Nginx

Geeta Vinnakota

What is nginx?

- Web Server & Proxy Server
- Modular: Specify the modules you want

Configuration (linux)

Info	nginx –v Version nginx –t Test configuration nginx –T Dump configuration to stdout
Location of Config Files on linux	/etc/nginx/nginx.conf (top level conf file. Includes others listed below) /etc/nginx/conf.d /etc/nginx/sites-available /etc/nginx/sites-enabled
Installation	sudo apt-get install nginx
Default Location Static Content	/usr/share/nginx/html
Service Commands with the init script (if you installed nginx from a package manager)	sudo service nginx status sudo service nginx stop sudo service nginx start sudo nginx –t (checks for any errors in config)

```
user  nginx;
worker_processes  1;

error_log  /var/log/nginx/error.log warn;
pid        /var/run/nginx.pid;


events {
    worker_connections  1024;
}


http {
    include       /etc/nginx/mime.types;
    default_type  application/octet-stream;

    log_format  main  '$remote_addr - $remote_user [$time_local] "$request" '
                      '$status $body_bytes_sent "$http_referer" '
                      '"$http_user_agent" "$http_x_forwarded_for"';

    access_log  /var/log/nginx/access.log  main;

    sendfile        on;
    #tcp_nopush     on;

    keepalive_timeout  65;

    #gzip  on;

    include /etc/nginx/conf.d/*.conf;
}
```

Default Top Level Config File

/etc/nginx/nginx.conf

```
server {
    listen       80;
    server_name  localhost;

    #charset koi8-r;
    #access_log  /var/log/nginx/log/host.access.log  main;

    location / {
        root   /usr/share/nginx/html;
        index  index.html index.htm;
    }

    #error_page  404              /404.html;

    # redirect server error pages to the static page /50x.html
    #
    error_page   500 502 503 504  /50x.html;
    location = /50x.html {
        root   /usr/share/nginx/html;
    }

    # proxy the PHP scripts to Apache listening on 127.0.0.1:80
    #
    #location ~ \.php$ {
    #    proxy_pass   http://127.0.0.1;
    #}

    # pass the PHP scripts to FastCGI server listening on 127.0.0.1:9000
    #
    #location ~ \.php$ {
    #    root           html;
    #    fastcgi_pass   127.0.0.1:9000;
    #    fastcgi_index  index.php;
    #    fastcgi_param  SCRIPT_FILENAME  /scripts$fastcgi_script_name;
    #    include        fastcgi_params;
    #}

    # deny access to .htaccess files, if Apache's document root
    # concurs with nginx's one
    #
    #location ~ /\.ht {
    #    deny  all;
    #}
}
```

Default Application level config file

Included in the top level config

/etc/nginx/conf.d/default.conf

Terminology

Terms	Description
Module	Modules are defined by directives
Types of Directives	Simple, Block/Context
Simple Directive	listen 80; name followed by parameter and semi-colon
Block/Context Directive	Instead of semicolon, it ends with a set of additional instructions surrounded by braces. A context is a block with other directives within braces
Main Context	http & events are in the main context.

Serving Static Content

```
server {

   location /  {
      root  /data/www;
   }

    location /images/ {
        root  /data;
    }
}
```

- Setup a server block inside the http block (included with default config mostly commented out)
- A config file may have multiple server blocks distinguished by ports or server names
- Nginx maps uri request header to a resource using the location directive. ie It tests the URI against the parameters of the location directive inside the server block.
- Root directive specifies the location
- When matching uri paths with locations, the one with longest prefix is checked first, followed by regular expressions

Nginx as Proxy Server

```
server {
    location / {
        proxy_pass http://localhost:8080;
    }
    location /images/ {
        root /data;
    }
}
```

- As a proxy server, nginx receives requests, sends them off to another server. Retreives responses and sends them to the client
- proxy_pass directive defines the background server via the protocol, domain & port
- In the code snippet, server block handles all requests to images locally & acts as a proxy and sends any other request to the background server

Location match

none	prefix match
=	exact match
~	case-sensitive regular expression match
~*	case-insensitive reg exp match
^~	best non reg exp match (prefix or exact)

Useful Nginx variables for rewrite rules

- Request – ‘http://localhost:8080/test?a=3&b=4’

Variable	Captures
$uri	/test
$request_uri	/test?a=3&b=4
$scheme	http
$server_name	
$request	
^	All paths

Rewrite Rules

- Rewrite rule: Changes part of all of the URL in a client request
- Purpose: To let users know that the resources they're requesting are at a different location
- Directives: 'return' and 'rewrite'

‘return’ directive

- Simpler and recommended to use of the two directives
- is enclosed in ‘server’ or ‘location’ context where the URL’s would point
- return: Tells nginx to stop processing the request immediately and send code 301(Moved permanently) and the specified rewritten url to the client.
- Can be used when –
  - Rewritten URL applies to every request that matches the server or location block
  - You can build the rewritten url with standard nginx variables

‘rewrite’ directive

- Also is enclosed in the ‘server’ or ‘location’ context that defines the URLs to be rewritten
- Syntax: *rewrite regex URL flag;*
- *regex* – Original url must pass another test, before it can be rewritten
- Can only return 301 or 302. To return other codes you must include a return directive after the rewrite directive
- Does not necessarily halt nginx processing
- Does not necessarily send a rewritten url to the client
- Normally runs through and processes the entire configuration block

‘rewrite’ contd

- ie If the rewritten url matches a subsequent directive, nginx performs the indicated action on the rewritten url (can rewrite it again)
- Unless planned carefully this can create loops (upto a built-in limit of 10)
- Can be used when-
  - elements in the original url without corresponding nginx variables need to be captured
  - change/add elements in the path