Serverless 前端落地与实践

王俊杰

腾讯 Serverless技术专家

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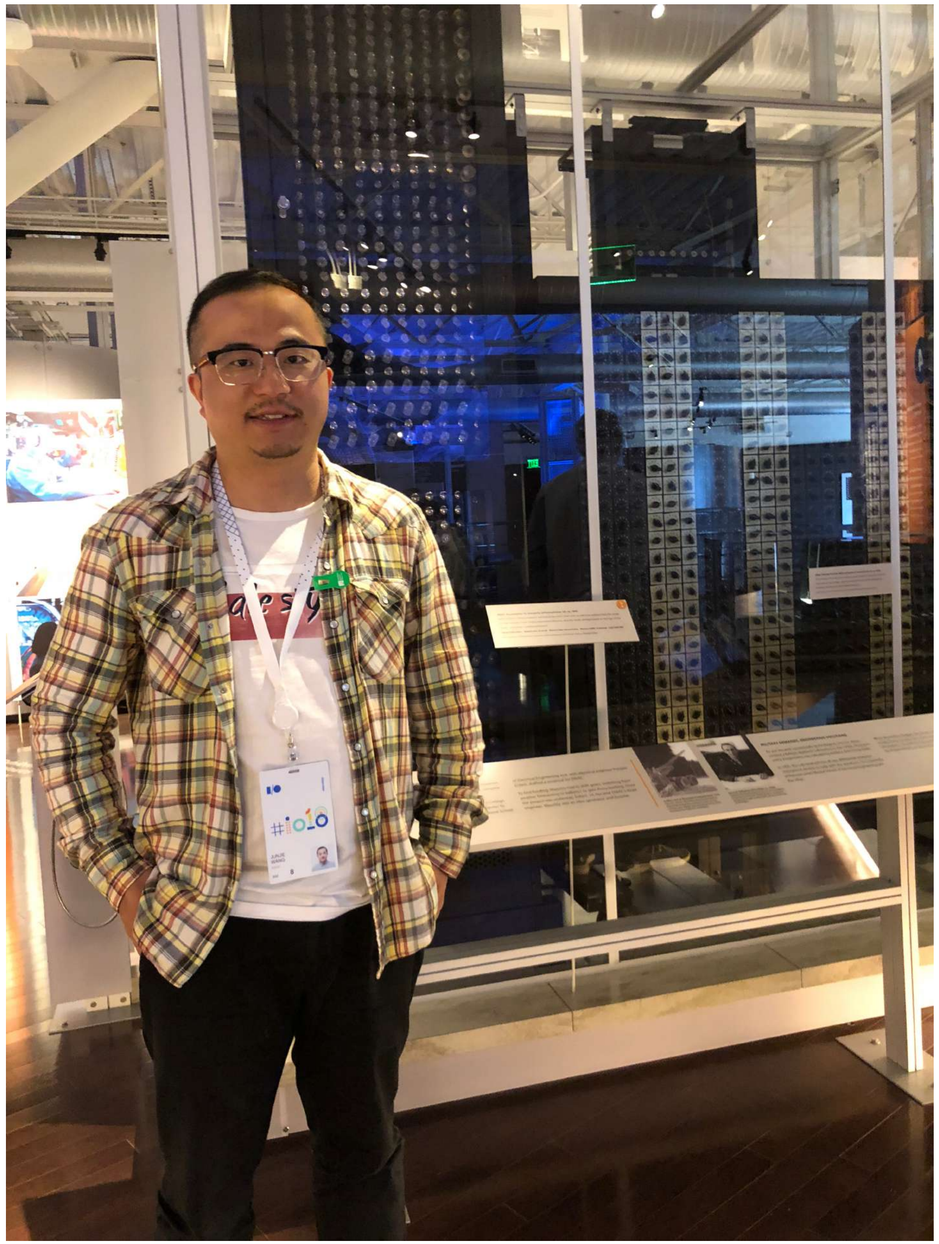
腾讯 Serverless 前端技术专家。

负责腾讯云函数与大前端研发结合方案设计，负责 SCF 云函数编排、Serverless 日志、监控、排障等相关 Topic。

同时担任腾讯云 Serverless 技术推动者，推动 Serverless 技术在行业大前端研发架构中的落地和实践。

曾担任百度搜索前端技术经理，负责百度搜索产品前端研发技术管理工作。



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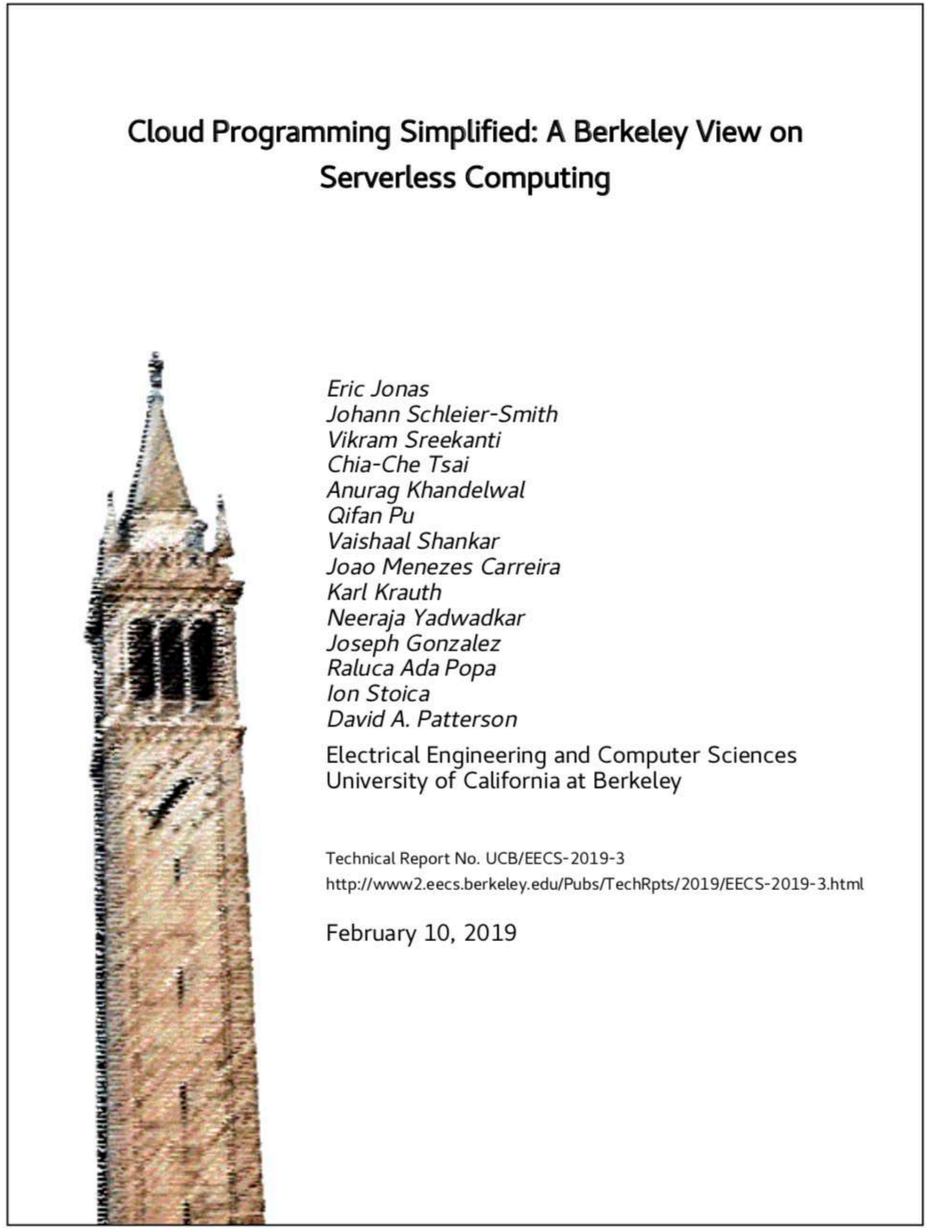
What is Serverless ?

Serverless = FaaS + BaaS ?

What is FaaS ?



Cloud Programming Simplified: A Berkeley View on Serverless Computing

Eric Jonas
Johann Schleier-Smith
Vikram Sreekanti
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Anurag Khandelwal
Qifan Pu
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Karl Krauth
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Electrical Engineering and Computer Sciences
University of California at Berkeley

Technical Report No. UCB/EECS-2019-3
http://www2.eecs.berkeley.edu/Pubs/TechRpts/2019/EECS-2019-3.html

February 10, 2019

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While cloud functions—packaged as FaaS (Function as a Service) offerings—represent the core of serverless computing, cloud platforms also provide specialized serverless frameworks that cater to specific application requirements as BaaS (Backend as a Service) offerings.

Put simply, serverless computing = FaaS + BaaS.

Cloud Programming Simplified: A Berkeley View on Serverless Computing

Eric Jonas, Johann Schleier-Smith, Vikram Sreekanti, Chia-Che Tsai
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Abstract

Serverless cloud computing handles virtually all the system administration operations needed to make it easier for programmers to use the cloud. It provides an interface that greatly simplifies cloud programming, and represents an evolution that parallels the transition from assembly language to high-level programming languages. This paper gives a quick history of cloud computing, including an accounting of the predictions of the 2009 Berkeley View of Cloud Computing paper, explains the motivation for serverless computing, describes applications that stretch the current limits of serverless, and then lists obstacles and research opportunities required for serverless computing to fulfill its full potential. Just as the 2009 paper identified challenges for the cloud and predicted they would be addressed and that cloud use would accelerate, we predict these issues are solvable and that serverless computing will grow to dominate the future of cloud computing.

