

Using your Performance Monitor to Watch z/VM and Linux

Richard Smrcina
Velocity Software, Inc.
VM Workshop
VCU – Richmond, VA
June, 2019



PROVEN PERFORMANCE

- **Challenges**
- **Using Technology to Address Those Challenges**
- **Performance Monitoring**
- **Operational Support**
 - zALERT
 - zOPERATOR

Setting correct expectations

This discussion and images contained in this presentation are generated by Velocity Software's zVPS product suite

Specific technology contained in the product suite will be discussed and displayed

Time is not our friend

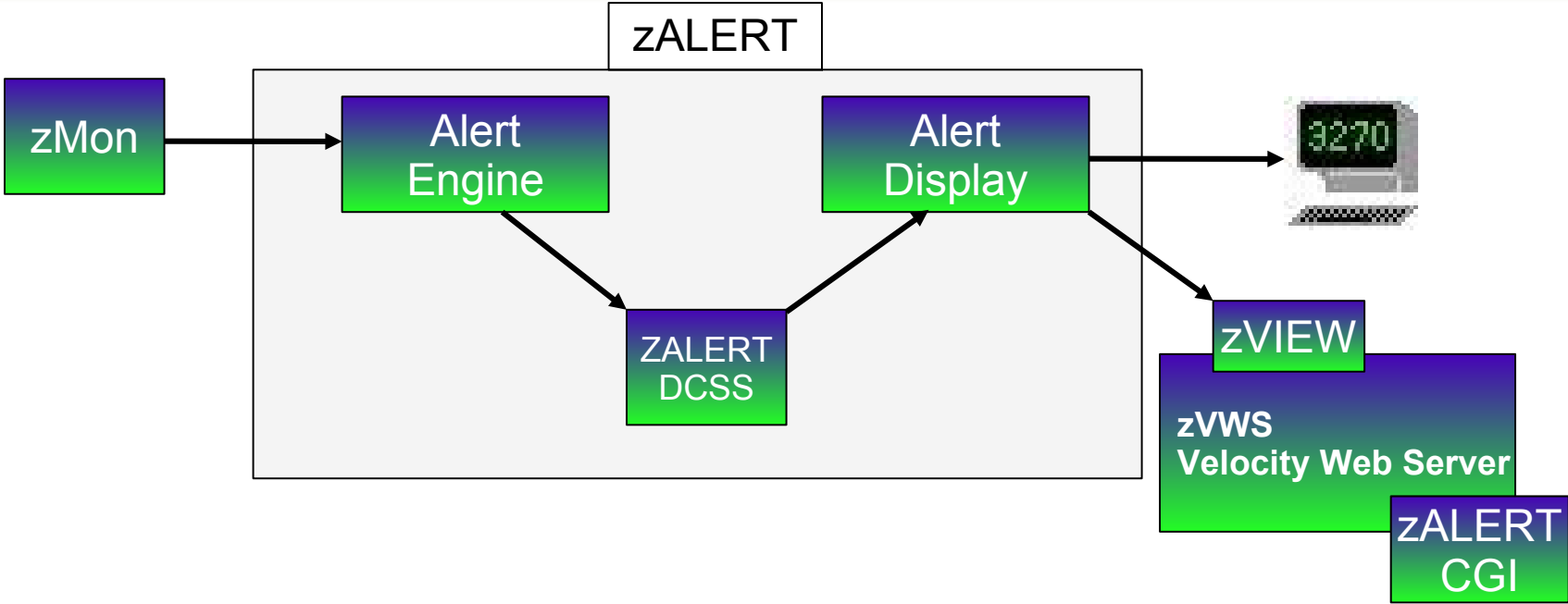
- There is never enough
- So much more to do

Aging workforce

- None of us are getting younger
- Technology has to step in

- **A service virtual machine is used to execute the 'alert engine'**
 - ◆ The virtual machine wakes up every minute
 - ◆ Installation defined alerts are evaluated
 - ◆ Monitor data is extracted
 - ◆ Values returned compared against user defined thresholds
 - ◆ User defined messages are generated and stored in the DCSS
 - ◆ Notifications can be sent to interested parties

zALERT Technology



```
06:53:51 AUTO LOGON   ***           LINUX001 USERS = 35     BY OPERATOR
07:00:40 HCPPGT401I 90 percent of all paging space is in use.
07:03:00 HCPPGT400I All paging space is in use.
07:03:43 HCPPGT401I 90 percent of all spooling space is in use.
```

```
07:03:57 HCPDMP908I SYSTEM FAILURE ON CPU 0000, CODE - PGT004
HCPDMP9250E SYSTEM DUMP FAILURE; NO DUMP UNIT - INSUFFICIENT SPOOL SPACE
07:04:06 HCPWRP9277I SYSTEM TERMINATION COMPLETE, ATTEMPTING RESTART
```

RUNNING VM01A

Catastrophic event

- **Outages can have a large impact**
 - ◆ Unavailability of applications
 - ◆ Potential for information loss
 - ◆ Disruption of customer service
 - ◆ Political ramifications
 - Complex to manage
 - Outage makes the platform appear weak



PROVEN PERFORMANCE

Maintain availability

- **Critical to success**
- **Reduction or elimination of outages is vital**
- **A well maintained, highly-available system...**
 - ◆ Looks good to customers, end-users, shareholders

What are alerts?

- **Proactive monitoring can detect an abnormal situation before it causes trouble**
- **Continually analyzes customer defined conditions**
- **A condition can be**
 - ◆ Exceeding a certain threshold
 - ◆ Message(s) that require attention
 - ◆ An object in a state not conducive to proper operation
 - Volume offline
 - Virtual machine not logged on
 - Incorrect system settings

- **Alert samples are delivered with the package**
 - ◆ ALERT1 MONALERT is a generic set of samples
 - ◆ Older sample files are shipped with the filetype MONSAMP
 - VMALERT, LINALERT, HEALTH and HEALTH2
 - ◆ Samples ship with alerts to check various conditions that can potentially occur
 - LPAR, System, User, Linux node, Devices
- **Additional samples available on our web site**

- **A notification can be any of**
 - ◆ Message displayed via a 3270 session, zVIEW or zALERT CGI
 - ◆ CP MSG to a user (eg: OPERATOR)
 - ◆ Email to interested parties
 - Text message on a mobile device
 - ◆ SNMP trap sent to a management console
 - ◆ Combinations of the above

Defining your own alerts

- **Alerts generally use the following statements**
 - ◆ **EXTRACT**
 - Signifies the start of the data extract
 - ◆ **CRITERIA**
 - Provides a filter for data extracted from the monitor
 - ◆ **VAR**
 - Defines a local variable made up of an expression involving monitor variables
 - ◆ **ALERT**
 - Defines an alert on a variable defined in VAR
 - ◆ **LEVEL**
 - User defined thresholds and optional actions
 - ◆ **TEXT**
 - User defined display text with variable replacement

Defining your own alerts

```
07:00:40 HCPPGT401I 90 percent of all paging space is in use.
```

- **Alerts can help to detect this condition**
 - ◆ Before it degenerates into an abend and outage
- **Sample page space utilization alert**

```
extract
var  pgutil  | 3 1 | (sytasg.calslti1*100)/sytasg.calslta1

alert pgutil page
level 20 green
level 50 yellow
level 80 red
text Page utilization is &pgutil%
```

Defining your own alerts

'Extract' is the beginning of an alert definition or set of alert definitions

extract

```
var pgutil | 3 1 | (sytag.calslti1*100)/sytag.calslta1
```

```
alert pgutil page
```

```
level 20 green
```

```
level 50 yellow
```

```
level 80 red
```

```
text Page utilization is &pgutil%
```

Defining your own alerts

```
extract
```

```
var pgutil
```

```
| 3 1 |
```

Size of each variable with optional decimal precision

```
(sytag.calslti1*100)/sytag.calslta1
```

```
alert pgutil page
```

```
level 20 green
```

```
level 50 yellow
```

```
level 80 red
```

```
text Page utilization is &pgutil%
```

Variables defined for use
in the following alerts

Defining your own alerts

```
extract
var  pgutil  | 3 1 | (sytag.calslti1*100)/sytag.calslta1

alert pgutil page
level 20 green
level 50 yellow
level 80 red
text Page utilization is &pgutil%
```

Fields to extract -
names are described in the PDR
(Performance Data Reference)

Can be a single field or multiple
fields involved in simple to
complex math operations.

