



VELOCITY
SOFTWARE

Docker Performance Management

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Containers...

Docker Options

Data Collection

What data is there

z/VM

Linux on z

Containers

- Docker most common
- Redhat has different

Docker (container technology) virtualizes:

- Interfaces (at least one per container)
- File systems
- Processes
- Disks

What does Linux see?

- Rksctnr1 is a container with an snmp inside
- Sles12 is the host of the container
- Can see same process from two different perspectives

Report: ESALNXP	LINUX HOST Process Statistics Report										Velocity			
node/ Name	<--Process ID	Ident--> PPID	GRP	Nice Valu	PRTY Valu	<-----CPU Tot	Percents sys	user	syst	usrt	<----- Size	RSS	Peak	S
11:15:00														
rksctnr1	0	0	0	0	0	19.0	0.03	0.02	0.03	18.9	31	11	396	
stresser	22	1	1	0	20	18.9	0.00	0	0.03	18.9	4	2		
sles12	0	0	0	0	0	20.4	0.72	0.99	0.04	18.6	3486	209	0	
snmpd	1485	1	1482	-10	10	0.94	0.55	0.38	0	0	21	10	0	
stresser	37173	37096	0	0	20	18.6	0.00	0	0.03	18.6	4	2		

Linux – very large penetration world wide

Linux Containers

- In productive use by few customers
- Requirements for management

IBM Secure Software Container

- Linux under cover
- signed container solution
- All access via controlled user interface

z/OS Container Extensions zCX

- Linux containers on zip under z/OS

Linux Containers

- Linux snmp data
- Snmp inside every container
- Docker provides hypervisor level data
- Docker data exposed by Velocity Software mib

Collectd

- Open source package
- UDP – one direction only (different port, data format)
- Set ip address of collector and options
- Not as sophisticated or complete as VSI linux mib

Plugin options supported (some supported by VSI)

- CPU (by CPU number) – system level
- LOAD – load averages
- DF – file systems
- DISK – disk activity
- Interface – network activity by interface
- Memory – system level
- Process – by process name?
- StatsD – different statistics
- Swap
- Virt – virtual machine

IBM Secure Software Container

- Black box, as provided by IBM
- (Solution to performance – take a dump of partition)
- See <https://VelocitySoftware.com/collectd.html>
- Collectd open source docker solution
- Tested with IBM SSC
- IBM adds additional plugins

z/OS Container Extensions zCX

- “container” is address space
- Virtualized, under covers, a black box for z/OS
- Likely collectd is solution

Linux Containers

- Linux snmp data
- Docker mib added (by Velocity Software)

IBM Secure Software Container

- Black box, as provided by IBM
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- See <https://VelocitySoftware.com/collectd.html>
- Collectd open source docker solution
- Tested with IBM SSC

z/OS Container Extensions zCX

- Likely collectd is solution

IBM Secure Software Container / collectd

```
Report: ESASSCC          Collectd Report          V
Monitor initialized: 09/22/19 at 06:20:57 on 2828 serial 0314C7  F
-----
<-----Container-----> <-----CPU Percents----->
Name      <----IPADDR---->
          Totl  User  SYST  Nice  Intr  SIRQ  STL  Wait  Idle
-----
06:22:00
sles12    192.168.5.178    3.9  2.4  1.3    0  0.1  0.1  1.0  1.1  94.0
sles12    67.218.99.142    3.9  2.4  1.3    0  0.1  0.1  1.0  1.1  94.0
sles15    192.168.5.112    0.5  0.3  0.2    0   0   0.0  0.3  0.0  199
sles15    67.218.99.142    0.5  0.3  0.2    0   0   0.0  0.3  0.0  199
-----
06:23:00
sles12    192.168.5.178    2.5  1.3  1.1    0  0.1  0.1  0.4  0.7  96.4
sles12    67.218.99.142    2.5  1.3  1.1    0  0.1  0.1  0.4  0.7  96.4
sles15    192.168.5.112    0.5  0.3  0.2    0   0   0.0  0.3  0.0  199
sles15    67.218.99.142    0.5  0.3  0.2    0   0   0.0  0.3  0.0  199
```

