

Nabendu Bikash Maiti

Senior Embedded System Lead | IoT Secure Design | 18+ Years' Expertise

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Highly skilled Embedded System Design professional with 18+ years of experience. Specializing in secure IoT system design, embedded software development, and team leadership. Proficient in security software implementation, agile methodologies, full-stack graphics, Kubernetes, and Docker. Adept at managing multi-core projects and delivering results across global locations. Technical expertise in Linux OS, VxWorks, and various RTOSs. Detail-oriented with strong analytical abilities.

WORK EXPERIENCE

Sr. Software Engineer

May 2023 – Present

Intel, Bangalore, India

Worked in device provisioning effort using Tinkerbell Kubernetes based OS Provisioning.

- Done Libvirt kvm based bare metal provisioning for KPI
- Optimized OS >70% for performance
- Enabled full TPM2 based FIDO secure onboarding.
- Streamlined Tinkerbell provisioning on Kubernetes cluster.
- Single handedly created Full stack POC having react frontend & Golang backend service

Sr. Security Software Engineer

June 2017 – April 2023

Intel, Bangalore, India

Played a key role in the internal security team by designing, coding, leading, and creating proofs of concept.

- Improved internal product security by uncovering critical vulnerabilities through Whitehat hacking, Restlier API fuzzing, and AFL++ program fuzzing. Conducted ML-based fuzzing POC projects.
- Designed architecture and coded for SGX enablement on Slim bootloader
- Led Team for Secure device onboarding protocol implementation while doing agile task planning and scheduling for releases.
- Significantly contributed to the implementation of security protocols such as ECDSA and AES at a low level for Linux and FreeRTOS across multiple platforms. This encompassed secure code reviews, resolution of memory leaks, and optimization efforts.

Graphics Software Engineer

January 2014 – May 2017

Intel, Bangalore, India

Contributed to vital aspects of i915 Linux display driver: NV12, scaling, bug fixes, and kernel patch upstreaming.

- Developed NV12 driver and display hardware scaling for i915, including test case design and coding.
- Mentored junior team members
- Up streamed patches internally and open sourcing

Software Engineer II

February 2013 – November 2013

Broadcom, Bangalore, India

Was involved in 4G modem firmware team to create, optimize power and KPI measurements.

- Conducted profiling and optimization of power consumption across various power planes
- Was responsible for fixing bugs and enhancement of codes as per requirements from Stack team.

Senior Software Engineer

August 2011 – February 2013

Concurrent Technology, Bangalore, India

Contributed to enabling diverse device drivers and BSPs for Linux and VxWorks in the platform team.

- Designed developed, validated and tested VxWorks BSP for new CPCI, VME and VPX Boards.
- Developed a built-in firmware test diagnostic suite based on Free RTOS.
- Developed drivers for PCH based Ethernet GEI.

Senior Software Engineer

July 2010 – August 2010

Applied Micro, Pune, India

Worked with the BSP, device driver, and platform team to ensure that the new multicore SOC was ready for tape out in both the pre-silicon and post-silicon phases.

- Designed and developed multi-processor multi-channel DMA drivers and SDHC v3 drivers.
- Led the development of BSPs for SMP and AMP systems in a multi-core environment.
- Worked on ethernet packets Classification IP driver porting

Software Engineer

September 2006 – July 2010

Igate Patni Computers, Mumbai, India

Played a pivotal role leading software effort from customer requirements to architecture, design, coding, and testing. Collaborated closely with hardware design team for seamless coordination. Delivered solutions deployed in real-world public settings.

- Led end-to-end project execution, spanning requirement analysis, planning, testing, and deployment.
- Instrumental in designing and implementing VxWorks Device Driver, crafting Image processing APIs, and developing a Linux device driver for Frame Grabber PCI Board functionality.
- Directed high-level and low-level software architecture design for Discrete Graphics Processor board, encompassing device drivers, applications, and GUI interface library.
- Executed coding for Embedded Graphic Processor driver, SD memory card driver on VxWorks, and developed components like Bmp decoder, encoder, and YUV converter.
- Ported, tested, debugged of Embedded Linux and VxWorks on Coldfire M5475
- Led the efforts in the development of frame buffer memory drivers for GUI on the embedded platform.
- Analyzed feasibility of DirectFB on SM501 graphics controller.
- Designed, coded, tested, and debugged preemptive context switching on MpLab XMK Scheduler for PIC32 Microcontroller.
- Executed an on-site assignment at Japan, capturing customer requirements.
- Devised comprehensive testing strategies and executed coding for punctual delivery of I/O module designs at customer location.
- Spearheaded VxWorks BSP and bootloader development, alongside the porting of U-Boot for the Industrial Embedded CPU Module based on Freescale Soc.
- Orchestrated the design, coding, porting, enhancement, and rigorous testing of RTC device drivers for Linux, with a specific emphasis on firewire OHCI.