Defining your own alerts

```
extract
var  pgutil  | 3 1 | (sytasg.calslti1*100)/sytasg.calslta1

alert pgutil page
level 20 green
level 50 yellow
level 80 red
text Page utilization is &pgutil%
```

Paging Data			
SYTASG		SYTASG	
SAMPLES	flt =	flt 0	Observations
CAL90FUL	flt =	flt 1	Times paging area was 90 percent full
CAL91FUL	flt =	flt 1	Times spooling area was 90 percent full
CALSLTA1	flt =	flt 0	Paging slots allocated
CALSLTI1	flt =	flt 0	Paging slots in use

Defining your own alerts

```
extract
var pgutil | 3 1 | (sytag.calslti1*100)/sytag.calslta1
```

```
alert pgutil page
level 20 green
level 50 yellow
level 80 red
text Page utilization is &pgutil%
```

Four character code used when displaying alerts

ALERT statement defines a specific alert

Each alert requires a previously defined variable

Defining your own alerts

```
extract
var  pgutil  | 3 1 | (sytag.calslti1*100)/sytag.calslta1

alert pgutil page
level 20 green
level 50 yellow
level 80 red
text Page utilization is &pgutil%
```

Color of the alert text when this level is exceeded

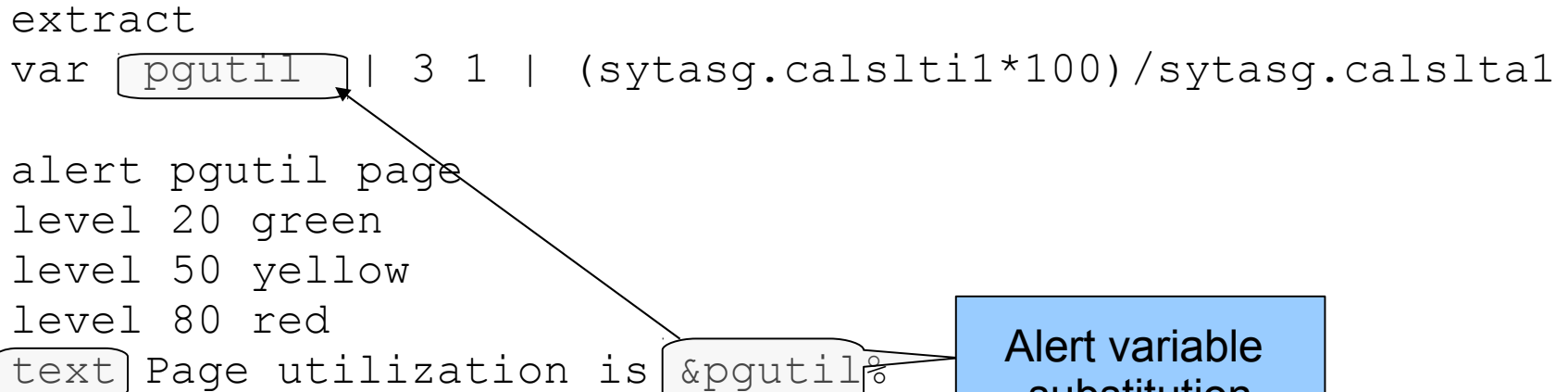
Values tested against the alert variable

LEVEL statement controls the threshold values

Defining your own alerts

```
extract
var pgutil | 3 1 | (sytag.calslti1*100)/sytag.calslta1

alert pgutil page
level 20 green
level 50 yellow
level 80 red
text Page utilization is &pgutil%
```



Message displayed on 3270
and zView alert screens

Alert variable
substitution

Alert result - 3270

- The 3270 screen based on the alert definition

Screen: **ALERTPAG** RKS2LV 4 Jan 2017 09:53:14

----- Exceptions Analysis Alerts -----

Type	Description
PAGE	Page utilization is 26.6%

Code specified on ALERT statement

TEXT directive with variable substitution

Alert result - zVIEW

- Same data in zVIEW

ALERTPAG - Exceptions Analysis Alerts - 17/01/04 at 09:57 - RKS2LV	
Code	Alert Description
PAGE	Page utilization is 26.6%

Page and Spool Utilization combined

- **Some alerts can be combined under one extract**
 - ◆ Saves processing time
 - ◆ Needs to be similar data

```
extract
```

```
var  pgutil  | 3 1 | (sytag.calslti1*100)/sytag.calslta1
```

```
var  sputil  | 3 1 | (sytag.calslti2*100)/sytag.calslta2
```

```
alert pgutil page
```

```
level 20 green
```

```
level 50 yellow
```

```
level 80 red
```

```
text Page utilization is &pgutil%
```

```
alert sputil spol
```

```
level 20 green
```

```
level 50 yellow
```

```
level 80 red
```

```
text Spool utilization is &sputil%
```

Screen: PGSP

RKS2LV

----- Exceptions Analysis Alerts

Type	Description
------	-------------

PAGE	Page utilization is 26.0%
------	---------------------------

SPOL	Spool utilization is 61.2%
------	----------------------------

- **Adjust the number and value of levels based on local requirements**
 - ◆ At least one LEVEL statement is necessary
 - ◆ LEVEL statements are evaluated from the bottom up
- **Standard 3270 colors are allowed**
 - ◆ Turquoise, Blue, Red, Yellow, Green, Pink, White
 - ◆ If no color is specified, the default is Green
 - ◆ Color modifiers are allowed
 - **REV**video – reverse video
 - **BL**ink – blink the entire text
 - **UNDERLINE** – underline the entire text

- **Alert for LPAR Utilization**

```
Extract
```

```
Parms LPAR *
```

```
Criteria sytcup.lcupname <> 'Totals:'
```

```
var  lpname      | 8      | sytcup.lcupname
```

```
var  lputil      | 3 0  | sytcup.pctcpu
```

```
alert lputil lpcp
```

```
level 70 yellow
```

```
level 85 red
```

```
level 92 red rev
```

```
text LPAR utilization of &lpname is &lputil%
```

LPAR Utilization

- Alert for LPAR Utilization

Extract

Parms LPAR *

Informs the extract to pull data for all LPARs

Criteria sytcup.lcupname <> 'Totals:'

var lpname | 8 | sytcup.lcupname

var lputil | 3 0 | sytcup.pctcpu

Data filtering

alert lputil lpcp

level 70 yellow

level 85 red

level 92 red rev

text LPAR utilization of &lpname is &lputil%

LPAR Utilization

Extract

```
Parms LPAR *
```

```
Criteria sytcup.lcupname <> 'Totals:'
```

```
var lpname | 8 | sytcup.lcupname
```

```
var lputil | 3 0 | sytcup.pctcpu
```

```
alert lputil lpcp
```

```
level 70 yellow
```

```
level 85 red
```

```
level 92 red rev
```

```
text LPAR utilization of &lpname is &lputil%
```

Text will be in reverse video
(black text, red background)

ALERTLPR - Exceptions Analysis Alerts - 18/02/20 at 06:16 - VM5

Code	Alert Description
LPCP	LPAR VSIVM4 CPU Utilization is 94%

External Processing

- **An alert can call an external process**
 - ◆ Function
 - ◆ Stage
- **Function is a REXX EXEC that processes already extracted data**
 - ◆ Called for each record returned from an extract
 - ◆ Returns a single value
- **Stage is an EXEC that is called as a pipeline stage**
 - ◆ Must have a filetype of REXX
 - ◆ Can independently run it's own extract
 - ◆ Returns a single value

Missing Virtual Machine

- **Detection mechanism for required virtual machines**
 - ◆ Service machines
 - ◆ Utility machines
 - ◆ Linux systems

```
extract
var    dummy      | 1 | 1
stage alrtmusr   | 8 |

alert dummy xmvm
level 0 red action CP MSG OP &code &text
text User &alrtmusr not logged onto system
```

```
Screen: TOP20                                RKS2LV
----- Exceptions Analysis Alerts -----
Type Description
XMVM User ZWEB06 not logged onto system
```

MISSING USER

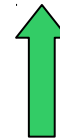
```
/* VELOCITY Virtual Machines
ZSERVE ZTCP
ZADMIN ZWEB01 ZWEB02 ZWEB03
ZWEB04 ZWEB05 ZWEBLOG
ZWEB06
/*
/*      SFS service machines
/*
VMSERVU VMSERVS SFSZVPS
/*
CRON
```

Second vdisk usage

- Using two swap disks with different priority
 - ◆ Second disk larger than the first
 - ◆ First disk fills, Linux uses the second disk
 - ◆ Alert when second disk is used

ESAVDSK - VDISK Analysis - RKS2LV															
Time	Owner	Space Name	<--Size-->		<--pages-->		Prv	VIO	<AddSpce>			<-----pages/s<			
			AddSpc	VDSK	Resi-	Lock-			or	rate	Usr	Cre-	Del-	Sto-	<--DASD-->
			Pages	Blks	dent	ed	Shr	/min	Lks	ates	etes	len	Read	Write	
07:56:00	LINUX001	VDISK\$LINUX001\$0202\$0031	4000	32000	407	0	Shr	311	1	0	0	41.2	48.0	38.6	
07:56:00	LINUX001	VDISK\$LINUX001\$0203\$0032	16000	128K	8093	0	Shr	845	1	0	0	37.6	172.5	36.6	
07:56:00	LINUX002	VDISK\$LINUX002\$0202\$0053	4000	32000	0	0	Shr	0	1	0	0	0	0	0	

Vdisk activity indicator



Second vdisk usage

- **Create an alert to show Vdisk activity**
 - ◆ Only care about the second disk

```
extract
parms space vdisk* user *
criteria stoasi.mdiovdev = '0203'
var    userid    | 8    | aspace.userid
var    vdev      | 4    | stoasi.mdiovdev
var    io_rate   | 6    | stoasi.qdiocnt
```

Select address spaces
beginning with vdisk

Common second
virtual disk

```
alert io_rate lsvd
level 0 red
text Node &userid is using the second virtual disk
```


Second vdisk usage

- **Result**

```
extract
parms space vdisk* user *
criteria stoasi.mdiovdev = '0203'
var    userid    | 8    | aspace.userid
var    vdev      | 4    | stoasi.mdiovdev
var    io_rate   | 6    | stoasi.qdiocnt

alert io_rate lsvd
level 0 red
text Node &userid is using the second virtual disk
```

Screen: **LSVD**

RKS2LV

----- Exceptions Analysis Alerts -----

Type Description

LSVD Node LINUX001 is using the second virtual disk

- **A condition that causes a virtual machine to delay processing**
- **When a virtual machine waits, it can not do useful work**
 - ◆ Simulation wait – waiting for simulation functions
 - Master processor, IUCV, RPI, line mode commands
 - ◆ Page wait – waiting for page fault resolution
 - ◆ CPU wait – waiting for CPU

