KubeCon | CloudNativeCon

China 2018

Kube-Liveboard

make your cluster visible

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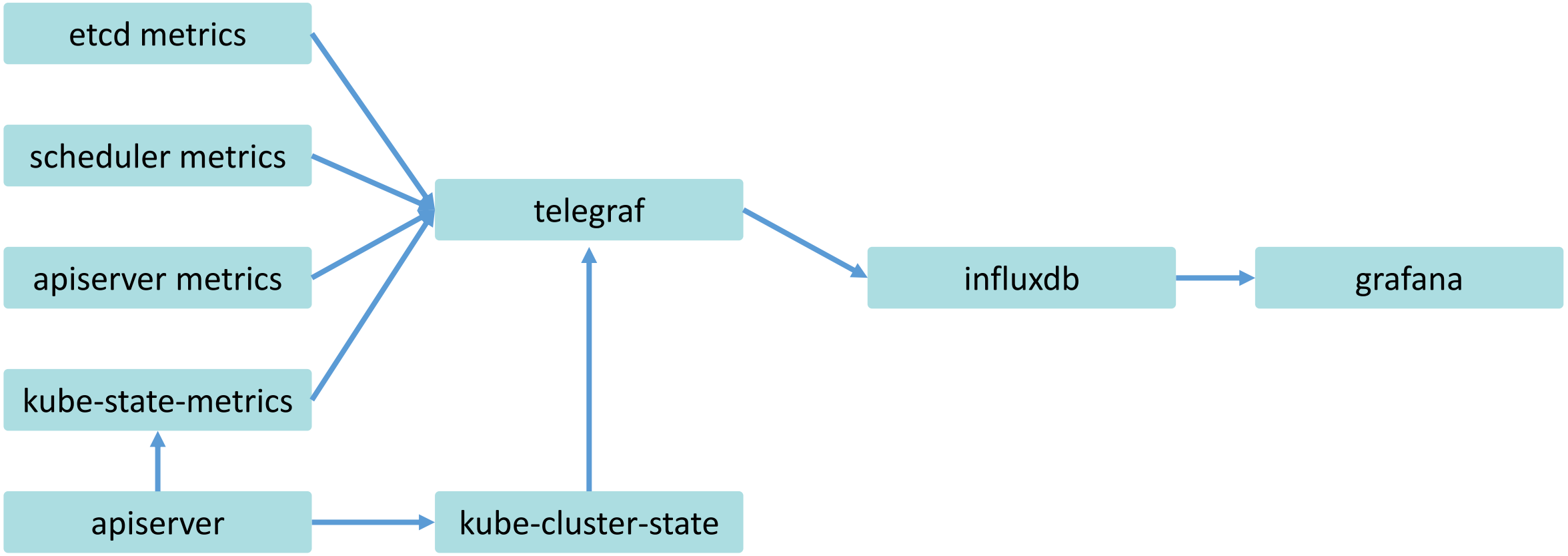
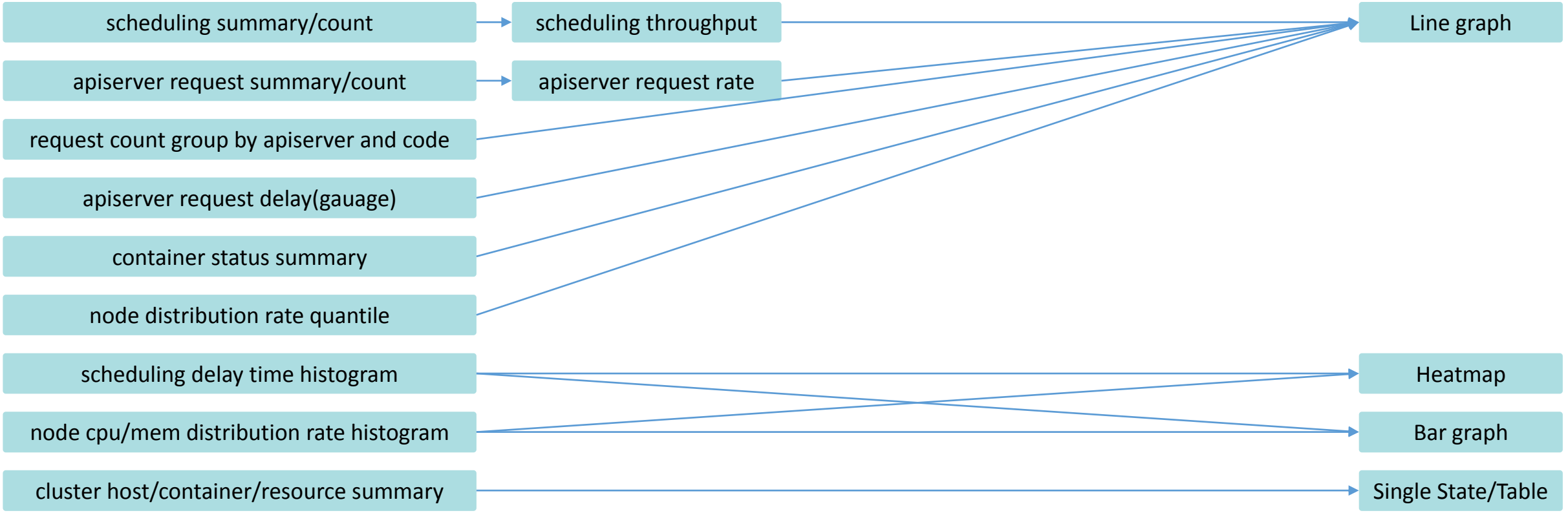
Nov 13, 2018

