High Performance Solution for PHP
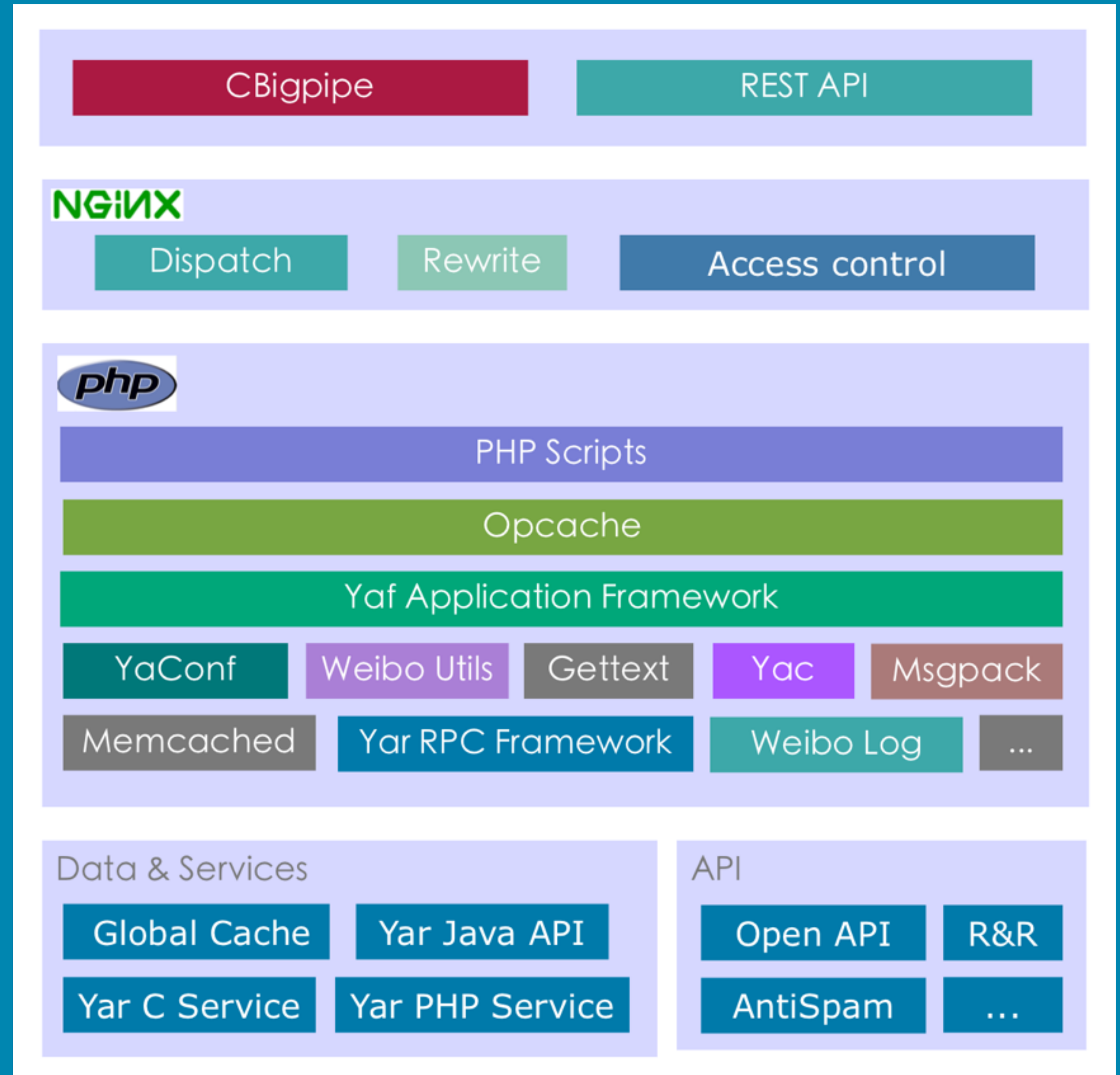
An introduction to the PHP extensions of mine

@laruence

About Me

- Author of Yaf, Yar, Yac, Yaconf, Taint

- Maintainer of Opcache, Msgpack, PHP-Lua

- PHP core developer since 2011

- Consultant at Zend since 2013

- Core developer of PHP7(NG branch)

