
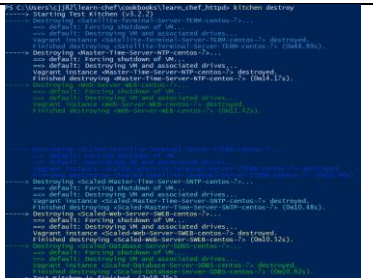
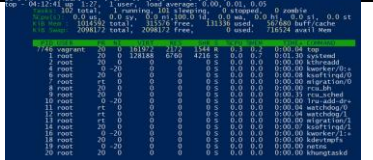





# Diagnostic Report

Data Description	Optimal Range	Data and Results	Automation Script Used to Extract Data (text only)	Screenshot of Result of Script
Time to scale from 1 cluster to 200 clusters (60,000 advertisements expected at peak global usage) based on 300 satellites per cluster (subject to change based on load testing)	15–30 minutes for each cluster	One Cluster = 5min 15sec 200 clusters = 63,000min (1050 hours)	kitchen create	
Time to register a cluster and then quench connections to the load balancer, taking the cluster off-line (start-up, operation, shutdown)	1 minute per connection quench, start of cluster launch, and part of time to scale cluster, can be tracked separately as a quench	-----> Test Kitchen is finished. (2m19.25s)	kitchen destroy	
Peak load averages per system at 200, and 300, satellites per cluster	60% of CPU triggers new cluster launch; if reaching core load at 200 satellites, launch new cluster on 60% CPU loads	top - 04:13:05 up 1:27, 1 user, load average: 0.00, 0.01, 0.05	kitchen exec Web-Server- WEB-centos-7 -c 'top'	
Write times to the diagnostic data drive	<30 milliseconds	1073741824 bytes (1.1 GB) copied, 8.01425 s, 134 MB/s	kitchen exec Web-Server- WEB-centos-7 -c 'dd if=/dev/zero of=testWriteSpeed.txt bs=1G count=1'	

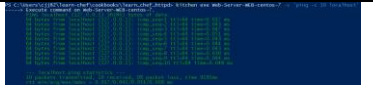


Pull time from the game instances (1 Satellite Terminal Server, 1 Web Server, 1 Database, and 1 time server) and initialization time	Part of cluster launch 15-30 minutes	One Cluster = 5min 15sec	kitchen create	
*Average messaging service (queue) time	<1 minute in queue	N/A	N/A	N/A
Average latency for the Time server	<30 milliseconds	<pre> -----&gt; Execute command on Web-Server-WEB- centos-7. PING google.com (172.217.4.206) 56(84) bytes of data. 64 bytes from lga15s48-in- f206.1e100.net (172.217.4.206): icmp_seq=1 ttl=109 time=17.9 ms 64 bytes from lga15s48-in- f206.1e100.net (172.217.4.206): icmp_seq=2 ttl=109 time=14.7 ms 64 bytes from lga15s48-in- f206.1e100.net (172.217.4.206): icmp_seq=3 ttl=109 time=15.0 ms 64 bytes from lga15s48-in- f206.1e100.net (172.217.4.206): </pre>	kitchen exe Web-Server- WEB-centos-7 -c 'ping -c 10 google.com'	

