Kata Containers metrics report

Auto generated

02 July, 2020

Introduction

This report compares the metrics between multiple sets of data generated from the Kata Containers report generation scripts.

This report was generated using the data from the **llvm-cfi-1/, llvm-cfi-2/, llvm-nocfi-1/, llvm-nocfi-2/** results directories.

Container PSS footprint

This test measures the PSS footprint of all the container runtime components whilst running a number of parallel containers. The results are the mean footprint proportion for a single container.

No test results found

Container scaling system footprint

This test measures the system memory footprint impact whilst running an increasing number of containers. For this test, KSM is enabled. The results show how system memory is consumed for different sized containers, and their average system memory footprint cost and density (how many containers you can fit per Gb) is calculated.

No test results found

Memory used inside container

This test measures the memory inside a container taken by the container runtime. It shows the difference between the amount of memory requested for the container, and the amount the container can actually 'see'.

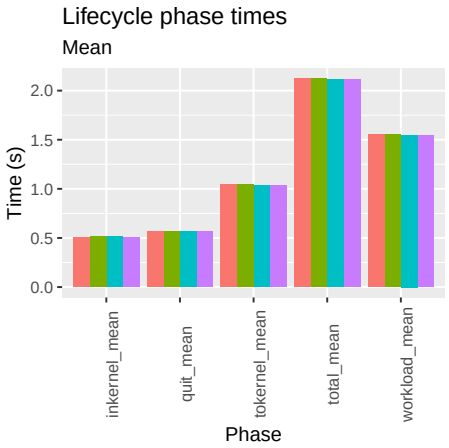
The *% Consumed* is the key row in the table, which compares the *Requested* against *Total* values.

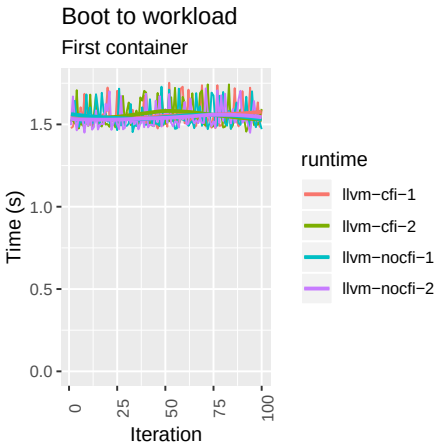
No test results found

Container Docker boot lifecycle times

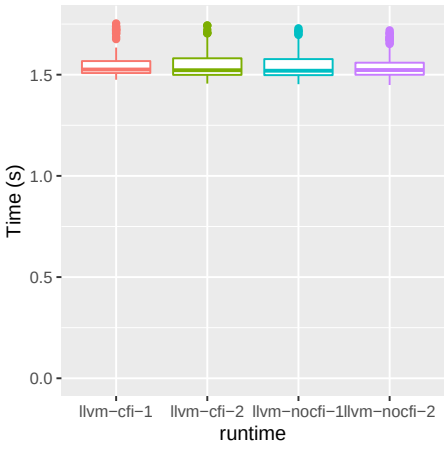
This test uses the `date` command on the host and in the container, as well as data from the container kernel `dmesg`, to ascertain how long different phases of the create/boot/run/delete Docker container lifecycle take for the first launched container.

To decode the stats table, the prefixes are 'to(2)' and '`in`'. The suffixes are '`k`ernel', '`w`orkload' and '`q`uit'. 'tot' is the total time for a complete container start-to-finished cycle.





Results	2k	ik	2w	2q	tot
llvm−cfi−1	1.05	0.51	1.55	0.57	2.12
llvm−cfi−2	1.04	0.51	1.55	0.57	2.12
llvm−nocfi−1	1.04	0.51	1.55	0.57	2.11
llvm−nocfi−2	1.04	0.51	1.54	0.57	2.11
Units	s	s	s	s	s



Storage I/O

Measure storage I/O bandwidth, latency and IOPS using this test.

This test measures using separate random read and write tests.