- Chief architect at Lianjia.com

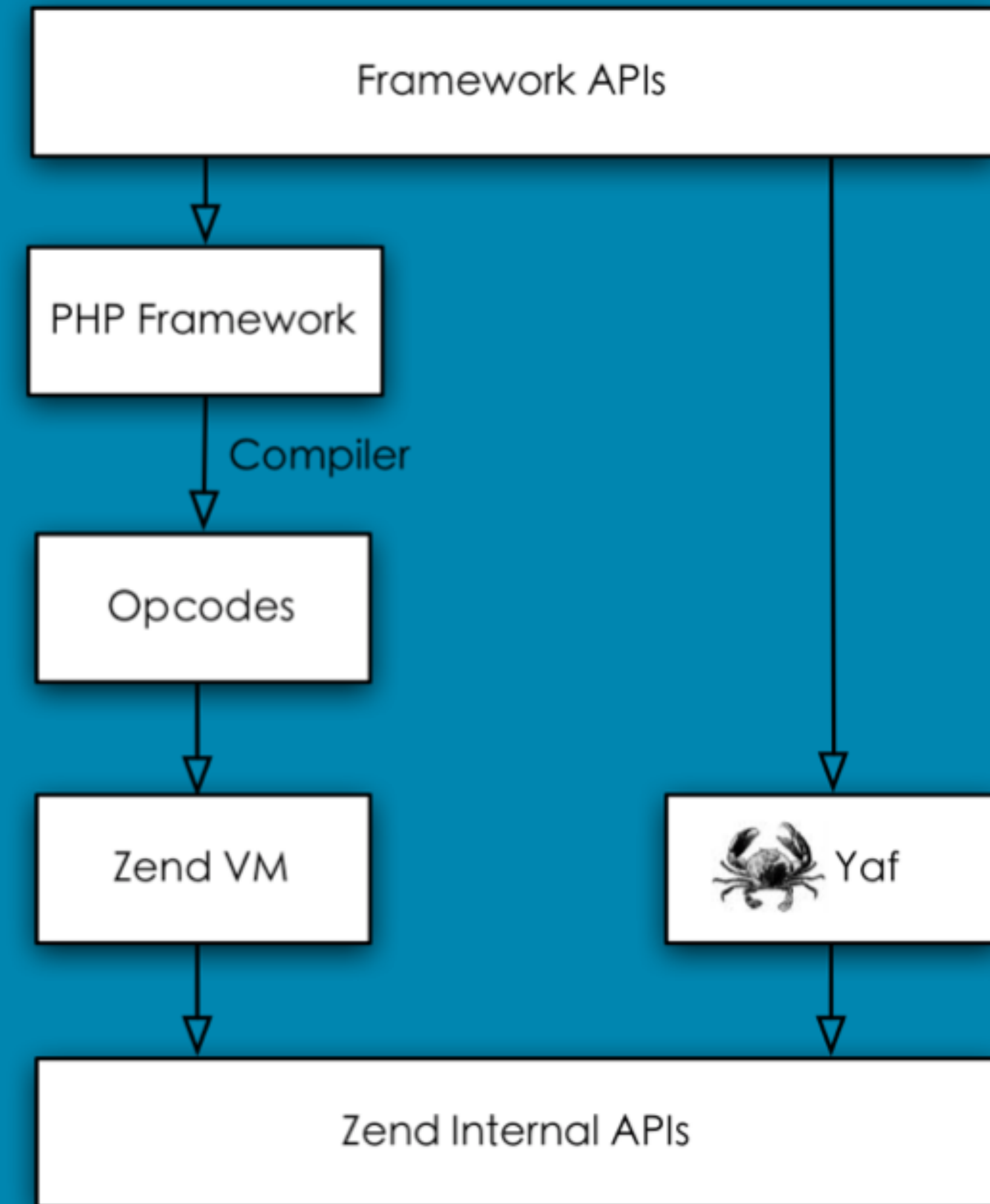- Terrible english speaker
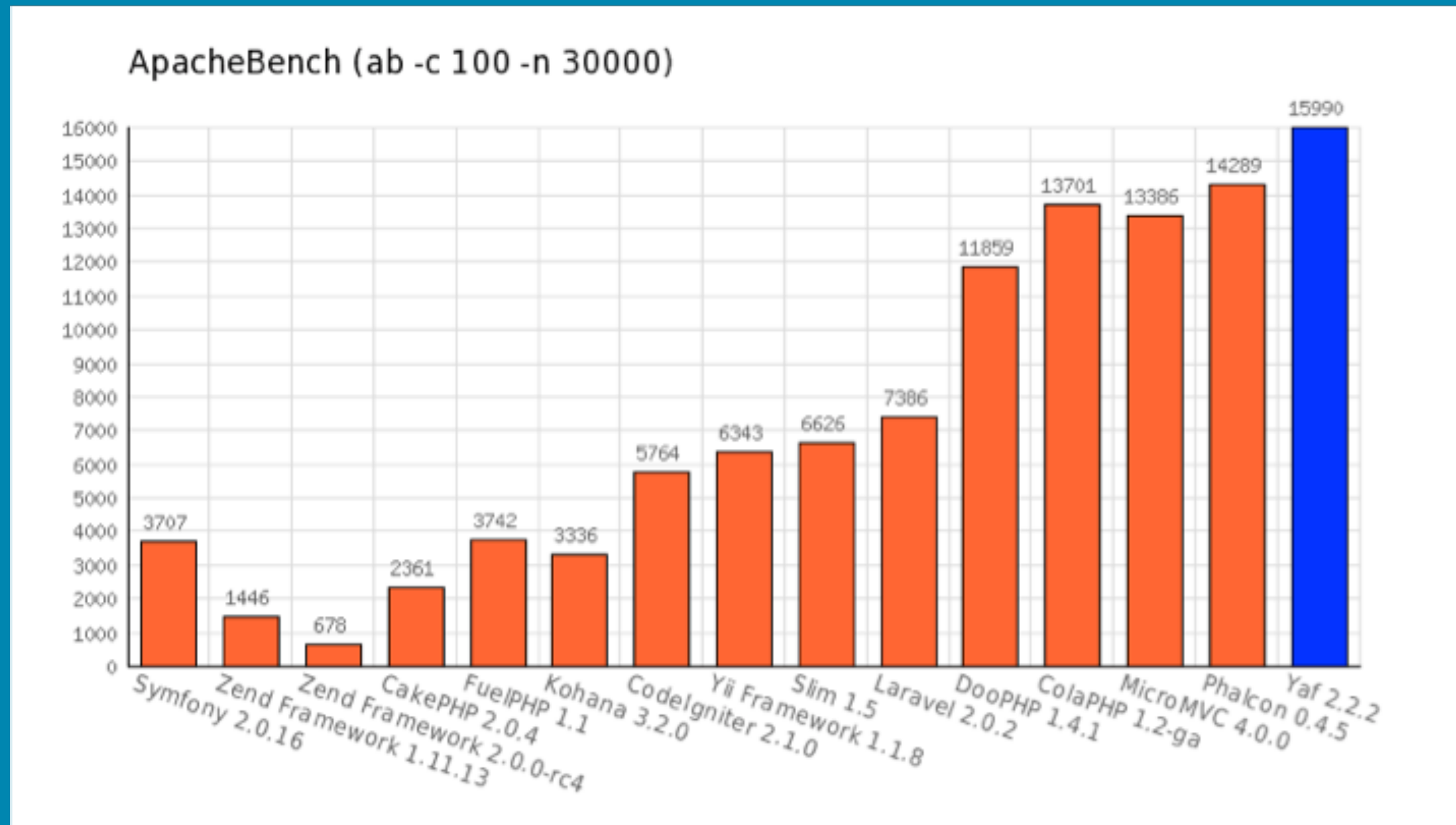
Overview

