 74 0 2807 0 1094 0 0 1421 0 9855 0 0
L215P 7609 7511 98 0 3799 0 2218 0 0 435 0 14899 11 0
L224P 7199 7105 94 0 9272 0 10286 0 0 10981 0 2699 0 0
L24FP 1988 1962 26 0 518 0 3 0 0 160 0 7482 324 0
  
```

Total storage analysis (in pages, new “megabyte” option)

- Largest consumer(s) resident storage
- Largest consumer - which virtual disk?
- VDISK Spike (1gb) ? Which server?

VDISK for Swap: ESAVDSK

Report: ESAVDSK VDISK Analysis Report Velocity Software Corporate

Owner	Space Name	-----<--Size--->	<AddSpce>	Priv	VIO	<--pages----->						
		AddSpc	VDSK	Cre-	Del-	or	rate	User	Resi-	Lock-	Sto-	DASD
		Pages	Blks	ates	etes	Shrd	/sec	Links	dent	ed	len	Read
10:45:00												
LNXXQA01	VDISK\$LNXXQA01\$0206\$0530	64256	512K	0	0	Shrd	0.00	1	122	0	0.7	0.0
LNXXQA01	VDISK\$LNXXQA01\$0207\$0531	64256	512K	0	0	Shrd	0.04	1	2565	0	3.5	0.2
LNXTWA04	VDISK\$LNXTWA04\$0206\$051C	131K	1049K	0	0	Shrd	1.28	1	11K	0	0	0.0
LNXXUA03	VDISK\$LNXXUA03\$0206\$051E	250K	2002K	0	0	Shrd	0.65	1	14K	0	1.6	6.7
LNXXUA03	VDISK\$LNXXUA03\$0207\$051F	375K	3002K	0	0	Shrd	0.29	1	4980	0	0.4	0.7
LNXXUA03	VDISK\$LNXXUA03\$0208\$0520	513K	4102K	0	0	Shrd	0.28	1	4751	0	0.4	0.4
System Totals:		7805K	125M	0	0	.	5.09	204	46K	0	7.3	8.1

11:00:00												
LNXXQA01	VDISK\$LNXXQA01\$0206\$0530	64256	512K	0	0	Shrd	0	1	46.9	0	0.1	0
LNXXQA01	VDISK\$LNXXQA01\$0207\$0531	64256	512K	0	0	Shrd	0	1	1381	0	0.3	0
LNXTWA04	VDISK\$LNXTWA04\$0206\$051C	131K	1049K	0	0	Shrd	0	1	3984	0	11.7	0
LNXXUA03	VDISK\$LNXXUA03\$0206\$051E	250K	2002K	0	0	Shrd	10.1	1	46K	0	12.9	58.4
LNXXUA03	VDISK\$LNXXUA03\$0207\$051F	375K	3002K	0	0	Shrd	16.2	1	88K	0	6.1	19.7
LNXXUA03	VDISK\$LNXXUA03\$0208\$0520	513K	4102K	0	0	Shrd	16.1	1	88K	0	5.8	20.2
System Totals:		7805K	125M	0	0	.	84.6	204	237K	0	37.2	98.3

Virtual Disk Analysis

- Which virtual disk spiked?
- Are there multiple vdisks, and **PRIORITIZED!!!**

```
Report: ESAVDSK          VDISK Analysis Report          Velocity Softwar
Monitor initialized: 08/29/18 at 20:00:35 on 2827 serial 0669C7  First record ana
-----
Maximum VDISK:          Blocks  (MB)
System storage:         --No Limit--
Storage per user:       --No Limit--

                                <--Size--> <AddSpce> Priv  VIO          <--pages-->
                                AddSpc VDSK Cre- Del-  or   rate   User Resi- Lock-
                                Pages  Blks ates etes Shrd /sec Links dent  ed
-----
08/29/18
20:01:35
L23BP      VDISK$L23BP$$$$0160$00BB  128K 1024K    0    0 Priv 0.32    1 9903    0
L24FP      VDISK$L24FP$$$$0160$0036  128K 1024K    0    0 Priv 5.57    1  83K    0
-----
System Totals:                2334K   37M    0    0    . 16.0    38 101K    0
-----
```

Virtual Disk Analysis

- Which server is using vdisk?
- Are there multiple vdisks, and **PRIORITIZED!!!**

z/VM 6.3 Invalid but Resident Storage Analysis

Report: ESAUSTR User Storage Analysis Velocity Software Corporate ZMAP 4.4.0
 Monitor initialized: 08/29/18 at 20:00:35 on 2827 serial 0669C7 First record analyzed: 08/29/18 20:00

