Ant Technology

About mPaaS kernel
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}`

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1.About mPaaS kernel

The Ant mPaaS kernel, developed by Alipay's technology department, is based on the Chromium engine. This browser kernel has been proven in a multitude of Alipay App and Mini Program scenarios, benefiting from years of technological refinement. The mPaaS kernel delivers ongoing enhancements in areas such as stability, startup speed, webpage loading, security, smooth operation, memory efficiency, and compatibility. Keeping pace with the latest stable Chromium releases, it offers a variety of flexible integration types and provides developers with superior web browsing services.

Features

In addition to providing Web standard capabilities and solving the basic demands of mobile WebView browser version fragmentation, it has the following features:

- Enhanced compatibility and stability, including GPU process support, page stuck detection, and custom crash reporting
- Advanced and customizable security features for browsers
- Open network customization, cookie customization, keyboard input method customization, Sandbox security process related capabilities
- Breakthroughs in WebView's inherent limitations for open usage
- Support for cutting-edge H5 standards like WebXR, SharedWorker, and WebGPU
- Browser functionalities better suited for Mini Programs
- Same-layer rendering, an independent V8 environment, a high-performance communication channel, and a multi-process architecture that balances security and performance

Benefits

Speed Improvement

The mPaaS kernel has been enhanced with the latest Chromium engine baseline, particularly in the V8 engine, rendering efficiency, and network library. These enhancements result in the mPaaS kernel delivering significantly faster webpage loading speeds compared to the system kernel across various webpage types and in complex network scenarios. Moreover, the mPaaS kernel offers webpage resource preloading technology that enables the instant launch of key business pages through tailored optimization, bolstering business value creation.

Kernel Security

The mPaaS kernel benefits from ongoing Ant security team support, with robust vulnerability scanning and monitoring that allows for rapid response and remediation of potential security issues. Regular updates to the kernel ensure alignment with the latest versions for enhanced security.

Good Compatibility

The mPaaS kernel maintains consistent versions to prevent fragmentation issues, improving frontend and client interface compatibility. It ensures uniformity across HTML, JS, CSS attributes, and WebView interfaces, sparing developers from compatibility concerns across different versions. The kernel's ongoing updates also guarantee support for new attributes and features, offering superior compatibility compared to the system kernel.

Webpage Experience

The mPaaS kernel enhances the webpage opening experience with various optimizations.

- Same-layer rendering capability

The mPaaS kernel facilitates same-layer rendering, effectively handling the integration of Native and Web elements. It supports kernel-level rendering of Native components, enabling the embedding of map components and video players within webpages.

- Typography adaptation

  Optimized mobile typography ensures text remains legible and well-arranged on screen after user scaling, with adaptations for mobile-specific scenarios.

- User-friendly prompts

  The kernel provides intuitive prompts for page abnormalities, forced scaling, night mode, password saving, forward and backward caching, and instant opening, significantly improving the user experience.

Stable Operation

The kernel supports functions such as friendly prompts for page exceptions, forced zooming, night mode, user password saving, forward and backward caching, and instant opening, ensuring that the user's web experience is comprehensively improved.

Standard support

- Latest kernel baseline version: Chromium 105.
- Support for HTML, CSS, JS attributes: Based on Chromium 105, offering extensive attribute support.
- Supported Android versions: Android 5.0 - Android 15+.
- Device compatibility: Works across a wide range of devices, supporting various brands, system kernels, and screen sizes, with WebGL compatibility reaching 95%.
- Network protocol: Support TLS1.3 standard protocol.

2.Integrate mPaaS kernel

Integration instruction

> **Note**
> Integration of the mPaaS kernel requires a baseline version of 10.2.3.55 or higher.

1. Add the new mvn configuration, refer to manually configure Maven repository.
2. Add the following configuration into the app's `build.gradle` file. For specific SDK version numbers, please refer to: mPaaS kernel version release notes.

```
android {
  ...
  configurations {
        // Remove UC
        all*.exclude group: 'com.mpaas.mriver', module: 'mriveruc-build'
        all*.exclude module: 'nebulauc-build'
   }

   packagingOptions {
      exclude '**/libWebViewCore_**.so'  // Remove unnecessary so to reduce package s
ize
   }
}

dependencies {
  ...
  api 'com.mpaas.myweb:mpaasmywebapi-build:xxx@aar'
  api 'com.mpaas.myweb:mpaasmyweb:xxx@aar'

  // The mini program container must be added, do not add if not using mini program
  api 'com.mpaas.mriver:mrivermyweb-build:xxx@aar'

  // The H5 container must be added
  api 'com.mpaas.nebula:nebulamyweb-build:xxx@aar'
}
```

