Ant Technology

mPaaS Overview
User Guide

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Document conventions

Style	Description	Example
Danger	A danger notice indicates a situation that will cause major system changes, faults, physical injuries, and other adverse results.	**Danger:** Resetting will result in the loss of user configuration data.
Warning	A warning notice indicates a situation that may cause major system changes, faults, physical injuries, and other adverse results.	**Warning:** Restarting will cause business interruption. About 10 minutes are required to restart an instance.
Notice	A caution notice indicates warning information, supplementary instructions, and other content that the user must understand.	**Notice:** If the weight is set to 0, the server no longer receives new requests.
Note	A note indicates supplemental instructions, best practices, tips, and other content.	**Note:** You can use Ctrl + A to select all files.
>	Closing angle brackets are used to indicate a multi-level menu cascade.	Click **Settings**> **Network**> **Set network type**.
Bold	Bold formatting is used for buttons , menus, page names, and other UI elements.	Click **OK**.
`Courier font`	Courier font is used for commands	Run the `cd /d C:/window` command to enter the Windows system folder.
Italic	Italic formatting is used for parameters and variables.	`bae log list --instanceid` *Instance_ID*
[] or [a|b]	This format is used for an optional value, where only one item can be selected.	`ipconfig [-all|-t]`
{} or {a|b}	This format is used for a required value, where only one item can be selected.	`switch {active|stand}`

Table of Contents

1.What is mPaaS

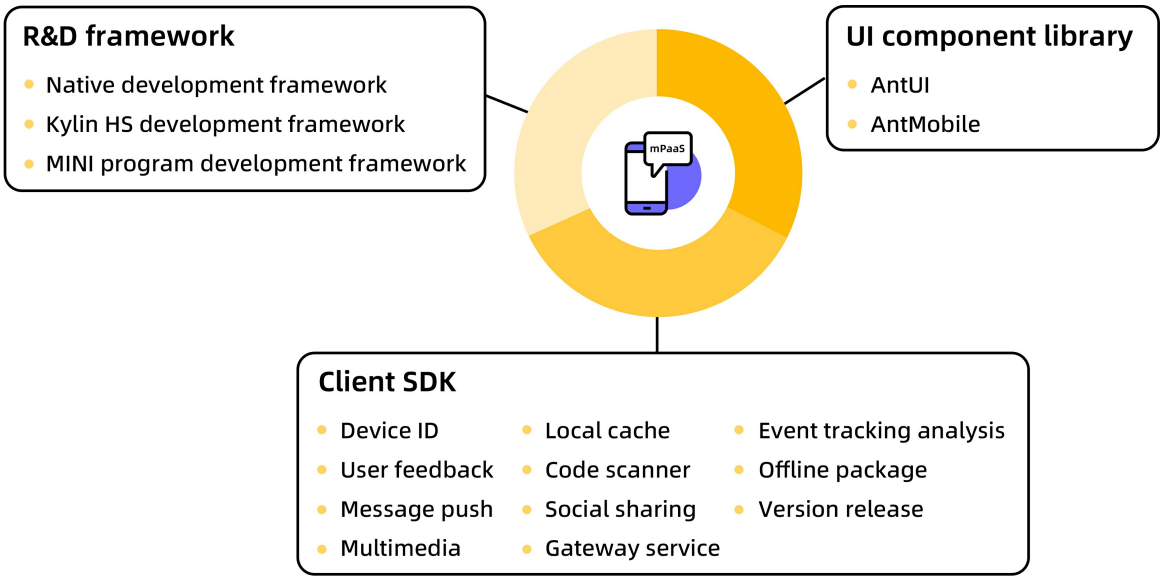
mPaaS (Mobile PaaS) is a mobile development platform originated from AliPay App, providing cloud-to-end one-stop solution for mobile development, testing, maintenance, and operation. mPaaS can effectively lower technological barrier, reduce R&D cost, improve development efficiency and facilitate the enterprise to build a stable high-quality mobile App rapidly.

Advantages

Dynamic and flexible client capabilities

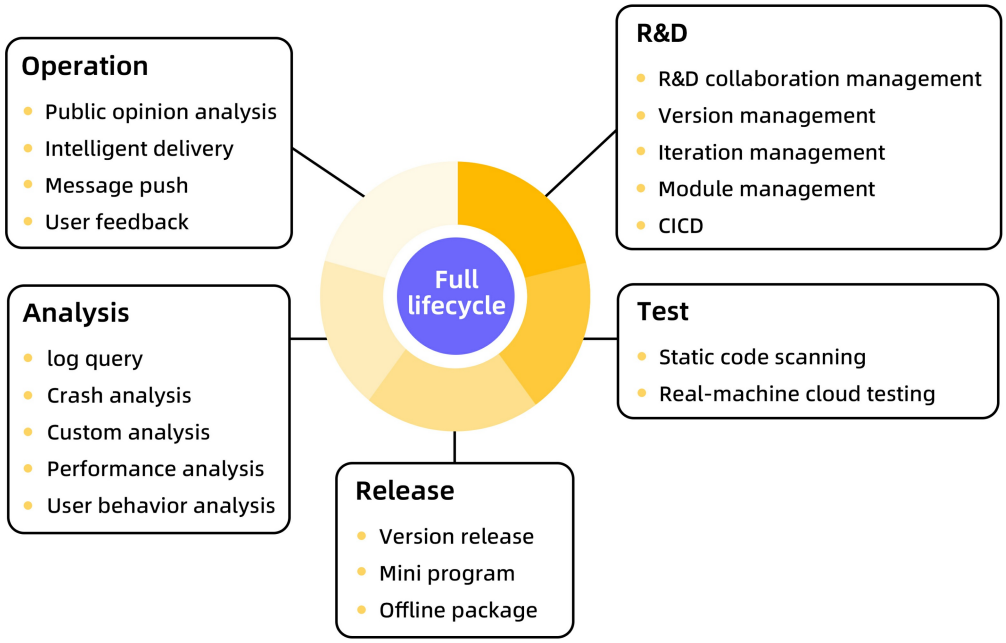
As a developer, you can effectively improve development efficiency and create an ultimate App experience with the help of the following dynamic and flexible client capabilities:

- 3 development frameworks: Native development framework, Kylin HTML5 development framework, and Mini development framework.
- 20+ functional components, such as gateway service, event tracking analysis, user feedback, message push, offline package.
- 100+ UI controls, including AntUI and AntMobile.



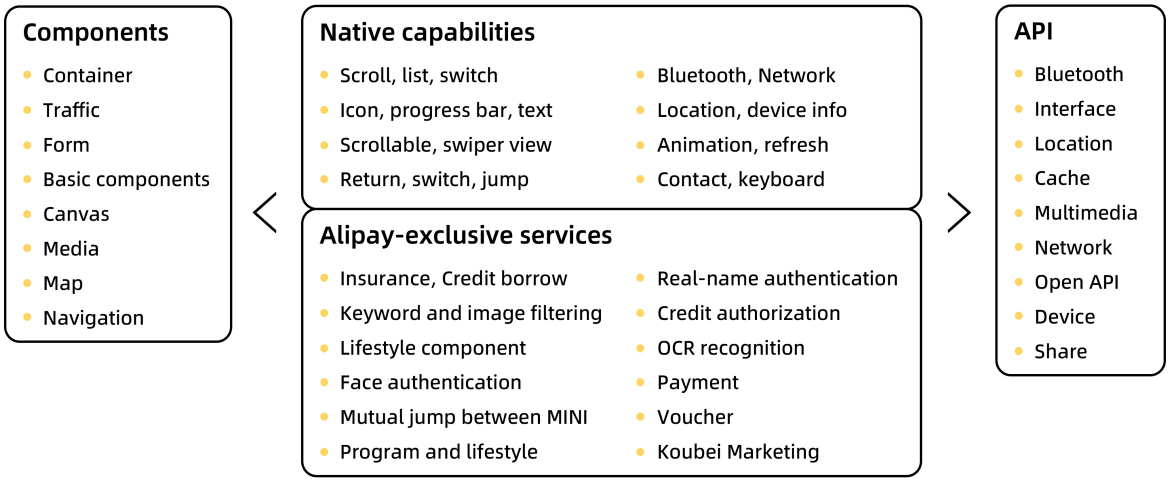
Solid mobile middle office capability

This capability covers the entire lifecycle of the App, provides strong support to ensure a stable and efficient operation of the client, and to perform rapid change and innovation.



