FrankenPHP

Serving Exponential 6 with FrankenPHP, the Caddy server with PHP built in: through Velocity's frankenphp engine (the usual way, a few settings) or on its own with a checked Caddyfile that keeps the routing of...

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FrankenPHP is the Caddy web server with PHP built in, as one binary. There are two ways to run Exponential on it:

> **Warning**
>
> `.htaccess` **slows down every request.** When `.htaccess` files are enabled (`AllowOverride` anything but `None`), let alone used, Apache looks for them and reads and evaluates them on every request, in every directory of the path, and page loading times go up drastically (measured). The only real fix is to switch the feature off for the virtual host: `AllowOverride None` in the HTTPS virtual host, and the rules in the virtual host's own configuration as mod_rewrite rules. That is far faster in production speed tests and well worth the time it takes to optimize a production configuration. Switch over right away: copy the rules of the example HTTPS virtual host into your virtual host (with the static cache, also `staticcache_offload.conf`), set `AllowOverride None`, run `apachectl configtest`, reload Apache and test the site. The same rules for other servers: nginx, LiteSpeed, Caddy, IIS, Velocity (built in); where virtual host rules go in a control panel: Plesk, cPanel, DirectAdmin, ISPConfig. **On LiteSpeed or OpenLiteSpeed,** the server's own page cache can also answer anonymous visitors and crawlers without PHP: Page caching with LiteSpeed and OpenLiteSpeed.

- **Through Velocity** (recommended): `exp:velocity` downloads and verifies the binary, writes the Caddyfile from `velocity.ini` on every start, validates it before use and drives the server with the same commands as its other engines. You write no Caddyfile.
- **On its own**: you start `frankenphp run` with a Caddyfile of your own, for example `frankenphp.Caddyfile.example` below.

> **Warning**
>
> Never use FrankenPHP's `php_server` directive for Exponential. It serves every file that exists, `settings/*.ini` and the SQLite database included. Both ways below route like `.htaccess_root` instead.

FrankenPHP never reads `.htaccess`, so `exp:setup:htaccess` does not change how it routes. `config.php` is put into place and edited with `./console exp:setup:config --apply` and `./console exp:config:set ... --apply`, as on every server. In classic mode (the only one Exponential uses) each request reads it again once OPcache sees the new file; if a change does not show, restart the server (through Velocity: `exp:velocity restart`). See Setting up .htaccess and config.php from the console.

Through Velocity

Shell

```
php bin/php/console exp:velocity config set --apply ServerSettings Engine frankenphp --allow-root
-user
php bin/php/console exp:velocity install --allow-root-user     # optional: start installs it when
 missing
php bin/php/console exp:velocity start --allow-root-user
php bin/php/console exp:velocity ctl caddyfile --allow-root-user   # print the generated configur
ation
```

The settings are in `settings/velocity.ini` `[FrankenPHPSettings]`; set yours in `settings/override/velocity.ini.append.php` (or with `exp:velocity config set`):

INI

```
[FrankenPHPSettings]
# HTTP and HTTPS ports (shipped: 8089 and 8444)
Port=8089
HTTPSPort=8444
# PHP threads; empty: FrankenPHP's default, twice the CPU cores
Workers=
# The binary reads no php.ini of the machine: these are passed to it
IniOptions[]
IniOptions[]=display_errors=Off
IniOptions[]=log_errors=On
IniOptions[]=memory_limit=512M
IniOptions[]=opcache.enable=1
IniOptions[]=post_max_size=64M
IniOptions[]=upload_max_filesize=32M
# A file with Caddy directives of your own, imported into every site block
SiteInclude=

[HTTPSSettings]
# Your certificate; with both empty FrankenPHP makes a self-signed one
Certificate=/etc/ssl/example.com/fullchain.pem
Key=/etc/ssl/example.com/privkey.pem
```

The generated file is `var/vc/frankenphp/run/Caddyfile`. Its shape, with this machine's paths and versions replaced:

Config

```
{
    auto_https off
    admin "unix//var/www/example.com/var/vc/frankenphp/run/admin.sock"
    persist_config off
    grace_period 15s
    servers {
        protocols h1 h2
    }
    frankenphp {
        num_threads 16
        max_threads 16
        php_ini "memory_limit" "512M"
        php_ini "opcache.enable" "1"
    }
}

(exp) {
    root * "/var/www/example.com"
    encode zstd br gzip
```

```
    route {
        respond /Q/health 200
        @static {
            path_regexp static ^/(design/[^/]+/(stylesheets|images|javascript|fonts)/|...|w3c/p3p
\.xml$)
            not path_regexp (?i)(\.(php\d?|phtml|phar)$|/\.)
        }
        header @static Cache-Control "public, max-age=31536000"
        file_server @static
        @rest path_regexp rest ^/(api/|index_rest\.php)
        rewrite @rest /index_rest.php
        @treemenu path_regexp treemenu ^/([^/]+/)?content/treemenu
        rewrite @treemenu /index_treemenu.php
        @front not path /index_rest.php /index_treemenu.php
        rewrite @front /index.php
        php {
            env EXP_VELOCITY_ENGINE "FrankenPHP"
        }
    }
}

http://:8089 {
    import exp
}
https://:8444 {
    tls "/etc/ssl/example.com/fullchain.pem" "/etc/ssl/example.com/privkey.pem"
    import exp
}
```

Do not edit it: it is rewritten on every `start`, `graceful` and `restart`. Directives of your own go in the file named by `SiteInclude`, which is imported into both site blocks and validated with the rest.

