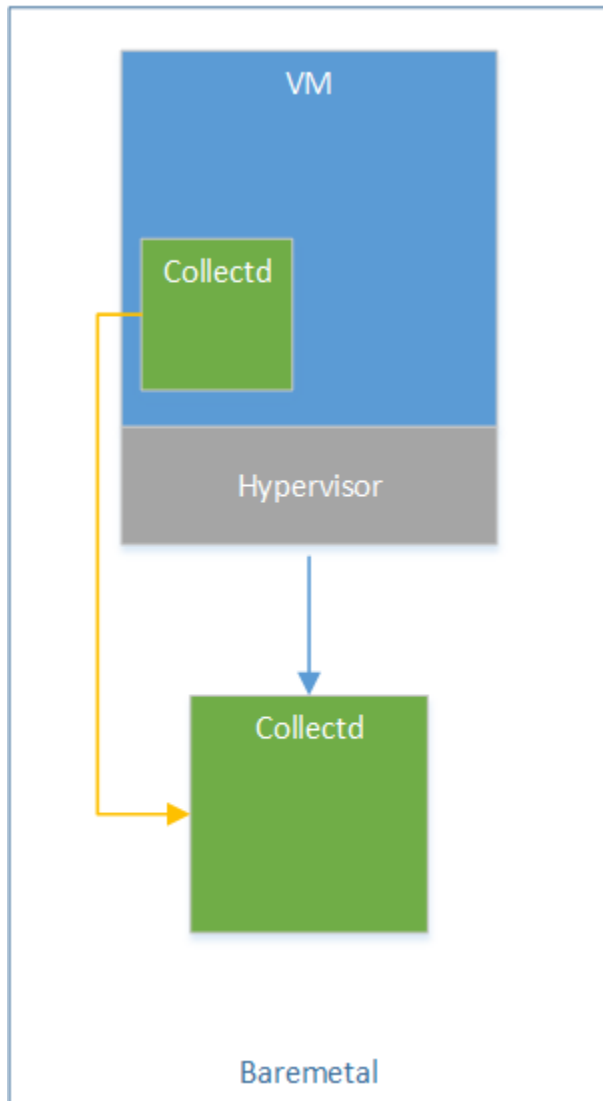


CPU Utilisation Case Study

Configuration/Setup instructions can be found here: [CPU Utilisation case study Configuration](#)

The idea behind this wiki is to look at the CPU metrics from the baremetal host, the hypervisor and the VM itself to see the if the CPU utilisation metrics reported are consistent across all 3.



Two tests were conducted. One without isolating cpus from the OS and one with isolating CPUs from the OS on the baremetal host and pinning the vCPUs to those isolated cores. Results for the unisolated tests as expected have some unusual results...

The CPU plugins for collectd were configured not to report the CPU metrics per state - so just a single metric for utilization.

The interval used for the test was for 1 second (this interval was used for the host and guest collectd cpu plugins, the virt plugin wouldn't go down to a 1 second configuration).

1 second was selected in order to get the timing differences between starting the plugin on the host and starting the plugin on the guest down to a lower value...

Tests were conducted with more/less an idle environment and will be repeated with a busy env.

Function used to convert nanoseconds virt metrics to percent:

[illegible]

```

        unsigned long long cpu_time_new) {

double percent = 0.0;
unsigned long long cpu_time_diff = 0;
double time_diff_sec = CDTIME_T_TO_DOUBLE(plugin_get_interval());
if (node_cpus != 0 && time_diff_sec != 0 && cpu_time_old != 0) {
    cpu_time_diff = cpu_time_new - cpu_time_old;
    percent = ((double)(100 * cpu_time_diff)) /
        (time_diff_sec * node_cpus * NANOSEC_IN_SEC);
}

```

With Isolation (stress test test, 1 second interval)