```

-----
      <-----Virtual Server Storage (MB)-----> <Resident> Mbyte <-----Page Rates / Second-----
UserID  Size  Alloc Resi- UFO  <-----IBR-----> <AgeList> <Unreferd> slots Made IBR AgeLst <PreWrite> Diag
/Class          dent Activ TOT  <2gb >2gb <2gb >2gb <2gb >2gb  used  IBR Refd Refd  IBR AgeLst Rlse
-----
08/29/18
20:01:35  205K  177K  144K  141K  14.1  0.1  14.0  32.3  2494  6.5  530  88145  882  165  353.9  630  2.3  48.5
***Key User Analysis ***
TCPIP    128.0  15.3   6   3.0  0.5  0.0  0.5   0  2.9   0  0.0   12  11.0  6.8  4.2   0   0   0
***User Class Analysis***
Servers  312.0  57.3   2   0.0  0.4  0.0  0.4  0.1  1.8   0  0.0   57  7.9  2.0  5.9   0   0  0.7
Velocity 496.0  50.3  25  2.1  0.9  0.0  0.9  0.6  21.7  0.0  0.7   35  66.5  8.9  65.9  0.1  0  4.2
*Prod    185K  173K  143K  140K  8.5  0.1  8.4  29.2  2306  5.2  447  85284  750  22.3  207.9  623  2.1  31.0
*Util    16128  1066  197  160.1  0.5  0  0.5  0.6  36.0  0.0  6.2  1027  29.3  7.2  13.8  0.9  0  5.3
TheUsrs  2688  2085  919  787.9  3.3  0.0  3.3  1.8  126  1.3  75.7  1730  17.8  118  56.2  6.2  0.2  7.4
***Top User Analysis***
L24BP    27648  27637  25578  25361  0.5  0.0  0.5  2.9  214  0.7  51.7  12451  42.4  0.2  1.6  66.5  0.0  0.1
L233P    18432  18322  14602  14418  0.5  0.0  0.5  1.9  182  0.6  54.6  8964  41.1  1.9  5.2  42.7  0.2  0.1
L200P    10240  10211  8491  8411  0.5  0  0.5  1.1  78.4  0.2  15.2  7773  43.1  4.1  28.0  5.4  0.1  3.9
  
```

Invalid but Resident (IBR as of z/VM 6.3)

- Are correct servers losing pages? (Yes)

Report: ESAUCD2 LINUX UCD Memory Analysis Report Velocity Softwar

```

-----Storage Sizes (in MegaBytes)-----
Node/ <-----Real Storage--> <-----SWAP Storage-----> Total <-----Storage in Use----->
Time/ <-----Real Storage--> <-----SWAP Storage-----> Total <-----Storage in Use----->
Date  Total Avail Used  Total Avail Used  MIN  Avail CMM  Buffer Cache Ovrhd
-----
*** Nodes *****
LINUXVM2  495.2   7.2 488.1  63.5  63.5   0.0  15.6  70.7           0   63.9 283.2 141.0
LNXDPOB02 493.0  52.5 440.5   0     0     0   15.6  52.5           0   89.6 278.8  72.1
V2TPSP01 1992.8  28.7 1964 269.5  84.9 184.6 16.4 113.6           0  218.3 669.7 1076
V2TPSP06 1895.4 757.1 1138 256.3 256.3  0   15.6  1013           0  126.9 901.2 110.2
V2TPSP04 1895.5 756.9 1139 256.3 256.3  0   15.6  1013           0  127.0 901.1 110.4
V2TPSP05 1895.5 756.8 1139 256.3 256.3  0   15.6  1013           0  126.6 901.3 110.8
V2TPSP03 1895.4 723.4 1172 256.3 201.8  54.5 15.6  925.2           0  109.0 655.7 407.2
V2TMSP04 1501.1   8.3 1493 256.3 256.3  0.0  15.6  264.7           0   82.0 599.3 811.5
V2TMSP05 1501.1 121.7 1379 256.3 256.3  0.0  15.6  378.0           0   84.0 269.2  1026
V2TMSP02 1501.1  65.3 1436 256.3 256.3  0.0  15.6  321.6           0  105.9 599.5 730.3
V2TMSP03 1501.1  64.2 1437 256.3 256.3  0.0  15.6  320.5           0   80.4 270.3  1086
    
```

Linux Storage Map

- Opportunities?
 - High available (greater than 5%)
 - High buffer (greater than 20mb)
- Issues? Swap
- If swap used, but also large buffer, CMM?

Report: ESAUCD2 LINUX UCD Memory Analysis Report Velocity Software Corpor

```

-----
Node/      <-----Storage Sizes (in MegaBytes)----->
Time/      <--Real Storage--> <-----SWAP Storage-----> Total <-----Storage in Use----->
Date       Total  Avail Used  Total Avail Used  MIN  Avail CMM  Buffer Cache Ovrhd Shared
-----
20:01:35
***Node Groups***
*Prod      179728  9206  167K  150K  147K  2314  281.3  156K      0  4769.9  129K  33148      0
*Util      15871  15055  815.9  18828  18828      0  15.6  33883      0  111.9  411.9  292.1      0
TheUsrs    2005.3   6.7  1999  1173  1173      0  15.6  1180      0  282.7  1347  369.2      0
*** Nodes *****
L200P      10064  53.3  10010  1669  1669      0  15.6  1723      0  15.7  6693  3301      0
L203P      6036.0  103.7  5932  1669  1523  145.9  15.6  1627      0  72.1  3944  1916      0
L210P      4022.1  26.9  3995  2843  2525  317.7  15.6  2552      0  96.5  2737  1161      0
L215P      8055.9  488.8  7567  1669  1501  168.1  15.6  1990      0  73.5  5999  1495      0
L23AC      2005.3   6.7  1999  1173  1173      0  15.6  1180      0  282.7  1347  369.2      0
L23BP      6036.0  37.2  5999  2843  2656  186.5  15.6  2693      0  9.8  4825  1164      0
L233P      18119  548.7  17571  35611  35495  116.3  15.6  36043     0  352.0  11915  5304      0
l239p      31753  6101  25653  35611  35611      0  15.6  41711     0  532.8  21944  3176      0
L24BP      27209  289.6  26919  2843  2795  48.1  15.6  3084      0  614.5  23608  2696      0
L24FP      2005.3   8.4  1997  2843  2067  775.4  15.6  2076      0  9.2  1350  637.8      0
    