- Weibo V5 (2012 ~ 2015)

  - Billions PV per day(PHPend)

  - 300% Performance improvement

  - 60% Response time reduced

  - More than 1000 servers saved
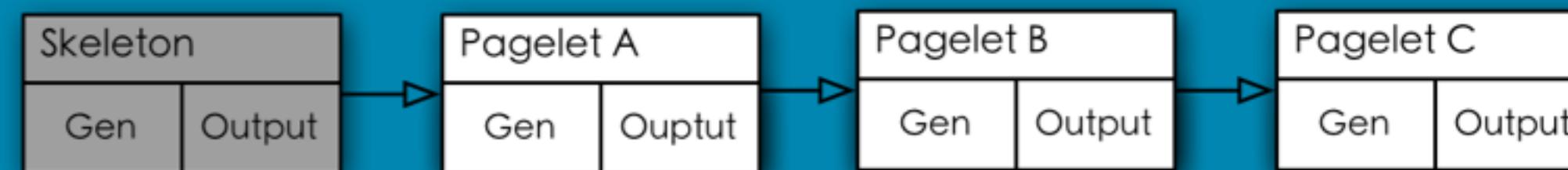
  - Nginx , PHP-5.4

Framework

Yaf

- Use or Not Use Framework was a problem

Yaf

- What should a PHP framework do

  - Routing

  - Dispatching

  - Autoloading

  - View?

  - ORM?

Yaf - Yet Another Framework

- The first PHP framework in extension

ApacheBench (ab -c 100 -n 30000)

Framework	Requests
Symfony 2.0.16	3707
Zend Framework 1.11.13	1446
Zend Framework 2.0.0-rc4	678
CakePHP 2.0.4	2361
FuelPHP 1.1	3742
Kohana 3.2.0	3336
CodeIgniter 2.1.0	5764
Yii Framework 1.1.8	6343
Slim 1.5	6626
Laravel 2.0.2	7386
DooPHP 1.4.1	11859
ColaPHP 1.2-ga	13701
MicroMVC 4.0.0	13386
Phalcon 0.4.5	14289
Yaf 2.2.2	15990

Framework APIs → PHP Framework → Compiler → Opcodes → Zend VM → Zend Internal APIs

Framework APIs → Yaf → Zend Internal APIs

Yaf

- Wildly used at Weibo, Baidu, Sina etc

- https://github.com/laruence/yaf

- Alternative: Phalcon

SOA

Yar

- Why SOA

  - Decoupling

  - Cooperation

  - High Available

  - Scale out

  - ?

