



Version Release Package

User Guide

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About This Document

Purpose

This document describes the overall structure and content of the release package. It aims to guide users to use the release package and to systematically learn the content of the release package.

Intended Audience

This document is intended for:

- Technical support engineers
- Software development engineers
- Hardware development engineers

Change History

Changes between document issues are cumulative. Therefore, the latest document issue contains all changes made in previous issues.

Issue 00B01 (2015-06-15)

This issue is the first draft release.



Contents

About This Document.....	ii
1 Linux Release Package	1
1.1 Overview	1
1.1.1 Version Naming Rules	1
1.1.2 Directory Structure.....	1
1.1.3 Directories in the Release Package	2
1.2 Guidance	3
2 Android Release Package	4
2.1 Overview	4
2.1.1 Directory Structure.....	4
2.1.2 Directories in the Release Package	4
2.2 Guidance	5
3 hardware Directory	6
3.1 Overview	6
3.1.1 Directory Structure.....	6
3.1.2 Directories in the Release Package	6
3.2 Guidance	7
4 document Directory	9
4.1 Overview	9
4.1.1 File Path	9
4.1.2 File Classification	9
4.2 Linux Solution.....	11
4.2.1 Development Guide	11
4.2.2 User Guide	15
4.2.3 Data Sheet	16
4.2.4 Tools.....	17
4.2.5 FAQs	19
4.3 Android Solutions.....	19
4.3.1 Development Guide	20
4.3.2 User Guide	22
4.3.3 Tools.....	24



4.3.4 FAQ.....	24
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Figures

Figure 1-1 Directory of the Linux release package	2
Figure 2-1 Directory of the Android release package.....	4
Figure 3-1 Structure of the hardware directory	6
Figure 4-1 Path of the document directory	9
Figure 4-2 HiSilicon file classification.....	10
Figure 4-3 Logic structure of the UNF API Difference Description	12
Figure 4-4 Logic structure of the HMS Development Guide	13



Tables

Table 4-1 List of user guides	15
Table 4-2 List of tool user guides	17
Table 4-3 List of FAQ documents.....	19
Table 4-4 List of user guides	23



1 Linux Release Package

1.1 Overview

1.1.1 Version Naming Rules

HiSTBLinux V_{xxx}R_{xxx}C_{xx} is designed for different customers and markets. During the release of a version, this part of the version name hardly changes. The development of the version mainly consists of the following two types.



NOTE

This section takes HiSTBLinux V100R004C00 as an example to illustrate the version naming rules.

1.1.1.1 SPC Version

Take HiSTBLinux V100R004C00SPC_{xyz} as an example. The first version released is usually HiSTBLinux V100R004C00SPC010, and the subsequent versions are named HiSTBLinux V100R004C00SPC020, HiSTBLinux V100R004C00SPC030, and so on. SPC_{xyz} is described as follows:

- _{xy} indicates the major version.
 - _x ranges from 0 to 9.
 - _y ranges from 0 to 9 and A to Z.
- _z ranges from 1 to 9, indicating the patch version based on _{xy}.

For example, for HiSTBLinux V100R004C00SPC010, if no new features are added after the modification of bugs, the version after upgrade is HiSTBLinux V100R004C00SPC011.

1.1.1.2 CP Version

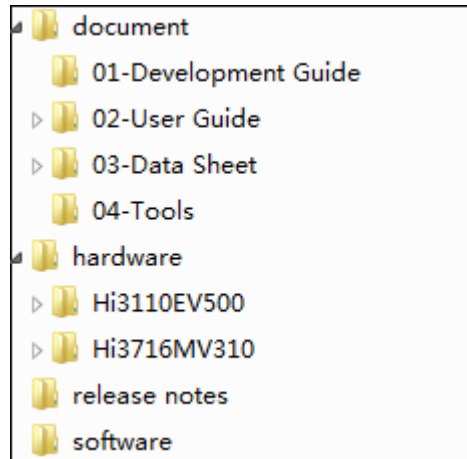
HiSTBLinux V100R004C00CP_{yyyy} is an emergency patch provided for certain customers. It is not a common patch. CP_{yyyy} version starts from CP0001.

1.1.2 Directory Structure

Take HiSTBLinux V100R004C00SPC_{xyz} as an example. [Figure 1-1](#) shows the directory structure of the Linux release package.



Figure 1-1 Directory of the Linux release package



1.1.3 Directories in the Release Package

1.1.3.1 document

This directory contains four sub directories for storing guidance files required for version development, including:

- **01-Development Guide:** provides the unified (UNF) application programming interface (API) guide, advanced secure CA development guide, and Loader development guide. These documents and the cases in the **sample** directory of the software development kit (SDK) help you to learn how to develop functions such as audio and video playback by using UNF APIs.
- **02-User Guide:** provides the debugging guide and FAQs. These documents help you to solve problems that you encountered during development or environment establishment.
- **03-Data Sheet:** provides the chip data sheet, brief data sheet, and hardware user guide. These documents help you to understand the functions and specifications of chips and provide guidance for designing the hardware circuit.
- **04-Tools:** provides instruction on how to use the tools. There is a **tools** directory in the root directory of the SDK.

1.1.3.2 hardware

This directory provides documents required for hardware demo board development, including the schematic diagram and printed circuit board (PCB) reference design. For details, see chapter 3 "[hardware](#)."

