



# Kirk Tolleshaug

Senior Backend Software Engineer | C#.NET | APIs, Distributed Systems & Architecture

📍 Vancouver, Washington, United States · ✉ kirk@ktoll.dev · 📺 /in/ktolleshaug · 🌐 ktoll.dev

---

## Summary

I'm a senior backend software engineer focused on building reliable, high-performance systems, APIs, and architecture.

My technical career began with hands-on IT support and deployment work and grew into 12+ years of professional software development across C#.NET, REST APIs, distributed and event-driven systems, relational databases, cloud-hosted applications, and legacy modernization.

Recent work has focused on .NET backend services supporting web, mobile, external integrations, and high-volume event processing across systems serving tens of thousands of users and millions of devices. I work across API design and versioning, secure authentication, distributed processing, observability, and production reliability.

I've improved API response times from several seconds to sub-second performance, reduced long-running processing from hours to minutes and minutes to seconds, modernized legacy .NET services, and built resilient event-driven workflows.

I contribute through architecture ownership, technical design, project decomposition, mentoring, and end-to-end delivery. I'm most interested in senior backend roles where I can remain hands-on while helping shape technical direction, modernization, and reliable systems at scale.

---

## Technical Skills

**Languages & Frameworks:** C#, .NET, ASP.NET, Go, Java, Angular, React

**APIs & Distributed Systems:** REST APIs, API Versioning, OpenAPI/Swagger, Azure API Management, Distributed Systems, Event-Driven Architecture, gRPC, RabbitMQ, Background Services, Multithreading, Parallel Processing, Technical Leadership

**Reliability & Observability:** Idempotency, Retries, Dead-Letter Queues, Serilog, New Relic, Structured Logging, Metrics, Service Health Monitoring

**Data & Messaging:** Microsoft SQL Server, PostgreSQL, Entity Framework, Schema Migrations, Redis, Distributed Caching

**Cloud & Delivery:** Azure, AWS, Docker, Docker Compose, Infrastructure as Code, CI/CD, Azure App Services, Azure SQL, Key Vault, Azure Functions, Pulumi, Bicep, IIS

**Security & Quality:** OAuth/SSO, JWT, Roles and Claims, Service-to-Service Authentication, Test-Driven Development, NUnit, xUnit, Unit Testing, Integration Testing, End-to-End Testing, Performance Testing

---

## Professional Experience

### Digital Monitoring Products

#### Software Engineer

December 2022 - Present · Springfield, MO

Work across backend services, APIs, distributed processing, device integrations, delivery automation, and web applications.

**Relevant Skills:** C# in .NET, REST APIs, RabbitMQ, Azure API Management, Docker, PostgreSQL, New Relic, Technical Leadership

- Design and optimize C#.NET backend services and REST APIs for internal web and mobile applications and external integrations, supporting tens of thousands of users and handling more than 100M API requests each month.
- Design and version public REST APIs, introducing v2 routes and schemas while deprecating v1 endpoints; maintain OpenAPI/Swagger documentation and configure Azure API Management with JWT validation, subscription keys, rate limits, and request transformations.
- Implement authentication services and standardize JWT handling through internal libraries, establishing Azure Key Vault usage for secure application secret management.
- Diagnose performance bottlenecks across memory, request processing, concurrency, and workload distribution, reducing operations from hours to minutes, minutes to seconds, and selected API paths to sub-second response times.
- Build resilient RabbitMQ event and job workflows using dead-letter queues, duplicate-event protection, retry logic, pending-message validation, and idempotent API handling.