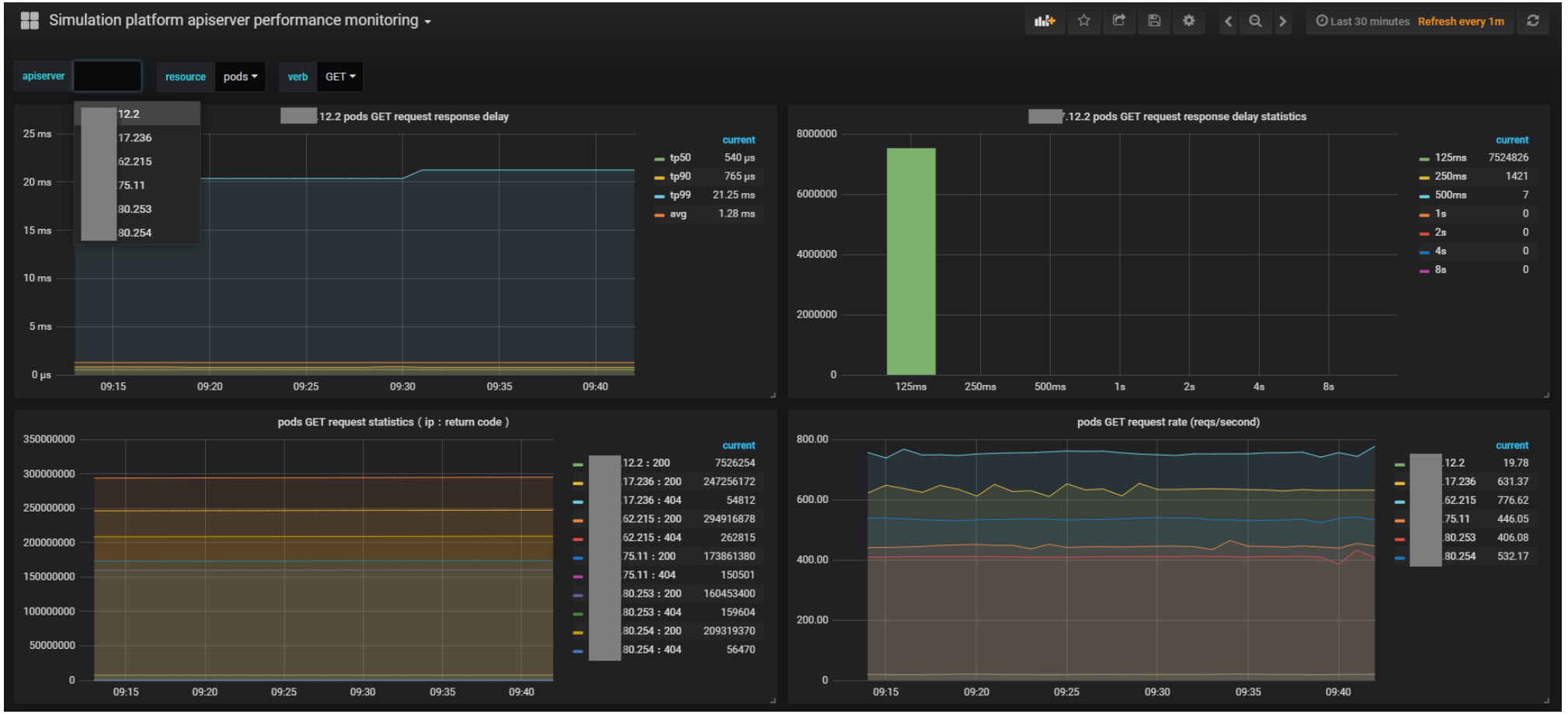
Pipeline


etcd metrics
scheduler metrics
apiserver metrics
kube-state-metrics
apiserver
telegraf
kube-cluster-state
influxdb
grafana

Metrics


scheduling summary/count
scheduling throughput
apiserver request summary/count
apiserver request rate
request count group by apiserver and code
apiserver request delay(gauage)
container status summary
node distribution rate quantile
scheduling delay time histogram
node cpu/mem distribution rate histogram
cluster host/container/resource summary
Line graph
Heatmap
Bar graph
Single State/Table

Demo


Simulation platform apiserver performance monitoring
Last 30 minutes
Refresh every 1m
apiserver
resource
pods
verb
GET
12.2
17.236
62.215
75.11
80.253
80.254
12.2 pods GET request response delay
current
tp50 540 µs
tp90 765 µs
tp99 21.25 ms
avg 1.28 ms
25 ms
20 ms
15 ms
10 ms
5 ms
0 µs
09:15
09:20
09:25
09:30
09:35
09:40
.12.2 pods GET request response delay statistics
current
125ms 7524826
250ms 1421
500ms 7
1s 0
2s 0
4s 0
8s 0
8000000
6000000
4000000
2000000
0
125ms
250ms
500ms
1s
2s
4s
8s
pods GET request statistics (ip : return code)
current
12.2 : 200 7526254
17.236 : 200 247256172
17.236 : 404 54812
62.215 : 200 294916878
62.215 : 404 262815
75.11 : 200 173861380
75.11 : 404 150501
80.253 : 200 160453400
80.253 : 404 159604
80.254 : 200 209319370
80.254 : 404 56470
350000000
300000000
250000000
200000000
150000000
100000000
50000000
0
pods GET request rate (reqs/second)
current
12.2 19.78
17.236 631.37
62.215 776.62
75.11 446.05
80.253 406.08
80.254 532.17
800.00
600.00
400.00
200.00
0

