a little Nginx (1)

detailyang@gmail.com

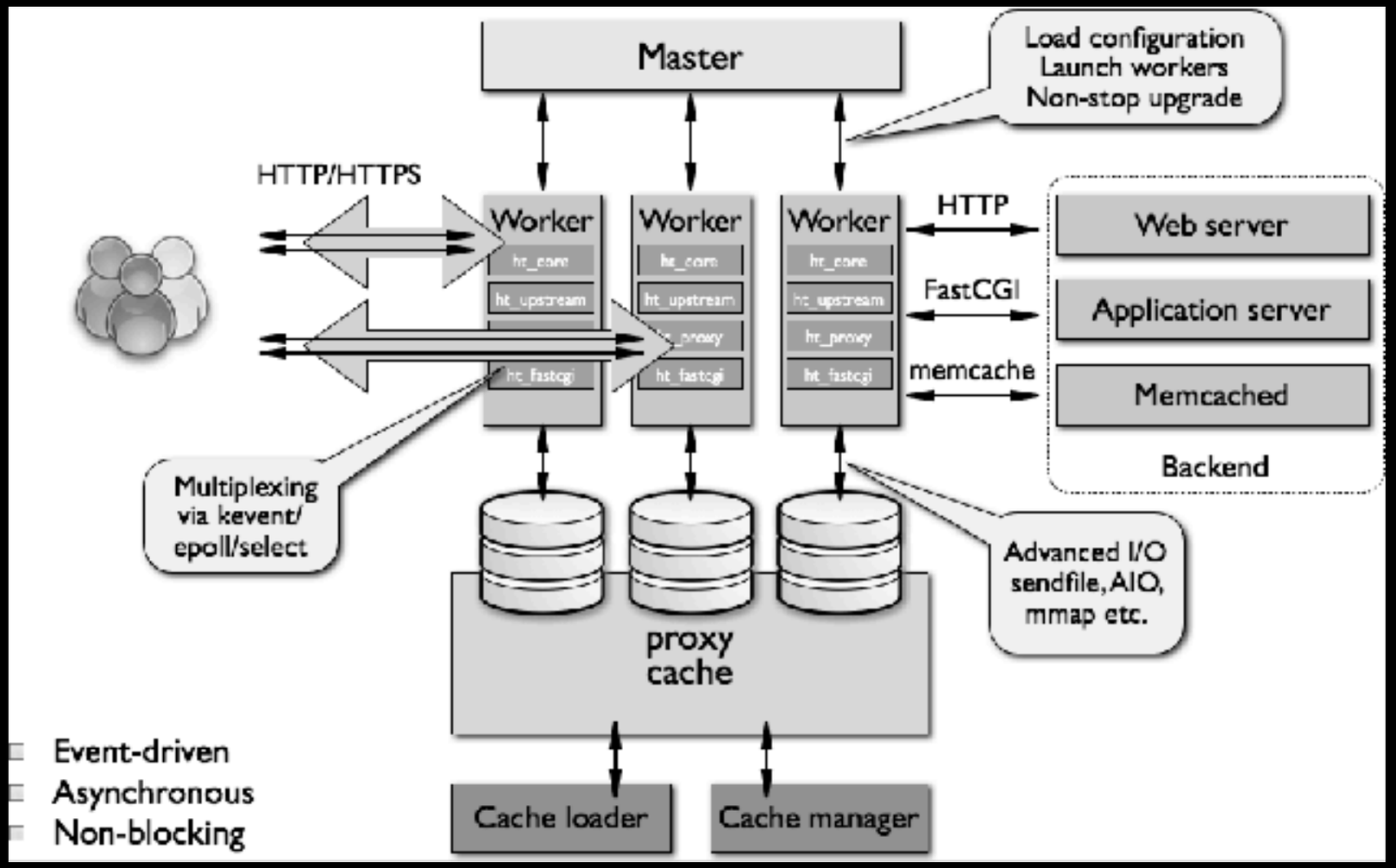
2016.10

Nginx

1. HTTP and reverse proxy server
2. a mail proxy server
3. a generic TCP/UDP proxy server