Host View		VM View		Hypervisor View		
silpixa00399126/cpu-10/percent-active-2017-03-07		ubuntu_vm/cpu-0/percent-active-2017-03-07		6c33ff2f-40d0-7a45-873b-7f3ead32413b/virt/virt_cpu_total-2017-03-07		
epoch	value	epoch	value	epoch	value	percent
				1492431855	1343320000000.00	
1492431856	78.35	1492431856	62.19512	1492431856	1344110000000.00	79.72
1492431857	100.00	1492431857	82.02247	1492431857	1345110000000.00	100.00
1492431858	100.00	1492431858	56.25	1492431858	1346110000000.00	100.00
1492431859	100.00	1492431859	62.5	1492431859	1347110000000.00	100.00
1492431860	100.00	1492431860	89.58333	1492431860	1348110000000.00	100.10
1492431861	100.00	1492431861	75.25773	1492431861	1349110000000.00	99.90
1492431862	23.00	1492431862	0	1492431862	1349310000000.00	20.00
1492431863	2.02	1492431863	0	1492431863	1349330000000.00	2.00
1492431864	1.00	1492431864	0	1492431864	1349350000000.00	2.00
1492431865	1.01	1492431865	19.19192	1492431865	1349390000000.00	4.00
1492431866	19.19	1492431866	0	1492431866	1349550000000.00	16.00
1492431867	0.99	1492431867	14.14141	1492431867	1349570000000.00	2.00
1492431868	82.83	1492431868	100	1492431868	1350420000000.00	84.92
1492431869	100.00	1492431869	100	1492431869	1351420000000.00	100.00
1492431870	100.00	1492431870	100	1492431870	1352420000000.00	100.00
1492431871	100.00	1492431871	100	1492431871	1353420000000.00	100.00
1492431872	100.00	1492431872	100	1492431872	1354420000000.00	100.10
1492431873	100.00	1492431873	100	1492431873	1355420000000.00	99.90
1492431874	100.00	1492431874	100	1492431874	1356420000000.00	100.00
1492431875	100.00			1492431875	1357420000000.00	100.10
1492431876	100.00			1492431876	1358420000000.00	99.90
1492431877	100.00			1492431877	1359420000000.00	100.00
1492431878	33.33			1492431878	1359730000000.00	31.00
1492431879	0.00			1492431879	1359730000000.00	0.00
1492431880	0.00			1492431880	1359750000000.00	2.00
1492431881	1.00			1492431881	1359760000000.00	1.00
1492431882	1.00			1492431882	1359770000000.00	1.00

With Isolation (stress test test, 10 second interval)

Note: stress was ran for 20 seconds in this case

Host View		VM View		Hypervisor View		
silpixa00399126/cpu-10/percent-active-2017-03-07		ubuntu_vm/cpu-0/percent-active-2017-03-07		6c33ff2f-40d0-7a45-873b-7f3ead32413b/virt/virt_cpu_total-2017-03-07		
epoch	value	epoch	value	epoch	value	percent
				1492433815	1398840000000.00	
1492433825	77.56345	1492433833	65.57712	1492433825	1405960000000.00	71.44
1492433835	85.4	1492433843	40.22066	1492433835	1414630000000.00	86.70
1492433845	18.07229	1492433853	1.002004	1492433845	1416330000000.00	17.00
1492433855	1.705115	1492433863	1.202405	1492433855	1416530000000.00	2.00
1492433865	1.606426	1492433873	43.7	1492433865	1416730000000.00	2.00
1492433875	66.4	1492433883	100	1492433875	1423510000000.00	67.79
1492433885	100	1492433893	59.34066	1492433885	1433500000000.00	99.91
1492433895	37.21164	1492433903	0	1492433895	1437100000000.00	36.00
1492433905	1.606426	1492433903	0	1492433905	1437300000000.00	2.00
1492433915	1.803607	1492433913	0.901804	1492433915	1437490000000.00	1.90

With Isolation (idle test)

