前置要求：

操作系统：Ubuntu 22.04
CPU架构：x86_64
参考Electron鸿蒙化指导文档git拉取Electron源代码

一、aki源码下载和编译

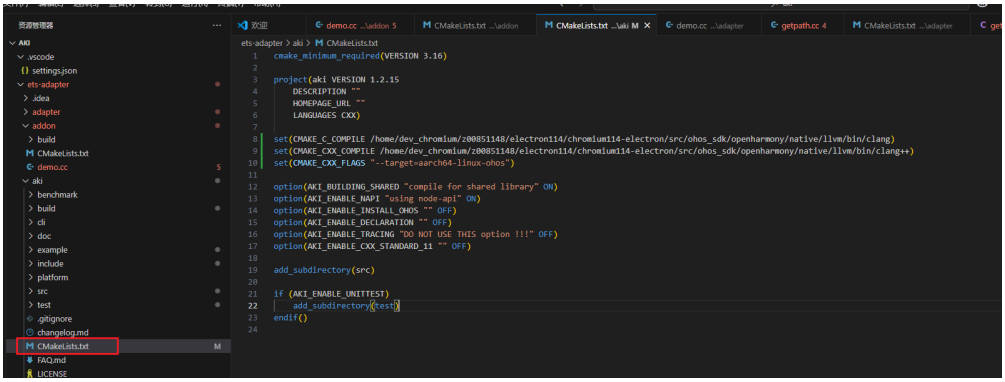
1 利用git下拉aki框架代码

```
git clone https://gitee.com/openharmony-sig/aki.git
```

2 配置cmake

进入aki目录，在cmake中增加以下编译配置（服务器中鸿蒙clang、clang++对应的路径，以下路径仅作参考）：

```
set(CMAKE_C_COMPILE /home/dev_chromium/z00851148/electron114/chromium114-electron/src/ohos_sdk/openharmony/native/llvm/bin/clang)
set(CMAKE_CXX_COMPILE /home/dev_chromium/z00851148/electron114/chromium114-electron/src/ohos_sdk/openharmony/native/llvm/bin/clang
set(CMAKE_CXX_FLAGS "--target=aarch64-linux-ohos")
```



3 配置环境变量（clang、clang++换为实际路径）

```
export CC="/home/dev_chromium/z00851148/electron114/chromium114-electron/src/ohos_sdk/openharmony/native/llvm/bin/clang --target=a
export CXX="/home/dev_chromium/z00851148/electron114/chromium114-electron/src/ohos_sdk/openharmony/native/llvm/bin/clang++ --targe
```

4 编译

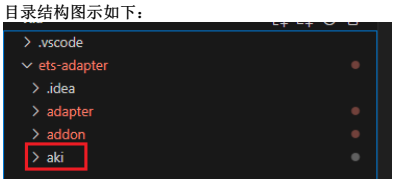
运行结束在build/src路径会生成最终的编译产物 libaki_jsbind.so

```
cd aki
mkdir build
cd build
cmake ../ -DCMAKE_BUILD_TYPE=Release
make
```