```

Linux Storage Map

- Opportunities?
 - High available (greater than 5%)
 - High buffer (greater than 20mb)
- Issues? Swap
- Swap used vs available....

Top down:

- z/VM
- Configuration
- Rates
- Space full
- Device busy

Paging rules change in 6.3

Paging Subsystem: ESAPSDV

Report: ESAPSDV Page And Spool Device Activity Veloc
 Monitor initialized: 08/29/18 at 20:00:35 on 2827 serial 0669C7 First

-----Paging/Spooling----->												
Dev	<-----Slots----->					<per sec>		</Sec><Device->				
No.	Serial	Avail	Used	%Use	Max	Read	Writ	Queue	+RSCH	Serv Time	Resp Time	%Alloc Select
08/29/18												
20:01:35												
Page Devices												
2A9A	LV1P0A	1803K	547K	30	547K	10.0	8.3	0	4.9	1.3	1.3	100.0
2AD6	LV1P0B	1803K	551K	31	551K	9.0	8.6	0	4.5	1.3	1.3	100.0
2A23	LV1P0C	1803K	549K	30	549K	11.9	8.9	0	5.8	1.0	1.0	100.0
2A5D	LV1P0D	1803K	551K	31	551K	11.4	17.2	0	7.6	0.4	0.4	100.0
2A9B	LV1P0E	1803K	549K	30	549K	10.8	8.4	0	5.9	1.7	1.7	100.0
...												
2A21	LV1P05	1803K	551K	31	551K	12.0	8.7	0	5.9	0.6	0.6	100.0
2A9F	LV1P29	1803K	547K	30	547K	15.4	17.4	0	9.7	0.3	0.3	100.0
Total Page		78M	24M	31	24M	473	458					
Spool Devices												
Total Sp1		1803K	986K	55	986K	0	0	0	268.9	395	395	100.0

Paging Configuration:

- How many devices (11)
- Equal sizes?
- How full? (70% target?)
- Rates reasonable? Device type dependent

Report: ESADSD2 DASD Performance Analysis Velocity Software Corporate
 Monitor initialized: 08/29/18 at 20:00:35 on 2827 serial 0669C7 First record analyzed: 08/2

										<-----DASD Response times (ms)----->						
Dev	Device	<--SSCH-->	<%DevBusy>	<SSCH/sec-->			<---Service times-->				<---Queueing-->					
No.	Serial	Type	Total	ERP	Avg	Peak	avg	peak	Resp	Serv	Pend	Disc	Conn	DASD	Cntl	THR
08/29/18																
20:01:35																
Top DASD by Device busy																
2A8C	LV1P22	3390-9	392	0	1.6	1.6	6.6	6.6	2.5	2.5	0.1	2.2	0.2	0	0	0
2A9D	LV1P16	3390-9	434	0	1.6	1.6	7.4	7.4	2.1	2.1	0.1	2.0	0.1	0	0	0
2A89	LV1P19	3390-9	387	0	1.5	1.5	6.6	6.6	2.3	2.3	0.1	2.1	0.1	0	0	0
2ADA	LV1P2A	3390-9	298	0	1.5	1.5	5.1	5.1	3.0	3.0	0.1	2.7	0.2	0	0	0
2AC4	LV1P1A	3390-9	343	0	1.4	1.4	5.8	5.8	2.4	2.4	0.1	2.2	0.1	0	0	0

Page Device Analysis – DASD Subsystem

- Page Devices are usually in “top ten DASD”
- Device busy > 20% cause for concern
- Device busy > 50% serious
- Minute by minute analysis would show 30% “Peak”

Paging Analysis: ESABLKP

Report: ESABLKP Block Paging Analysis Velocity Software Corporate
 Monitor initialized: 08/29/18 at 20:00:35 on 2827 serial 0669C7 First record analyzed: 08/29/18

Time	<----Load----> <-Users-> Tran Actv In Q /sec	Serv Time (ms)	<-Block-> <-Reads-> /sec Size	<-Blocks Formed By-> <-Steal-> /sec Size	<Migrate> /sec Size	Block Fault /sec	<--Block Exceptions/sec--> <Single Read> User System	<No Refers> Migr Steal
08/29/18								
20:01:35	31 35.0 0.4	10.9	21.3 9.6	29.4 15.1	0 0	21.3	202.2	0 0 202.0
20:02:35	31 34.0 0.5	10.9	1.3 8.6	7.3 16.3	0 0	1.3	9.9	0 0 49.7
20:03:35	37 35.0 0.5	10.9	3.4 10.2	11.4 16.3	0 0	3.4	23.3	0 0 81.9