Why Nginx is fast

1. reactor architect based multi IO dispatch

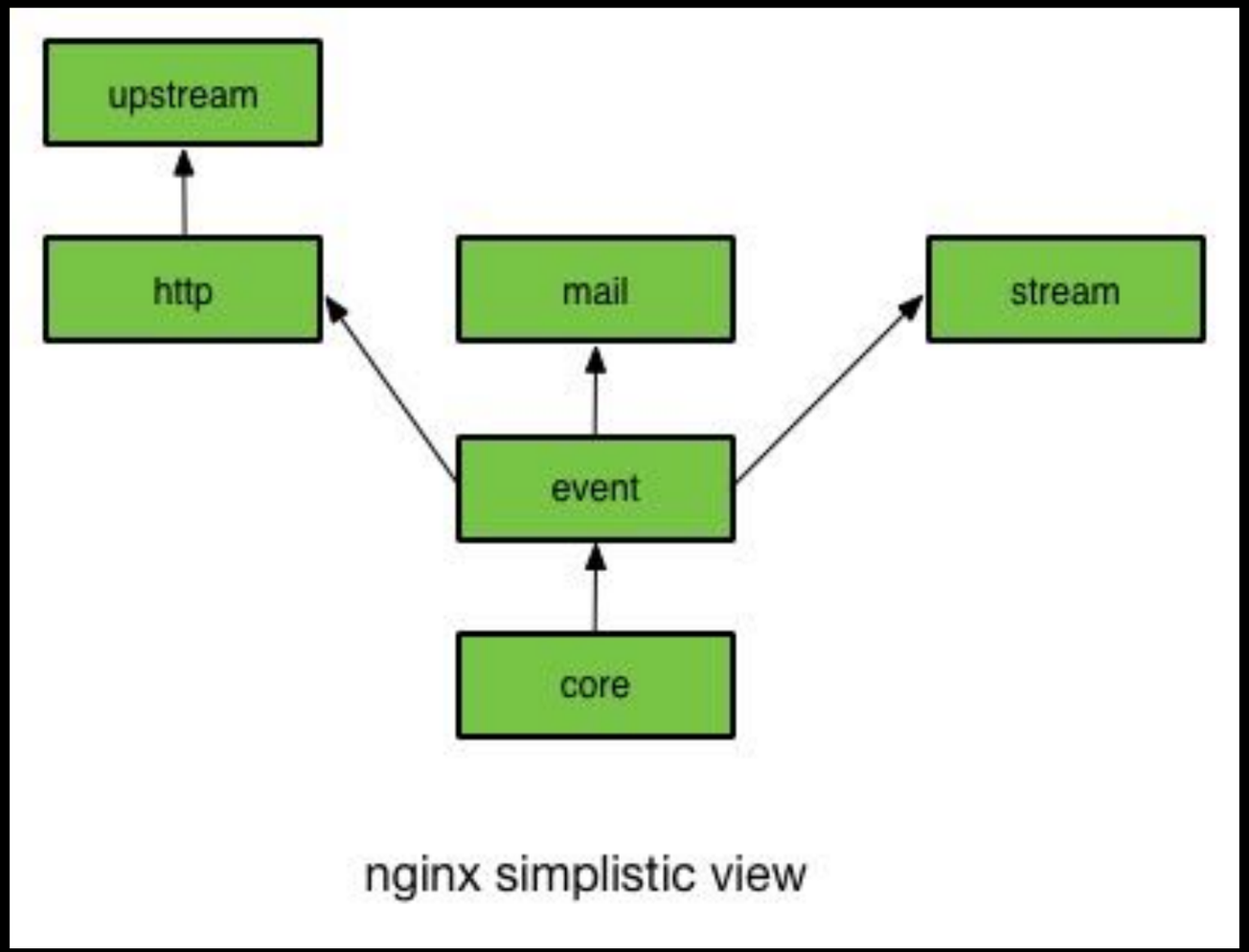


One master and several worker processes; worker processes run under an unprivileged user;

