Referensi Cepat Nginx

Server block, proxy, SSL, load balancing, logging

Instalasi

Instalasi per OS

Ubuntu / Debian	`sudo apt install nginx`
RHEL / CentOS	`sudo dnf install nginx`
macOS	`brew install nginx`
Alpine	`apk add nginx`
Docker	`docker run -p 80:80 nginx`

Manajemen Layanan

`sudo systemctl start nginx`	Mulai Nginx
`sudo systemctl stop nginx`	Hentikan Nginx
`sudo systemctl reload nginx`	Muat ulang konfigurasi (tanpa downtime)
`sudo systemctl enable nginx`	Aktifkan saat booting
`nginx -t`	Uji sintaks konfigurasi
`nginx -T`	Uji dan tampilkan konfigurasi lengkap
`nginx -s reload`	Kirim sinyal reload ke proses yang berjalan

Konfigurasi Dasar

Lokasi File

`/etc/nginx/nginx.conf`	File konfigurasi utama
`/etc/nginx/conf.d/`	Konfigurasi site tambahan (*.conf)
`/etc/nginx/sites-available/`	Konfigurasi site tersedia (Debian)
`/etc/nginx/sites-enabled/`	Symlink ke konfigurasi aktif
`/var/log/nginx/`	Log akses dan error
`/var/www/html/`	Document root default

Konfigurasi Minimal

```
server {
    listen 80;
    server_name example.com;
    root /var/www/mysite;
    index index.html;
}
```

Struktur Konfigurasi

`http { }`	Pengaturan server HTTP (level teratas)
`server { }`	Definisi virtual host
`location { }`	Blok pencocokan URI
`upstream { }`	Grup server backend
`events { }`	Pengaturan penanganan koneksi

Server Block

Virtual Host Berbasis Nama

```
server {
    listen 80;
    server_name site-a.com;
    root /var/www/site-a;
}
server {
    listen 80;
    server_name site-b.com;
    root /var/www/site-b;
}
```

Default & Catch-All

```
server {
    listen 80 default_server;
    server_name _;
    return 444;  # putus koneksi
}
```

Redirect ke HTTPS

```
server {
    listen 80;
    server_name example.com;
    return 301 https://$host$request_uri;
}
```

Location Block

Prioritas Pencocokan (tinggi ke rendah)

`= /path`	Pencocokan tepat (prioritas tertinggi)
`^~ /path`	Pencocokan prefix, lewati regex
`~ regex`	Regex case-sensitive
`~* regex`	Regex case-insensitive
`/path`	Pencocokan prefix (prioritas terendah)

Contoh Location

```
location = / {
    # hanya root tepat
}
location /api/ {
    proxy_pass http://backend;
}
location ~* \.(jpg|png|gif)$ {
    expires 30d;
}
```

try_files

```
location / {
    try_files $uri $uri/ /index.html;
}
```

Coba file, direktori, lalu fallback -- penting untuk SPA

Reverse Proxy

Proxy Dasar

```
location /api/ {
    proxy_pass http://localhost:3000/;
    proxy_set_header Host $host;
    proxy_set_header X-Real-IP $remote_addr;
    proxy_set_header X-Forwarded-For $proxy_add_x_forwarded_for;
    proxy_set_header X-Forwarded-Proto $scheme;
}
```

Proxy WebSocket

```
location /ws/ {
    proxy_pass http://localhost:3000;
    proxy_http_version 1.1;
    proxy_set_header Upgrade $http_upgrade;
    proxy_set_header Connection "upgrade";
}
```

Direktif Proxy

`proxy_pass`	URL backend
`proxy_set_header`	Teruskan header kustom ke backend
`proxy_read_timeout`	Timeout respons backend (default 60s)
`proxy_buffering off`	Nonaktifkan buffering respons
`proxy_redirect`	Tulis ulang header Location dari backend

SSL / TLS

Server HTTPS

```
server {
    listen 443 ssl;
    server_name example.com;

    ssl_certificate     /etc/ssl/certs/example.crt;
    ssl_certificate_key /etc/ssl/private/example.key;
    ssl_protocols       TLSv1.2 TLSv1.3;
    ssl_ciphers         HIGH:!aNULL:!MD5;
}
```