二、应用adapter编写

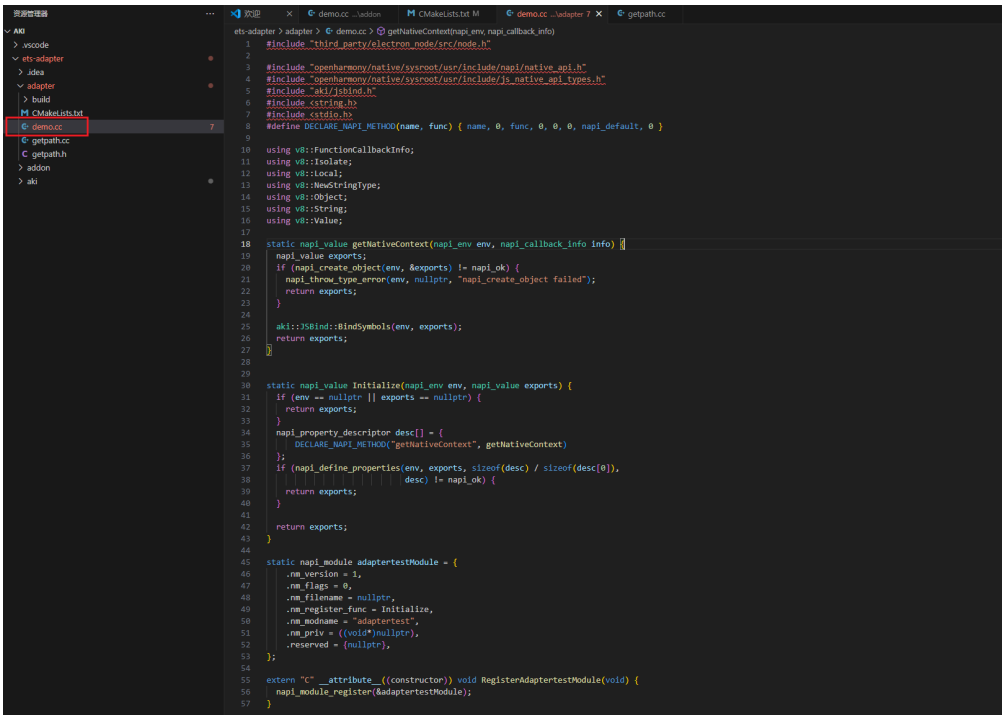
1 样例目录结构

目录结构图示如下：



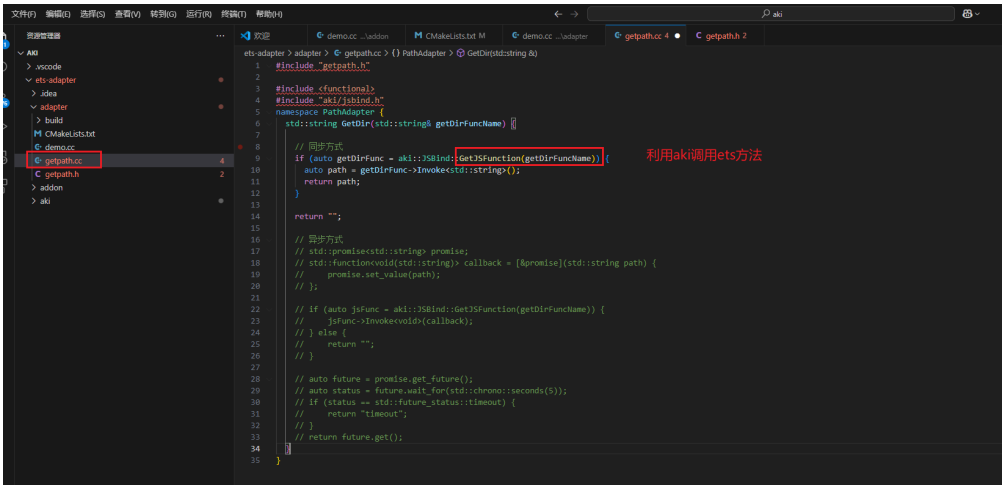
其中，aki文件夹为第一步git下来的aki。

2. 仿照adapter下的demo进行方法的注册



3. 仿照getPatch.cc进行方法的绑定

此处提供同步和异步两种方式，供应用自己选择：



4. CMakeLists编写

```
# Project Name
SET(TARGETFILENAME "adaptertest")
PROJECT(${TARGETFILENAME})

#  CMake minimum version requirement setting
cmake_minimum_required(VERSION 3.8)

# set electron path
set(ELE_PATH /home/dev_chromium/z00851148/electron114/chromium114-electron)

# ohos
set(CMAKE_C_COMPILER ${ELE_PATH}/src/ohos_sdk/openharmony/native/llvm/bin/clang)
set(CMAKE_CXX_COMPILER ${ELE_PATH}/src/ohos_sdk/openharmony/native/llvm/bin/clang++)
set(CMAKE_CXX_FLAGS "--target=aarch64-linux-ohos")

# 设置包含目录
# ohos
include_directories(${ELE_PATH}/src/)
include_directories(${ELE_PATH}/src/third_party/electron_node/deps/v8/include/)
include_directories(${ELE_PATH}/src/ohos_sdk/)
include_directories(${CMAKE_CURRENT_SOURCE_DIR}/../aki/include)

message(${CMAKE_CURRENT_SOURCE_DIR})

set(src demo.cc getpath.cc)
set(headers getpath.h)

# 生成可执行文件
#add_executable(${TARGETFILENAME} demo.cpp)


# 生成静态库
#ADD_LIBRARY(${TARGETFILENAME} STATIC demo.cpp)


# 生成动态库或共享库
```

```
ADD_LIBRARY (${TARGETFILENAME} SHARED
     ${src}
)
target_compile_features(${TARGETFILENAME} PUBLIC cxx_std_17)
target_compile_definitions(${TARGETFILENAME} PUBLIC JSBIND_USING_NAPI=1)
target_compile_definitions(${TARGETFILENAME} PUBLIC AKI_BUILDING_SHARED=1)

# 设置链接库文件-ohos
target_link_libraries(${TARGETFILENAME} PUBLIC ${CMAKE_CURRENT_SOURCE_DIR}/../aki/build/src/libaki_jsbind.so)
target_link_libraries(${TARGETFILENAME} PUBLIC ${ELE_PATH}/src/out/musl_64/libelectron.so)

# 修改后缀名为  .node
# SET_TARGET_PROPERTIES(${TARGETFILENAME} PROPERTIES SUFFIX ".node")
```