1.1.3.3 release notes

This directory includes but is not limited to the following two parts:

- Release notes: describes resolved issues, new features, usage, and mapping of versions.
- List of deliverables: lists the deliverable documents in the release package and the description of the SDK directory structure.



1.1.3.4 software

This directory is the compressed SDK. It is to compile and generate binary images, which are then burnt to the board flash. The documents include the description of boot, Linux kernel, file system, drivers, and application components that support multimedia functions.

1.2 Guidance

For the first time that you obtain a version release package, you are advised to use the release package as follows:

- Step 1** View the list of deliverables in the **release notes** directory, and ensure the integrity of the documents delivered.
- Step 2** Read the release notes to gain a better insight into the purpose, resolved issues, installation and usage of the version.
- Step 3** Obtain the software package from the **software** directory and decompress the package on the Linux server used for development.
- Step 4** Set up the compilation environment on the Linux server by following the instructions in the **install Notes.txt** in the root directory and *Linux Development Environment User Guide* in the **02-User Guide** directory.
- Step 5** Read the documents in the **document** directory.
- For development based on UNF interfaces, see documents in the **01-Development Guide** directory and instances in the **sample** directory of the SDK.
 - To know about chip functions and operating principle, see the brief data sheet and manuals in the **03-Data Sheet** directory.
 - To locate or debug problems that you encounter during development, see the documents in the **02-User Guide** directory. For details about how to use a tool, see the corresponding document in the **04-Tools** directory.

----End



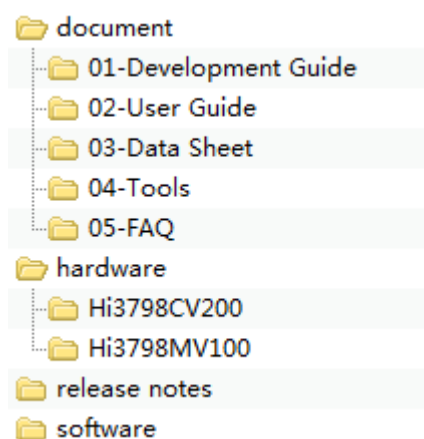
2 Android Release Package

2.1 Overview

2.1.1 Directory Structure

Take HiSTBAndroid V600R002C00SPCXXX as an example. [Figure 2-1](#) shows the directory structure of the Android release package.

Figure 2-1 Directory of the Android release package



2.1.2 Directories in the Release Package

2.1.2.1 document

The **document** directory stores the reference guide documentation for version development. For details, see [chapter 4 "document."](#)

2.1.2.2 hardware

The **hardware** directory contains documents required for hardware board development, compatible components, and chip solution test data. For details, see [chapter 3 "hardware."](#)



2.1.2.3 release notes

The **release notes** directory includes the following contents:

- Release notes: describes resolved issues, usage, mapping of versions, and release purpose.
- Deliverables list: lists deliverables in the release package based on the directory structure.
- HiSilicon Copyright Notice and Written_Offer.

2.1.2.4 software

The **software** directory contains the compressed software package, server installation script, and compilation tool chain. The software package is a source code package or a patch version based on the source code package. It is used to compile binary images to be burnt to the board.

2.2 Guidance

For the first time that you obtain a version release package, check the list of deliverables in the **release** directory to ensure the integrity of deliverables. Read the release notes to gain a better insight into the purpose, resolved issues, and installation methods of the version.

You can obtain the required version by installing the baseline version and patch versions in sequence as instructed in the "Installation and Upgrade" section of the release notes.

- To know more about certain features of the product during development, see the reference files in the **01-Development Guide** directory.
- To know more about the usage, see the reference files in the **02-User Guide** directory.
- To know more about the hardware or chip information, see the reference files in the **03-Data Sheet** directory.
- To know more about the usage of a certain tool, see the reference files in the **04-Tools** directory.



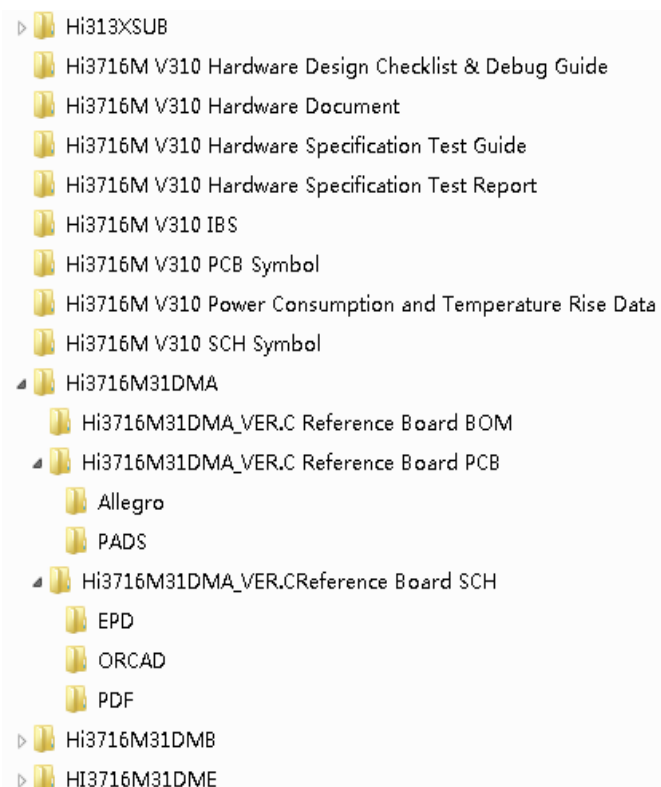
3 hardware Directory

3.1 Overview

3.1.1 Directory Structure

Take the Hi3716M V310 version package as an example. [Figure 3-1](#) shows the structure of the **hardware** directory.