20:04:35	33 35.0 0.5	10.9	0.9 7.3	1.8 15.4	0 0	0.9	5.1	0 0 0.7
20:05:35	35 35.0 0.5	10.9	1.2 7.6	6.9 16.3	0 0	1.2	6.3	0 0 12.9
20:06:35	39 35.0 0.6	10.9	2.7 7.9	7.4 18.4	0 0	2.8	36.4	6.8 0 16.2
20:07:35	31 35.0 0.5	10.9	1.5 7.7	3.6 17.4	0 0	1.4	2.0	0 0 16.6
20:08:35	37 35.0 0.5	10.9	1.0 3.3	3.3 17.4	0 0	1.0	1.1	0 0 19.2
20:09:35	35 37.0 0.6	10.9	0.8 3.8	1.6 17.9	0 0	0.8	0.7	0 0 7.1
20:10:35								3 0 20.5

Block Paging Analysis

- Block page read – optimal 10 pages
- Migrate should be zero with 6.3 and beyond
- Pages stolen, unreferenced – Storage stress
- Single page read – goes up with 6.3

Report: ESABLKP		Block Paging Analysis							TEST MAP						
Time	<---Load--->	<Users->	Tran	Serv	<-Block->	<-Blocks Formed By->	Block	<--Block Exceptions/sec-->	<Single Read>	<No Refers>					
	Actv	In	Q	Time	<-Reads->	<-Steal->	<Migrate>	Fault	User	System	Migr	Steal			
	/sec	/sec	/sec	(ms)	/sec	Size	/sec	Size	/sec	Size	/sec	Size	/sec		
07:49:00	83	262	0.7	.	65.6	5.6	31.4	18.8	0	0	25.4	291.2	1.7	0	0

Block Paging Analysis for 6.3+

- Block page read – optimal 5 pages??
- Migrate should be zero (No expanded storage)
- Pages stolen, unreferenced – zero with 6.3
- Single page read – goes up with 6.3
- Faster paging devices? (new market for SSD)

Top down:

- Configuration
- DASD I/O for system
- Rates by control unit
- Rates by device
- Rates by minidisk (by user)
- Cache

DASD Configuration: ESADSD1

Report: ESADSD1 DASD Configuration Velocity Software Corporate

Dev No.	Sys ID	Serial	Device Type	SHR	<CHPIDS OnLn>				MDisk Links	<---Type	Extent		<---MDC Elig	St Def
					01	02	03	04			Start	Size		
E92F	1B89	V2PAG1	3390-9	NO	7A	7B	78	79	0	Page	1	10K	Yes	On
E930	1B8A	V2PAG3	3390-9	NO	7A	7B	78	79	0	Page	1	10K	Yes	On
E931	1B8B	540RES	3390-9	NO	7A	7B	78	79	0	.	.	.	No	On
E933	1B8D	V2PAG5	3390-9	NO	7A	7B	78	79	0	Page	1	10K	Yes	On
E934	1B8E	V2PAG6	3390-9	NO	7A	7B	78	79	0	Page	1	10K	Yes	On
E935	1B8F	V2PAG7	3390-9	NO	7A	7B	78	79	0	Page	1	10K	Yes	On
E936	1B90	V4SPL2	3390-9	NO	7A	7B	78	79	0	.	.	.	No	On
E937	1B91	V2PAG8	3390-9	NO	7A	7B	78	79	0	Page	1	10K	Yes	On
E938	1B92	V2PA10	3390-9	NO	7A	7B	78	79	0	Page	1	10K	Yes	On
E939	1B93	VME939	3390-9	NO	7A	7B	78	79	0	.	.	.	No	On
E93B	1B95	V2PA11	3390-9	NO	7A	7B	78	79	0	Page	1	10K	Yes	On
E93C	1B96	V2PAG9	3390-9	NO	7A	7B	78	79	0	Page	1	10K	Yes	On
E93E	1B98	VME93E	3390-9	NO	7A	7B	78	79	0	.	.	.	No	On
E93F	1B99	V2PAG2	3390-9	NO	7A	7B	78	79	0	Page	1	10K	Yes	On
E940	1B9A	V2PAG4	3390-9	NO	7A	7B	78	79	0	Page	1	10K	Yes	On
E958	1BB2	V2U011	3390-9	NO	7A	7B	78	79	113	.	.	.	Yes	On
E959	1BB3	V2U013	3390-9	NO	7A	7B	78	79	15	.	.	.	Yes	On
E95A	1BB4	V2U015	3390-9	NO	7A	7B	78	79	39	.	.	.	Yes	On
E95B	1BB5	V2U017	3390-9	NO	7A	7B	78	79	29	.	.	.	Yes	On

DASD Configuration

- Multi channels to devices
- No minidisks on page devices
- MDC enabled appropriately

Control Unit Data Rates: ESADSD2

Report: ESADSD2 DASD Performance Analysis Velocity Sof
 Monitor initialized: 04/15/11 at 10:00:00 on 2097 serial 72655 First record

