

Circuit Breaker
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1. Enable httpbin sample

```
C:\Users\Darigan\Projects\istio-1.21.2>kubectl apply -f samples/httpbin/httpbin.yaml
serviceaccount/httpbin created
service/httpbin created
deployment.apps/httpbin created
```

2. Create destination rule

```
Darigan@Cocoon MINGW64 ~
$ kubectl apply -f - <<EOF
apiVersion: networking.istio.io/v1alpha3
kind: DestinationRule
metadata:
  name: httpbin
spec:
  host: httpbin
  trafficPolicy:
    connectionPool:
      tcp:
        maxConnections: 1
      http:
        http1MaxPendingRequests: 1
        maxRequestsPerConnection: 1
    outlierDetection:
      consecutive5xxErrors: 1
      interval: 1s
      baseEjectionTime: 3m
      maxEjectionPercent: 100
EOF
destinationrule.networking.istio.io/httpbin created
```

3. Confirm rule exists

```
C:\Users\Darigan\Projects\istio-1.21.2>kubectl get destinationrule httpbin -o yaml
apiVersion: networking.istio.io/v1beta1
kind: DestinationRule
metadata:
  annotations:
    kubectl.kubernetes.io/last-applied-configuration: |
      {"apiVersion":"networking.istio.io/v1alpha3","kind":"DestinationRule","metadata":{"annotations":{},"name":"httpbin","namespace":"default"},"spec":{"host":"httpbin","trafficPolicy":{"connectionPool":{"http":{"http1MaxPendingRequests":1,"maxRequestsPerConnection":1},"tcp":{"maxConnections":1},"outlierDetection":{"baseEjectionTime":"3m","consecutive5xxErrors":1,"interval":"1s","maxEjectionPercent":100}}}}}
  creationTimestamp: "2024-05-05T02:02:18Z"
  generation: 1
  name: httpbin
  namespace: default
  resourceVersion: "3491"
  uid: 31c9ef8f-3c96-459f-963c-e813f77ce018
spec:
  host: httpbin
  trafficPolicy:
    connectionPool:
      http:
        http1MaxPendingRequests: 1
        maxRequestsPerConnection: 1
      tcp:
        maxConnections: 1
    outlierDetection:
      baseEjectionTime: 3m
      consecutive5xxErrors: 1
      interval: 1s
      maxEjectionPercent: 100
```

4. Create http sample client

```
C:\Users\Darigan\Projects\istio-1.21.2>kubectl apply -f samples/httpbin/sample-client/fortio-deploy.yaml
service/fortio created
deployment.apps/fortio-deploy created
```

5. Make a curl call from fortio (minor changes needed for windows)

```
C:\Users\Darigan\Projects\istio-1.21.2>kubectl exec %FORTIO_POD% -c fortio -- /usr/bin/fortio curl -quiet http://httpbin:8000/get
HTTP/1.1 200 OK
server: envoy
date: Sun, 05 May 2024 02:16:20 GMT
content-type: application/json
content-length: 590
access-control-allow-origin: *
access-control-allow-credentials: true
x-envoy-upstream-service-time: 13

{
  "args": {},
  "headers": {
    "Host": "httpbin:8000",
    "User-Agent": "fortio.org/fortio-1.60.3",
    "X-B3-Parentspanid": "d6686edf6240537c",
    "X-B3-Sampled": "1",
    "X-B3-Spanid": "fd6e3539b81877f1",
    "X-B3-Traceid": "6365e2f81d375f4ad6686edf6240537c",
    "X-Envoy-Attempt-Count": "1",
    "X-Forwarded-Client-Cert": "Byzspiffe://cluster.local/ns/default/sa/httpbin;Hash=f241df9fdc906d2873b78b929093cd21eda19dafd4765da5c1e85b5c3b664fc9;Subject=\"\";URI=spl
ffe://cluster.local/ns/default/sa/default"
  },
  "origin": "127.0.0.6",
  "url": "http://httpbin:8000/get"
}
```

