# Soak Test serve_hostnames

This directory contains the source for a soak test `serve_hostnames` which performs the following actions when used with the GCE provider:

- A connection is established to the master of the cluster identified from the current context set in `$HOME/.kube/.kubeconfig`.
- The nodes available on the cluster are enumerated (say $N$ nodes).
- On each node, $M$ pods are created (by default 1). The pod encapsulates the `serve_hostnames` image which simply returns the name of the pod in response to a `GET` request. The pods are created individually (i.e. not with a replication controller).
- A service is created which maps to these pods.
- The program makes $I$ iterations (default 1) where it issues $QxNxM$ queries ($Q$ default is 10) via the service proxy interface at the master.
- The program verifies that every pod (and thus every node) responded to at least one query (the average should be about $Q$).
- The time taken to perform various operations is reported and some operations are re-tried if they failed.

Run the following command:

`./serve_hostnames`

Here is some representative output:

```
I0326 14:21:04.179893    11434 serve_hostnames.go:60] Starting serve_hostnames soak test with
I0326 14:21:04.507252    11434 serve_hostnames.go:85] Nodes found on this cluster:
I0326 14:21:04.507282    11434 serve_hostnames.go:87] 0: kubernetes-node-5h4m.c.kubernetes-sa
I0326 14:21:04.507297    11434 serve_hostnames.go:87] 1: kubernetes-node-9i4n.c.kubernetes-sa
I0326 14:21:04.507309    11434 serve_hostnames.go:87] 2: kubernetes-node-d0yo.c.kubernetes-sa
I0326 14:21:04.507320    11434 serve_hostnames.go:87] 3: kubernetes-node-jay1.c.kubernetes-sa
I0326 14:21:04.507347    11434 serve_hostnames.go:95] Using namespace serve-hostnames-8145 fo
I0326 14:21:04.507363    11434 serve_hostnames.go:98] Creating service serve-hostnames-8145/s
I0326 14:21:04.559849    11434 serve_hostnames.go:148] Creating pod serve-hostnames-8145/serv
I0326 14:21:04.605603    11434 serve_hostnames.go:148] Creating pod serve-hostnames-8145/serv
I0326 14:21:04.662099    11434 serve_hostnames.go:148] Creating pod serve-hostnames-8145/serv
I0326 14:21:04.707179    11434 serve_hostnames.go:148] Creating pod serve-hostnames-8145/serv
I0326 14:21:04.757646    11434 serve_hostnames.go:194] Waiting for the serve-hostname pods to
I0326 14:23:31.125188    11434 serve_hostnames.go:211] serve-hostnames-8145/serve-hostname-0-
I0326 14:23:31.165984    11434 serve_hostnames.go:211] serve-hostnames-8145/serve-hostname-1-
I0326 14:25:22.213751    11434 serve_hostnames.go:211] serve-hostnames-8145/serve-hostname-2-
I0326 14:25:37.387257    11434 serve_hostnames.go:211] serve-hostnames-8145/serve-hostname-3-
W0326 14:25:39.243813    11434 serve_hostnames.go:265] No response from pod serve-hostname-3-
I0326 14:25:39.243844    11434 serve_hostnames.go:269] Iteration 0 took 1.814483599s for 40 c
I0326 14:25:39.243871    11434 serve_hostnames.go:182] Cleaning up pods
I0326 14:25:39.434619    11434 serve_hostnames.go:130] Cleaning up service serve-hostnames-81
```

The pods are named with -$N$-$M$ suffixes which identify the number of the node

*N* and the number of the pod *M* on that node. Notice that in this run the pod (number 0) running on node 3 did not respond to any queries.

