PERFORMANCE NEWS

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zVRM - THE VELOCITY SOFTWARE RESOURCE MANAGER

BY BARTON ROBINSON

We are announcing availability of zVRM. Velocity Software's mission is to simplify the z/VM environment and help our customers achieve a more efficient and cost effective environement. zVRM is our next contribution to that endevour.

In traditional dedicated server architectures, servers were oversized to ensure that they would not need to take outages when the workload grew larger than the server was defined. That method of sizing servers is often continued to zLinux where resources are shared and wasting resources is very expensive. In our world on z, servers maybe resized dyanmically without an associated outage.

Installations attempt to simplify their server environment by creating identical servers irregardless of the workload requirements. This causes excessive storage use and increases overhead. The purpose of zVRM is to provide a centralized facility to evaluate each server's current resource requirements, and then using CMM (Colaborative Memory Management) to vary storage offline. zPRO provides an API allowing Linux command lines to be used to very off virtual CPUs if they are not needed and creating overhead.

The original zVRM model was built when servers were measured in Megabytes. Workloads ramp up quickly, and at that time zVRM was needed to react several times a minute. With current servers that are measured often in 100's of Gigabytes, there is more than enough time with the standard one minute interval.

For installations that generate one standard configuration server, zVRM will tailor the server real time to meet the current workload requirements. When servers are idle, this will free up their real storage to allow other servers to utilize it.

When too many virtual CPUs are online to a server, this degrades performance in multiple ways. Normal workloads on Linux run faster when there are fewer virtual CPUs. zVRM will evaluate each server and vary virtual processors on or offbased on current utilization.

Providing a centralized control facility allows standards to be easily set for the enterprise servers. There is an alternative that installaitons have tried. CPUPLUGD is a deamon that runs on each Linux server with it's own parameters. With no method of a global approach, there have been few successes. The result of managing with zVRM is that cookie cutter servers can be created and then sized to meet the workload as the workload goes up and down.

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EDITORIAL

For the last few years, the word "modernization" is the buzzword. The two required parts of "modernization" are the browser based front end, and the currentthinking that having APIs to manage the platform from off platform (likely browser based) functions.

Velocity Software has the only viable web server for z/VM. This provides the flexibility and the power of easily using all of the native z/VM functions. Using apache on Linux with a SMAPI interface is sufficiently complicated that all the projects I'm aware of that attempt to use it have failed. The approach to utilize a guest with a webserver to use difficult APIs is fundamentally a bad architecture.

Velocity Software has created APIs based on our webserver for zPRO. The objective of zPRO is to provide a modern front end on the z/VM platform to both manage and simplify the platform. The APIs developed for this are available for our customers to use outside the zPRO function as well. There are customers doing this now that are helping us validate the fact that we can provide APIs to manage all the z/VM functions.

Recently one of our installations told us they were "modernizing" by getting off of z/VM. There are people everywhere that have not had the opportunity to see the power and simplicity of what can be provided.

Velocity Software is very excited on another front. The impact of the EU and other organizations making carbon neutral commitments. Having seen some large financial institutions move large workloads to the z platform to meet carbon neutral objectives is exciting. With Velocity Software's objective of helping to improve system utilization, that even helps further to reduce floor space and power requirements. Carbon neutrality is our friend.

zPRO AND MODERNIZATION OF THE GREAT z/VM PLATFORM

The z/VM platform runs on the most modern hardware in existence. The 3270 front end is the only one provide for the platform and even most of the vendor supplied support programs. IBM has tried with XCAT, CMA, OpenStack to provide a different front end. We don't hear about these anymore suggesting they did not take a direction with a future.

We believe that with zPRO, first, as the user interface and the APIs are based on our native z/VM based web server, there is a very long future. We also look at existing traditional tools that are still using a 3270 interface. We have developed zSPOOL, zSCHEDULE, zDIRECT, and other tools to put a modern interface in front of traditional functions that are widely used and widely needed.

When any installation thinks that modernization is not happening on the z/VM platform, then that is on us for not making it more clear. Sure, 3270 is a very useful interface for those of us that do developement on z/VM. But your Linux administrators have a different perspetive and many won't be interested in learning.

