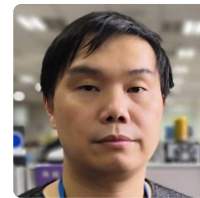# 朱天达

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27年工作经验 | 求职意向：网络安全工程师 | 期望薪资：25-40K | 期望城市：杭州

个人优势

本人本科学历，计算机科学与技术专业，有多年4G5G基站安全领域， 基站云化系统架构，基站传输同步系统架构领域相关工作经验，多年探索应用 AIML 技术到基站相关领域的经验和深刻理解，包括高斯分析，SVM, CNN，RNN, LSTM 等，熟练使用 python，pytorch 以及 tensorflow 等。具备良好的沟通和组织能力。多年始终保持良好的学习能力和习惯，对于新技术保持一贯的敏锐和积极学习态度。 对于 AIML 相关技术有很高的热情和学习热情。

工作经历

诺基亚通信系统技术（北京）有限公司浙江分公司　　架构师　　　　　　　　　　　　2003.01-2023.04

内容:

诺基亚 Nokia WCDMA, 4G和5G 基站多年架构工程师, 曾工作在不同的领域. 不同领域的工作经验和技能大致描述如下:

- (2020 - 2023) 5G 基站安全领域：主要包括 TLS/IPSec /基站证书框架/基站安全启动/3GPP, O-RAN 标准实现等, 除去架构日常工作内容，也研究并提交了诺基亚内部专利 NC319887， NC322641， NC317851。

-（2016 - 2020) 诺基亚物理基站(bare-metal BTS) 以及云基站(cloud BTS) 传输架构工程师， 包括基站内如传输架构比如无线单元(RU) 和 与云基站B(TS could VNF) 传输通信协议架构和网络架构设计(L2/L3), 云基站内部快速通道(the fast path)/慢速通道(slow path), 基站时钟同步(BTS synchronization/timing), 除去架构日常工作内容也研究并提交了诺基亚内部专利 NC306798 ,NC315320, NC306972

- (2017 - 2023) 使用 AIML 技术做基站内部实现改进 (python, tensorflow, pytorch), 项目包括:

* "A Machine Learning Based Method for Sync Input Degradation Detection for BTS"

* "Detection and prevention of DDOS using AIML".

* 研究并提交了诺基亚内部专利 NC324326, NC316224

- (2005 - 2015) RNC 系统高可靠性架构工程师， WCDMA RNC availability and system upgrade-ability domain leader.

1. Leading RNC system upgrade-ability Architect and specification work.

2. RNC Capacity and Performance Architect and specification

-（2003 — 2005) RNC 软件工程师，WCDMA RNC high availability recovery system senior software engineer. 1. Recovery core software implementation in RNC IPA platform 2, Recovery Archecture design.

业绩:

-- Winner of the Nokia hangzhou 2019 Future-X Innovation Incubation program

-- Top 10 inventors in nokia hangzhou for patent filing in 2018

-- Nokia internal Patent (IPR) submission

NC325570, a new method of auto detection and adjustment TDD air interface timing offset

NC324326, a machine learning based method for sync input degradation detection and holdover.

NC319887, AN IPSEC SPI BASED TRAFFIC FORWARD METHOD

NC317851, AN IPSEC IKE PROTOCOL SUPPLEMENT FOR DYNAMIC BYPASS NEGOTIATION"

NC306972, A S1/X2 INTERFACE DOWNLINK GTP-U TEID GENERATION AND FAST DATA FORWARDING METHOD. etc

上海贝尔通信技术有限公司　　通信研发工程师　　　　　　　　　　　　　　　　2001.04-2002.12

网络事业部软件开发工程师, team leader , 主要负责和带领交换机网管软件开发(SNMP etc)

阿里巴巴（中国）有限公司　　java开发工程师　　　　　　　　　　　　　　2000.01-2001.04

阿里巴巴网站软件工程师，从事阿里巴巴网站后台软件开发 (java)