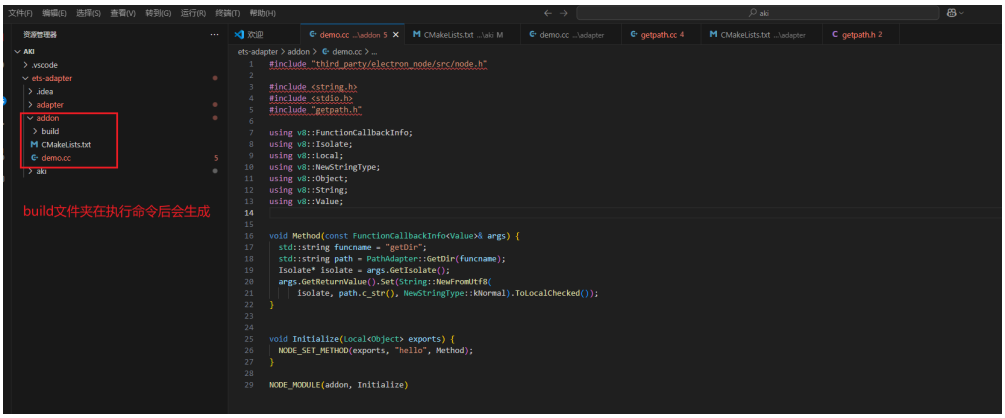
5. 获取编译产物

执行命令，可获取编译产物libadaptertest.so

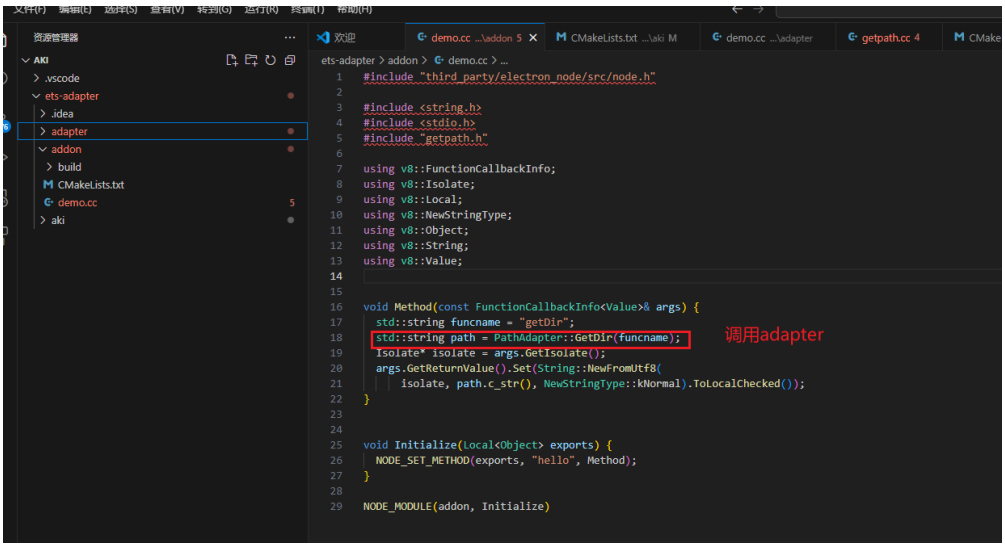
```
mkdir build
cd build
cmake ../
make
```

三、应用addon编写

1 样例目录结构



2 调用adapter



3 CMakeLists编写

```
# Project Name
SET(TARGETFILENAME "addon")
PROJECT(${TARGETFILENAME})

#  CMake minimum version requirement setting
cmake_minimum_required(VERSION 3.8)

# set electron path
set(ELE_PATH /home/dev_chromium/z00851148/electron114/chromium114-electron)

# ohos
set(CMAKE_C_COMPILER ${ELE_PATH}/src/ohos_sdk/openharmony/native/llvm/bin/clang)
set(CMAKE_CXX_COMPILER ${ELE_PATH}/src/ohos_sdk/openharmony/native/llvm/bin/clang++)
set(CMAKE_CXX_FLAGS "--target=aarch64-linux-ohos")

# 设置包含目录

# ohos

include_directories(${ELE_PATH}/src/)
include_directories(${ELE_PATH}/src/third_party/electron_node/deps/v8/include/)
```

```
include_directories(${ELE_PATH}/src/ohos_sdk/)
include_directories(${CMAKE_CURRENT_SOURCE_DIR}/../adapter/)


message(${CMAKE_CURRENT_SOURCE_DIR})

set(src demo.cc)

# 生成可执行文件

#add_executable(${TARGETFILENAME} demo.cpp)


# 生成静态库

#ADD_LIBRARY(${TARGETFILENAME} STATIC demo.cpp)


# 生成动态库或共享库
ADD_LIBRARY (${TARGETFILENAME} SHARED
     ${src}
)

# 设置链接库文件-ohos
target_link_libraries(${TARGETFILENAME} PUBLIC ${ELE_PATH}/src/out/musl_64/libelectron.so)
target_link_libraries(${TARGETFILENAME} PUBLIC ${CMAKE_CURRENT_SOURCE_DIR}/../adapter/build/libadaptertest.so)
target_compile_definitions(${TARGETFILENAME} PUBLIC NODE_MODULE_VERSION=116)

# 修改后缀名为  .node
 SET_TARGET_PROPERTIES(${TARGETFILENAME} PROPERTIES SUFFIX ".node")
```