Collectd

- system cpu

IBM Secure Software Container / collectd

Report: ESASSCC Colocity Software Corporate ZMAP 5.1.0 11/03/19 Page 490
Monitor initialized: 09rst record analyzed: 09/22/19 06:21:00

```
-----  
<----Container----- <-----Memory Used (MB)-----> <-----Process States----->  
Name <----IPADDR----- <SlabUsed>  
Used Buff Cach Free URcl Recl Blk Page run Sleep stop zomb  
-----  
06:22:00  
sles12 192.168.5.178 23.2 10.9 26.6 16.7 17.5 16.0 0 0 0 1.8 0 0  
sles12 67.218.99.142 23.2 10.9 26.6 16.7 17.5 16.0 0 0 0 1.8 0 0  
sles15 192.168.5.112 18.6 18.1 22.0 21.5 14.8 20.7 0 0 0 1.7 0 0  
sles15 67.218.99.142 18.6 18.1 22.0 21.5 14.8 20.7 0 0 0 1.7 0 0  
-----  
06:23:00  
sles12 192.168.5.178 23.2 11.0 26.6 16.0 17.5 16.0 0 0 0 3.6 0 0  
sles12 67.218.99.142 23.2 11.0 26.6 16.0 17.5 16.0 0 0 0 3.6 0 0  
sles15 192.168.5.112 18.6 18.1 22.0 21.5 14.8 20.7 0 0 0 3.3 0 0  
sles15 67.218.99.142 18.6 18.1 22.0 21.5 14.8 20.7 0 0 0 3.3 0 0
```

Collectd

- system memory
- Process overview

IBM Secure Software Container / collectd

Report: ESASSCP Collectd Process Report Velocity Software Corporate
Monitor initialized: 09/22/19 at 06:20:57 on 2828 serial 0314C7 First record analyzed: 09/2

Container							<--Process-->	<---I/O-->				Disk	
Procname	Proc	<-----Process Storage (MBytes)----->					CPU	PageFlt	<Rate/Sec>	Bytes			Bytes
Time/Date	Count	ps_vm	ps_rss	ps_data	ps_code	stacksz	Percent	/Second	I/O	bytes	/Sec	/Sec	

06:22:00													
sles15													
collectd	1	810	8.4	92.8	15.6	4194K	8.0	24.8	47.7	8681	0	0	
snmpd	1	20	8.3	5.3	13.3	0	1.0	0	0	0	0	0	
sles15													
collectd	1	810	8.4	92.8	15.6	4194K	8.0	24.8	47.7	8681	0	0	
snmpd	1	20	8.3	5.3	13.3	0	1.0	0	0	0	0	0	

06:23:00													
sles15													
collectd	1	810	8.4	92.8	15.6	4194K	8.0	21.0	47.2	8597	0	0	
snmpd	1	20	8.3	5.3	13.3	0	2.0	0	0	0	0	0	
sles15													
collectd	1	810	8.4	92.8	15.6	4194K	8.0	21.0	47.2	8597	0	0	
snmpd	1	20	8.3	5.3	13.3	0	2.0	0	0	0	0	0	

Collectd

- process data
- Processes must be selected for measurement

IBM SSC / collectd network data

Report: ESASSCN Collectd Network Devices
Monitor initialized: 09/22/19 at 06:20:57 on 2828 serial 0314C7

```
-----  
Container      <--Network Rates / Second-->  
DeviceName    Packets octets errors dropped  
-----  
06:22:00  
sles12        192.168.5.178  
  lo            0        3        0        0  
  docker0       0        0        0        0  
  eth0          6      1701     0        0  
sles12        67.218.99.142  
  lo            0        3        0        0  
  docker0       0        0        0        0  
  eth0          6      1701     0        0  
sles15        192.168.5.112  
  lo            0        0        0        0  
  eth0          2      1036     0        0  
sles15        67.218.99.142  
  lo            0        0        0        0  
  eth0          2      1036     0        0
```

Collectd

- network data

IBM Secure Software Container / collectd

```
Report: ESASSCF          Collectd File Systems
Monitor initialized: 09/22/19 at 06:20:57 on 2828 s
-----
Container      <-----Storage (MBytes)----->
File System    Size      Free Reserved   Used   PCT
-----
06:22:00
sles12         192.168.5.178
root           2955      2948           0        6   0.00
dev            512.4      512           0         0    0
usr-locat      531K      2864         2057     526K  0.99
tmp            531K      2864         2057     526K  0.99
var-opt        531K      2864         2057     526K  0.99
.snapsho       531K      2864         2057     526K  0.99
var-lib-       531K      2864         2057     526K  0.99
boot-zip       2063        5           5     2053  1.00
opt            531K      2864         2057     526K  0.99
opt-orac       531K      3529          770     527K  0.99
srv            531K      2864         2057     526K  0.99
var-cras       531K      2864         2057     526K  0.99
boot-gru       531K      2864         2057     526K  0.99
var-log        531K      2864         2057     526K  0.99
var-spoov      531K      2864         2057     526K  0.99
var-tmp        531K      2864         2057     526K  0.99
home           2955      2948           0         6   0.00
run-user       2955      2948           0         6   0.00
boot           531K      2864         2057     526K  0.99
etc            531K      2864         2057     526K  0.99
usr            531K      2864         2057     526K  0.99
```

Collectd

- File systems

Many virtualization options

- Linux
- Docker
- IBM ssc
- z/OS Container Extensions (linux on z/os)

Performance management provided by VSI

- Snmp solutions
- Collectd solutions

Single pane of glass