Rohit Talukdar

Software Architect · Integration Expert

Bangalore, India

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"Be the change that you want to see in the world."

Overview

19 years experience in backend development, file-system, storage management and integration. Passionate about infrastructure automation. Nerd and hobby Do-It-Yourself hobby hacker who loves prototyping, using linux and enjoys automating tasks of a repetitive nature. Firm believer in making simple building blocks for re-use in technology integration to solve usecases, so that the whole is greater than the sum of the parts.

Skills

Programming	Python | C | gdb | C++
Back-end	FastAPI | Flask | REST API
Operating Systems	Linux | BSD
DevOps	Docker | Ansible | Jenkins | Bash
Front-end	Jquery | HTML5

Education

NIT Jaipur(National Institute of Technology) *Bangalore*

B.E. in Computer Science and Engineering *Mar. 1998 - Mar. 2002*

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Work Experience

Dell EMC *Bangalore*

Software Senior Principal Engineer *May 2017 - Now*

- Designed, prototyped and implemented integration of platform features such as (Install / High-Availability / Non-Disruptive Upgrade of the Software-Defined NAS, a container-based, micro-services architecture powered, next-generation hyper-converged and unified storage solution, using tools like Ansible and paramiko on the Dell EMC PowerStore storage family of products. Architecture brainstorming and detailing is done using zoom whiteboarding / confluence / plantuml / visio / gliffy / PPT as the design stakeholders are geographically distributed.
- Lead Filesystems, VNX / VNX2 storage, as part of in market engineering. Solved high visibility storage issues of top enterprise customers.
- Conceptualized, designed, prototyped, developed and deployed auto triaging tool to automatically triage + diagnose high volume of incoming bugs in platform features using Jenkins / pytest / FastAPI / Grafana / sqlite / json / jquery to improve team productivity that reduced matched 60 percent of new issues in the incoming funnel to already known issues and resulted saving the PowerStore Business Unit more than two person-years of manual triaging effort within a year of its deployment.
- Conceptualized, designed, and prototyped deployed self-healing tool called 'Jaadu' packaged as a docker to do live field triage on the system + self-diagnose leveraging Cloud IQ and subsequently self-heal the live system without needing to wait for the upload of the Support material or wait for escalation intervention to do manual triage.

ElasticBeam, Startup *Bangalore*

Staff Engineer *Jan 2016 - Mar 2017*

- Development and Automation for Application Load Balancer and Application Firewall features - X-Forwarding, SSLv3 Disable, MQTT + Websocket Analysis.
- Wrote and maintained scripts for application Performance tuning to be applicable for Hosts, VMs and dockers.
- Developed client side Spike Arrest feature to prevent Backend Servers from crashing.
- Scale Testing of Spike Arrest Feature by developing a distributed web stress test tool simulating 50k+ concurrent TCP connections using just two Virtual Machines and by modifying open-source load generator tool 'wrk' to support multiple virtual IPs.
- Automation of testing of the Traffic Analytics Machine Learning Module by using Ansible, Go and Python.
- Implemented a python tool to analyze HAproxy Server logs and deduce traffic patterns with an hourly breakup with information such as : types of devices, browsers, methods, Operating Systems, mobile browsers, frequency of status codes by type and category, list of unique IPs with request counts, response bucket size by IP, load distribution frequency to backend servers, to help deduce and recommend spike thresholds.

Juniper Networks

Bangalore

Member of Technical Staff - 4 *Sep 2010 - Dec 2015*

- Maintenance and Bug Fixes for Application Identification using Qosmos Deep Packet Inspection(DPI) libraries. Also made a prototype for DNS Profiling that can be used to build DNS traffic patterns to detect malware. Used open-source ntop based nDPI on a cloud VM to quickly analyze network traffic and make a case for leveraging Websense along with Qosmos and doing Application Identification in the cloud.
- Troubleshooting and fixing stability, installation, filesystem, performance and memory leaks of standalone and HA models. Analysis of crash dumps, debugging memory issues and designing storage improvements for upgrade/revert scenarios. Design of File Partitioning Scheme for Next generation SRX(Security, Routing and Switching) Platform.
- As scrum-master, led a team of 7 Dev + 5 QA persons to completion to implement SDK API for L1/L2/L3 protocols, perform MPLS node and path discovery and helped solve performance issues with VM setups. Involved in the Design and Architecture of the management solution of a Next Generation Campus Network that should simplify network management. It essentially moves away from a device centric network architecture to a user-based architecture that ensures seamless mobility of users and their sessions across buildings and across access points.

NetApp India Pvt Ltd.