Reads

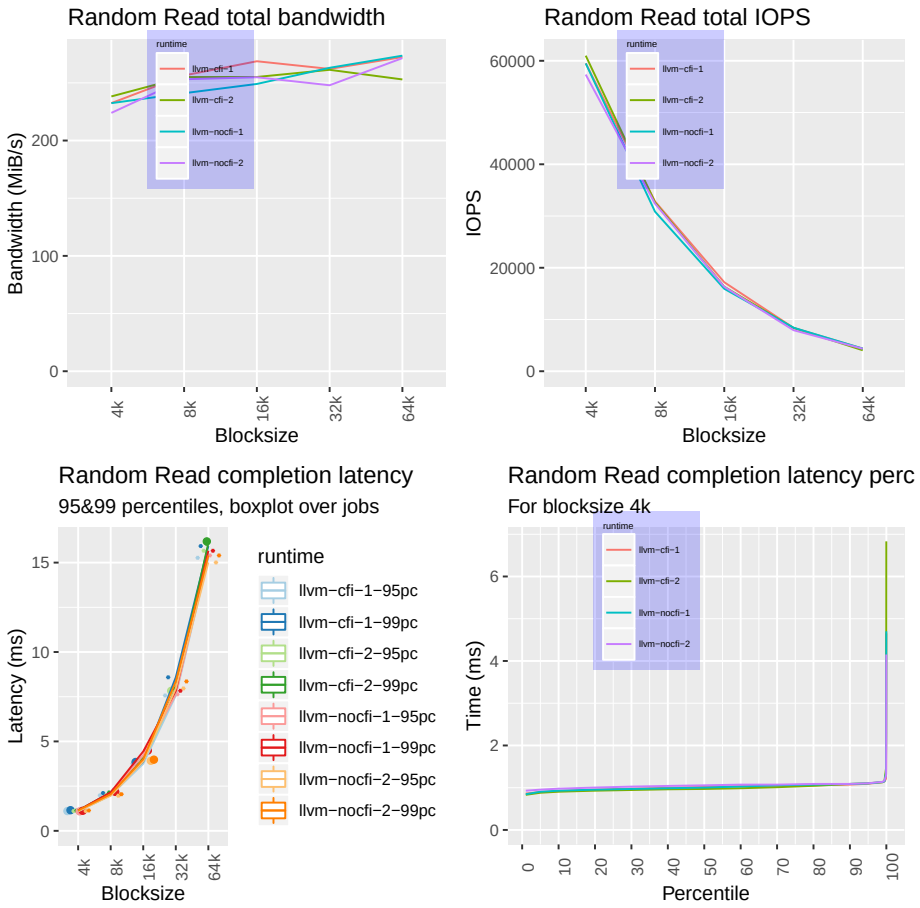


Figure 1: Storage I/O Reads

Bandwidth	llvm-cfi-1	llvm-cfi-2	llvm-nocfi-1	llvm-nocfi-2	Units
4k	232.5	238.2	232.4	224	MB/s
8k	256.4	255	241	253.1	MB/s
16k	268.7	255.1	249.1	254.9	MB/s
32k	262.1	261.3	263.1	247.9	MB/s
64k	272.4	253	273.6	271.5	MB/s

IOPS	llvm-cfi-1	llvm-cfi-2	llvm-nocfi-1	llvm-nocfi-2	Units
4k	59514.6	60991.2	59498.1	57339.2	IOP/s
8k	32823.9	32645.9	30853.3	32399.6	IOP/s
16k	17199.6	16326.3	15940.1	16310.9	IOP/s
32k	8387.4	8362	8417.9	7933.6	IOP/s
64k	4357.9	4047.6	4377.3	4343.3	IOP/s

lat 95pc	llvm-cfi-1	llvm-cfi-2	llvm-nocfi-1	llvm-nocfi-2	Units
4k	1.1	1.1	1.1	1.1	ms
8k	2	2	2.1	2	ms
16k	3.8	3.9	4.2	3.9	ms
32k	7.6	7.8	7.6	8	ms
64k	15.3	15.7	15.4	15	ms

lat 99pc	llvm-cfi-1	llvm-cfi-2	llvm-nocfi-1	llvm-nocfi-2	Units
4k	1.1	1.1	1.1	1.1	ms
8k	2.1	2.1	2.2	2	ms
16k	3.9	4	4.4	4	ms
32k	8.6	8	7.8	8.4	ms
64k	15.9	16.1	15.7	15.4	ms