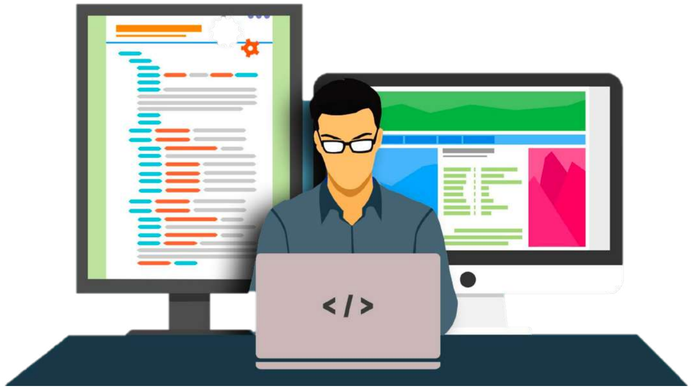
Contents

Serverless cloud computing handles virtually all the system administration operations needed to make it easier for programmers to use the cloud. It provides an interface that greatly simplifies cloud programming, and represents an evolution that parallels the transition from assembly language to high-level programming languages.

算力　　算法　　数据

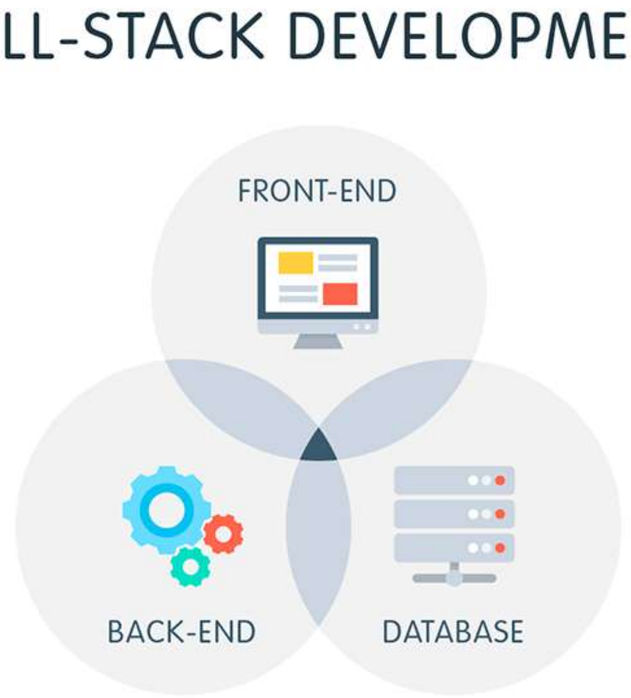
无服务器云计算（Serverless Computing）几乎封装了所有的底层资源管理和系统运维工作，使开发人员更容易使用云基础设施。

它提供了一个方式，极大地简化了基于云服务的编程，犹如汇编语言到高级编程语言般的转换。



Web Developer → Front-end Developer → Full stack Developer

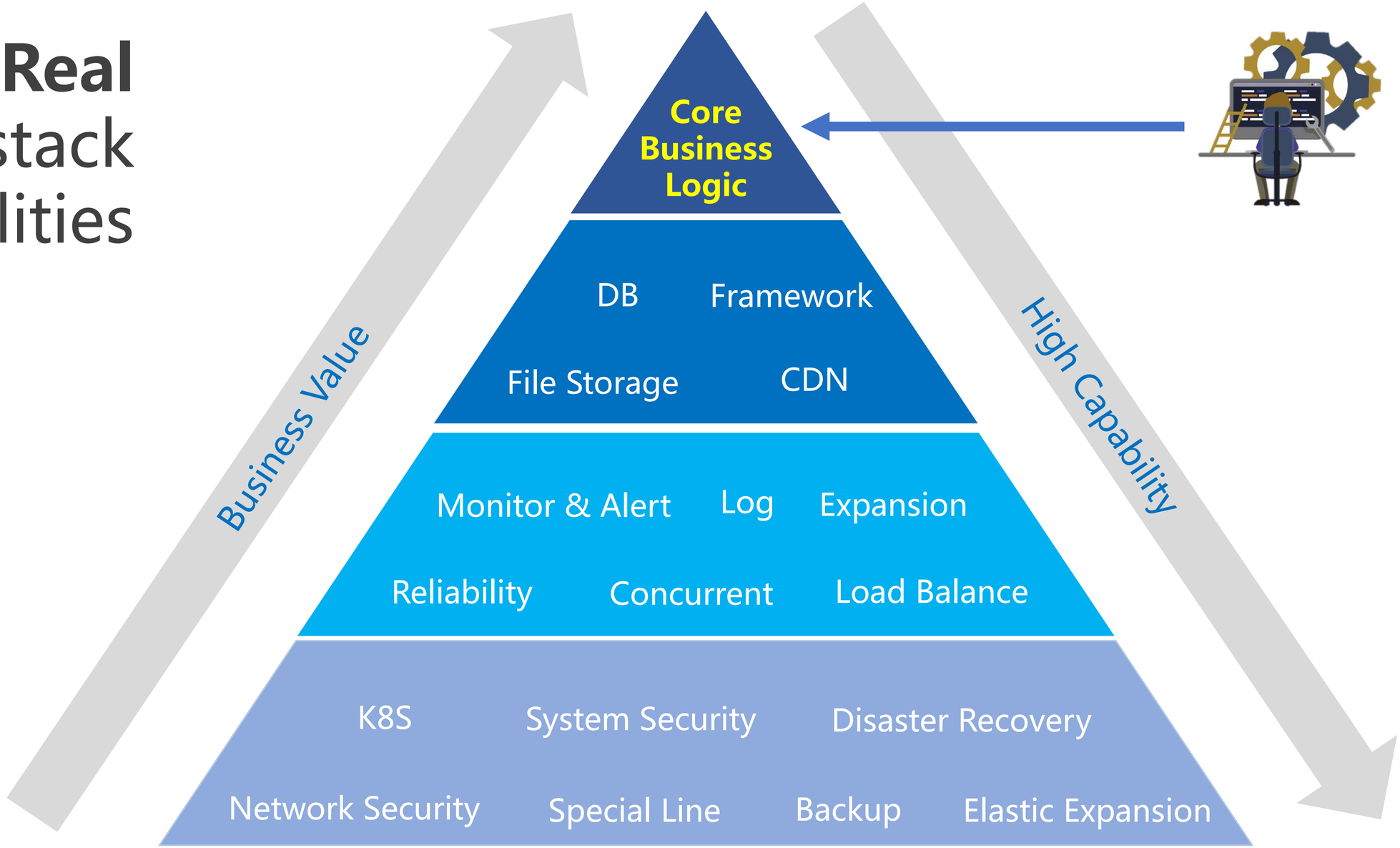
Interface discussion/integration commissioning/ API Dependence

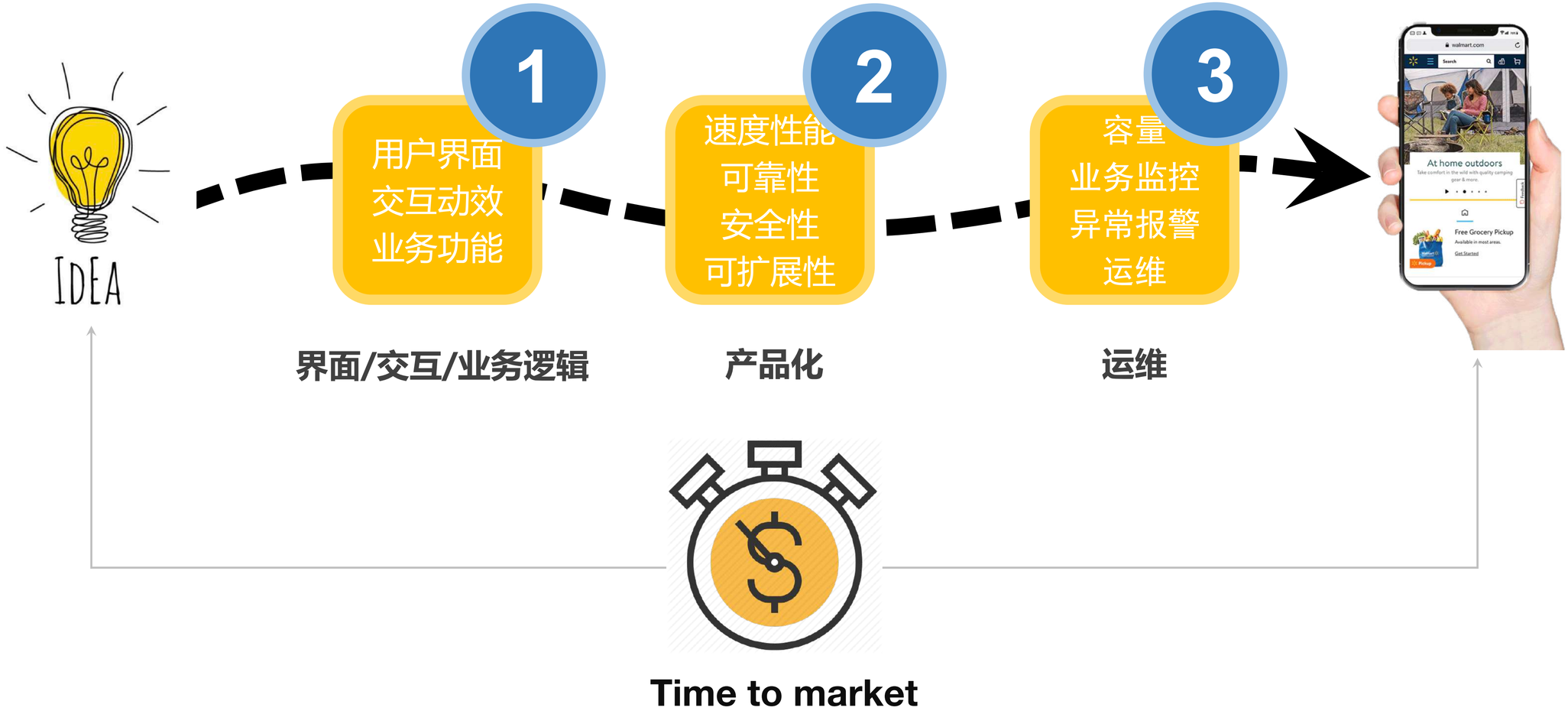


Enhancing the business efficiency.