Why Nginx is fast

2. The Nginx codebase is written in the C programming language and is extremely optimized by the Igor Sysoev.

simplistic view

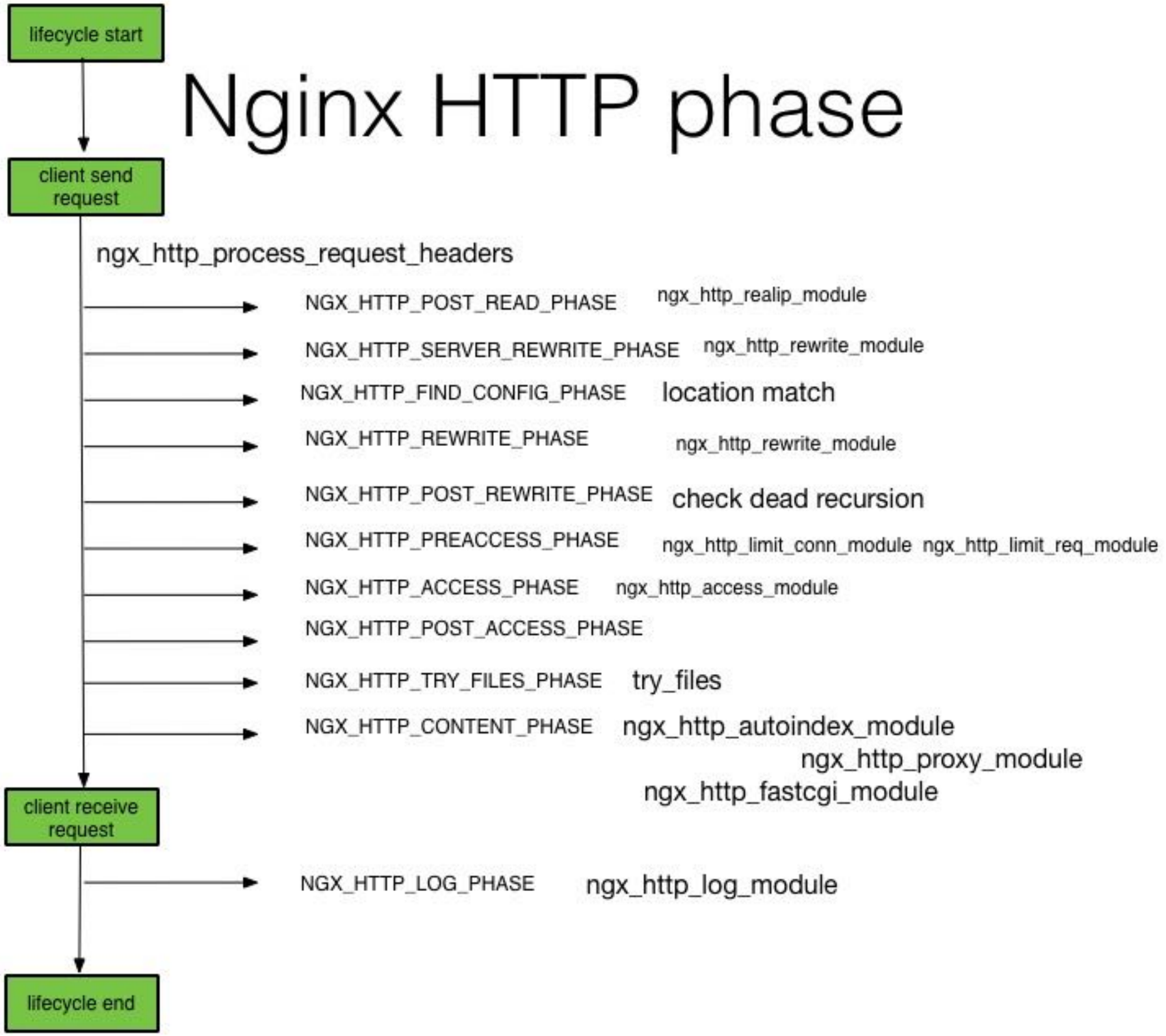


nginx simplistic view

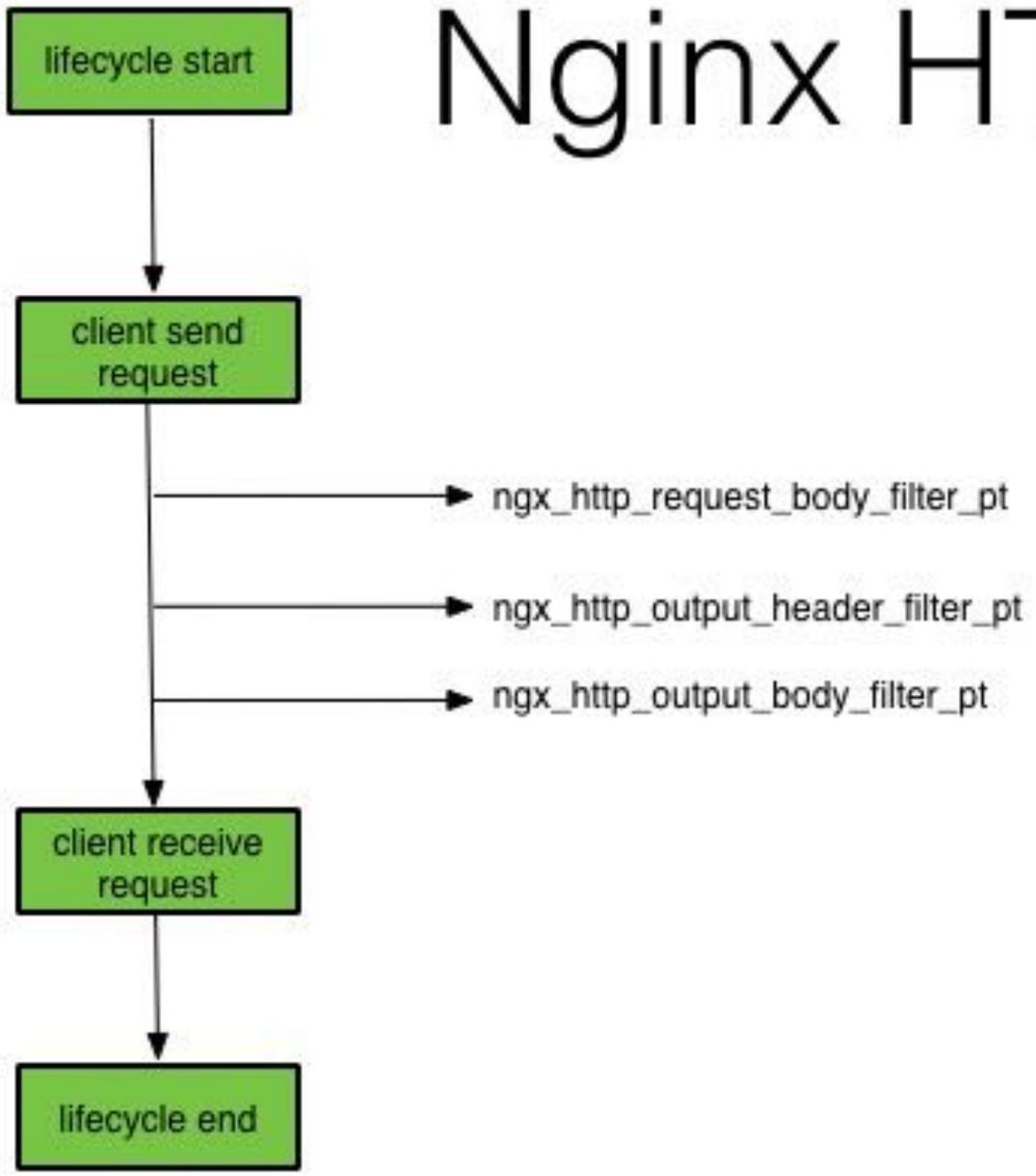
key concept

all is modular(e)