6. Send a heavy request load to cause problems

```
C:\Users\Darigan\Projects\istio-1.21.2>kubectl exec %FORTIO_POD% -c fortio -- /usr/bin/fortio load -c 2 -qps 0 -n 20 -loglevel Warning http://httpbin:8000/get
{"ts":1714875457.231251,"level":"info","x":1,"file":"logger.go","line":254,"msg":"Log level is now 3 Warning (was 2 Info)"}
Fortio 1.60.3 running at 0 queries per second, 12->12 procs, for 20 calls: http://httpbin:8000/get
Starting at max qps with 2 thread(s) [gomax 12] for exactly 20 calls (10 per thread + 0)
{"ts":1714875457.249353,"level":"warn","x":51,"file":"http_client.go","line":1104,"msg":"Non ok http code","code":503,"status":"HTTP/1.1 503","thread":0,"run":0}
{"ts":1714875457.255260,"level":"warn","x":52,"file":"http_client.go","line":1104,"msg":"Non ok http code","code":503,"status":"HTTP/1.1 503","thread":1,"run":0}
{"ts":1714875457.265529,"level":"warn","x":51,"file":"http_client.go","line":1104,"msg":"Non ok http code","code":503,"status":"HTTP/1.1 503","thread":0,"run":0}
{"ts":1714875457.261462,"level":"warn","x":52,"file":"http_client.go","line":1104,"msg":"Non ok http code","code":503,"status":"HTTP/1.1 503","thread":1,"run":0}
{"ts":1714875457.264844,"level":"warn","x":51,"file":"http_client.go","line":1104,"msg":"Non ok http code","code":503,"status":"HTTP/1.1 503","thread":0,"run":0}
{"ts":1714875457.267803,"level":"warn","x":52,"file":"http_client.go","line":1104,"msg":"Non ok http code","code":503,"status":"HTTP/1.1 503","thread":1,"run":0}
{"ts":1714875457.271028,"level":"warn","x":51,"file":"http_client.go","line":1104,"msg":"Non ok http code","code":503,"status":"HTTP/1.1 503","thread":0,"run":0}
{"ts":1714875457.273388,"level":"warn","x":52,"file":"http_client.go","line":1104,"msg":"Non ok http code","code":503,"status":"HTTP/1.1 503","thread":1,"run":0}
Ended after 41.41033ms : 20 calls, qps=482.97
Aggregated Function Time : count 20 avg 0.004054708 +/- 0.002997 min 0.000361663 max 0.010954004 sum 0.081094161
# range, mid point, percentile, count
```

7. 12 Requests of 20 passed

```
Uniform: false, Jitter: false, Ca
IP addresses distribution:
10.110.214.203:8000: 9
Code 200 : 12 (60.0 %)
Code 503 : 8 (40.0 %)
Response Header Sizes : count 20 a
Response Body/Total Sizes : count
```

8. After increasing to 3 connections with 30 requests, 70% (21) failed

```
Sockets used: 24 (for perfect kee
Uniform: false, Jitter: false, Ca
IP addresses distribution:
10.110.214.203:8000: 24
Code 200 : 9 (30.0 %)
Code 503 : 21 (70.0 %)
Response Header Sizes : count 30
```

9. Query 'istio-proxy' to check statistics

```
Darigan@Cocoon MINGW64 ~
$ kubectl exec %FORTIO_POD% -c istio-proxy -- pilot-agent request GET stats | grep httpbin | grep pending
cluster.outbound|8000||httpbin.default.svc.cluster.local.circuit_breakers.default.remaining_pending: 1
cluster.outbound|8000||httpbin.default.svc.cluster.local.circuit_breakers.default.rq_pending_open: 0
cluster.outbound|8000||httpbin.default.svc.cluster.local.circuit_breakers.high.rq_pending_open: 0
cluster.outbound|8000||httpbin.default.svc.cluster.local.upstream_rq_pending_active: 0
cluster.outbound|8000||httpbin.default.svc.cluster.local.upstream_rq_pending_failure_eject: 0
cluster.outbound|8000||httpbin.default.svc.cluster.local.upstream_rq_pending_overflow: 29
cluster.outbound|8000||httpbin.default.svc.cluster.local.upstream_rq_pending_total: 22
```

10. Remove rule

```
C:\Users\Darigan\Projects\istio-1.21.2>kubectl delete destinationrule httpbin
destinationrule.networking.istio.io "httpbin" deleted
```

11. Kill HTTP Client & Service

```
C:\Users\Darigan\Projects\istio-1.21.2>kubectl delete -f samples/httpbin/sample-client/fortio-deploy.yaml
service "fortio" deleted
deployment.apps "fortio-deploy" deleted

C:\Users\Darigan\Projects\istio-1.21.2>kubectl delete -f samples/httpbin/httpbin.yaml
serviceaccount "httpbin" deleted
service "httpbin" deleted
deployment.apps "httpbin" deleted
```