

Monitoring z/OS efficiently and effectively with Velocity Software's new zOSMON Performance Management for z/OS Offering

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**“If you can't Measure it,
I am Just Not Interested™”**



- **2020 at Velocity Software**
 - Metal to cloud in 2 days...
- **zVPS Version 5 supports Z**
- **Performance Management**
 - zVPS – Velocity Software Performance Suite
- **zOSMON**

2020 At Velocity Software

- **zVPS Version 5 released in January**
- **Went to SHARE, CMG/Germany**
- **March flew on Friday the 13th, then Lockdown???**
- **Datacenter Move (California to Ohio)**
 - Vicom Infinity worked to get Velocity Software into ESP
 - Z15 T02 ESP, New DS8910F disk subsystem
 - Metal to cloud in 2 days after code 20 (includes formatting disks)
 - “<http://VelocitySoftware.com/metal.html>”
- **Moved websites during interesting times**
 - VelocitySoftware.com, VMWORKSHOP.ORG, others
- **Moved VSI Development seamlessly**
 - Moved Linux, zVSE, z/OS servers

zVPS Version 5 is a MAJOR release

- z/VM support of latest and greatest
- **Linux subsystem support enhanced**
 - Docker, MongoDB, GPFS
- **zOSMON: new feature of zVPS**
 - Very efficient SMF processing for z/OS Performance MGMT
 - (SMF 70, 30, 110), more to come
 - 20 Reports/displays, 50 graphs, more to come
- **VSEMON no Charge Feature of zVPS**
 - z/VSE Support
 - TCPIP Support: BSI Stack, CSI Stack
 - CICS
- **IBM Secure Service Container Support**

Performance Management Requirements

Single pane of glass

- No enterprise has only one platform
- One user interface minimizes learning curves
- Evaluate multiple systems, platforms, networks in one view

Minimize Overhead of performance management

- Processor Costs of performance management can be large
- Many installations run 15-minute granularity to reduce overhead
- “Only run this when there is a problem” is not management

A target of less than 1% of CPU resource for performance management is a reasonable target

Performance Management: Performance Analysis

Why Performance Analysis: Service Level Mgmt

- Diagnose problems real time (**ONE MINUTE GRANULARITY....**)
- PLATFORM SPECIFIC....
- Analyze all z/VM subsystems in detail, real time
 - (DASD, Cache, Storage, Paging, Processor, TCPIP)
- Analyze Linux
 - (applications, processes, processor, storage, swap)
- Analyze z/OS
 - Subsystems (disk, CPU), jobs, CICS
- **Historical view of same data important**
 - Why are things worse today than yesterday?
 - Did adding new workload affect overall throughput?
 - Know who/what is using resource and how to re-allocate

Performance Management Requirements

Why Capacity Planning: Future Service Levels

- How many more servers / workload can you support with existing z15?
- What is capacity requirements for an application? (on
- **Avoid crisis *in advance***

Why Chargeback?

- Distributed chargeback model is by server (does NOT port to Z!)
- Shared chargeback model is by resource consumption
- **Encourages efficient/effective resource use**
- Align IT to your business model

Operational Requirements

- Operations will manage 100's (1000's) of servers
- Requires active performance management
- **Alerts** for processes in loops, disks 90% full, missing processes
- **zALERT always needed (One Minute Granularity)**
- **zOPERATOR, if no enterprise monitor, or do it anyway**

zVPS does “End to End” Performance Management

- **Management wants**
 - “single pane of glass” - One tool that does all (**and well**)
- **Complete performance management includes:**
 - z/VM System Level: CEC, LPAR data, ALL Subsystems
 - Linux – Storage, CPU, file system, network
 - Process level – applications, performance data
 - Network monitor
 - z/VSE: partitions, CPU, I/O, CICS, TCPIP (BSI,CSI)
 - **z/OS: CICS(110), BATCH (30), SYSTEM (70)**
- **Application subsystem analysis**
 - Java, WAS, Oracle, MongoDB, Docker
- **Outside “Z” server platform analysis**
 - Linux on “x”, VMWare, KVM, Secure Service Container
 - Microsoft servers
 - VPN, gateways, utilities

Why zOSMON™?

- **Velocity Software over 30+ years, in 25 countries:**
 - VM/XA, VM/ESA, z/VM
 - Network management
 - Linux management
 - Distributed servers
 - z/VSE
 - Now z/OS
- **Why z/OS now?**
 - Many customer requests for zVIEW presentation of z/OS data
 - z/OS performance management overhead is the target
 - One minute granularity at extremely low overhead
 - zVPS performance data storage and presentation easily extended

zVPS Architecture Overview

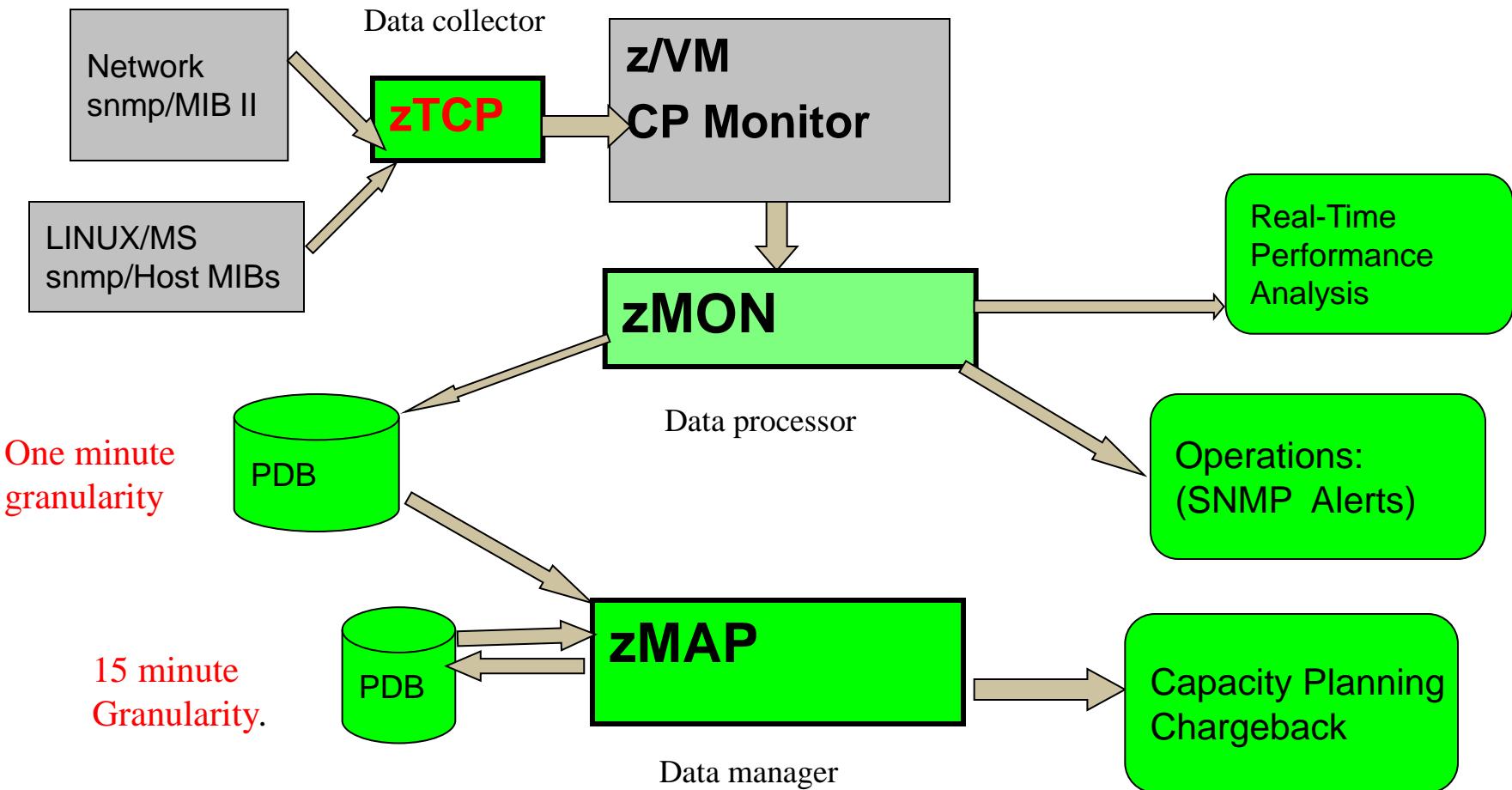
zVPS Basic Architecture

- z/VM, CMS based architecture
- Requires one small z/VM based LPAR
- (z/VM is a VERY **simple and elegant** platform)
- z/VM Designed for efficiency
- zVPS has **VERY Low resource consumption**
- Native Web Server provided
- **EVERYTHING (z/VM, zVPS) INSTALLS IN LESS THAN 2 DAYS**

