





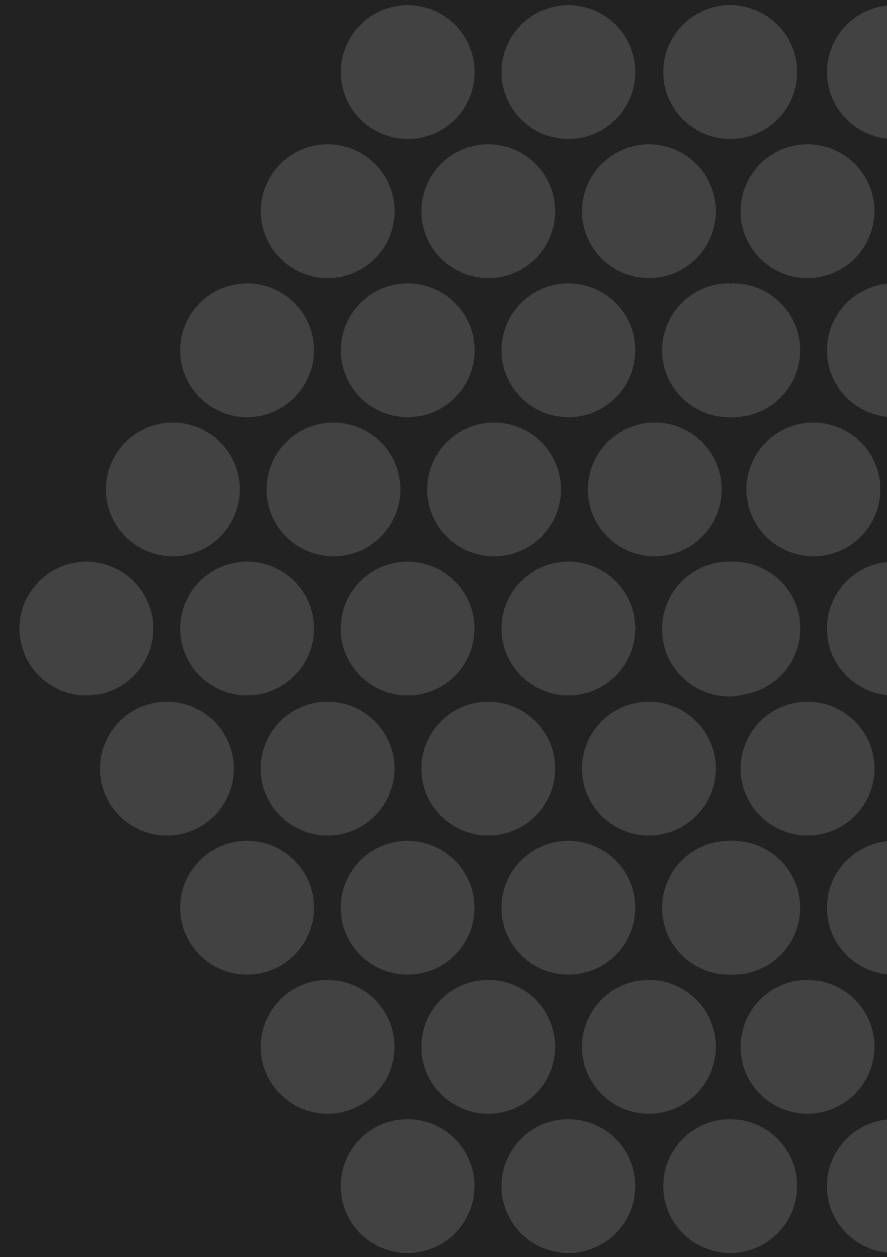
**F5 NGINX**

# NGINX 102

OLF 2022

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Technical Account Manager



# Agenda

**Very brief history of NGINX**

**Configuration and operation**

**Reverse proxy discussion and demo**

**Scripting discussion and demo**

**High availability discussion (demo time permitting)**

**Q&A**

# History

# Very Brief History of NGINX

## **2004 NGINX open sourced**

C10K Problem

Outperform Apache

## **2011 NGINX, Inc. formed**

NGINX Plus

Software subscription and support

## **2019 NGINX acquired by F5**

Foundational software for Modern Applications

# License and Support

## **BSD 2-Clause**

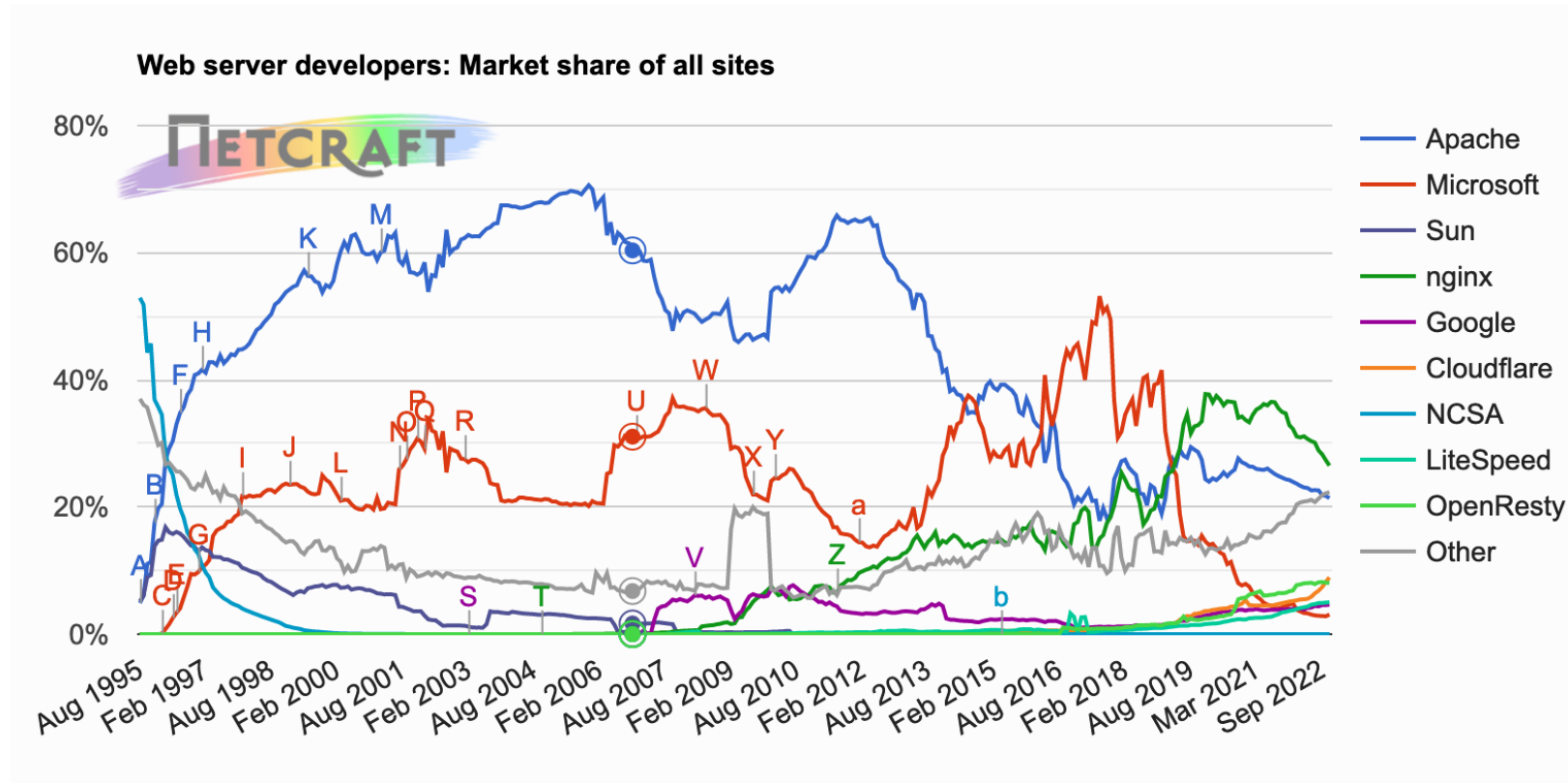
## **NGINX Open Source freely available**

Community support or software subscription

## **NGINX Plus based on NGINX Open Source**

Available only as software subscription

# Popularity





# Sources

F5	Community
Official Docker Image (mainline/stable)	NGINX Open Source (mainline/stable)
NGINX Open Source Packages *	OS Distros
NGINX Plus Packages *	Docker community

\* Subscription available (<https://www.nginx.com/support/>)

# Open Source & Free Projects

The Swiss Army Knife of reliable, high-performance traffic management



## NGINX Open Source

Simplify traffic management with a proxy that can handle everything from web serving to API traffic



## NGINX

JavaScript

Extend NGINX with sophisticated configuration solutions for server-side use cases and per-request processing



## Agent

An NGINX Project

Manage NGINX deployments with companion software that provides observability and a config API



## Unit

An NGINX Project

Run web applications and APIs, serve static content, and proxy to backends with a universal web app server



## NGINX Amplify

Run real-time diagnostics for NGINX Open Source and NGINX Plus

Use anywhere

Kubernetes-native



## NGINX Ingress Controller

Manage app connectivity at the edge of a Kubernetes cluster with API gateway, identity, and observability features