Yar

- Performance matters (latency or throughput)

  - Latency is not always 1/throughput

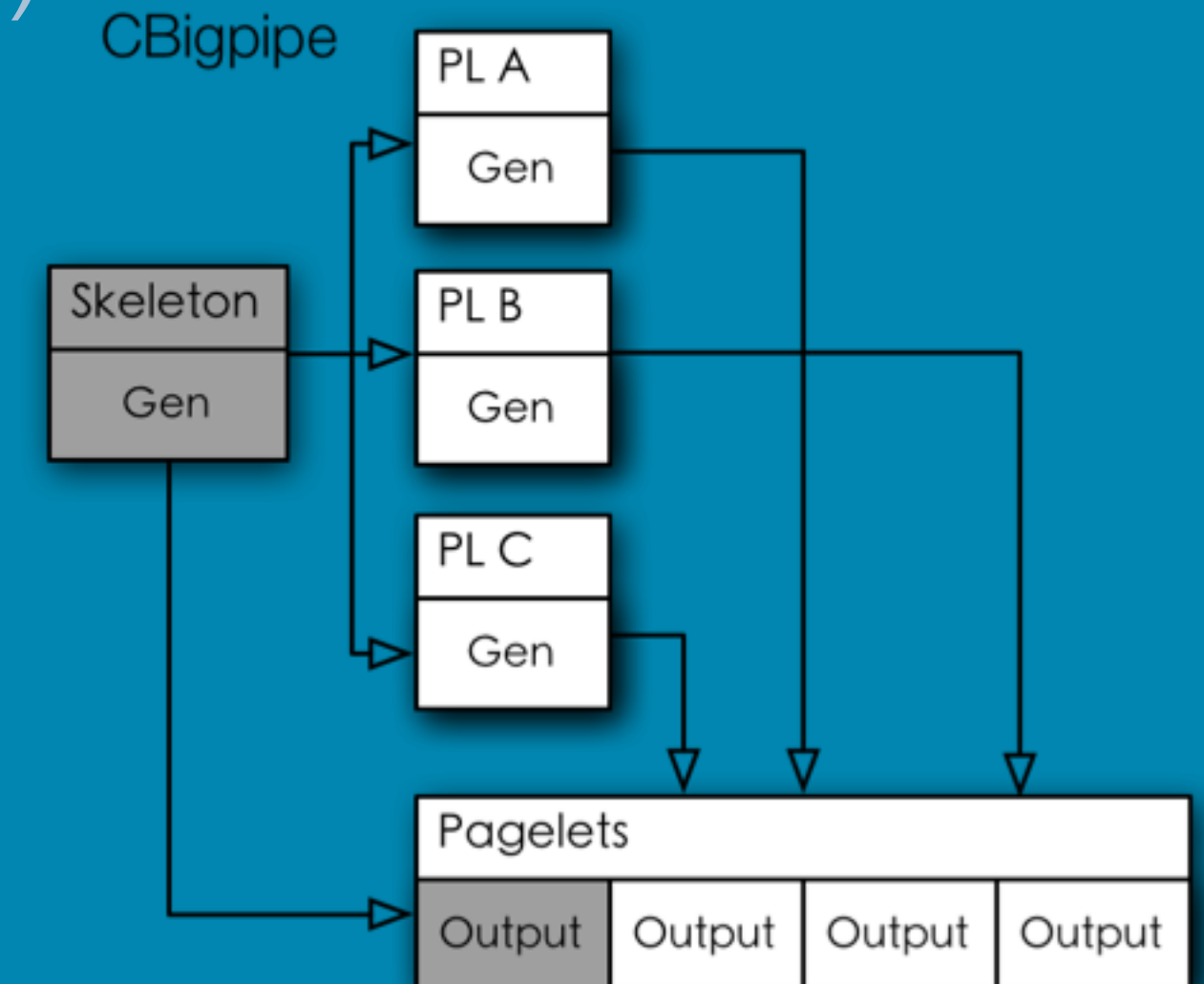 - Trade Throughput for latency

  - Concurrent

Yar - Yet Another RPC framework

- Concurrent, Light RPC framework in extension

- Multiply packagers supported(json, php, msgpack)