Host View/cpu plugin for cpu 10		VM View		Virt view				Virt Other metrics									
silpixa00399126/ cpu-10 /percent-active-2017-03-07		ubuntu_vm/ cpu-0 /percent-active-2017-03-07		6c33ff2f-40d0-7a45-873b-7f3ead32413b/virt/ virt_vcpu-0 -2017-03-07				6c33ff2f-40d0-7a45-873b-7f3ead32413b/virt/virt_vcpu-1-2017-03-07			6c33ff2f-40d0-7a45-873b-7f3ead32413b/virt/ps_cputime-2017-03-07			6c33ff2f-40d0-7a45-873b-7f3ead32413b/virt/03-07			
											the physical user/system cpu time consumed by the hypervisor, per-vm						
epoch	value	epoch	value	epoch	value	percent		epoch	value	percent	epoch	user	syst	% user	% syst	epoch	val
1488880609.34	0	1488880609.14	0	1488880613.37	1659000000.00			1488880613	3600000000		1488880613.37	1074000000	959000000.00			1488880613	3154000
1488880610.34	0	1488880610.14	0														
1488880611.34	0	1488880611.14	0														
1488880612.34	0	1488880612.14	0														
1488880613.34	0	1488880613.14	0.990099														
1488880614.34	0.990099	1488880614.14	0														
1488880615.34	0	1488880615.14	0														
1488880616.34	0	1488880616.14	0														
1488880617.34	0	1488880617.14	0														
1488880618.34	0.990099	1488880618.14	0.990099														
1488880619.34	0	1488880619.14	0														
1488880620.34	0	1488880620.14	0														
1488880621.34	0	1488880621.14	0														
1488880622.34	0	1488880622.14	0														
1488880623.34	0	1488880623.14	0	1488880623.36	1661000000.00	0.20		1488880623	3630000000	0.30	1488880623.36	1075000000	961000000.00	0.10	0.20	1488880623	3160000

148888062 4.34	0	148888062 4.14	0																	
148888062 5.34	0	148888062 5.14	0																	
148888062 6.34	0	148888062 6.14	0																	
148888062 7.34	1	148888062 7.14	0																	
148888062 8.34	1.980198	148888062 8.14	0																	
148888062 9.34	0	148888062 9.14	0																	
148888063 0.34	0	148888063 0.14	0.990099																	
148888063 1.34	0	148888063 1.14	0																	
148888063 2.34	0	148888063 2.14	0																	
148888063 3.34	0	148888063 3.14	0	148888063 3.36	16630000 000.00	0.20		1488880633	36500000 00	0.20	148888063 3.36	1076000 0000	9630000 000.00	0.10	0.20	1488880633	3166 000			
148888063 4.34	0	148888063 4.14	0																	
148888063 5.34	0	148888063 5.14	0																	
148888063 6.34	0	148888063 6.14	0																	
148888063 7.34	0	148888063 7.14	0																	
148888063 8.34	1	148888063 8.14	1																	
148888063 9.34	1	148888063 9.14	0																	
148888064 0.34	0	148888064 0.14	0																	
148888064 1.34	0	148888064 1.14	0																	
148888064 2.34	0.990099	148888064 2.14	0.990099																	
148888064 3.34	0	148888064 3.14	1.980198	148888064 3.36	16660000 000.00	0.30		1488880643	36700000 00	0.20	148888064 3.36	1077000 0000	9650000 000.00	0.10	0.20	1488880643	3172 000			
148888064 4.34	1	148888064 4.14	1.980198																	
148888064 5.34	0	148888064 5.14	1.020408																	
148888064 6.34	2.970297	148888064 6.14	0																	
148888064 7.34	0	148888064 7.14	0																	
148888064 8.34	1	148888064 8.14	1.980198																	
148888064 9.34	0	148888064 9.14	0																	
148888065 0.34	0	148888065 0.14	0																	
148888065 1.34	0.990099	148888065 1.14	0																	
148888065 2.34	0	148888065 2.14	1																	
148888065 3.34	1	148888065 3.14	0	148888065 3.36	16730000 000.00	0.70		1488880653	37200000 00	0.50	148888065 3.36	1078000 0000	9690000 000.00	0.10	0.40	1488880653	3187 000			
148888065 4.34	1	148888065 4.14	2.020202																	
148888065 5.34	2.020202	148888065 5.14	0																	
148888065 6.34	0.990099	148888065 6.14	0																	
148888065 7.34	0	148888065 7.14	0																	
148888065 8.34	2	148888065 8.14	1																	
148888065 9.34	0	148888065 9.14	0																	
148888066 0.34	0	148888066 0.14	0																	
148888066 1.34	0	148888066 1.14	0																	
148888066 2.34	0	148888066 2.14	0																	

