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- . . . nginx is *not* a distributed database (and is not going to be)!

Use Cases for Clustering with Nginx

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- Key-Value store synchronization (R16)
- Distributed request rate limiting (R16)

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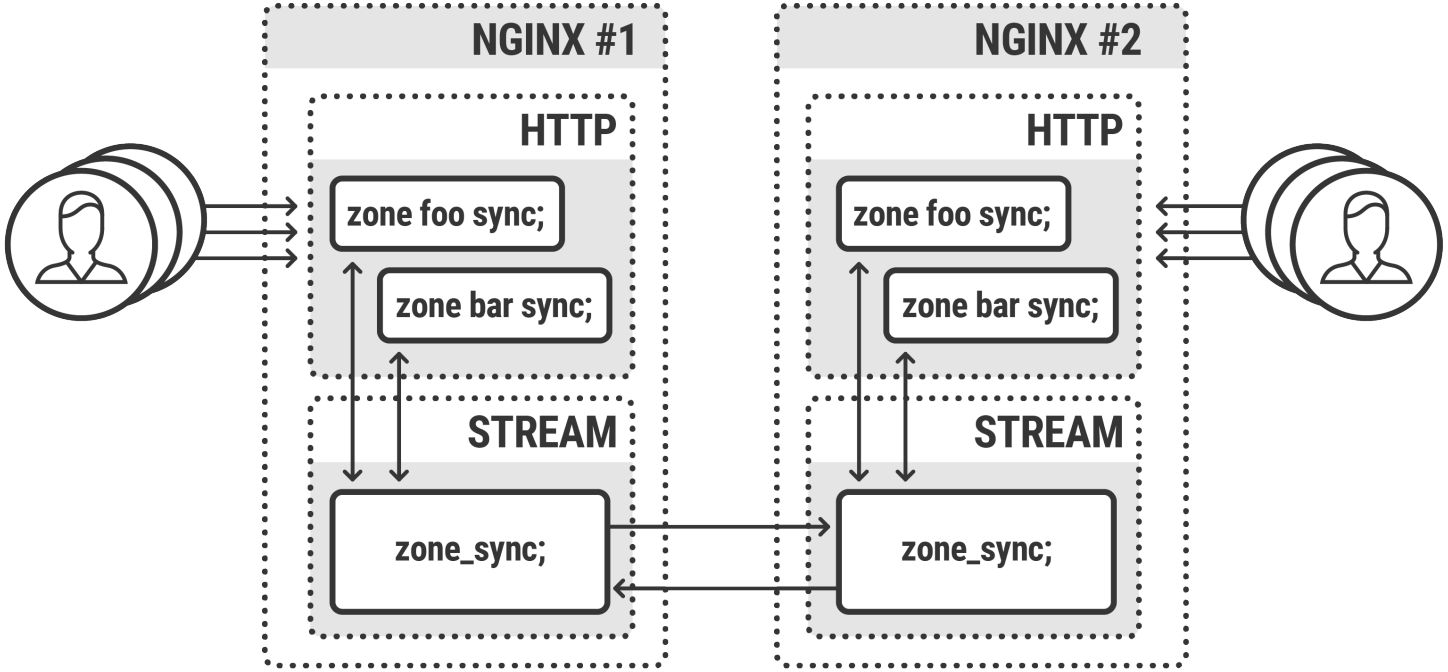
- Configurable latency/resources balance

Syncing Zones Configuration



Syncing Sticky Sessions

```
http {
    upstream backend {
        server ...;
        server ...;

        sticky learn create=$ups_key
                     lookup=$key
                     zone=z:10m     ;
    }
    server {
        ...
        location / {
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}
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    }
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```
stream {
    server {
        zone_sync;
        listen 192.168.1.1:12345;

        # cluster nodes list (including self)
        zone_sync_server 192.168.1.1:12345;
        zone_sync_server 192.168.1.2:12345;
    }
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```

Syncing Sticky Sessions