The number of iterations to perform for issuing queries can be changed from the default of 1 to some higher value e.g. `--up_to=3` and the number of pods per node can also be changed e.g. `--pods_per_node=2`:

```
./serve_hostnames --up_to=3 --pods_per_node=2
```

The output is similar to this:

```
I0326 14:27:27.584378    11808 serve_hostnames.go:60] Starting serve_hostnames soak test with
I0326 14:27:27.913713    11808 serve_hostnames.go:85] Nodes found on this cluster:
I0326 14:27:27.913774    11808 serve_hostnames.go:87] 0: kubernetes-node-5h4m.c.kubernetes-sa
I0326 14:27:27.913800    11808 serve_hostnames.go:87] 1: kubernetes-node-9i4n.c.kubernetes-sa
I0326 14:27:27.913825    11808 serve_hostnames.go:87] 2: kubernetes-node-d0yo.c.kubernetes-sa
I0326 14:27:27.913846    11808 serve_hostnames.go:87] 3: kubernetes-node-jay1.c.kubernetes-sa
I0326 14:27:27.913904    11808 serve_hostnames.go:95] Using namespace serve-hostnames-4997 fo
I0326 14:27:27.913931    11808 serve_hostnames.go:98] Creating service serve-hostnames-4997/s
I0326 14:27:27.969083    11808 serve_hostnames.go:148] Creating pod serve-hostnames-4997/serv
I0326 14:27:28.020133    11808 serve_hostnames.go:148] Creating pod serve-hostnames-4997/serv
I0326 14:27:28.070054    11808 serve_hostnames.go:148] Creating pod serve-hostnames-4997/serv
I0326 14:27:28.118641    11808 serve_hostnames.go:148] Creating pod serve-hostnames-4997/serv
I0326 14:27:28.168786    11808 serve_hostnames.go:148] Creating pod serve-hostnames-4997/serv
I0326 14:27:28.214730    11808 serve_hostnames.go:148] Creating pod serve-hostnames-4997/serv
I0326 14:27:28.261685    11808 serve_hostnames.go:148] Creating pod serve-hostnames-4997/serv
I0326 14:27:28.320224    11808 serve_hostnames.go:148] Creating pod serve-hostnames-4997/serv
I0326 14:27:28.387007    11808 serve_hostnames.go:194] Waiting for the serve-hostname pods to
I0326 14:28:28.969149    11808 serve_hostnames.go:211] serve-hostnames-4997/serve-hostname-0-
I0326 14:28:29.010376    11808 serve_hostnames.go:211] serve-hostnames-4997/serve-hostname-0-
I0326 14:28:29.050463    11808 serve_hostnames.go:211] serve-hostnames-4997/serve-hostname-1-
I0326 14:28:29.091164    11808 serve_hostnames.go:211] serve-hostnames-4997/serve-hostname-1-
I0326 14:30:00.850461    11808 serve_hostnames.go:211] serve-hostnames-4997/serve-hostname-2-
I0326 14:30:00.891559    11808 serve_hostnames.go:211] serve-hostnames-4997/serve-hostname-2-
I0326 14:30:00.932829    11808 serve_hostnames.go:211] serve-hostnames-4997/serve-hostname-3-
I0326 14:30:00.973941    11808 serve_hostnames.go:211] serve-hostnames-4997/serve-hostname-3-
W0326 14:30:04.726582    11808 serve_hostnames.go:265] No response from pod serve-hostname-2-
W0326 14:30:04.726658    11808 serve_hostnames.go:265] No response from pod serve-hostname-2-
I0326 14:30:04.726696    11808 serve_hostnames.go:269] Iteration 0 took 3.711080213s for 80 q
W0326 14:30:08.267297    11808 serve_hostnames.go:265] No response from pod serve-hostname-2-
W0326 14:30:08.267365    11808 serve_hostnames.go:265] No response from pod serve-hostname-2-
I0326 14:30:08.267404    11808 serve_hostnames.go:269] Iteration 1 took 3.540635303s for 80 q
I0326 14:30:11.971349    11808 serve_hostnames.go:269] Iteration 2 took 3.703884372s for 80 q
I0326 14:30:11.971425    11808 serve_hostnames.go:182] Cleaning up pods
I0326 14:30:12.382932    11808 serve_hostnames.go:130] Cleaning up service serve-hostnames-49
```

Notice here that for the first two iterations neither of the pods on node 2 responded but by the third iteration responses were received from all nodes.

For a soak test use `--up_to=-1` which will loop indefinitely.

Note that this is not designed to be a performance test. The goal for this program is to provide an easy way to have a soak test that can run indefinitely an exercise enough of Kubernetes' functionality to be confident that the cluster is still up and healthy. The reported QPS mainly indicates latency to the master since the proxy requests are issued (deliberately) in a serial manner.