148888066 3.34	0	148888066 3.14	0	148888066 3.36	16780000 000.00	0.50		1488880663	37700000 00	0.50	148888066 3.36	1080000 0000	9720000 000.00	0.20	0.30	1488880663	3198 000
148888066 4.34	0	148888066 4.14	0														
148888066 5.34	0	148888066 5.14	0														
148888066 6.34	0	148888066 6.14	1														
148888066 7.34	1.980198	148888066 7.14	0.990099														
148888066 8.34	1.010101	148888066 8.14	1.010101														
148888066 9.34	0	148888066 9.14	0														
148888067 0.34	0	148888067 0.14	0														
148888067 1.34	0	148888067 1.14	0														
148888067 2.34	3.960396	148888067 2.14	10.89109														
148888067 3.34	7	148888067 3.14	0	148888067 3.37	16910000 000.00	1.30		1488880673	39400000 00	1.70	148888067 3.37	1082000 0000	9790000 000.00	0.20	0.70	1488880673	3232 000
148888067 4.34	0	148888067 4.14	0														
148888067 5.34	0	148888067 5.14	0														
148888067 6.34	0	148888067 6.14	0.990099														
148888067 7.34	0	148888067 7.14	0														
148888067 8.34	1	148888067 8.14	2														
148888067 9.34	0	148888067 9.14	0														
148888068 0.34	0	148888068 0.14	0														
148888068 1.34	1.960784	148888068 1.14	0														
148888068 2.34	0	148888068 2.14	0														
148888068 3.34	0	148888068 3.14	0	148888068 3.36	16940000 000.00	0.30		1488880683	39600000 00	0.20	148888068 3.36	1083000 0000	9810000 000.00	0.10	0.20	1488880683	3239 000
148888068 4.34	0	148888068 4.14	0														
148888068 5.34	0	148888068 5.14	0														
148888068 6.34	0	148888068 6.14	0														
148888068 7.34	0	148888068 7.14	0														
148888068 8.34	1	148888068 8.14	1														
148888068 9.34	0	148888068 9.14	0														
148888069 0.34	0	148888069 0.14	0														
148888069 1.34	0	148888069 1.14	0.990099														
148888069 2.34	0.990099	148888069 2.14	0														
148888069 3.34	0	148888069 3.14	1	148888069 3.36	16960000 000.00	0.20		1488880693	39900000 00	0.30	148888069 3.36	1084000 0000	9830000 000.00	0.10	0.20	1488880693	3245 000
148888069 4.34	0	148888069 4.14	0														
148888069 5.34	0	148888069 5.14	0														
148888069 6.34	0	148888069 6.14	0														
148888069 7.34	0.990099	148888069 7.14	0.990099														
148888069 8.34	0	148888069 8.14	0														
148888069 9.34	0	148888069 9.14	0														
148888070 0.34	0	148888070 0.14	0														
148888070 1.34	0	148888070 1.14	0														

148888070 2.34	0.990099	148888070 2.14	0														
148888070 3.34	0	148888070 3.14	0	148888070 3.36	16970000 000.00	0.10		1488880703 40300000 00	0.40	148888070 3.36	10850000 0000	9850000 000.00	0.10	0.20	1488880703 3251 000		

Without Isolation (idle test)