Nginx HTTP phase



Nginx HTTP filter



Nginx Upstream Hook

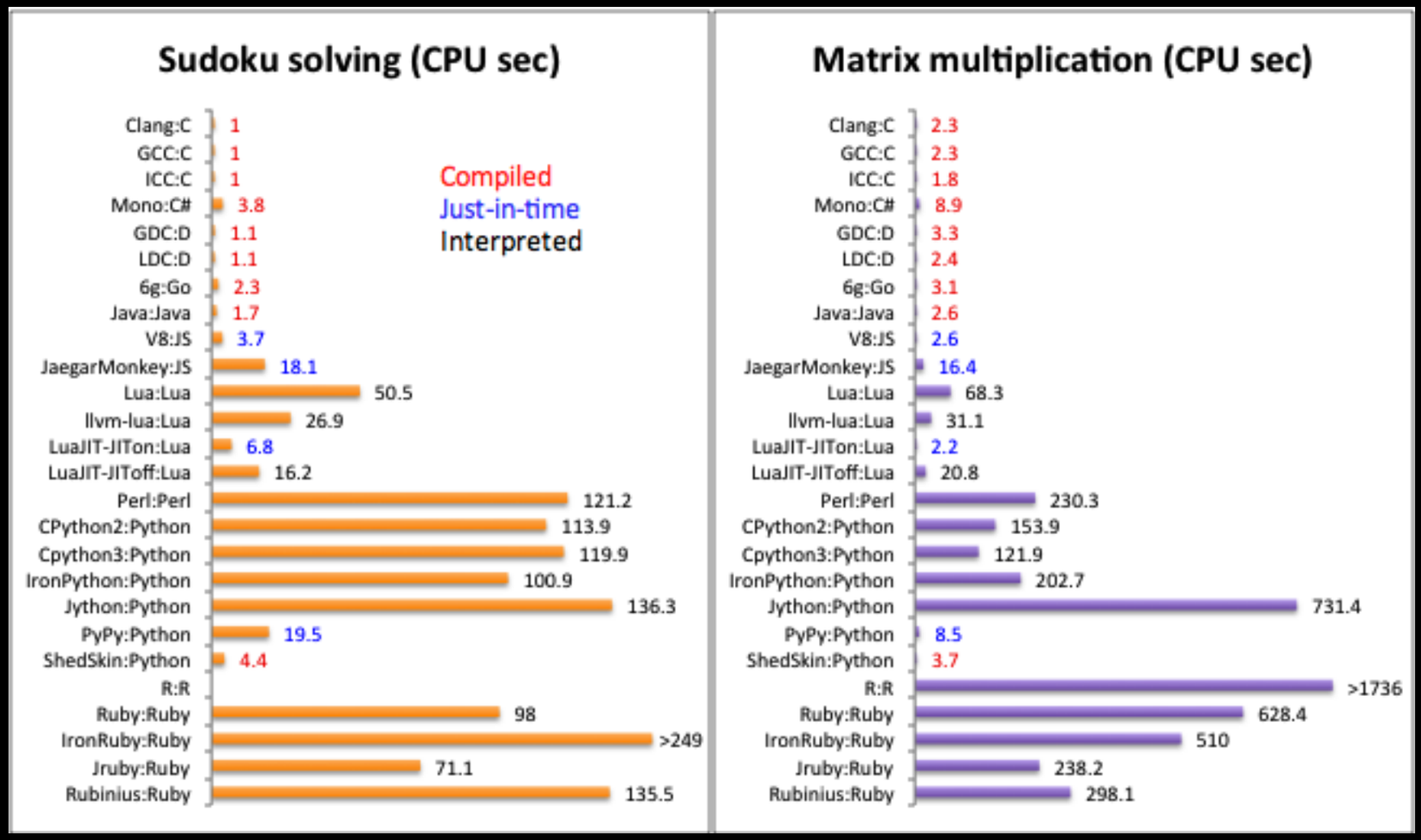
Nginx + Lua
Beyond Nginx

What’s the ngx_http_lua

Embed the power of Lua into Nginx

Why Lua

High Performance



easy to develop

20 row in C = 1 row in Lua

```c
part = &r->headers_in.headers.part;
h = part->elts;

for (i = 0; /* void */; i++) {
    if (i >= part->nelts) {
        if (part->next == NULL) {
            break;
        }

        part = part->next;
        h = part->elts;
        i = 0;
    }

    if (key.len == h[i].len &&
        ngx_strncasecmp(key.data, h[i].data,
            h[i].len) == 0)
    {
        h[i].value = *value;
    }
}
```

```lua
ngx.req.set_header("Content-Type", "text/css")
```