A more detailed report can be produced with `--v=4` which measures the time taken to perform various operations and it also reports the distribution of responses received from the pods. In the example below we see that the pod on node 0 returned 18 responses, the pod on node 1 returned 10 responses and the pod on node 3 returned 12 responses and the pod on node 2 did not respond at all.

`./serve_hostnames --v=4`

The output is similar to this:

```
I0326 14:33:26.020917    12099 serve_hostnames.go:60] Starting serve_hostnames soak test with
I0326 14:33:26.365201    12099 serve_hostnames.go:85] Nodes found on this cluster:
I0326 14:33:26.365260    12099 serve_hostnames.go:87] 0: kubernetes-node-5h4m.c.kubernetes-sa
I0326 14:33:26.365288    12099 serve_hostnames.go:87] 1: kubernetes-node-9i4n.c.kubernetes-sa
I0326 14:33:26.365313    12099 serve_hostnames.go:87] 2: kubernetes-node-d0yo.c.kubernetes-sa
I0326 14:33:26.365334    12099 serve_hostnames.go:87] 3: kubernetes-node-jay1.c.kubernetes-sa
I0326 14:33:26.365392    12099 serve_hostnames.go:95] Using namespace serve-hostnames-1631 fo
I0326 14:33:26.365419    12099 serve_hostnames.go:98] Creating service serve-hostnames-1631/s
I0326 14:33:26.423927    12099 serve_hostnames.go:118] Service create serve-hostnames-1631/se
I0326 14:33:26.423981    12099 serve_hostnames.go:148] Creating pod serve-hostnames-1631/serv
I0326 14:33:26.480185    12099 serve_hostnames.go:168] Pod create serve-hostnames-1631/serve-
I0326 14:33:26.480271    12099 serve_hostnames.go:148] Creating pod serve-hostnames-1631/serv
I0326 14:33:26.534300    12099 serve_hostnames.go:168] Pod create serve-hostnames-1631/serve-
I0326 14:33:26.534396    12099 serve_hostnames.go:148] Creating pod serve-hostnames-1631/serv
I0326 14:33:26.590188    12099 serve_hostnames.go:168] Pod create serve-hostnames-1631/serve-
I0326 14:33:26.590222    12099 serve_hostnames.go:148] Creating pod serve-hostnames-1631/serv
I0326 14:33:26.650024    12099 serve_hostnames.go:168] Pod create serve-hostnames-1631/serve-
I0326 14:33:26.650083    12099 serve_hostnames.go:194] Waiting for the serve-hostname pods to
I0326 14:33:32.776651    12099 serve_hostnames.go:211] serve-hostnames-1631/serve-hostname-0-
I0326 14:33:32.822324    12099 serve_hostnames.go:211] serve-hostnames-1631/serve-hostname-1-
I0326 14:35:03.741235    12099 serve_hostnames.go:211] serve-hostnames-1631/serve-hostname-2-
I0326 14:35:03.786411    12099 serve_hostnames.go:211] serve-hostnames-1631/serve-hostname-3-
I0326 14:35:03.878030    12099 serve_hostnames.go:249] Proxy call in namespace serve-hostname
I0326 14:35:03.923999    12099 serve_hostnames.go:249] Proxy call in namespace serve-hostname
I0326 14:35:03.967731    12099 serve_hostnames.go:249] Proxy call in namespace serve-hostname
I0326 14:35:04.011077    12099 serve_hostnames.go:249] Proxy call in namespace serve-hostname
I0326 14:35:04.054958    12099 serve_hostnames.go:249] Proxy call in namespace serve-hostname
I0326 14:35:04.099051    12099 serve_hostnames.go:249] Proxy call in namespace serve-hostname
I0326 14:35:04.143197    12099 serve_hostnames.go:249] Proxy call in namespace serve-hostname
```

```
I0326 14:35:04.186800    12099 serve_hostnames.go:249] Proxy call in namespace serve-hostname
I0326 14:35:04.230492    12099 serve_hostnames.go:249] Proxy call in namespace serve-hostname
I0326 14:35:04.274337    12099 serve_hostnames.go:249] Proxy call in namespace serve-hostname
