

VELOCITY  
SOFTWARE

## Welcome to 2023 Performance

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## Velocity Software covid highlight

- Metal to cloud in 2 days

Tuning Guide online

Architectural flexibility

Operational enhancements

zVPS Version 5

zOSMON: z/OS SMF

Secure Container

## Sessions

- Processor management
- Understanding SMT
- FlowChart Performance Analysis

# Velocity Software Upgrades Datacenter

## New Z15 T02

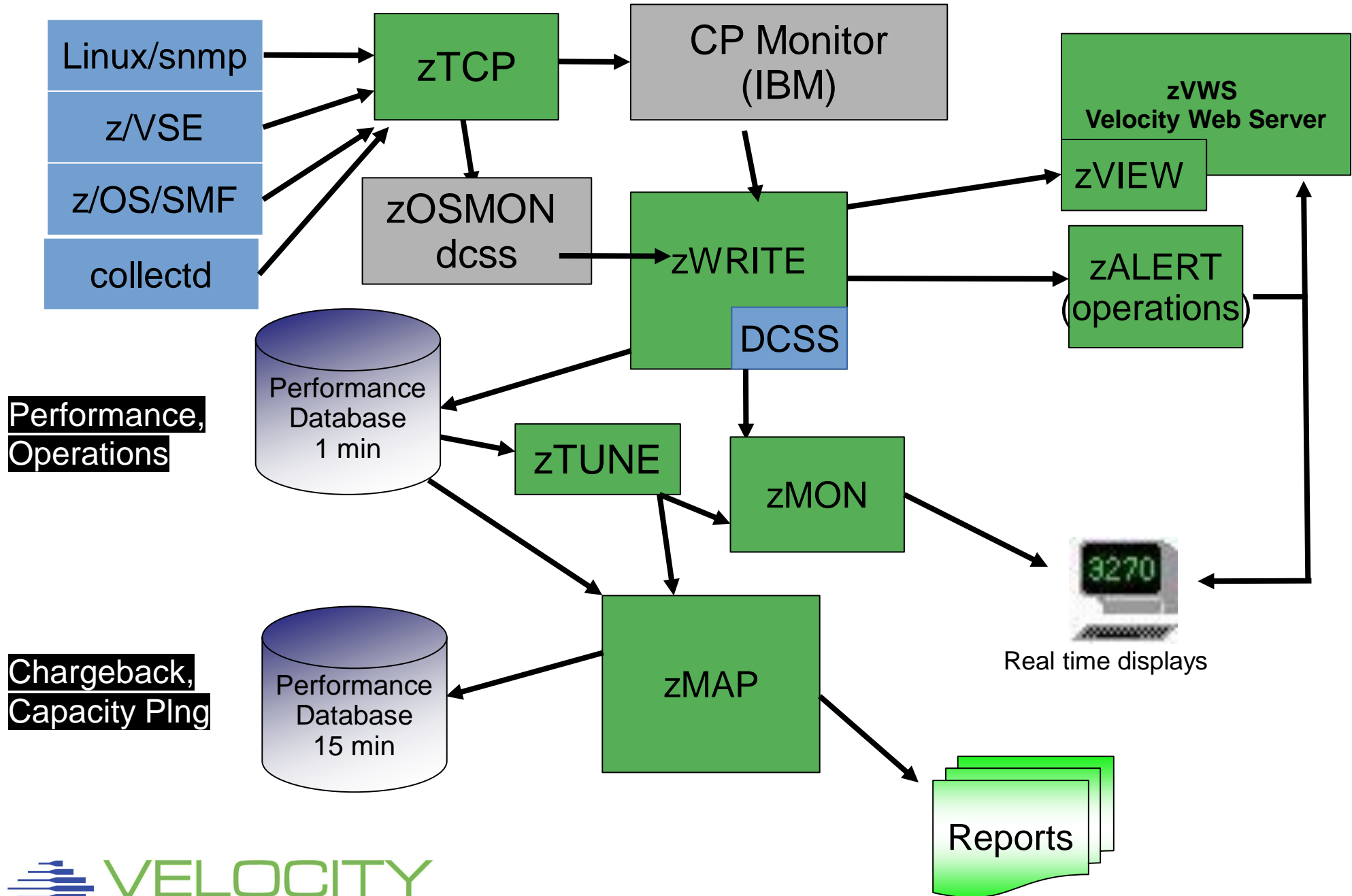
- Moved data center (2,000 miles)
- ESP for T02+
- **Metal to Cloud in 2 days** <http://velocitysoftware.com/MetaltoCloud>
- Two (8 hour) days after IBM code 20, PaaS cloud was ready:
- Four member SSI z/VM cluster operational
- RACF, TCPIP operational
- zVPS Installed and operational
- zPRO Installed and operational, with zDIRECT
- Installed Linux
- Cloned Linux 155 times in 20 minutes
- Cloned 50 2G servers in 3 minutes