Figure 2: Storage I/O Reads

Writes

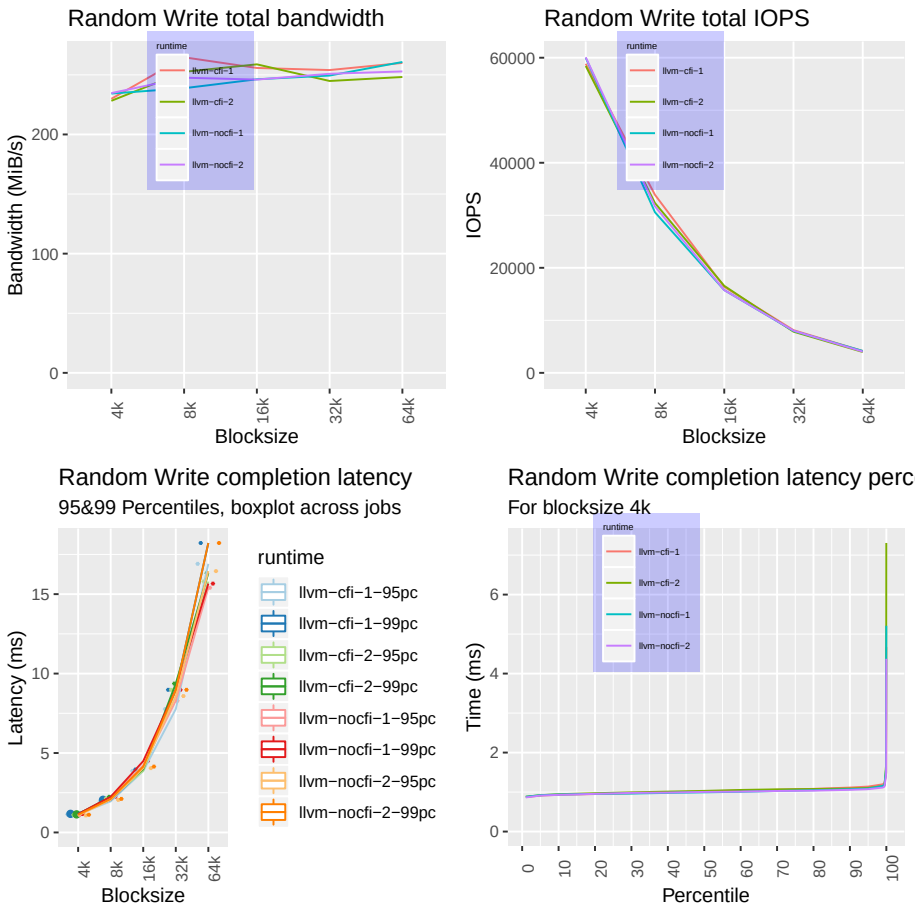


Figure 3: Storage I/O Writes

Bandwidth	llvm-cfi-1	llvm-cfi-2	llvm-nocfi-1	llvm-nocfi-2	Units
4k	229.9	228.2	234.3	234.7	MB/s
8k	264.7	252.5	238.8	247.6	MB/s
16k	255.8	258.8	246.3	246	MB/s
32k	254	244.9	249.4	250.9	MB/s
64k	260	248.2	260.8	252.9	MB/s