Future-oriented research and development: Mini program

Achieves one-development-and-multi-delivery and a smoother user experience. At the same time, Alipay capabilities are fully opened for quickly building new businesses and new ecosystems.

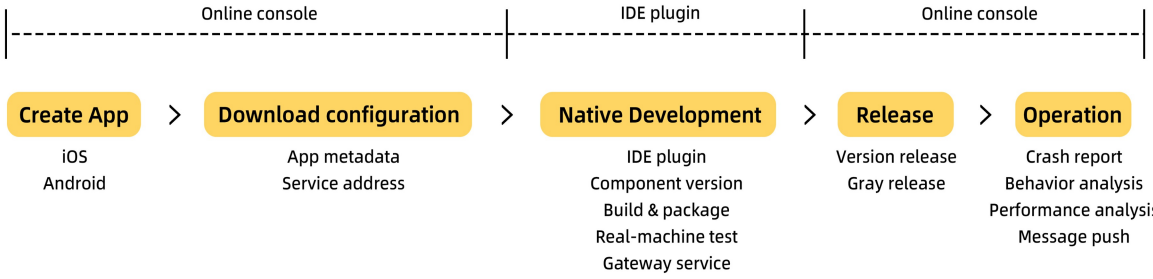


Component functions

To make the development more convenient, mPaaS encapsulates many high-performance components which cover every stage of mobile development. The components can either be used together with the framework to fast develop new Apps or be independently integrated into an existing App.

Operation flow

As a developer, you can use the functions of mPaaS through mPaaS console and mPaaS plugin. A complete process includes the following steps:



Related links

- Access method introduction - Android
- Access method introduction - iOS

2.Customer cases

2.1. Universal

This topic describes a mobile PaaS (mPaaS) customer case in general fields.

Haier

About the customer

Haier holds high miniaturization and individualization. It is important to design a technical architecture from the organizational point of view, and use the mobile mid-end to manage the iteration and update of branch services in a unified manner. Besides, the architecture can be extended flexibly to integrate more services that form an ecosystem.

Project background

Focusing on user experience and demand, Haier is vigorously empowering various fields with an ecosystem. The company wants to drive internal teams to rapidly incubate new business that covers intelligent manufacturing, hardware, education, and more.

To implement mobile mid-end technology selection, Haier urgently needs a suitable mobile mid-end that can ensure the isolation of each business module while maintaining highly concurrent and collaborative development.

Solution

Integrate mPaaS to develop, test, and release each business module independently. Separate the core elements such as code and resources of each business module, and centrally maintain core business such as logs, storage, and data synchronization. This delivers a more open and flexible client architecture while improving R&D efficiency.

Customer benefits

Build a mobile mid-end that belongs to Haier. Use mPaaS's unified client development framework and standard to meet the collaborative development of multiple teams within Haier Group. Meanwhile, based on a modular architecture, support integrating a module as a whole while ensuring the horizontal expansion of business.

Realize dynamic updates and releases on the mobile client. Use mPaaS HTML5 pages and Mini Program containers to build a real mobile frontend. Each business module can be updated and released independently, so online business operates in a more open and flexible way.

Improve app performance and monitor the performance in real time. Use capabilities such as offline packages and hotpatches to improve the app performance, with the component crash rate being lower than 0.05%. Use capabilities such as Mobile Gateway Service (MGS) and Mobile Analysis Service (MAS) to implement full-link monitoring of the app. The gateway is 99.99% available.

Laoyou Live

mPaaS and Laoyou Live. The performance monitoring of the app supports overall and high-precision positioning.

About the customer

Laoyou Live is a funny and interesting livestreaming platform designed for middle-aged people. Relive the classics by singing old songs in a KTV-style livestreaming atmosphere. Allow middle-aged and old people to fully show themselves on the platform by interacting with each other and exchanging gifts.

Project background

- The number of daily active users ranges from 400,000 to 500,000. Most users live in third- and fourth-tier cities and most of their phones are middle and low-end devices. Normally, user experience issues such as product performance, crash, and lag that can be located and solved quickly.
- Before selecting mPaaS, Laoyou Live used products from other vendors for performance monitoring. However, users' daily feedback on problems such as flashbacks and freezes, the products of other companies cannot make a complete record or accurately locate them, resulting in the efficiency of the R&D team in solving related problems has not been improved.

Solution

- Basic analysis: Focus on the running data of the app, including the number of daily logon users and new users, usage duration, user retention, page analysis, access path, and more.
- Advanced analysis: Focus on specific analysis of business growth, support flexible multi-dimensional analysis, and provide hotpatch reports to help users understand hotpatch, rollback, and related information.
- Performance analysis: Focus on performance monitoring such as crash, stuck, and lag. If a performance issue occurs on the client, MAS provides analysis statistics for viewing performance in real time.
- Log management: Support querying and searching logs by keyword in real time, or control the logic of reporting logs on the client by setting the switch on the server.

Customer benefits

Quick app O&M: For the feedback provided by end users, mPaaS MAS provides performance monitoring that allows the development team to quickly locate and solve problems.

Greater app stability: The mPaaS container fully guarantees app stability. It is compatible with complex device models based on Android. Combined with performance monitoring, meet the requirements of the development team.

Energy Monster

mPaaS and Energy Monster. Integrate Alipay's native scanning technology with one click.

About the customer

As a public intelligent hardware company, Energy Monster owns various innovative power sharing products. It is committed to meeting the needs of users and merchants by using energy and intelligent hardware networks, and combining IoT and big data in various scenarios.

Project background

As a power bank sharing provider, Energy Monster needs to ensure the stability of offline services, especially the recognition rate of the QR code on its product. The top priority is to improve the scanning performance and recognition rate, so that users can use the power bank immediately after they scan the QR code.

Solution

Customer benefits

Alipay's code scanning capability: Inherit Alipay's native code scanning component to deeply optimize scanning efficiency. The component ranks among the best in the industry in terms of recognition rate, recognition speed, fault tolerance rate, and other aspects. It can deal with extreme issues such as QR code reflection, damage, and blur in the company's offline business.

Real-time guarantee of business stability: Use MAS to monitor code scanning efficiency such as the open rate, crash rate, and use duration, which assists in improving user experience and retention.

Coca-Cola

mPaaS and Coca-Cola: Digital transformation in new retail business uplifts the efficiency of business collaboration significantly.

About the customer

Coca-Cola is the best-selling beverage in the Chinese market. There, the company has a 9% market share in the soft drink market and a 33% market share in the carbonated beverage market. Coca-Cola has long occupied three places among the four well-known brands of carbonated beverages in China. At present, Coca-Cola has tens of thousands of business representatives in China.