Figure 3-1 Structure of the hardware directory





3.1.2 Directories in the Release Package

- XXX Hardware Document
This directory includes but is not limited to the following documents:
 - XXX Hardware Design User Guide
 - XXX Hardware FAQs
 - XXX Thermal Design User Guide
 - XXX Hardware User Guide
 - Fastboot Table User GuideFor details, see relevant documents in chapter 4 "[document](#)."
- XXX IBS
This directory contains the ibs of XXX chips used for signal integrity (SI) simulation input.
- XXX PCB Symbol and XXX SCH Symbol
 - **XXX PCB Symbol** contains PCB symbols of two formats: Allegro and PADS.
 - **XXX SCH Symbol** contains schematic diagrams of two formats: eProduct designer (EPD) and OrCAD.
- XXX Hardware Design Checklist & Debug Guide
This directory contains relevant checklist in the process of hardware design and lists points that need particular attention during the design of each module. It is used as design and review reference.
- XXX
This directory contains project design reference documents, including HI313XSUB, HI3716M31DMA, HI3716M31DMB and HI3716M31DME. In addition, the project design reference documents contain PCB, EPD, ORCAD, and PDF schematic diagrams of both Allegro and PADS formats. Component checklist and upgrade records are also included.
- XXX Hardware Specification Test Guide, XXX Hardware Specification Test report
 - **XXX Hardware Specification Test Guide** contains relevant reference guide documentation of set-top box (STB) hardware tests.
 - **XXX Hardware Specification Test report Report** contains demo board specification test reports. You can use the documents for comparison and guidance.
- XXX power consumption and temperature rise data
This directory contains the power consumption and temperature rise test data in typical demo board scenarios. You can use the documents for comparison and guidance.
- Readme
This directory contains the specification description of each reference design board. Though **Readme**, users can choose relevant reference design board for project design.

3.2 Guidance

The first time that you obtain a version release package, you are advised to use the hardware release package as follows:

Step 1 Check whether the release package is complete and know more about the directory structure.



- Step 2** Assess the specification test report, power consumption data, and temperature rise data. Assess whether the hardware reference design of the demo board meets your requirements.
- Step 3** Read *Readme*, and choose the corresponding reference design project documents for your product specifications.
- Step 4** Complete hardware design by using the documents in the **XXX Hardware Document** directory.
- Step 5** Check whether the design meets HiSilicon design specifications by using the hardware checklist.
- Step 6** After the board returns, complete the specifications test according to the hardware specifications test guide.

----End



4 document Directory

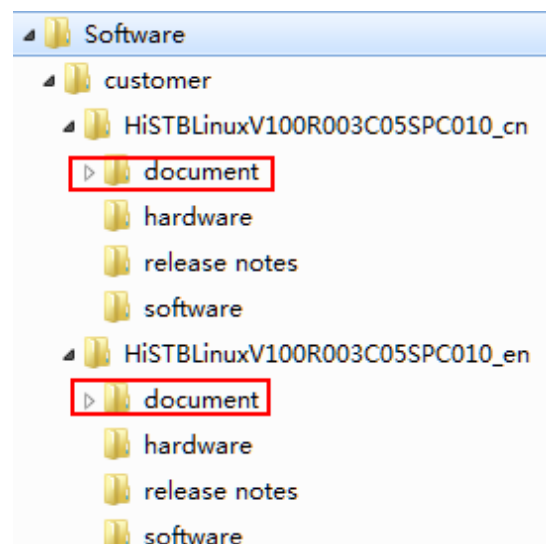
4.1 Overview

The **document** directory in the release package contains the documents that HiSilicon has officially released for customers, including .pdf, .chm, .xml, and video files.

4.1.1 File Path

HiSilicon documents are released together with the HiSilicon release package to assist secondary development of the customer based on the release package. HiSilicon documents are stored in the **document** directory. Take a Linux release package as an example. [Figure 4-1](#) shows the directory.

Figure 4-1 Path of the document directory

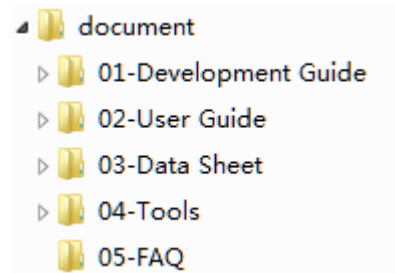


4.1.2 File Classification

Based on the classification standards and features of HiSilicon documents, HiSilicon classifies the existing documents of the release package into various categories and sorts the documents according to your reading habit. You are advised to read the documents in sequence based on the number stated in the directory name. See [Figure 4-2](#).