Host View		VM View		Virt view		
silpixa00399126/cpu-10/percent-active-2017-03-07		ubuntu_vm/cpu-0/percent-active-2017-03-07		6c33ff2f-40d0-7a45-873b-7f3ead32413b/virt/virt_vcpu-0-2017-03-07		
epoch	value	epoch	value	epoch	value	percent
1488877698.94	2.020202	1488877698.64	1.010101	1488877697.98	628610000000.00	
1488877699.94	14.14141	1488877699.64	0			
1488877700.94	0	1488877700.64	0			
1488877701.94	0	1488877701.64	0			
1488877702.94	0	1488877702.64	0			
1488877703.94	2.941176	1488877703.64	0			
1488877704.94	0	1488877704.64	0			
1488877705.94	0	1488877705.64	0			
1488877706.94	0	1488877706.64	0			
1488877707.94	0	1488877707.64	0	1488877707.97	628760000000.00	1.50
1488877708.94	0	1488877708.64	0			
1488877709.94	1.980198	1488877709.64	0			
1488877710.94	0	1488877710.64	0			
1488877711.94	0	1488877711.64	0			
1488877712.94	0	1488877712.64	0			
1488877713.94	0	1488877713.64	0			
1488877714.94	0	1488877714.64	0			
1488877715.94	0	1488877715.64	0			
1488877716.94	0	1488877716.64	0			
1488877717.94	0	1488877717.64	0	1488877717.96	628760000000.00	0.00
1488877718.94	2	1488877718.64	1.010101			
1488877719.94	1	1488877719.64	0			
1488877720.94	0	1488877720.64	0			
1488877721.94	0.990099	1488877721.64	0			
1488877722.94	0	1488877722.64	0			
1488877723.94	0	1488877723.64	0			
1488877724.94	1.980198	1488877724.64	0			
1488877725.94	0	1488877725.64	0			
1488877726.94	0	1488877726.64	0			
1488877727.94	1	1488877727.64	0	1488877727.96	628790000000.00	0.30
1488877728.94	1	1488877728.64	1			
1488877729.94	1.980198	1488877729.64	0			
1488877730.94	0	1488877730.64	0			
1488877731.94	0	1488877731.64	0			
1488877732.94	0	1488877732.64	0			
1488877733.94	0	1488877733.64	0			

1488877734.94	0	1488877734.64	0			
1488877735.94	0.990099	1488877735.64	0			
1488877736.94	0	1488877736.64	0			
1488877737.94	0.990099	1488877737.65	0	1488877737.96	628800000000.00	0.10
1488877738.94	8.080808	1488877738.64	2.020202			
1488877739.94	2	1488877739.64	0			
1488877740.94	0	1488877740.64	0			
1488877741.94	0	1488877741.64	0			
1488877742.94	0	1488877742.64	0			
1488877743.94	0	1488877743.64	0			
1488877744.94	0	1488877744.64	0			
1488877745.94	0.990099	1488877745.64	0			
1488877746.94	0	1488877746.64	0			
1488877747.94	0	1488877747.64	0	1488877747.96	628830000000.00	0.30
1488877748.94	2	1488877748.64	0			
1488877749.94	0	1488877749.64	0			
1488877750.94	0	1488877750.64	0			
1488877751.94	0	1488877751.64	0			
1488877752.94	0	1488877752.64	0			
1488877753.94	0	1488877753.64	1			
1488877754.94	0	1488877754.64	0			
1488877755.94	0	1488877755.64	0			
1488877756.94	1	1488877756.64	0			
1488877757.94	0.990099	1488877757.64	0	1488877757.97	628840000000.00	0.10
1488877758.94	1.010101	1488877758.64	1.010101			
1488877759.94	2	1488877759.64	0			
1488877760.94	0	1488877760.64	0			
1488877761.94	0	1488877761.64	0			
1488877762.94	0.990099	1488877762.64	0			
1488877763.94	0	1488877763.64	0			
1488877764.94	0	1488877764.64	0			
1488877765.94	0	1488877765.64	0			
1488877766.94	1	1488877766.64	0			
1488877767.94	0	1488877767.64	0	1488877767.97	628880000000.00	0.40
1488877768.94	3	1488877768.64	1			
1488877769.94	1.010101	1488877769.64	0			
1488877770.94	1.960784	1488877770.64	0			
1488877771.94	0	1488877771.64	0			
1488877772.94	1	1488877772.64	0			
1488877773.94	0	1488877773.64	0			
1488877774.94	0.990099	1488877774.64	0			
1488877775.94	1	1488877775.64	0			
1488877776.94	0	1488877776.64	0			
1488877777.94	0	1488877777.65	0	1488877777.96	628890000000.00	0.10
1488877778.94	3.960396	1488877778.64	1			
1488877779.94	1	1488877779.64	0			
1488877780.94	0	1488877780.64	0			

1488877781.94	0	1488877781.64	0			
1488877782.94	0	1488877782.64	0			
1488877783.94	0	1488877783.64	0			
1488877784.94	0.990099	1488877784.64	0			
1488877785.94	0.990099	1488877785.64	0			
1488877786.94	0	1488877786.64	0			
1488877787.94	0	1488877787.64	0	1488877787.96	628900000000.00	0.10
1488877788.94	1	1488877788.64	0			
1488877789.94	1.980198	1488877789.64	0			
1488877790.94	0	1488877790.64	0			
1488877791.94	0	1488877791.64	0			
1488877792.94	0	1488877792.64	0			
1488877793.94	1	1488877793.64	0			
1488877794.94	0	1488877795.64	0			
1488877795.94	1	1488877796.64	0			
1488877796.94	1	1488877796.64	0			
1488877797.94	0	1488877797.65	0	1488877797.96	628920000000.00	0.20