Full-stack， in eyes of front end developers

Real Full-stack Capabilities

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安全性
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3
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walmart.com
Search
At home outdoors
Take comfort in the wild with quality camping gear & more.
Free Grocery Pickup
Available in most areas.
Get Started
界面/交互/业务逻辑
产品化
运维
Time to market

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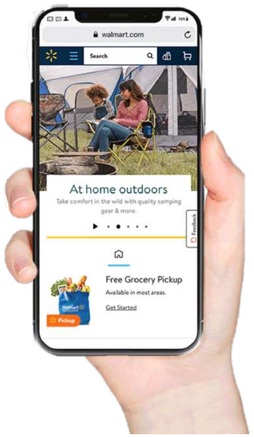
业务功能

2

速度性能
可靠性
安全性
可扩展性

3

容量
业务监控
异常报警
运维



界面/交互/业务逻辑

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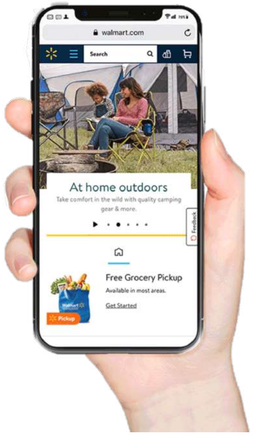

界面/交互/业务逻辑

产品化

运维


ALERTINGMAINTENANCESCALINGMONITORINGA
MONITORINGALERTINGMAINTENANCESCALINGI
SCALINGMONITORINGALERTINGMAINTENANC
E
GMAINTENANCESCALINGMONITORINGALERTING
OPS


Hundreds of lines of code

+


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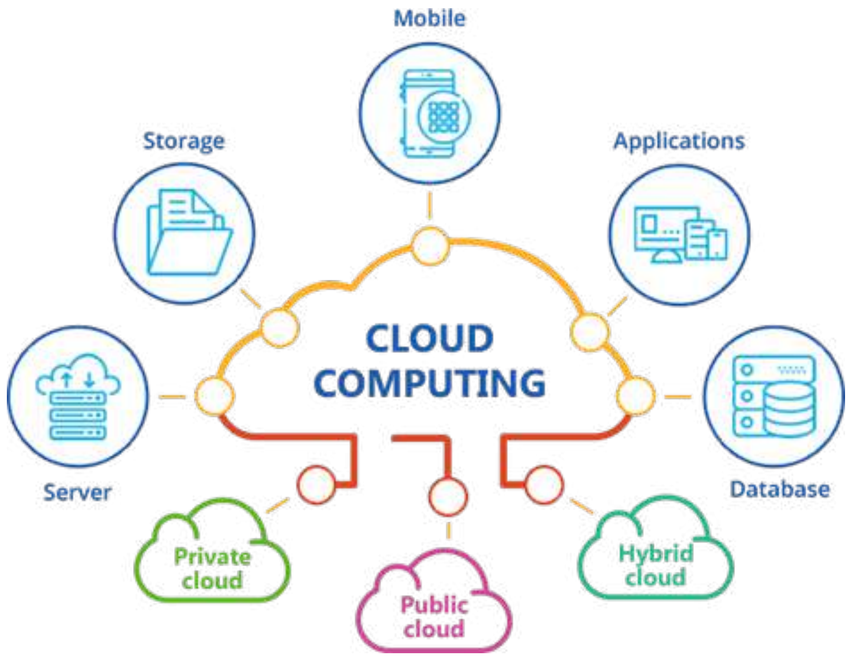
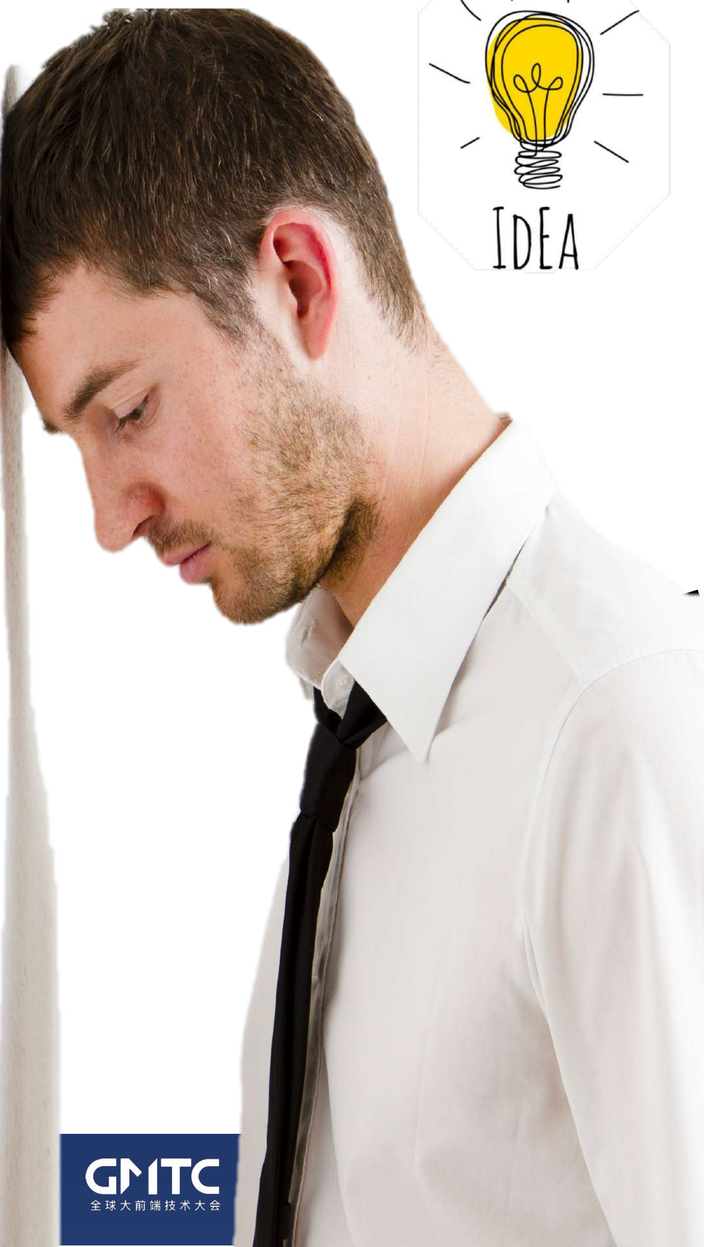

Mobile
Storage
Applications
CLOUD COMPUTING
Server
Database
Private cloud
Public cloud
Hybrid cloud



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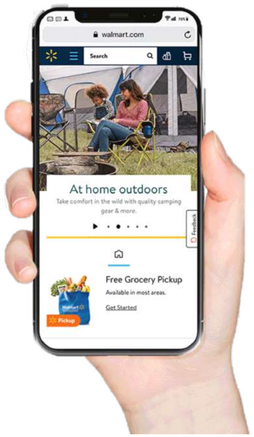

界面/交互/业务逻辑

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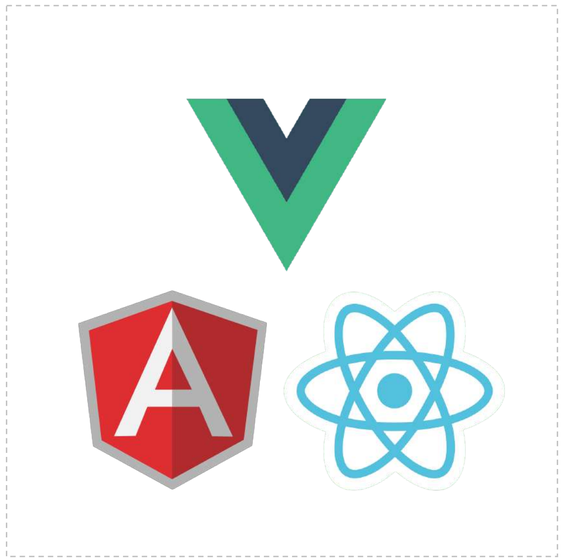


?

组件化

工程化

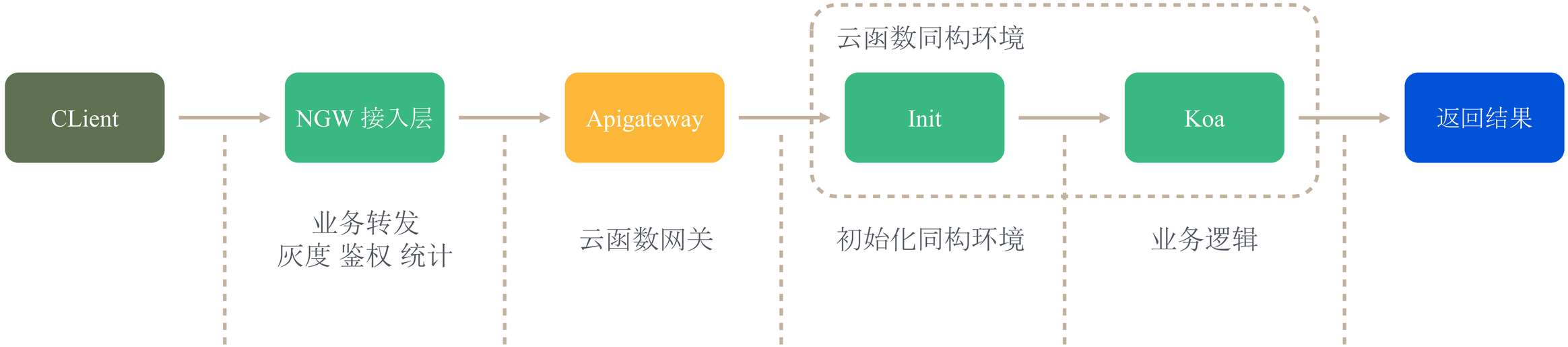
Serverless

Framework or not framework ?

That’s a question !