Let's Encrypt dengan Certbot

```
sudo certbot --nginx -d example.com
sudo certbot renew --dry-run
```

Best Practice SSL

`ssl_protocols TLSv1.2 TLSv1.3`	Nonaktifkan versi TLS lama
`ssl_prefer_server_ciphers on`	Server memilih cipher
`ssl_session_cache shared:SSL:10m`	Reuse sesi untuk performa
`add_header Strict-Transport-Security`	Header HSTS
`ssl_stapling on`	OCSP stapling untuk handshake lebih cepat

Load Balancing

Blok Upstream

```
upstream backend {
    server 10.0.0.1:3000;
    server 10.0.0.2:3000;
    server 10.0.0.3:3000;
}
server {
    location / {
        proxy_pass http://backend;
    }
}
```

Metode Load Balancing

`(default)`	Round-robin
`least_conn`	Koneksi aktif paling sedikit
`ip_hash`	Sesi sticky berdasarkan IP client
`hash $request_uri`	Hash konsisten berdasarkan URI

Opsi Server

`weight=3`	Kirim 3x lebih banyak traffic
`max_fails=3`	Kegagalan sebelum ditandai mati
`fail_timeout=30s`	Waktu menandai server sebagai mati
`backup`	Gunakan hanya jika server lain mati
`down`	Tandai server sebagai offline permanen

File Statis & Caching

Sajikan File Statis

```
location /static/ {
    alias /var/www/assets/;
    expires 30d;
    add_header Cache-Control "public, immutable";
}
```

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Kompresi Gzip

```
gzip on;
gzip_types text/plain text/css
           application/json application/javascript;
gzip_min_length 1000;
gzip_comp_level 5;
```

Direktif Caching

`expires 30d`	Set header Expires dan Cache-Control max-age
`expires off`	Nonaktifkan header expires
`etag on`	Aktifkan header ETag (default)
`sendfile on`	Penyajian file efisien via kernel
`tcp_nopush on`	Optimalkan pengiriman paket

Logging

Konfigurasi Log

```
access_log /var/log/nginx/access.log;
error_log  /var/log/nginx/error.log warn;

# Format log kustom
log_format main '$remote_addr - $status '
                '"$request" $body_bytes_sent';
access_log /var/log/nginx/access.log main;
```

Level Log Error

`debug`	Verbose (perlu --with-debug)
`info`	Informasional
`notice`	Normal tapi perlu diperhatikan
`warn`	Peringatan
`error`	Error (default)
`crit`	Masalah kritis

Logging Kondisional

```
map $status $loggable {
    ~^[23] 0;
    default 1;
}
access_log /var/log/nginx/access.log combined if=$loggable;
```

Lewati logging respons 2xx/3xx untuk mengurangi volume log

Keamanan

Rate Limiting

```
limit_req_zone $binary_remote_addr
    zone=api:10m rate=10r/s;

location /api/ {
    limit_req zone=api burst=20 nodelay;
}
```

Kontrol Akses

```
location /admin/ {
    allow 192.168.1.0/24;
    deny all;
}
```

Header Keamanan

`X-Frame-Options DENY`	Cegah clickjacking
`X-Content-Type-Options nosniff`	Cegah MIME sniffing
`X-XSS-Protection "1; mode=block"`	Filter XSS (browser lama)
`Content-Security-Policy`	Kontrol sumber pemuatan resource
`Referrer-Policy no-referrer`	Kontrol informasi referrer

Pola Umum

SPA (Single-Page App)

```
location / {
    root /var/www/app;
    try_files $uri $uri/ /index.html;
}
```

Header CORS

```
location /api/ {
    add_header Access-Control-Allow-Origin *;
    add_header Access-Control-Allow-Methods
               "GET, POST, PUT, DELETE, OPTIONS";
    if ($request_method = OPTIONS) {
        return 204;
    }
    proxy_pass http://backend;
}
```

Variabel Berguna

`$host`	Header Host request
`$uri`	URI saat ini (ternormalisasi)
`$request_uri`	URI asli dengan query string
`$remote_addr`	Alamat IP client
`$scheme`	http atau https
`$args`	Parameter query string
`$status`	Kode status respons