With core isolation from OS											
Host View		VM View		Virt view			Virt view				
silpixa00399126 /cpu-10/percent-active-2017-03-07		ubuntu_vm/cpu-0 /percent-active-2017-03-07		6c33ff2f-40d0-7a45-873b-7f3ead32413b/virt/virt_vcputime-0-2017-03-07			6c33ff2f-40d0-7a45-873b-7f3ead32413b/virt/ps_cputime-2017-03-07				
1488880609.34	0	1488880609.14	0	1488880613.37	1659000000.00		1488880613.37	1074000000	9590000000.00		
1488880610.34	0	1488880610.14	0								
1488880611.34	0	1488880611.14	0								
1488880612.34	0	1488880612.14	0								
1488880613.34	0	1488880613.14	0.990099								
1488880614.34	0.990099	1488880614.14	0								
1488880615.34	0	1488880615.14	0								
1488880616.34	0	1488880616.14	0								
1488880617.34	0	1488880617.14	0								
1488880618.34	0.990099	1488880618.14	0.990099								
1488880619.34	0	1488880619.14	0								
1488880620.34	0	1488880620.14	0								
1488880621.34	0	1488880621.14	0								
1488880622.34	0	1488880622.14	0								
1488880623.34	0	1488880623.14	0	1488880623.36	1661000000.00	0.20	1488880623.36	1075000000	9610000000.00	0.10	0.20
1488880624.34	0	1488880624.14	0								

e	v	e	v	e	v	p	e	u	sy	%	%
p	a	p	a	p	a	er	p	s	st	u	sy
o	l	o	l	o	l	c	o	e		s	st
c	u	c	u	c	u						

148888062 5.34	0	148888062 5.14	0								
148888062 6.34	0	148888062 6.14	0								
148888062 7.34	1	148888062 7.14	0								
148888062 8.34	1.9801 98	148888062 8.14	0								
148888062 9.34	0	148888062 9.14	0								
148888063 0.34	0	148888063 0.14	0.9900 99								
148888063 1.34	0	148888063 1.14	0								
148888063 2.34	0	148888063 2.14	0								
148888063 3.34	0	148888063 3.14	0	148888063 3.36	166300000 00.00	0.20	148888063 3.36	1076000 0000	963000000 0.00	0.10	0.20
148888063 4.34	0	148888063 4.14	0								
148888063 5.34	0	148888063 5.14	0								
148888063 6.34	0	148888063 6.14	0								
148888063 7.34	0	148888063 7.14	0								
148888063 8.34	1	148888063 8.14	1								
148888063 9.34	1	148888063 9.14	0								
148888064 0.34	0	148888064 0.14	0								
148888064 1.34	0	148888064 1.14	0								
148888064 2.34	0.9900 99	148888064 2.14	0.9900 99								
148888064 3.34	0	148888064 3.14	1.9801 98	148888064 3.36	166600000 00.00	0.30	148888064 3.36	1077000 0000	965000000 0.00	0.10	0.20
148888064 4.34	1	148888064 4.14	1.9801 98								
148888064 5.34	0	148888064 5.14	1.0204 08								
148888064 6.34	2.9702 97	148888064 6.14	0								
148888064 7.34	0	148888064 7.14	0								
148888064 8.34	1	148888064 8.14	1.9801 98								
148888064 9.34	0	148888064 9.14	0								
148888065 0.34	0	148888065 0.14	0								
148888065 1.34	0.9900 99	148888065 1.14	0								
148888065 2.34	0	148888065 2.14	1								
148888065 3.34	1	148888065 3.14	0	148888065 3.36	167300000 00.00	0.70	148888065 3.36	1078000 0000	969000000 0.00	0.10	0.40
148888065 4.34	1	148888065 4.14	2.0202 02								
148888065 5.34	2.0202 02	148888065 5.14	0								
148888065 6.34	0.9900 99	148888065 6.14	0								
148888065 7.34	0	148888065 7.14	0								
148888065 8.34	2	148888065 8.14	1								
148888065 9.34	0	148888065 9.14	0								