IVWEB 团队在 Serverless 的业务落地

Serverless 直出渲染（Serverless Render）



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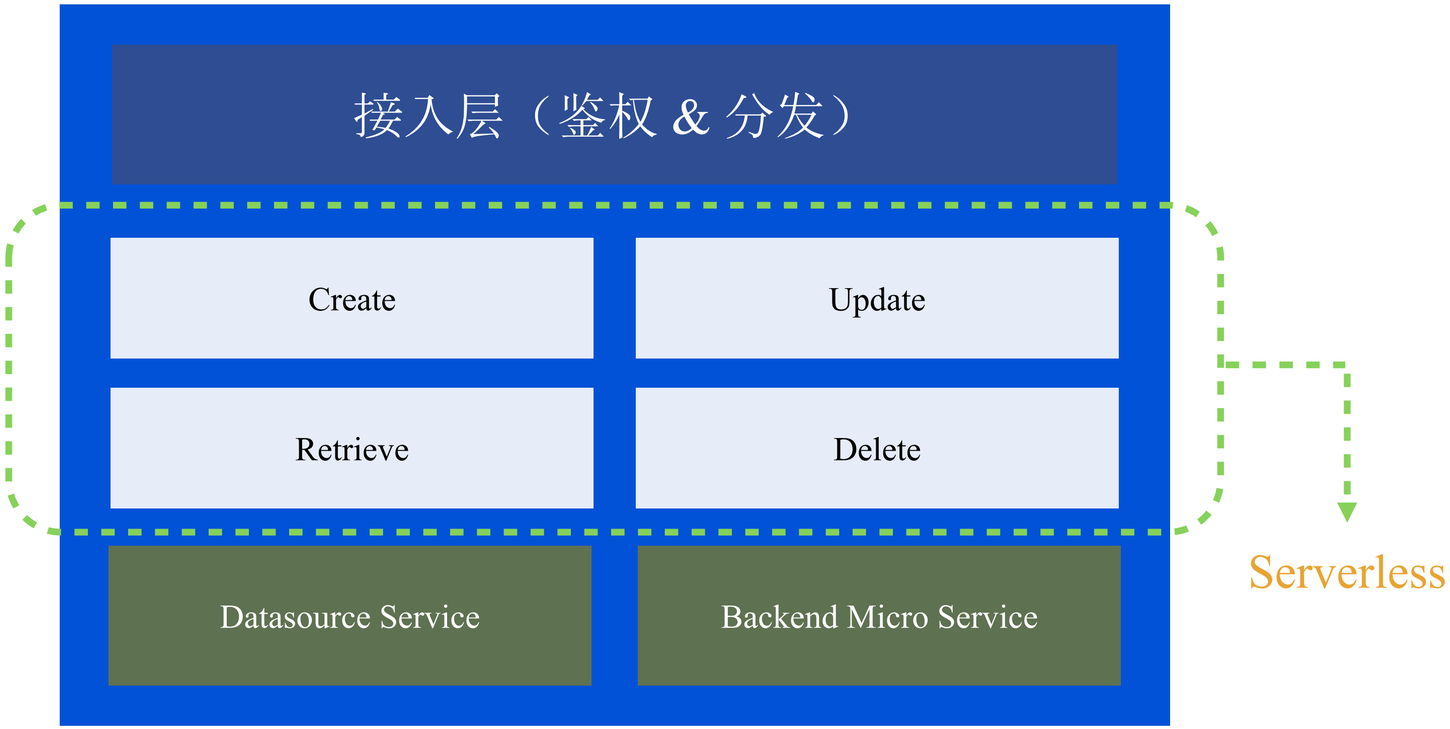
业务上线 & 维护工作量 降低 80%

IVWEB 团队在 Serverless 的业务落地

NOW 直播 B 侧运营平台



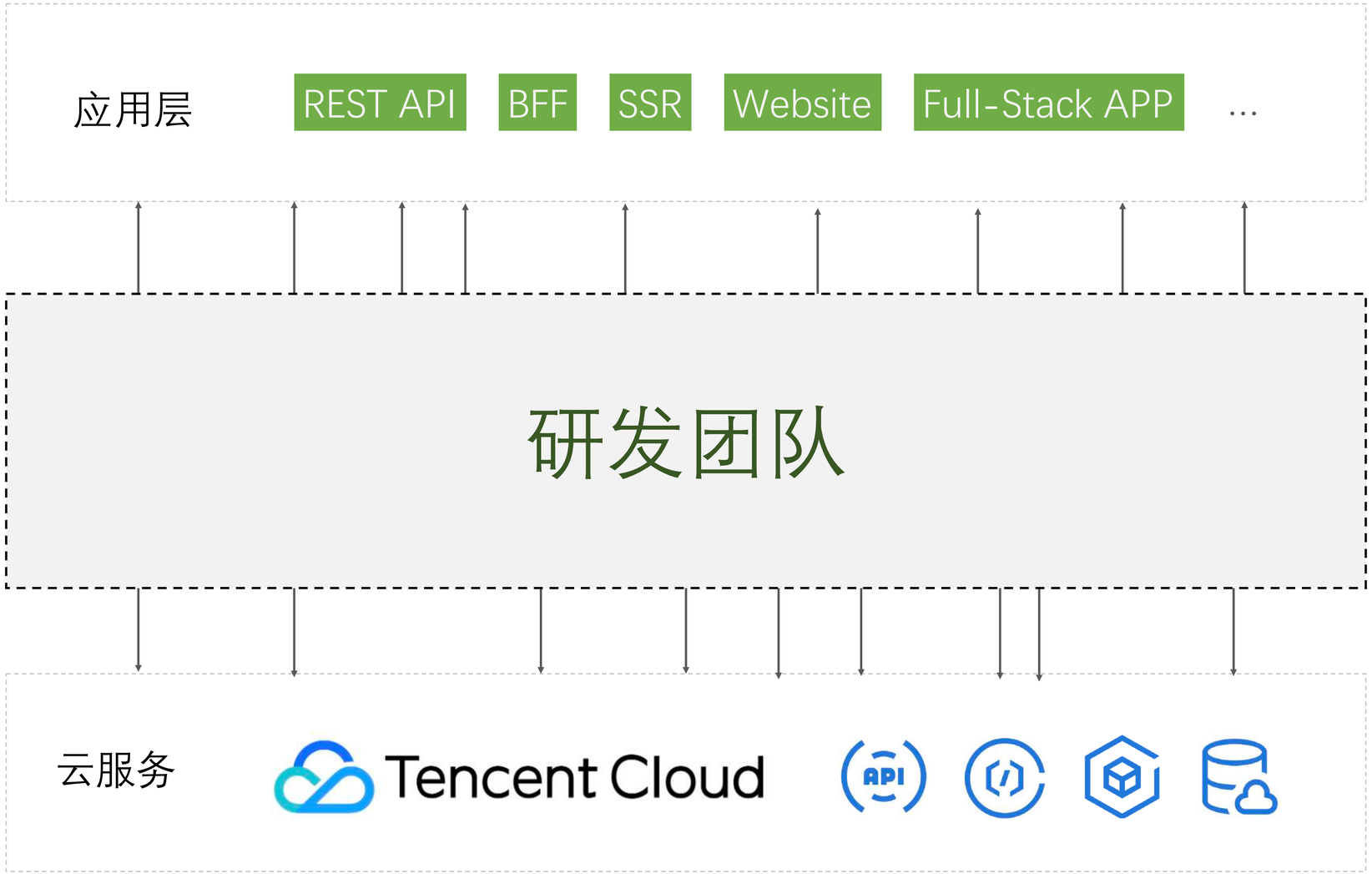
从 BFF 到 SFF

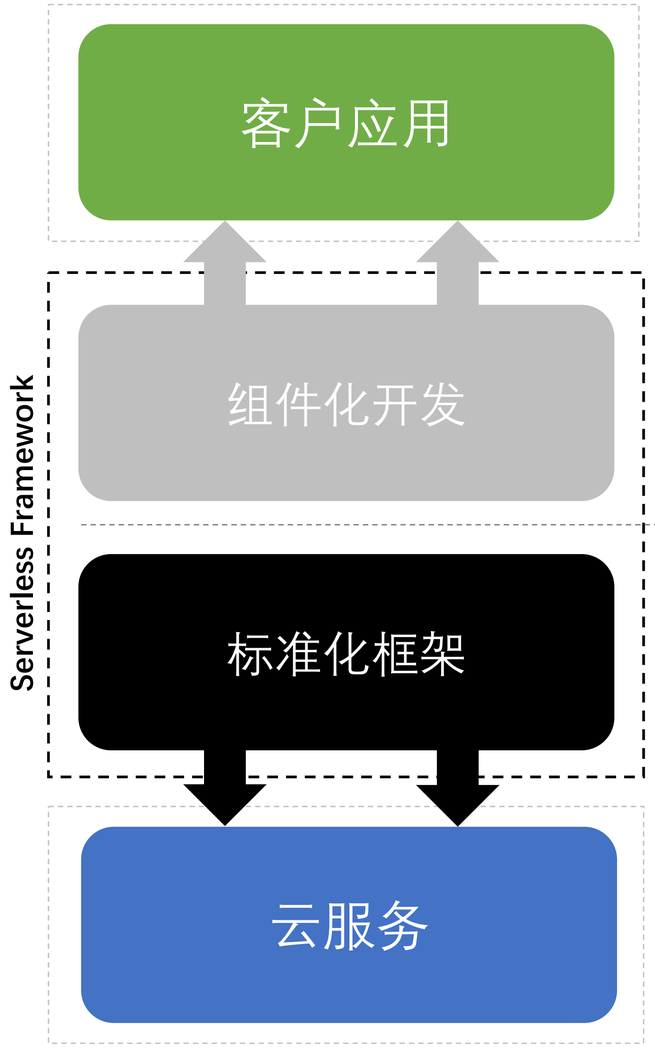
- 提高迭代效率
- 按需取用，用完即走
- 分离部署，安全可靠
- 细粒度的业务逻辑拆分