4 获取编译产物

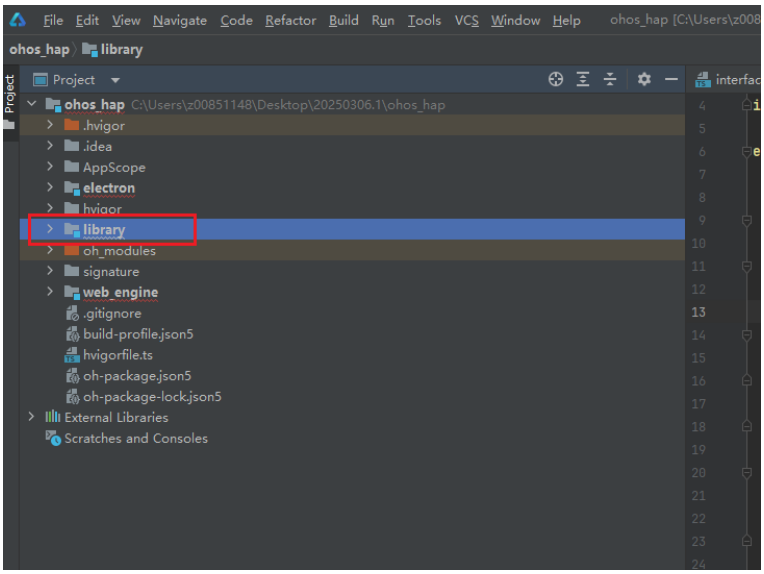
执行下述命令后，可获取编译产物addon.node

```
mkdir build
cd build
cmake ../
make
```

四、ets调用及har包构建

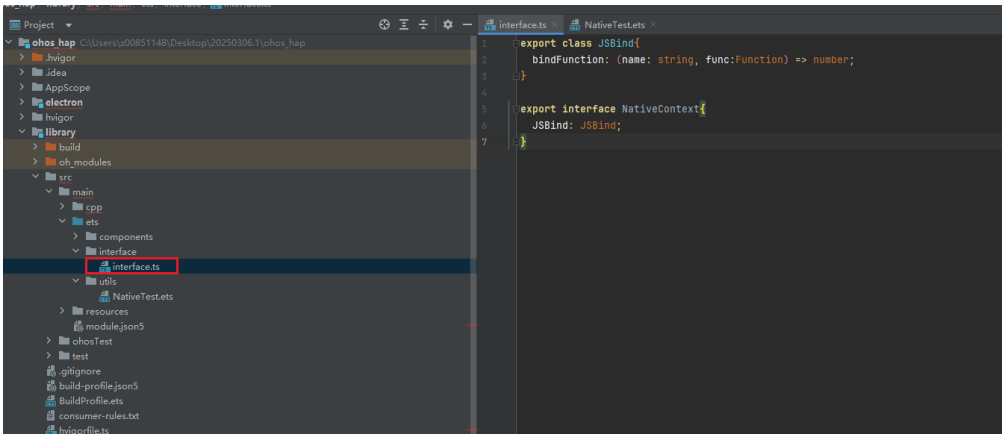
1 创建工程

deveco中点击File ==> New ==> Moudle ==> Static Library，创建一个Library



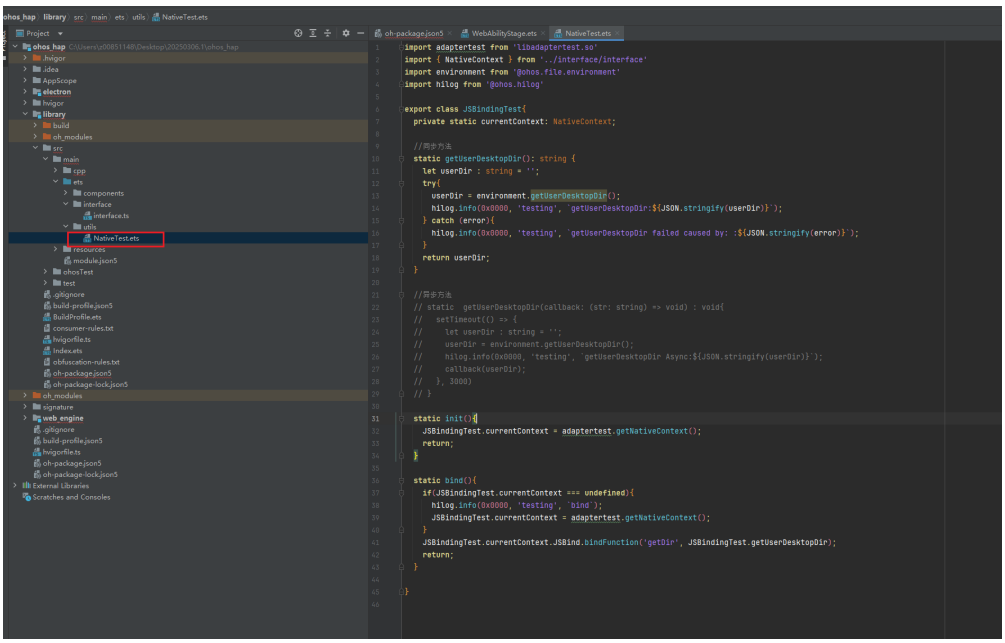
2 将adapter中的注册进行声明和初始化

2.1 adapter中的注册进行声明



```
export class JSBind{
  bindFunction: (name: string, func:Function) => number;
}

export interface NativeContext{
  JSBind: JSBind;
}
```