Velocity Software's Tuning Guide "VelocitySoftware.com/customer"

## Tuning Topics Table of Contents

- **Performance Tuning and Analysis**
  - [z/VM Performance](#)
  - [Linux Performance](#)
  - [z/VSE Performance](#)
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- **Chargeback / Accounting**
  - [z/VM Performance Chargeback](#)
  - [Linux Performance Chargeback](#)
  - [z/VSE Performance Chargeback](#)
  - [z/OS Performance Chargeback](#)
  - [CICS Performance Chargeback](#)

# zVPS Infrastructure for 30+ years



## Expanded data collector

- IBM Software Secure Container (SSC)
- z/OS SMF Records
- VSE CICS

## Expanded Applications

- Splunk support
- DOCKER
- MongoDB
- PostGres (open software version)

Raw data support (4 hours rolling data)

- (IBMers Not allowed to read zVPS reports)

Validate APARs installed (updated)

Dynamic user class / node class modifications

- zPORTAL in use

Add SIIS, RNI (John Burg's calculations) to MFC reports

- VSE/TCPIP issues

User pools – managing using groups of users

Snmpv3 for alerts

- sha/md5 authorization,
- des/aes encryption

## The value of architecture is extensibility with ease

### zVPS Version 5

- Operational Enhancements
- z/VM 7.1, z15
- zVM 7.2 / 7.3 z16
- Linux applications
- Linux support
- zOSMON: z/OS SMF
- VSEMON: DMF (CICS)
- Secure Container



## z/VM 7.1

- EAV Seek support (32 bit seek address)
- FCP/EDEV fields
- z/15 support (internal cpu numbering changed!)
- > 100 cpus
- LPAR Pools (ESALPARP)
- Expose settings (polarization, parking, etc)

## z/VM 7.2

- zone (AZN: 1.36,3.25) support

## z/VM 7.1

## LPAR POOLS

Report: ESALPARP      Logical Partition Pooling  
Monitor initialized: 09/20/21 at 20:00:02 on 8562 ser

```
-----<br>                <-----LPAR GROUP----->   <--%Assigned><br>                Name          CPU           Virt   <--percent--><br>Time           /LPAR         Type      Cap CPUs  Total   Ovhd<br>-----<br>20:02:00 VSIGRP1   IFL        0       7   106.2   0.8<br>           VSIVM4   IFL        0       2   101.2   0.5<br>           VSIVM1   IFL        0       1    1.366   0.0<br>           VSIVM2   IFL        0       1    1.369   0.0<br>           VSIVM3   IFL        0       1    0.299   0.0<br>           VSIVM5   IFL        0       2    1.918   0.2<br> VSIGRP2   IFL        1.5     4    27.97   0.3<br>           VSIVC1   IFL        0       1    25.08   0.1<br>           VSIVC2   IFL        0       1    1.206   0.0<br>           VSIVC3   IFL        0       1    0.611   0.0<br>           VSIVC4   IFL        0       1    1.064   0.1<br> VSIGRP2   CP         1.0     1    2.836   0.0<br>           VSIVC4   CP         0       1    2.836   0.0<br> VSIGRP1   CP         0       2   108.0   0.2<br>           VSIVM5   CP         0       2   108.0   0.2<br> VSIGRP3   CP         0       2    41.75   0.1<br>           ZOSLP1  CP         0       2    41.75   0.1<br>-----</pre>
```