Framework

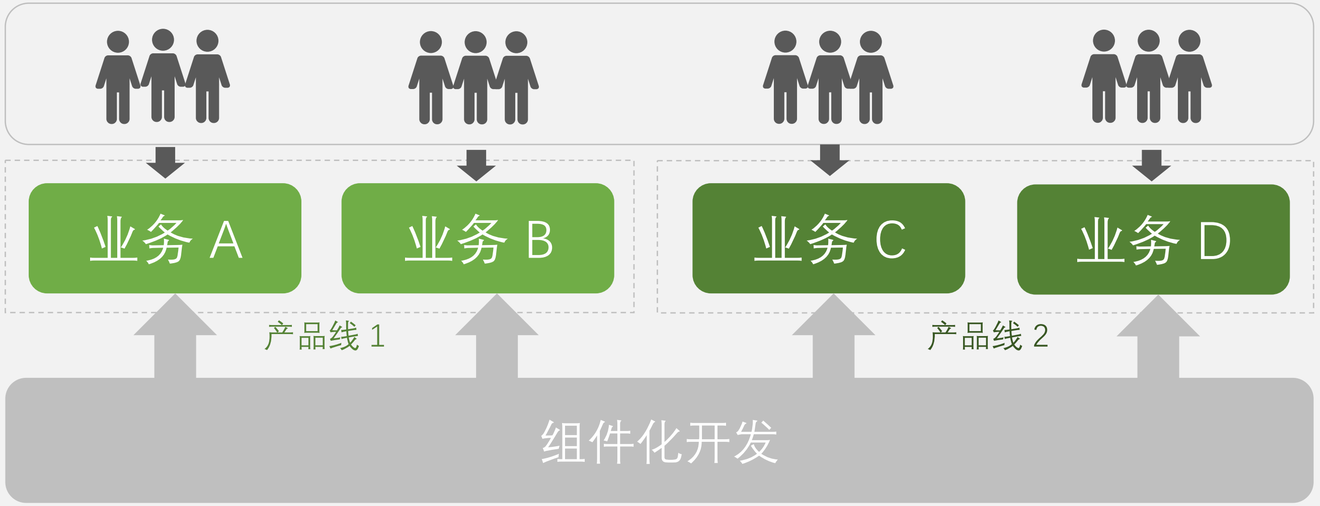
代码重用 | 统一规范 | 降低门槛和难度 | 专注业务逻辑 | 社区优势 | 易于维护 | 提升效率

