Santanu Sen

Bangalore, India

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Summary

Seasoned Software Development Engineer with rich experience in designing, implementing and driving the development of scalable distributed software systems. Currently responsible for leading execution from definition to delivery, collaborating with peer teams and mentoring team members for multiple projects involving space management in a distributed file system.

Proficient in C, C++, Object Oriented Design, Design Patterns, Distributed Systems, Data Structures, Algorithms, Application Development in Linux/Unix Environment, Multithreading, Multi-core Applications, IPC, File Systems.

Work Experience

NetApp India Pvt. Ltd.

Dec. 2018 - Present

Member Technical Staff — *Bangalore, India*

- Working on an Auto-Scaling solution to achieve reduction in cloud resource usage costs of NetApp's containerized Software Defined Data Management solution on Kubernetes orchestrated platforms.
- Quickly picked up the Golang basics to write a Kubernetes Vertical Pod Autoscaler (VPA) simulator. The simulator enabled simulation of several months of resource usage within seconds and helped fine tune the auto-scaling solution.
- Designed and implemented the liveness and readiness features for Data Management pods which helped in detection of multiple issues early in the development cycle.
- Optimized the RESTful API handler implementation for cluster-level space attributes retrieval to reduce API response timings from more than 5 seconds to less than a second.
- Designed and implemented a scheme for protection of system-critical memory pages from accidental writes in the Data Management binary.
- Designed and developed the startup and software upgrade features for the Data Management containers.

Infinera India Pvt. Ltd.

Jul. 2012 - Nov. 2018

Staff Software Development Engineer — *Bangalore, India*

- Enhanced the Network Element Transaction Framework through private workspace for write transactions which achieved a superior scaling to support 15 simultaneous NMS connections compared to only 3 NMS connections by a 64 chassis Network Element cluster.
- Created a Network Element Link Traversal Framework to simplify the fault correlation logic. The framework was later reused by multiple features which saw a reduction in the number of traversal related bugs from 2 per feature on average to 0.
- Designed and developed a declarative Fault Correlation and Management Framework for the Software Defined Networking suite which accomplished specification of new alarm definitions and fault correlation rules through external files without recompilation.
- Designed and developed a C++ Cryptographic Wrapper Library to simplify digital signature verification and decryption of Instant Bandwidth licenses. The library was later reused to implement several other security features.
- Contributed to engineering efforts from object modelling, to implementation and delivery of a number of Network Element Management Plane Software modules such as Optical Amplifiers, Broadcasting Modules, Multiplexers, Cross-Connects and Protection Switching modules across several releases.

Tejas Networks Ltd.

Jun. 2006 - Jun. 2012

Lead Engineer, R&D — *Bangalore, India*

- Enhanced the Network Element Software transaction performance by backgrounding and batching of configuration database commits which reduced centralized NMS based circuit restoration timings from 40 seconds to sub-second.
- Designed and implemented different Automatically Switched Optical Network service classes using Generalized Multi-Protocol Label Switching. Created a User Mode Linux based simulation framework which effected a drastic reduction in unit-testing time.
- Designed and developed a System Startup and Failover Manager supporting a state machine based phased initialization of Network Element Software.
- Improved management layer security of Network Elements through implementing HTTPS support for the web server, user session management, and audit logging of configuration changes.
- Simplified user-management across multiple Network Elements by implementing support for a centralized RADIUS based authentication. The feature relieved the operators from adding and managing users separately in each individual Network Element.

Education

Master of Technology in Computer Science and Engineering

2006

National Institute of Technology, Durgapur — *West Bengal, India*

- CGPA: 9.58/10
- Thesis Title: Integrated Feature Analysis, Input Fuzzy Set Selection and Fuzzy Rule-Based System Identification in a Neuro-Fuzzy Paradigm

Bachelor of Engineering in Computer Science and Engineering

2004

The University of Burdwan — *West Bengal, India*

- TCPA: 79.5%

Certifications & Test Scores

IBM Certified Associate Developer, IBM WebSphere Studio V5.0 *Apr. 2005*

IBM Certified Database Associate, IBM DB2 Universal Database V8.1 *Apr. 2005*

Secured a Percentile Score of 92.33 in Graduate Aptitude Test in Engineering *Mar. 2004*

Patents

Systems and Methods for Decoupled Optical Network Link Traversal *Jun. 2020*

USPTO, App. No. 16/136,810, Doc. Id: US 20200100003 A1, Status: Grant

Defining Architectures using Declarative Parametric Language *May. 2019*

USPTO, App. No. 16/415,853, Doc. Id: US 20200364061 A1, Status: Filed

Publications

A Neuro-Fuzzy Scheme for Integrated Input Fuzzy Set Selection and Optimal Fuzzy Rule Generation for Classification *Dec. 2007*

International Conference on Pattern Recognition and Machine Intelligence, pp 287-294, LNCS, vol. 4815, Springer

Honors & Awards

Spot Bonus Reward, NetApp *Bangalore, India*

- Awarded for stepping in during absence of the lead designer to deliver last-minute design changes for the TCM project. *Apr. 2023*
- Recognized for driving to the development of Automatic Incremental Repair for the Flex Group Rebalancing project. *Jul. 2022*
- Rewarded for contributions to the Flex Group Rebalancing project and mentoring new joiners. *Jan. 2022*

Hackathon Notable Project Winner, NetApp Hackathon *Bangalore, India*

- Awarded for demonstrating of the idea of “Photon Asynchronous IO Using io_uring.” *Nov. 2022*
- Awarded for demonstratimg the idea of “Vertical Pod Autoscaling for DMAP Containers.” *Feb. 2020*

Peer Recognition Award, NetApp *Bangalore, India*

- Recognized for teamwork during the “Quark Version Upgrade” project by the Cloud Engineering Team Peers. *May. 2020*

Spot Bonus Reward, Infinera *Bangalore, India*

- Rewarded for significant contributions to design and development of FBM Management Plane Software. *Mar. 2017*
- Rewarded for exceptional performance in design and development of Fault Integration and Alarm Correlation. *Jun 2015*

Hackathon Star Project Award, Infinera Hackathon *Bangalore, India*

- Awarded for demonstrating the project titled “Parametric Software.” *Jun. 2015*

Achievement Award, Tejas Networks *Bangalore, India*

- Awarded for optimizations in management plane software to reduce ASON circuit restoration time. *Apr. 2011*

Overnight Contest Winner, Mukti, An Annual National Level Technical Symposium, Linux Users’ Group, NIT *Durgapur, India*

- First Prize in C Programming Contest. *Jan. 2006*
- Third Prize in System Admininstration Contest. *Jan. 2006*