How Does Nginx Connect Lua

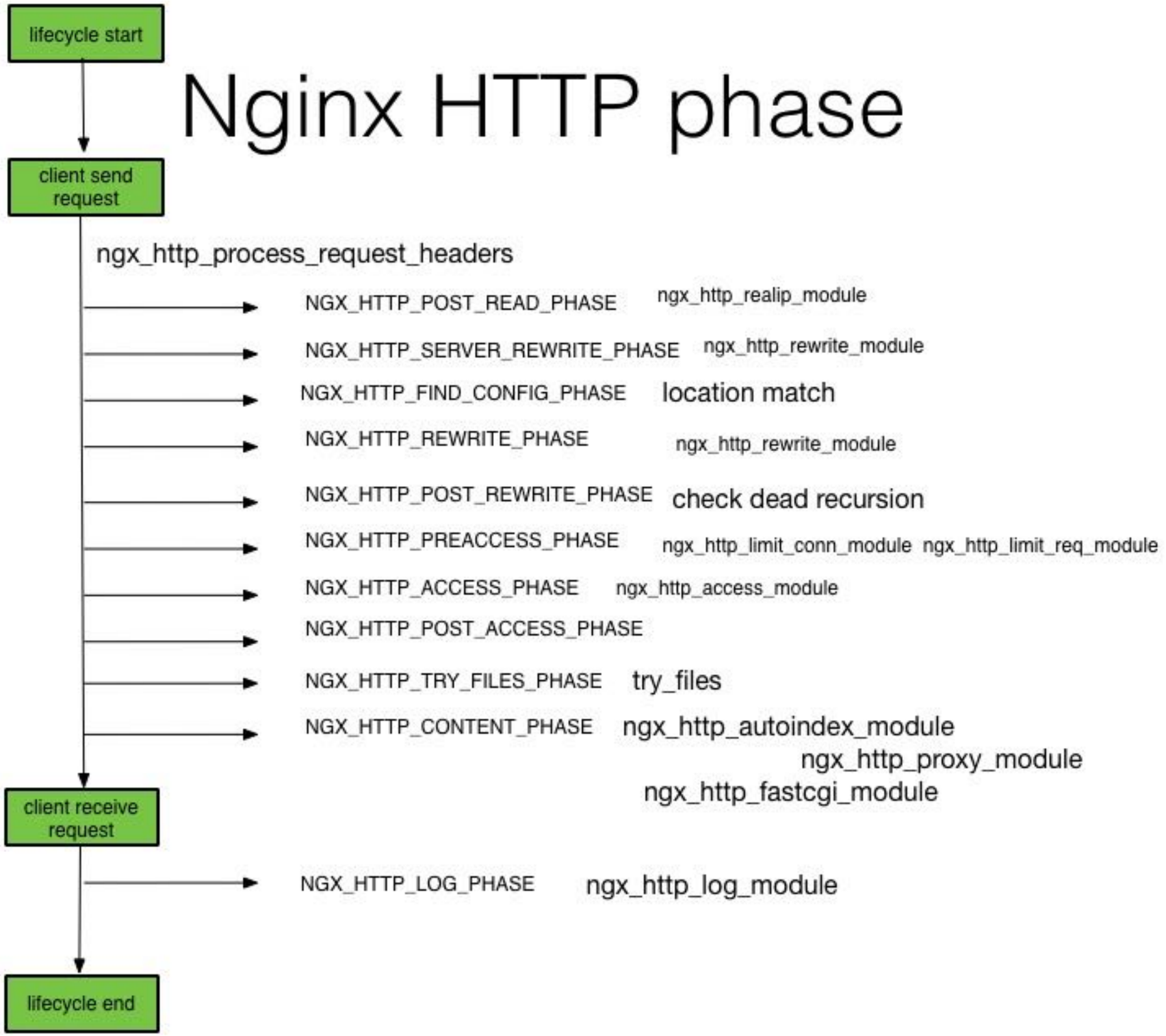
Inject Nginx C API To Lua VM

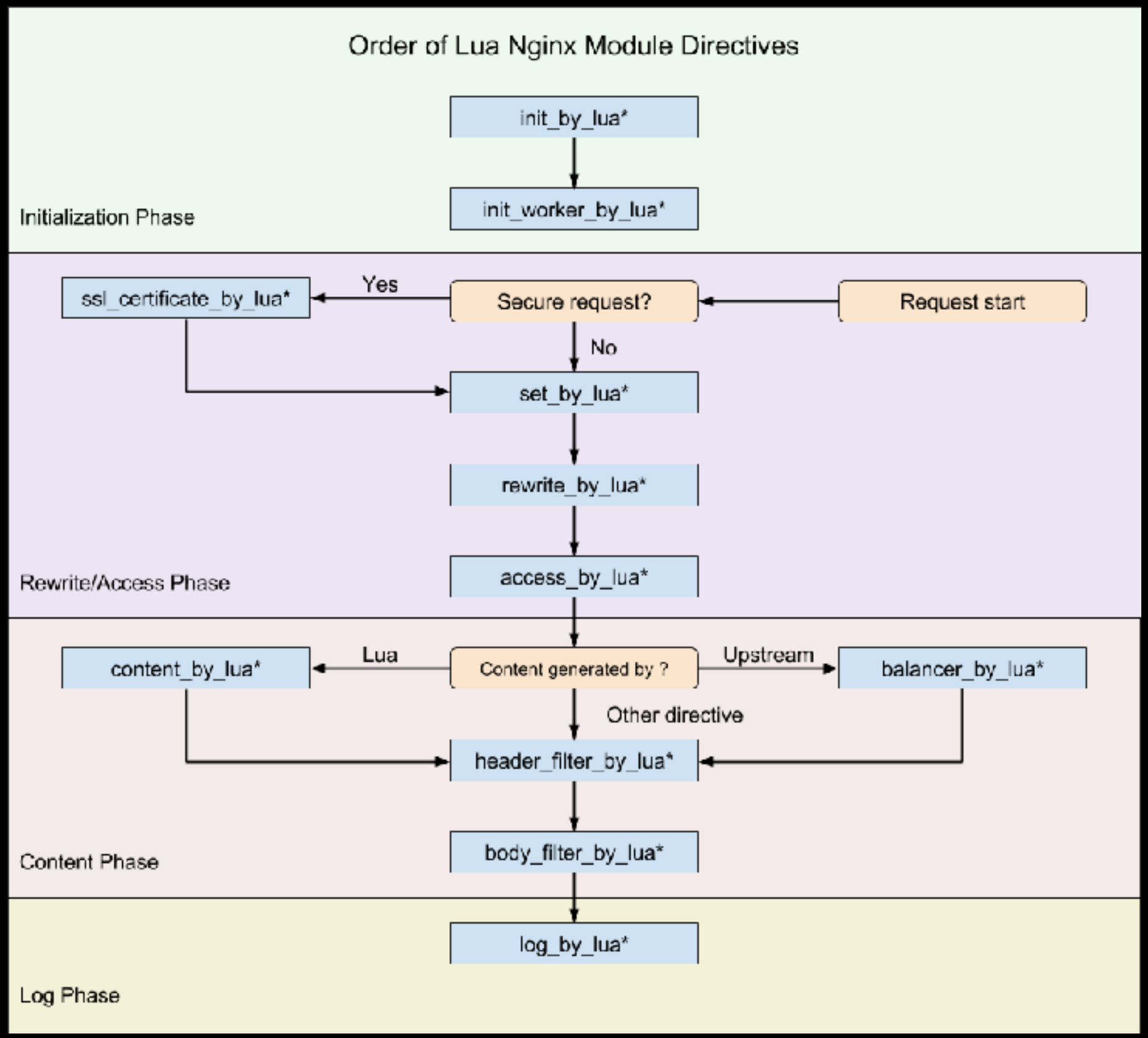
```c
int main(int argc, char *argv[]) {
    lua_State *l;

    l = luaL_newstate();
    luaL_openlibs(l);

    lua_pushcfunction(l, l_dir);
    lua_setglobal(l, "mydir");

    if (luaL_loadfile(l, "./dir.lua") != 0) {
        fprintf(stderr, "luaL_loadfile err: %s.\n", lua_tostring(l, -1));
        goto end;
    }

    if (lua_pcall(l, 0, 0, 0) != 0) {
        fprintf(stderr, "lua_pcall err: %s.\n", lua_tostring(l, -1));
    }

end:

    lua_close(l);
    return 0;
}
```

```
    lua_pushcfunction(L, ngx_http_lua_get_raw_phase_context);
    lua_setfield(L, -2, "_phase_ctx");