3. Add obfuscation configuration.

```
-keep class com.alipay.mywebview.** {*;}
```

4. Apply for authorization code and configure it in the `AndroidManifest.xml` as follows.

```
<meta-data
            android:name="MPKernelAuthKey"
            android:value="xxx" />
```

> **Important**
> The information required for the application includes the **Package name of the Apk** and the **Signature digest SHA256**.

How to obtain the signature digest

Method 1: Use `apksigner` command from the Android SDK.

```
apksigner verify -v --print-certs test.apk | grep 'certificate SHA-256'

// Output example
Signer #1 certificate SHA-256 digest:
389b49f7832f53e9017923220aa85e14dfaa4886ecd7428818bf339543cf498a
```

Method 2: Use `keytool`.

```
keytool -printcert -jarfile test.apk | grep SHA256

// Output example
 SHA256:
A0:02:3F:10:D8:B9:8F:FF:E2:57:4B:47:A6:46:30:0C:67:98:5E:BF:5A:98:BB:D5:25:32:DE:E6:F8:91
7:07
```

Verify whether the kernel application is successful

Filter the log webview version. If the version number is `0.11.xxx`, it proves that the kernel application is successful.

For customers who used UC kernel

If the mPaaS App has been integrated to the UC kernel before, you need to confirm the following points:

- Whether specific logic customization of the kernel has been done. If so, it needs to be re-implemented according to the new interface. You can determine this by searching whether the code contains `import com.uc.xxxxx`.
- The new kernel version no longer supports Nebula Mini Program. Users of Nebula Mini Program should upgrade to the new Mini Program container.
- Restore the related functions, mainly including:
  - For H5 container components (including embedded H5 in Mini Programs), kernel-related functions need to be restored. This includes all functions of H5 pages and dynamic switching of system kernel scenarios.
  - For Mini Program components, the Mini Program functions need to be restored. This includes rendering, components, API, plugins, etc.

3.mPaaS kernel version release notes

July 28, 2025

Version number

com.mpaas.myweb:mpaasmywebapi-build:1.0.0.250714155427@aar	Kernel version number
com.mpaas.myweb:mpaasmyweb:1.0.0.250714155427@aar	
com.mpaas.mriver:mrivermyweb-build:1.0.0.250714155427@aar	Mini Program adaptation SDK version
com.mpaas.nebula:nebulamyweb-build:1.0.0.250714155427@aar	H5 container adaptation SDK version

Update note

- Reduce kernel size.
- Change the integration method without excluding nebulaucsdk-build. For details, please refer to Integrate mPaaS kernel.
- To use this version of the mPaaS kernel, the baseline must be upgraded to version 10.2.3.67 or later.

June 6, 2025

Version number

com.mpaas.myweb:mpaasmywebapi-build:1.0.0.250606105320@aar	Kernel version number
com.mpaas.myweb:mpaasmyweb:1.0.0.250421150621@aar	
com.mpaas.mriver:mrivermyweb-build:1.0.0.250401142805@aar	Mini Program adaptation SDK version
com.mpaas.nebula:nebulamyweb-build:1.0.0.250401142805@aar	H5 container adaptation SDK version

Update note

- Fixed the crash issue of the mini program when using ICU related APIs such as new Date().toLocalDateString().

April 22, 2025

Version number

com.mpaas.myweb:mpaasmywebapi-build:1.0.0.250421150621@aar	Kernel version number
com.mpaas.myweb:mpaasmyweb:1.0.0.250421150621@aar	
com.mpaas.mriver:mrivermyweb-build:1.0.0.250401142805@aar	Mini Program adaptation SDK version
com.mpaas.nebula:nebulamyweb-build:1.0.0.250401142805@aar	H5 container adaptation SDK version

Update note

- Fixed the issue where the soft keyboard partially obscured the input box in non-immersive mode.

