DIPTA DAS

Software Engineer

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Passionate Software Engineer with 2+ years of professional experience in Golang, Docker, and Kubernetes. Pursuing an M.Sc. in Computer Science with R&D expertise in the microservice architecture, code analysis, Java, and Spring Boot.

EXPERIENCE

Graduate Research Assistant
Baylor Cloudhubs Lab

📅 August 2019 – Present   📍 Waco, TX, USA

Uses: Java, Spring Boot, Docker

- Performed Static Code Analysis for Spring Boot projects to detect RBAC inconsistencies and code smells within program source code and bytecode.
- Developed the backend and managed the production deployment of the virtual conference hosting site for ACM SAC 2020.

Intern Researcher And Team Lead
Red Hat Research

📅 Summer 2020   📍 Brno, CZ (Remote COVID-19)

Used: Java, Python

- Led a small team of undergraduate students to conduct research on log analysis.
- Analyzed source code and logs of the Red Hat Insights project to identify execution paths of error events.
- Automated the error debugging process by utilizing external knowledge sources like Stack Overflow and GitHub issues.

Software Engineer
AppsCode Inc.

📅 April 2017 – April 2019   📍 Dhaka, Bangladesh

Used: Golang, Kubernetes, Docker, gRPC, HAProxy

- Developed custom-resource (CRD) controllers for Kubernetes clusters.
- Extended the Stash project for Google Cloud Bucket and Azure Blob Storage by integrating them into a third-party open-source project Restic.
- Improved the Ingress CRD structure of the Voyager project and integrated HAProxy hitless reload for L4 & L7 load balancing.
- Developed KubeCI from scratch to achieve a Kubernetes native serverless platform, workflow-engine, and CI/CD system. Integrated Github with KubeCI to facilitate GitOps.
- Automated the Kubernetes cluster provisioning process in VMs for GCP, AWS EC2, Azure, and DigitalOcean Droplet.
- Implemented synchronization of Kubernetes ConfigMaps and Secrets across multiple clusters in the Kubed project.
- Wrote gRPC based API servers. Integrated monitoring for containers using Prometheus metrics and Grafana.

EDUCATION

M.Sc. in Computer Science
Baylor University

📅 Aug 2019 – Present   📍 Waco, TX, USA

CGPA: 3.90 **Thesis:** Security analysis for containerized microservices.
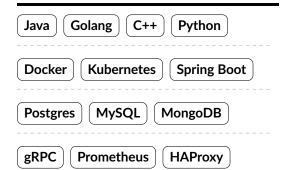
B.Sc. in Computer Science and Eng
Chittagong University of Eng and Tech

📅 2012 – 2017   📍 Chittagong, BD

CGPA: 3.59 **Thesis:** Improving performance of the BKZ lattice reduction algorithm.

SKILLS

`Java` `Golang` `C++` `Python`

`Docker` `Kubernetes` `Spring Boot`

`Postgres` `MySQL` `MongoDB`

`gRPC` `Prometheus` `HAProxy`

MOST PROUD OF

🖥 Competitive Programming
- Divisional champion of **ACM ICPC** Dhaka Regional 2014 and 2015.
- **Expert** at Codeforces with highest contest rating 1707.

⌥ Open Source Contribution
Contributed to 20+ open source projects by implementing new features, bug fixing, and issue reporting.

📕 Publications
5+ articles on microservice security and code analysis.

👥 Leadership
- Worked as the lead developer of Voyager, Stash, KubeCI open-source projects.
- Led a small team for log analysis project in collaboration with **Red Hat**.

PROJECTS

Voyager

🔗 https://github.com/voyagermesh/voyager

Voyager is an HAProxy backed secure L7 and L4 ingress controller with some extended features for Kubernetes. This can be used with any Kubernetes cloud providers including bare metal clusters.

- Extended core features including HAProxy hitless reload, Let's Encrypt certificate integration, SSL termination, SSL passthrough, TCP SNI, etc.
- Integrated OAuth2 to support authentication using Github, Google, Facebook, and OpenID.
- Improved the Ingress CRD structure for a better user experience.

Stash

🔗 https://github.com/stashed/stash

Stash is a cloud-native data backup and recovery solution for Kubernetes workloads. Under the hood, it uses Restic for backup and restore purposes.

- Extended open-source project Restic to support Google Cloud Bucket and Azure Blob Storage.
- Improved volume backup and implemented initial database backup system.

KubeCI

🔗 https://github.com/kube-ci/engine

KubeCI is a Kubernetes native serverless platform, workflow orchestrator, and CI/CD system.

- Developed KubeCI from scratch.
- Integrated Github with KubeCI to facilitate GitOps.

RAD

🔗 https://github.com/cloudhubs/rad

RAD (REST API Discovery) detects inter-microservice REST communication to perform software architecture reconstruction for a microservice mesh.

- Implemented RAD from scratch using bytecode analysis and extended further using source code analysis.
- Utilized RAD into separate projects for RBAC inconsistency and code smell detection.

FLARN

🔗 https://github.com/diptadas/flarn

Flarn is a learning portal for people of all ages with different academic backgrounds.

- Prepared initial design documentation and performed feasibility analysis.
- Developed the backend of the Flarn project using Spring Boot.
- Wrote unit and integration tests, integrated CI/CD pipeline and executed production deployment.

OSS CONTRIBUTIONS

Kubernetes

🔗 https://github.com/kubernetes/kubernetes

An open-source system for managing containerized applications across multiple hosts.

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Restic

🔗 https://github.com/restic/restic

A backup program that is fast, efficient, and secure.

- -

helm/charts

🔗 https://github.com/helm/charts

Curated applications for Kubernetes.

- -

Azure SDK for Go

🔗 https://github.com/Azure/azure-sdk-for-go

Provides Go packages for managing and using Azure services.

- -

Javassist

🔗 https://github.com/jboss-javassist/javassist

Java bytecode engineering toolkit.

- -

go-sh

🔗 https://github.com/codeskyblue/go-sh

Provides easy to call shell with Golang.

PUBLICATIONS

- Das, Dipta et al. (2021). "On automated RBAC assessment by constructing a centralized perspective for microservice mesh". In: *PeerJ Computer Science*.
- Walker, Andrew, Dipta Das, and Tomas Cerny (2020). "Automated Code-Smell Detection in Microservices Through Static Analysis: A Case Study". In: *Applied Sciences*.

PROFILES

GitHub

🔗 https://github.com/diptadas

LinkedIn

🔗 https://www.linkedin.com/in/diptadas

Codeforces

🔗 http://codeforces.com/profile/diptadas

Google Scholar

🔗 https://scholar.google.com/citations?user=WhgwUY8AAAAJ