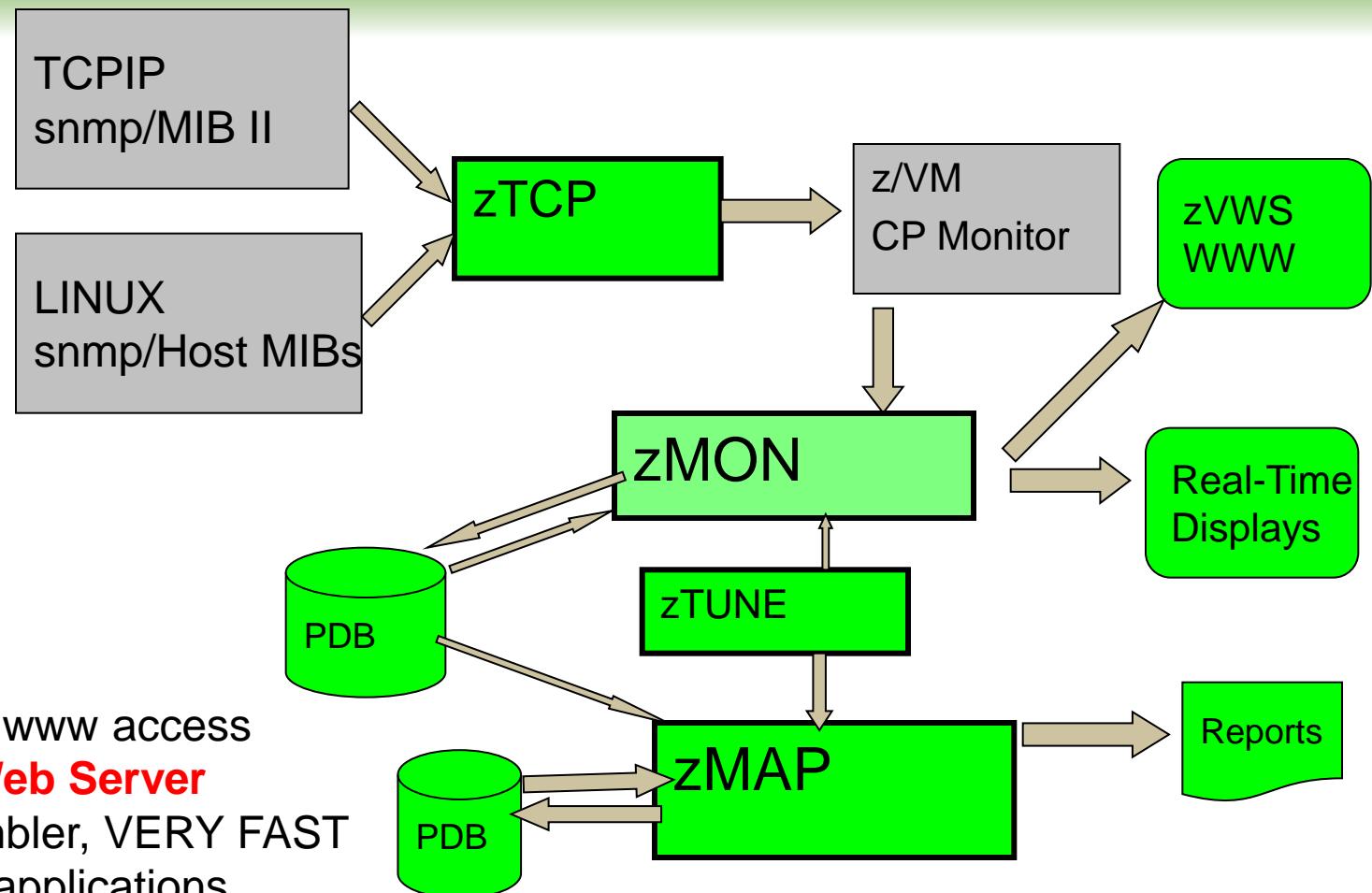
Data Sources – **All are architected interfaces**

- z/VM: CP Monitor
- Linux, MS, Distributed: snmp – **VERY EFFICIENT**
- z/OS: SMF – low cost, architected
- z/VSE: snmp, DMF
- IBM Secure Software Container: collectd

Linux Monitoring Technology



Modernize: Webserving, performance skills



ZVWS Provides www access

NATIVE z/VM Web Server

Written in assembler, VERY FAST

Many customer applications....

zTUNE: Rules based analysis

zVPS Enterprise View – All LPARs in Enterprise

Tailorable, expandable, zoomable

Today is Monday 2 Dec 2013 zVIEW Version 4159

VELOCITY SOFTWARE

Enterprise View - Velocity Software - VSIVM4 (DEMO)

First level

VSIVM1	Expand	VSIVM2	Expand	VSIVM3(old)	Expand
VM1 13/12/02 18:29 CP Total (2) 6.63%		VM2 13/12/02 18:29 IFL Total (1) 0.91%		VM3 13/12/02 21:29 024B42-0 99.22%	
Linux Nodes (Distributed Servers)					
LINUX9 (9) 3.93%		RH5X161 0.43%		000000-64 99.22%	
suselnx3 (9) 2.57%		RH5Z161 0.37%		Linux Nodes (z/VM-Guests)	
REDHAT (2) 2.30%				LES11T 2.29%	
				Linux Nodes (Distributed Servers)	
				PENSUSE 7.68%	

Demo System V4

Demo	13/12/02	18:29	IFL Total (1)	17.77%	Linux Nodes (z/VM-Guests)
robixl	2.83%				
redhat6	1.18%				
oracle	0.82%				
redhat56	0.47%				
redhat5x	0.43%				
lxsugar (2)	0.41%				
redhat64	0.31%				
sles8 (2)	0.31%				
sles10	0.29%				
redhat5	0.27%				
redhat3	0.25%				
redhat6x	0.24%				
suselnx2	0.22%				
sles11 (2)	0.22%				
sles11x	0.20%				
sles11x3	0.19%				
sles9x	0.18%				
ses10s	0.17%				
sles10x4	0.17%				
sles9	0.16%				
Linux Nodes (Distributed Servers)					
linux93 (2)	100.00%				
opensuse (2)	8.97%				
JIRA (2)	5.88%				
vpnbrz	5.50%				
vpnbrc	4.76%				
mail (9)	3.42%				
vpnz	2.35%				

Second level

Tim Test System	Expand
TimL2 13/11/27 13:09 IFL Total (1) 0.10%	
Linux Nodes (z/VM-Guests)	
1.85%	
1.50%	
0.85%	
0.57%	

zVIEW Linux performance in one click

Wednesday 7 Nov 2018 00:46

zVIEW Version 4310



Menu

mylinux ? B P X

ESALNXC - Linux Process Con... D B P ? X

ESALNXP - VSI Linux Percent Usage by Process - DEMO D B P ? X

Time	Node	Name	ID	PPID	GRP	Tot	sys	user	syst	usr	valu	Size	RSS	Peak	Swap	Data	Stk	EXEC				
00:46:00	ZSXL0006	lxdb2001	*Totals*	0	0	0	0.6	0.1	0.1	0.1	0.3	0	0	4549	322	4557	0	1391	4.8	3.8	14	
00:46:00	ZSXL0006	lxdb2001	init	1	1	1	0.0	0.0	0.0	0.0	0.0	0	0	20	2.4	0.9	2.4	0	0.2	0.1	0.0	1
00:46:00	ZSXL0006	lxdb2001	snmpd	2200	1	2199	0.1	0.1	0.1	0	0	-10	10	29.7	13.4	37.1	0	17.3	0.1	0.0	1	
00:46:00	ZSXL0006	lxdb2001	cron	2223	1	2223	0.1	0	0	0.0	0.0	0	0	20	2.6	0.9	2.7	0	0.2	0.1	0.0	1
00:46:00	ZSXL0006	lxdb2001	db2fmcld	2245	1	2245	0.4	0	0	0.1	0.3	0	0	20	50.9	13.9	51.0	0	3.5	0.2	0.1	4
00:46:00	ZSXL0006	lxdb2001	db2sysc	2833	2831	2833	0.0	0.0	0	0	0	0	0	20	877	91.6	877	0	262	0.1	0.1	1
00:46:00	ZSXL0006	lxora12	*Totals*	0	0	0	1.2	0.3	0.9	0.0	0.0	0	0	0	3970	724	4197	115	1845	6.6	7.4	4
00:46:00	ZSXL0006	lxora12	amdzxma0	1503	1	1503	0.0	0	0.0	0	0	0	0	20	250	10.1	314	0.9	66.3	0.1	0.4	26