杭州市公安局　　办公室科员　　　　　　　　　　　　　　　　　　　　　1996.09-2000.01

内容:

杭州市公安局信息化建设，网络安全，网络信息管理

业绩:

杭州市公安局信息化建设

杭州公安局办公自动化系统

杭州公安局报警系统

项目经历

Detection and prevention of DDOS with AIML　　项目技术负责人　　　　2023.01-2023.03

Detecting the pre-defined Intrusion attack to BTS (DDOS only in phase1) based on AI/ML solution (ready AI/ML solution from Bell Lab) so that BTS could take pre-defined actions to prevent BTS service down while Intrusion is ongoing and recovery BTS service in time while Intrusion is end.

O-RAN Netconf over TLS and SSH　　项目技术负责人　　　　　　　　2022.01-至今

provides the support of Netconf over TLS and FTPES based on X509 v3 operator certificate for Fronthaul M-plane interface for O-RU. From security perspective, it complies to the ORAN FH M

-Plane specification v07 version.

RU Front Haul TLS X509 manual certificate enrollment　　项目技术负责人　　2022.10-2023.02

Project support:

- Manual Enrollment of operator X.509 certificate in the RU (CSR export, cert import) to be used with IPSEC on the fronthaul interface for Classical and Cloud.

- Creation of the RSA key pair and of the CSR with export.

- Import of the signed certificates and trust chain.

- Mandates a local tool and connectivity to the RU for manual enrollment management

BTS FIPS-140-2/3 compliance for the OpenSSL crypto module　　项目技术负责人　　2022.10-2023.02

Nokia BTS FIPS-140-2/3 compliance evaluation and the system impact analysis for 4G5G BTS

TLS support for Trace, RTPM, PCMD and RFSC collectors　　项目技术负责人　　2020.06-2020.12

This project support Transport Layer Security (TLS) for protecting traffic for trace type interfaces

BTS Secondary IPsec backup tunnel over satellite　　Technical leader　　　2020.01-2020.06

● Project content: project supports the configuration of two alternative IPsec tunnels for same traffic, only one being established and carrying traffic at a time, to allow i.e. geo-redundant Security Gateway (SEG) deployments for SEG site disaster recovery.

● include adding extra IPSec tunnel via satellite, adding extra traffic based admission controlling and adding extra c-plane/cell controlling

● Role: Project Architecture and leader of the Project

IPSec supporting in cloud BTS (4G)　　项目技术负责人　　　　　　　　2016.06-2017.07

内容:

The project provides the transport IPsec feature set for the LTE specific functionality in Cloud BTS

● The standard IPsec considerations for the S1 and X2 interfaces on the backhaul of the veNB.

● IPsec on the new Fronthaul interface C1 between the RAP's and the veNB and C2 (between RAP's)

this project supports the configuration of two alternative IPsec tunnels for same traffic, only one being established and carrying traffic at a time, to allow i.e. geo-redundant Security Gateway (SEG) deployments for SEG site disaster recovery.

业绩:

● NC306798 A IPsec Policy Controller for Telecom Cloud

● NC317851, "AN IPSEC IKE PROTOCOL SUPPLEMENT FOR DYNAMIC BYPASS NEGOTIATION" submitted on 14 AUG 2019

A Machine Learning Based Sync Input Detection   项目技术负责人   2022.01-至今

内容:

By introduce extra Machine learning based abnormal detect to trigger the hold procedure in time so that the system could much more better holdover performance, at same time alarm the customer that the sync input reference is invalid and holdover happens.