    ngx_http_lua_inject_arg_api(L);

    ngx_http_lua_inject_http_consts(L);
    ngx_http_lua_inject_core_consts(L);

    ngx_http_lua_inject_log_api(L);
    ngx_http_lua_inject_output_api(L);
    ngx_http_lua_inject_time_api(L);
    ngx_http_lua_inject_string_api(L);
    ngx_http_lua_inject_control_api(log, L);
    ngx_http_lua_inject_subrequest_api(L);
    ngx_http_lua_inject_sleep_api(L);
    ngx_http_lua_inject_phase_api(L);

#if (NGX_PCRE)
    ngx_http_lua_inject_regex_api(L);
#endif

    ngx_http_lua_inject_req_api(log, L);
    ngx_http_lua_inject_resp_header_api(L);
    ngx_http_lua_create_headers_metatable(log, L);
    ngx_http_lua_inject_variable_api(L);
    ngx_http_lua_inject_shdict_api(lmcf, L);
    ngx_http_lua_inject_socket_tcp_api(log, L);
    ngx_http_lua_inject_socket_udp_api(log, L);
    ngx_http_lua_inject_uthread_api(log, L);
    ngx_http_lua_inject_timer_api(L);
    ngx_http_lua_inject_config_api(L);
    ngx_http_lua_inject_worker_api(L);

    ngx_http_lua_inject_misc_api(L);
```

How Does NginxLua Work Over Nginx Hooks

Nginx HTTP phase




Order of Lua Nginx Module Directives
init_by_lua*
init_worker_by_lua*
Initialization Phase
ssl_certificate_by_lua*
Yes
Secure request?
Request start
No
set_by_lua*
rewrite_by_lua*
access_by_lua*
Rewrite/Access Phase
content_by_lua*
Lua
Content generated by ?
Upstream
balancer_by_lua*
Other directive
header_filter_by_lua*
body_filter_by_lua*
Content Phase
log_by_lua*
Log Phase

Be Continued