- Modernize legacy services from .NET Framework 4.x and .NET Core 3 to modern .NET, and containerize local dependencies with Docker Compose to improve CI/CD reliability and cross-team development compatibility.
- Use AI-assisted engineering tools to analyze unfamiliar code paths, accelerate legacy refactoring and modernization, investigate defects, and review changes, with developer-owned validation through tests and code review.
- Apply AI-assisted analysis to logs and traces, dependency mapping, API and schema compatibility reviews, test-case generation, and drafting technical documentation, migration plans, and release notes.
- Design SQL queries, stored procedures, and indexes across SQL Server and PostgreSQL; manage PostgreSQL schema migrations, backward-compatible changes, data backfills, and production rollouts.
- Build observability with Serilog and New Relic, publishing metrics and dashboards for service performance and health.
- Develop React-based user interfaces and application workflows supporting backend services and operational needs.
- Design a Go-based security-camera integration using REST APIs and bidirectional gRPC; prototype mesh communication for relaying messages during connectivity loss.
- Provide technical leadership through architecture, design discussions, project decomposition, mentoring, and engineering/QA coordination.

## Vizient, Inc

### Senior Software Engineer

June 2014 - December 2022 · Cape Girardeau, MO

Progressed from software engineering intern to senior software engineer, taking on architecture ownership, technical leadership, and end-to-end delivery across identity, reporting, modernization, and Azure-hosted applications.

**Relevant Skills:** C# in .NET, Microsoft Azure, Angular, Microsoft SQL Server, OAuth, Infrastructure as code (IaC), Continuous Integration and Continuous Delivery (CI/CD), Test-Driven Development

- Led technical design and owned delivery across multiple initiatives, decomposing complex work, mentoring engineers, coordinating with QA, and setting implementation direction.
- Architected and owned specialized projects end to end, serving as the primary technical owner for requirements, system design, implementation, deployment, and ongoing support.
- Built cloud spend and usage reporting that identified unnecessary services and optimization opportunities, contributing to approximately \$30M in realized annual infrastructure savings.
- Developed C#/.NET applications and backend services across multiple generations of .NET, with Angular front ends and SQL Server data stores; designed Entity Framework migrations for greenfield Azure applications and contributed to Flyway-based legacy migrations.
- Applied TDD with NUnit and xUnit across new features, bug fixes, and modernization, using unit, integration, end-to-end, and performance testing in local and CI validation; built Docker-based test environments for dependent services.
- Improved backend and API performance, reducing select response times from several seconds to sub-second performance.
- Built Azure-hosted applications using App Services, Azure SQL, Key Vault, Functions, Pulumi, and early Bicep.
- Developed reusable infrastructure components and CI/CD automation to standardize application provisioning and deployment.
- Designed internal authentication services and OAuth/SSO integrations managing JWT lifecycle, roles and claims, service-to-service authentication, user management, Key Vault-backed secret rotation, API documentation, versioning, and backward compatibility.
- Designed and delivered a reporting system combining multiple domains and schemas, performing extensive customer-specific transformations and processing datasets containing millions of records.

## Southeast Missouri State University

### Teaching Assistant

January 2015 - December 2015 · Cape Girardeau, MO

Supported faculty and students across introductory computer science and foundational technical coursework.

**Relevant Skills:** C (Programming Language), Linux, Classroom Instruction, Mentoring, Java, Public Speaking

- Assisted faculty with instructional delivery for Computer Science I, II, III, C and Unix, and Logic Fundamentals courses.
- Provided one-on-one support for programming concepts, debugging, coursework, and technical problem solving.
- Supported course operations by grading assignments and coursework, providing feedback to students, and assisting with exam proctoring.

### WebParaprofessional

January 2014 - May 2015 · Cape Girardeau, MO

Supported university departments and instructional technology through custom web applications, platform administration, and multimedia content.

**Relevant Skills:** C# in .NET, ASP.NET, Microsoft SQL Server, Entity Framework, Internet Information Services (IIS), Moodle, HTML/CSS

- Designed and implemented ASP.NET/C# web applications for university departments using SQL Server, Entity Framework, and IIS.
- Designed and built an end-to-end sign-in and usage-tracking application supporting the university writing lab.
- Supported Moodle and related instructional systems for faculty and staff.
- Produced instructional video and voice content supporting university technology and course delivery.

---

## Education

### Southeast Missouri State University

Bachelor of Science - BS, General Studies · 2011 - 2015

---

## Certification

Azure Fundamentals ↗ - December 2021