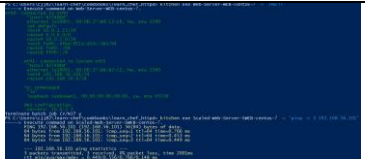


		<p>icmp_seq=4 ttl=109 time=14.8 ms 64 bytes from lga15s48-in- f206.1e100.net (172.217.4.206): icmp_seq=5 ttl=109 time=14.9 ms 64 bytes from lga15s48-in- f206.1e100.net (172.217.4.206): icmp_seq=6 ttl=109 time=14.3 ms 64 bytes from lga15s48-in- f206.1e100.net (172.217.4.206): icmp_seq=7 ttl=109 time=14.8 ms 64 bytes from lga15s48-in- f206.1e100.net (172.217.4.206): icmp_seq=8 ttl=109 time=15.5 ms 64 bytes from lga15s48-in- f206.1e100.net (172.217.4.206): icmp_seq=9 ttl=109 time=15.1 ms 64 bytes from lga15s48-in- f206.1e100.net (172.217.4.206): icmp_seq=10 ttl=109 time=14.8 ms</p>		
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		<pre> --- google.com ping statistics ---   10 packets transmitted, 10 received,   0% packet loss, time     9060ms       rtt min/avg/max/mdev = 14.391/15.239/17.942/0.   949 ms </pre>		
Average latency of each cluster	<30 milliseconds	<pre> -----&gt; Execute command on Web-Server-WEB- centos-7. PING localhost (127.0.0.1) 56(84) bytes of data.   64 bytes from localhost (127.0.0.1): icmp_seq=1 ttl=64 time=0.017 ms   64 bytes from localhost (127.0.0.1): icmp_seq=2 ttl=64 time=0.043 ms   64 bytes from localhost (127.0.0.1): icmp_seq=3 ttl=64 time=0.047 ms   64 bytes from localhost (127.0.0.1): icmp_seq=4 ttl=64 time=0.051 ms   64 bytes from localhost (127.0.0.1): icmp_seq=5 ttl=64 time=0.043 ms   64 bytes from localhost (127.0.0.1): </pre>	<pre> kitchen exe Web-Server- WEB-centos-7 -c 'ping -c 10 localhost' </pre>	



		<pre> icmp_seq=6 ttl=64 time=0.044 ms 64 bytes from localhost (127.0.0.1): icmp_seq=7 ttl=64 time=0.043 ms 64 bytes from localhost (127.0.0.1): icmp_seq=8 ttl=64 time=0.030 ms 64 bytes from localhost (127.0.0.1): icmp_seq=9 ttl=64 time=0.044 ms 64 bytes from localhost (127.0.0.1): icmp_seq=10 ttl=64 time=0.048 ms  --- localhost ping statistics --- 10 packets transmitted, 10 received, 0% packet loss, time 9195ms rtt min/avg/max/mdev = 0.017/0.041/0.051/0.009 ms </pre>		
Network data in and out for each cluster	<1 second	<pre> 1) -----&gt; Execute command on Web- Server-WEB- centos-7. eth0: connected to eth0 "Intel 82540EM" </pre>	<pre> 1) kitchen exe Web- Server-WEB- centos-7 -c 'nmcli' 2) kitchen exe Scaled-Web- Server-SWEB- centos-7 -c 'ping - c 3 192.168.56.101' </pre>	