```

-----
Dev          Device <--SSCH--> <%DevBusy> <SSCH/sec-> <-----DASD Response tim
No. Serial Type  Total  ERP  Avg  Peak  avg  peak  Resp  <--Service times-->
-----
11:00:00
1800 Control Unit    3000  0  0.0  0.0  3.4  3.4  0.3  0.3  0.3  0  0.0
1880 Control Unit    3000  0  0.0  0.0  3.4  3.4  0.3  0.3  0.2  0  0.0
E900 Control Unit  186192  0  0.7  1.8  210.4  530.4  3.9  3.8  0.3  0.4  3.1
E980 Control Unit    1500  0  0.0  0.0  1.7  1.7  0.4  0.4  0.4  0  0.1
EA00 Control Unit   42722  0  0.1  0.5  48.3  93.2  2.1  2.1  0.3  0.2  1.5
EA80 Control Unit    1500  0  0.0  0.0  1.7  1.7  0.4  0.4  0.3  0  0.1
-----
System:           237914  0  0.2  0.5  268.8  633.7  3.4  3.4  0.3  0.3  2.7
-----
  
```

DASD Control Units Rates, Performance ESADSD2

- By control unit shows where activity is
- Pend, indication of cache problems
- Compare control units to determine normality

Data Rates, Device Performance: ESADSD2

Report: ESADSD2		DASD Performance Analysis								Velocity Sof				
Dev	Device	<--SSCH-->	<%DevBusy>	<SSCH/sec-->	<-----DASD Response tim									
No.	Serial	Type	Total	ERP	Avg	Peak	avg	peak	Resp	Serv	Pend	Disc	Conn	
11:00:00														
Top DASD by Device busy														
E95C	V2U019	3390-9	23344	0	10.6	44.6	26.4	116.6	4.8	4.0	0.3	1.4	2.2	
E930	V2PAG3	3390-9	9170	0	6.2	19.5	10.4	29.3	5.9	5.9	0.3	0.0	5.6	
E93F	V2PAG2	3390-9	9759	0	5.9	15.8	11.0	31.7	5.3	5.3	0.3	0.0	5.0	
E93C	V2PAG9	3390-9	8101	0	5.8	17.1	9.2	29.3	6.3	6.3	0.3	0.0	6.0	
End Top DASD by Device busy														
1880	Control Unit		3000	0	0.0	0.0	3.4	3.4	0.3	0.3	0.2	0	0.0	
E900	Control Unit		186192	0	0.7	1.8	210.4	530.4	3.9	3.8	0.3	0.4	3.1	
E980	Control Unit		1500	0	0.0	0.0	1.7	1.7	0.4	0.4	0.4	0	0.1	
EA00	Control Unit		42722	0	0.1	0.5	48.3	93.2	2.1	2.1	0.3	0.2	1.5	
System:			237914	0	0.2	0.5	268.8	633.7	3.4	3.4	0.3	0.3	2.7	

DASD Rates, Performance ESADSD2

- System: rate, average service/response time
- Pend, disconnect low -> Else dasd cache
- Connect low -> Else faster channels
- Response = service, else queueing
- Peak busy for device (1 minute peak)

Data Rates, Device Performance: ESADSD2

Report: ESADSD2 DASH Performance Analysis Velocity Software Corporat
 Monitor initialized: 08/29/18 at 20:00:35 on 2827 serial 0669C7 First record analyzed: 08/

```

-----DASH Response times (ms)-----
Dev          Device <--SSCH--> <%DevBusy> <SSCH/sec->          <--Service times--> <--Queueing-->
No. Serial  Type  Total  ERP  Avg  Peak  avg  peak  Resp  Serv Pend Disc Conn DASH Cntl THR
-----
08/29/18
20:01:35
***Top DASH by Device busy***
2A8C LV1P22 3390-9    392    0    1.6  1.6    6.6  6.6    2.5  2.5  0.1  2.2  0.2    0    0    0
2A9D LV1P16 3390-9    434    0    1.6  1.6    7.4  7.4    2.1  2.1  0.1  2.0  0.1    0    0    0
2A89 LV1P19 3390-9    387    0    1.5  1.5    6.6  6.6    2.3  2.3  0.1  2.1  0.1    0    0    0
***End Top DASH by Device busy***
2200 Control Unit    1075    0    0.0  0.0   18.2  18.2    0.7  0.7  0.1  0.5  0.1    0    0    0
2479 L20804 3390-3     297    0    0.3  0.3    5.0  5.0    0.6  0.6  0.1  0.2  0.3    0    0    0
-----
2400 Control Unit    1248    0    0.0  0.0   21.2  21.2    0.4  0.4  0.1  0.2  0.1    0    0    0
  
```

DASH Rates, Performance ESADSD2

- System: rate, average service/response time
- Pend, disconnect low -> Else dasd cache
- Connect low -> Else faster channels
- Response = service, else queueing
- Peak busy for device (1 minute peak)

V2: DASD Cache: ESADSD5

Report: ESADSD5 3990-3 Cache Analysis Velocity Software Corporate ZM
Monitor initialized: 08/29/18 at 20:00:35 on 2827 serial 0669C7 First record analyzed: 08/29/18

```
-----  
Pct. <-----per second-----> <-----Write activity per se  
Dev      Actv <-----Total-----> <----Read----> <--Seq Read--> Total    DFW    DFW    SEQ      NVS  
No.    Serial Samp    I/O Hits Hit% Read%    I/O Hits Hit%    I/O Hits Hit%    I/O    I/O Hits    I/O Hit% Full  
-----  
08/29/18  
20:01:35  
***Top DASD by Device busy***  
2A8C    LV1P22    100    9.0    5.3 58.7    88.6    8.0    4.3 53.3      0      0      0      1.0    1.0    1.0    0.2    100      0  
2A9D    LV1P16    100    8.7    4.6 52.1    95.4    8.3    4.2 49.8      0      0      0      0.4    0.4    0.4    0.1    100      0  
2A89    LV1P19    100    8.1    4.1 50.1    91.0    7.4    3.3 45.1      0      0      0      0.7    0.7    0.7    0.1    100      0  
***End Top DASD by Device busy***  
  
-----  
2200 CtlUnit    100    17.5    14.6 83.7    49.0    5.3    2.7 51.1    3.3    3.0 91.5    8.9    8.9    8.9    2.8    100      0  
  
2479    L20804    100    4.9    3.3 67.5    92.2    2.6    1.1 44.2    2.0    1.8 91.5    0.4    0.4    0.4    0.0    100      0  
  