2.2 定义初始化和bind函数

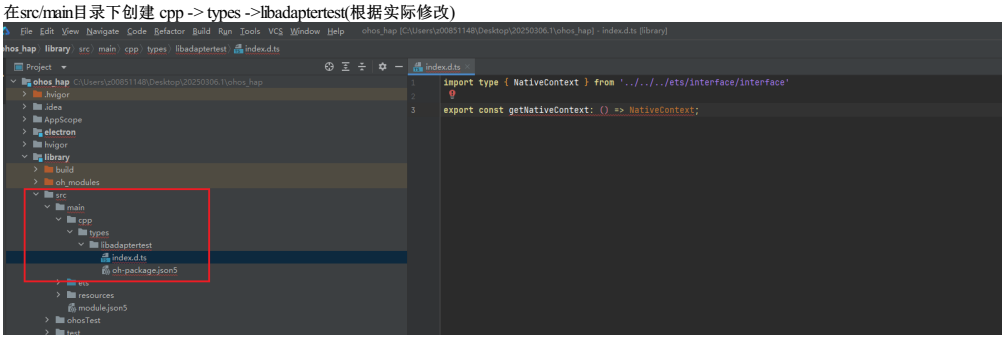


```
import adaptertest from 'libadaptertest.so'
import { NativeContext } from '../interface/interface'
import environment from '@ohos.file.environment'
import hilog from '@ohos.hilog'

export class JSBindingTest{
  private static currentContext: NativeContext;

  //同步方法
  static getUserDesktopDir(): string {
    let userDir : string = '';
    try{
      userDir = environment.getUserDesktopDir();
      hilog.info(0x0000, 'testing', `getUserDesktopDir:${JSON.stringify(userDir)}`);
    } catch (error){
      hilog.info(0x0000, 'testing', `getUserDesktopDir failed caused by: :${JSON.stringify(error)}`);
    }
    return userDir;
  }

  //异步方法
  // static  getUserDesktopDir(callback: (str: string) => void) : void{
  //   setTimeout(() => {
  //     let userDir : string = '';
  //     userDir = environment.getUserDesktopDir();
  //     hilog.info(0x0000, 'testing', `getUserDesktopDir Async:${JSON.stringify(userDir)}`);
  //     callback(userDir);
  //   }, 3000)
  // }

  static init(){
    JSBindingTest.currentContext = adaptertest.getNativeContext();
    return;
  }

  static bind(){
    if(JSBindingTest.currentContext === undefined){
      hilog.info(0x0000, 'testing', `bind`);
      JSBindingTest.currentContext = adaptertest.getNativeContext();
    }
    JSBindingTest.currentContext.JSBind.bindFunction('getDir', JSBindingTest.getUserDesktopDir);
    return;
  }

}
```

```
    }
    JSBindingTest.currentContext.JSBind.bindFunction('getDir', JSBindingTest.getUserDesktopDir);
    return;
  }

}
```

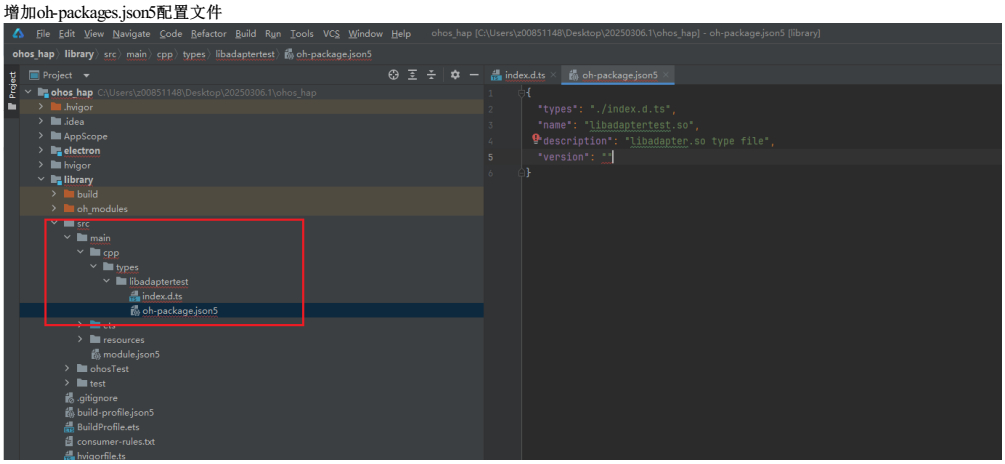
2.2.3 增加共享包导出声明入口

在src/main目录下创建 cpp -> types ->libadaptertest(根据实际修改)



