

Arka Pal

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Education

University of Illinois - Chicago (UIC), Chicago, IL

Master of Science in Computer Science (August 2022 – Expected May 2024)

Related coursework: Algorithms, Computer Networking, Cybersecurity.

K.J. Somaiya College of Engineering (KJSCE), University of Mumbai, India

Bachelor of Technology (August 2018 – May 2022)

Electronics and Communications Engineering

Related coursework: Data Structures and Algorithms, Computer Networking, Cloud Computing, Cybersecurity.

Experience

Project Intern | Chicago Transit Authority (CTA), Chicago, Illinois (May 2023 – Present August 2023)

- Created a new SharePoint site, formulated a document retention strategy for more than 1 Terabyte of digital assets.
- Integrated 4+ workflows from Power Automate for processing assets according to relevant Standard Operating Procedures (SOPs), leave requests, monitoring and automated alerts for privilege escalation.
- Developed a PowerShell script to search through filesystems (using full regex capabilities), batch rename, and organise assets.

Project Intern | TATA Projects, Mumbai, India (August 2020 – September 2020)

- Devised an application to collect details on 1000+ vehicles from a hosted database using APIs.
- Reduced data pre-processing time by 30% by making output of program compatible with requisite parameters for monitoring.

Technical Head | IETE, KJSCE chapter, Mumbai, India (July 2020 – July 2021)

- Led efforts for the ideation to the execution of 6+ technical projects for technical events and seminars.
- Spearheaded workshops on multiple subjects like embedded systems, microcontrollers, programming and Computer Networking, and taught 100+ students on these subjects.

Academic Projects

AWS Hybrid redundant BGP VPN, UIC (May 2023 – June 2023)

- Implemented a redundant VPN (over BGP) with a Transit Gateway and EC2 instances routers configured for failover using FFRouting.
- Engineered the infrastructure utilising over 6 AWS services including Transit Gateways (TGW), VPN Endpoints, Routing tables, SSM, IAM, and EC2.
- Reduced build times to 15 minutes by implementing the project using IaC principles with AWS CloudFormation and automated builds using Shell scripts.

AWS Cloudresume Challenge, UIC (December 2022 – January 2023)

- Crafted the front-end for hosting on an S3 bucket, and orchestrated its delivery through a CloudFront distribution for improved security and performance.
- Architected a backend consisting of the services of 4+ AWS services like DynamoDB, API Gateway, Lambda Functions and the requisite IAM capabilities (roles and permissions for temporary access) to show the number of visitors to the front-end (website).
- Consolidated all of the back-end infrastructure in CloudFormation templates to implement an IaC paradigm and assist in troubleshooting for the project.

SDN Firewall, KJSCE (August 2021 – April 2022)

- Simulated a custom network topology to simulate a corporate network to provide suitable avenues for DDoS and ARP attacks, using Software Defined Networking (SDN) components available in Mininet.
- Established a firewall for SDNs by implementing rule-based prevention logic to counter ARP and DDoS attacks on the Controller.
- Employed the POX and RYU controller implementations and automated detection processes using Python.

GRE-over-IPsec VPN, KJSCE (January 2021 – July 2021)

- Constructed a GRE-over-IPsec VPN between two endpoints. Configured the network with Cisco IOS and Cisco hardware (routers, switches and access points).
- Incorporated over 9+ technologies like DNS, DHCP, FTP, VLANs, OSPF, GRE, IPSEC, LACP, NAT44 (for IPv4).

Skills

Certifications:

- Cloud Computing: [AWS Certified Solutions Architect Associate \(SAA-C02\)](#), [AWS Certified Cloud Practitioner \(CLF-C01\)](#)
- Computer Networking: [CCNA: Enterprise Networking, Security, and Automation](#); [CCNA: Switching, Routing, and Wireless Essentials](#)

Cloud Computing: S3, Cloudfront, DynamoDB, Lambda, API Gateway, IAM, Cloudformation, EC2, VPC, ALB/ELB, EKS, VPC, TGW, IGW, VGW, CGW, Security Groups, Route Tables, NACLs, Docker, Kubernetes, Kernel-based Virtual Machine (KVM), Ansible, Terraform.

Computer Networking: DNS, DHCP, OSPF, LACP, IPsec, GRE (GRE over IPsec), VLANs, NAT44, BGP, MPLS, [Cisco IOS](#).

General: Automation through Python, Shell and PowerShell scripting, Linux administration (Debian).

Software Development: Python, Flask, BeautifulSoup, Requests, Pandas, HTML, CSS, Javascript, Bootstrap.