Serverless的开发模式



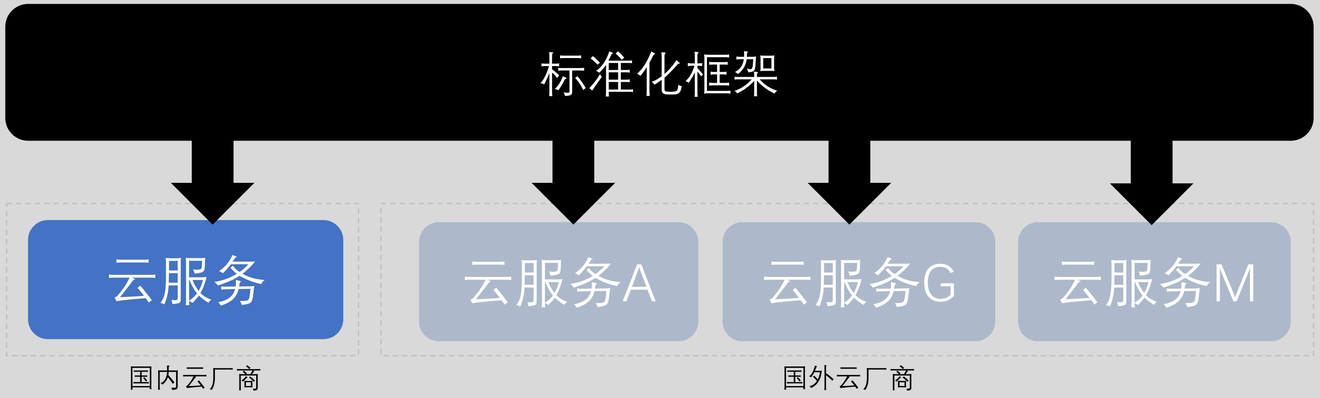


组件化开发



跨产品跨业务可组件复用，提升复用减少重复开发 / 人员技术栈要求相同，利于分工和招聘

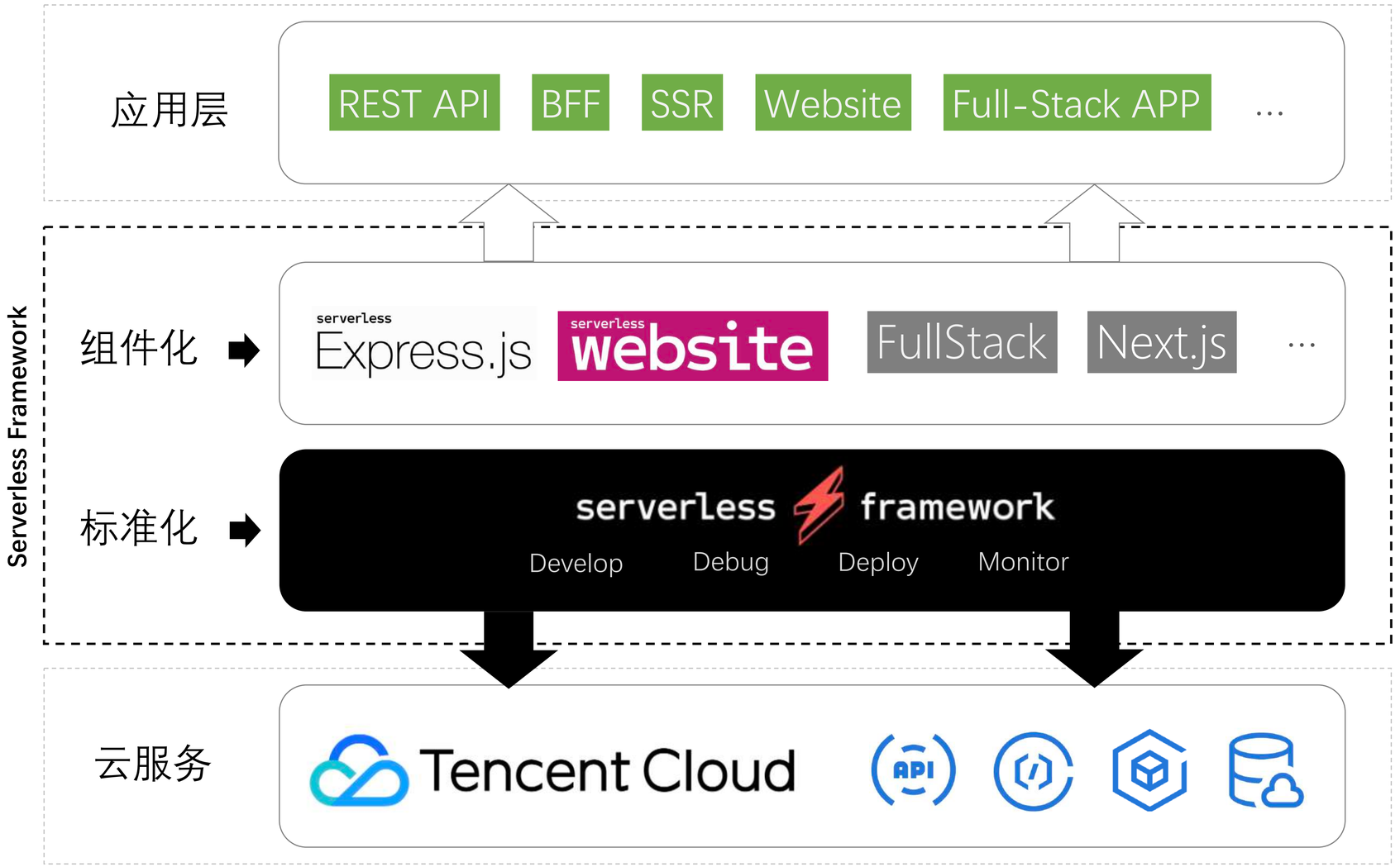
标准化框架



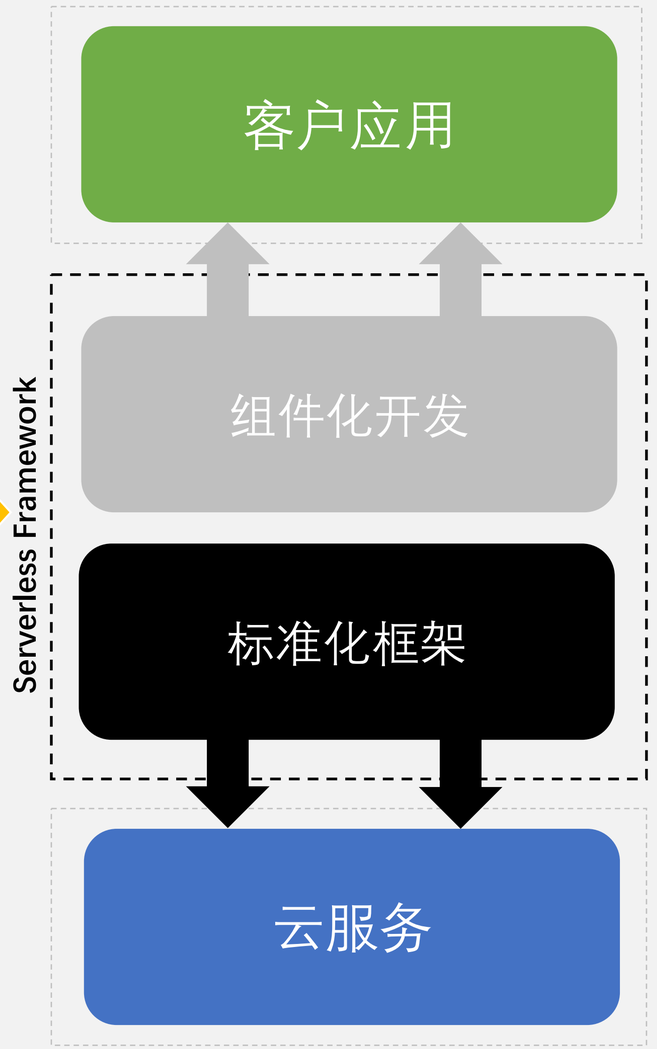
框架完美支持异构的云厂商接口和底层，业务在多云间无缝平滑迁移部署

目录

Serverless Framework 是一个 **标准化、组件化** 的 Serverless 应用开发产品

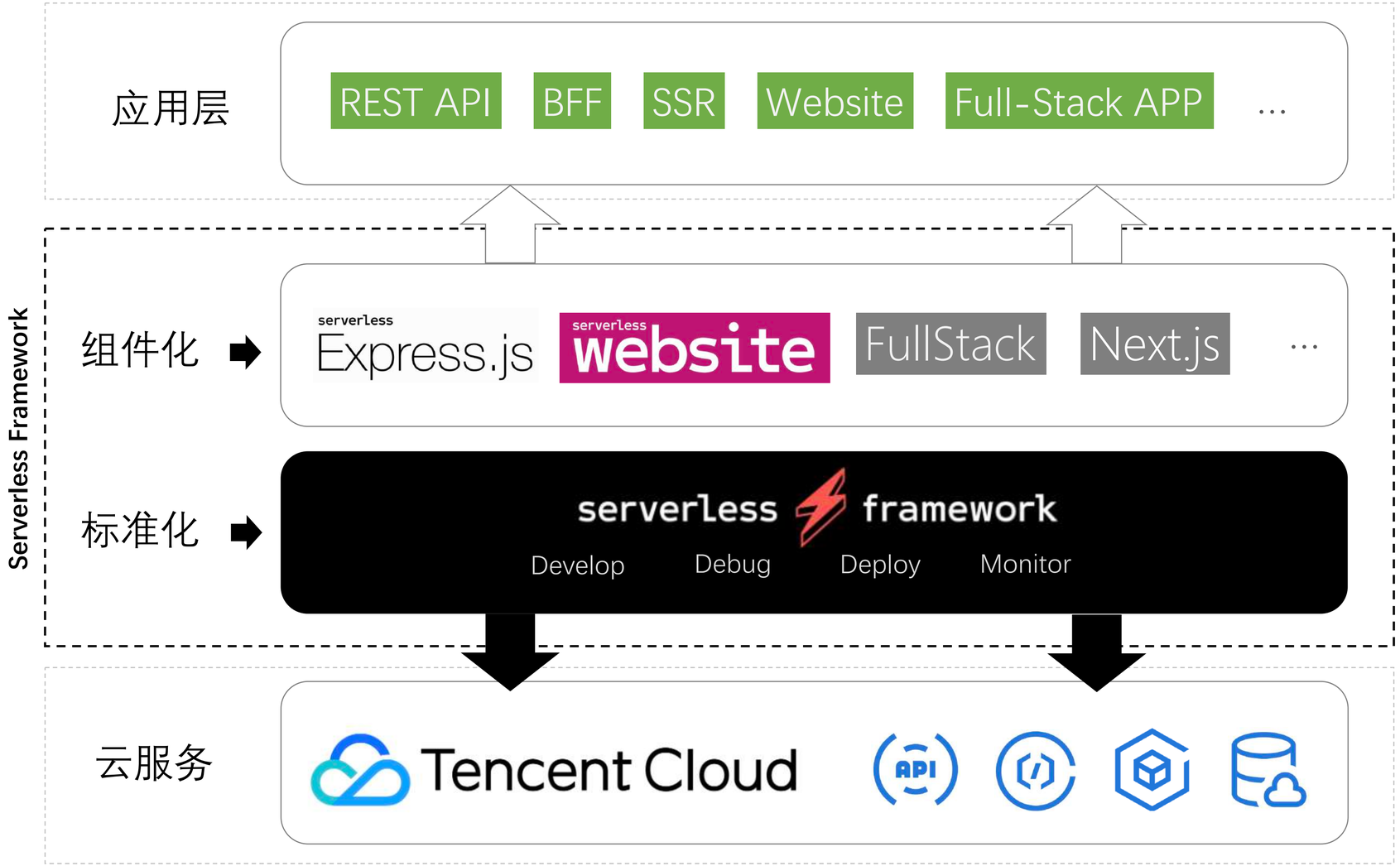


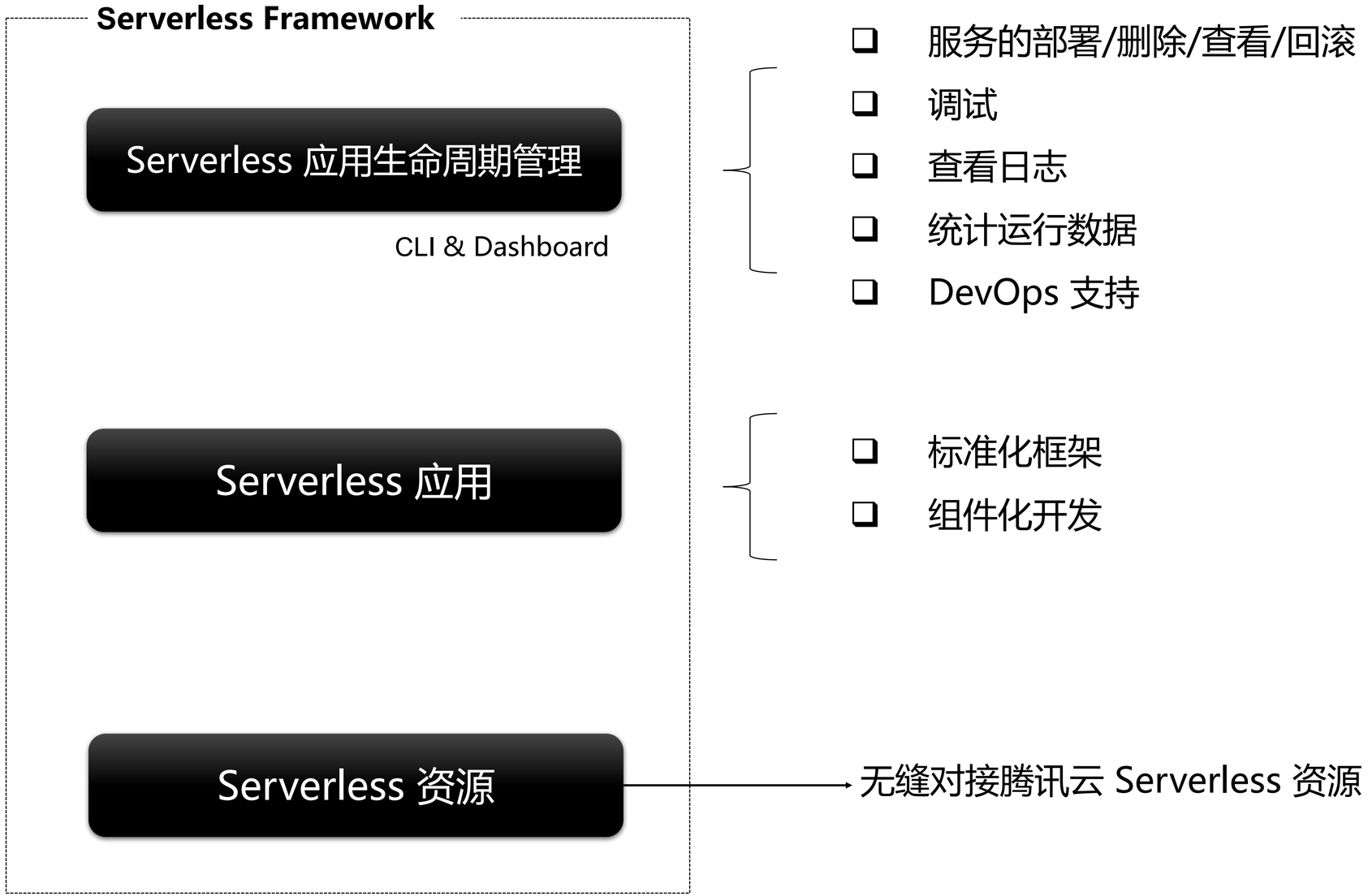
具象结构



抽象结构

Serverless Framework 是一个 **标准化、组件化** 的 Serverless 应用开发产品




Serverless Framework
Serverless 应用生命周期管理
CLI & Dashboard
Serverless 应用
Serverless 资源
服务的部署/删除/查看/回滚
调试
查看日志
统计运行数据
DevOps 支持
标准化框架
组件化开发
无缝对接腾讯云 Serverless 资源

Serverless Framework CLI

```
JENSWANG-MB0:~ jenswang$ serverless -h

Commands
* You can run commands with "serverless" or the shortcut "sls"
* Pass "--verbose" to this command to get in-depth plugin info
* Pass "--no-color" to disable CLI colors
* Pass "--help" after any <command> for contextual help

Interactive Quickstart
* Run serverless (or shortcut sls) without any arguments to initialize an interactive setup
  of functionalities related to given service or current environment
* Pass "--help-interactive" for contextual help on interactive CLI options

Framework
* Documentation: http://slss.io/docs

Environment Variables
* Set SLS_DEBUG=* to see debugging logs
* Set SLS_WARNING_DISABLE=* to hide warnings from the output

config ....................... Configure Serverless
config credentials ........... Configures a new provider profile for the Serverless Framework
config tabcompletion install .. Install a <tab> completion for chosen shell
config tabcompletion uninstall  Uninstall a <tab> completion for chosen shell
create ....................... Create new Serverless service
install ...................... Install a Serverless service from GitHub or a plugin from the Serverless registry
package ...................... Packages a Serverless service
deploy ....................... Deploy a Serverless service
deploy function .............. Deploy a single function from the service
deploy list .................. List deployed version of your Serverless Service
deploy list functions ........ List all the deployed functions and their versions
invoke ....................... Invoke a deployed function
invoke local ................. Invoke function locally
info ......................... Display information about the service
logs ......................... Output the logs of a deployed function
metrics ...................... Show metrics for a specific function
print ........................ Print your compiled and resolved config file
remove ....................... Remove Serverless service and all resources
rollback ..................... Rollback the Serverless service to a specific deployment
rollback function ............ Rollback the function to the previous version
slstats ...................... Enable or disable stats
plugin ....................... Plugin management for Serverless
plugin install ............... Install and add a plugin to your service
plugin uninstall ............. Uninstall and remove a plugin from your service
plugin list .................. Lists all available plugins
plugin search ................ Search for plugins
login ........................ Login or sign up for Serverless
logout ....................... Logout from Serverless
generate-event ............... Generate event
test ......................... Run HTTP tests
dashboard .................... Open the Serverless dashboard
```