ESAHST2 - LINUX HOST Storage Analysis Report - DEMO D B P ? X

Time	Node/ Group	Index	<-Utilization->	<MegaByte>	Pct	Alloc	Storage	
00:46:00	ZPRO	0	196K	109K	55.7	0	1K	Totals
00:46:00	VPNS	0	5376	5376	100	0	1K	Totals

ESAUCD2 - LINUX UCD Memory Analysis Report - DEMO D B P ? X

Time	Node/ Group	Total	<Real Storage (MB)>	<-SWAP Storage (MB)-->	Total	<-Storage in Use (MB)>	Alloc	Storage											
00:46:00	ZPRO	4609	2	1422	2186	8	2076	2016	10	4	107	F	4260	8	A	252	4	1079	0

ESAUCD4 - LINUX UCD System Statistics Report - DEMO D B P ? X

Time	Node/ Group	Total	<Processor Pct Util>	Idle	<-Swaps->	<-Disk IO->	Switch Intrpt	<-Load A	<-Memory Util>	<-Swap Util>	<-Disk Util>	<-Network Util>	<-CPU Util>	<-Memory Util>	<-Swap Util>	<-Disk Util>	<-Network Util>	<-CPU Util>
00:46:00	ZPRO	2.7	1.2	1.4	0	1188	0	0	56.7	2080.5	1023.7	0.49	0	0	0	0	0	0
00:46:00	VPNS	10.1	4.2	5.9	0	389	0	0	0	180.5	733.9	0.33	0	0	0	0	0	0

ESAHST4 - LINUX HOST System Statistics Report - DEMO D B P ? X

Time	Server	Num Users	<Processes>	StGsz	<-Local-->	System	<-System Initialization>
00:46:00	ZSXL0006	0	52	0	202	0	2010/11/07 00:46:00

LPAR... D B P ? X

IFL Utilization

Legend: VSIVM5 IFL, VSIVM2 IFL, VSIVM1 IFL, VSIVM4 IFL, Overhead IFL

Y-axis: 0, 67, 133, 200

X-axis: 15, 20, 25, 30, 35, 40, 45, 50, 55, 60

zVPS Enterprise View

Did I say scalable? A lot of LPARS....

“some installation”

Enterprise Performance Summary - “some installation”

Search JASS Inventory

DC1

V1P1	Expand	V1P2	Expand	V1P3	Expand	V1P4	Expand
V1P1 08:48 IFL Total (48) 776.64%		V1P2 08:48 IFL Total (48) 1144.68%		V1P3 08:48 IFL Total (48) 879.69%		V1P4 08:48 IFL Total (48) 1063.58%	
V1N1	Expand	V1N2	Expand	P105	Expand	P106	Expand
V1N1 08:48 IFL Total (18) 917.16%		V1N2 08:48 IFL Total (24) 837.35%		P105 08:48 IFL Total (40) 473.80%		P106 08:48 IFL Total (40) 671.12%	
P107	Expand	P108	Expand	P109	Expand	P110	Expand
P107 08:48 IFL Total (40) 1016.40%		P108 08:48 IFL Total (20) 594.27%		P109 08:48 IFL Total (24) 763.91%		P110 08:48 IFL Total (12) 177.45%	
P113	Expand	P114	Expand				
P113 08:48 IFL Total (24) 858.13%		P114 08:48 IFL Total (24) 576.48%					

DC2

V2P1	Expand	V2P2	Expand	V2P3	Expand	V2P4	Expand
V2P1 08:48 IFL Total (48) 296.63%		V2P2 08:48 IFL Total (48) 846.38%		V2P3 08:48 IFL Total (48) 812.27%		V2P4 08:48 IFL Total (48) 669.41%	
V2P5	Expand	V2P6	Expand	P207	Expand	P208	Expand
V2P5 08:48 IFL Total (40) 597.33%		V2P6 08:48 IFL Total (40) 458.40%		P207 08:48 IFL Total (56) 1429.15%		P208 08:48 IFL Total (64) 1865.63%	
P209	Expand	P210	Expand	P211	Expand	P212	Expand
P209 08:48 IFL Total (56) 1572.48%		P210 08:48 IFL Total (64) 1729.40%		P211 08:48 IFL Total (44) 1222.53%		P212 08:48 IFL Total (44) 895.74%	
P213	Expand	P214	Expand	P215	Expand	P216	Expand
P213 08:47 IFL Total (40) 1173.87%		P214 08:48 IFL Total (56) 1265.42%		P215 08:48 IFL Total (56) 1400.97%		P216 08:48 IFL Total (40) 1207.33%	
P217	Expand	P218	Expand	P219	Expand	P220	Expand
P217 08:48 IFL Total (40) 275.85%		P218 08:48 IFL Total (40) 768.81%		P219 08:48 IFL Total (48) 656.31%		P220 08:47 IFL Total (44) 495.74%	
C203	Expand	C204	Expand	C205	Expand	C206	Expand
C203 08:48 IFL Total (32) 462.11%		C204 08:48 IFL Total (32) 588.38%		C205 08:48 IFL Total (20) 195.26%		C206 08:47 IFL Total (20) 685.34%	
C207	Expand	C208	Expand	V2N1	Expand	V2N2	Expand
C207 08:48 IFL Total (24) 649.58%		C208 08:48 IFL Total (24) 792.82%		V2N1 08:48 IFL Total (20) 965.03%		V2N2 08:48 IFL Total (20) 1034.47%	
V2N3	Expand	V2C1	Expand	V2C2	Expand		
V2N3 08:48 IFL Total (20) 490.91%		V2C1 08:48 IFL Total (24) 974.38%		V2C2 08:48 IFL Total (24) 123.27%			

CDL

VLB1	Expand	VLB2	Expand	VLB3	Expand	VLB4	Expand
VLB1 08:48 IFL Total (52) 2849.84%		VLB2 08:48 IFL Total (36) 2868.00%		VLB3 08:48 IFL Total (40) 2373.59%		VLB4 08:48 IFL Total (38) 2391.49%	
VLB5	Expand	VLB6	Expand	VLB8	Expand	ZS01	Expand
VLB5 08:48 IFL Total (48) 5460.2%		VLB6 08:48 IFL Total (28) 2387.44%		VLB8 08:48 IFL Total (24) 1623.31%		ZS01 08:48 IFL Total (16) 13.72%	
ZS02	Expand	VLBX	Expand	HIL1	Expand	HIL2	Expand
ZS02 08:48 IFL Total (16) 9.82%		VLBX 08:48 IFL Total (3) 25.94%		HIL1 08:48 IFL Total (64) 55.85%		HIL2 08:48 IFL Total (60) 92.92%	

Customers ask for it:

- Efficient (Performance MGMT takes too many MSU)
- Fast: Real time monitoring is not a two minute response
- Centralized Data: How many LPARs can we do?
- Don't want to learn SMF
- Inexpensive:
- Performance monitoring is not 15 minute granularity

My objective: Low cost performance management

- Real time Performance Analysis
- Easy Capacity Planning
- Chargeback capabilities
- Operational Alerts