Project background

- Coca-Cola's business model still relies on offline retail distribution, that is, the company sends its business representatives to manage offline outlets, vending machines, and other sales channels. The representatives visit offline outlets and check shelves with point-to-point tracking records, which can hardly guarantee efficiency and precision.
- Therefore, the company's top priority is to intensively manage how business representatives visit customers, such as the visit efficiency, quality, and customer feedback.

Solution

Use a mobile app that provides a unified portal and tools for internal collaboration. For business representatives, divide different regions and outlets, and provide specific plans of visit routes and the requirements on tracking shelves by category. Manage on-site sign-in, photo taking, order placing, and visit records online.

Customer benefits

Greater efficiency of business collaboration: Business representatives can update and track the status of offline outlets on the app and place orders in real time. Based on mPaaS MGS, online services run smoothly and tens of thousands of business representatives can work together anytime and anywhere.

Comprehensive monitoring of the app running data: Based on mPaaS MAS, fully collect the app running data, monitor the app performance, and receive business feedback, providing data support to fuel business growth.

RELX E-Cigarette

mPaaS and RELX E-Cigarette. A powerful code scanning component helps new retail business track goods better.

About the customer

As a new e-cigarette brand, RELX has dominated 68.8% of the e-cigarette market share. Though RELX is a leading player in an emerging industry, the company prioritizes healthy and sustainable development compared with the market share.

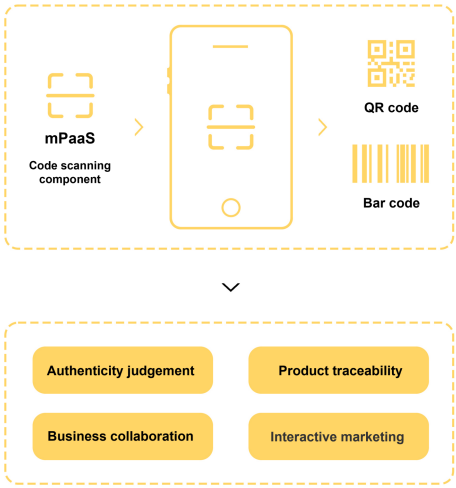
It is important that consumers can trace e-cigarettes and judge whether the cigarettes are real. Therefore, RELX needs to realize code scanning verification on the app.

Project background

As the distribution quantity of online channels and offline stores grows rapidly, RELX E-Cigarette needs a product traceability solution to ensure that consumers can judge the authenticity of products anytime and anywhere.

RELX E-Cigarette selects mPaaS and integrates Alipay's code scanning capability, which is applied to bar codes, QR codes, and other similar scenarios.

Solution



Customer benefits

Excellent code scanning capability and product traceability: Inherit Alipay's native code scanning component to deeply optimize scanning efficiency. The component ranks among the best in the industry in terms of recognition rate, recognition speed, fault tolerance rate, and other aspects. It can deal with extreme issues such as QR code reflection, damage, and blur in the company's offline business.

Internal collaboration app based on mPaaS: Based on mPaaS's unified client development framework and standard, RELX E-Cigarette team is rapidly developing an internal collaboration app to help employees collaborate in various stores. Looking forward, RELX will integrate mPaaS to rebuild its customer-side app.

- Excellent code scanning capability and product traceability: Inherit Alipay's native code scanning component to deeply optimize scanning efficiency. The component ranks among the best in the industry in terms of recognition rate, recognition speed, fault tolerance rate, and other aspects. It can deal with extreme issues such as QR code small, easy to reflect and flash.
- Internal collaboration app based on mPaaS: Based on mPaaS's unified client development framework and standard, RELX E-Cigarette team is rapidly developing an internal collaboration app to help employees collaborate in various stores. Looking forward, RELX will integrate mPaaS to rebuild its customer-side app.

2.2. Transportation

This topic describes a mobile PaaS (mPaaS) customer case in the transportation industry.

Beijing Public Transport

mPaaS and Tusbus. Reconstruct the R&D mode of the Beijing Transit app.

About the customer

Tusbus is China's leading solution provider and service operator of smart bus systems. Its product the Beijing Transit app connects bus and subway in Beijing's public transport system. This provides passengers with one-stop transport services, such as waiting for the bus, scanning the transit code, commuting, and entertainment.

Challenges

It is an urban public transport system with the largest scale, the largest number of vehicles, and the most complicated vehicle model and billing mode. The system needs to support 1,500 concurrent bus and subway access per second during rush hours. In Beijing, an average of 8 million people take public transportation per day, which means that 16 million card-swiping data records of public transport are generated per day.

To improve high concurrency on the client and assist the development team in improving efficiency, Tusbus urgently needs dynamic updates and releases to help the team reconstruct the R&D mode.

Solution

Tusbus (Beijing public transport version) uses mPaaS Mini Program containers to rebuild multiple business modules of the Beijing Transit app with mini programs. Also, Location-based Service (LBS) is selected as the map component.

The Mini Program container isolates the code of each business module, realizes highly concurrent and collaborative development, and improves R&D efficiency. With a more open and flexible architecture, business modules can be updated dynamically, improving user experience.

Customer benefits

Tusbus provides people in Beijing with green and convenient services through Beijing's intelligent public transport system. Meanwhile, Qidi is expanding its business in other large cities such as Guangzhou and Haikou.

- The Mini Program container allows each business module of the Beijing Transit app to be updated dynamically, building a real mobile frontend.
- With an independent rendering kernel, the Mini Program container allows the mobile client to work out-of-the-box.
- Code, written only once, can reproduce a variety of products to be put on different platforms such as its own app and Alipay.
- The code and resources of each business module are isolated to realize highly concurrent and collaborative development, improving R&D efficiency.

Dianhuowang

mPaaS and Dianhuowang. Only two Java developers are required to build an app using mPaaS Mini Program.

About the customer

Hengdong logistics Dianhuowang is an online freight platform based on the logistics industry trend and national policy. Dianhuowang Driver and Dianhuowang Cargo Owner, two mobile clients developed by the company, provide fast and convenient services that match truck drivers and owners.

Project background

Small team size and slow business iteration: For a long time, the project development team consists of two core developers and two intern developers.

Urgent business demands and insufficient development resources: The mobile client needs to embed the SDK plug-in of the supervision platform as the supervision policy on the Internet freight platform has changed.

Solution

Developers can use Java and Vue.js to build apps, but can not master a new programming language or develop native UI components within a short time. However, due to urgent business demands, the technical team decides to replace Uni-App in the original model with mPaaS Mini Program. The team migrated features to the Dianhuowang app and integrated the regulatory SDK plug-in.

Technology selection	Advantage	Disadvantage
Uni-App	Vue.js syntax is easy to use and across platforms.	Involve a high cost of learning technology that interacts with original plug-ins. Need to learn Weex.
Weex	Cross-platform.	Need to learn new technology.
Flutter	Good UI rendering performance and across platforms.	Need to learn a new language.
Android	Use Java to write business logic, providing better performance and greater stability.	Not cross-platform.
mPaaS	Componentized integration. mPaaS can be easily used if you know native development and mini program syntax. Some mini programs can be used across platforms.	Involve a learning cost.

Customer benefits

- App rebuild using mini programs: Based on mPaaS Mini Program, the Dianhuowang app allows users to enter a mini program automatically from the welcome screen. The app can call a custom API to destroy the welcome screen and verify Android permission.
- One-time development and multiple reuse: The network requests on the web and in Mini Program all use the same framework. To migrate services developed on the web to mPaaS Mini Program, you only need to adjust the code slightly to handle mPaaS business logic. This eliminates the need to write similar and repeated business code. Also, reuse ensures that the business logic is consistent on the web and client, as several developers in collaboration may understand the business in different ways.
- Flexible app update and iteration: After mPaaS is integrated, you need to update the app only when the native SDK plug-in is changed or added. To adjust or update the features of a mini program, you can upgrade the mini program without disturbing users, which also meets your demands of rapid business iterations.

