Self-introduction

Describe the software development process in brief:

Requirement analysis

Specification

Software architecture

Implementation

Testing

Documentation

Training and support

Maintenance

要申请岗位

Good morning. My name is Jianwei and I am applying for the position of embeded software engineer in BYD.

目前在小鹏工作

Currently, I work in Xpeng Automobile company as an embedded software engineer, which is very famous for its autonomous driving and intelligent entertainment in Chinese electric vehicle market.

工作两年想去asap

After working here for two years, I realize I will have more driving force and make full use of my skill sets if I can go to your company, because I can work with numerous brilliant developers and improve my programming capability productively.

在法国的经历

I graduated from ISEP in Paris in 2020 and majored in embedded system. After graduation, I first found a job in Huawei in the same city as a device test engineer responsible for admission testing of mobile phones and some hardware devices, such as router, smart watch, etc.

介绍Coding和跨部门部门合作能力

I THINK my programming work in Xpeng and Huawei has strongly strengthened my coding experience, and it empowers me to work cross department efficiently. I have rich experience in communicating with the project members, the developers as well as the legal compliance team. Additionally, I excel at C, C++ AND Python for developing functions.

熟悉欧洲文化

I notice that this position need to work in Netherland for 2 years or even more. So I think my study experience in Paris makes me easy adapt to the European culture and realize needs flexibly.

结束语

That's basically all about me. Thank you for your patience. Thank you for your listening.

Career plan

Currently, I work in the embedded department of the company, where I am involved in hardware, driver, and software development. But I realize that I am most interested in using software programming to implement functions.

What I want to do now is to further improve my skills as a software engineer. In the short term, I hope to have experience in different projects and make some contributions to the company. . Currently, I may start out as a junior software engineer, but within three to five years, I hope to become a senior software engineer. Then, In the long term, I want to participate in more challenging roles. I want to take more management responsibilities and may become a Tech Lead, and eventually progress to the level of Director or Chief Technology Officer (CTO).

●Project experience/successful achievement/problem solving experience/challenge experience/strengths

●I'd like to introduce a project I have developed in Xpeng automobile, and my role is to develop the ecall function from the bottom to application layer within 2 months.

●Frankly speaking, the application layer is not hard for me, as I am proficient in using C++ and python to achieve various functions. The real challenge for me at that time is to develop the audio driver so it can fit our existing hardware well, and it involves the linux kernel developing and how to configure chip pins with the driver, which I was not that familiar with at that time. However, I think software developers should always be prepared for learning new things, and I have been trying to jump out of my comfort zone several times based on different requirements. So first I searched online and got some manuals to know more about the hardware, and the method of kernel developing and then I started to test the driver's compatibility with the hardware.

版本发布

Audio driver avdd dvdd时序问题

市场问题 dump内核镜像

Ecall 碰撞实验

During this process, I have constantly analyzed what requirements should be achieved, and found ways to satisfy them one by one. (requirements analysis)When I needed to measure the current and voltage for chip development, I learnt how to use various tools like multimeters and osciloscopes; When I needed to debug the driver, I independently designed a testing software ; When I wanted to further improve our working efficiency, I further introduced the CI/CD into our datasets to remove potential bugs.(fast-learning aspect)

●My efforts paid back, after I have developed the related app, the ecall function is fully achieved and has been used in 80% of our cars. This experience also hugely developed my cross-department communication ability, because we need to discuss with the legal department, the hardware groups, and the testing members(communication). Working with them empowers me to be a better team worker(teamwork), and also makes me determined to keep working in software development.