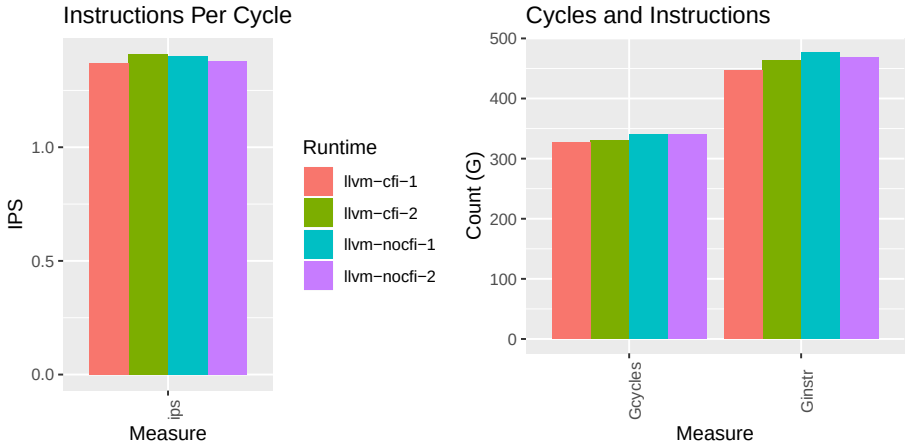
IOPS	llvm-cfi-1	llvm-cfi-2	llvm-nocfi-1	llvm-nocfi-2	Units
4k	58854.2	58425.6	59981.3	60082.4	IOP/s
8k	33886.4	32324.9	30565.3	31693.4	IOP/s
16k	16369.8	16564	15762.2	15746.1	IOP/s
32k	8128.9	7835.6	7980.8	8028.9	IOP/s
64k	4160	3971.3	4172.5	4045.9	IOP/s

lat 95pc	llvm-cfi-1	llvm-cfi-2	llvm-nocfi-1	llvm-nocfi-2	Units
4k	1.1	1.1	1.1	1.1	ms
8k	2	2.1	2.2	2	ms
16k	3.9	3.9	4.2	4	ms
32k	7.8	9	8.3	8.6	ms
64k	16.9	15.8	15.4	16.4	ms

lat 99pc	llvm-cfi-1	llvm-cfi-2	llvm-nocfi-1	llvm-nocfi-2	Units
4k	1.2	1.2	1.2	1.1	ms
8k	2	2.2	2.2	2.1	ms
16k	4	4	4.5	4.1	ms
32k	9	9.4	9	9	ms
64k	18.2	16.3	15.7	18.2	ms

Network CPU costs

Measure CPU costs whilst performing a fixed bandwidth container to container network test using this test. As local container-to-container networking is a pure local software activity, this test is a reasonable way to show changes in network stack processing costs.



llvm−cfi−1	llvm−cfi−2	llvm−nocfi−1	llvm−nocfi−2	Units
1.37	1.41	1.4	1.38	Ins/Cyc
326.19	329.6	339.6	340.42	G
446.39	463.35	476.85	469.04	G

Test setup details

This table describes the test system details, as derived from the information contained in the test results files.

llvm-cfi-1	llvm-cfi-2	llvm-nocfi-1	ll
1.11.1	1.11.1	1.11.1	
.badd2863a68f91c8d95e229898095	984ccea48a1badd2863a68f91c8d95e229898095	984ccea48a1badd2863a68f91c8d95e229898095	984ccea48a1badd2
651ae37852af882051e7e90658a129f8	1.11.1-f61beff0651ae37852af882051e7e90658a129f8	1.11.1-f61beff0651ae37852af882051e7e90658a129f8	1.11.1-f61beff0651ae
7428396a5bc89db94c4b4726f2793e4de	1.11.1-993826974283		
4.2.50	4.2.50	4.2.50	
ta-containers/vmlinuz-5.4.32.container	655/usr/share/kata-containers/vmlinuz-5.4.32.container	655/usr/share/kata-containers/vmlinuz-5.4.32.container	655/usr/share/kata-cor
amd64	amd64	amd64	
Ubuntu	Ubuntu	Ubuntu	
18.04	18.04	18.04	
n(R) CPU E5-2683 v4 @ 2.10GHz	Intel(R) Xeon(R) CPU E5-2683 v4 @ 2.10GHz	Intel(R) Xeon(R) CPU E5-2683 v4 @ 2.10GHz	Intel(R) Xeon(R) C
4.15.0-64-generic	4.15.0-64-generic	4.15.0-64-generic	4.15
kata-runtime	kata-runtime	kata-runtime	ka

Figure 4: System configuration details