Arnab Chatterjee

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Summary

Platform & Infrastructure Engineer (2.5+ yrs) specializing in Kubernetes, microVM/container sandboxing (Kata Containers, Firecracker, Cloud Hypervisor), Linux networking, and high-throughput observability. Experienced building isolated execution platforms for AI agents and resilient cloud-native systems in Go, Python, and TypeScript.

Experience

Platform Engineer – Infraspec Apr 2026 – Present

- **Agent Sandboxing (Kata Containers / K8s):** Deployed Kubernetes Agent Sandbox with Kata Containers on on-prem amd64/arm64 nodes (0.07s warm-pool startup) to run untrusted PR kustomize builds inside networkless, tokenless throwaway VMs; root-caused an undocumented CRI-O private overlay mount bug (mount --make-shared), cutting sandbox teardown from ~35min to 13s.
- **AI CI/CD & GitOps Diagnosis Agent:** Built an automated CI/CD and Flux GitOps failure-diagnosis agent pairing deterministic root-cause attribution with LLM explanations, pre-merge checks, and a deterministic prompt-injection guard; achieved 100% blame and citation accuracy across 72 live fault-injection evals (3.8s median latency, ~$0.004/diagnosis) with SigNoz/OTel tracing and keyless Cosign releases.
- **MicroVM Orchestration:** Architected a Firecracker and Cloud Hypervisor microVM orchestration platform targeting sub-second boot times for CI runners and AI sandboxes, authoring HLDs, OpenAPI/Protobuf contracts, and a three-layer gRPC push architecture with a stateless node agent.
- **Observability & ClickHouse Infrastructure:** Benchmarked Grafana LGTM, ClickHouse, and SigNoz up to ~50k RPS using a custom native k6 OTLP load generator; validated operator-managed ClickHouse + Keeper HA failover (23–61s recovery, zero lost writes) and crash-consistent hot/warm/S3-cold/archive tiering.
- **Kafka & LLM Observability:** Instrumented production Kafka clusters via Strimzi Prometheus JMX exporter, slashing metric cardinality from 6,450 to ~190 series/broker with zero memory overhead and defining SLIs/SLOs (36ms produce p99); deployed 8 backtested SigNoz LLM alerts catching silent prompt truncation, provider errors, and spend anomalies.

Backend & Cloud Engineer – CreoWis Feb 2024 – Apr 2026

- Led technical architecture and delivery for a Cloud Orchestration Platform (team of 4); managed production AWS EKS clusters with Argo CD GitOps across 2 environments, reducing production incidents by 45%.
- Architected a diagram-to-Terraform compiler translating visual workflows into reusable IaC modules and standardized Jenkins CI/CD pipelines with automated test gates, cutting deployment time by 60%.
- Built async ingestion services in FastAPI (asyncpg/PostgreSQL) achieving 99.9% processing reliability and a multi-tenant auth platform (NestJS, PostgreSQL, Redis, MongoDB) with RBAC and enterprise IdP integrations.

Full Stack Developer Intern – Scrobits Technology Jun 2023 – Feb 2024

- Developed full-stack features in Next.js, TypeScript, Redux, and Node.js (40% faster render times on large datasets) and standardized Dockerized local development workflows.

Open Source & Projects

- **KitOps (CNCF Sandbox) – Contributor (Go):** Merged PRs #1007 and #1074 adding Hugging Face model/dataset support and --remote Kitfile generation without local cloning, with URL security validation and unit tests.
- **Boxy – Container Runtime (Go, containerd, runc, CNI, iptables/nftables):** Built a lightweight Docker-like CLI with CNI bridge networking and 27+ automated tests covering networking flows and CLI parsing.
- **OptiSchema Slim (FastAPI, AsyncPG, Ollama, PostgreSQL, Docker):** Local-first, zero-egress AI PostgreSQL performance tool with a Collect–Analyze–Simulate pipeline; enriches pg_stat_statements with live schema/bloat stats for local Ollama or BYOK LLM analysis, verifies EXPLAIN cost drops via transient HypoPG virtual indexes, and ships as a single ~390MB container serving the React UI.

Technical Skills

- **Containers & Virtualization:** Kubernetes (On-Prem, EKS), Kata Containers, Firecracker, Cloud Hypervisor, CRI-O, Docker, containerd, runc, Linux (namespaces, cgroups, iptables/nftables)
- **Cloud, IaC & Delivery:** AWS (EKS, EC2, ECS, S3, SQS/SNS, Batch), Terraform, Helm, Kustomize, Flux, Argo CD, GitHub Actions, Jenkins, Cosign
- **Observability & Data:** OpenTelemetry, SigNoz, Grafana LGTM, ClickHouse, Kafka (Strimzi), k6, Langfuse, PostgreSQL, Redis, DuckDB
- **Languages & Frameworks:** Go, Python (FastAPI), TypeScript (NestJS, Node.js), gRPC, Protobuf

Education

B.Tech in Computer Science & Technology
Academy of Technology, West Bengal | Jul 2020 – Jul 2024 | CGPA: 8.93/10.0