Serverless Components

```yaml
# serverless.yml

myBucket:
  component: '@serverless/tencent-cos'
  inputs:
    bucket: my-bucket
```

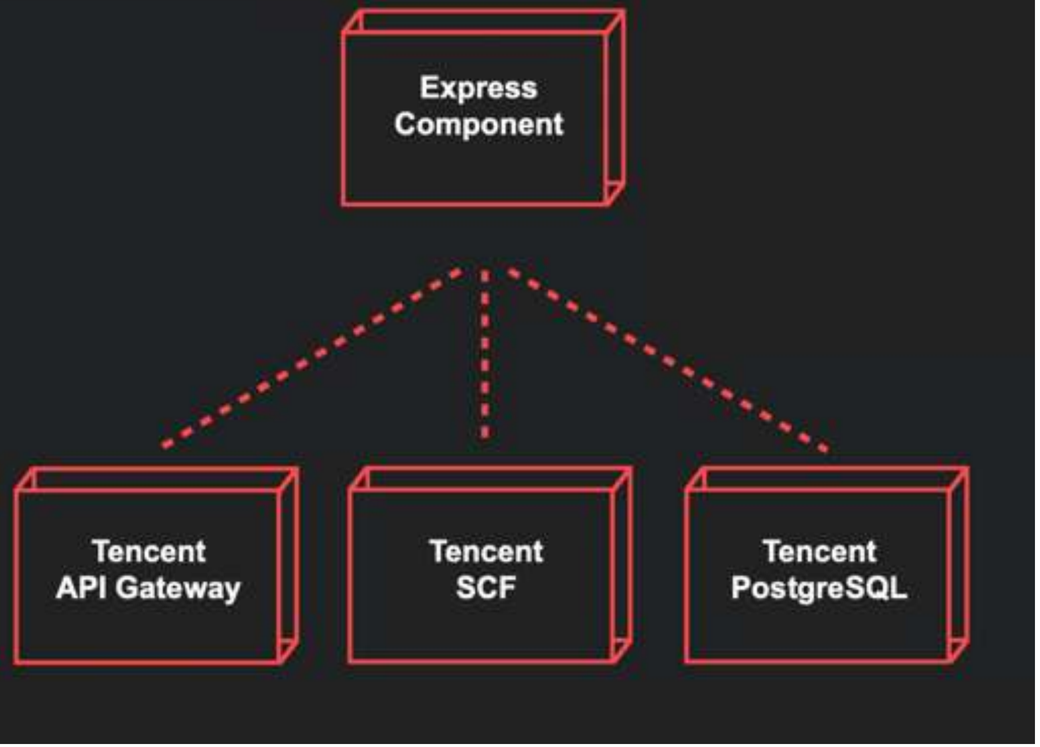
npm 模块，基于YAML配置文件，针对云服务的资源进行使用和配置

Serverless Components

流式处理，借助云API结合

```yaml
# serverless.yml

express:
  component: '@serverless/tencent-express'
  inputs:
    functionName: eslam-function
    serviceName: mytest
    code: ./code
    functionConf:
      timeout: 10
      memorySize: 128
      environment:
        variables:
          TEST: vale
    apigatewayConf:
      protocol: https
      environment: test
      usagePlan:
        usagePlanName: slscmp
        maxRequestNum: 1000
    postgresConf:
      region: ap-beijing
      dBInstanceName: postgres-ec289zvy
```



Serverless Component 代码结构

```
// serverless.js
const { Component } = require('@serverless/core')
class MyComponent extends Component {
  /*
   * Default (必须)
   * - default 是用来执行、准备和更新你的组建的函数
   * - 执行命令 `$ serverless` 会运行此函数
   * - You can run this function by running the "$ serverless" command
   */
  async default(inputs = {}) {
    return {}
  }

  /*
   * Remove (可选)
   * - 如果你的组件需要删除基础设施，推荐你添加他
   * - 执行命令 `$ serverless remove` 会运行此函数
   */
  async remove(inputs = {}) {
    return {}
  }

  /*
   * Anything (可选)
   * - 如果你想发布带有额外功能的组件，你可以将逻辑写在一个函数里，函数名可以自定义
   * - 执行命令 `$ serverless anything` 会运行此函数
   */
  async anything(inputs = {}) {
    return {}
  }
}
module.exports = MyComponent
```

Serverless Full-stack Application

通过组装集成组件形成高阶组件

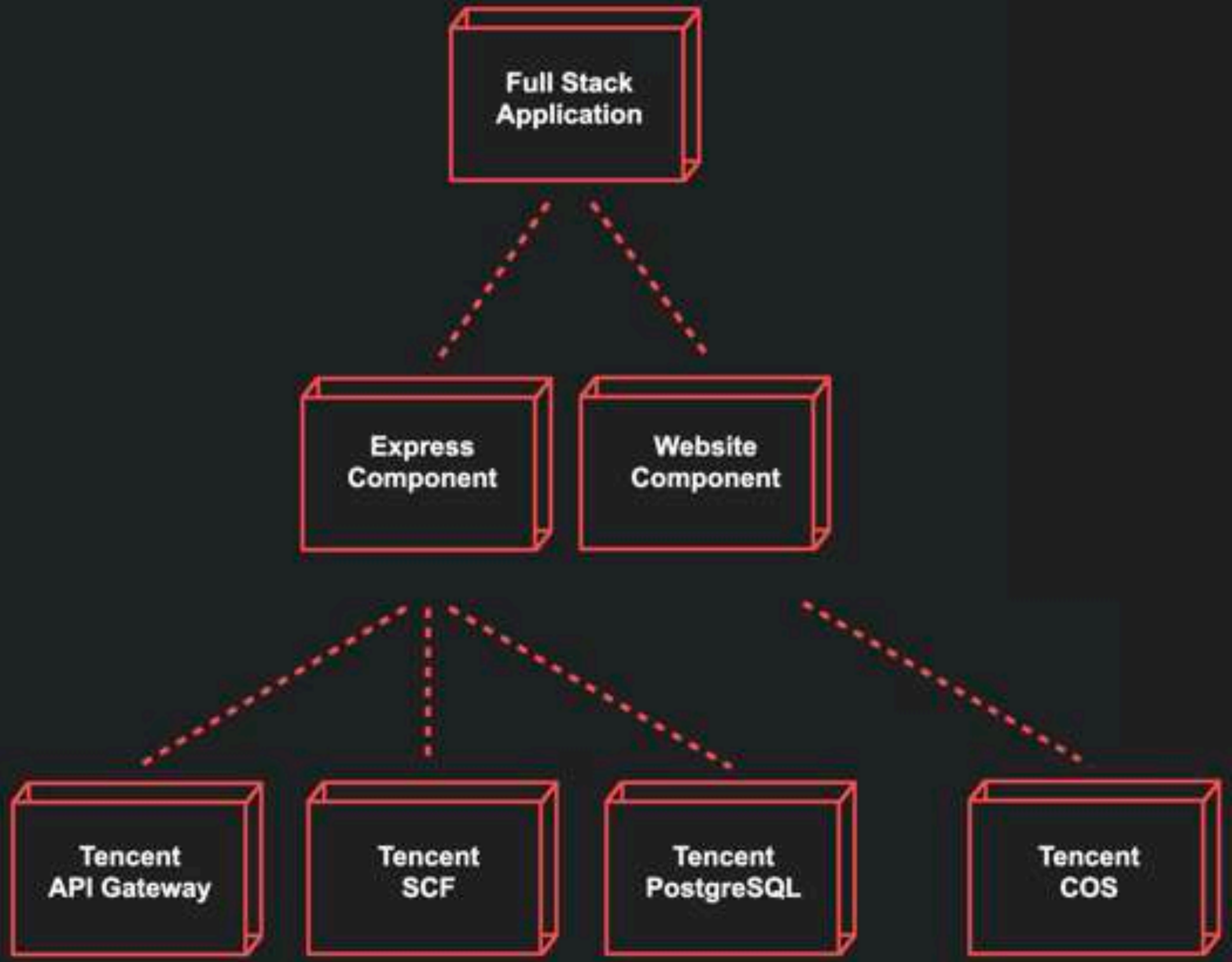
```yaml
# serverless.yml

name: fullstack-application-postgres

frontend:
  component: '@serverless/tencent-website'
  inputs:
    protocol: https
    code:
      src: dist
      root: frontend
      hook: npm run build
    env:
      apiUrl: ${api.url}

api:
  component: '@serverless/tencent-express'
  inputs:
    region: ap-beijing
    code: ./api
    functionName: fullstack-api-pg
    role: execute-scf
    apigatewayConf:
      protocol: https

postgres:
  component: '@serverless/tencent-postgres'
  inputs:
    region: ap-beijing
```