Shanghai Metro

mPaaS and Shanghai Metro. Help build a one-stop travel service platform.

About the customer

Shanghai Shentong Metro Group Co., Ltd. was reorganized and established in June 2004. It is the main body responsible for the investment, construction, and operation management of Shanghai rail transit. At present, the company has invested, constructed, and put into operation 17 rail transit lines. The lines include the first fully automatic driving line (Line 10) in Chinese mainland and the world's first commercial maglev line. The total length of the lines is 673 km (including a maglev line of 29 km). With a total of 395 stations, Shanghai Metro ranks first in the world in terms of the road network scale.

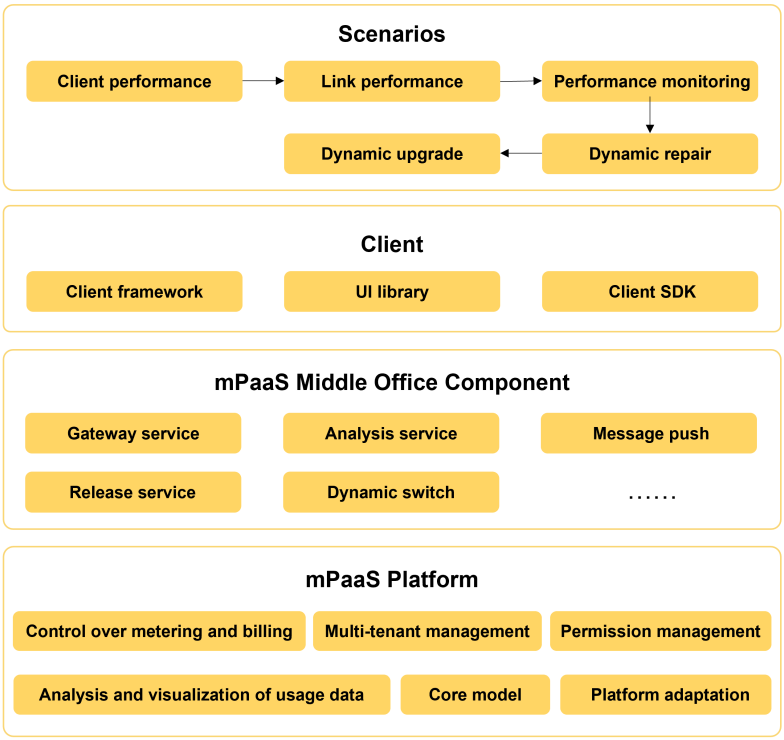
Project background

Shanghai Metro handles the average daily passenger flow of more than 11 million trips. A considerable part of people come from all over the country outside the city. Particularly, many people come from the Yangtze River Delta region.

It is inconvenient to hold tickets, tickets can be missing or stolen, and consumption feedback is unavailable. To provide better transportation services, Shanghai Metro urgently needs a complete solution to facilitate passenger travel and achieve digital operation and management.

Solution

mPaaS, a super app engine, significantly improves the stability, smoothness, and compatibility of an app.



- Alipay's high-precision code scanning technology: Based on the tests conducted by Ant Group Man-Machine Interaction Lab, the Shanghai Metro app supports adjusting the brightness, distance, and angle to help passengers with different phones enter the station smoothly.
- Dynamic release and management: The app has built a real mobile frontend using the mPaaS HTML5 container. The code of each business module is isolated to realize highly concurrent and collaborative development, and update and release services dynamically, improving R&D efficiency.

- High service availability: For many years, the mobile API gateway has stood the test of massive requests from Taobao's Double 11, Double 12, and Spring Festival red envelope activities. The gateway helps Shanghai Metro find a code scanning solution featuring a ultra-low response delay, a self-adaptive network, and a safe payment process.

Customer benefits

After the Shanghai Metro app was launched, nearly 7% of the passengers enter or exit by scanning the code, eliminating the need to stand in a queue.

- Fully compatible with mainstream phones: mPaaS has served hundreds of millions of users in Alipay's complex business scenarios. Compatible with mainstream phones, it helps Shanghai Metro build a quality, dynamic, and super app.
- High business stability: Introduce double offline technology to separate bookkeeping and payment. Even if the network is unavailable, the app can bookkeep first and then deduct money when the network is restored. For the client request and server response process, build complete capabilities of traffic division, data transmission encryption, and signature verification to secure the data of online services.
- Scenario ecosystem: The app is a one-stop travel service platform. After the app integrates Hellobike, exit taxi calling, and other features, users can have a better and safer travel experience in one stop.

2.3. Finance

This topic describes a mobile PaaS (mPaaS) customer case in the financial sector.

Shenzhen Rural Commercial Bank

mPaaS and Shenzhen Rural Commercial Bank. The scenario-based marketing policy on the Internet is empowering the traditional finance sector.

About the customer

As the only local private bank in Shenzhen, Shenzhen Rural Commercial Bank is embracing financial technology and accelerating digital transformation. The bank ranked 300th and its return on capital (ROC) ranked third among banks in Chinese mainland, according to Top 1000 World Banks 2019 unveiled by The Banker, a magazine based in London.

The bank is committed to building an intelligent and scenario-based platform of financial services, so users can feel more secure about using the services smoothly.

Project requirements

After the bank released a new version of the app developed using mPaaS, the mobile app performance has been greatly improved. For the second phase, the bank expects to increase user activeness through scenario-based marketing.

- How can the app achieve greater user activeness and loyalty? Mobile apps in the traditional financial sector only serve as tools, lacking scenario-based services with few active users.
- How can the app integrate more mature marketing scenarios? How can the app secure the financial accounts of users and ensure their experience without the Internet marketing experience or product?
- How can the bank reduce costs in integrating multiple scenarios? The bank only needs to integrate local frequent scenarios in one stop quickly.

Solution

The bank decides to integrate the Haoxiangpin mini program into its mobile app using the mPaaS development framework. The mini program can increase user activeness and transactions so that users link bank cards for payment on the client.

- Mini programs in local life scenarios: Integrate scenario-based resources of the Alibaba economy for joint marketing. The scenarios and services prompt users to consume and pay using bank cards, which drives financial business. The Haoxiangpin mini program has been integrated into the app. Later, Hema and other Alibaba local life scenarios will be introduced.
- User behavior analysis and precision reach: Mobile Analysis Service (MAS) analyzes user behaviors and determines target customers based on the tracking points of the app and mini program. Mobile Push Service (MPS) pushes messages to the target users to achieve precision marketing and optimize return on investment (ROI).

Customer benefits

After the mini program was delivered within one week, its average daily page views (PVs) increased by 20 times, and the conversion rate from views to transactions reached 10%. Scenario-based marketing has significantly stimulated user activeness on the client.

- Increase user activeness: Introduce Alibaba's Haoxiangpin, deliver the program in banner advertisements in the middle of the app homescreen, and launch an operational activity to increase the monthly active users of the mobile banking app.
- Stimulate card activeness: Specify that the bank card is the only payment method so that users use bank cards for payment, which stimulates the activeness of card payment.
- Increase deposits: Consumption scenarios in the app promote users to consume and pay using bank cards, which increases card deposits.