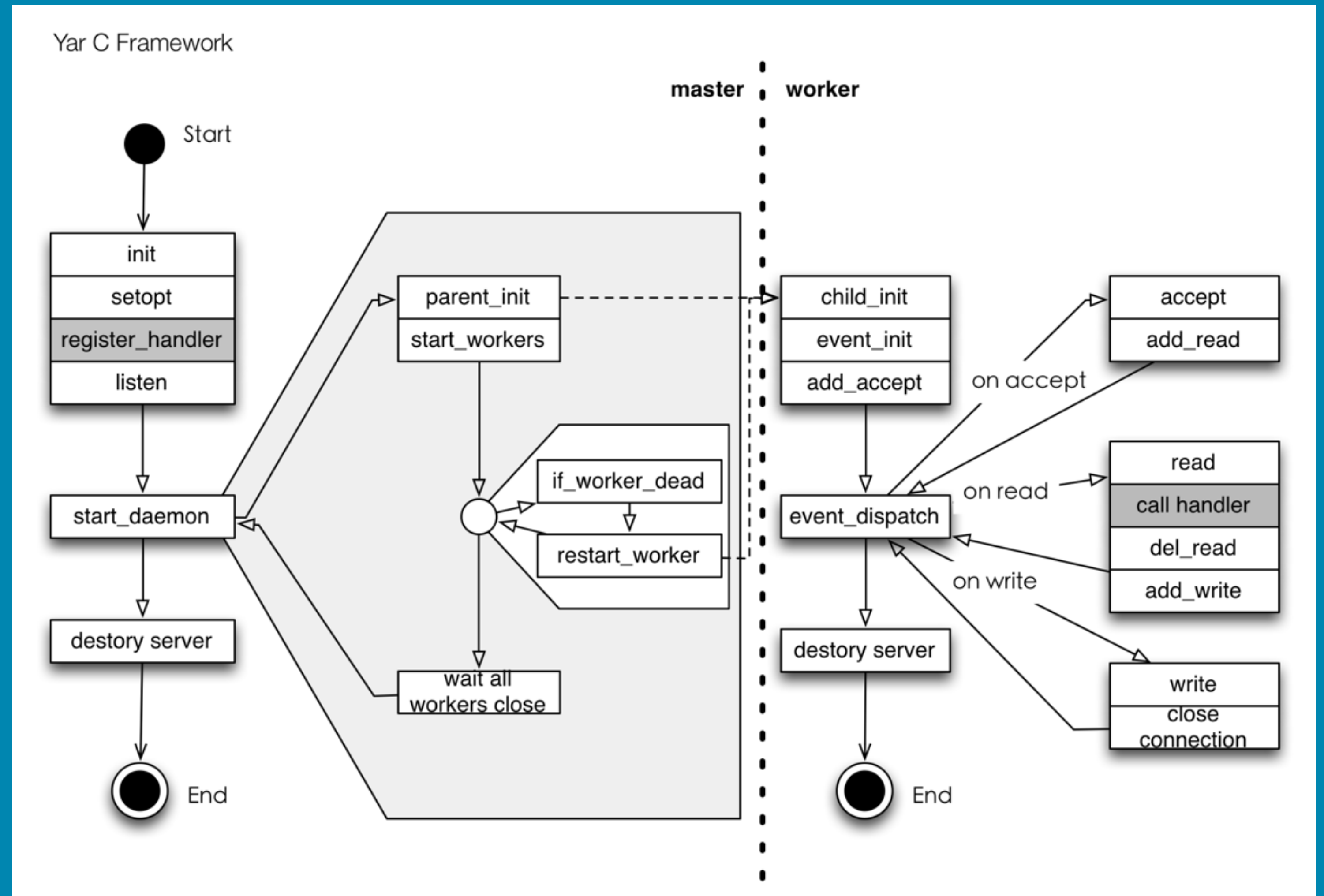- Multiply types of backend supported(C, PHP, Java)