-----  
2400 CtlUnit    100    19.8    16.5 83.4    65.8    9.7    6.7 68.8    3.3    3.0 92.3    6.8    6.8    6.8    2.3    100      0  
-----
```

DASD Cache: ESADSD5

- Hit percent (read, write)
- Low hit% -> need more cache or batch (backups)
- NVS full -> fast write stops
- Data shows activity from all lpars to device/ctl unit

Data activity by user: ESASEEK, ESAUSEK

Report: ESAUSEK User DASD Seeks Report Velocity
Monitor initialized: 04/15/11 at 10:00:00 on 2097 serial 72655 First re
Monitor period: 3600 seconds (1:00:00) Last rec

```
-----  
Userid      Dev Volume <--Minidisk-> <Cylinder-> Total <---Non-zero---> Read  
/Time       No. Serial Ownerid  Addr Start Stop  Seeks Seeks Pct. Dist. Pct.  
-----  
*****Summary*****  
Average:  
LNXUWA01    E95C V2U019 LNXUWA01 0233 40591 40722    2389    1699 71.1    9685     0  
EA59 V2U016 LNXUWA01 0210        1 16698 14762    9854 66.8    2220     0  
E903 V2U034 LNXUWA01 021F 15207 32689    7542    4394 58.3    1578 16.6  
E903 V2U034 LNXUWA01 0220 32986 33350        63        63 100    10459     0  
E95A V2U015 LNXUWA01 0209        1 12084 10345    4849 46.9    4981 28.4  
E95A V2U015 LNXUWA01 020A 12085 19617    2608    2024 77.6    8521     0  
E95A V2U015 LNXUWA01 020F 52329 53478        24        16 66.7    33363     0  
E926 V2U041 LNXUWA01 0232    6062    7598    2239    1544 69.0    4294     0  
E95B V2U017 LNXUWA01 021E 26231 28597        42        36 85.7    10207     0  
E95E V2U023 LNXUWA01 0204 63268 63850        675        327 48.4    21376     0  
EA58 V2U014 LNXUWA01 0205    3029    3033        3        2 66.7    31999     0
```

DASD activity by virtual machine: ESAUSEK

DASD activity by minidisk/volume: ESASEEK

- Correlate activity to poor performing disks
- Note read percent for Linux minidisks

Network Activity

- Configuration
- Rates
- Errors
- Vswitch/guest lan

Network Configuration: ESATCPI

Report: ESATCPI TCPIP Interface Configuration Report Velocity Sof
Monitor initialized: 04/15/11 at 10:00:00 on 2097 serial 72655 First record
Monitor period: 3600 seconds (1:00:00) Last record:

```
-----  
NODE      Idx      Speed <-Status-> Up    <-----Interface-----  
          Nbr MTU   (Est) Oper Admin Time MACAddress      Description Type  
-----
```

*****Summary*****

```
Average:  
TCPIP      1  1500 1000M      .      .      .      .      ETHERNET viETHERNET-  
VMLOCAL    1  1500 1000M      UP     UP     0 00:20:20:20:20:20 ETHERNET viETHERNET-  
LINUXVM2   2  1500 100M        UP     UP     0 02:00:00:00:00:30 eth0      ETHERNET-  
LNXDPOB02  3  1492 100M        UP     UP     0 02:00:00:00:00:04 eth0      ETHERNET-  
V2TPSP01   1 16436 10M         UP     UP     0 00:20:20:20:20:20 lo        Software  
           2  1500 100M        UP     UP     0 02:00:00:00:00:15 eth0      ETHERNET-  
V2TMSP05   1 16436 10M         UP     UP     0 00:20:20:20:20:20 lo        Software  
           2  1500 100M        UP     UP     0 02:00:00:00:00:09 eth0      ETHERNET-  
V2TMSP02   1 16436 10M         UP     UP     0 00:20:20:20:20:20 lo        Software  
           2  1500 100M        UP     UP     0 02:00:00:00:00:06 eth0      ETHERNET-  
V2TMSP03   1 16436 10M         UP     UP     0 00:20:20:20:20:20 lo        Software  
           2  1500 100M        UP     UP     0 02:00:00:00:00:07 eth0      ETHERNET-  
LNXUWA01  1 16436 10M         UP     UP     0 00:20:20:20:20:20 lo  
           4 1492 100M        UP     UP     0 02:00:00:00:00:22 eth0
```

Interface configuration

- Ethernet adapter
- Loop back
- MTU check

Network Configuration: ESATCPI

Report: ESATCPI TCPIP Interface Configuration Report Velocity Software Corpo
Monitor initialized: 08/29/18 at 20:00:35 on 2827 serial 0669C7 First record analyzed:
Monitor period: 3600 seconds (1:00:00) Last record:

```
-----  
NODE      Idx      Speed <-Status-> Up    <-----Interface-----  
          Nbr MTU   (Est) Oper Admin Time MACAddress      Description Type  
-----
```

*****Summary*****

Average:

L10CU	1	16436	10M	UP	UP	0	00:20:20:20:20:20	lo	Software LoopBack
	2	1492	10G	UP	UP	0	02:78:C1:01:0C:00	eth0	ETHERNET-CSMACD
	3	1492	10G	UP	UP	0	02:78:C1:01:0C:01	eth1	ETHERNET-CSMACD
L20BP	1	16436	10M	UP	UP	0	00:20:20:20:20:20	lo	Software LoopBack
	2	1492	10G	UP	UP	0	02:78:C1:02:0B:00	eth0	ETHERNET-CSMACD
	3	1492	10G	UP	UP	0	02:78:C1:02:0B:01	eth1	ETHERNET-CSMACD
L20DP	1	16436	10M	UP	UP	0	00:20:20:20:20:20	lo	Software LoopBack
	2	1492	10G	UP	UP	0	02:78:C1:02:0D:00	eth0	ETHERNET-CSMACD
	3	1492	10G	UP	UP	0	02:78:C1:02:0D:01	eth1	ETHERNET-CSMACD
L24BP	1	16436	10M	UP	UP	0	00:20:20:20:20:20	lo	Software LoopBack
	2	1492	10G	UP	UP	0	02:78:C1:02:4B:00	eth0	ETHERNET-CSMACD
	3	1492	10G	UP	UP	0	02:78:C1:02:4B:01	eth1	ETHERNET-CSMACD

Interface configuration

- Ethernet adapter
- Loop back
- MTU check

Network Data Rates: ESATCP4