EDUCATION FOR THE PLATFORM

We've seen the need for instructor led education in a lot of areas. There is a need for both Velocity Software as we hire new people, and for our customers as they hire people to support their growing platforms. The z/VM platform has very little if any instructor led education. Other vendors are training for their z/OS development. It is up to Velocity Software for the z/VM components. Customers that we have talked to about this have gotten excited that we are doing this, especially about the cost. We are starting to build a curiculum of what would be no-charge instructor led online education.

The areas that we are building up one hour sessions are the following:

Introduction to z/VM
- CMS, REXX, XEDIT

Introduction to systems programming
- SFS, Diretory, Systems Config

Introduction to programming
- PL1, Assembler

Our objective is to schedule webex classes and see who shows up. When customers ask for specific classes, we will schedule them. If there is education and students that you would like to have taught, or if you have something that seems like it should be in our curiculum, please contact Barton@VelocitySoftware.com.

THE VELOCITY SOFTWARE PERFORMANCE CLASS PRIOR TO THE VM WORKSHOP AT OHIO STATE UNIVERSITY.

When: June 20 & 21, 2023
Where: Ohio State University

To register send an email with your company details to:
info@velocitysoftware.com

The class is limited to 25 people, make sure to reserve your seat today!

zPORTAL – A WEB INTERFACE TO MANAGE zVPS

BY RICH SMRCINA

zVPS provides world class performance management for z/VM, Linux, and VSE. Our very popular web interface, zVIEW, is a window into performance that is extremely popular to eliminate the need to use a 3270 to see the inner workings of your system.

Our zPRO product provides a web interface not only to Linux virtual machine management, but also more recently, z/VM systems management.

Borrowing from the zPRO user interface is a component of zVPS called zPORTAL.

zPORTAL gives you a web based management interface into zVPS. The user interface and many backend functions are shared with zPRO, in addition to the same security mechanism and enterprise support.

Some of the functions available with zPORTAL are:

- Managing zTCO nodes
- zWRITE user class managementESAVSEP
- Display and/or upload console files
- Display web server logs
- Show web server status and statistics

In the last couple of years zPORTAL is able to perform configuration functions for zVPS in a similar way to the 3270 based configurator. For most configuration functions, it is no longer necessary to use the 3270. It can be done from a web browser.

Recently, zVPS provided a unattended installation function. Whereby ZVPS can be XAUTOLOGged to perform installation functions for previously downloaded products.

With the zPORTAL enterprise support, it made sense to extend that function to zPORTAL.
Now there is a mechanism in zPORTAL to drive the unattended installation process. The product level display in zPORTAL has been updated to have a similar look to that in VSIMAINT. The products are displayed along with the currently installed level, and the 8 most recent levels. The recent levels are color coded as they are in VSIMAINT. (Figure 1)

Also new in this display are the buttons at the bottom. They provide the various unattended installation functions; Install ALL will install all previously downloaded products, Install RDR will install and products that are in the ZVPS RDR, Install Prod will provide a list of the available levels for a product selected from the list. This allows a very selected install function, and also allow for the backlevelling of a product.

Since unattended installation is a background process, it is initiated and the progress must be checked later. That is the reason for the Check Status function. Usually installation is extremely fast, so checking the status can typically be done right after the process is started. (Figure 2)

Unattended installation can additionally install a product key, and provides a full product files display (in a similar fashion to the CMS FILELIST command).