Tianjin Trust

mPaaS and Tianjin Trust. Build a wealth management app from 0 to 1 and conduct financial business online quickly.

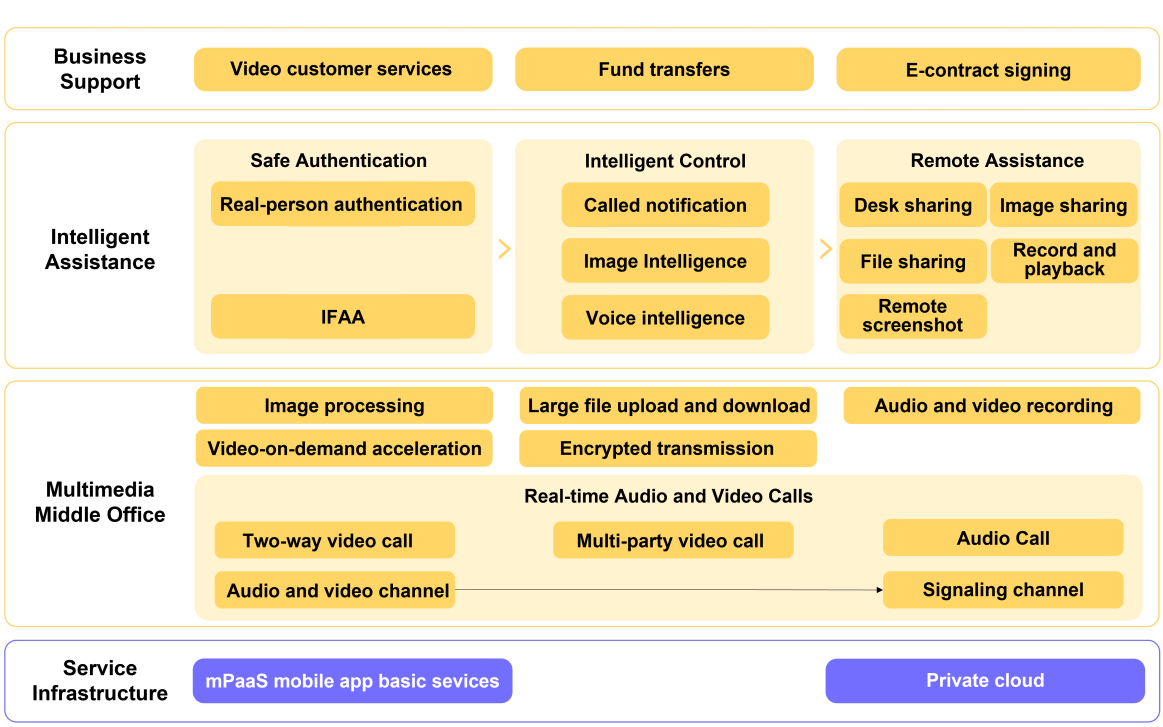
About the customer

Tianjin Trust Co., Ltd. was established by the People's Bank of China Tianjin Branch. It is one of the earliest trust and investment institutions established in Chinese mainland. The company has launched a series of trust products around infrastructure, energy and transportation, enterprise groups, small and micro businesses, modern logistics, real estate, education, and high-tech industries.

Project background

As the wealth management business becomes professional and can be handled remotely and online, the company needs to build a wealth management app from 0 to 1 to provide efficient, convenient, and safe online services. Also, the company wants to improve customer satisfaction and brand loyalty, and strengthen the development and management of mobile Internet technology.

Solution



- mPaaS: mPaaS redefines the mobile development platform. Rely on a client development framework to unify development standards, improve app performance and stability, speed up R&D efficiency, strengthen dynamic control of apps, and provide diversified digital operation capabilities. Based on mPaaS, Tianjin Trust has quickly embraced the mobile Internet and migrated more business systems to the mobile client, forming its unique business model.
- Audio and video call: Support two-way real-time video calls, and audio and video recordings. Provide stable and low-delay communication capabilities for dual-recording scenes such as video customer services, fund transfers, and e-contract signing. Secure the serving process and dual-recording files by encrypting audio and video streams, signaling transmission, and storage.
- Intelligent dual-recording: In scenarios of customer-side trust product sales, allow users to open accounts, complete transactions remotely, and contact customer services using intelligent biometric technology, real-person authentication, and other capabilities. Allow users to print poof of assets online and provide other services such as evaluation of investment assets. Set the answering rules for financial managers during video dual-recording and count the statistics of appointments, so account managers can contact customers and remind them to complete e-contract signing and video dual-recording. After customers complete dual-recording, encrypt and upload the audio and video files. The files can be queried, downloaded, and reviewed to meet industry regulatory requirements.

Jiangsu Minfeng Rural Commercial Bank Co., Ltd.

mPaaS and Jiangsu Minfeng Rural Commercial Bank Co., Ltd. It is a county-level bank with a technical team of 12 people, but the bank has found the secret of digital transformation.

About the customer

Headquartered in Suqian City, Jiangsu Province, Minfeng Rural Commercial Bank is formerly known as a local rural credit cooperative with total assets exceeding 40 billion yuan. By relying on its development team of 12 people, digital technology in the cloud, and a monthly investment of about 10,000 RMB, the bank has completed digital transformation that greatly contributes to its stable and rapid growth.

Project requirements

Many local small and medium-sized banks such as Minfeng Rural Commercial Bank conduct business operations separately and rely on workers to handle business. For marketing, the banks visit their customers and launch ground promotion activities. However, since the outbreak of COVID-19, contactless financial services and digital operations are increasingly being pursued, so the banks urgently need to upgrade their digital capabilities.

Most of them have realized the need to change and carry out digital transformation. However, what can they do with limited capital investment and insufficient talent and technological strength? The vast majority of the banks have no clear answers.

Solution

Minfeng Rural Commercial Bank starts by improving post functions and processes by putting forward the model of three offices and six posts.

They build three small offices within the framework of three big offices in the traditional credit process. Specifically, take marketing and investigation as the small front office, approval and contract signing as the small middle office, and account manager and collection as the small back office. Employees in the six posts perform their respective duties, check and balance each other, and cooperate efficiently, ensuring that professional people do professional things.

Assisted by the mPaaS team, the bank rebuilt its app by the end of 2018, which brought a smooth user experience and a very low crash rate. In the second year, the bank built an ecosystem using popular mini programs. Through independent operations, the mobile app has attracted users and active users by providing features such as code payment, utility bills, Taopiaopiao, and Tmall selection.

Customer benefits

The mobile app takes on more business. Based on the app Susu-e, a loan platform, the bank has launched several online loan services such as Agriculture-e loan, Financing-e loan, Business-e loan, and Fast-e loan. This year, the bank plans to migrate 40% of its loan business to the mobile client. The figure will continue to increase.

2.4. Healthcare

This topic describes a mobile PaaS (mPaaS) customer case in the healthcare industry.

Nanjing Child Health

mPaaS and Nanjing Child Health. Compared with a native app, the Mini Program container shortens the development cycle of a healthcare app.