## z/VM 7.1

### Parking controls exposed (ESAHDR)

SET SRM UNPARKING **large** | medium | small

- Keep more unparked

SET SRM TYPE IFL **high** | medium | low | none

- Be aggressive about using more engines

```
Horizontal/Vertical Scheduling Configuration IFL CPUs
UNPARKING set to LARGE
EXCESSuse medium
Confidence Percent 95%
Algorithm          02
Confidence         90%
Algorithm          01
Max parked CPUs   80
Fudge CPU Factor  (SRM CPUPAD) 1.000
Horizontal capacity 1.000
```

## TCPIP stack support

- BSI – maps to standard snmp metrics
- CSI – not standard snmp. New reports, ESACSI1 / 2

## CICS DMF support (no charge feature for VSE)

Report: **ZOSCIX2** z/OS Region Transaction Analysis  
Monitor initialized: 09/13/19 at 10:26:00 on BC12 serial 0614C7

```
-----  
Time/          <Transactions> <-Response Time-> <Dispatch Time>  
SYSID/ APPLID  Group      Count Total  Susp  Disp  CPU  DISP ZIP  
Time                               Resp  Time  Time  Time  Wait CPU  
-----  
10:26:00 - 10:27:00  
VSI1  CICSZA1  Totals      214 0.013 0.001 0.012 0.011 0.000  0  
      InFlight    10 120.0 120.0 0.074 0.042 0.033  0  
      CICSZA2  Totals     1214 0.005 0.002 0.003 0.002 0.000  0  
      InFlight    10 119.8 119.5 0.312 0.158 0.036  0  
V61C CICSZP1  Totals     1476 0.096 0.074 0.012 0.004 0.002  0  
      InFlight  
ZV61 CICSZP1  Totals      656 0.110 0.085 0.014 0.004 0.001  0  
      InFlight
```

## Linux specific

- Collect release information
- 32 bit process ID

## Linux Applications

- DOCKER
- MongoDB
- PostGres (open software version)

## OSA Support

- IBM mib very limited

## Software level reporting – via zPORTAL

- Report levels of all software installed

## Secure Software Container: CollectD (open source)

- ESASSCC - collectd Configuration report
- ESASSCH - Collectd Process Thread Report
- ESASSCD - Collectd Disk Report
- ESASSCF - Collectd File Systems
- ESASSCN - Collectd Network Devices
- ESASSCP - Collectd Process Report

zVPS has the data, export it to dashboard very efficient

Splunk requests common

- Splunk agent expensive (20 IFLs worth at one place)
- Much of data collected duplicates zVPS

Instana (IBM) current project – skunk works

## Correct data

- Linux in virtualized environments was very wrong (bogomips?)
- “stealtime” implemented, but often misunderstood
- Linux in **SMT environment** – challenging (not intuitive)
- Capacity of SMT environment increases by how much?
- (<http://VelocitySoftware.com/SMT.HTML>)

## Capture ratios (is the data valid?)

- Do we know where our resources are being utilized?
- Compare data from multiple sources (HMC, z/VM, Linux, etc)
- (“<http://VelocitySoftware.com/handouts/capture.html>”)



# Product Longevity - Data Sources

## Longevity requires consistency and standards

- Correct data implies standard data
- Data sources must be consistent, low overhead, integrated
- zVPS uses standard sources (mostly....)

z/VM: CP Monitor (IBM) Exclusively

Networks: snmp mib-ii (standard, open source)

Linux: netsnmp (standard with Linux, “z” and “x”)

- Netsnmp is 1% “agentless” agent (ucd mib, host mib)
- Velocity Software snmp mib (“z” and “x”) replaces most metrics for .1%
- ALL Distributions (suse, redhat, ubuntu), all releases (z & x)

VSE: IBM mib, Velocity Software mib, CICS (DMF) (2021)

- (“<http://VelocitySoftware.com/vsecics.html>”)

z/OS: SMF records (IBM/logstream) Exclusively (70/30/CICS, DB2, etc)