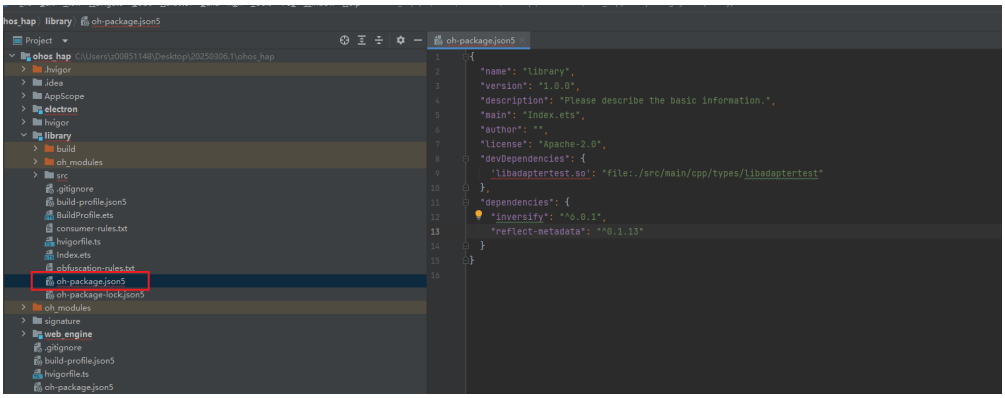
```
import type { NativeContext } from '../../../ets/interface/interface'

export const getNativeContext: () => NativeContext;
```

增加oh-packages.json5配置文件



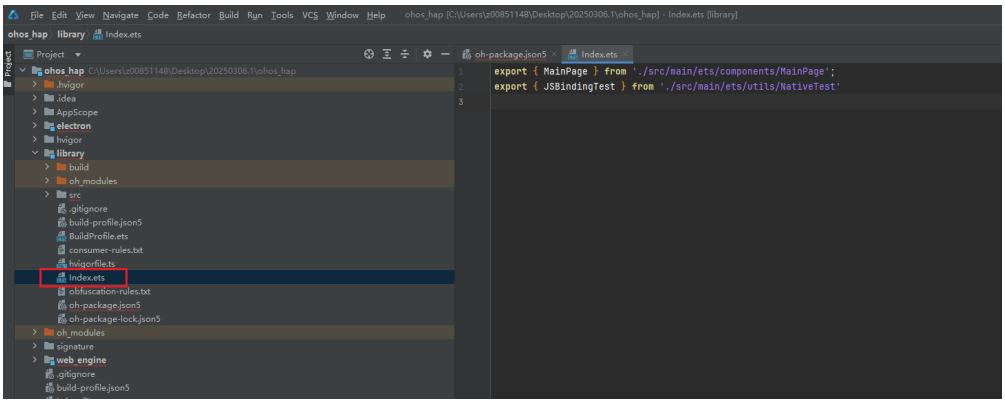
```
{
  "types": "./index.d.ts",
  "name": "libadaptertest.so",
  "description": "libadapter.so type file",
  "version": ""
}
```

2.2.4 修改library根目录下的oh-packages.json5配置文件，增加引用依赖



```
{
  "name": "library",
  "version": "1.0.0",
  "description": "Please describe the basic information.",
  "main": "Index.ets",
  "author": "",
  "license": "Apache-2.0",
  "devDependencies": {
    'libadaptertest.so': "file:./src/main/cpp/types/libadaptertest"
  },
  "dependencies": {
    "inversify": "^6.0.1",
    "reflect-metadata": "^0.1.13"
  }
}
```

2.2.5 修改library根目录下的Index.ets配置文件，增加导出方法

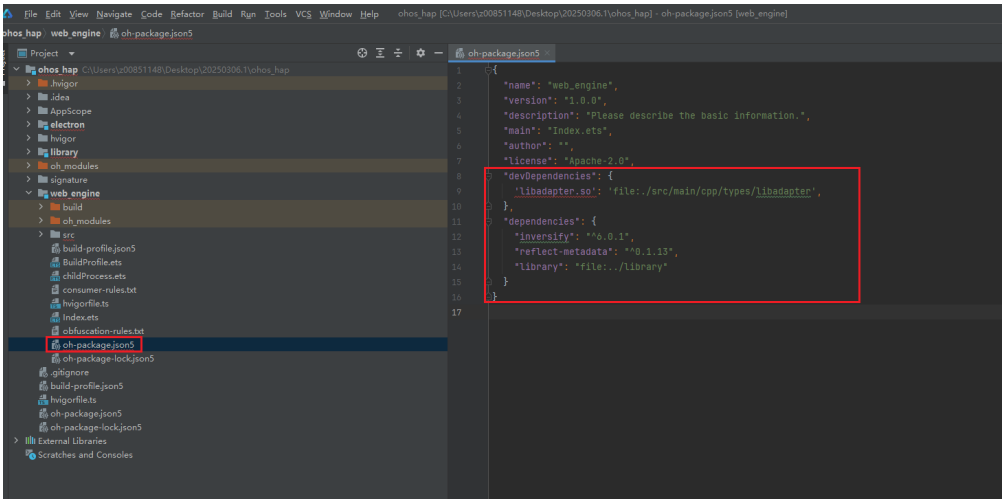


```
export { MainPage } from './src/main/ets/components/MainPage';
export { JSBindingTest } from './src/main/ets/utils/NativeTest'
```