## NGINX Kubernetes Gateway

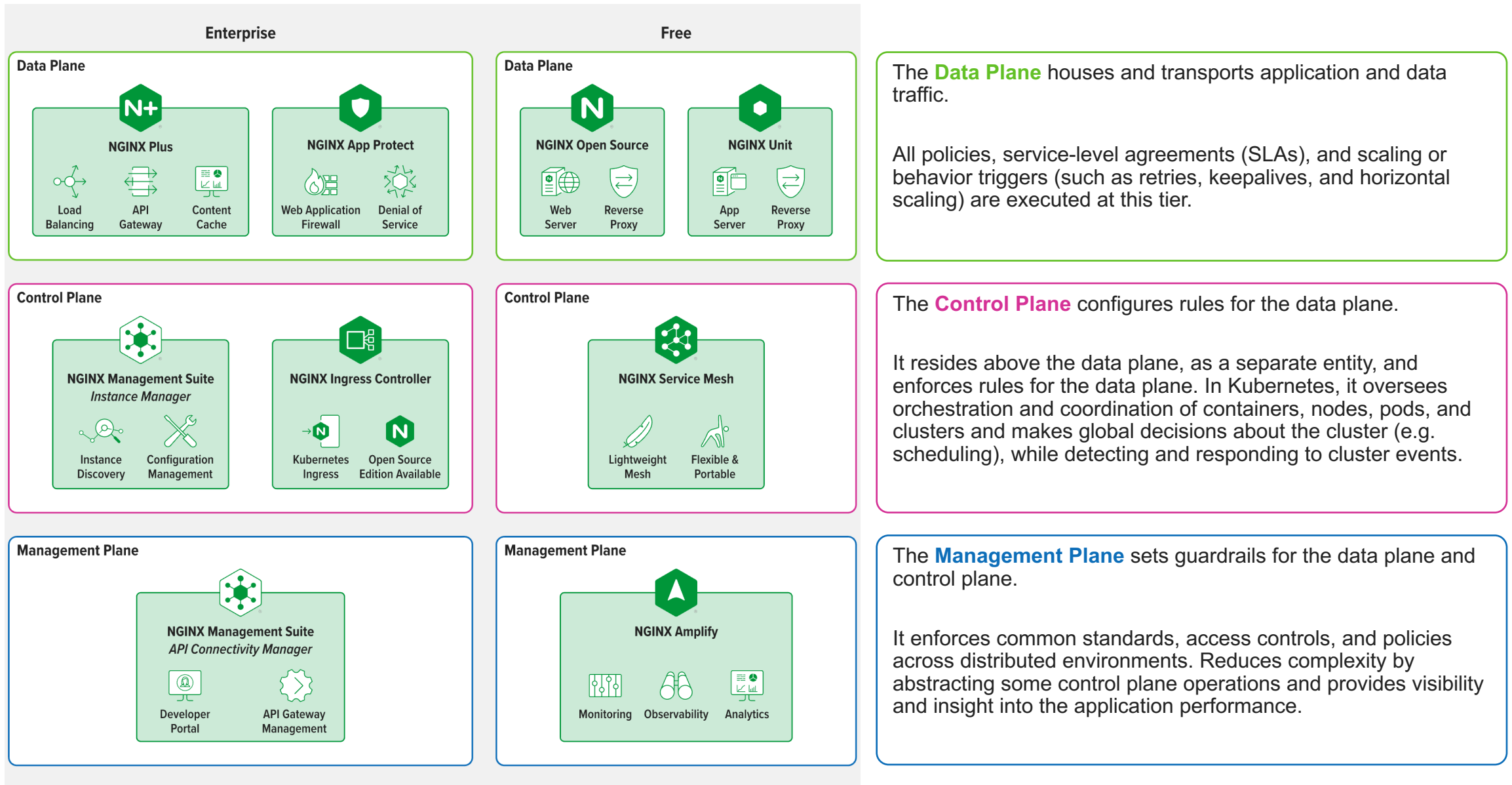
Experiment with the new Gateway API using NGINX as the data plane



## NGINX Service Mesh

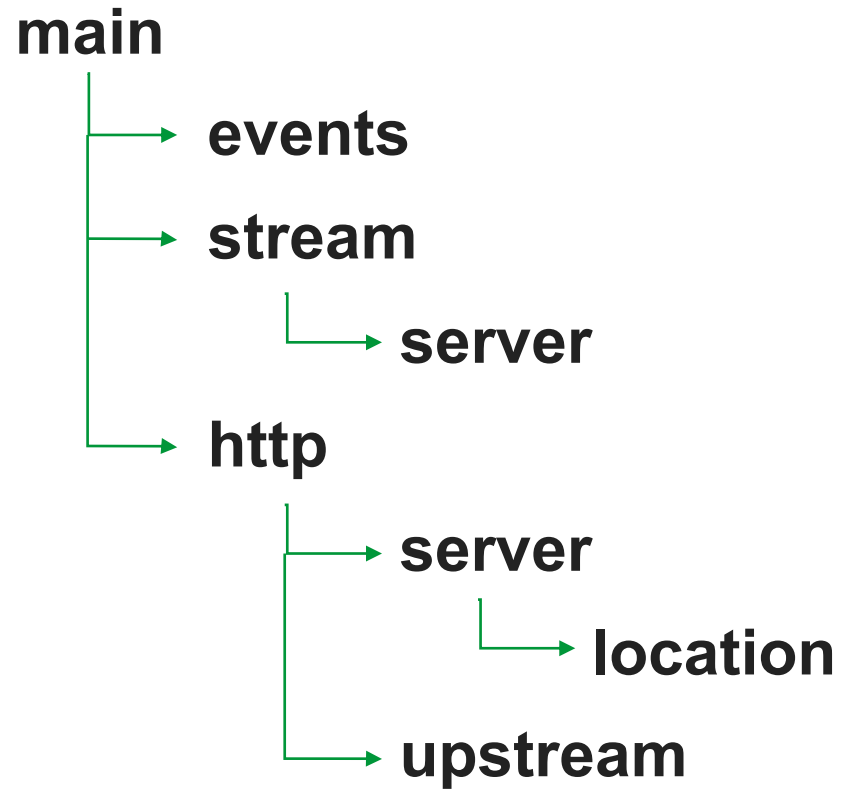
Implement developer-friendly service-to-service connectivity, security, orchestration, and observability

# An Architecture for Modern Apps



# Configuration and Operation

# Configuration Context Hierarchy



# Documentation

## Context matters for directives and inheritance

```
Syntax: limit_req_zone key zone=name:size rate=rate [sync];  
Default: —  
Context: http
```

```
Syntax: limit_req zone=name [burst=number] [nodelay | delay=number];  
Default: —  
Context: http, server, location
```