I0326 14:35:04.317801    12099 serve_hostnames.go:249] Proxy call in namespace serve-hostname
I0326 14:35:04.362778    12099 serve_hostnames.go:249] Proxy call in namespace serve-hostname
I0326 14:35:04.406845    12099 serve_hostnames.go:249] Proxy call in namespace serve-hostname
I0326 14:35:04.450513    12099 serve_hostnames.go:249] Proxy call in namespace serve-hostname
I0326 14:35:04.494369    12099 serve_hostnames.go:249] Proxy call in namespace serve-hostname
I0326 14:35:04.538399    12099 serve_hostnames.go:249] Proxy call in namespace serve-hostname
I0326 14:35:04.583760    12099 serve_hostnames.go:249] Proxy call in namespace serve-hostname
I0326 14:35:04.637430    12099 serve_hostnames.go:249] Proxy call in namespace serve-hostname
I0326 14:35:04.681389    12099 serve_hostnames.go:249] Proxy call in namespace serve-hostname
I0326 14:35:04.725401    12099 serve_hostnames.go:249] Proxy call in namespace serve-hostname
I0326 14:35:04.769218    12099 serve_hostnames.go:249] Proxy call in namespace serve-hostname
I0326 14:35:04.812660    12099 serve_hostnames.go:249] Proxy call in namespace serve-hostname
I0326 14:35:04.857974    12099 serve_hostnames.go:249] Proxy call in namespace serve-hostname
I0326 14:35:04.901706    12099 serve_hostnames.go:249] Proxy call in namespace serve-hostname
I0326 14:35:04.945372    12099 serve_hostnames.go:249] Proxy call in namespace serve-hostname
I0326 14:35:04.989023    12099 serve_hostnames.go:249] Proxy call in namespace serve-hostname
I0326 14:35:05.033153    12099 serve_hostnames.go:249] Proxy call in namespace serve-hostname
I0326 14:35:05.077038    12099 serve_hostnames.go:249] Proxy call in namespace serve-hostname
I0326 14:35:05.124299    12099 serve_hostnames.go:249] Proxy call in namespace serve-hostname
I0326 14:35:05.168162    12099 serve_hostnames.go:249] Proxy call in namespace serve-hostname
I0326 14:35:05.211687    12099 serve_hostnames.go:249] Proxy call in namespace serve-hostname
I0326 14:35:05.255553    12099 serve_hostnames.go:249] Proxy call in namespace serve-hostname
I0326 14:35:05.299352    12099 serve_hostnames.go:249] Proxy call in namespace serve-hostname
I0326 14:35:05.342916    12099 serve_hostnames.go:249] Proxy call in namespace serve-hostname
I0326 14:35:05.386952    12099 serve_hostnames.go:249] Proxy call in namespace serve-hostname
I0326 14:35:05.431467    12099 serve_hostnames.go:249] Proxy call in namespace serve-hostname
I0326 14:35:05.475834    12099 serve_hostnames.go:249] Proxy call in namespace serve-hostname
I0326 14:35:05.519373    12099 serve_hostnames.go:249] Proxy call in namespace serve-hostname
I0326 14:35:05.563584    12099 serve_hostnames.go:249] Proxy call in namespace serve-hostname
I0326 14:35:05.607126    12099 serve_hostnames.go:249] Proxy call in namespace serve-hostname
I0326 14:35:05.607164    12099 serve_hostnames.go:258] serve-hostname-3-0: 12
I0326 14:35:05.607176    12099 serve_hostnames.go:258] serve-hostname-1-0: 10
I0326 14:35:05.607186    12099 serve_hostnames.go:258] serve-hostname-0-0: 18
W0326 14:35:05.607199    12099 serve_hostnames.go:265] No response from pod serve-hostname-2-
I0326 14:35:05.607211    12099 serve_hostnames.go:269] Iteration 0 took 1.774856469s for 40 c
I0326 14:35:05.607236    12099 serve_hostnames.go:182] Cleaning up pods
I0326 14:35:05.797893    12099 serve_hostnames.go:130] Cleaning up service serve-hostnames-16
```