I am AIML owner in this project and project leader

业绩:

internal patent submission: NC324326, a machine learning based method for sync input degradation detection and holdover

BTS Auto detection and adjustment TDD   Technical leader   2022.01-2022.12

内容:

Find way to detect BTS Timinging problem. With utilizing the SSTD measurement in LTE dual connectivity and the TA measurement to detect and determine the TimingOffset between an E

-UTRA eNB with PCell and an E-UTRA eNB with PSCell (for LTE-DC) Or utilizing the SFTD measurement in 5G and the TA measurement to detect and determine the TimingOffset between:

- an E-UTRA eNB with PCell and an NR with PSCell (for EN-DC),

- an NR with PCell and an E-UTRA eNB with PSCell (for NE-DC),

- an NR with PCell and an NR with PSCell (for NR-DC)

- an E-UTRA eNB/gNB and an NR with neighbor cell.

UE or BTS may do the TimingOffset calculation based on the SSTD/SFTD and TA information of the pair BTSes above. Based on the calculated TimingOffset from multiple BTS pairs, the Timing Alignment Error of the related BTS may be determined. BTS calculate the AlignOffset which is the adjustment time shift for next step based on TimingOffset and the multiple actions could be taken to correct such timing alignment error include TDD UL-DL frame structure and special subframe pattern reconfiguration and the BTS internal timing offset adjustment accordingly.

业绩:

Nokia内部专利提交:"a new method of auto detection and adjustment TDD air interface timing offset" submitted on 14 APR 2022.

Cloud BTS VRAN 1.0/2.0 Transport Architecture work   transport architecture   2016.03-2020.01

内容:

- Cloud BTS transport/synchronization architecture work, for example MBTAC (measure based TAC) for RAP/cBTS VNF architecture, ICOM gateway for cloud BTS (internal communciation architecture), cBTS transport capacity/performance envulation work, RAP/Cloud BTS transport recommended configuration etc.

- Cloud BTS VRAN 2.0 transport architecture FSY work.

业绩:

Nokia internal patent submission:

● NC306972 'A S1/X2 INTERFACE DOWNLINK GTP-U TEID GENERATION AND FAST DATA FORWARDING METHOD '

Cloud BTS SR IOV based Virtual Ethernet Interface   Transport Architecture   2017.07-2017.10

provide RAN level requirements for SR-IOV based Ethernet interface.

This feature is to support Single Root I/O Virtualization (SR-IOV) based vNIC in Cloud BTS xxx to meet requirements from VCP Edge

(Verizon Cloud Platform name, aka Corona in earlier phase). It shall adhere to standard SRIOV function for ensuring interoperability based on PCI-SIG SRIOV specification

Cloud BTS VCP Edge VM deployment and Dimensioning   Transport Architecture   2017.06-2017.09

This project provide :

a) capacity throughput of Cloud BTS VNF considering :

- traffic model

- Computational node

- Scalability Support (Scale Up/Down not supported)

b) support VM deployment on xxx Platform

c) follow the same architecture split as proposed in another project.

A Machine learning based Transport admission control   技术负责人   2017.01-2017.06

This project study a new machine learning method: GPR or Sparse GPR based TAC. The GPR based TAC has ability to learn real traffic load distribution according to multiple features such as the real time current traffic load, the call maximum bit rate and the accepted admitted bandwidth since last epoch time, which are used in old MBTAC. In addition, features that including call holding time, call number etc. are utilised to enhance the performance of the proposed approach.

Cloud BTS IPv4/IPv6 based ICOM Gateway   Transport Architecture   2016.12-2017.04

CBTS splits the eNB into one component running in the cloud and another component, the radio access point (RAP). The communication within the eNB between these components is based on Nokia propritary internal protocols. The new deployment requires these protocols to traverse IPv4 / IPv6 based networks.

Here comes the ICOM GW into the picture. This entity tunnels or interworks the internal protocols across IPv4 / IPv6 based networks, allowing the cloud based components to communicate with the RAPs. The ICOM GW further supports beside QoS and security aspects the whole feature set TRS provides. Since for UP different internal protocols are utilized per RAP HW type, the ICOM GW could also be understood as a kind of protocol harmonizer.

教育经历

浙江大学   本科   计算机科学与技术   1992-1996