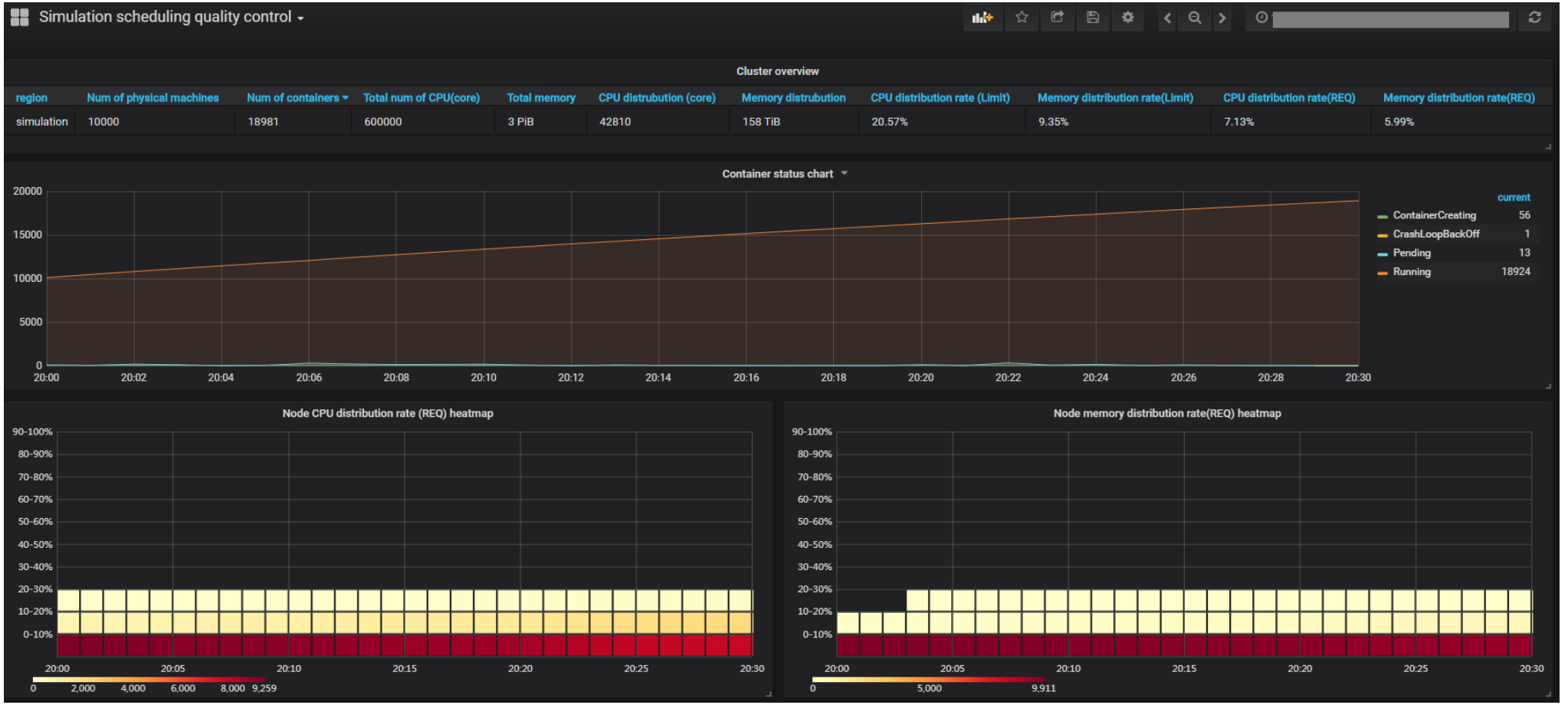
Demo

Request rate for each apiserver (reqs/second)
2500.00
2000.00
1500.00
1000.00
500.00
0
09:16
09:18
09:20
09:22
09:24
09:26
09:28
09:30
09:32
09:34
09:36
09:38
09:40
09:42
09:44
current
12.2 60.13
17.236 1742.68
62.215 2065.60
75.11 1234.17
80.253 1124.68
80.254 1463.43
Request rate for various resources (reqs/second)
6000.00
5000.00
4000.00
3000.00
2000.00
1000.00
0
09:16
09:18
09:20
09:22
09:24
09:26
09:28
09:30
09:32
09:34
09:36
09:38
09:40
09:42
09:44
current
bindings 0
certificatesigningrequests 0
clusterrolebindings 0
clusterroles 0
componentstatuses 0
configmaps 0
daemonsets 0.02
deployments 0
endpoints 4.42
events 0
horizontalpodautoscalers 0
ingresses 0.02
jobs 0.02
limitranges 0
namespaces 0.80
networkpolicies 0
nodes 2015.97
persistentvolumeclaims 0
persistentvolumes 0.02