Bigpipe

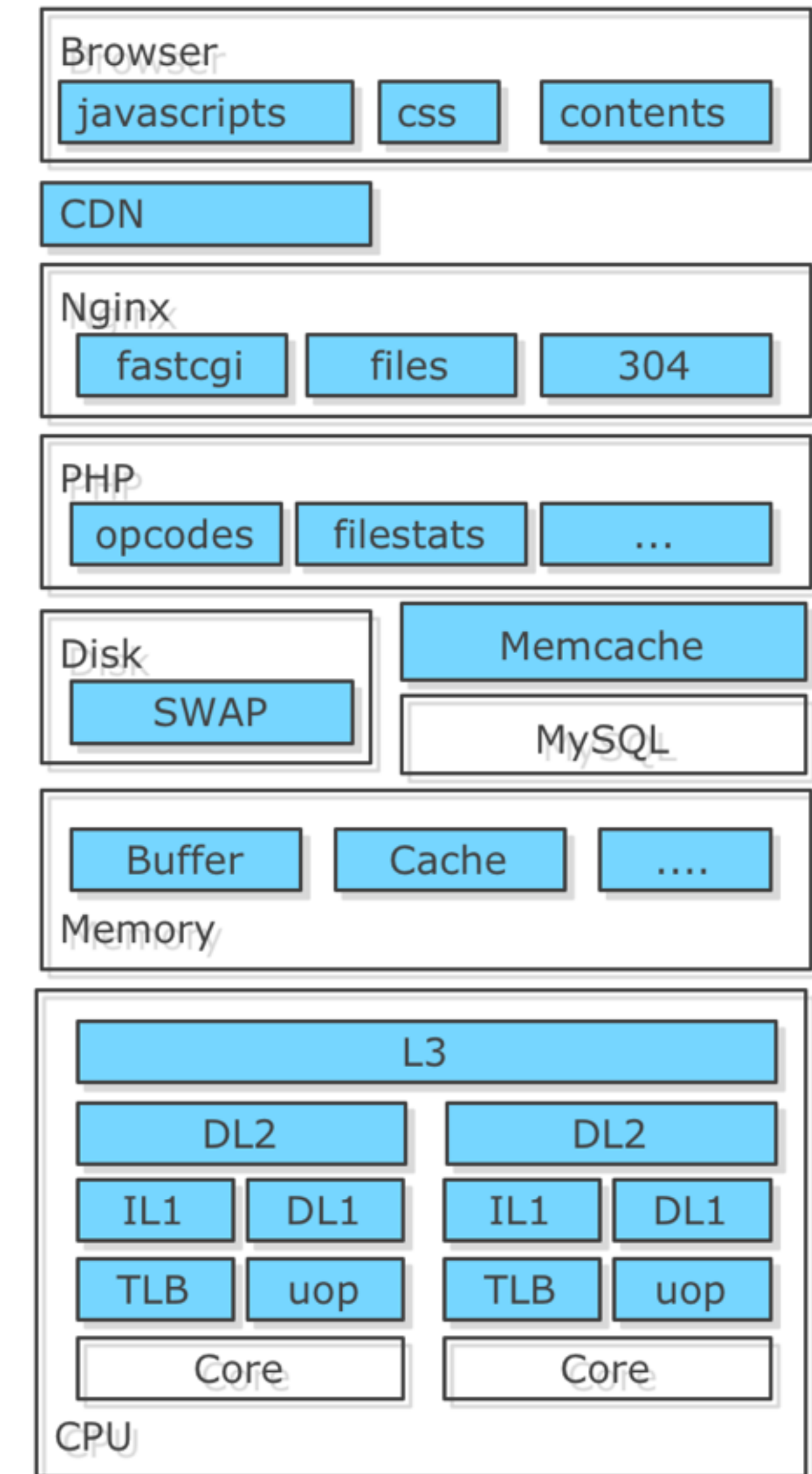| Skeleton	
Gen	Output

Pagelet A	
Gen	Ouptut

Pagelet B	
Gen	Output

Pagelet C	
Gen	Output

CBigpipe

PL A
Gen

Skeleton
Gen

PL B
Gen

PL C
Gen

Pagelets			
Output	Output	Output	Output

Yar

- Yar for C framework

  - Multiply processes

  - Async

  - Event Driven

Yar

- Wildly used at Weibo

- https://github.com/laruence/yar

- https://github.com/laruence/yar-c

- Alternative: json-rpc, thrift

Cache