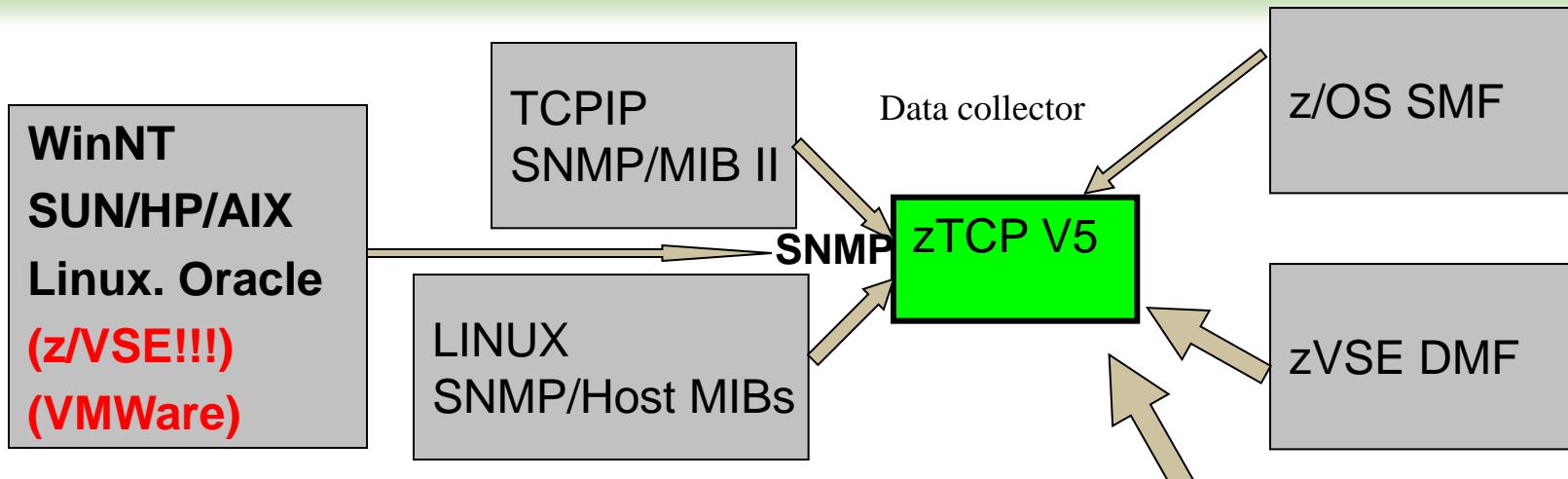
z/VM Required

- A “one off Ipar” easily implemented (easily maintained too)
- If supporting Linux on IFLs, z/VM runs on IFL

z/OS requirements

- SYSPLEX mode, even if only one member
- Logstream mode
- Agent easily installed

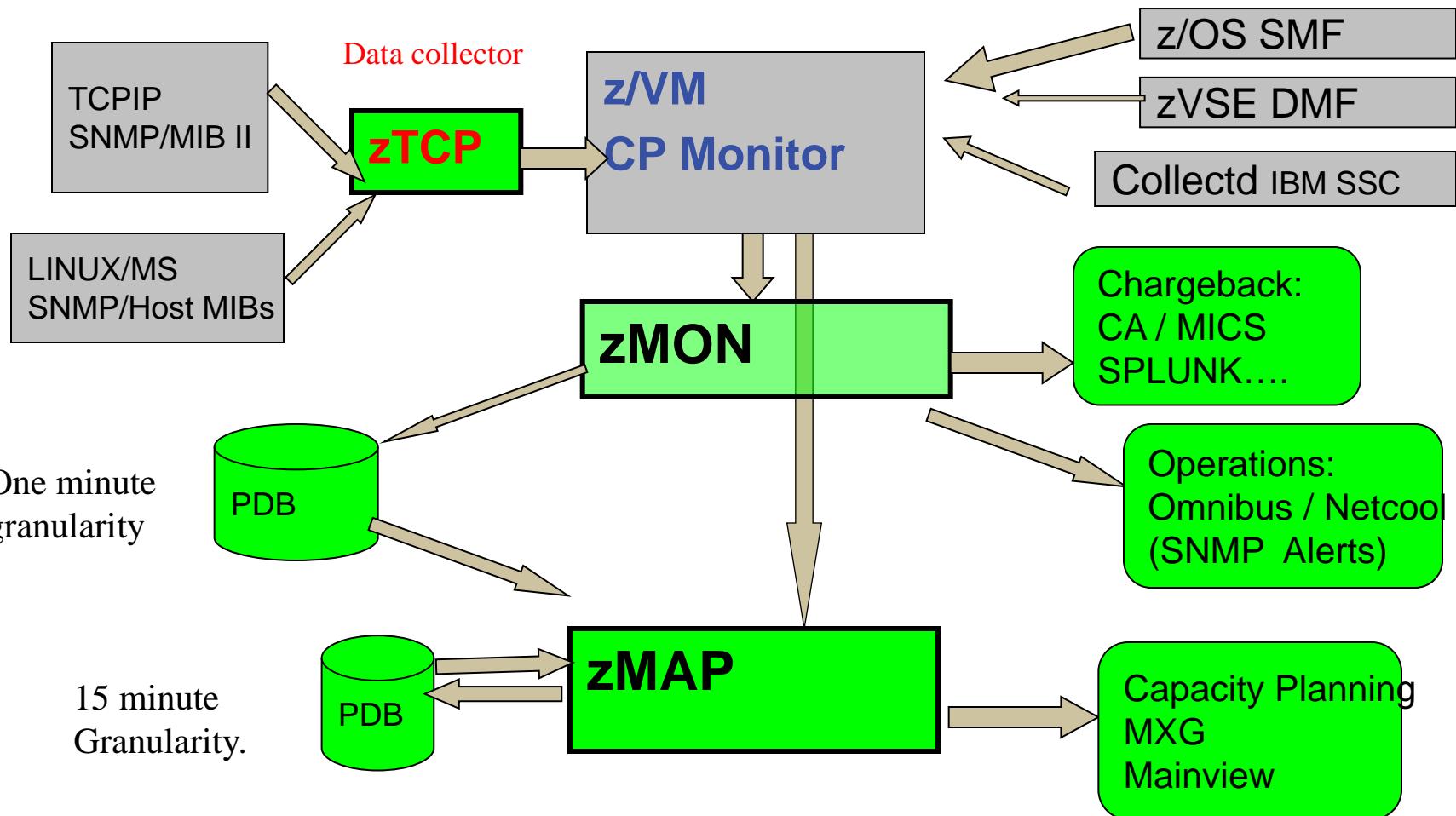
“snmp” Collector zTCP Enhanced



zTCP: Network Monitor

- Standard SNMP collection
- Data added to PDB
- Now accepts SMF Records
- Now accepts DMF records
- Now accepts Collectd

SOP: Standard Operating Procedure



zOSMON fully integrated – one click

Instant z/OS system, CPU, jobs, configuration. (Tailorable)

The screenshot displays four integrated windows from the zOSMON application:

- ZOSCEC - z/OS CEC Detail Analysis - DEMO**: Shows processor utilization details. Data table:

Time	Serial	Type	Cnt	DED	VCPUs	Total Logical Stg(GB)	Central
08:58:00	0614C7	CP	2	0	5	199.7	199.5
08:58:00	0614C7	IFL	2	0	6	46.4	45.7

- ZOSCFG - z/OS LPAR Configuration - DEMO**: Shows LPAR configuration details. Data table:

Time	SYSID	Name	Type	Model	Serial	Cnt	Mode	CPU ZIP	ZAP	Perm	Temp	GAU	Actual	Scale	Name	Zone	CPU	MSO	I/O	SRB	Unit	
08:58:00	VS11	VSIPLEX	BC12	A02	0614C7	4	PR/SM	2	0	0	11	11	0	670254	64	RMF	-7	100	0	50	100	6842
08:58:00	VS12	VSIPLEX	BC12	A02	0514C7	0	VMguest	2	1	0	11	11	0	670254	64	RMF	-7	100	0	50	100	6842

- z/OS Workload CPU b...**: Bar chart showing CPU utilization by category (TSO, SYSTEM, SYSSTC, SYSSOTHER). Y-axis: 0 to 24.
- z/OS CPU Utilization by SYSID - DEMO**: Bar chart showing CPU utilization by SYSID (VS11, VS12). Y-axis: 0 to 200.
- CPU Utilization by LPAR**: Bar chart showing CPU utilization by LPAR (VS1M1, VS1M2, VS1M3, VS1M4, VS1M5, zOS). Y-axis: 0 to 200.
- ZOSJCPU - z/OS Job/Step CPU/Resource Analysis - DEMO**: Detailed table of job/resource analysis. Data table:

Time	SYSID	Name	ID	Service	Class	Total	Stnrd	SRB	Initiator	Reg	<----- Service Units ----->	Total	CPU	SRB	I/O	MSO	Encl	Tot Encl	Real Dep Used						
08:57:00	VS11	Totals	*			34.1	20.5	13.0	0	0	0.6	0.0	0	8300.9	4805	3027	558.1	0	16.0	0	0	0	879		
08:57:00	VS11	CICSZAI	STC04376	SYSSTC		15.1	12.4	2.7	0	0	0	0	0	3544.2	2903	640.9	0	0	0	0	0	0	0	18.2	
08:57:00	VS11	TN3270	STC02464	SYSSTC		6.7	0.2	6.5	0	0	0	0	0	1559.1	39.3	1520	0	0	0	0	0	0	0	4.0	
08:57:00	VS11	TCP/IP	STC09990	SYSSTC		3.2	0.6	2.6	0	0	0	0	0	738.5	132.4	606.1	0	0	0	0	0	0	0	5.1	
08:57:00	VS11	IZUSVRL	STC00010	SYSSTC		2.1	2.1	0.0	0	0	0	0	0	1036.9	500.4	3.0	533.5	0	16.0	0	0	0	0	0	240
08:57:00	VS11	WLM	WLM	SYSTEM		0.8	0.6	0.2	0	0	0	0	0	195.3	149.4	45.9	0	0	0	0	0	0	0	0.0	
08:57:00	VS11	ZOSMONTK	JOB06705	SYSSOTHER		0.6	0.6	0.0	0	0	0	0	0	135.3	133.9	1.5	0	0	0	0	0	0	0	1.0	
08:57:00	VS11	ZOSNMVM2	STC04445	SYSSTC		0.6	0.6	0	0	0	0	0	0	151.4	150.3	1.1	0	0	0	0	0	0	0	0.0	
08:57:00	VS11	VTAM	STC09992	SYSSTC		0.6	0.0	0.0	0	0	0.6	0	0	6.8	4.8	2.8	0	0	0	0	0	0	0	0.0	
08:57:00	VS11	ZFS	STC09985	SYSSTC		0.5	0.5	0.0	0	0	0	0	0	130.8	119.3	8.9	1.8	0	0	0	0	0	0	0.0	
08:57:00	VS11	JES2MON	JES2MON	SYSTEM		0.5	0.3	0.2	0	0	0	0	0	123.8	73.7	50.1	0	0	0	0	0	0	0	0.0	
08:57:00	VS11	JES2	JES2	SYSSTC		0.5	0.5	0.0	0	0	0	0	0	124.5	112.5	7.3	4.8	0	0	0	0	0	0	0.0	
08:57:00	VS11	DBPDEV	TSU07188	TSO		0.5	0.4	0.0	0	0	0.0	0	0	114.2	95.8	9.9	8.5	0	0	0	0	0	0	0.1	
08:57:00	VS11	TN3270C	STC02462	SYSSTC		0.3	0.2	0.1	0	0	0	0	0	62.3	38.5	23.8	0	0	0	0	0	0	0	1.1	
08:57:00	VS11	SDSFAUX	STC09999	SYSSTC		0.3	0.3	0.0	0	0	0	0	0	74.3	61.0	13.3	0	0	0	0	0	0	0	0.1	
08:57:00	VS11	RMF	STC09991	SYSSTC		0.3	0.3	0.0	0	0	0	0	0	71.4	60.9	10.5	0	0	0	0	0	0	0	0.0	
08:57:00	VS11	XCFAS	XCFAS	SYSTEM		0.2	0.2	0.0	0	0	0.0	0	0	57.3	44.7	6.2	6.5	0	0	0	0	0	0	3.0	
08:57:00	VS11	SMF	SMF	SYSTEM		0.2	0.2	0.0	0	0	0	0	0	41.3	35.9	5.3	0	0	0	0	0	0	0	0.0	
08:57:00	VS11	ZOSNMVM4	STC06255	SYSSTC		0.1	0.1	0.0	0	0	0	0	0	23.7	23.3	0.4	0	0	0	0	0	0	0	0.0	
08:57:00	VS11	SMS	SMS	SYSSTC		0.1	0.1	0	0	0	0	0	0	24.0	19.5	1.5	3.0	0	0	0	0	0	0	0.1	
08:57:00	VS11	SDSF	STC09989	SYSSTC		0.1	0.0	0.0	0	0	0	0	0	15.5	10.6	4.9	0	0	0	0	0	0	0	0.3	
08:57:00	VS11	OMVS	OMVS	SYSTEM		0.1	0.1	0	0	0	0	0	0	27.9	27.2	0.7	0	0	0	0	0	0	0	30.4	
08:57:00	VS11	MSTRCL00	MSTR	SYSTEM		0.1	0.1	0.0	0	0	0	0	0	33.6	22.5	11.1	0	0	0	0	0	0	0	0.0	

zOSMON fully integrated

Instant z/OS Graphs. (Tailorable)

<http://demo.velocitysoftware.com/zview/zview.cgi?view=zosgraph&heading=no&menu=no>



What can we do, and at what cost?

SMF 70 supported

- ZOSCFG - configuration
- ZOSCPU – CPU utilizations
- ZOSLPRS – LPAR summary
- ZOSLPAR – LPAR by CPU
- ZOSCEC – CEC analysis
- ZOSSTR – system storage

SMF 30

- ZOSJCFG – job configuration
- ZOSJCPU – job/step CPU
- ZOSJDSD – job/step DASD I/O
- ZOSJUSS – job/step Unix System Services Analysis
- ZOSJSTR – job/step storage analysis
- ZOSJWKLD – service class analysis

What can we do, and at what cost?

SMF 110 supported

- ZOSCLX1 – CICS High Level Analysis
- ZOSCLX2 – CICS Region Analysis
- ZOSCLX3 – CICS Transaction Response time Analysis
- ZOSCLX4 - CICS Transaction ID Analysis

But at what cost?

Our Configuration

Two z/OS systems, one in LPAR, one guest...

BC12 A02 rated 11 MSU

Configuration report

```
Report: ZOSCFG          z/OS LPAR Configuration Report
Monitor initialized: 11/04/19 at 01:00:00 on BC12 serial 06
-----
SYSID SYSPLEX <-Physical Processor-> <LPAR Configuration>
      Name     Type Model   Serial CPU    Mode    <CPUs Online>
                           Cnt
                           -----
01:15:00
VSI1  VSIPLEX    BC12   A02    0614C7    4 PR/SM      2   0   0
VSI2  VSIPLEX    BC12   A02    0514C7    0 VMGuest    2   1   0
```

*** MSUs are used for software pricing only; they are not a capacity metric.

Our Utilization

Two z/OS systems, one in LPAR, one guest...

Guests do not provide CPU in SMF 70

No limit to collector on number of LPARs (that we know of)

Report: ZOSCPU Z/OS CPU Report									
Monitor initialized: 11/05/19 at 00:00:00 on BC12 serial 051									
TIME/		<--CPU--> Sample <-CPU Utilization>				<-----Rates----->			
						<---Dispatch--->			
SYSID	ID	Type	Count	Total	Wait	Parked	SRB	TCB	Wait
00:15:00									
VSI1	Tot	GP	15	98.9	19.7	0	858.5	827.4	29.8
	0	GP	15	50.1	9.4	0	562.1	521.3	20.1
	1	GP	15	48.8	10.4	0	296.4	306.1	9.7
VSI2	Tot	GP	15	0	108.9	0	86.1	126.2	105
	0	GP	15	0	54.6	0	43.0	63.1	52.8
	1	GP	15	0	54.2	0	43.1	63.1	51.8
	2	zIIP	15	0	92.5	0	0	33.6	6.9

Our Jobs

Feeding three different data collectors (vm2, vm4, vmtk)... Capture ratio?