Figure 4-2 HiSilicon file classification



where:

- 01-Development Guide
This directory instructs you to use application programming interfaces (APIs) for secondary development. The file structure is relatively fixed.
- 02-User Guide
This directory describes how to use a function. The file structure is relatively flexible, which varies according to the content and format.
- 03-Data Sheet
This directory introduces the chip function, mainly for reference. It describes the overall functions and features of the current chip, including information of hardware pin design and register configuration. A set of data sheet contains six documents:
 - Brief Data Sheet
 - XXX Data Sheet 01
 - XXX Data Sheet 02
 - XXX Data Sheet 03
 - XXX Data Sheet 04
 - XXX Data Sheet 05
- 04-Tools
This directory contains documents that instruct you to use tools, including the Windows GUI tool, Windows command line tool, Linux server tool, and board tool. The structure is relatively fixed, and the tools are mainly provided by the HiTool platform.
- 05-FAQ (optional)
This directory contains the debugging and fault diagnosis documents, which are sorted by module. The structure is fixed (in the form of questions and answers). The FAQ documents are classified into the following two types:
 - Problem-solving type. Documents of this type begin with the actual problem, describe in detail the scenarios in which the problem occurs, and then analyze the causes and provide solutions.
 - Usage type. Documents of this type are not based on actual problems. They provide the debugging experience and methods. Therefore, no actual scenario or reason analysis is included.



NOTE

If an FAQ is closely related to a certain module, the FAQ may be integrated into the FAQ chapter of the development guide or user guide of the corresponding module.



4.2 Linux Solution

4.2.1 Development Guide



CAUTION

Before reading the *XXX Development Guide*, you are advised to read the *XXX Release Notes* to get a full picture of the version information.

The development guide documents in the HiSilicon Linux solution include but are not limited to the following:

- 01-UNF APIs Difference Description
- 02-HMS Development Guide
- 03-Loader Development Guide
- 04-Advanced CA Development Guide
- 0X-HMS API Development Reference
- ...



NOTE

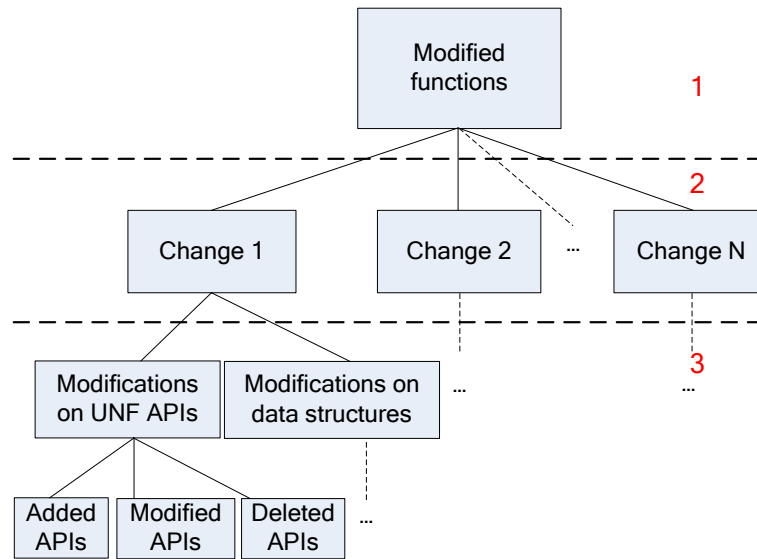
As a reference document, the priority of the *HMS API Development Reference* is the lowest. Different development guides may be added based on the functions of a chip project. For example, the *07-CI Plus Protocol Stack Development Guide*.

4.2.1.1 01-UNF APIs Difference Description

This document describes in detail the differences between the current UNF version and the earlier one to help you know about the changes made to APIs of HiSilicon, including the newly-added, modified, and deleted APIs. The document structure is quite fixed, as shown in [Figure 4-3](#). The *UNF API Difference Description* provides the following information:

1. Layer 1 lists the changes made to each module in terms of overall functions.
2. Layer 2 lists the modifications made to the data structures and APIs for each modified function.
3. Layer 3 specifies the modifications made to the data structures and APIs, reasons of modifications, and precautions to be taken.