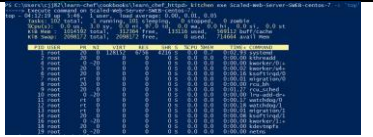


		<pre> ethernet (e1000), 08:00:27:B9:12:C 6, hw, mtu 1500 ip4 default inet4 10.0.2.15/24 route4 0.0.0.0/0 route4 10.0.2.0/24 inet6 fe80::4fbd:911e:d 14c:1b1/64 route6 fe80::/64 route6 ff00::/8  eth1: connected to System eth1 "Intel 82540EM" ethernet (e1000), 08:00:27:BB:B2:C 2, hw, mtu 1500 inet4 192.168.56.101/2 4 route4 192.168.56.0/24  lo: unmanaged "lo" loopback (unknown), </pre>		
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		<pre>00:00:00:00:00:0 0, sw, mtu 65536  DNS configuration:     servers:         10.0.2.3 2) -----&gt; Execute command on Scaled-Web- Server-SWEB- centos-7.     PING     192.168.56.10     1     (192.168.56.10     1) 56(84)     bytes of data.         64 bytes     from     192.168.56.10     1: icmp_seq=1     ttl=64     time=0.766 ms         64 bytes     from     192.168.56.10     1: icmp_seq=2     ttl=64     time=0.453 ms         64 bytes     from     192.168.56.10     1: icmp_seq=3     ttl=64     time=0.449 ms      ---     192.168.56.10</pre>		
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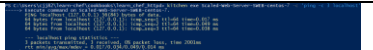
		1 ping statistics --- 3 packets transmitted, 3 received, 0% packet loss, time 2001ms rtt min/avg/max/ mdev = 0.449/0.556/0. 766/0.148 ms		
Overall CPU utilization of the environment for each cluster	Not >60%	<p>-----&gt; Execute command on Scaled-Web-Server-SWEB-centos-7.</p> <p>top - 04:12:19 up 5:46, 1 user, load average: 0.00, 0.01, 0.05</p> <p>Tasks: 102 total, 1 running, 101 sleeping, 0 stopped, 0 zombie</p> <p>%Cpu(s): 0.0 us, 3.0 sy, 0.0 ni, 97.0 id, 0.0 wa, 0.0 hi, 0.0 si, 0.0 st</p> <p>KiB Mem : 1014592 total, 312364 free, 133116 used, 569112 buff/cache</p> <p>KiB Swap: 2098172 total, 2098172 free, 0 used. 714664 avail Mem</p> <p>PID USER PR NI VIRT RES SHR S %CPU %MEM TIME+ COMMAND</p>	kitchen exe Scaled-Web-Server-SWEB-centos-7 -c 'top'	



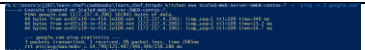


		<pre> 1 root    20  0 128152  6756 4216 S 0.0 0.7 0:02.93 systemd 2 root    20  0 0  0  0 S 0.0 0.0 0:00.00 kthreadd 4 root    0 -20 0  0  0 S 0.0 0.0 0:00.00 kworker/0:+ 5 root    20  0 0  0  0 S 0.0 0.0 0:00.02 kworker/u4+ 6 root    20  0 0  0  0 S 0.0 0.0 0:00.16 ksoftirqd/0 7 root    rt  0 0  0  0 S 0.0 0.0 0:00.01 migration/0 8 root    20  0 0  0  0 S 0.0 0.0 0:00.00 rcu_bh 9 root    20  0 0  0  0 S 0.0 0.0 0:01.27 rcu_sched 10 root    0 -20 0  0  0 S 0.0 0.0 0:00.00 lru-add-dr+ 11 root    rt  0 0  0  0 S 0.0 0.0 0:00.17 watchdog/0 12 root    rt  0 0  0  0 S 0.0 0.0 0:00.18 watchdog/1 13 root    rt  0 0  0  0 S 0.0 0.0 0:00.01 migration/1 14 root    20  0 0  0  0 S 0.0 0.0 0:00.08 ksoftirqd/1 </pre>		
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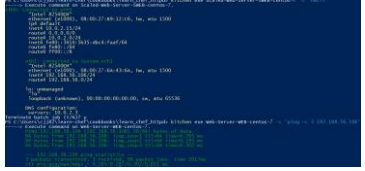


		<pre> 16 root    0 -20 0  0    0 S  0.0 0.0 0:00.00 kworker/1:+ 18 root    20  0 0  0    0 S  0.0 0.0 0:00.00 kdevtmpfs 19 root     0 -20 0  0    0 S  0.0 0.0 0:00.00 netns </pre>		
*Diagnostic data able to be written by the automation to the correct cloud bucket storage space	Show read/write times <1 second	N/A	N/A	N/A
Scaled Satellite Cluster latency	<30 milliseconds	<pre> -----&gt; Execute command on Scaled-Web-Server- SWEB-centos-7. PING localhost (127.0.0.1) 56(84) bytes of data. 64 bytes from localhost (127.0.0.1): icmp_seq=1 ttl=64 time=0.017 ms 64 bytes from localhost (127.0.0.1): icmp_seq=2 ttl=64 time=0.049 ms 64 bytes from localhost (127.0.0.1): icmp_seq=3 ttl=64 time=0.038 ms  --- localhost ping statistics --- 3 packets transmitted, 3 received, 0% packet loss, time 2001ms </pre>	kitchen exe Scaled-Web-Server-SWEB-centos-7 -c 'ping -c 3 localhost'	