# zVPS Enterprise View – All LPARs in

Tailorable, expandable, zoomable

Today is Monday 2 Dec 2013 zVIEW Version 4159

**VELOCITY SOFTWARE** **zVIEW**  
Enterprise View - Velocity Software - VSIVM4 (DEMO)

First level

VSIVM1				VSIVM2				VSIVM3(old)							
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)				Linux Nodes (zVM-Guests)				Linux Nodes (zVM-Guests)							
LINUX9 (9)			3.93%		RH5X161			0.43%					000000-64	99.22%	
suselnx3 (9)			2.57%		RH5Z161			0.37%							
REDHAT (2)			2.30%												

Demo System V4				
Demo	13/12/02	18:29	IFL Total (1)	17.77%
Linux Nodes (zVM-Guests)				
roblx1			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%	
scsil0s			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

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

# zVPS Enterprise View – Access

## Very fast access

- VSE
- z/OS
- Linux

Cloud 1		
<u>VSIVC1</u>	14:08	<u>IFL</u> Total (4) ⊕ 4.21%
zOS Systems		
<u>V25A</u>	4.60%	
<u>V25A</u>	0.02%	
VSE Systems		
<u>zvse61c</u>	1.17%	
<u>zvse61b</u>	1.07%	
<u>zvse62c</u>	0.89%	
<u>zvse62b</u> (2)	0.70%	
Top 15 Linux Nodes(z/VM-Guests)		
⊕ <u>MONG505A</u> (1)	0.47%	
⊕ <u>VSIEXTRN</u> (1)	0.31%	
⊕ <u>RHKS NFS1</u> (1)	0.22%	
⊕ <u>JSVEXTRN</u> (1)	0.15%	
⊕ <u>JSVSVR13</u> (1)	0.08%	
⊕ <u>S15PSTG1</u> (1)	0.06%	
⊕ <u>SLFSRV10</u> (1)	0.05%	
⊕ <u>JSVSVR10</u> (1)	0.04%	
⊕ <u>JSVWRK01</u> (1)	0.04%	
⊕ <u>CBSVR010</u> (1)	0.03%	
⊕ <u>JSVSVR12</u> (2)	0.03%	
⊕ <u>RS327001</u> (1)	0.03%	
⊕ <u>DSVSVR01</u> (1)	0.02%	
⊕ <u>GOLDVM71</u> (1)	0.02%	
⊕ <u>JSVSVR20</u> (1)	0.02%	
Remaining 1 servers	0.02%	
Top 5 Users		
<u>ZALERT</u>	0.66%	
<u>ZVWS</u>	0.49%	

Close

## z/OS Support on single pane of glass

### Logstream – very similar to z/VM CP Monitor

- Lightweight collector on z/OS
- Select records to transmit
- **Z15 compression utilized**
- One minute intervals because no overhead
- SMF data collection and/or processing