# Managing Configuration

## Standard configuration management options:

Monolithic

Conf.d

Includes

# Managing Configuration

## **Check config:**

`nginx -t`

## **Print config:**

`nginx -T`

## **Apply config:**

`nginx -s reload`



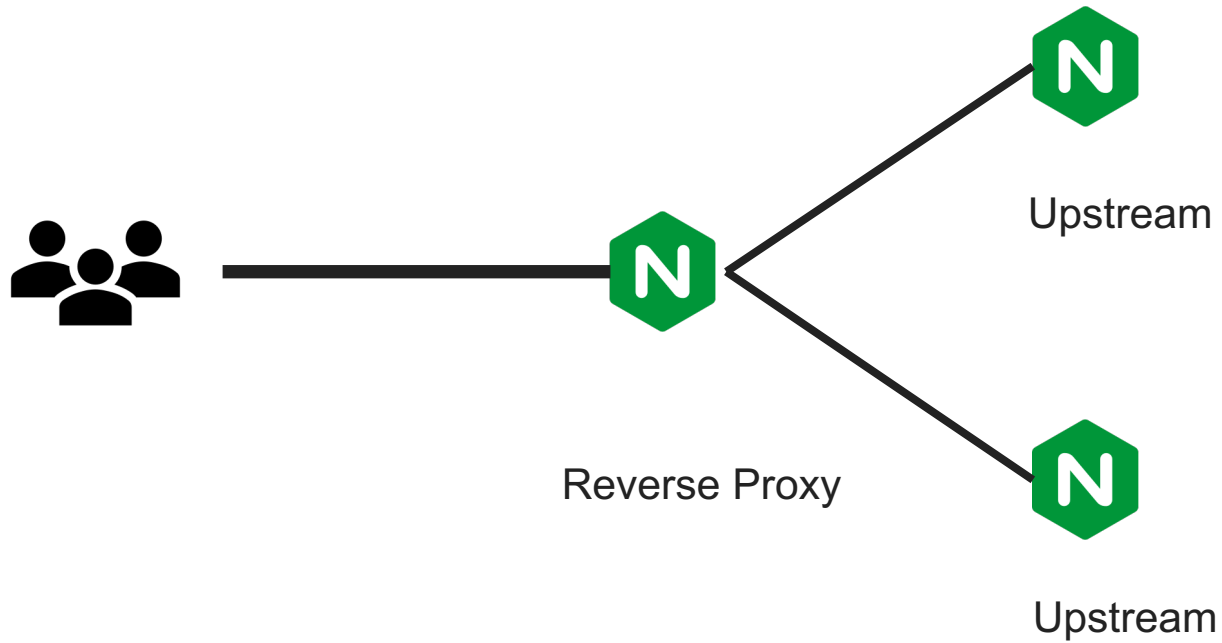
# Docker Image

# Quick Start

```
$ docker run -p 80:80 -v $(pwd)/html:/usr/share/nginx/html nginx:latest
```

# Reverse Proxy

# Simple Reverse Proxy



# Reverse Proxy Use Cases

**Caching**

**Load Balancing**

**SSL Termination**

**API Gateway**

# Reverse Proxy Setup

**Upstreams:** http context

**Keepalive:** upstream context

**Load balancing algorithms:** upstream context

**Persistence:** upstream context

([http://nginx.org/en/docs/http/nginx\\_http\\_upstream\\_module.html](http://nginx.org/en/docs/http/nginx_http_upstream_module.html))

# Reverse Proxy Demo

# Rate Limiting



# Rate Limiting

**Limit Request Zone:** http context

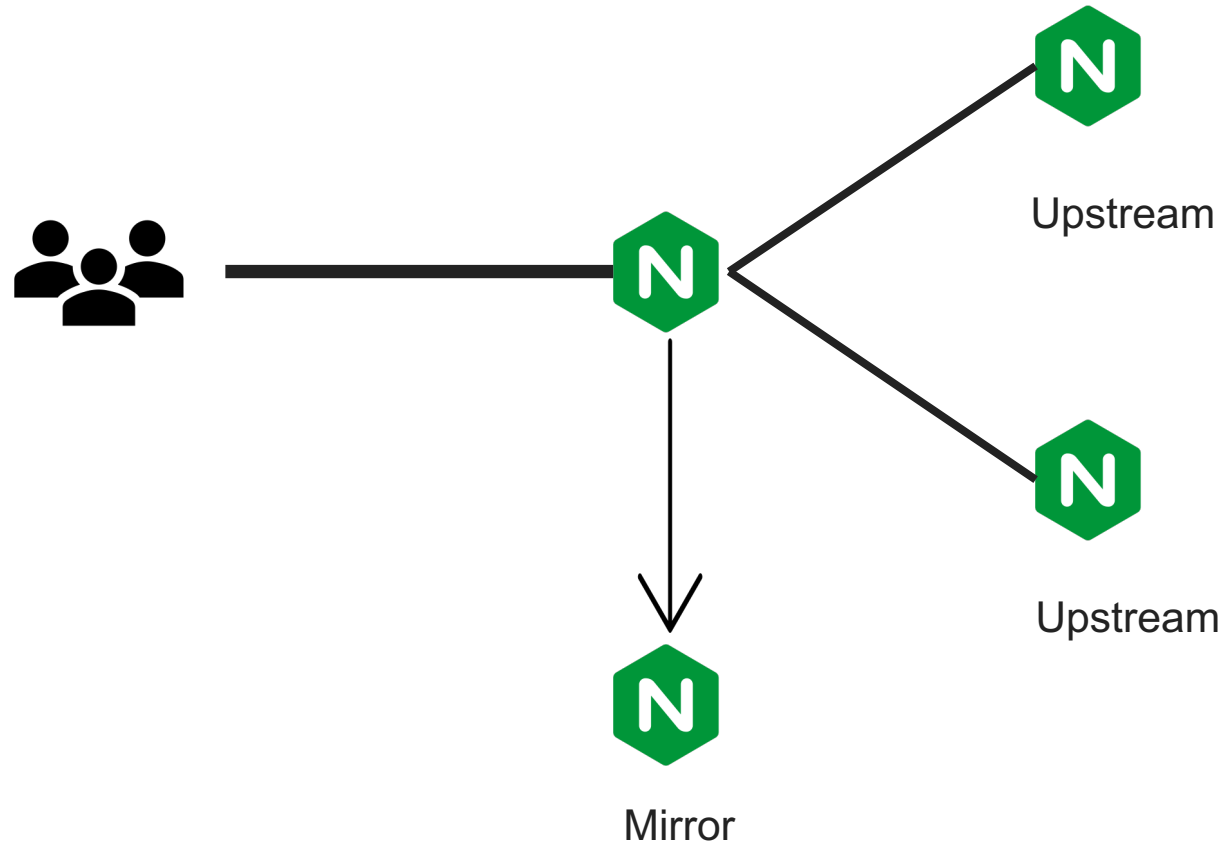
**Limit Request:** http, server or location context