CDCU

All ADC channel testing and verification. Provide necessary interface or document for other users to use ADC channels .读取板子的board id(电阻分压) ufs温度mcu温度 switch温度

ADC related technical summary

Initially create and enable T-bench automatic test. T-bench automatic test intial setup

TBench自动化测试平台由Web服务和TBench服务两部分组成。

Web服务

通过Web提供编排用例，创建测试任务，查看设备状态等功能。

TBench服务

负责检测和管理CDU等设备，管理和加载测试用例，执行测试任务等。

CI/CD

解释CICD的概念：CICD是一种软件开发实践，通过自动化和集成工具链，在应用程序的开发、测试和部署过程中实现持续性。它包括持续集成（CI）、持续交付（CD）和持续部署（CD）等环节。

描述CICD的好处和优势：强调CICD的价值，如增加开发团队的效率、减少错误和Bug、提高交付速度、降低风险和重复劳动、增强产品质量和稳定性等等。

探讨CICD面临的挑战和解决方案：指出实施CICD可能面临的挑战，如复杂的架构、遗留系统的整合、安全性问题等，并提供相应的解决方案或建议，例如逐步迁移、自动化测试覆盖率、使用容器化等。

The main difference between **memory overflow and memory leak** is that memory overflow occurs when a program tries to store more data in a buffer than it can hold, while memory leak occurs when a program fails to release memory it has allocated. Memory overflow can cause immediate problems such as crashes and data corruption, while memory leaks can cause gradual degradation of system performance over time.

TCP怎么保证可靠性？

1、序列号、确认应答、超时重传

2、窗口控制与高速重发控制/快速重传（重复确认应答）

简述一下TCP建立连接和断开连接的过程。

连接三次握手

1、客户端请求，标志位SYN置为1 发送x;