2.2.6 构建har包

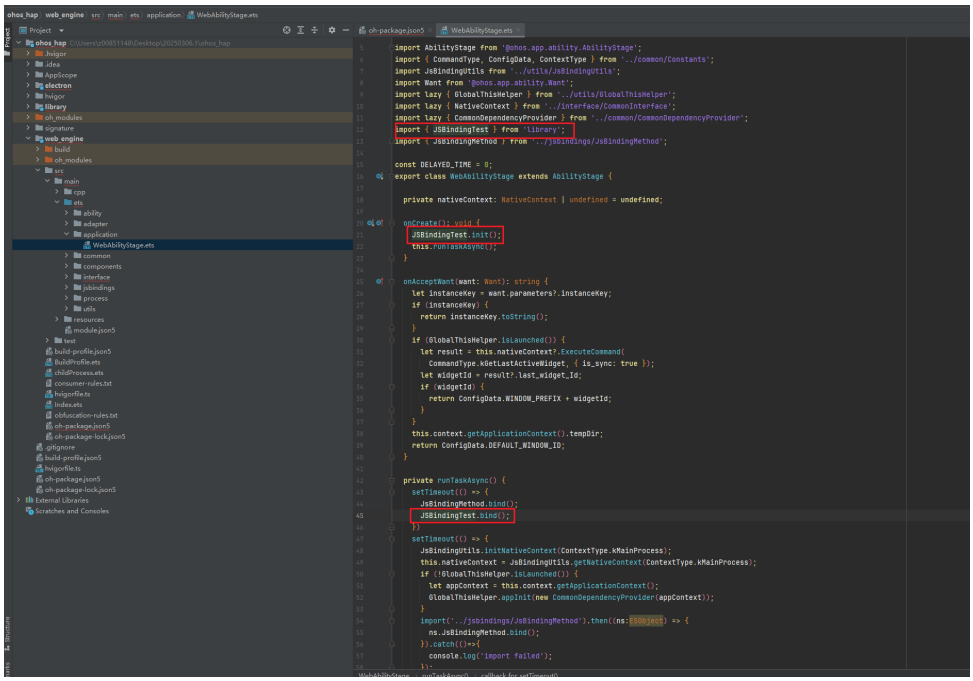
参考文档：引用共享包-开发及引用共享包-应用/元服务开发-DevEco Studio - 华为HarmonyOS开发者

1. 在web_engine模块中引用此HAR包 webgine/oh-packages.json5 中增加引用配置



```
{
  "name": "web_engine",
  "version": "1.0.0",
  "description": "Please describe the basic information.",
  "main": "Index.ets",
  "author": "",
  "license": "Apache-2.0",
  "devDependencies": {
    'libadapter.so': 'file:./src/main/cpp/types/libadapter',
  },
  "dependencies": {
    "inversify": "^6.0.1",
    "reflect-metadata": "^0.1.13",
    "library": "file:../library"
  }
}
```

2. 在WebAbilityStage.ets文件中初始化、绑定



```
// Copyright (c) 2024 Huawei Device Co., Ltd. All rights reserved.
// Use of this source code is governed by a BSD-style license that can be
// found in the LICENSE file.

import AbilityStage from '@ohos.app.ability.AbilityStage';
import { CommandType, ConfigData, ContextType } from '../common/Constants';
import JsBindingUtils from '../utils/JsBindingUtils';
import Want from '@ohos.app.ability.Want';
import lazy { GlobalThisHelper } from '../utils/GlobalThisHelper';
import lazy { NativeContext } from '../interface/CommonInterface';
import lazy { CommonDependencyProvider } from '../common/CommonDependencyProvider';
import { JSBindingTest } from 'library';
import { JsBindingMethod } from '../jsbindings/JsBindingMethod';

const DELAYED_TIME = 0;
export class WebAbilityStage extends AbilityStage {

  private nativeContext: NativeContext | undefined = undefined;

  onCreate(): void {
    JSBindingTest.init();
    this.runTaskAsync();
  }

  onAcceptWant(want: Want): string {
    let instanceKey = want.parameters?.instanceKey;
    if (instanceKey) {
      return instanceKey.toString();
    }
    if (GlobalThisHelper.isLaunched()) {
      let result = this.nativeContext?.ExecuteCommand(
        CommandType.kGetLastActiveWidget, { is_sync: true });
      let widgetId = result?.last_widget_Id;
      if (widgetId) {
        return ConfigData.WINDOW_PREFIX + widgetId;
      }
    }
    this.context.getApplicationContext().tempDir;
    return ConfigData.DEFAULT_WINDOW_ID;
  }

  private runTaskAsync() {
    setTimeout(() => {
      JsBindingMethod.bind();
      JSBindingTest.bind();
    })
    setTimeout(() => {
      JsBindingUtils.initNativeContext(ContextType.kMainProcess);
      this.nativeContext = JsBindingUtils.getNativeContext(ContextType.kMainProcess);
      if (!GlobalThisHelper.isLaunched()) {
        let appContext = this.context.getApplicationContext();
```