April 1, 2025

Version number

com.mpaas.myweb:mpaasmywebapi-build:10.2.3.00001207@aar	Kernel version number
com.mpaas.myweb:mpaasmyweb:10.2.3.00001207@aar	
com.mpaas.mriver:mrivermyweb-build:1.0.0.250401142805@aar	Mini Program adaptation SDK version
com.mpaas.nebula:nebulamyweb-build:1.0.0.250401142805@aar	H5 container adaptation SDK version

Update notes

- Fixed the issue where some devices may crash under Xiaomi HyperOS 2.0 system.

March 1, 2025

Version number

com.mpaas.myweb:mpaasmywebapi-build:10.2.3.00001207@aar	Kernel version number
com.mpaas.myweb:mpaasmyweb:10.2.3.00001207@aar	
com.mpaas.mriver:mrivermyweb-build:10.2.3.00001200@aar	Mini Program adaptation SDK version

com.mpaas.nebula:nebulamyweb-build:10.2.3.00001319@aar	H5 container adaptation SDK version

Update note

- Adaptation for target 34.

December 2, 2024

Version number

com.mpaas.myweb:mpaasmywebapi-build:10.2.3.00001170@aar	Kernel version number
com.mpaas.myweb:mpaasmyweb:10.2.3.00001170@aar	
com.mpaas.mriver:mrivermyweb-build:10.2.3.1029@aar	Mini Program adaptation SDK version
com.mpaas.nebula:nebulamyweb-build:10.2.3.2043@aar	H5 container adaptation SDK version

Update note

- Supports for WebRTC.
- Fixed crashe issues related to AndroidX compatibility.
- Fixed occasional crash issue in the error callback process.
- Fixed the numeric keyboard issue on some certain models.

October 22, 2024

Version number

com.mpaas.myweb:mpaasmywebapi-build:10.2.3.00001054@aar	Kernel version number
com.mpaas.myweb:mpaasmyweb:10.2.3.1029@aar	
com.mpaas.mriver:mrivermyweb-build:10.2.3.1029@aar	Mini Program adaptation SDK version
com.mpaas.nebula:nebulamyweb-build:10.2.3.00001054@aar	H5 container adaptation SDK version

Update note

- Supports for mPaaS kernel.

4.mPaaS kernel supports WebRTC

The mPaaS kernel supports WebRTC, and you need to set up authorization for recording and camera permissions.

WebRTC permission authorization

Upon completion of initialization, establish a custom permission handler using the Provider.

```
H5Utils.setProvider(MPH5WebChromeClientProvider.class.getName(), new
MPH5WebChromeClientProvider() {
  @Override
  public H5WebChromeClient generateH5WebChromeClient(H5PageImpl h5Page) {
      return new CustomH5WebChromeClient(h5Page);
  }
});
```

```
package com.mpaas.demo;

import android.webkit.PermissionRequest;

import com.alipay.mobile.nebulacore.core.H5PageImpl;
import com.alipay.mobile.nebulacore.web.H5WebChromeClient;

public class CustomH5WebChromeClient extends H5WebChromeClient {

    public CustomH5WebChromeClient() {
    }

    public CustomH5WebChromeClient(H5PageImpl page) {
        super(page);
    }

    @Override
    public void onPermissionRequest(PermissionRequest request) {
        // Check if the app includes the permission. If not, request the corresponding
permission.

        // If the permission is granted, invoke grant
        //request.grant(request.getResources());

        // If the permission is rejected, call deny
        // request.deny(request.getResources());
    }

    @Override
    public void onPermissionRequestCanceled(PermissionRequest request) {
    }
}
```

5.mPaaS kernel FAQ

Business issues

Why is it recommended to use the mPaaS kernel?

- Technical continuity: The mPaaS kernel, developed by Ant Group, ensures more controllable and reliable upgrades and maintenance.
- Seamless integration: Originating from Alipay's technology, the mPaaS kernel's integration and compatibility with other client-side features have been thoroughly tested.

What dimension is MYWeb's authorization charged by?

Authorization is charged per App. The mPaaS kernel authorization code is tied to the App's package name and sign, and does not depend on the number of environments.

Technical issues

Is it confirmed that this event only affects Android clients, and does it affect iOS and H5 interfaces?

This event is confirmed to affect only Android clients and does not impact iOS. H5 offline packages on Android clients require regression testing to ensure functionality after the kernel switch.

How long does it take to integrate the mPaaS kernel?

The integration typically takes two days, with full technical support and guidance provided by mPaaS. After the integration is completed, customers need to perform regression testing and verification on all mini programs and H5 services.