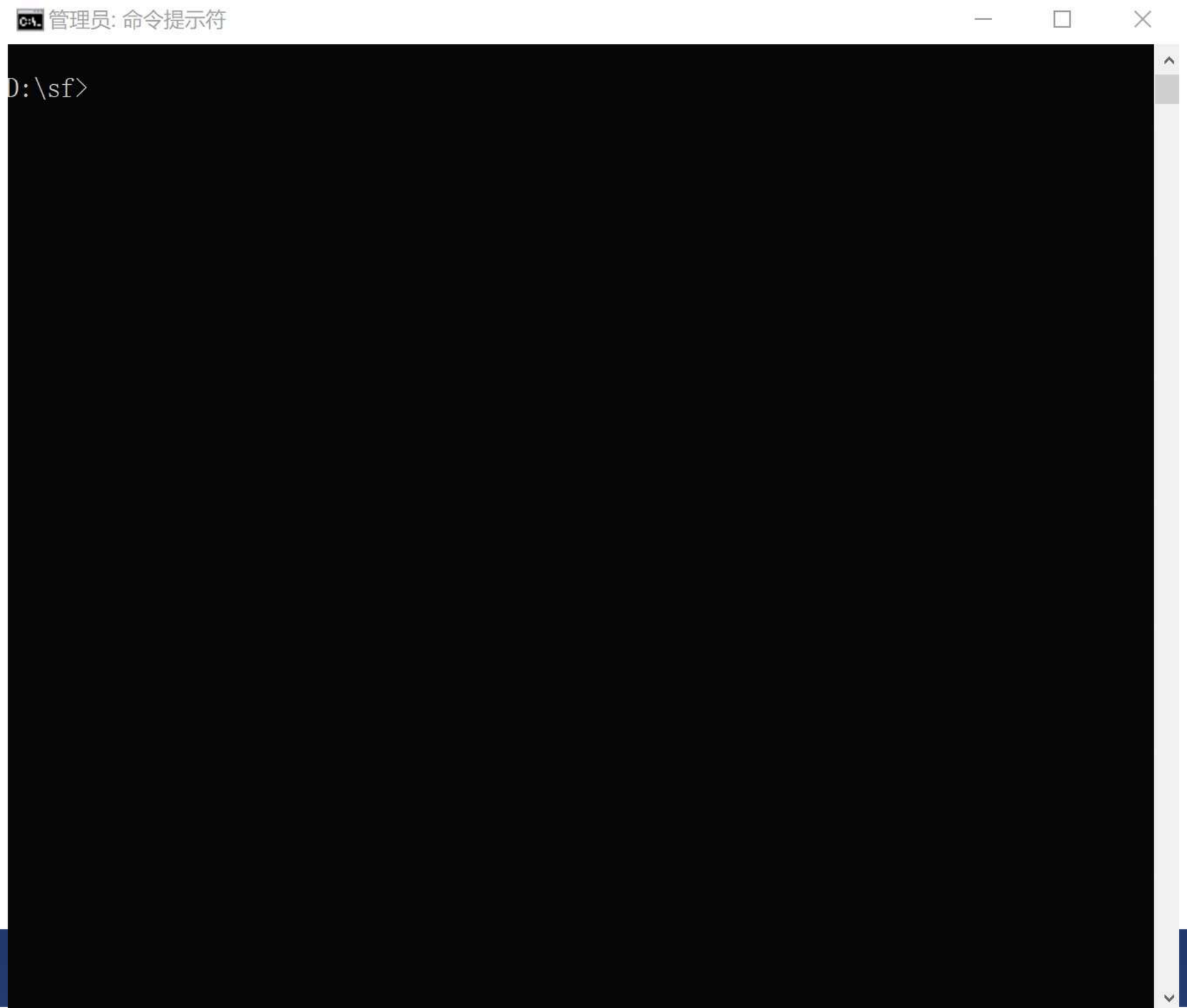


目录

Live Code

+

serverless framework


管理员: 命令提示符
D:\sf>

a Website

- HTTP Server
- HTTPS SSL 证书
- 对象存储COS
- CDN
- Domain CNAME
- 进程监控/自动重启
- 防攻击/DDos
- 日志清理
- 数据分析/日志挖掘


Tencent Cloud
provider
serverless framework
serverless
Express.js
serverless framework + Tencent Cloud
serverless
website
serverless framework + Tencent Cloud
serverless
Flask
serverless framework + Tencent Cloud
serverless
React
serverless framework + Tencent Cloud
serverless
Vue.js
serverless framework + Tencent Cloud
serverless
{ REST }
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serverless
Slim
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serverless
fastify
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serverless
PostgreSQL
serverless framework + Tencent Cloud
serverless
django
serverless framework + Tencent Cloud
serverless
Laravel
serverless framework + Tencent Cloud

https://github.com/serverless-components/tencent-express

serverless

Express.js

1. 安装

通过 npm 安装 serverless

```
$ npm install -g serverless
```

serverless
Express.js

2. 创建

本地创建 `serverless.yml` 文件：

```
$ touch serverless.yml
```

初始化一个新的 npm 包，并安装 Express：

```
npm init               # 创建后持续回车
npm i --save express   # 安装express
```

创建一个 `app.js` 文件，并在其中创建您的 Express App：

```
const express = require('express')
const app = express()

app.get('/', function(req, res) {
  res.send('Hello Express')
})

// don't forget to export!
module.exports = app
```

serverless

Express.js

3. 配置

在 serverless.yml 中进行如下配置

```yaml
# serverless.yml

express:
  component: '@serverless/tencent-express'
  inputs:
    region: ap-shanghai
```

```yaml
# serverless.yml

express:
  region: ap-shanghai
  component: '@serverless/tencent-express'
  inputs:
    region: ap-shanghai
    functionName: eslam-function
    serviceName: mytest
    serviceId: service-np1uloxw
    code: ./code
    functionConf:
      timeout: 10
      memorySize: 128
      environment:
        variables:
          TEST: vale
      vpcConfig:
        subnetId: ''
        vpcId: ''
    apigatewayConf:
      protocols:
        - http
        - https
      environment: test
      usagePlan:
        usagePlanId: 1111
        usagePlanName: slscmp
        usagePlanDesc: sls create
        maxRequestNum: 1000
      auth:
        serviceTimeout: 15
        secretName: secret
        secretIds:
          - AKIDNSdvdFcJ8GJ9th6qeZH0ll8r7dE6HHaSuchJ
```

serverless
Express.js

4. 部署

您可以直接通过 `微信` 扫描命令行中的二维码进行授权登陆和注册。

通过 `sls` 命令进行部署，并可以添加 `--debug` 参数查看部署过程中的信息

```
$ sls --debug

  DEBUG — Resolving the template's static variables.
  DEBUG — Collecting components from the template.
  DEBUG — Downloading any NPM components found in the template.
  DEBUG — Analyzing the template's components dependencies.
  DEBUG — Creating the template's components graph.
  DEBUG — Syncing template state.
  DEBUG — Executing the template's components graph.
  DEBUG — Compressing function ExpressComponent_7xRrrd file to /Users/dfounderliu/Desktop/temp/code/.ser
  DEBUG — Compressed function ExpressComponent_7xRrrd file successful
  DEBUG — Uploading service package to cos[sls-cloudfunction-ap-shanghai-code]. sls-cloudfunction-defaul
  DEBUG — Uploaded package successful /Users/dfounderliu/Desktop/temp/code/.serverless/ExpressComponent_
  DEBUG — Creating function ExpressComponent_7xRrrd
  DEBUG — Created function ExpressComponent_7xRrrd successful
  DEBUG — Starting API-Gateway deployment with name express.TencentApiGateway in the ap-shanghai region
  DEBUG — Using last time deploy service id service-n0vs2ohb
  DEBUG — Updating service with serviceId service-n0vs2ohb.
  DEBUG — Endpoint ANY / already exists with id api-9z60urs4.
  DEBUG — Updating api with api id api-9z60urs4.
  DEBUG — Service with id api-9z60urs4 updated.
  DEBUG — Deploying service with id service-n0vs2ohb.
  DEBUG — Deployment successful for the api named express.TencentApiGateway in the ap-shanghai region.

  express:
    region:              ap-shanghai
    functionName:        ExpressComponent_7xRrrd
    apiGatewayServiceId: service-n0vs2ohb
    url:                 http://service-n0vs2ohb-1300415943.ap-shanghai.apigateway.myqcloud.com/release/

  36s › express › done
```

serverless
Express.js

5. 移除

通过以下命令移除部署的存储桶

```
$ sls remove --debug

  DEBUG — Flushing template state and removing all components.
  DEBUG — Removed function ExpressComponent_MHrAzr successful
  DEBUG — Removing any previously deployed API. api-kf2hxrhc
  DEBUG — Removing any previously deployed service. service-4ndfl6pz

  13s › express › done
```

koa

next generation web framework for node.js

基于 Serverless 的 koa 和 egg 的 component，已由社区开发者贡献

What’s next?

将于近期发布...

- 实时日志
- 远程调试
- Serverless DB
- 监控平台

学习资源

中文技术社区

https://serverlessCloud.cn

官网

https://serverless.com

https://serverless.com/cn (即将上线)

Github

https://github.com/serverless

https://github.com/serverless-components

腾讯云文档

https://cloud.tencent.com/product/sf

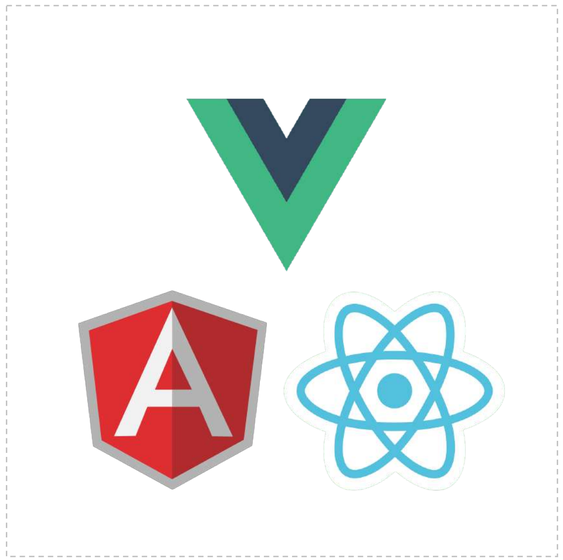
总结

前端与 Serverless 的不解之缘

Serverless 前端工程化的基本思路

Serverless Framework 原理

Serverless Now



Serverless Framework

组件化

工程化

Serverless

Austen

CEO and founder of serverless.com

Serverless is the future of the cloud. Serverless is like superpowers for developers. We believe the future is all about developers and serverless especially empowers developers because it enables them to build more manage less.

THANKS

GMTC
全球大前端技术大会