([http://nginx.org/en/docs/http/nginx\\_http\\_limit\\_req\\_module.html](http://nginx.org/en/docs/http/nginx_http_limit_req_module.html))

# Rate Limiting Demo

# Mirroring

# Reverse Proxy with Mirror



# Rate Limiting

**Mirror Location:** server context

**Mirror Directive:** location context

([http://nginx.org/en/docs/http/nginx\\_http\\_mirror\\_module.html](http://nginx.org/en/docs/http/nginx_http_mirror_module.html))

# Mirroring Demo

# Extending NGINX

# Extending NGINX

## Modules

C

Extensive community(<https://www.nginx.com/resources/wiki/modules/>)

Many NGINX features are modules, we've already seen:

Upstream

Mirror

Rate limit



# Extending NGINX with NJS

## NJS

Subset of JavaScript

ECMAScript 5.1 compatible (some ECMAScript 6 extensions)

# Extending NGINX with NJS

## NJS

Subset of JavaScript

ECMAScript 5.1 compatible (some ECMAScript 6 extensions)

Implemented with ngx\_http\_js\_module



# Extending NGINX with NJS

**Load NJS Module:** main context

**Import the JS:** http, server or location context

**Call the JS functions:**

js\_content to set a location handler

js\_body\_filter to filter response

**Full docs at** ([http://nginx.org/en/docs/http/nginx\\_http\\_js\\_module.html](http://nginx.org/en/docs/http/nginx_http_js_module.html))

# NJS Demo

# High Availability

# NGINX Plus Features

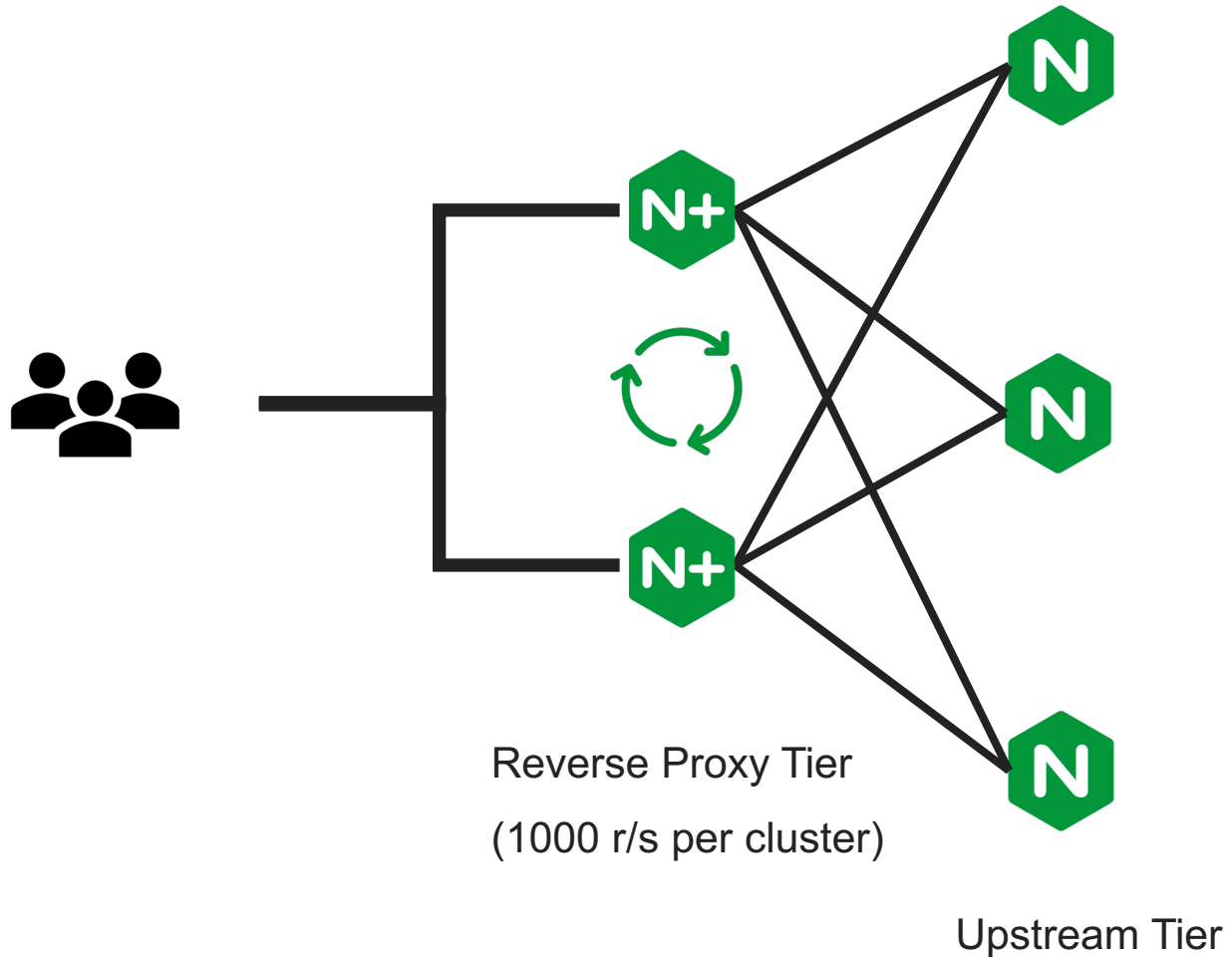
**Shared Zones**

**Active Health Checks**

**Dynamic Upstreams**

(<https://www.nginx.com/products/nginx/compare-models>)