Wait states

```
extract
parms user *
criteria userdata.userid <> 'System:' & useact.vmdttime > 0
var userid      | 8    | userdata.userid
var cpuwpct     | 3 0 | (useint.hfcpuwt*100)/useint.nondorm

alert cpuwpct vmcw
level 0 blue
level 10 blue
level 20 yellow
level 50 red
text User &userid is in &cpuwpct% CPU wait
```

Wait states

ESAXACT - Transaction Delay Analysis - DEMO



Time	UserID /Class	-<Samples->		<---Percent non-dormant----->										non-dormant----->					Times			
		Total	Pct	In Q	Run	Sim	CPU	SIO	Pag	SVM	I/O	Pag	Ldg	Lst	Elg	SVM	SVM	CF	Idl	Oth	SVM	I/O
08:10:00	LINUXVM	60	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	100	0	0.0
08:10:00	LXDB2001	60	100.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	100	0	0	0	0.6
08:10:00	LXDB2002	60	100.0	0	0	1.7	0	0	0	0	0	0	0	0	0	0	0	98	0	0	0	0.9
08:10:00	LXSUGAR	60	100.0	0	0	1.7	0	0	0	0	0	0	0	0	0	0	0	98	0	0	0	0.2
08:10:00	OPERATOR	60	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
08:10:00	ORACLE	60	98.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	100	0	0	0	1.4
08:10:00	RACFVM	60	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:10:00	REDHAT6X	60	100.0	1.7	0	8.3	0	0	0	0	0	0	0	0	0	0	0	90	0	0	0	1.2
08:10:00	REDHAT73	60	46.7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	100	0	0	0	0.1
08:10:00	RKSDEV	60	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
08:10:00	RKSUBU01	60	31.7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	100	0	0	0	0.2
08:10:00	RKSVM01	60	61.7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	100	0	0	0	0.0
08:10:00	RKS2LV	60	80.0	0	0	4.2	0	0	0	0	0	0	0	0	0	0	0	96	0	0	0	0.6

Screen: **WAITS** Velocity Software - VSIVM4 23 May 2018 08:10:10

----- Exceptions Analysis Alerts -----

- | Type | Description |
|------|----------------------------------|
| VMCW | User JSV2LVL is in 2% CPU wait |
| VMCW | User LXDB2002 is in 2% CPU wait |
| VMCW | User LXSUGAR is in 2% CPU wait |
| VMCW | User REDHAT6X is in 8% CPU wait |
| VMCW | User RKS2LV is in 4% CPU wait |
| VMCW | User SLES12 is in 13% CPU wait |
| VMCW | User SSNODE3 is in 2% CPU wait |
| VMCW | User S11S20RA is in 12% CPU wait |
| VMCW | User ZSXL0004 is in 3% CPU wait |
| VMCW | User ZSXL0007 is in 8% CPU wait |



- **Linux statistics are collected via SNMP**
- **Integrated into the monitor by zTCP**
- **Node utilization**
 - ◆ CPU Utilization reported for each node
- **Process utilization**
 - ◆ CPU Utilization of each process running on a node

Node and process utilization

```
extract
parms node *
criteria ucdsys.totcpu > 0
var node      | 8    | tcpip.node
var cpuutil   | 4 1  | ucdsys.systpct + ucdsys.userpct
```

```
alert cpuutil lncp
level 5 green
level 50 yellow
level 90 red
text CPU utilization on node &node is &cpuutil%
```

```
extract
parms node *
criteria vsisft.name <> '*Totals*'
var node      | 8    | tcpip.node
var name      | 8    | vsisft.name
var pid       | 8    | vsisft.id
var procutil  | 4 2  | vsisft.totcpupct
```

```
alert procutil lnpu
level 10 yellow
level 50 red
text Process utilization for &name-&pid on &node is &procutil%
```

Node and process utilization

```
extract
parms node *
criteria ucdsys.totcpu > 0
var node      | 8
var cpuutil   | 4
```

```
Screen: NODEPRCS          Velocity Software - VSIVM4          30 May 2018 07:16:06
----- Exceptions Analysis Alerts -----
```

```
alert cpuutil lnc
level 5 green
level 50 yellow
level 90 red
text CPU utilization
```

Type	Description
------	-------------

LNCP	CPU utilization on node mail is 32.9%
LNCP	CPU utilization on node ssnodel is 9.8%
LNCP	CPU utilization on node ssnodel2 is 8.4%
LNCP	CPU utilization on node ssnodel3 is 7.9%
LNCP	CPU utilization on node suselnx2 is 51.3%
LNPU	Process utilization for init-1 on lxora12 is 2.38%
LNPU	Process utilization for init-1 on lxora12b is 2.38%
LNPU	Process utilization for python-3339 on ssnodel is 9.39%
LNPU	Process utilization for python-3214 on ssnodel2 is 8.23%
LNPU	Process utilization for python-3329 on ssnodel3 is 7.76%
LNPU	Process utilization for smallstr-8785 on suselnx2 is 51.21%

```
extract
parms node *
criteria vsisft.
var node      | 8
var name      | 8
var pid       | 8
var procutil  | 4
```

```
alert procutil lnp
level 10 yellow
level 50 red
text Process utilization for &name-&pid on &node is &procutil%
```

Swap utilization and rate

- **Swap utilization**
 - ◆ How much swap are we using?
- **Swap rate**
 - ◆ Are we swapping now?

Swap utilization and rate

```
extract
parms node *
criteria ucdsys.swappct > 0
var      node      | 8    | tcpip.node
var      swaprate  | 6 1 | ucdsys.swaprate
var      swapused  | 4 0 | ucdsys.swappct

alert swaprate lnsr
level 50 red rev
text Swap i/o rate for Linux node &node is &swaprate

alert swapused lnsu
Level 20 green
level 50 yellow
level 90 red rev
text Swap utilization for Linux node &node is &swapused%
```

Screen: SWAPUTRT

RKS2LV

----- Exceptions Analysis Alerts -----

Type	Description
------	-------------

LNSR	Swap i/o rate for Linux node linux001 is 151.2
------	--

LNSU	Swap utilization for Linux node sles12 is 24%
------	---

- **A notification is a message sent to interested parties of an alert condition**
- **Sent in one or more of the following forms**
 - ◆ CP MSG/MSGNOH
 - ◆ Email
 - ◆ Text page (via email)
 - ◆ SNMP Trap

Notifications

- At it's simplest a notification can take the form of a message to a CMS user

```
alert userprt vmpg | count &userid  
level 5 green action CP MSG OP &code &text  
text Page rate for &userid is &userprt/sec (above &tlevel for &tcount)
```

ACTION keyword on the LEVEL statement allows targeted messaging for a specific threshold

```
09:27:10 ZALERT VMPG Page rate for OPERATOR is 6.8/sec (above 5 for 6)
```

- **SNMP Trap configuration**

- ◆ Create/Modify SNMP TRAPDEST on the CONFIG disk

* following is default 1.3.6.1.4.1.15601
192.168.5.182 velocity 2B06010401F971 ;

- ◆ Use the TRAP directive on the LEVEL command

```
alert spool_use spol
level 10 green
level 70 yellow trap &code &atext
level 80 pink
level 90 red
text Spool utilization is &spool_use% (above &tlevel)
```

Notifications

- SNMP Trap result

```

Screen: RKS2LV                               RKS2LV                               6
----- Exceptions Analysis Alerts -----
Type Description
APSP Page space is 26.51% used
DVRT I/O rate for volume VM5W01 0124 103.35/sec
DVRT I/O rate for volume VM5PG1 0127 7.72/sec
ESAD ESAMON DCSS utilization is 3.3%
LNCP CPU utilization on Linux node sles12 is 22.66%
LNDX /usr area on linux001 is 86.65% full
LNDX /usr area on linux002 is 86.65% full
LNDX /var area on linux002 is 88.36% full
LNPU Process stresser CPU usage on node sles12 is 20.65%
LNSU Swap utilization for Linux node sles12 is 24%
PGRT System paging rate 48 (above 5)
SPOL Spool utilization is 72% (above 70)
VMCP User ZVPS is at 1.8807%
VMC2 User RKSDEV used 0.0018 CPU sec (0.0030%)
VMC2 User ZALERT used 0.2047 CPU sec (0.3412%)
VMIO I/O rate for user SFSZVPS 17
VMPG Page rate for OPERATOR is 6.9/sec (above 5 for 5)
VMPG Page rate for SMTP is 5.5/sec (above 5 for 1)
VMPG Page rate for ZALERT is 10.6/sec (above 5 for 1)
XACP Processor utilization at 3.1%
    
```

ID	Severity	Time	Node	Interface
217	Normal	Jan 6, 2017 9:41:00 AM		192.168.5.48
uei.opennms.org/generic/traps/EnterpriseDefault Edit notifications for event				
Trap from 192.168.5.48 Type: 0 Message: SPOL Spool utilization is 72% (above 70)				