Yac

- Cache ~ Panacea for performance

  - Memcached

  - Redis

Yac

- Why not memcached

  - Network

  - Single point problem

  - Complexity of operation and maintenance

Yac

- Lockless user data cache in shared memory
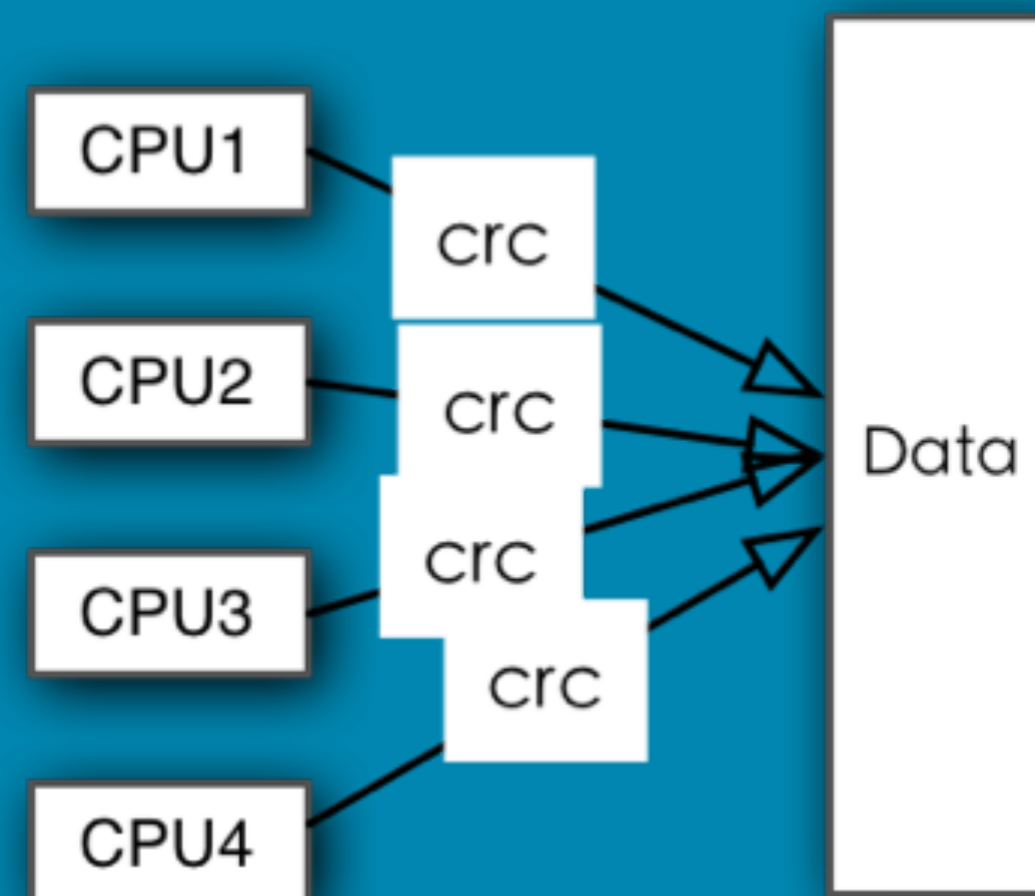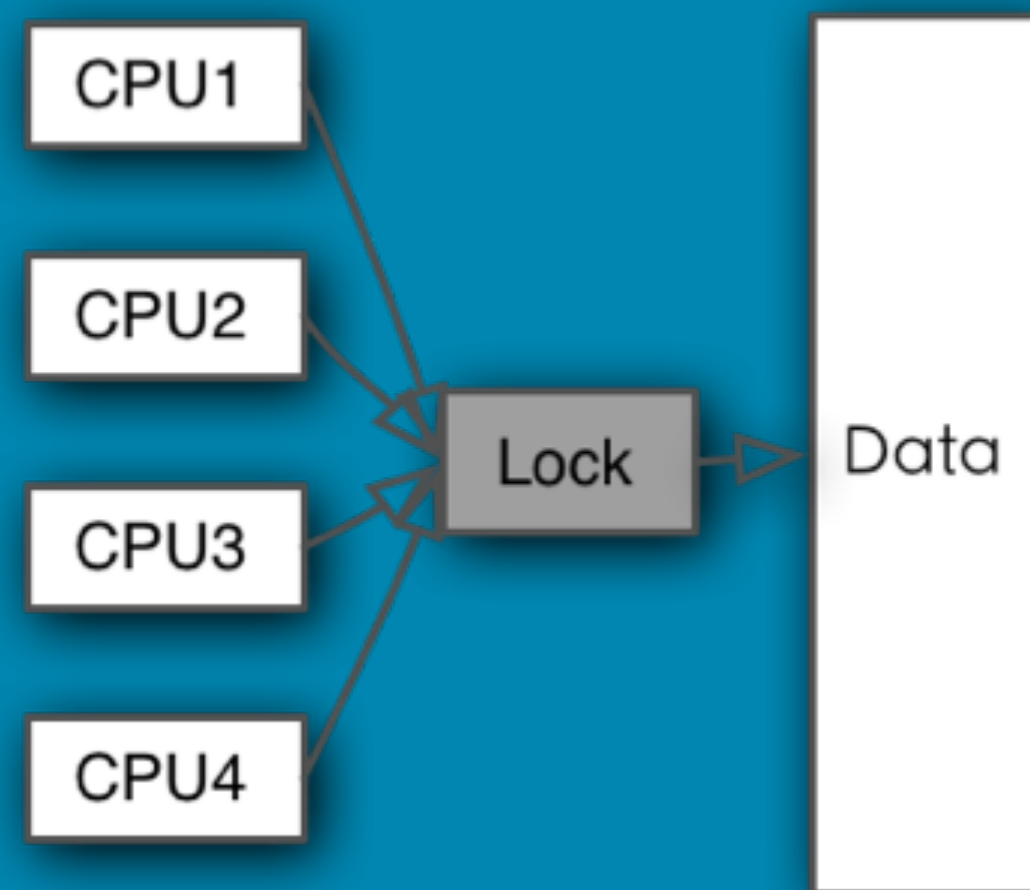
Yac - Yet Another Cache

- Yac is not safe

- less than 1/10000000 chance it will get a wrong result

- Where is can be used

Yac

- Not wildly used :)

