Varad Belwalkar

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Education

D Y Patil college of engineering and technology, Kolhapur   2021-ongoing
Bachelor, Computer Science and Engineering

Publications and Research Projects

Load Balancing standalone docker engines | *Hobby Research Project*   2022-ongoing
○ Engineered a custom **load-balancer** in **Go** to facilitate the load balancing on multiple nodes
○ Plugin is in development and implementation following the Raft consensus algorithm

Machine learning to help mitigate side-channel attacks | *Research project*   2022-ongoing
○ Observed possible side channels through full compilation and JIT Compilation in an Embedded system

Ethereum-Facilitated Secure Tunnelling | *Blockchain Technology*
○ Leveraging Smart Contracts on the PoA test network Rinkeby for End-to-End highly concurrent connectivity interface between client and server behind NAT, with RESTful client implemented in Django
○ Only Contract owners will be able to communicate through the tunnel

Bring Localhost to the Internet! | *Blockchain Technology*
○ Leveraging off-chain framework Perun to support real time communication between server and multiple clients simultaneously
○ Only Contract owners will be able to communicate through the tunnel

Published PaaS Framework as Docker image which has over 2.8k+ pulls on Docker Hub

Key Projects

Scalable Platform as a Service | *Distributed Systems*
○ Built an **auto-scaling** container-based PaaS framework by implementing NGINX reverse-proxy to load-balance with services controlled by replicated **Django-server** through Docker-Swarm
○ Provided a deployment platform, auto-configuring clients for Linux and Windows systems and TLS verification and encryption from the client side

Compute Services | *CI/CD Pipelining*
○ Engineered backend in **Go** to provide storage and container services by utilizing docker-SDK for Go
○ Used **MongoDB** for storage, Computing platform, and Cookie based sessions
○ Implemented Client in Go with conventional security practices and hybrid encryption
○ Implemented CI/CD pipeline using **Jenkins** to automate the build, test, and deployment process

Integration Service | *Microservices*
○ Built an integration platform in Go for various online services to integrate in any cloud infrastructure

Exploiting DNN weights using DeepSteal | *Machine Learning*
○ Performed DeepSteal protocol attack on Deep-Neural-Network to exploit weighted parameters

Web-based Labs | *Web application*   2022-ongoing
○ Developing a User-friendly Web app with **ReactJS** providing services offered by the Compute service framework
○ Implementing a built-in terminal and various conventional practices and security features

D-RAM Addressing Attack | *Computer architecture*
○ Performed a timing attack on intel core i5 to reverse engineer the confidential address mappings
○ Established a **Covert-Channel** to perform illicit inter-process communication between the host and isolated VM

Technical Skills

Languages: C/C++, Python, Java, JavaScript, Bash, PHP, SQL, Go, LaTeX   **Platforms**: Linux and Windows
Software Tools: git, GitHub, Docker, Jenkins, Wireshark, Kubernetes   **Web servers**: Apache, Nginx
Databases: MySQL, PostgreSQL, MongoDB, Redis, Apache Cassandra
Web Development: HTML5, CSS3, JavaScript, Node.js, ReactJS, ExpressJS, Django

Position and Responsibility

- Carried out Linux-Wargames, took Linux-related sessions, and established DYP-Linux Users' Group