Software Engineer

September 2005 – February 2006

ABB, Faridabad, India

Executed Logic Design and HMI Design for Industrial Control & Automation.

- Programmed ABB BRC Controller and IO modules for power plant automation.
- Conducted on-site visits to customer factories for resolution of customer issues.

EDUCATION

Development for Advanced Computing (CDAC), Kolkata

P.G. Diploma (82%) in Embedded System

Heritage Institute of Technology (HITK), Kolkata

B.Tech. (CGPA 8.35) in Applied Electronics and Instrumentation Engineering

CERTIFICATIONS & TRAININGS

Professional Trainings

- Linux 2.6 Device Driver Training from Comptrix Systems Pvt. Ltd., Pune.
- Workshop on MATLAB Image Processing and making of ball follower robot from TRI, IIT Mumbai.
- Industrial training on Modern Electronics Industrial Automation.
- Training on Embedded system (8051 and PIC programming) and PLC Programming (Ladder Logic Siemens S5) from Center of Electronics Test Engineers.

Certifications

- Alexa Skill Development for Beginner from Udemy
- All about Nodejs from Udemy
- Artificial Intelligence Foundations: Machine Learning from Lynda.com
- Learn and Understand Nodejs from Udemy
- Learning Secure Socket layer from Lynda.com
- Learning cryptography and network security from Lynda.com
- Course: Python Parallel Programming Solutions
- Python Parallel Programming Solutions from LinkedIn Learning

OTHER PROJECTS

Full Stack MERN Stock Gui: React-js, Golang and python based real-time stock alert Gui application.

Python Telegram Bot: Python based multiuser interactive telegram bot to interact with user.

Alexa WaterBas

Home Automation: Designed and implemented a voice-controlled personal assistant and Wi-Fi home automation/security system using CMU Sphinx and Google Cloud. Included sensor and actuator hardware, along with an OpenWrt based server. Tools used: RT5350, ESP8266 Wi-Fi, OpenWrt, Eagle, Proteus, FUSION360.

Automatic Door Lock: Controlling and monitoring Computerized Door lock & Attendance System [Tool Used: Linux 2.6.4.]

Low cost PLC: IELAC (Intelligent & Efficient Logic & Analog Controller)-[Tool Used: Eagle, Proteus circuit simulator, PicSimulator IDE, Mplab, Visual Basic.]

Autonomous Robotic Vehicle: Architecting, circuit Design and Implementation. [Tool Used: OrCAD, Proteus circuit simulator, PicSimulator IDE, MpLab, Visual Studio, DirectX9]

AVR USB HID Gpio: Design of AVR Based USB Target I/O Board Design using AVR without any USB target controller [Tool Used: AVR GCC, Eagle schematic.]

SKILLS & OTHER

Languages: C, C++, Assembly, Python, Golang, NodeJS, JavaScript, html, shell script

Operating Systems: Linux, VxWorks 6.4- 6.9 (RTOS), XMK (RTOS), OpenWrt, FreeRTOS, MbedOS

Development Tools: GCC, Diab, Mplab, KEIL, GDB-KGDB, WDB, Arduino, DSTREAM, TRACE32, ICE, BDI

Containerization and Orchestration: Docker, compose, Kubernetes – k3d, rk2

Tools: JTAG, Logic Analyzer, Power-PC, ARM (cortex M/A), x86, RT5350, ESP8266, 808x, 8051, PIC, AVR, UART, PCI(e), SD, SPI, I2C, Modbus, Firewire, servo motors, PIR sensors, WIFI

Schematic & PCB design: Eagle, Proteus for simulation

Others: Embedded Systems, Dockers, AWS Beanstalk, IOT, Machine Learning, Natural Language processing, ReactJS Framework, Webapp, System Programming, Perforce, CVS, GIT, JIRA, Bugzilla, Industrial Automation, IOT clouds, [3D CAD] Fusion360, Raspberry-PI