- https://github.com/laruence/yac

- Alternative: APC, Memcached

Configurations

Yaconf

- Configurations is always not really configurations

- Envs, Dicts, Caches

- PHP, Json, Yaml

Yaconf

- What is wrong with it

  - Parsing every time

  - Release with codes

  - Opaque for developer

  - …

# Yaconf - Yet Another Config Container

- Persistent configurations container in extension

- INI file

- Supports multiply files, sections

- Supports constants, environ variables in PHP

- Loading once serve multiply requests

Yaconf

- Wildly used at Weibo

- https://www.github.com/laruence/yaconf

- Alternative: Hidef

Security

Taint

- What is the top security issues in PHP

- XSS, SQL Injection, RCE

Taint

- How taint works

  - echo, print, file_put_contents, die, exit, header etc

  - require, include, eval, fopen etc

  - mysql_query, mysqli_query, PDO::query, PDO::prepare etc

  - system, exec, shell_exec, proc_open etc

  - call_user_func, preg_replace_callback, unserialize etc

Taint

- It is not a cure

- Don't use it in product env since it will slow down the performance

- https://wiki.php.net/rfc/taint

- https://github.com/laruence/taint

- Alternative: RIPS etc

Accelerator

Opcache

- It is not only a opcodes cache

- It also is a opcodes optimizer

  - Contant propagation

  - Dead codes removal

  - Literations compact

  - NOPS removal

  - ...
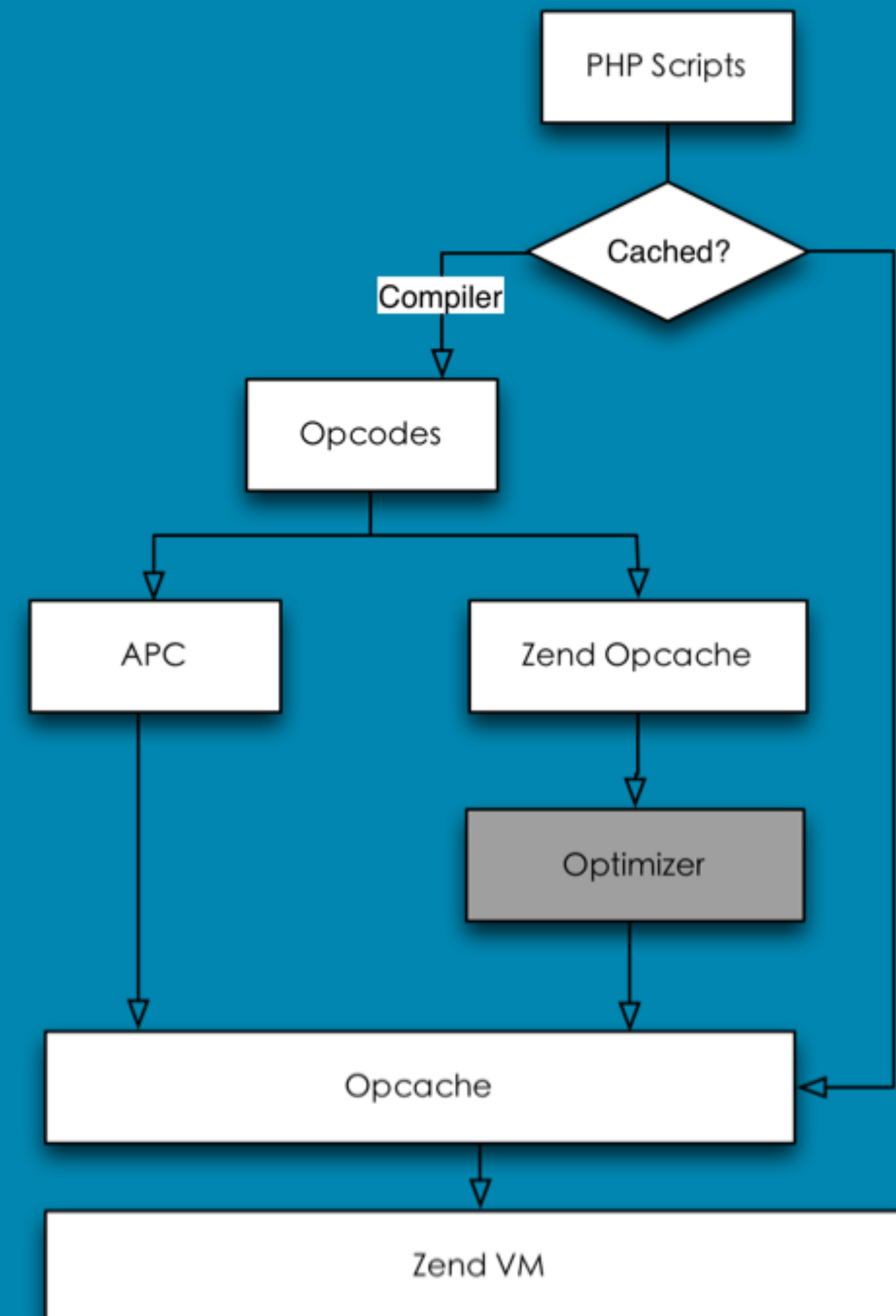
Opcache

- Wildly used everywhere

- Actually, it is shipped with PHP since PHP-5.5

- Always remember to enable it

PHP7

- Yaf 17%

- Yar 10%

- Yac 20%

- Yaconf (only for PHP7)

- Opcache

  - file-based opcodes cache

  - hugepagefy text segment

Q&A