Report: **ZOSJCPU** z/OS Job/Step CPU/Resource Report
Monitor initialized: 11/04/19 at 01:00:00 on BC12 serial 0614C

SYSID	<----Job-----> <-----CPU Percents----->								
	Name	JobID	Total	STD	SRB	Initiate	Regn	I/O	Cntrl
01:15:00									
VSI1									
Totals		90.9	80.0	10.3	0.0	0	0.6	0.0	0.1
ANTAS000	ANTAS000	0.0	0.0	0.0	0	0	0	0	0
CICSJZ1	STC09632	21.5	19.6	2.0	0	0	0	0	0
EXMATGRP	JOB01605	27.0	27.0	0.0	0	0	0	0	0
RACF	RACF	0.0	0.0	0.0	0	0	0	0	0
RMF	STC09991	0.3	0.3	0.0	0	0	0	0	0
SMF	SMF	0.2	0.1	0.0	0	0	0	0	0
SMFDMPPLS	JOB08464	41.1	40.9	0.2	0	0	0.1	0	0
SMS	SMS	0.1	0.1	0.0	0	0	0.0	0	0
SMSPDSE	System	0.0	0.0	0.0	0	0	0	0	0
SYSLOGD	STC09988	0.0	0.0	0.0	0	0	0	0	0
TCPPIP	STC09990	2.7	0.5	2.2	0	0	0	0	0.0
TN3270	STC02464	5.0	0.1	4.8	0	0	0	0	0
TN3270C	STC02462	0.2	0.1	0.1	0	0	0	0	0
VLF	VLF	0.0	0.0	0.0	0	0	0	0	0
VMCF	VMCF	0.0	0.0	0	0	0	0	0	0
VTAM	STC09992	0.5	0.0	0.0	0	0	0.5	0	0
WLM	WLM	1.3	1.0	0.2	0	0	0	0	0
XCFAS	XCFAS	0.3	0.2	0.0	0	0	0.0	0	0
ZFS	STC09985	0.6	0.5	0.0	0	0	0.0	0	0
ZOSMNVM2	STC00912	0.6	0.6	0.0	0	0	0.0	0.0	0
ZOSMNVM4	STC08192	0.1	0.1	0.0	0	0	0.0	0.0	0
ZOSMONTK	JOB09418	0.5	0.5	0.0	0	0	0	0	0

Feeding three different data collectors (vm2, vm4, vmtk)...

```

Report: ZOSJCPU      z/OS      Velocity Software Corporat
Monitor initialized: 11/7
-----
SYSID <---Job-----> <-----Service Units----->
      Name    JobID   <-----Per Second----->
                           Tot   CPU   SRB    IO   MSO Enclv
-----
01:15:00
VSI1
      Totals          22K   19K  2414   704     0  16.6
      ANTAS000  ANTAS000  0.9   0.4   0.5     0     0     0
      CIC SJZ1  STC09632  5038  4576  463     0     0     0
      EXMATGRP  JOB01605  6312  6310  0.8   0.9     0     0
      RACF        RACF     2.0   0.9   1.1     0     0     0
      RMF         STC09991  70.0  59.3  10.7    0     0     0
      SMF         SMF     39.4  34.0   5.3     0     0     0
      SMFDMPPLS  JOB08464  9739  9553  42.5   143    0     0
      SMS         SMS     24.3  19.7   1.7   2.9     0     0
      SMSPDSE    System    7.1   5.3   7.1     0     0     0
      SYSLOGD    STC09988  4.4   2.4   2.0     0     0     0
      TCPIP       STC09990  631   117   514     0     0     0
      TN3270     STC02464  1160  31.8  1128    0     0     0
      TN3270C   STC02462  53.6  31.1  22.5    0     0     0
      VLF         VLF     1.3   0.8   0.6     0     0     0
      VTAM        STC09992  6.9   4.0   2.8     0     0     0
      WLM         WLM     293   246   47.7    0     0     0
      XCFAS      XCFAS    63.7  49.5   7.8   6.4     0     0
      ZFS         STC09985  140   126   11.6   2.0     0     0
      ZOSMNVM2  STC00912  139   137   1.2     0     0     0
      ZOSMNVM4  STC08192  23.3  22.7   0.7     0     0     0
      ZOSMONTK  JOB09418  122   121   1.5     0     0     0

```

zVPS Overhead? What overhead?

Two CICS regions, 5,000 transactions / minute, 80 / second

“Velocity” is zVPS, all of it. Monitoring z/VM, Linux, VSE, z/OS

Screen: **ZOSCIX1** Velocity Software
2 of 2 CICS Analysis

ESAMON 5.112 07/23 11:18-11:23
SYSID * JOB * APPLID *

Time	SYSID	CICS Program->		Transactions->		Task Statistics----->					
		APPLID	JobName	Total	Resp	CPU	Total	MXT	Actv	PctM	MXTQ
11:24:00	VSI1	CICSZA1	CICSJZ1	2414	1.138	0.007	2397	150	84	56.0	0
		CICSZA2	CICSJZ2	3134	1.003	0.008	3158	120	96	80.0	0
11:23:00	VSI1	CICSZA1	CICSJZ1	2408	1.194	0.007	2448	150	55	36.7	0
		CICSZA2	CICSJZ2	3200	0.943	0.008	3210	120	88	73.3	0
11:22:00	VSI1	CICSZA1	CICSJZ1	2406	1.225	0.007	2373	150	62	41.3	0
		CICSZA2	CICSJZ2	3198	0.989	0.008	3177	120	93	77.5	0

.

====>
Screen: **ESAUSP2** Velocity Software
1 of 3 User Percent Utilization

VSIVM2
ESAMON 5.112 07/23 11:10-11:23
CLASS VELOCITY 8562 020F78

Time	UserID /Class	Processor->		Main Storage-(MB)->								
		<-use CPU%>	T:V	<Resident->	Lock	<----WSSize----->	Total	Actv	-ed	Total	Actv	Avg
11:24:00	Velocity	0.31	0.29	1.1	77.3	73.7	0.01	77.0	73.5	3.9		
11:23:00	Velocity	0.30	0.28	1.1	77.3	76.1	0.01	77.0	75.7	4.0		
11:22:00	Velocity	0.30	0.28	1.1	77.3	73.7	0.01	77.0	73.5	3.9		
11:21:00	Velocity	0.31	0.29	1.1	77.3	73.7	0.01	77.0	73.4	3.9		
11:20:00	Velocity	0.30	0.28	1.1	77.3	73.7	0.01	77.0	73.4	3.9		
11:19:00	Velocity	0.32	0.30	1.1	77.3	73.7	0.01	77.0	73.4	3.9		

CICS Configuration

z/OS, z/VSE, no limit (that we know of)...

4 Regions/Partitions, 3M transactions per day

Report: ZOSCICS1 z/OS CICS Analysis							Vel	
Monitor initialized: 11/04/19 at 01:00:00 on BC12 serial 0614C7								
SYSID	<--CICS Program-->		<----Start---->		Platform	<---Location--->		
	APPLID	JobName	Date	Time	O/S	VRM	LPARName	VMID
<hr/>								
01:15:00								
VSII	CICSZA1	CICSJZ1	10/20/19	02:03:56	z/OS	0720	VSIVM6	
V61C	CICSP1	CICSJA68	11/02/19	14:34:28	VSE	0420	VSIVM5	ZVSE61C
	DBDCCICS	CICSICCF	10/09/19	12:50:14	VSE	0420	VSIVM5	ZVSE61C
V62B	CICSP1	CICSJA95	10/20/19	06:25:23	VSE	0430	VSIVM5	ZVSE62B
	DBDCCICS	CICSICCF	09/14/19	06:07:49	VSE	0430	VSIVM5	ZVSE62B
V62C	CICSP1	CICSJA69	10/21/19	03:15:02	VSE	0430	VSIVM5	ZVSE62C
	DBDCCICS	CICSICCF	10/14/19	07:01:09	VSE	0430	VSIVM5	ZVSE62C

CICS configuration by Region

Configuration, VSE, z/OS

Report: ZOSCICS1 z/OS CICS Analysis Velo
Monitor initialized: 07/19/20 at 00:00:00 on Z15S serial 0E0F78