Figure 4-3 Logic structure of the UNF API Difference Description

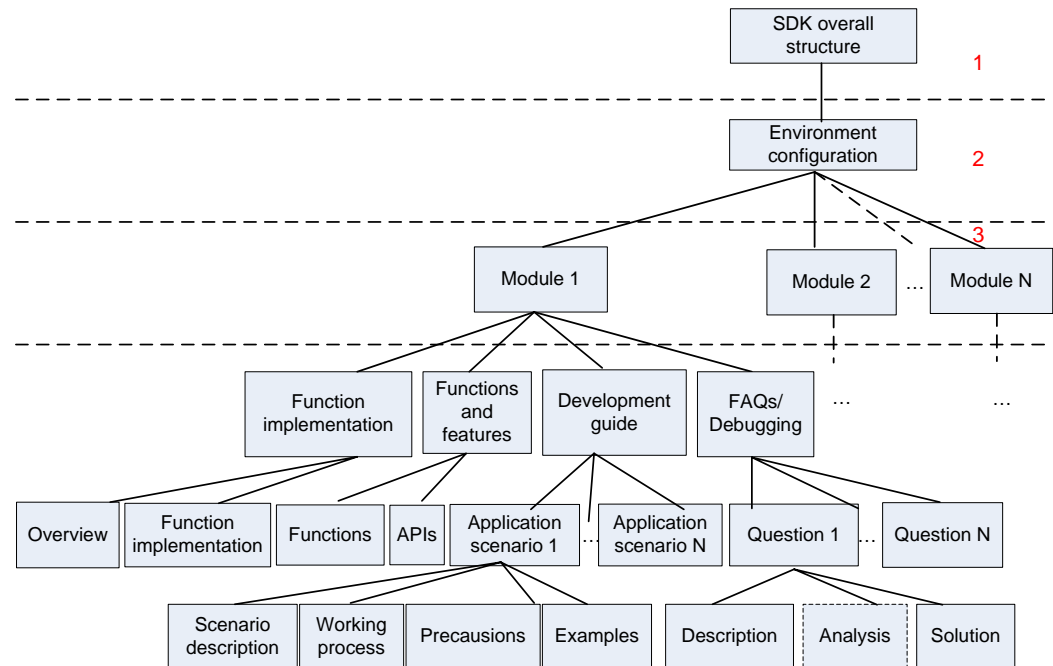


4.2.1.2 02-HMS Development Guide

The *HMS Development Guide* is the basic guidance document of HiSilicon APIs and is used together with HiSilicon samples and header files. The logic structure of the *HMS Development Guide* is quite fixed and is described as follows:

1. Layer 1 describes the overall structure of the SDK and some software conventions.
2. Layer 2 introduces the environment configurations of the SDK, including the compiling method of the SDK, expected results, and requirements on the operation environment.
3. Layer 3 introduces each module in detail.
 - Defines the module and describes its relationship with other modules.
 - Describes important terminologies and concepts related to the module.
 - Describes functions and features of a module, lists the APIs and functions, and describes function implementation of complex modules (optional).
 - Describes module development under different application scenarios, including:
 - Scenario description
 - Development process
 - Precautions to be taken
 - Sample
 - Provides module-related FAQs or debugging methods.

Figure 4-4 Logic structure of the HMS Development Guide



4.2.1.3 03-Loader Development Guide



NOTE

This document applies only to solutions using the Loader.

This development guide introduces the Loader, an upgrade program provided by HiSilicon. The logic structure of this development guide differs from that of the *HMS Development Guide*. Its content and logic structure is as follows:

1. Describes important concepts related to the Loader, and provides information such as the overall workflow, code structure, supported upgrade modes, protocols, and system partitions.
2. Introduces how to compile, execute, and debug the Loader program.
3. Describes how to develop and customize the Loader based on the existing Loader solution.
4. Introduces various protocols.

4.2.1.4 CI Plus Protocol Stack Development Guide



NOTE

This document applies only to projects containing the CI module.

The common interface (CI) Plus standard is extended based on the European digital video broadcasting standard DVB-CI. Its core content is to enhance protection for high-value contents. This document introduces how to implement secondary development based on the CI Plus standard.

The document structure is similar to that of the *HMS Development Guide*. As a document on advanced CA, this document is quite special and is separately compiled. It provides the following information:



1. CI Plus service structure and related deliverables
2. Environment configuration, including compilation methods and the running environment
3. Porting guidance, including:
 - Operation procedures
 - Description of bottom-layer APIs
 - Description of upper-layer APIs
 - Description of application-layer APIs

4.2.1.5 04-Advanced CA Development Guide

This document describes the security solutions and production configuration process of advanced CA chips. Advanced CA is a secure STB service jointly developed by the chip vendor, CA vendor, and STB vendor.

It contains the following information:

1. Introduces and lists HiSilicon advanced CA chips, and describes the basic features of advanced CA chips.
2. Specifies the advanced CA solutions.
 - Secure boot, including boot by using the BOOT image, non-BOOT software verification, and secure software upgrade
 - TS decryption by using the ciphertext control word (CW)
 - Content encryption/decryption
 - Secure PVR
 - JTAG protection
3. Describes the general process for producing advanced CA STBs and the major difference between advanced CA STBs and the common ones.

4.2.1.6 0X-HMS API Development Reference

This document is automatically generated by the doxygen tool using the .h header file provided by HiSilicon. It aims to combine all header files into one document to facilitate locating. The document is mainly for reference and the content is the same as that of the header files.

The writing style of the header file is fixed. A header file contains the following information:

- Description of the document version and change history (written by document personnel)
- Macro definitions, enumerations, and error codes
- Overall functions of data structures and member functions
- API description, including:
 - Purpose
 - Precautions
 - Parameters
 - Return value
 - Related information



4.2.2 User Guide

Of all the documents of HiSilicon Linux solutions, user guides are flexible with no fixed structure, and even the number of documents varies according to the project. The documents listed in [Table 4-1](#) are for reference only and may not exist in some projects.

