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Agenda

- Highlights
- Project Outline - Infra Unification in EKS (2025)
- Project Outline - Modernize MySQL Clusters (2024)
- What’s Next?

Highlights

Current Role:
Lead Core and Data Infrastructure teams of 9 engineers (including 2 tech leads) across multiple time zones (East Coast, West Coast, APAC).

Core Focus Areas:
AWS, EKS, Observability, IaC, Databases, SRE, ETL pipelines, Security & Compliance,
Cost Efficiency & Optimizations

Major achievements:
Unified infrastructure stacks on EKS, reducing infrastructure costs by 35% over 12 months.

Career Progression at Houzz:
2017 - Senior Software Engineer
2019 - Staff Software Engineer/Tech Lead
2020 - Engineering Manager (team of 5)
2024 - Senior Engineering Manager (team of 9)

Mission:
Build and evolve a secure, scalable, and cost-effective Cloud and Data infrastructure that
supports Houzz products and analytics at scale. I focus on driving reliability, efficiency, and developer empowerment across AWS, Kubernetes, and our Data platforms.

Leadership Style:
- Facilitate cross-team initiatives with structured priorities, transparency, and shared goals.
- Champion scalable, low-maintenance systems with clear ownership and minimal operational overhead.
- Guide technical decisions while empowering leads to evaluate trade-offs and own designs.
- Assign outcomes, not tasks — trust leads to drive projects end-to-end with support, not micromanagement.
- Promote documentation, retros, and shared learning as part of team culture.

Project Outline - Infra Unification in EKS

Challenges:
- **Outdated kops clusters** with maintenance overhead
- **Architectural inefficiencies**: Monolithic clusters had tight coupling, cross-cluster dependencies, additional routing hops, and hardcoded ELBs.
- **Inconsistent tech stacks**: Observability (Thanos vs VM), Service Mesh (Istio vs Linkerd), CNI (Cilium vs Calico), Cluster Topology, etc.

Technical decisions:
- Business-oriented cluster topology (e.g., consumer, saas, bot, payment).
- **In-place upgrades**: EKS-native in-place upgrade over Blue/Green to reduce cost & operational complexity.
- **IaC tool split**: Used Terraform for infrastructure provisioning and ArgoCD for workload GitOps
- **Pre-cluster routing**: Shifted from EC2-based proxies (HAProxy/Nginx) to Fastly → ALB → K8s Ingress, reducing network hops and cost.

Outcome:
- Reduced overall infra + engineering cost.
- Established a repeatable, fully automated cluster provisioning process (i.e. provisioning a production ready cluster in 30mins).
- Enhanced **Disaster Recovery** posture —clusters are now backed by IaC and mesh-based routing.
- Achieved zero-downtime deployments using canary rollouts and in-place upgrades.

What would you do differently next time?
- Focus on one cluster and certain components once at a time instead of working on multiple areas.

Post-Migration Efforts
- Conducted a cost-performance analysis to refine instance types and savings plan utilization.

Project Outline – Modernize MySQL Clusters

Challenges:
- **Operational overhead**: Managing multiple replicas across EC2 MySQL clusters involved complex tooling.
- **Resilience gaps**: Manual failover workflows were error-prone, with outages tied to Orchestrator instability.
- Over-provisioned clusters without autoscaling
- Outdated MySQL version 5.7 vs 8.4

Technical decisions:
- **Real-time** data replication to AWS Aurora
- Read traffic canary ramp-up and write traffic flip
- Use **Aurora RDS** for its shared storage model, superior failover times, and better throughput under large dataset workloads.
- **Performance tuning**: Used Graviton instances and I/O-optimized configs; targeted 99% InnoDB buffer cache hit ratio to minimize disk I/O and improve latency

Outcome:
- No data loss and minimum downtime during operation
- Better performance
- Lower cost with autoscaling setup in Aurora RDS
- Less maintenance overhead
- Blue/Green failover with minimum downtime
- Updated to MySQL 8.3.x (8.4 now)
- Support existing operations and pipelines

What would you do differently next time?
- Implement **reverse replication** for EC2 fallback safety
- Set up a production traffic replay testbed earlier in the life cycle
- Improve staging/production environment parity to minimize surprise misconfigurations

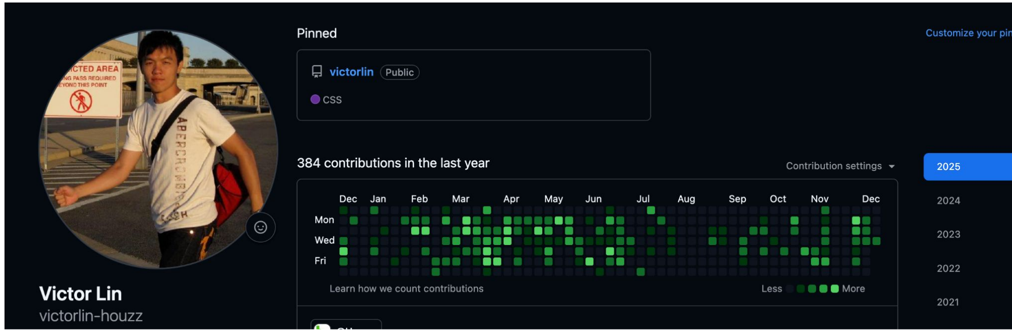
Post-Migration Efforts
- Reviewed and adjusted autoscaling policies and instance types based on observed workload patterns.

What's Next?

Challenges:
- AI Adoption
- Cost Efficiency
- Site Performance, Scalability & Reliability
- Next generation of Analytics Platform at Houzz

Ongoing Projects:
- Claudecode adoption for Infra organization
- Snowflake Partnership
- Istio Ambient Mode evaluation
- Open Telemetry Client + Collector Implementation
- MySQL performance regression detection
- Flink tuning and resource consolidation
- JupyterHub support in Kubeflow with shared data
- Next-Gen WAF adoption in Fastly

Reference:
- Resume (Link)
- LinkedIn (Link)
- Github (Link) - 384 Contributions in 2025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