Project background

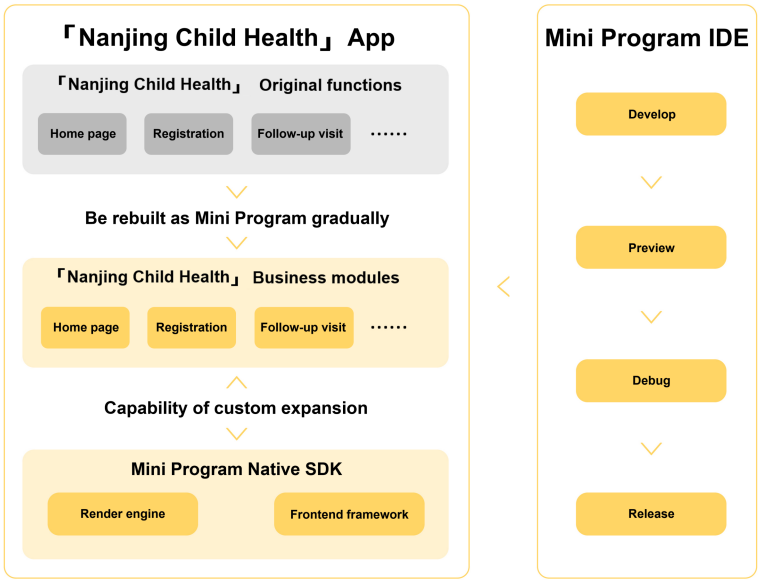
Nanjing Child Health is an official app developed by Nanjing Children's Hospital. Initially, the app was developed as a native container app using HTML5 pages.

However, after the app had been launched for a period of time, users experienced performance issues such as loading and lag on HTML5 pages. As the number of users is increasing, the technical team of the app decides to rebuild the app to meet user requirements.

Solution

mPaaS Mini Program is used to rebuild multiple business modules of the app. The user experience can equal that provided by a native app. Also, Mini Program shortens the release process and allows developers to fix bugs quickly online, achieving dynamic updates and releases.

Later, the team plans to integrate other mPaaS components to improve user experience. For example, client-side log uploads help developers find bugs.



Solution benefits

- Rapid iterative development of the client version: During iterative development, the client only needs to handle the extension of APIs that interact with HTML5 pages or mini programs. Concurrent and iterative development is supported so the client app can be built rapidly.
- Update and release in seconds: After a mini program is built, you can release a version and submit a test task with one click on Alipay Mini Program IDE. To update and release the mini program, manually release the version in the console.

Customer benefits

Efficient

The frontend development is standardized, which facilitates code reuse and management and enriches the platform. An app can be built within several days.

Smooth

The app performance is greatly improved. Mini programs work out-of-the-box.

- Allow you to deliver the app new version, HTML5 offline package, mini program package, and switch configuration.
- Support official release and canary release.
- Provide release capabilities from dimensions such as the whitelist, device model, and system version to manage your app dynamically.
- Optimize the size of a release package to save traffic and storage.
- Integrate a mini program into the native app and other platforms such as Alipay and Taobao.

2.5. Government affairs

This topic describes a mobile PaaS (mPaaS) customer case in government affairs.

Hainan Pass

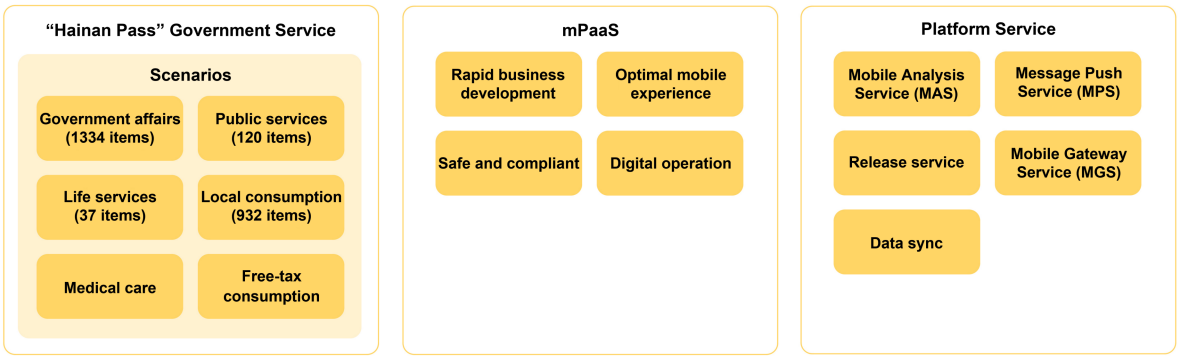
mPaaS and Hainan Pass. Contribute to the construction of Hainan Free Trade Port.

Project background

As Overall Plan for the Construction of Hainan Free Trade Port was released, constructing the port with high quality and standards has becomes a major national strategy. For this, the People's Government of Hainan needs an app facing all its people. The app integrates livelihood services such as health, transportation, and consumption. The code of all its people is unique. To maintain and increase user loyalty and activeness, the government introduces highly frequent scenarios such as credit, consumption, medical care, social security, and government affairs.

Solution

Digital Hainan selects mPaaS as the development and operation platform for the Hainan Pass app. Specifically, mPaaS provides the following capabilities to support business on Hainan Pass.



- Rapid business development: Based on mPaaS HTML5 pages and mini programs, develop and launch hundreds of business within one month, covering highly frequent scenarios such as government affairs, public services, life services, and local consumption.
- Citizen services operation: mPaaS Mobile Analysis Service (MAS) establishes hundreds of analysis indicators based on the app tracking points to gain in-depth insight into user behaviors and consumption habits. Use marketing tools to target users, increase user loyalty, and help merchants make profits.
- Optimal mobile experience: Developers can quickly solve performance issues by checking crash logs. The app starts in milliseconds, the message service is 95%+ available, and the gateway is 99.999% available, ensuring a good user experience.
- Security compliance at the government level: Integrate the SDK into the client, secure local data using Mobile Encrypted Storage (MES), support RSA and national cryptography using Mobile Gateway Service (MGS), provide security capabilities such as signature verification, and support disaster recovery and IPv6 to meet the security compliance requirements on government affairs.

Customer benefits

- Personalized and convenient public services: For the first time, the digitalization of urban governance is automated and fine-grained, and every resident has access to interact with the local government.
- Better social governance and public service quality: Reach tens of millions of citizens, know their needs through data analysis and evaluation, and improve their experience in using livelihood services. Break down barriers in business and promote integrated information.

3.Basic concepts

This term list is presented in lexicographical order.

| # | A | B | C | D | E | F | H | I | J | L | M | N | O | P | R | S | T | U | V | W |

#

95th percentile

The percentile is a measure in which all values are sorted in ascending order and the first N% value is the N% percentile. The 95th percentile represents the first 95 data among 100 data which is sorted in ascending order.

A

Active promotion activity

It refers to a direct promotion event for the targeted population, such as pushing a message notifying a daily login reward event to users who had not logged in for the last 15 days.

Advertisement space

It refers to a position in a booth where advertisement materials are displayed. An advertisement space can display an advertisement. A booth can contain multiple advertisement spaces.

Advertisement space frames

It refers to the number of advertisement spaces in a booth, that is, the number of advertisements displayed in the booth when the booth is occupied for event purposes.

Ad-token

It refers to the unique identifier of an Android device and is frequently used in client-side SDKs.

Application Not Responding (ANR)

Application Not Responding (ANR) is a dialogue box displayed on an Android device when the App is unresponsive.

Anti-debugging

It refers to a method of examining the current runtime environment based on the knowledge of the debugger features to hamper the execution of JavaScript code in the debugging mode.

Anti-formatting

It forces the code to be displayed in a single line. This code will fail to be executed if it is formatted or renamed.

Apache Dubbo (Dubbo)

Dubbo is an open-source and distributed service framework that provides capabilities targeted at interface proxies such as high-performance RPC call and microservice governance.

API group

A group of APIs with a common attribute. The API group name can be a specific system name, a component name, or an abstract identifier.