```
Report: ESATCP4          TCPIP Hardware Layer/Interfaces Report          Velocity Software Corp
Monitor initialized: 08/29/18 at 20:00:35 on 2827 serial 0669C7      First record analyzed:
-----
Date/          <Total Octets> Avg   <-Subnet packets / Sec-> <-----Packets Discarded----->
Time          <-Per second->   Q   <-Unicast-> <NonUnicast> <In Error> <NonError> Unknown
Node          IFT Input  Output  Len  Input Output Input Output Inpt Output Inpt Output Protocol
-----
08/29/18
20:01:35
***Node Groups***
KeyUser  -  0 61803   12635      0 100.0  58.7      0    1.25      0  1.33      0      0      0
*Prod    -  0 728K  829279      0  1267  1221 520.4      0      0      0  9.19      0      0
*Util    -  0 3884  1851.0      0 11.70   2.7 36.43      0      0      0      0      0
TheUsrs  -  0 3537  1911.6      0  2.91   3.6 37.01      0      0      0      0      0
*** Nodes *****
L24BP    -  1 96.61   96.61      0  0.63   0.6      0      0      0      0      0
          -  2 5210   14818      0 24.11  29.3      0      0      0      0      0
          -  3 2874      0          0      0      0 34.08      0      0      0      0
```

Network activity, server, by interface
Understand rates
Check for errors

Network Data Rates: ESATCP4