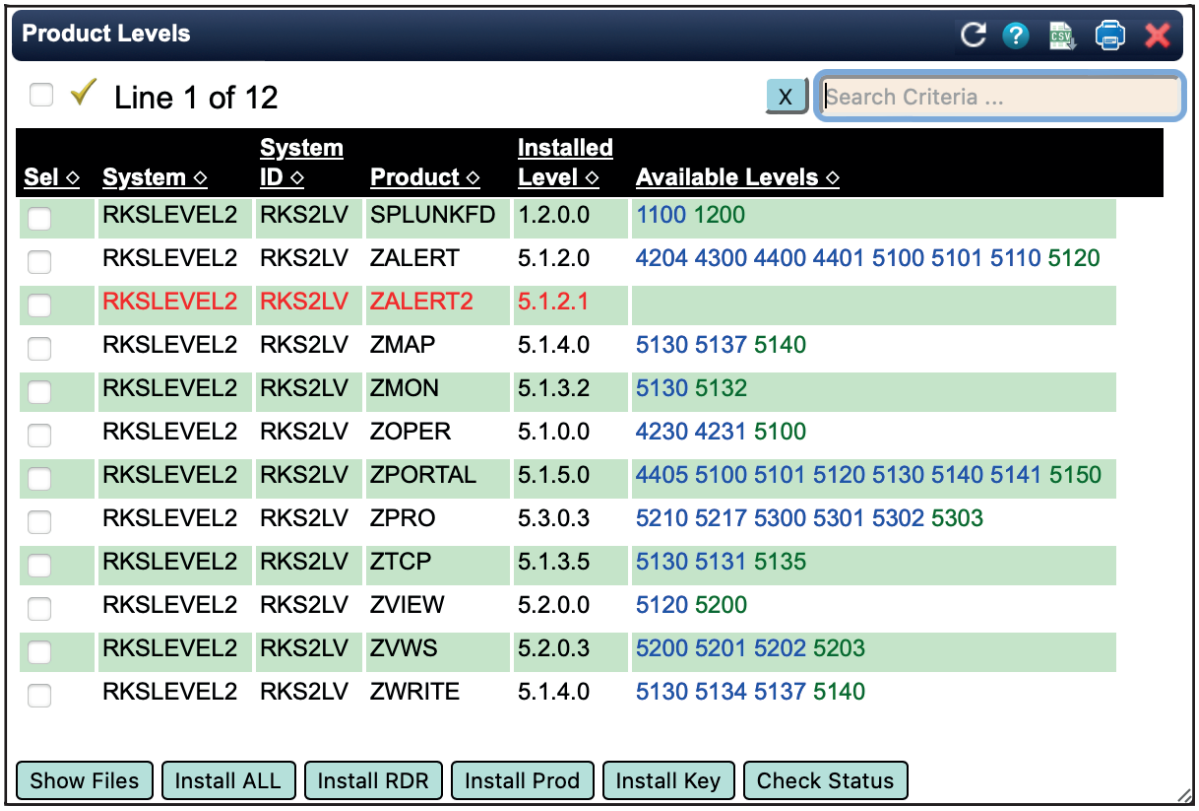

Figure 1

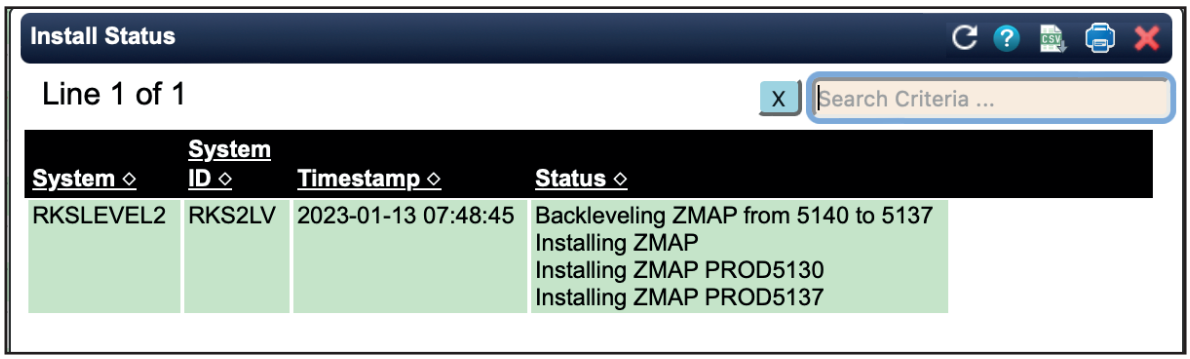

Figure 2

NEW TUNING GUIDE!

BY CHRISTY BROGAN – A NEW RIDER ON THE VELOCITY BUS

After several years away from my own VM performance tuning and a full year and a half of retirement, I have the privilege of working for a company that I have always admired.

One of the things I have always loved about Velocity is the vast amount of knowledge among its owner/employees and how their customer service was always stellar when contacting them for assistance. Now I get to pay it forward! I've been asked to take the plethora of information from the Velocity screens/reports/handouts/seminars/etc. and put it into a simple, easy-to-follow tuning guide. I definitely have my work cut out for me! However, I've managed to put together a good start (ok, I think so anyway).