APK/ABB package reinforcement

It enhances the security of APK/ABB packages by providing the following capabilities: anti-decompilation for APK/ABB packages, encapsulation for DEX files, anti-tamper for DEX files, anti-white-box attacks, secure shell encryption algorithms, anti-debugging, anti-tamper of memory, anti-hook, anti-emulator, anti-repackaging for APK/ABB packages, and anti-dumping of memory.

appId

The appId is an identifier generated when a mPaaS app is created. You can view the appId in the download configuration file page on the console.

AppId

It identifies a unique app and is generated when the app is created.

Attribute

An event contains information such as the ID of a user who triggered an event, the app version, and the device model. The abovementioned are collectively referred to as attributes. The mobile analysis platform provides some built-in attributes that are frequently used, and you can custom your own attributes as needed.

Attribute ID

It is a unique identifier of an attribute that is a global concept in an app. Therefore, the attribute ID must be unique in the same mPaaS app.

B

Background

It refers to a state when the App is running in the background, that is, when the phone is on the home screen or black screen, or the user is operating another App.

Binding relationship

It refers to the mapping relationship between a device and a user identifier. It corresponds to the operations of binding and unbinding.

BizType

It indicates the business type and is the unique identifier of a business scenario. After data is pushed, the client-side data synchronization SDK uses Biztype to distribute data to corresponding service components.

Booth

It refers to the area on an app page that is used to display an advertisement.

Branch forgery

The branch forgery is a method used for control flow obfuscation based on opaque predicates, and its component is built in the safe compiler. It can reorganize the control flow at relatively low costs (with performance scarcely affected and file size slightly increased).

Broadcast push

It refers to a method of pushing the same message to all devices connected to the network. The message content is obtained by replacing the parameter values in a message template.

Build

Website building is a process of assembling components into a web page, involving operations such as adding, duplicating, deleting, and reordering components on the page as well as configuring data.

Business dimension

The business dimension of the synchronization service falls into the user dimension and the device dimension. For the user dimension, data is pushed according to userId. For the device dimension, data is pushed according to utdId.

C

Call graph obfuscation

A call graph indicates the calling relationships among functions, which is an important indicator used to describe the macrostructure of a program. Compared with the technique of confusing control flow graphs, the call graph obfuscation is a component-based obfuscation technique that confuses the reference relationships among functions. The call graph conversion component can compromise the macrostructure of the source code by conversing all calling commands of the source program, so that the design features of components of the source program can be removed.

Class reinforcement

It refers to a method that disarranges Java code to hide its execution flow so that the reinforced code is incomprehensible enough to counter the decompiling by using tools such as Jadx-Gui and Jeb.

Client-side message identifier

It is automatically generated by the system or customized by the user. It is used to identify a unique message in a client-side system.

Code condensation

It refers to a method of condensing the code into several lines to reduce its readability. This method is implemented by deleting unnecessary content such as spaces and line breaks or processing the part of code that is likely to be reused.

Command replacement

The command replacement component is used to transform or unfold the simple binary operations of the source code such as arithmetic operations and boolean operations. The processed operations are incomprehensible enough to counter the cracking by developers. The command replacement component has dozens of built-in replacement rules which are randomly selected for the replacement process, thus diversifying the generated commands.

Component

It refers to the minimal unit of materials used to build a page.

Confidence interval

The confidence interval is a range of estimates for the population parameter based on the observed sample parameter. A confidence interval displays the probability that a parameter will fall between a pair of values around the mean. It shows the credibility of the measured value of the observed parameter, that is, the abovementioned "certain degree of confidence".

Confidence level

It describes the credibility of the measured value of the observed parameters, that is, the "certain degree of confidence" required by the confidence interval.

Constant encryption

It supports compile-time encryption of array constants of various types. It aims to hide explicit strings such as log information to reduce the risk of information leakage and to hide static constant arrays such as AES-Sbox to complicate the recognition of static features of general algorithms.

Control flow obfuscation

It refers to a method of disarranging the execution flow of the source code and the calling relationships of functions to make the logic of the code incomprehensible.

Critical event occurrence

It refers to the occurrence of a mobile analysis event associated with an event after the user taps the event advertisement within a period of time.

Critical event occurred devices

It refers to the deduplicated devices where a mobile analysis event associated with an event occurs after the users tap the event advertisement.

Custom event

In a MAS event, it refers to a recorded action a user performs within an app. You can set a custom event for any triggered action such as tapping a button. The custom event is created by customizing conditions.

D

Debug

It refers to the debugging performed before a created test is officially implemented. It aims to check whether the test can be implemented properly.

Device Token

It refers to the unique identifier of an Apple device, which is provided by Apple.

Deduplicated share devices

It refers to the deduplicated devices that have tapped the share button on the landing page within a period of time. The implementation result depends on the accuracy of the customer-side tracking.

Display position

It refers to the position of the booth on the page, such as the top and the bottom.

Display style

It refers to the display style of the booth on the page, such as displaying it as a banner or as a bulletin.

Distributed Resource Management (DRM)

Distributed Resource Management (DRM) is a dynamic real-time configuration management framework in a distributed environment. It enables dynamic upgrades of configurations without restarting the App. It is universally applied in scenarios such as business parameter configuration and emergency switch enabling/disabling.

Dynamic booth

It refers to a booth that is integrated through dynamic configuration. The display process for such a booth must be controlled through the information issued by the server (console).

E

Event

It refers to a recorded action a user performs within an app. You can set a custom event for any triggered action such as tapping a button.

Event analysis

The event and its attribute information are stored in a local client as logs and then reported to mobile analysis servers. After completing the configuration in the console, you can view the event analysis report.

Event conversion rate

It refers to the proportion of the number of devices that triggered the mobile analysis event associated with a campaign to the number of responding devices.

Event ID

It is a unique identifier of an event which is a global concept in an app. Therefore, an event ID must be unique in the same mPaaS app.

Event unit

It refers to a set of marketing events created for a common marketing purpose. An event unit contains multiple events with the same topic.

F

Fatigue

It refers to the upper limit of reaches to a user or device during a unit time period.

Front end

It refers to a state when an app is currently open.

H

Hadoop Distributed File System (HDFS)

Hadoop Distributed File System (HDFS) provides standard HDFS access protocols. It allows users to use the distributed file system featuring unlimited storage, extended performance, unique space name, high reliability, and high availability without making any modifications to the existing big data analysis application.

HRPC

HRPC is an HTTP-based RPC scheme.

I

Idempotence

Anyone among the combination of bizType, linkToken, thirdMsgId in SyncOrder is executed multiple times while only one successful implementation is allowed to be achieved. In this process, the newly generated data will be deprecated, and the result code is DUPLICATED_BIZ_ID.

Interactive marketing event

It refers to a targeted marketing event triggered by one or more user behaviors. For instance, an active user has viewed financial products for consecutive days during a promotion period, and then an ad of financial products will be displayed on the homepage of the user's app accordingly.

J

JavaScript domain name binding

It refers to a method where the JavaScript code can only be executed under a specified domain name.

Junk code and bad code insertion

The junk code refers to the code that can be executed while interfering with analysis. The bad code refers to the illegal code that cannot be executed. The junk code and bad code insertion component is used to counter the analysis capability provided by decompilers which is capable of analyzing static instruction flow.

L

Laboratory

You can manage a group of tests in a laboratory. The laboratories fall into two types: server-side laboratories and client-side laboratories.

Location Based Services (LBS)

Location Based Services (LBS) refers to an online service that provides information resources and services to a device based on the device location obtained by using multiple positioning technologies.

M

Message template

It is a framework used to generate a message. It contains the attributes and configuration of a message, the fixed message content, and placeholder parameters.