Notifications

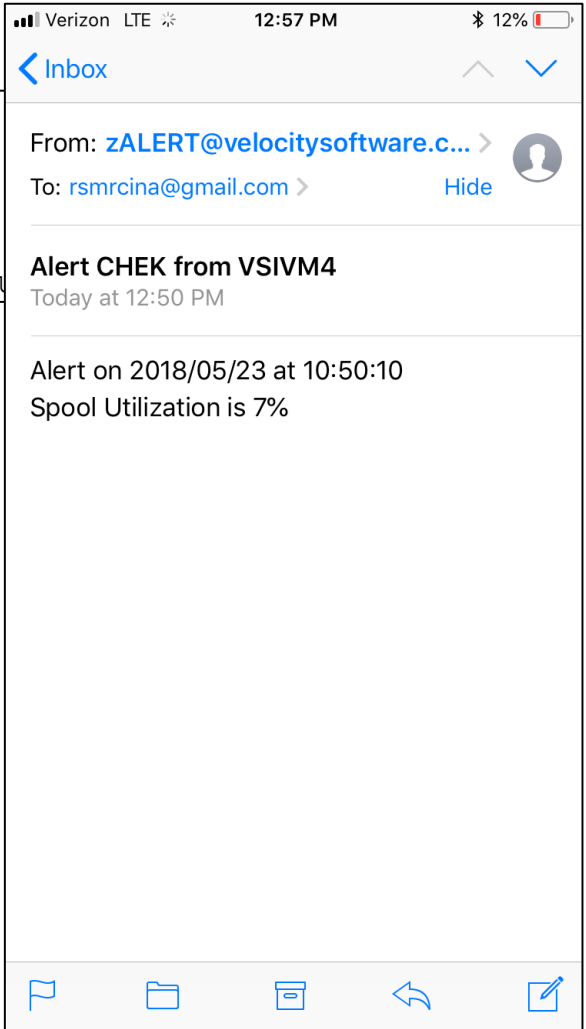
- **Email**

VSIVM4 MONALERT:	<pre>alert spool_use chek limit 359 1 &cpu_serial email joeadmin@mydomain.com level 1 green notify text Spool Utilization is &spool u</pre>
-------------------------	---



```
VSIVM4 NOTIFY C1 F 80

|...+....1....+....2
===== * * * Top of File * * *
===== *
===== * * * End of File * * *
```



- Since z/OS data is integrated into the architecture, writing alerts is very easy

```
Screen: ZOS                               Velocity Software - VSIVM4           17 Jun 2019 06:52:15
----- Exceptions Analysis Alerts -----
Type Description
ZCEC IFL CPU Utilization 102.0
ZSIO VSI1 I/O Rate 26.5
ZSYS VSI1 CPU Utilization 20.2
```

```
extract
parms zos * CPU TOTAL
criteria zoscpu.samples > 0
var sysid | 8 | zosid.sysid
var cpuutil | 6 1 | zoscpu.pctbusy
var cpuutiln | 6 1 | zoscpu.pctbusy / zoscpu.samples

alert cpuutiln zsys
level 2 blue
level 8 yellow
level 80 red
text &sysid CPU Utilization &cpuutil
```

MongoDB alerts

- Same for Mongo, Docker and ILMT

```
extract
criteria vsimng.seconds > 0
var userid    | 8    | tcpip.node
var upcount   | 8 0 | VSIMNG.GUPDATE+VSIMNG.GDELETE+VSIMNG.GINSERTS
var qucount   | 8 0 | VSIMNG.GQUERY+VSIMNG.GGETMORE+VSIMNG.GCOMMAND
```

```
alert upcount mnou
limit 5:60 1 1 | &userid
level <10 red
text User &userid Mongo update count &upcount
```

```
alert qucount mnqu
limit 5:60 1 1 | &userid
level <10 red
text User &userid Mongo query count &qucount
```

```
Screen: MONGO          Velocity Software - VSIVM4          17 Jun 2019 09:17:14
----- Exceptions Analysis Alerts -----
```

<u>Type</u>	<u>Description</u>
MNOU	User mongo01 Mongo update count 12589
MNQU	User mongo01 Mongo query count 49614

TCP/IP (customer request)

- Failed attempts

```
extract
```

```
parms node *
```

```
var      userid      | 8      | tcpip.node
```

```
var      fails       | 3 1   | tcp.attemptfails
```

```
alert fails tcpf
```

```
level 10 blue
```

```
level 20 blue rev
```

```
level 40 yellow rev
```

```
level 80 red rev
```

```
text User &userid TCP fail count &fails
```

```
TCPF      User s11s2ora TCP fail count 11.9
```

ATTMPTFAILS	flt	=	flt 0	TCP Connections to CLOSED from SYNSENT/ SYN-RCVD
-------------	-----	---	-------	---

The VM System Console is the destination for messages issued by CP

The user OPERATOR is typically the destination for these messages

Most messages are informational

You really want to be aware of the ones that aren't

Console and Automations Manager

No charge component of zVPS

Integrated with zMON

Scrollable, searchable console display

Messages can be

Colored, Highlighted, Held, Suppressed, Sent to a User, Written to a File,
Emailed, Trap Sent, Command Executed

Log files retained for user specified days

Can be used on Operator or any other user that collects messages

Can handle Linux messages

Secuser/Observer, Syslog

zOPERATOR Technology

```
CON FILE 0723 SENT TO ZVPS RDR AS 4745 RECS 0137 CPY 001 T NOHO
USER DSC LOGOFF AS ZMAP USERS = 109
USER DSC LOGOFF AS TIMMAP USERS = 108 FORCED BY SYSTEM
Average log file size calculated: 250
Space clearing complete. Free blocks: 25295 and need 3250
Console log count 88 is over the LOGDAYS limit
> Moving CONSOLE 20180221 B1 to the alternate
copy CONSOLE 20180221 B1 to log disk rc 0
erase CONSOLE 20180221 B1 rc 0
move completed successfully.
Number of log files 87 now under LOGDAYS limit
HCPMxE6224I Event recording is pending because
HCPMxE6224I Sample recording is pending because there are no users conn
LINUXVM : DMS5BC3065I Operator command processing complete
LINUXVM : DMS4HA3239I The DDNAME=BACKUP file is being created with the
LINUXVM : DMS4HA3239I timestamp: 05-21-18 01:10:00
LINUXVM : DMS4HA3293I 05-21-18 01:10:00 File pool control data backup s
LINUXVM : DMS4GL3294I 05-21-18 01:10:01 File pool control data backup c
```

*MESSAGE

zOPERATOR

Filters/
Actions

Direct logon/
DIAL

3270

Console view

3270

Logs

zVIEW

zVWS
Velocity Web Server

zALERT
MSG Action



Redisplay and Searching

Page or Search forward or backward

Date and/or Time selection

Text search

- Similar to XEDIT / literal /
- ALL command
- Multiple operands with & | ↵

Customizable PFKEYS

zOPERATOR commands

Commands with data inserted from command line

CLEAR key to clear current display

Console display access

Logged on to OPERATOR

DIAL terminals

- Option to restrict commands
- One terminal buffer
- Terminal size must be \leq original screen size

View from another CMS user

zVIEW web interface

- Automatically updates every 60 seconds
- Select data and time range
- Select user
- zALERT click through

Console Messages

Typical console display

```
05:11:52 USER DSC LOGOFF AS ZWEBLOG USERS = 23
05:11:52 USER DSC LOGOFF AS ZADMIN USERS = 22
05:11:55 USER DSC LOGOFF AS ZWEB01 USERS = 21
05:11:55 USER DSC LOGOFF AS ZWEB02 USERS = 20
05:11:55 USER DSC LOGOFF AS ZWEB03 USERS = 19
05:11:55 USER DSC LOGOFF AS ZWEB04 USERS = 18
05:11:55 USER DSC LOGOFF AS ZWEB05 USERS = 17
05:11:58 AUTO LOGON *** ZADMIN USERS = 18 BY ZVPS
05:11:58 AUTO LOGON *** ZWEBLOG USERS = 19 BY ZADMIN
05:11:58 AUTO LOGON *** ZWEB01 USERS = 20 BY ZADMIN
05:11:58 AUTO LOGON *** ZWEB02 USERS = 21 BY ZADMIN
05:11:58 AUTO LOGON *** ZWEB03 USERS = 22 BY ZADMIN
05:11:58 AUTO LOGON *** ZWEB04 USERS = 23 BY ZADMIN
05:11:58 AUTO LOGON *** ZWEB05 USERS = 24 BY ZADMIN
05:12:14 GRAF 0700 LOGOFF AS ZVPS USERS = 23
05:12:21 GRAF 0700 LOGON AS MAINT640 USERS = 24
```

Console Messages

zOPERATOR console display

```
Screen: ZOPER      Velocity Software      ESAMON 4.304 03/07 05:13
1 of 1            OPERATOR Console      USER *           2828 0414C7
```

```
05:13:13 OPERATOR USER DSC LOGOFF AS ZWEBLOG USERS = 23
05:13:13 OPERATOR USER DSC LOGOFF AS ZADMIN USERS = 22
05:13:16 OPERATOR USER DSC LOGOFF AS ZWEB02 USERS = 21
05:13:16 OPERATOR USER DSC LOGOFF AS ZWEB04 USERS = 20
05:13:16 OPERATOR USER DSC LOGOFF AS ZWEB03 USERS = 19
05:13:16 OPERATOR USER DSC LOGOFF AS ZWEB05 USERS = 18
05:13:16 OPERATOR USER DSC LOGOFF AS ZWEB01 USERS = 17
05:13:19 OPERATOR AUTO LOGON *** ZADMIN USERS = 18 BY ZVPS
05:13:19 OPERATOR AUTO LOGON *** ZWEBLOG USERS = 19 BY ZADMIN
05:13:19 OPERATOR AUTO LOGON *** ZWEB01 USERS = 20 BY ZADMIN
05:13:19 OPERATOR AUTO LOGON *** ZWEB02 USERS = 21 BY ZADMIN
05:13:19 OPERATOR AUTO LOGON *** ZWEB03 USERS = 22 BY ZADMIN
05:13:19 OPERATOR AUTO LOGON *** ZWEB04 USERS = 23 BY ZADMIN
05:13:19 OPERATOR AUTO LOGON *** ZWEB05 USERS = 24 BY ZADMIN
05:13:30 OPERATOR GRAF 0700 LOGOFF AS ZVPS USERS = 23
05:13:37 OPERATOR GRAF 0700 LOGON AS MAINT640 USERS = 24
PF1=Help      2=          3=Quit      4=Del Hold  5=All      6=PFKEY Off
PF7=Backward  8=          9=Loc Back 10=         11=        12=Retrieve
====> [ ]
```


Console Messages

zOPERATOR console web interface

The screenshot displays the zOPERATOR console web interface. On the left is a navigation sidebar with various system monitoring options. The main area shows a terminal window titled "ZOPER - zOPERATOR Console" displaying system logs. An arrow points to the "zOPERATOR" option in the sidebar.