```
http {
    upstream backend {
        server ...;
        server ...;
        # mark zone 'z' for synchronization
        sticky learn create=$ups_key
                     lookup=$key
                     zone=z:10m sync;
    }
    server {
        ...
        location / {
             proxy_pass http://backend;
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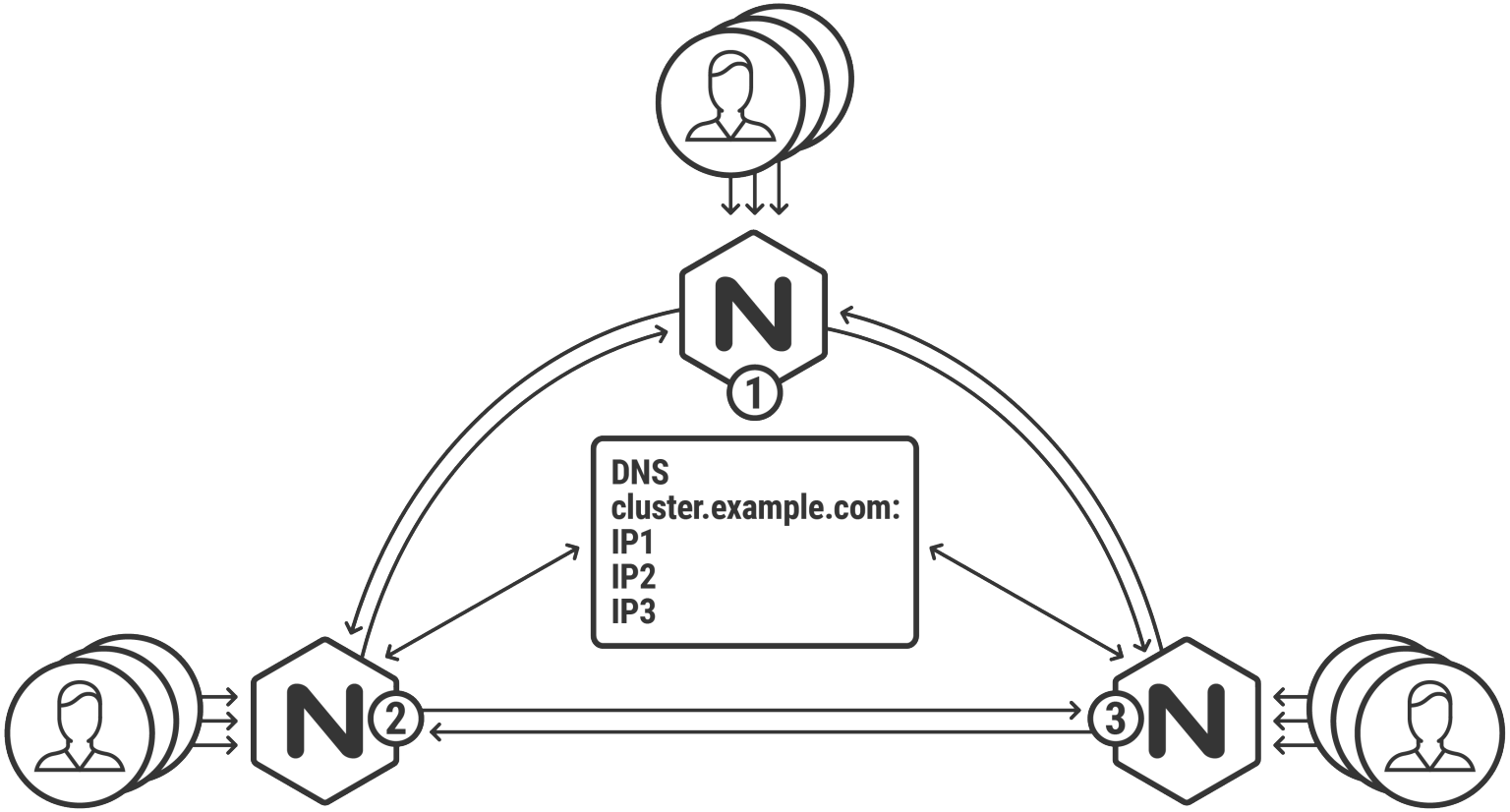
Using DNS to Obtain Cluster Nodes



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    }
}

http { ... }
```

Using DNS to Obtain Cluster Nodes

```
stream {
    resolver 127.0.0.1;
    server {
        zone_sync;
        listen 192.168.1.1:12345;




        zone_sync_server cluster.example.com:12345 resolve;
    }
}

http { ... }
```

Secure Connections Between Nodes with SSL

```
zone_sync;
listen 192.168.1.1:12345 ssl;

ssl_certificate foo.crt;
ssl_certificate_key foo.key;

zone_sync_ssl on;
zone_sync_ssl_certificate node.crt;
zone_sync_ssl_certificate_key node.key;
zone_sync_ssl_verify on;
zone_sync_ssl_trusted_certificate trusted.crt;
```

Tuning Synchronization: latency vs bandwidth/CPU

```
zone_sync;
listen ...;
zone_sync_server ...;

zone_sync_interval 500ms;

zone_sync_buffers 256 8k;
zone_sync_recv_buffer_size 8k;
zone_sync_timeout 5s;
```

More modules

- Key-Value storage (http and stream):

```
keyval_zone zone=one:32k state=one.keyval sync;
```

- HTTP Request Limiting:

```
limit_req_zone $binary_remote_addr
               zone=one:10m
               rate=1r/s sync;
```

Thank you!

Links:

- https://nginx.org/en/docs/stream/ngx_stream_zone_sync_module.html
- https://www.nginx.com/blog/nginx-plus-r15-released/#state-sharing
- https://www.nginx.com/blog/nginx-plus-r16-released/#r16-cluster-rate-limiting
- https://www.nginx.com/blog/nginx-plus-r16-released/#r16-cluster-key-value

Questions?

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- Vladimir Khomutov / vl@nginx.com