# HA Reverse Proxy with NGINX Plus

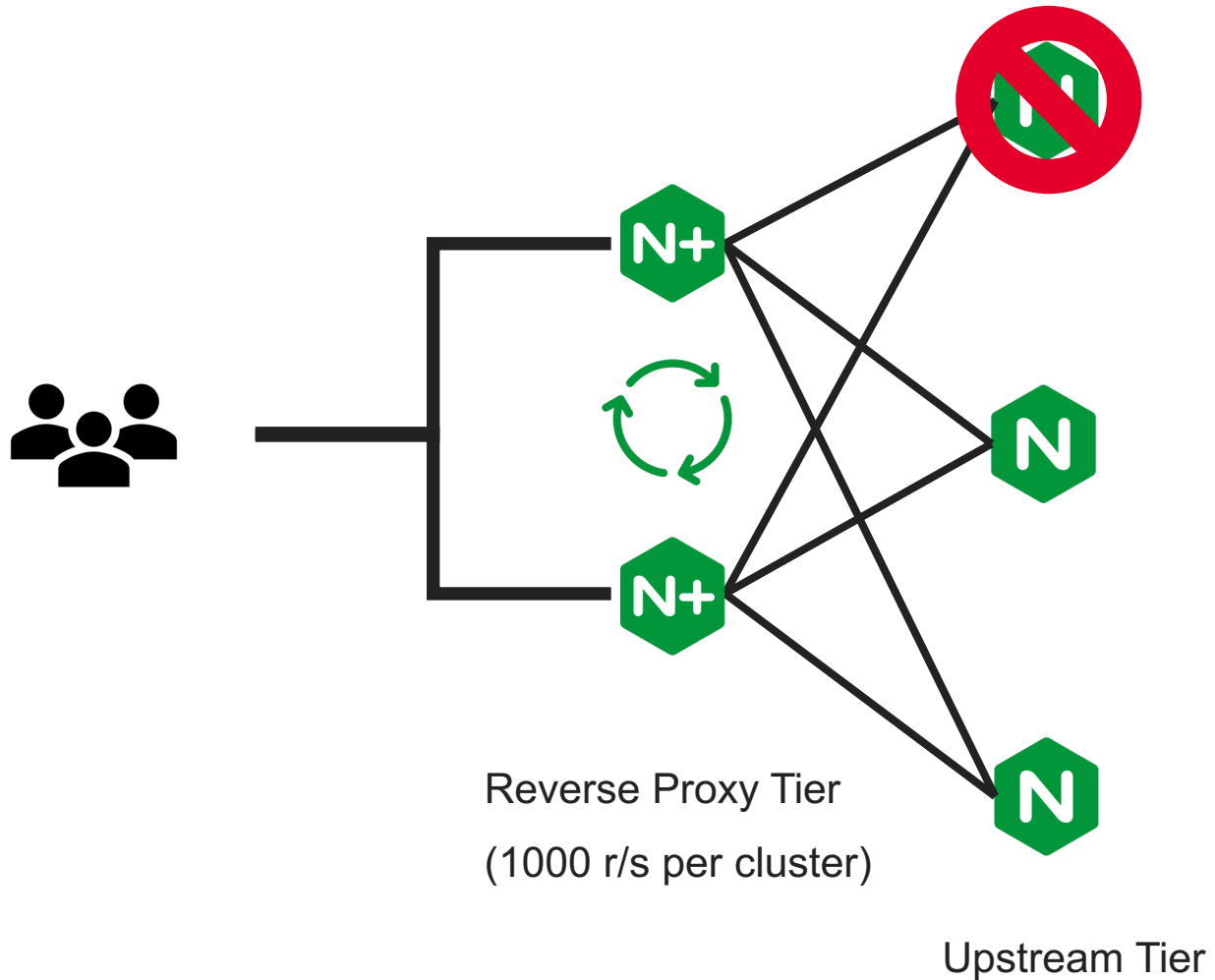


## Goals

Redundancy

1000 r/s

# HA Reverse Proxy with NGINX Plus



## Goals

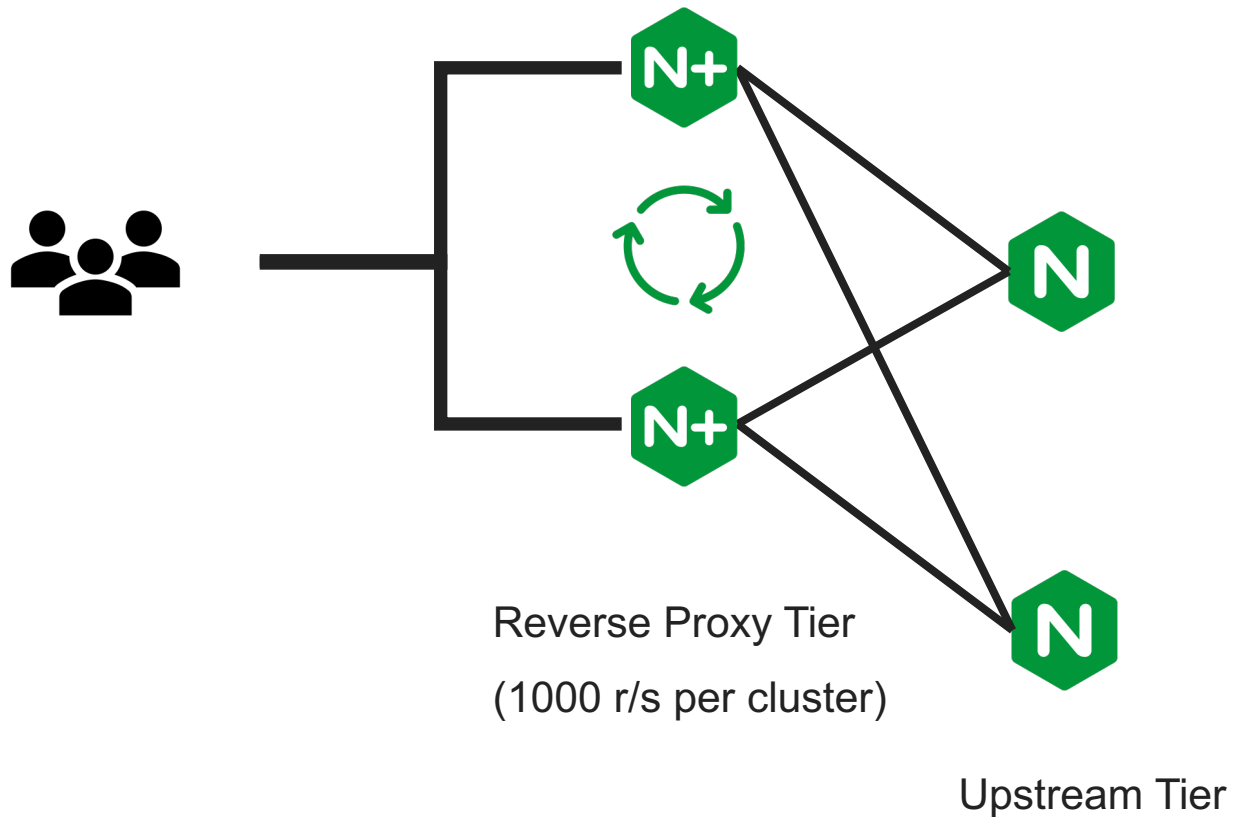
Redundancy

1000 r/s



# HA Reverse Proxy with NGINX Plus

Active Health Check, proxy stops sending requests to unhealthy upstreams

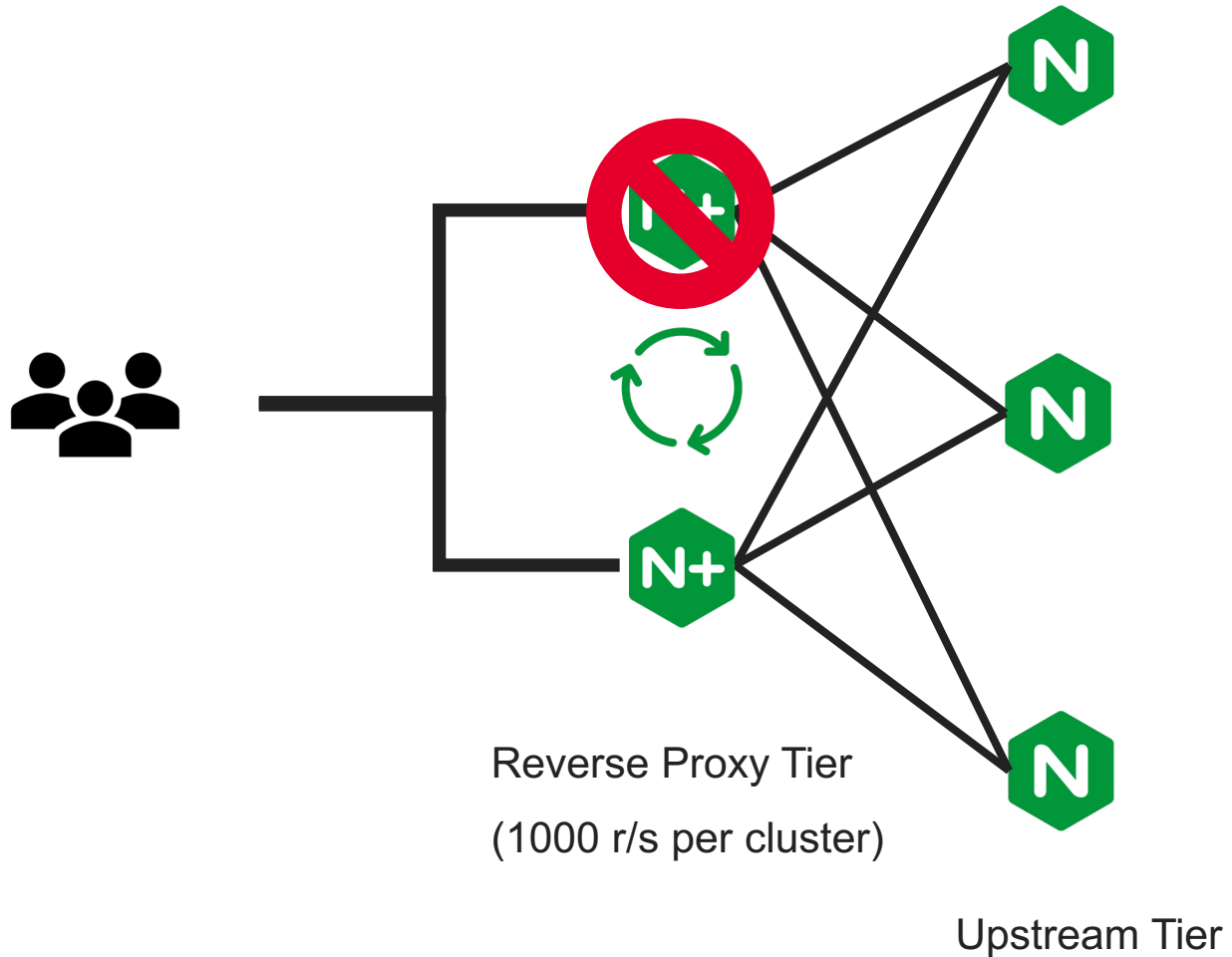


## Goals

Redundancy

1000 r/s

# HA Reverse Proxy with NGINX Plus



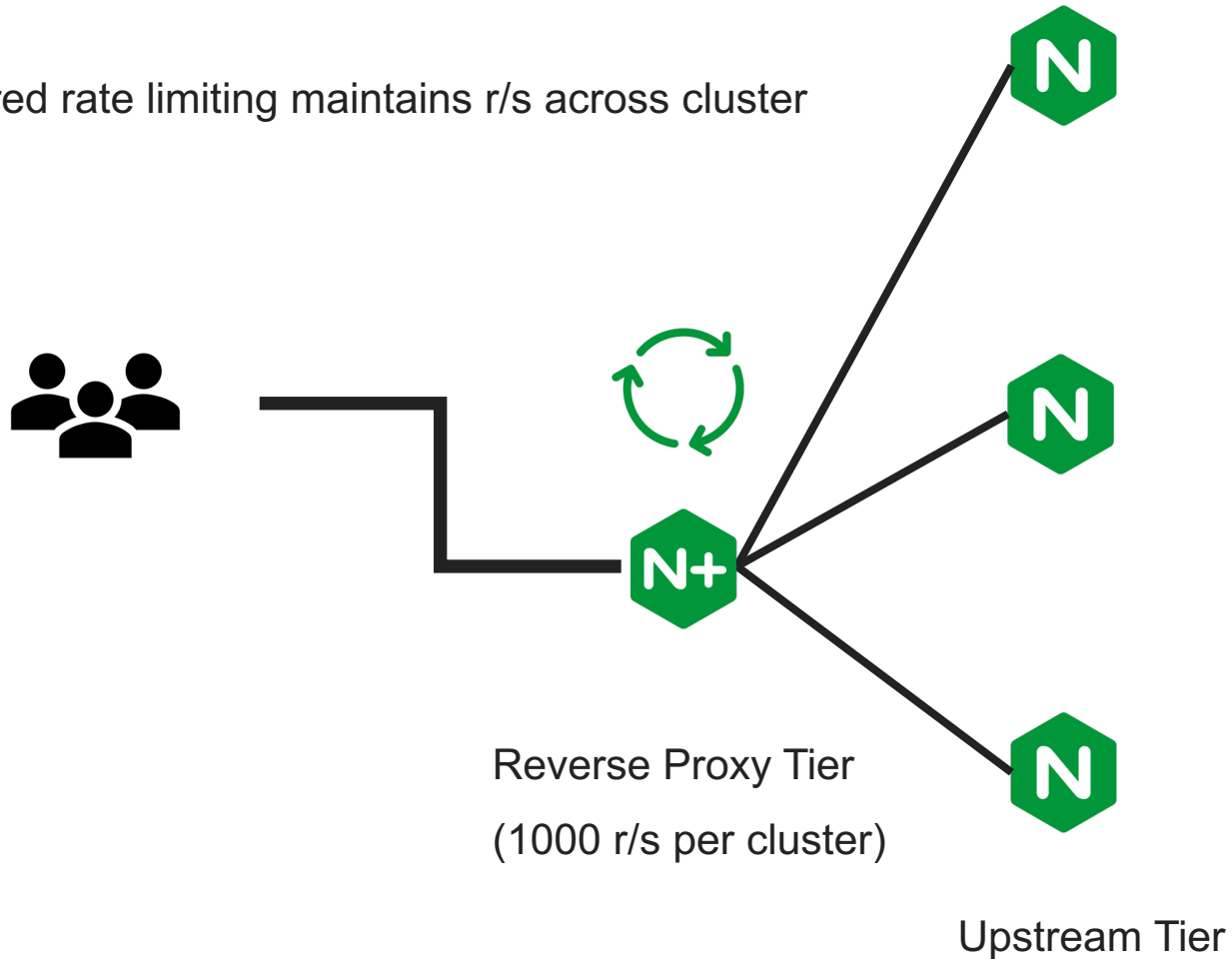
## Goals

Redundancy

1000 r/s

# HA Reverse Proxy with NGINX Plus

Shared rate limiting maintains r/s across cluster



## Goals

Redundancy

1000 r/s

# High Availability with NGINX Plus Demo

## (Time permitting)

# High Availability NGINX Plus Info

## License Required

Sign up (<https://www.nginx.com/free-trial-request>)

Or see me at the booth (this way supports OLF!!!)

## Example Material

[https://github.com/timquinlan/nginxplus\\_api\\_gw](https://github.com/timquinlan/nginxplus_api_gw)

# Links

NGINX Material: <https://github.com/timquinlan/nginx102>

NGINX Plus Material: [https://github.com/timquinlan/nginxplus\\_api\\_gw](https://github.com/timquinlan/nginxplus_api_gw)

NGINX Plus Trial: <https://www.nginx.com/free-trial-request>

NGINX Docs: <https://nginx.org/en/docs>

NGINX Plus Docs: <https://docs.nginx.com/>

NGINX Plus Features: <https://www.nginx.com/products/nginx/compare-models>

NGINX Plus High Availability: <https://docs.nginx.com/nginx/admin-guide/high-availability/>

NGINX Modules: <https://www.nginx.com/resources/wiki/modules/>

NJS Examples: <https://github.com/nginx/njs-examples>

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