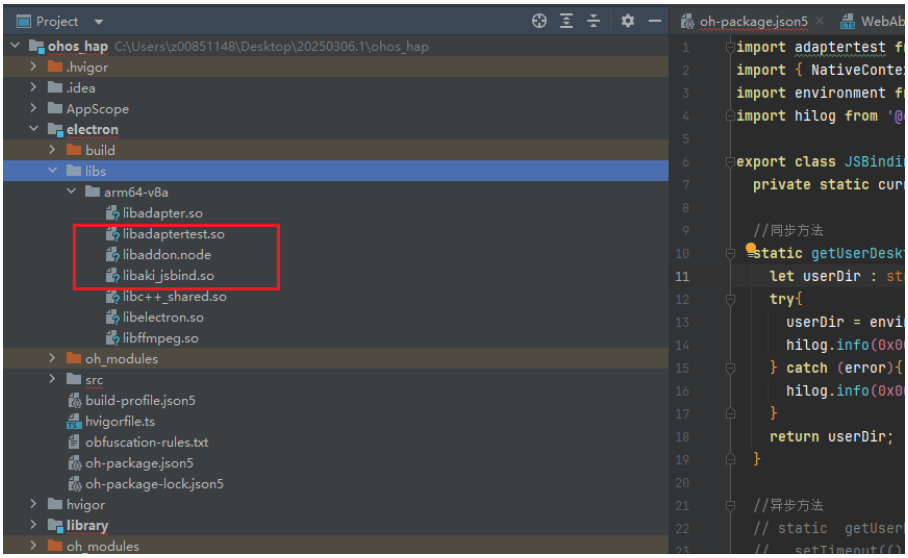
```
        GlobalThisHelper.appInit(new CommonDependencyProvider(appContext));
      }
      import('../jsbindings/JsBindingMethod').then((ns:ESObject) => {
        ns.JsBindingMethod.bind();
      }).catch(()=>{
        console.log('import failed');
      });
    }, DELAYED_TIME)
  }
}
```

2.2.7 附加：部分目录结构介绍

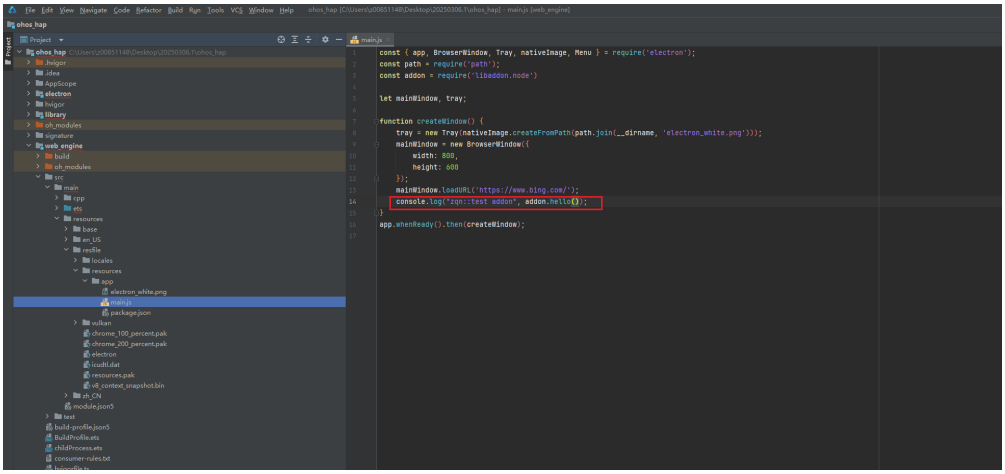
- libs：用于存放.so文件。
- src > main > cpp > types：用于存放C++ API描述文件，子目录按照so维度进行划分。
- src > main > cpp > types > liblibrary > Index.d.ts：描述C++接口的方法名、入参、返回参数等信息。
- src > main > cpp > types > liblibrary > oh-package.json5：描述so三方包声明文件入口和so包名信息。
- src > main > cpp > CMakeLists.txt：CMake配置文件，提供CMake构建脚本。
- src > main > cpp > napi_init.cpp：共享包C++代码源文件。
- Index.ets：共享包导出声明的入口。

五、最终调用

1 HAP包目录结构



2 JS代码调用



3 运行结果