Santanu Sen

Bangalore, India

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Summary

Seasoned Software Development Engineer with rich experience in design and development of distributed software systems in Data Management and Telecommunication domains. Currently working as a developer in a Software Defined Data Management project leveraging Linux, cloud ecosystem features and containerization.

Proficient in C, C++, Object Oriented Design, Design Patterns, Distributed Transactional Systems, Data Structures, Algorithms, Application Development in Linux/Unix Environment, Multi-threading, IPC, Docker, and Kubernetes Based Software Solutions.

Work Experience

NetApp India Pvt. Ltd.

A Fortune 500 Hybrid Cloud Data Management Solutions Company — *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.
- Wrote a Kubernetes Vertical Pod Autoscaler (VPA) simulator to mimic resource recommendations and evictions of a VPA managed pod. The tool enabled simulation of several months of resource usage within seconds and helped fine tune the auto-scaling solution.
- Architected 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 in the Data Management binary from accidental writes.
- Designed and developed the software upgrade flow for the Data Management containers.

Infinera India Pvt. Ltd.

A Global Supplier of Innovative Networking Solutions; A Pioneer in Large-Scale Photonic Integrated Circuits Design — *Jul. 2012 - Nov. 2018*

Staff Software Development Engineer — *Bangalore, India*

- Enhanced the Network Element Transaction Framework through private workspaces 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.
- Architected and implemented 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.
- Designed the Management Layer object modelling of a number of Network Element modules, such as Optical Broadcasting Modules, Multiplexers, Muxponders and Protection Switching modules, across several releases.

Tejas Networks Ltd.

A TL 9000 Certified Optical Networking Products Company — *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 with a state machine based phased initialization of Network Element Software.
- Improved management layer security of Network Elements through imlementing HTTPS support for the webserver, 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.

Honors & Awards

Peer Recognition Award, NetApp, Bangalore, India — *May. 2020*

Recognized for teamwork during the "Quark Version Upgrade" project by the Cloud Engineering Team Peers.

Productization of Hackathon Idea, NetApp, Bangalore, India — *Feb. 2020*

Demonstrated the idea of "Vertical Pod Autoscaling for DMAP Containers" at NetApp Hackathon which was shortlisted by the panelists of Technical Directors for productization.

Spot Bonus Reward, Infinera, Bangalore, India *Mar. 2017*

Rewarded for significant contribution to design and development of management plane software of Flexible Broadcast Modules.

Hackathon Star Project Award, Infinera, Bangalore, India *Jun. 2015*

Awarded for the project titled "Parametric Software" presented at Infinera Hackathon.

Spot Bonus Reward, Infinera, Bangalore, India *Jun. 2015*

Rewarded for exceptional performance in design and development of Fault Integration and Alarm Correlation for the Gen-3 Line Systems.

Achievement Award, Tejas Networks, Bangalore, India *Apr. 2011*

Awarded for optimizations in management plane software to reduce ASON circuit restoration time and development of the session management feature.

Obtained a 92.33 Percentile Score in Graduate Aptitude Test in Engineering, MHRD, India *Mar. 2004*

Patents and Publications

Patents

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

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

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

Education

National Institute of Technology, Durgapur *2006*

Master of Technology in Computer Science and Engineering *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

The University of Burdwan *2004*

Bachelor of Engineering in Computer Science and Engineering *West Bengal, India*

- TCPA: 79.5%

Burnpur Boys' High School *2000*

Higher Secondary, West Bengal Council of Higher Secondary Education *West Bengal, India*

- Science Major, 79.4%

Asansol Ramakrishna Mission High School *1998*

Secondary, West Bengal Board of Secondary Education *West Bengal, India*

- 82%

Extracurricular

CryptCpp, A C++ Cryptographic Interface Library *2020 - Present*

https://github.com/santanusen/cryptcpp *GitHub*

- Wrote this C++ library to decouple application code from cryptographic libraries.

Participant in Mukti, A National Level Technical Symposium on Linux and FOSS *Jan. 2006*

Linux Users' Group, NIT, Durgapur *India*

- Received First Prize in C Programming contest.
- Received Third Prize in System Administration contest.

IBM Certifications *Apr. 2005*

Professional Certification Program from IBM *India*

- IBM Certified Associate Developer in IBM WebSphere Studio V5.0
- IBM Certified Database Associate in IBM DB2 Universal Database V8.1