		rtt min/avg/max/mdev = 0.017/0.034/0.049/0.014 ms		
Scaled Satellite Cluster latency between gateway/scaled clusters and core	<30 milliseconds	<pre> -----&gt; Execute command on Scaled-Web-Server- SWEB-centos-7.       PING google.com (172.217.4.206) 56(84) bytes of data.       64 bytes from ord37s19-in- f14.1e100.net (172.217.4.206): icmp_seq=1 ttl=109 time=346 ms       64 bytes from ord37s19-in- f14.1e100.net (172.217.4.206): icmp_seq=2 ttl=109 time=15.2 ms       64 bytes from ord37s19-in- f14.1e100.net (172.217.4.206): icmp_seq=3 ttl=109 time=14.7 ms        --- google.com ping statistics ---       3 packets transmitted, 3 received, 0% packet loss, time 2065ms       rtt min/avg/max/mdev = 14.799/125.467/346.348/ 156.186 ms </pre>	kitchen exe Scaled-Web- Server-SWEB-centos-7 -c 'ping -c 3 google.com'	




Scaled Satellite Cluster latency between scaled clusters and environment	<30 milliseconds	<p>1) -----&gt; Execute command on Scaled-Web-Server-SWEB-centos-7. eth0: connected to eth0</p> <p>"Intel 82540EM" ethernet (e1000), 08:00:27:B9:12:C6, hw, mtu 1500 ip4 default inet4 10.0.2.15/24 route4 0.0.0.0/0 route4 10.0.2.0/24 inet6 fe80::3414:5b35:dbc4:faaf/64 route6 fe80::/64 route6 ff00::/8</p> <p>eth1: connected to System eth1 "Intel 82540EM" ethernet (e1000), 08:00:27:6A:43:6A, hw, mtu 1500</p>	<p>1) kitchen exe Scaled-Web-Server-SWEB-centos-7 -c 'nmcli' 2) kitchen exe Web-Server-WEB-centos-7 -c 'ping -c 3 192.168.56.106'</p>	 <pre> # nmcli con show NAME: eth0 TYPE: ethernet STATE: up IPV4: 10.0.2.15 IPV6: fe80::3414:5b35:dbc4:faaf MTU: 1500 ... # ping -c 3 192.168.56.106 PING: 192.168.56.106: 64 bytes of data: 0% loss, 0.000 ms avg, 0.000 ms min, 0.000 ms max </pre>
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		<div>inet4 192.168.56.106/24 route4 192.168.56.0/24  lo: unmanaged "lo" loopback (unknown), 00:00:00:00:00:00, sw, mtu 65536  DNS configuration: servers: 10.0.2.3  2) -----&gt; Execute command on Web- Server-WEB- centos-7. PING 10.0.2.15 (10.0.2.15) 56(84) bytes of data. 64 bytes from 10.0.2.15: icmp_seq=1 ttl=64 time=0.019 ms 64 bytes from 10.0.2.15: icmp_seq=2</div>		
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		<pre> ttl=64 time=0.039 ms   64 bytes from 10.0.2.15: icmp_seq=3 ttl=64 time=0.047 ms  --- 10.0.2.15 ping statistics ---   3 packets transmitted, 3 received, 0% packet loss, time 2021ms  rtt min/avg/max/mdev = 0.019/0.035/0.047/0.011 ms </pre>		
Pull time from the scaled clusters and initialization time	15–30 minutes for each cluster	One Cluster = 5min 15sec	kitchen create	

\* *Note : If using a desktop-based client, such as Docker or Vagrant, and not the AWS solution, the Data Description aspects "Average messaging service (queue) time" and "Diagnostic data able to be written by the automation to the correct cloud bucket storage space" should be populated with "N/A". If proposing an AWS solution, these datasets will be populated.*