148888066 0.34	0	148888066 0.14	0								
148888066 1.34	0	148888066 1.14	0								
148888066 2.34	0	148888066 2.14	0								
148888066 3.34	0	148888066 3.14	0	148888066 3.36	167800000 00.00	0.50	148888066 3.36	1080000 0000	972000000 0.00	0.20	0.30
148888066 4.34	0	148888066 4.14	0								
148888066 5.34	0	148888066 5.14	0								
148888066 6.34	0	148888066 6.14	1								
148888066 7.34	1.9801 98	148888066 7.14	0.9900 99								
148888066 8.34	1.0101 01	148888066 8.14	1.0101 01								
148888066 9.34	0	148888066 9.14	0								
148888067 0.34	0	148888067 0.14	0								
148888067 1.34	0	148888067 1.14	0								
148888067 2.34	3.9603 96	148888067 2.14	10.891 09								
148888067 3.34	7	148888067 3.14	0	148888067 3.37	169100000 00.00	1.30	148888067 3.37	1082000 0000	979000000 0.00	0.20	0.70
148888067 4.34	0	148888067 4.14	0								
148888067 5.34	0	148888067 5.14	0								
148888067 6.34	0	148888067 6.14	0.9900 99								
148888067 7.34	0	148888067 7.14	0								
148888067 8.34	1	148888067 8.14	2								
148888067 9.34	0	148888067 9.14	0								
148888068 0.34	0	148888068 0.14	0								
148888068 1.34	1.9607 84	148888068 1.14	0								
148888068 2.34	0	148888068 2.14	0								
148888068 3.34	0	148888068 3.14	0	148888068 3.36	169400000 00.00	0.30	148888068 3.36	1083000 0000	981000000 0.00	0.10	0.20
148888068 4.34	0	148888068 4.14	0								
148888068 5.34	0	148888068 5.14	0								
148888068 6.34	0	148888068 6.14	0								
148888068 7.34	0	148888068 7.14	0								
148888068 8.34	1	148888068 8.14	1								
148888068 9.34	0	148888068 9.14	0								
148888069 0.34	0	148888069 0.14	0								
148888069 1.34	0	148888069 1.14	0.9900 99								
148888069 2.34	0.9900 99	148888069 2.14	0								
148888069 3.34	0	148888069 3.14	1	148888069 3.36	169600000 00.00	0.20	148888069 3.36	1084000 0000	983000000 0.00	0.10	0.20
148888069 4.34	0	148888069 4.14	0								

148888069 5.34	0	148888069 5.14	0								
148888069 6.34	0	148888069 6.14	0								
148888069 7.34	0.9900 99	148888069 7.14	0.9900 99								
148888069 8.34	0	148888069 8.14	0								
148888069 9.34	0	148888069 9.14	0								
148888070 0.34	0	148888070 0.14	0								
148888070 1.34	0	148888070 1.14	0								
148888070 2.34	0.9900 99	148888070 2.14	0								
148888070 3.34	0	148888070 3.14	0	148888070 3.36	169700000 00.00	0.10	148888070 3.36	1085000 0000	985000000 0.00	0.10	0.20

14924 31873	100.00	14924 31873	100												14924 31873	1355420 000000. 00	99.90
14924 31874	100.00	14924 31874	100												14924 31874	1356420 000000. 00	100. 00
14924 31875	100.00														14924 31875	1357420 000000. 00	100. 10
14924 31876	100.00														14924 31876	1358420 000000. 00	99.90
14924 31877	100.00														14924 31877	1359420 000000. 00	100. 00
14924 31878	33.33														14924 31878	1359730 000000. 00	31.00
14924 31879	0.00														14924 31879	1359730 000000. 00	0.00
14924 31880	0.00														14924 31880	1359750 000000. 00	2.00
14924 31881	1.00														14924 31881	1359760 000000. 00	1.00
14924 31882	1.00														14924 31882	1359770 000000. 00	1.00