Introducing the new performance problem analysis and tuning section in the Customer Area. Click on the new Tuning Guide and you will see a concise performance problem methodology that gives information about the zVPS screens/reports from general to specific. The contents start with Velocity Software's methodology for solving performance issues, which is very helpful to determine "Where do I start?". Whatever zVPS can measure, there is a section that helps explain what to look for on that system – z/VM, Linux, z/VSE, z/OS, and applications. (Figure 1)

There is also a link to a flow chart analysis page that takes dozens of handouts and puts the information in an easy-to-follow flow with customer examples. Here is a snip. (Figure 2)

As valued customers, this information in the Customer Area has tips and tricks that Barton and company have discovered over the years that may not be commonly known. As VM has evolved, some of the information the system can provide is no longer necessarily relevant. For each part of the VM system (hardware, system settings, user utilization, etc.) the most important and/or simplest way to get the data needed to solve a performance problem is documented. This includes pictures, descriptions, what to watch for, and tips for planning, operations, and chargeback. Beneficial information with a list of the most helpful screens/reports to view, pictures with highlighted fields, and what those fields mean are provided. For example, here is a picture from the Examining User Wait States page. (Figure 3)

As a long-time customer, I am thrilled to be a part of putting this documentation together. I hope it is helpful to those using it. If there is any feedback, desired additions, questions, or definitely if there are times when this information has assisted in solving a performance issue, please let me know – christy@velocitysoftware.com. Thank you and may all your problems be easy to solve!

Tuning Topics Table of Contents

- **Performance Methodology**
  - zVPS Performance Methodolgy
- **Performance Tuning and Analysis**
  - z/VM Performance
  - Linux Performance
  - Linux Application Performance
  - z/VSE Performance
  - z/OS Performance
  - CICS Performance
- **Chargeback / Accounting**
  - z/VM Performance Chargeback
  - Linux Performance Chargeback
  - z/VSE Performance Chargeback
  - z/OS Performance Chargeback
  - CICS Performance Chargeback

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z/VM Performance Tuning and Analysis

- **z/VM High Level - understand the system and high level analysis.**
  - The System Configuration Level
  - The CPU Level
  - The LPAR Level
  - The Storage/Paging Level
  - The DASD Level
  - The Network Level
- **z/VM Subsystem Level - delving deeper.**
  - Setting SHARE Values for Virtual Machines
  - Resource Pool/CPU Pool
  - Examining User Wait States
  - SMT (Simultaneous MultiThreading) Analysis
  - Steal Analysis White paper
  - Measuring Virtual Machine Requirement
  - CPU/LPAR Parking

Figure 1

z/VM Problem Determination Flow Chart Analysis

(1) What is the system configuration (how the system hardware/software/etc is set up) -

Review the The System Configuration Level

(2) Is it a system problem? -

- **Review the System load analysis**
- **Review the Wait state constraint analysis**
- **Review the Virtual machine configuration analysis**
- **Review the The CPU Level**
- **Review the The LPAR Level**
  - **Review the LPAR weights/overhead analysis**
  - **Review the LPAR pool analysis**
- **Review the The Storage/Paging Level**
  - **Review the System storage analysis**
  - **Review the System page analysis**
  - **Review the IBR analysis**
- **Review the The DASD Level**
  - **Review the DASD configuration analysis**
  - **Review the DASD utilization analysis**
  - **Review the DASD cache analysis**
- **Review the The Network Level**
  - **Review the Network configuration analysis**
  - **Review the Network data rate analysis**
  - **Review the QDIO utilization analysis**
  - **Review the OSA utilization analysis**

(3) Is it a server/user problem? -

Figure 2

ESAXACT - This shows virtual machine state and wait state analysis information. Helpful information:

		<-Samples->		<---Percent non-dormant---------->						<Async>			Lim	Pct	non-dormant-------> E-	T-		Tst		D-	Times I/O	
Time	UserID /Class	Total	Pct In Q	Run	Sim	CPU	SIO	PAG	SVM	I/O	Pag	Ldg	Lst	Elg	SVM	SVM	CF	Idl	Oth	SVM	Throt	CPU%
17:36:00	System:	6480	24.0 3.0	0.1	0.7	0	0	2.6	0	0	0	0	0	0	2.6	0	94	0	9.4	0	58.9
17:36:00	ORACLE	180	100.0 0.6	0.6	1.7	0	0	0	0	0	0	0	0	0	0	0	97	0	0	0	1.1
17:36:00	**REDHAT**	**420**	**61.4 0.8**	**0**	**0.4**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**99**	**0**	**0**	**0**	**1.7**
17:36:00	REDHAT6	60	96.7 3.4	0	1.7	0	0	0	0	0	0	0	0	0	0	0	95	0	0	0	1.2
17:36:00	REDHAT74	120	35.0 0	0	0	0	0	0	0	0	0	0	0	0	0	0	100	0	0	0	0.0
17:36:00	REDHAT75	120	49.2 0	0	0	0	0	0	0	0	0	0	0	0	0	0	100	0	0	0	0.4
17:36:00	REDHAT8	120	82.5 0	0	0	0	0	0	0	0	0	0	0	0	0	0	100	0	0	0	0.1
17:36:00	Servers	1680	4.9 0	0	0	0	0	11	0	0	0	0	0	0	11	0	89	0	22	0	0.4
17:36:00	SUSE	240	81.3 21	0.5	0	0	0	0	0	0	0	0	0	0	0	0	79	0	0	0	50.1
17:36:00	TheUsrs	1560	40.8 0.2	0	0.6	0	0	0.8	0	0	0	0	0	0	0.8	0	98	0	3.5	0	3.3
17:36:00	TEST	720	20.4 0	0	2.0	0	0	0	0	0	0	0	0	0	0	0	98	0	0	0	0.9
17:36:00	Velocity	420	11.4 4.2	0	0	0	0	44	0	0	0	0	0	0	44	0	52	0	5.0	0	1.4
17:36:00	Web	1260	0.5 0	0	0	0	0	100	0	0	0	0	0	0	100	0	0	0	13	0	0.0

- **UserID/Class** - This shows the system total and totals for servers/classes. Can click (zview) or zoom/PF2 (z/VM) to see each user/server in a class. (This assumes classes are set up in zMON. See above.)
- **Percent non-dormant CPU** - This shows the percentage of time a user/server/class is waiting for CPU. If an id is in this state, they are waiting for CPU. Check the CPU utilization for the system. Also check LPAR weights/overhead.*
- **Percent non-dormant SIO** - This shows the percentage of time a user/class is waiting for I/O. If an id is in this state, they are waiting for I/O which usually means DASD. Check the DASD utilization for the system. There may be a device having issues or being over used.
- **Percent non-dormant PAG** - This shows the percentage of time a user/class is waiting on paging. If an id is in this state, they are waiting for a page to be read by the system. Check the storage/paging utilization for the system.
- **Percent non-dormant Async I/O** - This shows the percentage of time a server (multiprocessing system) is waiting for I/O. If a server is in this state, they are waiting for I/O which usually means DASD. Check the DASD utilization for the system. There may be a device having issues or being over used.
- **Percent non-dormant Async Pag** - This shows the percentage of time a server (multiprocessing system) is waiting on paging. If a server is in this state, they are waiting for a page to be read by the system. Check the storage/paging/DASD utilization for the system.
- **Percent non-dormant Ldg** - This shows the percentage of time a user/server/class is 'loading' if it has a high count of page reads or if its pages were paged out. This can indicate a thrashing condition. This is where the system is struggling to get storage resources to run machines. Check the storage/paging/DASD utilization for the system.
- **Percent non-dormant Lim Lst** - This shows the percentage of time a user/server/class is on the "Limit List". This could be due to SHARE LIMIT being set or possibly a resource pool constraint. Check SHARE size for the id, CPU utilization and/or resource pool utilization.

Figure 3

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2023 IBM z, z/VM AND LINUX ON z EVENTS

Looking to improve your z Systems knowledge and skills? Here are some events, that we will be attending. Please check our next newsletters and social media sites for updates.

EVENTS

March 5–8: SHARE
Atlanta
March 13: T3 and client workshop
Ehningen, Germany
March 17: GSE Technical University for Mainframe Modernization
Kassel, Germany
March 17: T3 and client workshop
Poughkeepsie, NY
April 3: T3 and client workshop
Mexico City
April 18: MVMUA, New York Metropolitan VM User's Association
Online
May 23–25: GSE Nordic Region conference
Oslo, Norway
June 20–21: Velocity Performance Class
Columbus, OH
June 22–24: VM Workshop
Columbus, OH
July 18: MVMUA, New York Metropolitan VM User's Association
Online
August 13–18: SHARE Summer
New Orleans
October 24: MVMUA, New York Metropolitan VM User's Association
Online
October: GSE Technical University for Linux, z/VM and VSE
Germany
November: GSE UK
Whittlebury Hall, UK

Imprint
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