### SMF Records

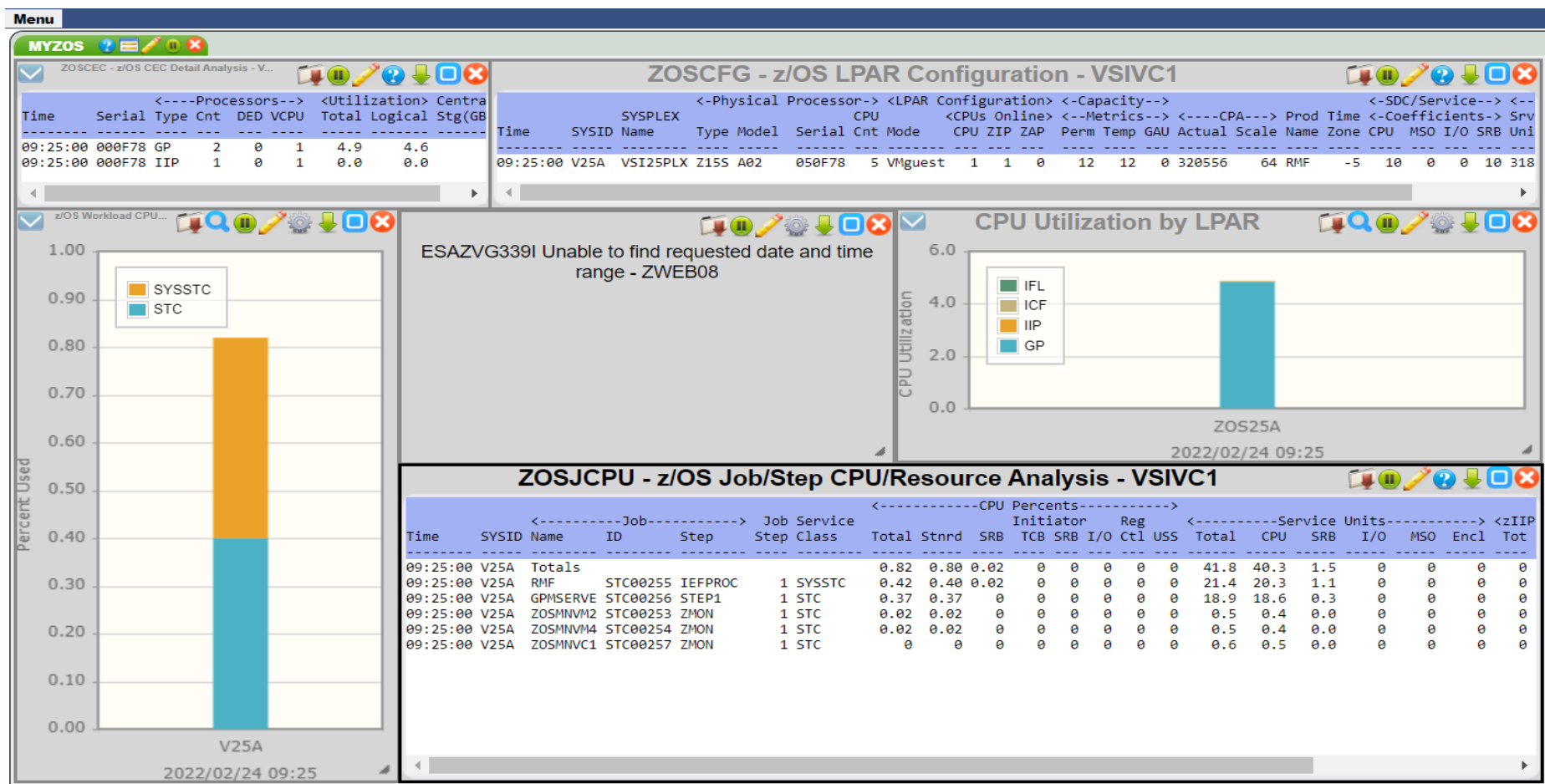
- 70: System (9 reports)
- 30: Jobs (8 reports)
- 75: Paging (1 report)
- 110: CICS (8 reports)
- 100: DB2 (15 reports)
- 113: MFC (3 reports, same as z/VM)



# z/OS performance in one click

End users define their environment(s) – z/OS at one click

- Secure, no need for logon
- Fast and efficient



# z/OS performance in one click

End users define their environment(s) – z/VSE at one click

- Secure, no need for logon
- Fast and efficient, system partitions, jobs pretty chart at one click

The screenshot displays the MYVSE software interface with four main panels:

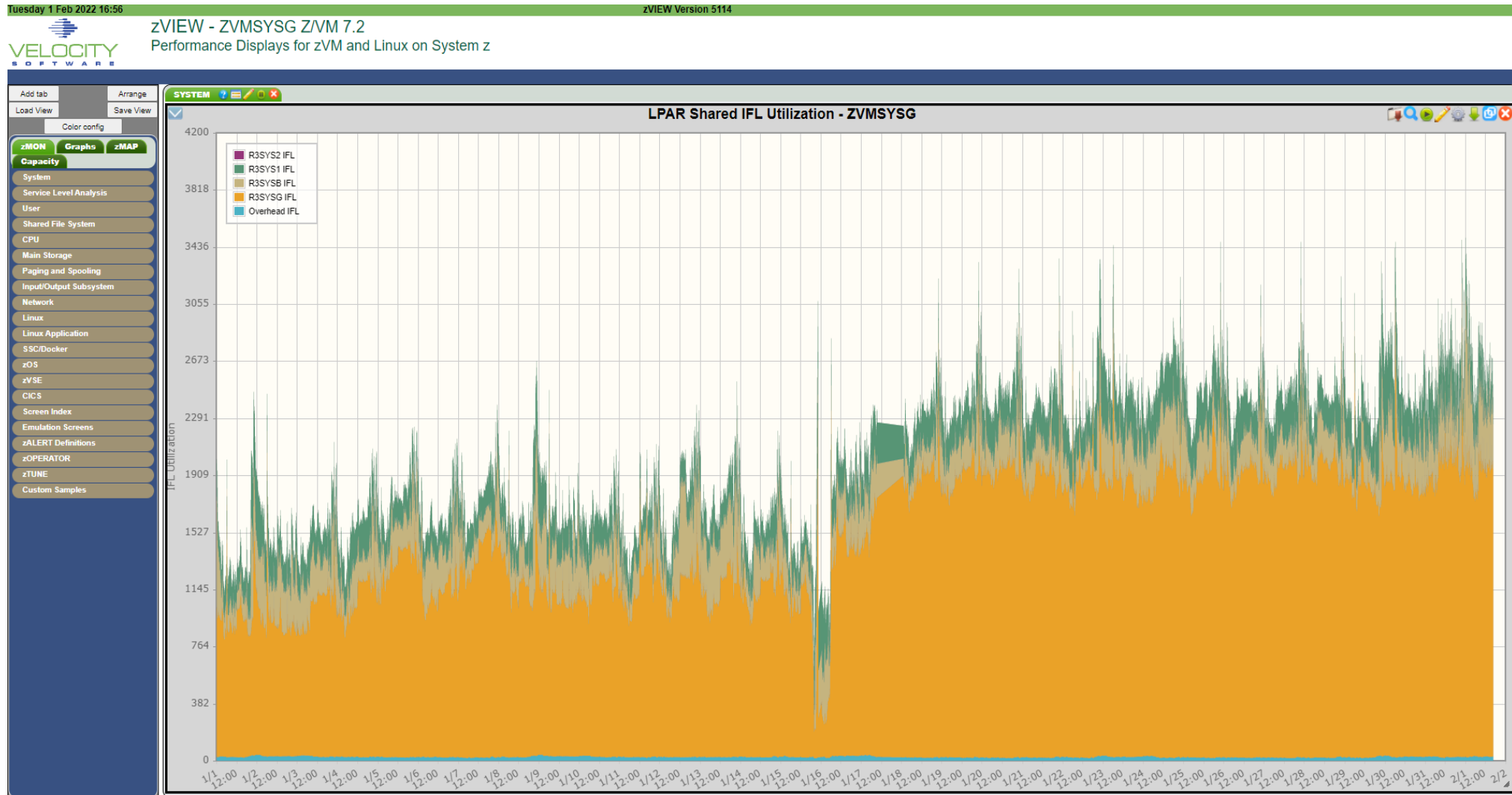
- ESAVSEC2 - VSE System Performance per CPU - VS...**: A table showing system performance metrics for node zvse61b at 14:15:00. Key values include CPU utilization of 94.9% and a total of 489 pages/sec.
- ESAVSES - VSE System Configuration - VSIVC1**: A table showing system configuration details for node zvse61b, including VM ID (ZVSE61B), logical part (VSIVM5), and hardware details (IBM 8562-A02 02).
- ESAVSEC - VSE System Performance - VSIVC1**: A detailed performance table for node zvse61b, including page/sec, rate/sec, and CPU utilization breakdown.
- ESAVSEP - VSE Partition Performance - VSIVC1**: A table listing various system partitions and jobs, such as POWSTART, SECSERV, and VMAMSTR, along with their CPU usage and phases.
- VSE CPU Utilization by Node**: A line chart showing CPU utilization for node zvse61b over time. The y-axis represents CPU Utilization (0.0 to 3.0) and the x-axis shows time from 13:46 to 14:16. A significant spike is visible around 13:56.



# Capacity Planning Dynamic Example....

## Dynamic Charts

- Data extracted from database dynamically to create graph





# *Velocity Software Pandemic Summary*

Upgraded data center

Operational Support Improvements

Normal support for z/VM releases

z/OS enhancements

Splunk, Mongo, Postgres

Docker, Openshift