On its own

Config

```
# Exponential 6: FrankenPHP on its own (without exp:velocity)
#
# Free documentation: GFDL 1.3 or later, see doc/eng-us/README-LICENSE.md; rules derived from .ht
access_root (GPL v2 or later).
#
# The shape of the Caddyfile that "exp:velocity" generates for its FrankenPHP
# engine (kernel/classes/expvelocityfrankenphp.php, caddyfileText(), in
# var/vc/frankenphp/run/Caddyfile), for a FrankenPHP you start yourself:
# public names with Caddy's automatic HTTPS instead of the generated ports,
# example paths instead of this machine's, and the first two rules of
# .htaccess_root added. Explained in frankenphp.md next to this file.
#
# With Velocity, do not use this file: set [ServerSettings] Engine=frankenphp
# and let "exp:velocity start" write and validate its own Caddyfile; put own
# directives in the file named by [FrankenPHPSettings] SiteInclude.
#
# Never use php_server for Exponential: it serves every file that exists,
# settings/*.ini and the SQLite database included.
#
# Run: frankenphp run --config /etc/frankenphp/Caddyfile
# Check: frankenphp validate --config /etc/frankenphp/Caddyfile --adapter caddyfile

{
    email webmaster@example.com
    grace_period 15s
```

```
    frankenphp {
        # PHP threads; FrankenPHP's default is twice the CPU cores
        #num_threads 16
        # The binary reads no php.ini of the machine: what velocity.ini
        # [FrankenPHPSettings] IniOptions[] ships
        php_ini display_errors Off
        php_ini log_errors On
        php_ini memory_limit 512M
        php_ini opcache.enable 1
        php_ini post_max_size 64M
        php_ini upload_max_filesize 32M
    }
}

(exp) {
    # The installation root, where index.php is
    root * /var/www/example.com
    log {
        output file /var/log/frankenphp/example.com-access.log
        format json
    }
    encode zstd br gzip
    header {
        ?X-Content-Type-Options "nosniff"
        ?X-Frame-Options "SAMEORIGIN"
        ?Referrer-Policy "strict-origin-when-cross-origin"
        ?Permissions-Policy "camera=(), microphone=(), payment=(), usb=()"
    }
    route {
        # No dot path (.well-known stays reachable) and no script below the root
        @dot {
            path_regexp dot /\.
            not path /.well-known/*
        }
        respond @dot 404
        @script path_regexp script ^/.+/[^/]+\.(php[0-9]?|phtml|phar)$
        respond @script 404

        @svg path_regexp svg (?i)\.svgz?$
        header @svg Content-Security-Policy "sandbox; default-src 'none'; style-src 'unsafe-inlin
e'"

        # As generated: expVelocity::STATIC_PATHS, never a script or a dot path
        @static {
            path_regexp static ^/(design/[^/]+/(stylesheets|images|javascript|fonts)/|share/icons
/|extension/[^/]+/icons/[A-Za-z0-9_/-]+\.(svg|png|gif)$|extension/[^/]+/design/[^/]+/(stylesheets
|flash|images|lib|javascripts?|fonts|vendor|media)/|var/([^/]+/)?storage/images(-versioned)?/|var
/([^/]+/)?storage/pdf/[A-Za-z0-9][A-Za-z0-9._-]*\.pdf$|var/([^/]+/)?storage/original/image/.+\.(p
ng|jpe?g|gif|webp|svg)$|var/([^/]+/)?cache/(texttoimage|public)/|packages/styles/.+/(stylesheets|
images|javascript)/[^/]+/|packages/styles/.+/thumbnail/|var/storage/packages/.+\.(png|jpe?g|gif|w
ebp)$|favicon\.ico$|design/standard/images/favicon\.ico$|robots\.txt$|(index|sw)\.js$|w3c/p3p\.xm
l$)
            not path_regexp (?i)(\.(php\d?|phtml|phar)$|/\.)
        }
        header @static Cache-Control "public, max-age=31536000"
        file_server @static
        @rest path_regexp rest ^/(api/|index_rest\.php)
        rewrite @rest /index_rest.php
        @treemenu path_regexp treemenu ^/([^/]+/)?content/treemenu
        rewrite @treemenu /index_treemenu.php
        @front not path /index_rest.php /index_treemenu.php
        rewrite @front /index.php
        php
    }
```

```
}

example.com, www.example.com {
    import exp
}
```

Install the binary from FrankenPHP's releases (or use the one Velocity downloaded, `var/vc/frankenphp/bin/`), copy the file to `/etc/frankenphp/Caddyfile`, replace `example.com`, the e-mail address and `/var/www/example.com`, then:

Shell

```
frankenphp validate --config /etc/frankenphp/Caddyfile --adapter caddyfile
frankenphp run --config /etc/frankenphp/Caddyfile
```

Compared with the generated file it adds Caddy's automatic HTTPS for the public names, the security headers (set only when the page does not have them yet), the `sandbox` policy for SVG files, and the first two rules of `.htaccess_root` (dot paths and scripts below the root answer 404; the generated file sends those to `index.php`, which answers them). FrankenPHP runs in classic mode here: each request starts from a clean state, as under PHP-FPM.

How this example was checked: `frankenphp validate --adapter caddyfile` with FrankenPHP 1.12.7 (Caddy 2.11); the generated configuration it follows is the one Velocity validates and serves with its `frankenphp` engine.

Related pages

- Caddy: the same routing with a PHP-FPM pool.
- Chapter 8, section 8.4: FrankenPHP, FrankenPHP as the Exponential web engine and Velocity engines.
- Velocity, Web server examples and all examples.
- Setting up .htaccess and config.php from the console.
- Free documentation: this page is free to copy, translate and improve.

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