2、服务端回复，标志位SYN和ACK都置为1 回复 x+1,和 y

3、客户端收到后回复 y+1，服务端检查ack是否为1，是的话就连接成功

断开

1、客户端发送 x+2 回复y+1 进入FIN\_WAIT\_1 状态

2、服务端回复x+3 服务器进入CLOSE\_WAIT状态。客户端收到后进入FIN\_WAIT\_2状态

3、服务端发送完所有数据之后发送y+1 服务器进入LAST\_ACK状态

4、客户端回复y+2 客户端进入TIME\_WAIT状态等待2MSL（报文段最大生存时间）后关闭

TCP/UDP

1、TCP面向连接，UDP无连接

2、TCP数据保证正确、顺序正确，UDP可能丢包

3、TCP可靠稳定，但是慢效率低，UDP快，容易丢包

TCP相比UDP为什么是可靠的？

1、确认和重传机制

2、数据排序

3、流量控制 窗口和计时器的使用

4、拥塞控制

什么是OSI七层模型和TCP/IP四层模型？每层列举2个协议。

物理层: 通过媒介传输比特,确定机械及电气规范,传输单位为bit，主要包括的协议为：IEE802.3

CLOCK RJ45

数据链路层: 将比特组装成帧和点到点的传递,传输单位为帧,主要包括的协议为MAC VLAN PPP

网络层：负责数据包从源到宿的传递和网际互连，传输单位为包,主要包括的协议为IP ARP ICMP

传输层：提供端到端的可靠报文传递和错误恢复，传输单位为报文,主要包括的协议为TCP UDP

会话层：建立、管理和终止会话，传输单位为SPDU，主要包括的协议为RPC NFS

表示层: 对数据进行翻译、加密和压缩,传输单位为PPDU，主要包括的协议为JPEG ASII

应用层: 允许访问OSI环境的手段,传输单位为APDU，主要包括的协议为FTP HTTP DNS

TCP/IP

链路层：MAC VLAN PPP

网络层：IP协议、ICMP协议、ARP协议、RARP协议。

传输层：UDP协议、TCP协议。

应用层：FTP（文件传送协议）、Telnet（远程登录协议）、DNS（域名解析协议）、SMTP（邮件传送协议），POP3协议（邮局协议），HTTP协议。

IIC协议

1、IIC协议是由数据线SDA和时钟SCL构成的串行总线，可发送和接收数据,是一个多主机的半双工通信方式

2、空闲状态

SDA与SCL都处于高电平，就是空闲状态。

2、起始信号

时钟线为高，数据线由高到低就是启动信号，只能由主机发起空闲状态下才能启动该信号

3、停止信号

时钟为高，数据线由低到高就是停止信号

4、传输数据格式

SCL为高就会获取SDA数据值，SDA在这期间必须稳定

SCL为低便是SDA电平变化状态，在此期间SDA可以自由变化

可以主动拉低SCL让IIC进入等待状态知道处理结束再释放SCL数据传输会继续

5、ACK应答信号

发送方在第9个时钟脉冲奇迹爱你释放SDA数据，当接收方接收成功时，会输出一个应答信号，低电平有效

6、写操作

start信号–设备地址–方向（读、写）。回应（确定这个设备是否存在）–发送数据–回应–发送完之后主芯片发送一个停止信号。

白色主到从、灰色从到主。

7、读操作

除了数据需要主到从，其余差不多。

从在浏览器地址栏中输入http://www.baidu.com到看到百度首页，这个过程中间经历了

1.客户端浏览器获取用户在地址栏输入的域名。

2.客户端浏览器将域名发送给DNS域名系统，请求解析。

3.DNS解析域名得到相应的IP，返回给客户端浏览器。

4.客户端浏览器根据IP向服务器发起TCP三次握手，建立TCP连接。

5.客户端浏览器向服务器发送HTTP请求，请求百度首页。

6.服务器通过HTTP响应向客户端浏览器返回百度首页文件。

7.释放TCP连接。

8.客户端浏览器解析HTML文件，根据文件内容获取CSS、JS等资源文件，将页面渲染展示给用户。

服务端：socket-bind-listen-accept

客户端：socket-connect

请你来说一下socket编程中服务器端和客户端主要用到哪些函数？

基于TCP的socket

服务器端程序

（1）、创建一个socket，用函数socket()

（2）、绑定IP地址、端口等信息到socket上，用函数bind()

（3）、设置允许的最大连接数，用函数listen()

（4）、接收客户端上来的连接，用函数accept()

（5）、收发数据，用函数send()和recv()，或者read()和write()

（6）、关闭网络连接

客户端程序：

（1）、创建一个socket，用函数socket()

（2）、设置要连接的对方的IP地址和端口等属性

（3）、连接服务器，用函数connect()

（4）、收发数据，用函数send()和recv()，或read()和write()

（5）、关闭网络连接

SPI：高速全双工串行总线。接口：输出线、输入线、时钟线、片选信号线

1、片选信号线由高到低是SPI的起始信号 ，从机检测到自己的NSS线起始信号之后就知道自己被选中了，然后由低到高是停止信号。

2、SPI 使用 MOSI 及 MISO 信号线来传输数据，使用 SCK 信号线进行数据同步。 在时钟线上升沿触发输出，在下降沿被采样。

1. IIC协议是由数据线SDA和时钟SCL构成的串行总线，可发送和接收数据,是一个多主机的半双工通信方式

嵌入式产品开发流程通常包括以下几个主要阶段：

需求分析：明确嵌入式产品的功能和性能要求，包括硬件、软件和用户界面等方面。

架构设计：制定系统整体架构，确定硬件和软件之间的接口标准和数据交换协议。

硬件设计：设计硬件电路板，并进行原理图设计、PCB布局、线路连接等工作。

软件设计：根据嵌入式产品的需求，编写软件代码、驱动程序，并对系统进行调试和测试。

硬件和软件集成：将设计好的硬件模块与软件代码结合起来，进行集成测试和系统联调。

生产制造：制造符合规格要求的产品，包括制造样机并进行验证、量产前准备、设备采购、生产流程优化等。

测试验收：对生产出来的嵌入式产品进行全面的测试和验证，以确保其满足预期的功能和性能要求。

售后服务：提供相关的售后技术支持，以便不断改进产品质量和客户满意度。