SYSID	<--CICS Program-->		<----Start---->		Platform	<---Location--->	
	APPLID	JobName	Date	Time	O/S	VRM	LPARName VMID
07/19/20							
00:00:00 - 00:15:00							
VSI1	CICSZA2	CICSJZ2	07/15/20	17:40:03	z/OS	0720	ZOSLP1
	CICSZA1	CICSJZ1	07/15/20	17:35:18	z/OS	0720	ZOSLP1
V61B	CICSJA60	CICSJA60	05/26/20	20:14:33	VSE	0420	VSIVM5 ZVSE61B
	CICSJB60	CICSJB60	05/26/20	20:14:43	VSE	0420	VSIVM5 ZVSE61B
V62C	CICSJA69	CICSJA69	06/24/20	08:10:01	VSE	0430	VSIVM5 ZVSE62C
00:15:00 - 00:30:00							
VSI1	CICSZA2	CICSJZ2	07/15/20	17:40:03	z/OS	0720	ZOSLP1
	CICSZA1	CICSJZ1	07/15/20	17:35:18	z/OS	0720	ZOSLP1
V61B	CICSJA60	CICSJA60	05/26/20	20:14:33	VSE	0420	VSIVM5 ZVSE61B
	CICSJB60	CICSJB60	05/26/20	20:14:43	VSE	0420	VSIVM5 ZVSE61B
V62C	CICSJA69	CICSJA69	06/24/20	08:10:01	VSE	0430	VSIVM5 ZVSE62C

CICS by Region

By minute, real time, wrapped up at night to 15 minute

Report: ZOSCLIX2 z/OS Region Transaction Analysis										Vel
Monitor initialized: 07/19/20 at 00:00:00 on Z15S serial 0E0F78										
Time/	<Transactions>			<-Response Time->		<Dispatch Time>			total	
SYSID/ APPLID	Group	Count	Total	Susp	Disp	CPU	DISP	ZIP	CPU	
Time			Resp	Time	Time	Time	Wait	CPU	Secs	
07/19/20										
00:00:00 - 00:15:00										
VSI1	CICSZA2	Totals	1	0.261	0.260	0.002	0.001	0.000	0	0.0
		InFlight	135	68.89	68.88	0.001	0.000	0.000	0	0.0
	CICSZA1	Totals	1	0.019	0.005	0.028	0.007	0.003	0	0.0
		InFlight	130	83.28	83.28	0.001	0.000	0.000	0	0.0
V61B	CICSJA60	Totals								
		InFlight	14	1782	1782	0.006	0.004	0.004	0	0.1
	CICSJB60	Totals	1	0.001	0.000	0.001	0.001	0	0	0.0
		InFlight	16	1503	1503	0.005	0.004	0.003	0	0.1
V62C	CICSJA69	Totals								
		InFlight	4	1800	1800	0	0	0	0	0

CICS by Transaction ID

Transaction data, waits by Transaction ID

Report: ZOSCIX4 z/OS CICS Tranaction IO Wait Analysis Velocity So
Monitor initialized: 07/19/20 at 00:00:00 on Z15S serial 0E0F78

Time/ SYSID APPLID	Transaction	<-Response Total ID	Count	Time	<DispTime(Secs)>	Suspend Time Susp Time	Disp Time	CPU Time	PC Time	ZIP Disp	MXT Wait	TC Dly	Trm	Jrn
07/19/20 00:00:00 - 00:15:00	VSI1													
VSI1	CICSZA2	Total	1	0.261	0.260	0.002	0.001	0	0	0.01	0	0	0	0
		CSSY	1	0.261	0.260	0.002	0.001	0	0	0.01	0	0	0	0
V61B	CICSZA1	Total	1	0.019	0.005	0.028	0.007	0	0	2.50	0	0	0	0
		VSI1	1	0.019	0.005	0.028	0.007	0	0	2.50	0	0	0	0
CICSJA60	Total													
CICSJB60	Total	1	0.001	0.000	0.001	0.001		0	0	0	0	0	0	0
	CSPQ	1	0.001	0.000	0.001	0.001		0	0	0	0	0	0	0

CICS by Transaction ID

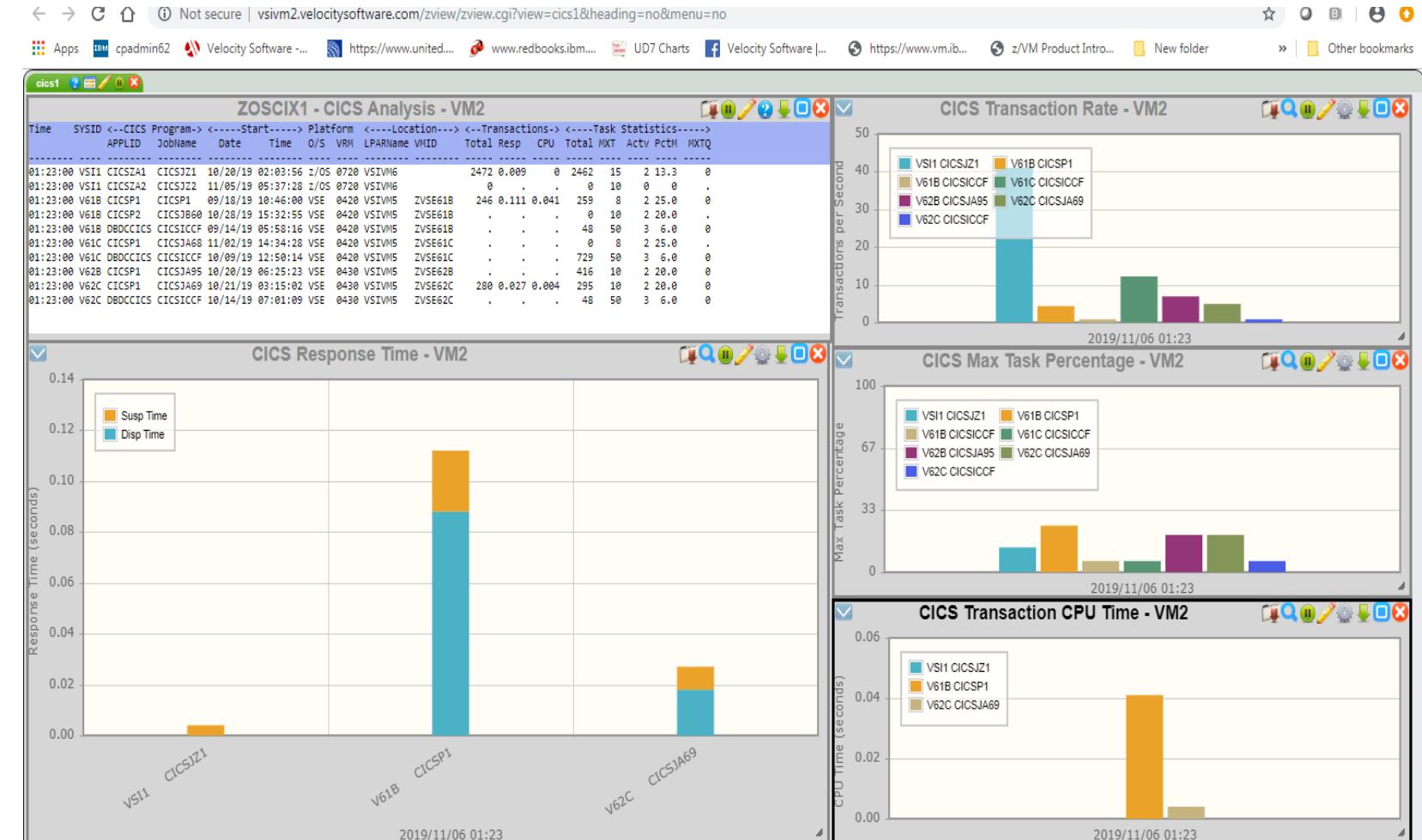
Transaction data, waits by Transaction ID

Report: ZOSCIX3 z/OS CICS User Transaction Wait Analysis Velocit
 Monitor initialized: 07/19/20 at 00:00:00 on Z15S serial 0EOF78