```
Report: ESATCP4          TCPIP Hardware Layer/Interfaces Report          Ve
-----
Date/      <Total Octets> Avg  <-Subnet packets / Sec-> <-----Pack
Time      <-Per second->   Q  <-Unicast-> <NonUnicast> <In Error>
Node      IFT  Input  Output  Len  Input Output Input Output Inpt Output
-----
11:00:00
*** Nodes *****
TCPIP    - 1 16897 6231.9      0 25.74 21.3      0      0      0      0
VMLOCAL  - 1 16859 6223.3      0 25.70 21.3      0      0      0      0
LINUXVM2 - 2 93.06 208.92      0 0.38 0.4        0      0      0      0
LNXDPA02 - 3 293.8 590.32      0 2.25 2.4        0      0      0      0
V2TPSP01 - 1 418.3 418.26      0 1.54 1.5        0      0      0      0
          - 2 188.6 666.61      0 0.95 1.2        0      0      0      0
V2TMSP05 - 1 323.6 323.61      0 6.16 6.2        0      0      0      0
          - 2 1517 2481.8      0 4.70 4.5        0      0      0      0
LNXDMS2A - 3 103.4 299.74      0 0.47 0.6        0      0      0      0
LN XUWA01 - 1 21167 21167      0 57.81 57.8      0      0      0      0
          - 4 109K 122K      0 236.9 268.5     0      0      0      0
LN XDWA02 - 1 920.2 920.23      0 5.03 5.0        0      0      0      0
          - 4 9112 10306      0 25.84 24.3      0      0      0      0
```

Network activity, server, by interface
Understand rates
Check for errors

QDIO Data Rates: ESAQDIO

Report: ESAQDIO Queued I/O Report Velocity Software Corpor
 Monitor initialized: 04/15/11 at 10:00:00 on 2097 serial 72655 First record analyzed: 0

Date/ Time	Dev. Nmbr	owner	Virt DevN	QDIO Fmt	Number <QDIO SIGA Instructions/Sec->				<-Throughput / sec->						
					Queues	In	Out	Read	Writ	"s"	Read	Writ	"s"	<Buffers>	<---Bytes-->
11:00:00	0000	Totals	0000	QDIO	0	0	0	0	0	693	0	1066	676	644K	422K
	F3D8	VSWCTRL2	F3D8	QDIO	1	1	0	0	0	573	0	895	535	527K	306K
	F3E0	VSWCTRL2	F3E0	QDIO	1	1	0	0	0	119	0	171	141	118K	117K
	F53E	LN XUWA02	7002	HPER	1	4	0	0	0	0.6	0	1	0	89	0
*****Summary*****															
Average:	0000	Totals	0000	QDIO	0	0	0	0	0	639	0	1040	621	615K	441K
	F3C8	VSWCTRL1	F3C8	QDIO	1	1	0	0	0	0	0	0	0	0	0
	F3D8	VSWCTRL2	F3D8	QDIO	1	1	0	0	0	530	0	891	491	529K	322K
	F3E0	VSWCTRL2	F3E0	QDIO	1	1	0	0	0	108	0	149	130	85716	119K
	F3F0	VSWCTRL1	F3F0	QDIO	1	1	0	0	0	0	0	0	0	0	0
	F515	LN XDPB02	7002	HPER	1	4	0	0	0	0	0	0	0	0	0
	F518	LN XDWA01	7002	HPER	1	4	0	0	0	0	0	0	0	0	0
	F53B	LN XUWA01	7002	HPER	1	4	0	0	0	0	0	0	0	0	0
	F53E	LN XUWA02	7002	HPER	1	4	0	0	0	0.6	0	1	0	92	0
	F542	LN XUWA03	7002	HPER	1	4	0	0	0	0	0	0	0	0	0
	F545	LN XUWA04	7002	HPER	1	4	0	0	0	0	0	0	0	0	0
	F548	LN XDMS2A	7002	HPER	1	4	0	0	0	0	0	0	0	0	0

QDIO activity

- Hipersockets
- Virtual switch

QDIO Data Rates: ESAQDIO

Report: ESAQDIO Queued I/O Report Velocity Software Corpor
 Monitor initialized: 08/29/18 at 20:00:35 on 2827 serial 0669C7 First record analyzed: 0

Date/ Time	Dev. Nmbr	owner	Virt DevN	QDIO Fmt	Number		<QDIO SIGA		Instructions/Sec->		<-Throughput / sec->		<---Bytes-->			
					Queues	In Out	<---Guest----	<----CP----->	Read	Writ	"s"	Read	Writ	"s"	Sent	From
08/29/18																
20:01:35	0000	Totals	0000	QDIO	0	0	0	0	0	0	815	0	3511	1711	101M	842K
	1790	DTCVSW1	0600	QDIO	1	1	0	0	0	0	130	0	195	117	150K	150K
	7584	L24BP	7584	FCP	1	1	0	0	0	0	0	0	4	4	51939	0
	7588	L24FP	7588	FCP	1	1	0	0	0	0	0	0	57	28	2212K	0
	758E	L10CU	758E	FCP	1	1	0	0	0	0	0	0	2	2	3519	0
	759D	L25FP	759D	FCP	1	1	0	0	0	0	0	0	3	3	78867	0
	75C4	L24BP	75C4	FCP	1	1	0	0	0	0	0	0	4	4	48033	0

QDIO activity

- Hipersockets
- Virtual switch

Guest Lan / Virtual Switch Data Rates: ESANIC / ESATCP4

Report: ESANIC Virtual NIC Activity Report Velocity Software Corporate
 Monitor initialized: 08/29/18 at 20:00:35 on 2827 serial 0669C7 First record analyzed: 08/29/18

Date/Time	Virt	NIC	Tranp	<---network lock requests--->				<-stack->		<-bytes->		<-----Pack				
Userid	Virtual	Devc	BASE	/type	<---Per Second-->	waits/sec	wait	</second>	</Second>	<-Rate-->						
	LanName	ADDR	ADDR		Ntwrk	send	rcv	send	rcv	time	rqst	dfrd	Sent	Rcvd	Sent	Rcvd
08/29/18																
20:01:35																
L233P	VSW4	0340	0340	02/02	579.8	580	175	0	0	0.1	595	0	497K	474K	598	595
L233P	VSW4	0360	0360	02/02	98.4	98.4	60.2	0	0	0.0	82.8	0	24K	25K	100	82.8
L24BP	VSW5	0360	0360	02/02	12.8	12.8	8.2	0	0	0	10.5	0	6699	2580	12.9	10.5

Screen: **ESATCP4** Velocity Software - VSIWM4
 1 of 2 TCPIP Hardware Layer / Interfaces

Time	Node/ Group	Interface	<Total Octets>	
			<-Per second->	
			Input	Output
15:24:00	redhat71	enccw0.0.	390.87	584.07
	redhat71	lo	0	0
	redhat64	eth0	918.03	1908
	redhat64	lo	0	0
	redhat6x	eth0	818.33	1900
	redhat6x	eth1	0.47	0
	redhat6x	lo	3059	3059
	redhat6	eth0	1862	4660
	redhat6	lo	0	0

Guest lan / virtual switch activity

- ESANIC: CP Monitor data
- ESATCP4: SNMP data
- Compare “received to input”
- Redhat7 renamed eth0

Report: ESAOSA OSA System Configuration Report
Monitor initialized: 06/15/16 at 00:00:00 on 2828 seria

```
-----  
Collector <-----OSA Configuration--> MacAddress  
Node       Idx   Name   Nbr   Type Level Shrd Active  
-----  
06/15/16  
00:15:00  
OSA178       2   OSA1     0 1G Eth 6.00   Yes 6CAE8B483FD4  
  
redhat6x     3   OSA1     0 1G Eth 6.00   Yes 6CAE8B483FD4
```

OSA data collected via snmp

- Configuration data
- Total data
- Data by LPAR if shared
- (New with 4.3)

Report: ESAOSA Velocity Software Corporate Z
Monitor initialized: 06/15/16 at 00:00:00 on 2828 seria 314C7
First record analyzed: 06/15/16

```
-----  
Collector <----- LPAR Bus    CPHID   KBytes/Sec   Packets/sec  
Node       Idx   Name   NBR Util Util       IN    OUT       In    OUT  
-----  
  
OSA178       2   OSA1   Tot    0   15    4.0   8.1   25.5   16.7  
              2    0    .     53    15  
              4    0    .    288   291  
              5    0    .     59    55  
  
redhat6x     3   OSA1   Tot    0   15   12.7   5.3   26.8   16.8  
              1    0    .     2     56  
              2    0    .    61    15  
              4    0    .    312   400  
              5    0    .     59    55
```