Metric

The metric is used to determine the test result. The default system metrics are Page View (PV), Unique Visitor (UV), and the 7-day retention rate. You can also create a MAS metric or compound metric by using the custom event feature of Mobile Analysis Service (MAS).

Mobile Gateway Service

Mobile Gateway Service (MGS) is the name of the component that provides an API gateway service.

Message Identifier (MSGID)

It is used in MPS to identify a unique message and is automatically generated by the system.

MSS data

It refers to data to be pushed by data synchronization servers.

MSS push

It refers to a method of actively pushing a piece of data from servers to clients. The data will be instantly pushed when the clients that call the services are online. Otherwise, the push will not be triggered until the clients are online.

Multiple device synchronization

It means that data synchronization among multiple devices of a user is supported. Specifically, when a user logs on to another device, the data received on the previously-used device will still be sent to the currently used device. When the app is reinstalled and started on the device, the data will still be pushed.

Multiple frame booth

It refers to a booth with an advertisement displayed for more than 1 frame.

Multiple pushes

It refers to a method of pushing personalized messages to multiple target IDs. The message content is obtained by replacing parameter values in the same template according to different target IDs.

N

Network jitter

It refers to the variation in latency between packet flow from one client to another, which is a commonly used concept in Quality of Service (QoS). The jitter is the difference between the max and the min latency and describes the stability of a network. For example, if the max latency is 20 milliseconds and the min latency is 5 milliseconds, then the network jitter is 15 milliseconds.

Network latency

It refers to the time delay between when a message is sent and when it is received over a network connection. It usually consists of transmission latency and processing latency.

O

Object key replacement

It refers to a method of replacing the names of object keys to hide the calling relationships among functions.

Online

It means that there is a network available for the app on the client and a stable long-lived TCP connection can be maintained. On most Android phones, apps can keep running in the background. For an iPhone, because of the limit of the iOS system, an app can run in the background for 3 minutes.

OperationType

OperationType is the required field for creating an API. It is a unique identifier for API services.

OSS

Object Storage Service (OSS) is a cloud storage service featuring unlimited space, security, low costs, and high reliability, providing up to 99.9999999999% of data persistence and 99.995% of data availability. Multiple storage types are available.

P

Page

A page is a result generated by using Mobile Pages Building Service (MBS). One page corresponds to a URL. After the page is published, users can visit it on their phones. A page is a visible interface of an app, that is, the interface shown to general users when they use the app.

Page load time

It refers to the time it takes for a page to load on your device.

Persistence

Persistence refers to a mechanism where program data can be transformed into persistent or non-persistent data. In data synchronization services, this mechanism generates 2 types of data: persistent data and non-persistent data.

- Persistent data: when the user or device is offline, the data will be persisted and stored in the database. When the user or the device is online, the data synchronization SDK will trigger synchronization.
- Non-persistent data: when the user or device is online, data will be instantly pushed. Otherwise, the data will be deprecated. Even when the user is online later, the data will not be pushed.

Pointer encryption

The pointer encryption component is used to remove the explicit reference relationships between functions and data.

Preset booth

It refers to the booths integrated through client configuration. The display positions of such booths must be fixed by codes on the client.

Program popularization

After a test is done, you can choose a program based on the test result to apply it to the general traffic. This process is referred to as program popularization.

Push certificate

It is used to connect with the Apple Push Notification service (APNs) servers.

Push target ID

It refers to the target that receives the push. The target ID can be the Ad-token of an Android device, the device token of an iOS device, or a userId. Its meaning depends on the context.

Push to a single device

It means that a message will be pushed only once to the single device that the user log on to most recently. When the app is reinstalled and then started on the device or the user logs on to other devices, the message will not be pushed again.

Push type

It refers to the two types of push: targeted push and global push.

- Targeted push: pushes a piece of data to a user or device that corresponds to a userId or utdId respectively.
- Global push: pushes data to all online users or devices. The pushed data is synchronized among multiple devices.

R

Reach

It refers to the sum of exposures and pushes of campaign advertisements within a certain period of time.

Reached devices

It refers to the sum of deduplicated devices as carriers of any advertisement materials as well as devices that received pushes within a promotion period.

Reinforcement

It refers to the method of achieving enhanced anti-cracking capability by recompiling and packing the app as well as modifying the executing order of commands.

Request response time

It refers to the period from when the request is sent by the client to when the response is received.

Responding devices

It refers to the sum of the deduplicated devices where an advertisement and the push are tapped over a period of time.

Response rate

It refers to the proportion of the responding devices to all reached devices.

Responses

It refers to the sum of the taps of an advertisement and the push over a period of time.

Retention rate

The retention rate is an indicator that reflects the operation of a website, app, or online game. Specifically, it refers to the average ratio of the number of daily active users to users who still start the app on the next N day within a period of statistics (week/month). Wherein, the value of N is usually set to 2, 3, 7, 14, 30, respectively corresponding to next-day retention rate, three-day retention rate, weekly retention rate, half-month retention rate, and monthly retention rate.

Remote Procedure Call (RPC)

Remote Procedure Call (RPC) is used to upgrade the OCR model online. The upgrade will take effect after the system backend is configured accordingly.

S

Security reinforcement package

It refers to the reinforced APK/AAB package. The security reinforcement package in a certain task refers to the APK/AAB package reinforced during the task.

Share rate

It refers to the ratio of the devices that have shared the push to the total devices that have received the push.

Shares

It refers to the number of shares of an event on the landing page within a period of time. The implementation result depends on the accuracy of client tracking.

Simple Push

It refers to a method of pushing one message to one target ID.

Single-frame booth

It refers to a booth with an advertisement displayed for 1 frame.

Symbol encryption

It refers to a method of encrypting the names of specified functions and variables.

SYNC

It refers to the data synchronization service, which enables data synchronization between servers and clients.

T

TaobaoRemoting (TR)

The TR framework refers to the underlying communications framework used for PRC. TR is provided by the Ant Group.

Task name

A message-pushing request is identified as a task.

Template parameter

It refers to a part in a message template that can be dynamically replaced. It can be also referred to as a template placeholder.

Template parameter value

It refers to the specific content corresponding to a template placeholder.

Template push

It refers to a method of pushing a message to one pushing target ID. The message content is obtained by replacing the template parameter.

Threshold

It refers to the upper limit of data backlog on servers. If a user or device is offline for a long time and new data is constantly generated by the MSS servers, there may be a backlog of data on the servers. In this case, only the latest data within the threshold will be retained, and the rest of the data will be deprecated.

Tracking point

The tracking point refers to a technique and its implementation process that are used to capture, process, and report specified user behaviors or events. Information of an app is collected to track the condition of the app being used so that the product and operation can be optimized based on data including visits, visitors, taps, and visit duration.

U

User identifier

It identifies a unique user and corresponds to a specified device. It is generally used in binding relationships.

UserId

Advertisements are pushed to targeted users according to their userIds. When the targeted userIds are online, the advertisements will be pushed to the corresponding users. When a user logs in on multiple devices, the advertisements will be pushed to all the devices.

UTDID

Advertisements are pushed for targeted UTDIDs. Regardless of whether the user ID is online, when the app is opened on the targeted devices, the advertisements will be displayed.

V

Variable

When a test is performed on the client side, variables are required to be pushed to the app through Mobile Delivery Service (MDS) dynamic configurations. When a test is performed on the server-side and gateway, variables should be configured.

W

workspaceId

It is an identifier of a workspace on the mobile platform. It is used to isolate different environments. You can view it on the download configuration file page on the console.