Time/ SYSID APPLID	<--Transaction-->			<-Response Time->		<-----Delays (ms)---		
	Type	Rate	Total	Susp	Disp	Lock	EXEC	Interval Disp.
	ID	Count	/Sec	Resp	Time	Time Manager	Extern Control	-atch
07/19/20 00:00:00 - 00:15:00								
VSI1								
CICSZA2	Total	1	0.00	0.261	0.260	0.002	0	0
	CHCK	13	0.01	69.23	69.23	0.000	0	69225.8
	CISE	14	0.02	68.57	68.57	0	0	0
	CISM	14	0.02	68.57	68.57	0	0	0
	CISP	14	0.02	68.57	68.57	0.000	0	0
	CISR	14	0.02	68.57	68.57	0	0	0
	CSHQ	13	0.01	69.23	69.23	0.000	0	0
	CSNE	14	0.02	68.57	68.57	0	0	0
	CSSY	1	0.00	0.261	0.260	0.002	0	0
	CSTP	13	0.01	69.23	69.22	0.007	0	0
CICSZA1	Total	1	0.00	0.019	0.005	0.028	0	0
	CHCK	13	0.01	69.23	69.23	0.000	0	69225.8
	CISE	13	0.01	69.23	69.23	0	0	0
	CISM	13	0.01	69.23	69.23	0	0	0
	CISP	13	0.01	69.23	69.23	0.000	0	0
	CISR	13	0.01	69.23	69.23	0	0	0
	CSHQ	13	0.01	69.23	69.23	0.000	0	0
	CSNE	12	0.01	69.99	69.99	0	0	0
	CSOL	1	0.00	1887	1887	0.001	0	0
	CSSY	26	0.03	69.23	69.22	0.002	0	0
	CSTP	13	0.01	69.23	69.22	0.007	0	0
	VSI1	1	0.00	0.019	0.005	0.028	0	0

CICS analysis real time – 1 click

<http://vsivm2.velocitysoftware.com/zview/zview.cgi?view=cics1&heading=no&menu=no>



Cost of supporting everything on one IFL?

Percents always percent of ONE CPU, one minute granularity

Screen: ESAU\$P2 Velocity Software
1 of 3 User Percent Utilization

ESAMON 5.103 11/06 01:
CLASS * 28

Time	UserID /Class	<--Processor-->			<-----Main Storage-(MB)----->							
		<-use CPU%>	T:V	<Resident->	Lock	<----WSSize----->	Total	Actv	-ed	Total	Actv	Avg
01:02:00	System:	1.89	1.62	1.2	421.2	243.6	5.01	415.7	238.3	3.4		
	TheUsrs	0.75	0.73	1.0	100.0	67.8	0.11	99.9	67.7	2.7		
	Velocity	0.53	0.48	1.1	76.6	72.2	0.01	76.3	71.9	3.8		
	KeyUser	0.46	0.28	1.6	50.8	50.8	4.83	45.9	45.9	23.0		
	Servers	0.09	0.09	1.1	79.3	28.2	0.03	79.2	28.2	2.6		
	suse	0.06	0.04	1.6	114.4	24.6	0.04	114.3	24.6	1.9		

- **Processing requirements for 40 CICS transactions/sec**
 - 140,000 transactions per hour
 - z/OS: .6-.7% GP (BC12 A02) for collector, ONE MINUTE SAMPLE TIME
 - zVPS: <1% of one IFL for everything, including web servers.
- **z/OS smf record processing time**
 - 24 hours records 30/70 1 minute granularity: 24 cpu seconds on one IFL
- **zOSMON Futures**
 - DB2 (101,102)
 - MQ
 - MFC (113)
 - What customers want
 - Please send SMF data

If you don't have z/VM

- Vicom will install and support it for you
- Velocity Software will install and support zVPS
- KVM? One shared IFL partition for z/VM (and less expensive)
- z/OS only? One shared GP partition sufficient
- Full cloud configuration – you never see z/VM (if you don't want)

z/VM ordered through Vicom Infinity....

zALERT - Operational Support

zALERT

- User tailorable
- Alerts are 3270 based, web based, and / or SNMP traps
- **Linux alert examples:**
 - Disk full
 - Missing processes (requires complete data)
 - **Looping processes (requires correct data)**
- **z/VM alert examples**
 - Page/spool space full (avoid abends), page rates
 - Looping servers
 - DASD service times
- **Network alert examples**
 - Transport errors, ICMP rates, Bandwidth thresholds
- **z/OS / zVSE**
 - CPU, job utilization, CEC (CPU type) utilization,
 - CICS max task, response times, etc

Operations Tool (many installations!)

- Log analyzer
- Diagnostics tool

The Problem

- Agent is very high overhead
- Each Linux runs splunk agent, feeds central database
- One installation reports 2-4% of ONE IFL per server for Splunk agent
 - (Using 20 IFLs just for Splunk agent)

The (VERY efficient) solution

- All (almost all?) data captured by zVPS
- zVPS feeds splunk (no additional charge, big savings in CPU)
- Installation details on Velocity Software website

Z15 Compression Fun and Games

Experiments with on z15 board compression

- Easy to use in both CMS and z/OS
- Compression for SMF records about 90%

Compression / Decompression Pipe stage created

zVPS will likely start compressing history data

Could do it for VSE when z15 is used

Z15 Compression Fun and Games

ZOSMON agent sends data to zVPS (VM2,VM4,NTK)

- Uses .3% of one GP (A02...)

Screen: ZOSJCPU Velocity Software ESAMON 5.112 06/12
2 of 4 z/OS Job/Step CPU/Resource Analysis SYSID VSII SRVCLS *

<-----Job-----> <-----Service Units----->

Time	SYSID	Name	ID	Step	Total	CPU	SRB	I/O
15:37:00	VSII	ZOSMNVM2	STC08971	ZMON	146.6	146.3	0.3	0
		ZOSMNVM4	STC07095	ZMON	145.7	145.3	0.4	0
		ZOSMONTK	JOB09346		137.6	137.3	0.4	0
15:36:00	VSII	ZOSMNVM2	STC08971	ZMON	147.4	147.2	0.3	0
		ZOSMNVM4	STC07095	ZMON	146.4	146.0	0.4	0
		ZOSMONTK	JOB09346		127.1	126.7	0.4	0
15:35:00	VSII	ZOSMNVM2	STC08971	ZMON	142.7	142.4	0.3	0
		ZOSMNVM4	STC07095	ZMON	144.4	144.1	0.3	0
		ZOSMONTK	JOB09346		127.8	127.4	0.3	0

←----- Compressed -----→

Screen: ZOSJCPU Velocity Software ESAMON 5.112 06/12 14:16-16:17
1 of 4 z/OS Job/Step CPU/Resource Analysis SYSID VSII SRVCLS * JOB ZOS*
<-----CPU Percents----->

<-----Job-----> Initiator Reg

Time	SYSID	Name	ID	Step	Total	Stnrd	SRB	TCB	SRB	I/O	Ctl	USS	
15:37:00	VSII	ZOSMNVM2	STC08971	ZMON	0.3	0.3	0	0	0	0	0	0	
		ZOSMNVM4	STC07095	ZMON	0.3	0.3	0	0	0	0	0	0	0
		ZOSMONTK	JOB09346		0.3	0.3	0	0	0	0	0	0	0

Performance management is a business model

- Performance analysis and tuning
- Capacity planning
- Operational support
- Chargeback

Single pane of glass

Efficiency critical, not just a diagnostic tool

Flexibility important – architecture works....

Velocity Software zVPS Provides:

- **z/VM Performance Monitor (for 31 years)**
- **NETWORK Monitoring (for 20 years)**
- **Linux on “Z” Monitoring (for 18 years)**
- **Oracle, Websphere Monitoring (for 10 years)**
- **z/VSE Monitoring (for 5 years)**
- **No charge features**
 - zOPERATOR for fully INTEGRATED operations management console
 - zALERT for supporting fully INTEGRATED operations
 - Distributed server monitoring (Linux, Microsoft)
- **And now zOSMON....**

New Technologies

- Docker (thousands of containers)
- MongoDB (see Marriott presentations)
<http://VelocitySoftware.com/MongoDB.html>"
- z/VM 7.1 (done, fcp, edev, diagnose, 80 threads)
- Splunk (done) "http://VelocitySoftware.com/splunk.html"
- z/OS.... (common request)
- VSE CICS too
- z/OS: Send link to your z/OS people....
<http://demo.velocitysoftware.com/zview/zview.cgi?view=myzos&heading=no&menu=no>
- See **HTTP://VelocitySoftware.com/zOSMON.HTML"**
Make it easy, low overhead, amazingly fast...

For More Information please contact...

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About Vicom Infinity

Account Presence Since 1990's

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Vicom Family of Companies Also Offer Leasing & Financing and IT Staffing & IT Project Management

Linux Foundation Open Mainframe Project – Chair

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Recipient of The North America IBM Z Business Partner Sales Excellence Award

PROVEN PERFORMANCE

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