Navigation Sidebar:

- Add tab
- Arrange
- Load View
- Save View
- Color config
- zMON
- Graphs
- zMAP
- Capacity
- System
- Service Level Analysis
- User
- Shared File System
- CPU
- Main Storage
- Paging and Spooling
- Input/Output Subsystem
- Network
- Linux Reports
- Linux Application Reports
- VSE
- Screen Index
- Emulation
- zALERT Definitions
- zOPERATOR**
- zTUNE
- Custom Samples

Terminal Output:

```
ZOPCZ0115E Error 1114 linking to OPERATOR 191 HCPLNM114E OPERATOR 0191 not linked; mode or password incorrect
05:13:13 OPERATOR USER DSC LOGOFF AS ZWEBLOG USERS = 23
05:13:13 OPERATOR USER DSC LOGOFF AS ZADMIN USERS = 22
05:13:16 OPERATOR USER DSC LOGOFF AS ZWEB02 USERS = 21
05:13:16 OPERATOR USER DSC LOGOFF AS ZWEB04 USERS = 20
05:13:16 OPERATOR USER DSC LOGOFF AS ZWEB03 USERS = 19
05:13:16 OPERATOR USER DSC LOGOFF AS ZWEB05 USERS = 18
05:13:16 OPERATOR USER DSC LOGOFF AS ZWEB01 USERS = 17
05:13:19 OPERATOR AUTO LOGON *** ZADMIN USERS = 18 BY ZVPS
05:13:19 OPERATOR AUTO LOGON *** ZWEBLOG USERS = 19 BY ZADMIN
05:13:19 OPERATOR AUTO LOGON *** ZWEB01 USERS = 20 BY ZADMIN
05:13:19 OPERATOR AUTO LOGON *** ZWEB02 USERS = 21 BY ZADMIN
05:13:19 OPERATOR AUTO LOGON *** ZWEB03 USERS = 22 BY ZADMIN
05:13:19 OPERATOR AUTO LOGON *** ZWEB04 USERS = 23 BY ZADMIN
05:13:19 OPERATOR AUTO LOGON *** ZWEB05 USERS = 24 BY ZADMIN
05:13:30 OPERATOR GRAF 0700 LOGOFF AS ZVPS USERS = 23
05:13:37 OPERATOR GRAF 0700 LOGON AS MAINT640 USERS = 24
05:14:31 OPERATOR GRAF 0700 LOGOFF AS MAINT640 USERS = 23
05:14:36 OPERATOR GRAF 0700 LOGON AS ZVPS USERS = 24
```

Console Messages

zOPERATOR rules to control message display

```
ZOPRULES                                Velocity Software Inc.                ZOPER PROD4211
                                ZOPER ZOPRULES Configuration

                                zOPERATOR Action Rules
Match:  Msg type CMSOUT User ID _____ Comment Error writing console file
        Start col 10   End col 12 = Target ZOP
        & Start col2 19 End col2 19 = Target E
Action: Color RED      Ext highlight REVERSE  Suppress ___ Hold YES Stop ___
        Send to _____ Send type _____ Send zSERVE ___
        Cmd _____ File _____
        EMAIL address _____ SNMP trap ___

Match:  Msg type CPOUT  User ID OPERATOR Comment Suppress AUTO LOGON
        Start col 10   End col *   = Target AUTO LOGON
        Start col2 ___ End col2 ___ Target _____
Action: Color _____ Ext highlight _____ Suppress YES Hold ___ Stop YES
        Send to _____ Send type _____ Send zSERVE ___
        Cmd _____ File _____
        EMAIL address _____ SNMP trap ___
```

Console Messages

Suppressed messages

```
Screen: ZOPER Velocity Software ESAMON 4.304 03/07 05:51
1 of 1 OPERATOR Console USER * 2828 0414C7
```

```
05:50:19 OPERATOR USER DSC LOGOFF AS ZWEBLOG USERS = 23
05:50:19 OPERATOR USER DSC LOGOFF AS ZADMIN USERS = 22
05:50:22 OPERATOR USER DSC LOGOFF AS ZWEB01 USERS = 21
05:50:22 OPERATOR USER DSC LOGOFF AS ZWEB02 USERS = 20
05:50:22 OPERATOR USER DSC LOGOFF AS ZWEB03 USERS = 19
05:50:22 OPERATOR USER DSC LOGOFF AS ZWEB04 USERS = 18
05:50:22 OPERATOR USER DSC LOGOFF AS ZWEB05 USERS = 17
```

```
PF1=Help 2= 3=Quit 4=Del Hold 5=All 6=PFKEY Off
PF7=Backward 8= 9=Loc Back 10= 11= 12=Retrieve
```

3279 43/008

```
Screen: ZOPER Velocity Software ESAMON 4.304 03/07 05:51
1 of 1 REDISPLAY 03/07/18 OPERATOR Console USER * 2828 0414C7
```

```
05:13:19 OPERATOR AUTO LOGON *** ZWEB01 USERS = 20 BY ZADMIN
05:13:19 OPERATOR AUTO LOGON *** ZWEB02 USERS = 21 BY ZADMIN
05:13:19 OPERATOR AUTO LOGON *** ZWEB03 USERS = 22 BY ZADMIN
05:13:19 OPERATOR AUTO LOGON *** ZWEB04 USERS = 23 BY ZADMIN
05:13:19 OPERATOR AUTO LOGON *** ZWEB05 USERS = 24 BY ZADMIN
05:13:30 OPERATOR GRAF 0700 LOGOFF AS ZVPS USERS = 23
05:13:37 OPERATOR GRAF 0700 LOGON AS MAINT640 USERS = 24
05:14:31 OPERATOR GRAF 0700 LOGOFF AS MAINT640 USERS = 23
05:14:36 OPERATOR GRAF 0700 LOGON AS ZVPS USERS = 24
05:31:10 OPERATOR USER DSC LOGOFF AS ZWEBLOG USERS = 23
05:31:10 OPERATOR USER DSC LOGOFF AS ZADMIN USERS = 22
05:31:13 OPERATOR USER DSC LOGOFF AS ZWEB01 USERS = 21
05:31:13 OPERATOR USER DSC LOGOFF AS ZWEB02 USERS = 20
05:31:13 OPERATOR USER DSC LOGOFF AS ZWEB03 USERS = 19
05:31:13 OPERATOR USER DSC LOGOFF AS ZWEB04 USERS = 18
05:31:13 OPERATOR USER DSC LOGOFF AS ZWEB05 USERS = 17
05:31:16 OPERATOR AUTO LOGON *** ZADMIN USERS = 18 BY ZVPS
05:31:16 OPERATOR AUTO LOGON *** ZWEBLOG USERS = 19 BY ZADMIN
05:31:16 OPERATOR AUTO LOGON *** ZWEB01 USERS = 20 BY ZADMIN
05:31:16 OPERATOR AUTO LOGON *** ZWEB02 USERS = 21 BY ZADMIN
05:31:16 OPERATOR AUTO LOGON *** ZWEB03 USERS = 22 BY ZADMIN
05:31:16 OPERATOR AUTO LOGON *** ZWEB04 USERS = 23 BY ZADMIN
05:31:16 OPERATOR AUTO LOGON *** ZWEB05 USERS = 24 BY ZADMIN
05:50:19 OPERATOR USER DSC LOGOFF AS ZWEBLOG USERS = 23
05:50:19 OPERATOR USER DSC LOGOFF AS ZADMIN USERS = 22
05:50:22 OPERATOR USER DSC LOGOFF AS ZWEB01 USERS = 21
05:50:22 OPERATOR USER DSC LOGOFF AS ZWEB02 USERS = 20
05:50:22 OPERATOR USER DSC LOGOFF AS ZWEB03 USERS = 19
05:50:22 OPERATOR USER DSC LOGOFF AS ZWEB04 USERS = 18
05:50:22 OPERATOR USER DSC LOGOFF AS ZWEB05 USERS = 17
05:50:25 OPERATOR AUTO LOGON *** ZADMIN USERS = 18 BY ZVPS
05:50:25 OPERATOR AUTO LOGON *** ZWEBLOG USERS = 19 BY ZADMIN
05:50:25 OPERATOR AUTO LOGON *** ZWEB01 USERS = 20 BY ZADMIN
05:50:25 OPERATOR AUTO LOGON *** ZWEB02 USERS = 21 BY ZADMIN
05:50:25 OPERATOR AUTO LOGON *** ZWEB03 USERS = 22 BY ZADMIN
05:50:25 OPERATOR AUTO LOGON *** ZWEB04 USERS = 23 BY ZADMIN
05:50:25 OPERATOR AUTO LOGON *** ZWEB05 USERS = 24 BY ZADMIN
```

```
PF1=Help 2= 3=Return 4= 5=All 6=PFKEY Off
PF7=Backward 8=Forward 9=Loc Back 10=Loc Fwd 11= 12=Retrieve
```