Bangalore

Member of Technical Staff - 4 *Jun 2006 – Aug 2010*

- Development, Bug fixing and kernel level modifications for the WAFL (Write Anywhere File Layout) File-system. Investigated Heap segment allocation (HSEG) on low memory platforms that caused the FAS-3050 platform to frequently run out of heap memory when all features were enabled. The problem was intermittent and would occur only when all features were enabled (Deduplication + Max Flexvols Online + Cluster setup + qtrees + Network Load). This issue made the FAS3050 platform highly unstable when operating with all features enabled in the to-be-qualified release. After studying the existing memory management system, used simple gdb scripts and existing slab allocator memory management allocation diagnostics to determine differences in the memory footprint of each module in the baseline setup and the later setup where the memory starvation and subsequent segfaults were noticed. After comparing the baseline and problematic image versions, drilled down the problem due to indiscriminate use of heap memory by mbufs and consequently helped the networking team stabilize the platform for Cluster mode ONTAP kernel by quantitative analysis of memory footprints.
- WAFL FS has a max concurrent file deletion filesystem limit. In day-to-day operations, the envelope does not come into play. However, admins tend to clean up /make space only when the filer reaches near max capacity, which then starts to degrade filesystem performance. Admins solve the problem by deleting all log files and other temporary swap files that are frequently huge in number. The filesystem (FS) returns control to the client (CIFS/NFS) only when it can guarantee completion of that filesystem deletion request. Since the FS is optimized at file allocation but not at file deletion, this problem manifests itself as slowing the whole system down during periods of high number of file deletions and making the client OS's sluggish and unresponsive during that period. Worked on subverting the max deletion limit in WAFL by using pending zombies linked-lists to ensure faster FS response during such conditions. Also persisted the pending list to account for kernel cluster failovers in a high availability scenario.
- Design and implementation of bottleneck analysis on linux and over / under-utilization based on performance thresholds of Filers. Also involved in sustenance and handling customer escalations for DFM(Data Fabric Manager) /Ops Manager. Proposed ideas like DFM Restartability to reduce downtime window and Threshold templates for Performance Service Level Agreements.

NetDevices

Bangalore

Senior Software Engineer *Apr 2004 – Jun-2006*

- Part of a team working on a Unified networking solution for edge enterprise networks that works out of a box. Involved integrating routing, security and VoIP functionality in a single box. This results in simpler network administration and lower operational costs.
- Design and Implementation of Layer 2 Multi-Link Frame Relay Protocol (MLFR) using C / Finite State automata(FSA) / Linux / gdb to allow multiple T1/E1 Links to appear as a single fat pipe to the user. Reduced FR connection setup time from 1 minute to less than 10 seconds.
- IPSec/IKE VPN Protocol Suite implementation that involved study of RFC's, Analysis of FreeBSD IPSec, Openssl Crypto Library and removing driver/mbuf related code to suit requirements to run in user-space. Involved in Integration, unit-testing and handover to QA.
- Design/Implementation of License Manager for the to allow enabling/disabling of premium services like VoIP without rebooting.

eInfinitus Technologies India Pvt. Ltd

Bangalore

Member of Technical Staff *Sep 2002 – Nov 2003*

- xMPLS is a patented protocol to provide QoS in MPLS networks, satisfying required QoS levels. Implementation of algorithms based on OSPFv2 f or dynamic creation of network topology. Implemented Algorithms to generate Network Topology used to set-up Label Switch Paths using LDP.
- Phase A: Socket Handler and Topology Creation. Determined up interfaces and handled messages to/from the Process Handler.
- Phase B: Wrote a packet sniffer to analyze network traffic transmitted on the network for debugging and validation. Coding was in C and each Linux machine was configured as router patched with the xMPLS code inside the kernel. Implemented using Threads, Signals, Pipes, IPCs, and Semaphores etc.

Honors & Awards

Hackathons

2007|09 **Twice winner - Build it now Award,** NetApp Outrageous Opinion Hack: DFM Restartability | AutoSupport++ *Bangalore*

2007|09|10 **Three time winner,** Yahoo OpenHack - SocialRouting '07 | Best Navigation Hack '09 | Chirpshire '10 *Bangalore*

Patents

Cloud Chunking Adaptor

USPTO | Filed Date: 30 Jan 2018

Patent ID: 81443416 | Ref: 110041.01

Status: Granted

Co-Inventer

- Mechanism to stripe data across cloud providers with BYOK (Bring your own Key) for privacy, resiliency, high availability and disaster recovery.

Mechanisms to implement High-Availability events in layered cluster architecture

USPTO | Filed Date : 10 Sep 2020

Patent ID: 81698487 | Ref: 121234.01

Status: Authorized

Co-Inventer

- Mechanisms to synchronization and reconciliation of high availability primitives that may occur spontaneously in nested layers of sub-systems.
- eg. application docker cluster over a VM / Barebones cluster.

Committee

2014 — **Joint Secretary, Security**, Designed and Implemented a simple Visitor Tracking System using HTML5, LAMP, Python at a Large Apt Complex that was used directly by security, where I reside with Gate Pass Printing and Barcode Tracking, that has been used to track and report in/out time of 4.5 Lakh+ visits and 30k+ visitors that reduced incidents of petty theft, parking violations and alongwith CCTVs reduced incidence of security issues by more than 90 percent. *Bangalore*

Extracurricular Activity

2014 — **Joint Secretary, Security**, Designed and Implemented a simple Visitor Tracking System using HTML5, LAMP, Python at a Large Apt Complex that was used directly by security, where I reside with Gate Pass Printing and Barcode Tracking, that has been used to track and report in/out time of 4.5 Lakh+ visits and 30k+ visitors that reduced incidents of petty theft, parking violations and alongwith CCTVs reduced incidence of security issues by more than 90 percent over a 3 year period. *Bangalore*