Table 4-1 List of user guides

Document	Format	Contents
Linux Development Environment User Guide	PDF	Describes how to establish the Linux development environment, how to compile, configure, and burn the kernel and root file system, how to configure the secure system environment (including the common capabilities and FAQs), and introduces the development of applications.
Fastboot Table User Guide	PDF	Introduces how to use and configure the HiSilicon Fastboot table and some precautions. This document may be integrated into the <i>HiTool User Guide</i> later and no longer be provided.
HMS Debugging Guide	PDF	Instructs users to locate and debug problems of each module by obtaining the proc debugging information.
Peripheral User Guide	PDF	Provides guidance on controlling peripherals that are connected to driver modules such as the Ethernet (ETH), universal serial bus (USB), serial advanced technology attachment (SATA), peripheral component interconnected express (PCIe), 3G, and space diversity (SD)/multimedia card (MMD) modules. The document describes the preparations, operation procedures, precautions to be taken during operation, and operation instances.
Mass Production Burning User Guide	PDF	Introduces the chip mass production burning solution, including how to create burning images, burning methods, and precautions to be taken.
Hardware Specifications Test Guide	PDF	Provides guidance for the hardware specifications tests, including the networking, test procedures, and precautions for the audio/video, USB, Ethernet port, high definition multimedia interface (HDMI), channel, SATA, and PCIe specifications tests.
ePad Soldering for HiSilicon QFP Chips User Guide	PDF	Describes the ePad soldering process for HiSilicon quad flat package (QFP) chips and the precautions to be taken. It is not applicable to non-QFP chips.
Hardware Design User Guide	PDF	Provides supplement to the hardware design in the <i>XXX Data Sheet 02</i> and describes some special hardware design separately.
Low-Power Solution User Guide	PDF	Describes the configuration of software and hardware parameters and the debugging method of the dynamic voltage scaling solution, including basic concepts of dynamic voltage scaling, hardware power design, and SDK debugging.
Cost Reduction Design User Guide	PDF	Describes the cost-reduction design and provides reference for reducing the cost on hardware design.
STB Thermal Design User Guide	PDF	Describes the STB thermal design and provides thermal design guidance and references, including design recommendations for the entire board and cover.



Document	Format	Contents
Wi-Fi Use Guidance	PDF	Describes the configurations, basic operations, and debugging methods of the Wi-Fi module as well as precautions and solutions to common problems.
MMZ Memory User Guide	PDF	Describes how to configure the media memory zone (MMZ) and system memory.
CASignTool User Guide	PDF	Describes how to generate dedicated secure boot files for advanced CA chips by using the CASignTool.
HDMI Certification User Guide	PDF	Describes the required test operations for the HDMI authorized test center (ATC) certification and high-bandwidth digital content protection (HDCP) certification.
Anti-Copy Technology User Guide	PDF	Introduces the working principle and procedures of HiSilicon chip copy protection (the concept of copy protection is the same as anti-copy), including the primary, medium, and advanced solutions.
Dolby Certification User Guide	Exl	Describes the required Dolby certifications, certification procedures, and FAQs. It also describes how to simplify electrical specifications. In addition, it provides you with digital media adapter (DMA) and digital video broadcasting2 (DVB2) self-test forms.
...	-	-

4.2.3 Data Sheet

The structure of the data sheet is quite fixed with rich content. Therefore, the data sheet is divided into six documents to enhance its readability. The number in the document name indicates the order for reference. If the delivery time is limited, documents can be delivered based on the priority indicated by the numbers to match the development process. The data sheet content is briefly introduced as follows:

- XXX Brief Data Sheet
Provides brief introduction of chip functions, usually for publicity and quick understanding of the features and specifications of chips. This document is quite small in size, generally 2–4 pages.
- XXX Data Sheet 01
Describes the overall chip structure, address space mapping, boot mode, soldering process, moisture-sensitive specifications, ordering information, and acronyms and abbreviations.
- XXX Data Sheet 02
Provides the hardware information of the chip, including pins, pin multiplexing register, electrical specifications, schematic diagram design recommendations, PCB design recommendations, heat dissipation recommendations, and interface timings of each module.
- XXX Data Sheet 03
Describes the system modules and the related registers, such as the clock, reset, system controller, peripheral controller, timer, and watchdog modules.



- XXX Data Sheet 04
Describes the peripherals supported by the chip and related registers, such as the GPIO and Ethernet ports. The supported peripherals vary according to the chip, and the content of this document varies accordingly.
- XXX Data Sheet 05
Describes the data stream interfaces and audio/video encoding and decoding interface as well as related registers.

4.2.4 Tools

The structure of the tool guide is quite fixed and the logic structure is usually as follows:

1. Introduces the definition and functions of the tool.
2. Describes the environment required for running this tool.
3. Introduces the main GUI and then the functional GUIs.
4. Introduces the functions and application methods of each functional GUI.
5. Provides related FAQs.

The **Tools** directory contains a lot of tool user guides and tutorial videos. [Table 4-2](#) lists most of the documents in this directory.



NOTE

The documents and videos listed in [Table 4-2](#) may vary according to the project.

Table 4-2 List of tool user guides

Document	Format	Contents
HiTool Platform User Guide	PDF	Describes the definition, functions, and usage of the HiTool platform.
HiRegBin User Guide	PDF	Describes the usage of the HiRegBin, including viewing/modifying board hardware configurations and register configurations, creating the Reg file for Fastboot and Cfg file for the advanced CA solution, and importing/replacing the Reg file in Fastboot.
HiGVBuilder User Guide	PDF	Describes how to develop GUIs by using the HiGVBuilder and HiGV.
HiReg User Guide	PDF	Describes how to debug HiSilicon chip registers, I ² C registers, and double data rate (DDR) data by using the HiReg.
HiBurn User Guide	PDF	Describes how to use the HiBurn. By using the HiBurn, you can burn all program images to the flash memory of a board in one-click mode, burn images to the flash memory of a board with boot by the flash address, or burn the boot image only to the flash memory of a board.
HiFastPlay User Guide	PDF	Describes how to create the startup image and fastplay image by using the HiFastPlay.
HDCP Key User Guide	PDF	Describes the usage of the HiSilicon HDCP key and the factory operation process for using the HDCP key solution.