3279 43/008

Console Messages

Suppressed messages

ZOPER - zOPERATOR Console									
ZOPCZ0115E Error 1114 linking to OPERATOR 191 HCPLNM114E OPERATOR 0191 not linked; mode or password incorrect									
05:13:13	OPERATOR	USER	DSC	LOGOFF	AS	ZWEBLOG	USERS = 23		
05:13:13	OPERATOR	USER	DSC	LOGOFF	AS	ZADMIN	USERS = 22		
05:13:16	OPERATOR	USER	DSC	LOGOFF	AS	ZWEB02	USERS = 21		
05:13:16	OPERATOR	USER	DSC	LOGOFF	AS	ZWEB04	USERS = 20		
05:13:16	OPERATOR	USER	DSC	LOGOFF	AS	ZWEB03	USERS = 19		
05:13:16	OPERATOR	USER	DSC	LOGOFF	AS	ZWEB05	USERS = 18		
05:13:16	OPERATOR	USER	DSC	LOGOFF	AS	ZWEB01	USERS = 17		
05:13:19	OPERATOR	AUTO	LOGON	***		ZADMIN	USERS = 18	BY ZVPS	
05:13:19	OPERATOR	AUTO	LOGON	***		ZWEBLOG	USERS = 19	BY ZADMIN	
05:13:19	OPERATOR	AUTO	LOGON	***		ZWEB01	USERS = 20	BY ZADMIN	
05:13:19	OPERATOR	AUTO	LOGON	***		ZWEB02	USERS = 21	BY ZADMIN	
05:13:19	OPERATOR	AUTO	LOGON	***		ZWEB03	USERS = 22	BY ZADMIN	
05:13:19	OPERATOR	AUTO	LOGON	***		ZWEB04	USERS = 23	BY ZADMIN	
05:13:19	OPERATOR	AUTO	LOGON	***		ZWEB05	USERS = 24	BY ZADMIN	
05:13:30	OPERATOR	GRAF	0700	LOGOFF	AS	ZVPS	USERS = 23		
05:13:37	OPERATOR	GRAF	0700	LOGON	AS	MAINT640	USERS = 24		
05:14:31	OPERATOR	GRAF	0700	LOGOFF	AS	MAINT640	USERS = 23		
05:14:36	OPERATOR	GRAF	0700	LOGON	AS	ZVPS	USERS = 24		
05:31:10	OPERATOR	USER	DSC	LOGOFF	AS	ZWEBLOG	USERS = 23		
05:31:10	OPERATOR	USER	DSC	LOGOFF	AS	ZADMIN	USERS = 22		
05:31:13	OPERATOR	USER	DSC	LOGOFF	AS	ZWEB01	USERS = 21		
05:31:13	OPERATOR	USER	DSC	LOGOFF	AS	ZWEB02	USERS = 20		
05:31:13	OPERATOR	USER	DSC	LOGOFF	AS	ZWEB03	USERS = 19		
05:31:13	OPERATOR	USER	DSC	LOGOFF	AS	ZWEB04	USERS = 18		
05:31:13	OPERATOR	USER	DSC	LOGOFF	AS	ZWEB05	USERS = 17		
05:31:16	OPERATOR	AUTO	LOGON	***		ZADMIN	USERS = 18	BY ZVPS	
05:31:16	OPERATOR	AUTO	LOGON	***		ZWEBLOG	USERS = 19	BY ZADMIN	
05:31:16	OPERATOR	AUTO	LOGON	***		ZWEB01	USERS = 20	BY ZADMIN	
05:31:16	OPERATOR	AUTO	LOGON	***		ZWEB02	USERS = 21	BY ZADMIN	
05:31:16	OPERATOR	AUTO	LOGON	***		ZWEB03	USERS = 22	BY ZADMIN	
05:31:16	OPERATOR	AUTO	LOGON	***		ZWEB04	USERS = 23	BY ZADMIN	
05:31:16	OPERATOR	AUTO	LOGON	***		ZWEB05	USERS = 24	BY ZADMIN	
05:50:19	OPERATOR	USER	DSC	LOGOFF	AS	ZWEBLOG	USERS = 23		
05:50:19	OPERATOR	USER	DSC	LOGOFF	AS	ZADMIN	USERS = 22		
05:50:22	OPERATOR	USER	DSC	LOGOFF	AS	ZWEB01	USERS = 21		
05:50:22	OPERATOR	USER	DSC	LOGOFF	AS	ZWEB02	USERS = 20		
05:50:22	OPERATOR	USER	DSC	LOGOFF	AS	ZWEB03	USERS = 19		
05:50:22	OPERATOR	USER	DSC	LOGOFF	AS	ZWEB04	USERS = 18		
05:50:22	OPERATOR	USER	DSC	LOGOFF	AS	ZWEB05	USERS = 17		



Console Messages

Enterprise View

Wednesday 30 May 2018 09:49

zVIEW Version 4304



zVIEW - Velocity Software - VSIVM4 (DEMO)
Performance Displays for zVM and Linux on System z

Menu

SYSTEM [Icons] RKSZOPER [Icons]

ZOPER - zOPERATOR Console - VM1

09:26:00	OPERATOR	ZWEB07	1202	67.218.99.131..80	194.67.210.177..7269	SYN-received
09:26:00	OPERATOR	ZWEB09	1107	67.218.99.131..80	194.67.210.177..44565	SYN-received
09:26:00	OPERATOR	ZWEB09	1219	67.218.99.131..80	194.67.210.177..31496	SYN-received
09:26:00	OPERATOR	ZWEB08	1293	67.218.99.131..80	194.67.210.177..3091	SYN-received
09:26:00	OPERATOR	ZWEB08	1194	67.218.99.131..80	194.67.210.177..21712	SYN-received
09:26:00	OPERATOR	ZWEB12	1285	67.218.99.131..80	194.67.210.177..62885	SYN-received
09:26:00	OPERATOR	ZWEB12	1216	67.218.99.131..80	194.67.210.177..17108	SYN-received
09:26:00	OPERATOR	ZWEB12	1199	67.218.99.131..80	194.67.210.4..53390	SYN-received
09:26:00	OPERATOR	ZWEB11	1267	67.218.99.131..80	194.67.210.4..63780	SYN-received
09:26:00	OPERATOR	ZWEB11	1040	67.218.99.131..80	194.67.210.4..13648	SYN-received
09:26:00	OPERATOR	ZWEB10	1042	67.218.99.131..80	194.67.210.4..22913	SYN-received
09:26:00	OPERATOR	ZWEB10	1309	67.218.99.131..80	213.17.190.64..55146	SYN-received
09:37:39	OPERATOR	ZWEB10	1107	67.218.99.131..80	201.236.215.43..58876	SYN-received
09:46:24	OPERATOR	ZWEB11	1309	67.218.99.131..80		

ZOPER - zOPERATOR Console - VM2

09:25:57 ZVWS ZWEB02 VSIWWW0009E The TCP/IP RECEIVE call failed RC=60
09:25:57 OPERATOR EXEC SYNHACK
09:25:59 ZVWS ZWEB01 VSIWWW0009E The TCP/IP RECEIVE call failed RC=60
09:25:59 OPERATOR EXEC SYNHACK
09:25:59 ZVWS ZWEB05 VSIWWW0009E The TCP/IP RECEIVE call failed RC=60
09:25:59 OPERATOR EXEC SYNHACK
09:26:00 ZVWS ZWEB04 VSIWWW0009E The TCP/IP RECEIVE call failed RC=60
09:26:00 OPERATOR EXEC SYNHACK
09:26:01 OPERATOR ZWEB02 1183 67.218.99.132..80 194.67.210.177..32819 SYN-received
09:26:01 ZVWS ZWEB02 VSIWWW0009E The TCP/IP RECEIVE call failed RC=60
09:26:01 OPERATOR EXEC SYNHACK
09:31:37 ZVWS ZWEB05 VSIWWW0009E The TCP/IP RECEIVE call failed RC=61
09:31:37 OPERATOR EXEC SYNHACK

ZOPER - zOPERATOR Console - Demo

09:26:01 OPERATOR ZWEB08 1113 67.218.99.134..80 194.67.210.4..40508 SYN-received
09:26:01 OPERATOR ZWEB08 1201 67.218.99.134..80 194.67.210.4..27762 SYN-received
09:26:01 OPERATOR ZWEB11 1107 67.218.99.134..80 194.67.210.177..44114 SYN-received
09:26:01 OPERATOR ZWEB10 1025 67.218.99.134..80 194.67.210.177..8139 SYN-received
09:26:01 OPERATOR ZWEB12 1110 67.218.99.134..80 194.67.210.177..63037 SYN-received

09:26:10 ZALERT LRPC LPAR VSIVM4 CPU Utilization is 99%
09:26:10 ZALERT LNER CPU Utilization for process smallstr-18848 on suselnx2 is 50%
09:36:10 ZALERT LRPC LPAR VSIVM4 CPU Utilization is 100%
09:36:11 ZALERT LNER CPU Utilization for process smallstr-19599 on suselnx2 is 51%
09:46:10 ZALERT LRPC LPAR VSIVM4 CPU Utilization is 102%
09:46:10 ZALERT LNER CPU Utilization for process smallstr-20327 on suselnx2 is 50%

09:47:00 OPERATOR AUTO LOGON *** JAMES101 USERS = 117 BY ZADMIN
09:47:01 OPERATOR USER DSC LOGOFF AS JAMES101 USERS = 116