Demo

Simulation scheduling performance monitoring
Scheduling algorithm + binding delay time heatmap
16 s
8 s
4 s
2 s
1 s
512 ms
256 ms
128 ms
64 ms
32 ms
16 ms
8 ms
4 ms
2 ms
1 ms
20:00
20:05
20:10
20:15
20:20
20:25
20:30
0
2,000
4,000
6,000
8,128
Scheduling delay time
250 ms
200 ms
150 ms
100 ms
50 ms
0 ns
20:00
20:02
20:04
20:06
20:08
20:10
20:12
20:14
20:16
20:18
20:20
20:22
20:24
20:26
20:28
20:30
2018-11-07 20:28:00
binding 50th percentile delay: 2 ms
binding 90th percentile delay: 3 ms
binding 99th percentile delay: 15 ms
binding scheduling average delay: 3 ms
predicate_evaluation 50th percentile delay: 160 ms
predicate_evaluation 90th percentile delay: 201 ms
predicate_evaluation 99th percentile delay: 218 ms
predicate_evaluation scheduling average delay: 166 ms
priority_evaluation 50th percentile delay: 35 ms
priority_evaluation 90th percentile delay: 46 ms
priority_evaluation 99th percentile delay: 75 ms
priority_evaluation scheduling average delay: 37 ms
Scheduling throughput(pod/s)
pod/s
10.00
8.00
6.00
4.00
2.00
0
historical average throughput Min: 5 Max: 9 Avg: 6 Current: 5
1min average throughput Min: 4 Max: 7 Avg: 5 Current: 4
Scheduling algorithm + binding delay time
4,000
3,000
2,000
1,000
0
1ms
2ms
4ms
8ms
16ms
32ms
64ms
128ms
256ms
512ms
1s
2s
4s
8s
16s
current
1ms 0
2ms 0
4ms 0
8ms 0
16ms 0
32ms 0
64ms 1
128ms 1
256ms 3,690
512ms 325
1s 0
2s 0
4s 0

Demo


Simulation scheduling quality control
Cluster overview
region
Num of physical machines
Num of containers
Total num of CPU(core)
Total memory
CPU distrubution (core)
Memory distrubution
CPU distribution rate (Limit)
Memory distribution rate(Limit)
CPU distribution rate(REQ)
Memory distribution rate(REQ)
simulation
10000
18981
600000
3 PiB
42810
158 TiB
20.57%
9.35%
7.13%
5.99%
Container status chart
current
ContainerCreating 56
CrashLoopBackOff 1
Pending 13
Running 18924
Node CPU distribution rate (REQ) heatmap
Node memory distribution rate(REQ) heatmap

Demo

Simulation scheduling quality control
Node CPU distribution rate(REQ)
2500
2000
1500
1000
500
0
0-10%
10-20%
20-30%
30-40%
40-50%
50-60%
60-70%
70-80%
80-90%
90-100%
current
10-20% 72
20-30% 1124
30-40% 532
40-50% 2094
50-60% 237
60-70% 34
Node memory distribution rate(REQ)
1500
1250
1000
750
500
250
0
0-10%
10-20%
20-30%
30-40%
40-50%
50-60%
60-70%
70-80%
80-90%
90-100%
current
0-10% 38
10-20% 213
20-30% 484
30-40% 1198
40-50% 1397
50-60% 76
60-70% 20
90-100% 667
Node CPU distribution rate quantile chart
100.0%
80.0%
60.0%
40.0%
20.0%
0%
0th
10th
20th
30th
40th
50th
60th
70th
80th
90th
100th
current
0th 10.00%
10th 23.33%
20th 23.33%
30th 30.00%
40th 39.67%
50th 41.00%
60th 43.50%
70th 46.17%
80th 46.67%
90th 49.33%
100th 69.83%
Node memory distribution rate quantile chart
100.0%
80.0%
60.0%
40.0%
20.0%
0%
0th
10th
20th
30th
40th
50th
60th
70th
80th
90th
100th
current
0th 7.00%
10th 22.40%
20th 31.29%
30th 35.75%
40th 38.57%
50th 40.65%
60th 43.16%
70th 45.85%
80th 49.60%
90th 96.00%
100th 96.00%

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Thanks!