Document	Format	Contents
HiWorkbench User Guide	PDF	Describes how to port and develop the code and how to debug application programs and bare board programs by using the HiWorkbench.
HiDdrTraining User Guide	PDF	Describes how to check the anti-interference capability of the DDR by using the DDR Training tool to acquire a more stable DDR environment.
HiUpdateEdit User Guide	PDF	Describes how to quickly modify the update.zip package by using the HiUpdateEdit.
HiDBTool User Guide	PDF	Describes how to edit preset programs and default system settings before STB delivery by using the HiDBTool.
HiFontTool User Guide	PDF	Describes how to tailor the true type font (TTF) as user-defined Unicode binary file (UBF) fonts by using the HiFontTool to save board resources.
HiLoader User Guide	PDF	Describes how to package the original loader images as upgraded files according to the upgrade protocol by using the HiLoader.
HiDebugger User Guide	PDF	Describes the usage of the HiDebugger, including obtaining the debugging information, obtaining and displaying proc information, and recording streams.
HiChannel User Guide	PDF	Describes how to debug HiSilicon channel products by using the PC software HiChannel.
RawEditor User Guide	PDF	Describes how to display pictures, convert formats, and compare and edit pictures by using the RawEditor.
HiSilicon PQ Tools User Guide	PDF	Describes how to adjust the picture quality (PQ) and implement differentiated adjustment by using the picture quality debugging tool.
HiBurn quick start video V1.0	EXE	Tutorial video
HiDdrTraining quick start video V1.0	EXE	Tutorial video
HiDebugger Quick Guide (EN)	MP4	Tutorial video
HiFastplay Quick Guide (EN)	MP4	Tutorial video
HiGVBuilder quick start video V2.0	MP4	Tutorial video
HiPQTools Quick Guide (EN)	MP4	Tutorial video
HiReg quick start video V1.0	EXE	Tutorial video
HiTool quick start video V1.0	EXE	Tutorial video



Document	Format	Contents
HiWorkbench quick start video V1.0	EXE	Tutorial video
...	-	-

4.2.5 FAQs

The structure of the FAQ document is simple and fixed, and is divided into the following three parts:

- Problem description: detailed description of what the problem is.
- Problem analysis (optional): description of possible reasons leading to the problem. The tortuous process of locating the problem is often not included and possible reasons are listed directly.
- Solution: solutions and concrete operation procedures regarding the description and reasons of problems are provided.

FAQs are loosely distributed in the documents of the Linux solution. Many FAQs are integrated into the corresponding development guide and user guide. Generally, FAQs in dedicated FAQ documents are sorted by type. [Table 4-3](#) lists some of the FAQ documents.

Table 4-3 List of FAQ documents

Document	Format	Contents
HMS FAQs	PDF	Describes the problems that field application engineers (FAEs) encountered in the process of supporting customers in the HiXXX solution and the solutions to these problems. The FAQs are categorized into but not limited to the following groups: <ul style="list-style-type: none">• Media processing• Graphics• DMX• System• Hardware
HiXXX Hardware Design FAQs	PDF	Describes the special hardware processing of the smart card interface (SCI) in the HiXXX hardware design and suggestions for the DDR design.
HiXXX Board Hardware Upgrade FAQs	PDF	Describes the implementation, methods, and instances for board impedance control during the HiXXX hardware design as well as the DC-DC peripheral impedance selection for the CPU and core power.

4.3 Android Solutions

Android solutions are developed on the basis of Linux SDKs. All Linux documents related to the project are included, together with the peculiar documents of Android.



NOTE

This chapter introduces only the documents peculiar to Android, and relevant Linux documents are not included.

4.3.1 Development Guide



CAUTION

Before reading the *XXX Development Guide*, you are advised to read the *XXX Release Notes* to get a full picture of the version information.

The development guides in the HiSilicon Android solution mainly include the following:

- Android Solution Development Guide
- Android PlayReady Development Guide
- Level-1 Security Solution for the HiSilicon Intelligent STB Development Guide
- Widevine L3 Development Guide
- API Development Reference
- ...

4.3.1.1 Android Solution Development Guide

The *Android Solution Development Guide* is obtained by combining multiple development guides as required by customers. The structure remains the same as that of the *HMS Development Guide* of Linux. It is the basic guide documentation of Android solutions. The document structure is as follows:

1. Overall architecture of the Android solution
The overall structure is as follows:
 - Android basic structure: changes and modifications that HiSilicon made based on the basic structure.
 - HiSilicon extended structure: interfaces and functions that HiSilicon has added.
2. Development environment configuration
 - Environment requirements
 - How to set up a development environment
 - How to develop and compile the Android development package
 - How to burn images
3. Memory configuration
 - Memory configuration method
 - How to modify memory configurations
 - ✓ Introduces each component.
 - ✓ Describes the component, the functional block diagram or networking.
 - ✓ Describes important terminologies and concepts related to the components.
 - ✓ Describes the functions and features of the component.
 - ✓ Introduces the module development under different application scenarios.



- ✓ Provides module-related FAQs or debugging methods.