ZOPER - zOPERATOR Console - VM5

09:32:36 ZVSE62 DATE 05/30/2018, CLOCK 08/32/36, DURATION 00/00/19
09:32:36 ZVSE62 Y1 0001 IQ3EI DYNAMIC CLASS 'Y' WAITING FOR WORK
09:32:37 ZVSE52 Y1 0048 // JOB SCANVSM1
09:32:53 ZVSE52 Y1 0048 EOJ SCANVSM1 MAX.RETURN CODE=0000
09:35:01 ZVSE52 BG 0000 // JOB LIBRDIR
09:35:23 ZVSE52 BG 0000 EOJ LIBRDIR MAX.RETURN CODE=0000
09:35:48 ZVSE61 Y2 0046 EOJ SCANVSM3 MAX.RETURN CODE=0000
09:36:13 ZVSE52 Y2 0050 EOJ SCANVSM3 MAX.RETURN CODE=0000
09:36:20 ZVSE52 S2 0046 EOJ STGPLAY1 MAX.RETURN CODE=0000
09:36:21 ZVSE52 S2 0046 // JOB STGPLAY5
09:36:30 ZVSE52 S1 0045 EOJ STGPLAY4 MAX.RETURN CODE=0000
09:40:00 ZVSE61 BG 0000 // JOB LIBRDIR
09:40:01 ZVSE62 BG 0001 IQ471 BG LIBRDIR 48131 FROM (OPERATOR), TIME= 8:40:01,
09:40:01 ZVSE62 TKN=0000007A
09:40:01 ZVSE62 BG 0000 // JOB LIBRDIR
09:40:01 ZVSE62 DATE 05/30/2018, CLOCK 08/40/01
09:40:16 ZVSE61 BG 0000 EOJ LIBRDIR MAX.RETURN CODE=0000
09:40:19 ZVSE62 BG 0000 EOJ LIBRDIR MAX.RETURN CODE=0000
09:40:19 ZVSE62 DATE 05/30/2018, CLOCK 08/40/19, DURATION 00/00/18
09:40:20 ZVSE62 BG 0001 IQ34I BG WAITING FOR WORK
09:41:28 ZVSE52 S2 0046 EOJ STGPLAY5 MAX.RETURN CODE=0000

ZOPER - zOPERATOR Console - RKS2LV

09:07:48 OPERATOR OP1191 192 D R/O
09:07:48 OPERATOR - DIR L R/W VMSYSVPS:OPERATOR.LOGS
09:07:48 OPERATOR MNT190 190 S R/O
09:07:48 OPERATOR TCM592 120 X R/O
09:07:48 OPERATOR MNT19E 19E Y/S R/O
09:07:48 OPERATOR - DIR Z R/O VMSYSVPS:ZMON.CODE
09:08:12 OPERATOR ACC VMSYSVPS:ZVPS.CONFIG C
09:08:13 OPERATOR DMSACR723I C (VMSYSVPS:ZVPS.CONFIG) R/O
09:08:17 OPERATOR GRAF L0005 LOGOFF AS ZVPS USERS = 31
09:08:17 OPERATOR EXEC LOGMEON
09:08:17 OPERATOR LOGMEON:
09:22:40 OPERATOR GRAF L0006 LOGON AS ZVPS USERS = 32 FROM 192.168.5.75
09:24:03 OPERATOR GRAF L0006 LOGOFF AS ZVPS USERS = 31
09:24:03 OPERATOR LOGMEON USERS
09:24:03 OPERATOR LOGMEON: USERS
09:24:21 OPERATOR GRAF L0003 LOGON AS ZVPS USERS = 32 FROM 192.168.5.75
09:26:25 OPERATOR USER DSC LOGOFF AS ZALERT USERS = 31
09:26:25 OPERATOR LOGMEON ZALERT
09:26:41 OPERATOR Command accepted
09:26:41 OPERATOR AUTO LOGON *** ZALERT USERS = 32 BY OPERATOR
09:26:41 OPERATOR HCPCLS6056I XAU70LOG information for ZALERT: The IPL command is verified by the IPL com



PROVEN PERFORMANCE

Trapping a required machine log off

```
Match: Msg type CPOUT User ID OPERATOR Comment Trap zALERT log off
       Start col 21 End col * = Target LOGOFF
       & Start col2 32 End col2 * = Target ZALERT
Action: Color RED Ext highlight _____ Suppress ____ Hold ____ Stop YES
       Send to _____ Send type _____ Send zSERVE ____
       Cmd LOGMEON &5 File _____
       EMAIL address rich@velocitysoftware.com SNMP trap ____
```

```
09:26:25 OPERATOR USER DSC LOGOFF AS ZALERT USERS = 31
09:26:25 OPERATOR LOGMEON ZALERT
09:26:41 OPERATOR Command accepted
09:26:41 OPERATOR AUTO LOGON *** ZALERT USERS = 32 BY OPERATOR
09:26:41 OPERATOR HCPCLS6056I XAUTOLOG information for ZALERT: The IPL command
is verified by the IPL command processor.
```

LOGMEON EXEC:	<pre>/* */ Parse Arg id 'CP SLEEP 10' 'XAUTOLOG' id</pre>
---------------	---

Taking Action

Sending an email

Make sure email settings are correct in zOPERATOR configuration

```
Email from domain velocitysoftware.com
SMTP server VM:SMTP
```

```
Match: Msg type CPOUT User ID OPERATOR Comment Trap zALERT log off
       Start col 21 End col * = Target LOGOFF
       & Start col2 32 End col2 * = Target ZALERT
Action: Color RED Ext highlight _____ Suppress ___ Hold ___ Stop YES
       Send to _____ Send type _____ Send zSERVE ___
       Cmd LOGMEON &5 File _____
       EMAIL address rich@velocitysoftware.com SNMP trap ___
```

OPERATOR@rks2lv.velocitysoftware.com

Message from zOPERATOR: OPERATOR USER DSC LOGOFF AS ZALERT USERS = 31

To: RICH@VELOCITYSOFTWARE.COM,

Reply-To: No reply

10:23:11 OPERATOR USER DSC LOGOFF AS ZALERT USERS = 31

Recent real-world example

Customer wanted to be notified when a Linux filesystem check was performed on certain machines for certain filesystems

```
(1) -- /var" fsck.ext3 -a /dev/disk/by-path/ccw-0.0.0205-part1
n/ccw-0.0.0205-part1 has been mounted 1 times without being checked, check forced.
...3...+...4...+...5...+...6...+...7...+...8...+...9...+...10...+...
n/ccw-0.0.0205-part1: 1682/12512 files (3.3% non-contiguous), 11163/12498 blocks
```



Recent real-world example

zOperator Rule

ZOPRULES

Velocity Software Inc.
ZOPER ZOPRULES Configuration

ZOPER PROD4220

```
Match:  Msg type *      User ID LINUX002 Comment fsck checker
        Start col 28    End col * = Target ccw-0.0.0205-part1
        & Start col2 95 End col2 * = Target check forced.
Action: Color RED      Ext highlight _____ Suppress ___ Hold ___ Stop YES
        Send to _____ Send type _____ Send zSERVE ___
        Cmd _____ File _____
        EMAIL address rich@velocitysoftware.com      SNMP trap ___
```

Recent real-world example

Result – Console Message

```
Screen: ZOPER      RKS2LV      ESAMON 4.350 03/07 10:20
1 of 1 REDISPLAY 03/07/19  OPERATOR Console  USER *      2828 0414C7

08:57:33 LINUX002  Y/sbin/fsck.ext3 (1) -- /local" fsck.ext3 -a /dev/disk/by-pat
h/ccw-0.0.0206-part1
08:57:33 LINUX002  /dev/disk/by-path/ccw-0.0.0206-part1: clean, 11/5024 files, 1
194/4998 blocks
08:57:33 LINUX002  Y/sbin/fsck.ext2 (1) -- /usr" fsck.ext2 -a /dev/disk/by-path/
ccw-0.0.0204-part1
08:57:33 LINUX002  /dev/disk/by-path/ccw-0.0.0204-part1: clean, 27766/75040 file
s, 130290/149998 blocks
08:57:33 LINUX002  Y/sbin/fsck.ext3 (1) -- /var" fsck.ext3 -a /dev/disk/by-path/
ccw-0.0.0205-part1
08:57:33 LINUX002  /dev/disk/by-path/ccw-0.0.0205-part1 has been mounted 1 times
without being checked, check forced.
08:57:33 OPERATOR  File EMAIL FILE A1 sent to SMTP at RKS2LV on 03/07/19 08:57:3
3
08:57:33 SMTP      * From SMTP: Received Spool File 1042
08:57:33 SMTP      * From SMTP: Mail delivered to: <RICH@VELOCITYSOFTWARE.COM>
08:57:33 LINUX002  /dev/disk/by-path/ccw-0.0.0205-part1: 1686/12512 files (3.3%
non-contiguous), 11171/12498 blocks
```

Recent real-world example

Result - Email

OPERATOR@rks2lv.velocitysoftware.com

Inbox - VSI

Message from zOPERATOR: LINUX002 /dev/disk/by-path/ccw-0.0.0205-part1 has been mounted 1 times without being checked, check f...

To: <RICH@velocitysoftware.com> <RICH@VELOCITYSOFTWARE.COM>,

Reply-To: No reply

08:57:33 LINUX002 /dev/disk/by-path/ccw-0.0.0205-part1 has been mounted 1 times without being checked, check forced.

Trap Configuration

Create/Modify SNMP TRAPDEST on the CONFIG disk

```
* following is default 1.3.6.1.4.1.15601  
192.168.5.182 velocity 2B06010401F971 ;
```

Make sure OPERATOR is authorized in zTCP

In ESATCP PARMS

```
authuser = 'ZALERT'  
authuser = 'OPERATOR'
```

Sending a Trap

ZOPRULES Velocity Software Inc. ZOPER PROD4210
ZOPER ZOPRULES Configuration

Match: Msg type SECUSR User ID _____ Comment Linux authentication error
Start col 29 End col 55 = Target PAM: Authentication failure
Start col 2 End col 2 Target _____
Action: Color RED Ext highlight _____ Suppress _____ Hold _____ Stop _____
Send to _____ Send type _____ Send zSERVE _____
Cmd _____ File _____
EMAIL address _____ SNMP trap YES

Looking for
'PAM: Authentication failure'

```
OPERATOR Console ESAMON 4.300 01/11 14:11  
USER * 2828 0414C7  
14:01:07 LINUX001 sshdY4729 : error: PAM: Authentication failure for root from  
192.168.5.77  
14:01:07 LINUX001 sshdY4729 : error: PAM: Authentication failure for root from  
192.168.5.77  
14:02:17 LINUX001 sshdY4729 : error: PAM: Authentication failure for root from  
192.168.5.77  
14:02:17 LINUX001 sshdY4729 : error: PAM: Authentication failure for root from  
192.168.5.77  
14:02:17 ZTCP 14:02:17 Unauthorized command request from: OPERATOR requesti  
ng:ALERT LINUX001 s  
14:02:17 ZTCP 14:02:17 Unauthorized command request from: OPERATOR requesti  
ng:ALERT LINUX001 s  
14:03:04 LINUX001 sshdY4733 : pam_unix2(sshd:auth): conversation failed  
14:03:04 LINUX001 sshdY4733 : error: ssh_msg_send: write  
14:03:04 LINUX001 sshdY4733 : error: ssh_msg_send: write  
14:05:34 OPERATOR USER DSC LOGOFF AS ZTCP USERS = 33  
14:05:40 OPERATOR AUTO LOGON *** ZTCP USERS = 34 BY ZVPS  
14:06:22 LINUX001 sshdY4734 : error: PAM: Authentication failure for root from  
192.168.5.77  
14:06:22 LINUX001 sshdY4734 : error: PAM: Authentication failure for root from  
192.168.5.77  
14:07:00 OPERATOR GRAF L0005 RECONNECT ZTCP USERS = 34 FROM 192.168.5.7  
7  
14:07:12 LINUX001 sshdY4734 : error: PAM: Authentication failure for root from  
192.168.5.77  
14:07:12 LINUX001 sshdY4734 : error: PAM: Authentication failure for root from  
192.168.5.77  
14:08:10 ZALERT VMGP Page rate for OPERATOR is 16.1/sec (above 5 for 3)  
14:08:10 ZALERT VMGP Page rate for SMTP is 10.8/sec (above 5 for 3)  
14:08:10 ZALERT VMGP Page rate for ZALERT is 7.2/sec (above 5 for 3)  
14:08:19 LINUX001 sshdY4738 : pam_unix2(sshd:auth): conversation failed  
14:08:19 LINUX001 sshdY4738 : error: ssh_msg_send: write  
14:08:19 LINUX001 sshdY4738 : error: ssh_msg_send: write  
14:09:10 ZALERT VMGP Page rate for SMTP has recovered, now 2.5  
14:09:33 OPERATOR GRAF L0005 DISCONNECT ZTCP USERS = 34  
14:11:10 ZALERT VMGP Page rate for OPERATOR has recovered, now 4.2  
14:11:10 ZALERT VMGP Page rate for ZALERT has recovered, now 3.6  
PF1=Help 2= 3=Quit 4=Del Hold 5=All 6=PFKEY Off  
PF7=Backward 8= 9=Loc Back 10= 11= 12=Retrieve  
====>
```

Result of sending the trap

247	Normal <input type="checkbox"/> <input type="checkbox"/>	Jan 11, 2017 2:08:03 PM <input type="checkbox"/> <input type="checkbox"/>	192.168.5.48 <input type="checkbox"/> <input type="checkbox"/>
<hr/>			
uei.opennms.org/generic/traps/EnterpriseDefault <input type="checkbox"/> <input type="checkbox"/> Edit notifications for event			
<hr/>			
Trap from 192.168.5.48			
Type: 0			
Message: LINUX001 sshd[4734]: error: PAM: Authentication failure for root from 192.168.5.77			

Codepage challenges

IE/Edge seem to have the most problems

- Spinning load screen

In other cases square brackets from Linux machines don't show up correctly

In CONFIG ZVIEW add

```
HOSTCODEPAGE = 37
```

Works for messages routed to OPERATOR

```
alert cpuutil vmcp
limit 5 1 | &userid
level 20 yellow rev action cp msg op &code &atext
level 40 red
text &userid running at &cpuutil%
```


CLICKTHRU directive in CONFIG ZALERT

```
CLICKTHRU VMCP GRAPH=USERCPU USER=W1
```

Points to a display element in zVIEW

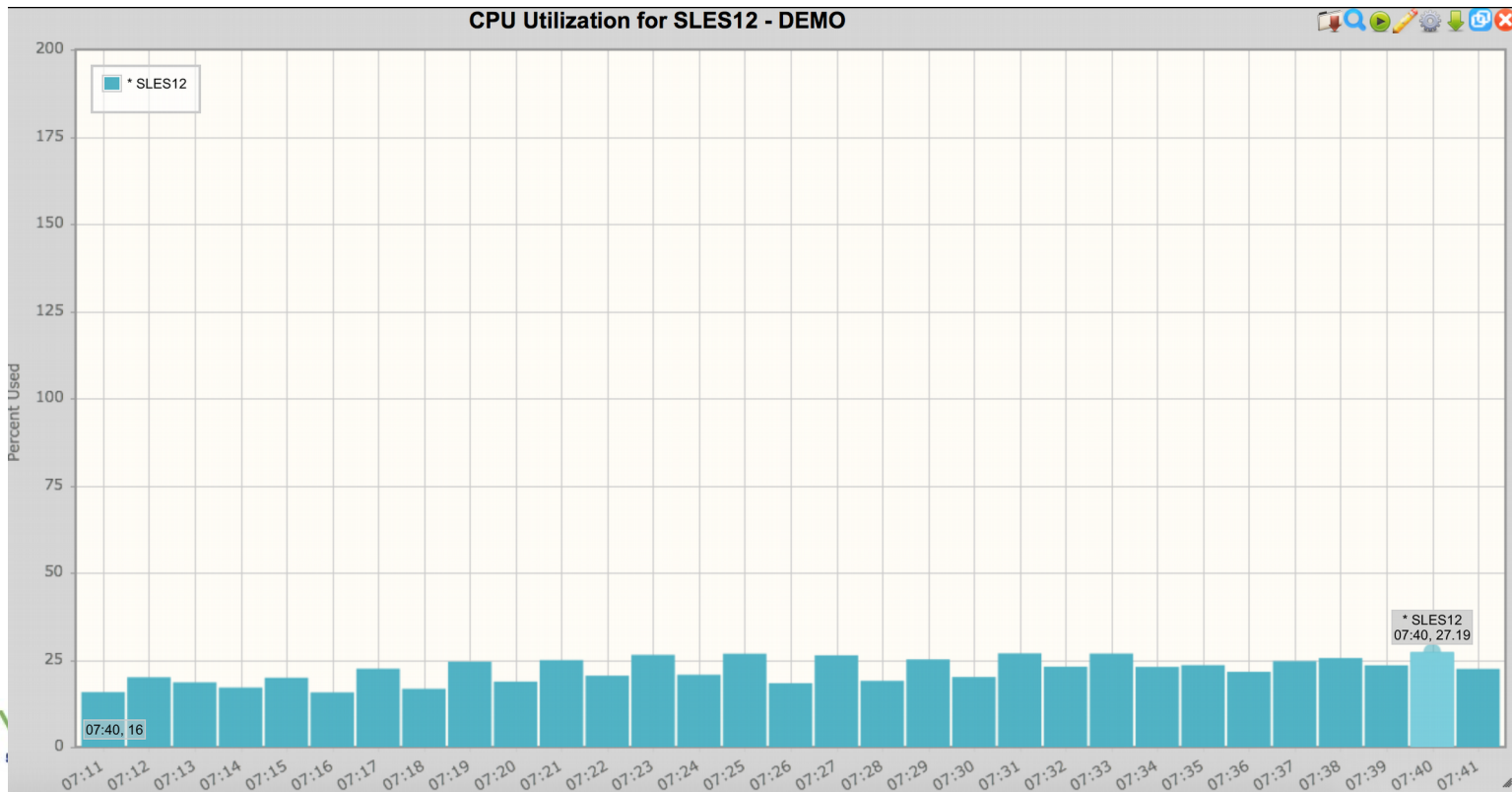
- Passes an optional parameter

```
07:34:10 ZALERT VMCP SLES12 RUNNING AT 23.0%  
07:40:04 S11S2ORA -- MARK --  
07:40:10 ZALERT VMCP SLES12 RUNNING AT 27.2%
```

Alerts configured for
click through are underlined

Click on an alert code

- Bring up the specific report, graph or view
- Targeted to the optional parameter



- **Proactive monitoring can watch the system**
 - Based on monitor data or console activity
- **Notifications can be delivered for more critical issues**
- **Management consoles fit this mechanism perfectly**
- **Many useful samples are provided**

Questions?

Rich Smrcina
Velocity Software, Inc
rich@velocitysoftware.com