The components include but are not limited to the following:

- HiMediaPlayer
- HiDLNA
- HiMultiScreen
- HiTranscoder
- HiMiracast
- HiKaraoke

4.3.1.2 Android PlayReady Development Guide

PlayReady is the new digital rights management (DRM) system of Microsoft, which is the upgraded version of Windows media DRM (WMDRM) and is compatible with WMDRM. It provides content protection support for digital media.

This document describes the operating principles of the PlayReady. This document also describes how to develop PlayReady on the HiSilicon Android platform and the precautions to be taken by giving examples. The document contains the following:

1. Brief introduction of PlayReady and related workflow
2. Hardware PlayReady development guide, including:
 - Block diagram of the solution
 - Preparations
 - Compilation, signature, burning, and testing
 - Factory manufacturing
3. Software PlayReady development guide, including:
 - Block diagram of the solution
 - Preparations
 - Compilation
 - Factory manufacturing
4. Development and application guide

4.3.1.3 Level-1 Security Solution for the HiSilicon Intelligent STB Development Guide

This document provides level-1 flashing protection solution to meet the security requirements of the market.

STB manufacturers need to participate in enabling some of the functions described in the level-1 security solutions. The content includes the following:

- Chips to which this document is applicable
- Android release modes
- Related configuration operations of Android
- Generation of Recovery images and upgrade packages
- Processing of serial ports on the PCB



4.3.1.4 Widevine L3 Development Guide

Widevine is an American company that provides DRM. The DRM technology of the company is widely applied in the field of digital streaming media such as online video and digital television. On September 3, 2010, Google acquired this company in an attempt to expand its own digital streaming media movie service and to obtain the DRM protection technology of this company.

This document mainly introduces the working principles of HiSilicon Widevine L3, its development process, and precautions to be taken. The document structure is as follows:

1. Widevine introduction, overall structure, working principle, and security level
2. Development process, environment configuration, and equipment Keybox

4.3.1.5 API Development Reference

The Android API development references are similar in structure. The documents mainly consist of some files generated by integrated Java language interfaces and are for your review and reference. The API development references include:

- HiDLNA API Reference
- HiDualNet API Reference
- HiMediaPlayer API Reference
- HiMultiScreen API Reference
- HiSettings API Reference
- Hisysmanager API Reference
- HiTranscoder API Reference

4.3.2 User Guide

User guides of the HiSilicon Android solution are quite diversified. Some user guides are applicable only to peculiar market. The following documents are existing ones, and any deletion or addition is up to particular project and market. The document version may vary according to the Android version. Note the document version when using a file. Currently, the Android versions include the following:

- Android 4.2: corresponding to the document version Android V500R001
- Android 4.4: corresponding to the document version Android V600R001C00
- Android 5.0/5.1/Android L: corresponding to the document version Android V600R001C05



Table 4-4 List of user guides

Document	Contents	Remarks
Android Solution User Guide	<p>Introduces the configurable and modifiable modules, HiSilicon reference implementation, application and configuration of common tool commands. The content includes but is not limited to the following:</p> <ul style="list-style-type: none">• Infrared remote control• Implementation of user-based insurance (UBI) system• Recovery• Network file server (NFS) and SAMBA• Loader• Standby• 3G dongle• Fast startup• HiDLNA• HiMultiScreen• HiMiracast• Oprofile• Android debug bridge (ADB) tools• DDMS tools• LOGCAT tools• Procrank and Dumpsys tools	Some content may vary regarding different Android versions or projects and is subject to the manual released by the final project.
Android Customization User Guide	<p>Describes the usage and debugging methods of some Android solution functions as well as precautions to be taken. The content includes but is not limited to the following:</p> <ul style="list-style-type: none">• Configuration of the running environment variables• System upgrade• Debugging tool for production• Others	Subjects to specific project
Android Quick Boot Feature Specifications	<p>Introduces the working principle, function, configuration methods, testing points, and problem-locating methods of quick power-on. It aims to instruct users to apply and test the features of quick boot.</p>	Subjects to specific project
DTS-M6 Audio Decoding Library User Guide	<p>Introduces the usage, operation procedures and precautions to be taken. It aims to guide users to use the DTS-M6 audio decoding library.</p>	Subjects to specific project
Android 4.4 CTS Test User Guide	<p>Introduces the testing methods of Android operating system based on HiSilicon release package. The content includes but is not limited to the following:</p> <ul style="list-style-type: none">• Introduction of the concepts of controller terminal system (CTS)• Compilation of the test version• Setting up of the test environment• Testing methods	Applicable only to Android 4.4 currently



Document	Contents	Remarks
Level 2 Security Solution for the HiSilicon Intelligent STB User Guide	Describes how to use the HiSilicon secure boot and verification solution, which are developed based on the hardware protection scheme provided by HiSilicon CA chips. This solution provides high-level protection on important data. In addition, it imposes few restrictions on the Android system and board and does not affect the necessary debugging methods.	Subjects to specific project
...	-	-

4.3.2.2 Data Sheet

The data sheets in the Android solution are the same as those in the Linux solution.

4.3.3 Tools

The tool user guides in the Android solution are the same as those in the Linux solution.

4.3.4 FAQ

Currently, the *Android Solution FAQs* is the only FAQ document in the Android solution package. The *Android Solution FAQs* is a collection of problems and solutions during the previous development for providing guidance in problem solving and debugging.

The content includes but is not limited to the following:

- Android development environment
- Network
- Storage
- Peripherals
- Browsers
- Media processing
- Application
- System