Case Study

Overcoming Insurmountable Tech Debt with Stride Conductor GenAI and Docker at a leading US e-commerce company

About Stride: Stride works hand-in-hand with you to build and deliver software that creates lasting value for businesses and users.
Industry: IT Services and IT Consulting
Location: New York, NY

Highlights

- **83% of linting errors were resolved,** drastically reducing manual effort and improving code quality.
- **90x faster resolution of errors,** reducing time from 6 minutes to 4 seconds, significantly accelerating the development process.
- **An 80% projected cost reduction,** from $300,000 to $65,000, will allow the company to reallocate resources more effectively.

"Stride Conductor has changed the ROI equation for us to take care of these errors, now and in the future."

VP of Engineering

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Introduction

Stride was approached by a leading American e-commerce company, dominating its sector with an annual revenue of $8 billion. Faced with a critical technical challenge, their PHP codebase had accumulated over 17,000 linting errors. These errors were not just minor nuisances; they hindered upgrades to their testing libraries, introduced security vulnerabilities, and caused system downtimes, costing the company over $1 million annually.

Describing the situation as “an insurmountable amount of tech debt,” the VP of Engineering outlined a daunting prospect: manually resolving these errors would take one developer an entire year, costing approximately $300,000. Seeking a faster, more cost-effective solution, the company turned to Stride and their proprietary multi-agent GenAI tool, Conductor, supported by Docker, to tackle this issue. Docker's secure containerization facilitated rapid deployment and compliance with stringent security protocols, making it an ideal choice for this complex challenge. The technical debt also threatened customer satisfaction and overall business growth, making it a critical problem to address swiftly.

> “This innovative approach has laid the groundwork for more efficient and automated error handling in the future.”
>
> **VP of Engineering**

The Challenge

Overcoming “Insurmountable tech debt”

An $8 billion American e-commerce company faced a significant technical issue: a staggering backlog of over 17,000 linting errors in their PHP codebase. These errors presented multiple challenges:

- **Technical debt:** The accumulation of linting errors severely hindered the company’s ability to upgrade its testing libraries, leading to outdated and inefficient testing processes.
- **Security vulnerabilities:** The unresolved linting errors introduced vulnerabilities, exposing the system to potential security threats and risking data integrity and confidentiality.
- **System downtime:** Frequent system downtimes caused by these errors had a detrimental impact on operations, with an estimated annual cost of over $1 million.
- **Resource intensity:** Addressing this backlog would require one developer to work for an entire year, costing approximately $300,000.

The VP of Engineering described the situation as “an insurmountable amount of tech debt.” This technical debt threatened operational efficiency and risked customer satisfaction and overall business growth. The scale and complexity of the problem necessitated a faster, cost-effective solution. The company was considering advanced GenAI tools to tackle these issues more efficiently. It brought Stride to leverage its proprietary multi-agent GenAI tool, Conductor, supported by Docker, to find a robust solution. Without addressing these errors, the company faced escalating costs and heightened security threats in the future.

Solution

Stride introduced Conductor, their proprietary multi-agent GenAI tool, supported by Docker, to address the client’s backlog of 17,000 linting errors. The Conductor tool was specifically chosen for its advanced capabilities in automating error resolution while ensuring the client's stringent security requirements were met.

Conductor leverages sophisticated GenAI techniques, including configurable agents, few-shot prompt engineering, ctags, and Python scripting, to efficiently resolve linting errors across millions of lines of code. This tool was tailored to fit seamlessly into the client’s existing workflow through its multi-agent workflows. These workflows informed the client’s team, allowing them to review the work in progress and customize the agents according to their preferences, standards, and success criteria. This ensured the automation process was accurate and aligned with the client's development goals.

One of Conductor's standout features is its ability to generate traceable and verifiable outputs. This feature was crucial for maintaining high code quality and security standards, as it allowed the client’s team to inspect and verify the automated fixes before they were fully integrated into the codebase. This transparency was vital for building trust in the automated process and ensuring the changes met the client’s rigorous standards.

To complement the capabilities of Conductor, Stride employed Docker to facilitate a smooth and secure onboarding process. By using a Dockerized snapshot of the client's codebase, Stride could bypass the usual hurdles of system access. This containerized approach limited access to only the necessary portions of the codebase, ensuring compliance with the client's stringent security policies. Additionally, Docker enabled rapid onboarding, allowing Stride to begin value-adding work within a day, compared to the typical week-long setup process. Docker's containerization technology enabled Stride to create isolated environments, ensuring that only the necessary parts of the codebase were accessed, significantly enhancing security.

This isolation also facilitated parallel development, as multiple application versions could be worked on simultaneously without interference. For instance, Conductor identified and corrected a recurring syntax error in multiple files, significantly improving code quality and consistency. Key team members, including developers and security experts, were actively involved in customizing and implementing the solution, ensuring it met all the client's requirements.

The combined use of Conductor and Docker addressed the immediate issue of linting errors and provided a framework for future error resolution and code maintenance. Conductor managed to resolve 83% of the linting errors, reducing the manual effort required to just 17%. The time taken to fix each error was drastically reduced from 6 minutes to 4 seconds, achieving a 90x increase in speed. This approach significantly reduced the total effort required from one developer working for a year to just eight weeks, bringing the cost down to $65,000—only 21.6% of the previously estimated manual cost.

In summary, Stride's solution using Conductor and Docker swiftly and cost-effectively resolved the linting errors and ensured that the client's codebase remained secure and high-quality. This innovative approach laid the groundwork for more efficient and automated error handling in the future, underscoring the transformative potential of GenAI tools in software development.

Key Benefits

83% error resolution, drastically cutting manual effort.

90x speed increase, reducing error resolution time from 6 minutes to 4 seconds.

Cost reduction by nearly 80%, from $300,000 to $65,000.

Enhanced code quality and security with traceable and verifiable outputs.

Rapid onboarding and minimal disruption, thanks to Docker.

Results

The implementation of Conductor, supported by Docker, yielded remarkable results for the $8 billion American e-commerce company. The overwhelming backlog of 17,000 linting errors in their PHP codebase was significantly reduced, driving operational and financial benefits. By leveraging Docker, Stride ensured a secure and rapid onboarding process, crucial in achieving the 90x speed increase and 80% cost reduction. Docker's ability to enable parallel development allowed the client to maintain operational continuity while resolving the linting errors.

Efficiency gains

Conductor resolved 83% of the linting errors, dramatically decreasing the manual effort required from 100% to just 17%. Its automation capability reduced the time to fix each error from 6 minutes to a mere 4 seconds, marking a 90x increase in speed. This rapid resolution enhanced the development process and minimized disruptions, enabling the team to focus on more strategic tasks.

Cost savings

The project demonstrated substantial cost efficiency. Initially, the manual resolution of the linting errors was estimated to cost $300,000, requiring a developer to work for an entire year. With Conductor, the total cost was slashed to $65,000, representing only 21.6% of the projected manual costs. This significant expense reduction allowed the company to reallocate resources toward other critical initiatives.

Operational continuity

Using Docker ensured the project adhered to the client's stringent security protocols. By leveraging a Dockerized snapshot of the codebase, Stride facilitated a secure and efficient onboarding process. This approach allowed Stride to begin work within a day, compared to the typical week-long setup and enabled parallel development, ensuring that the client's ongoing projects were not disrupted.

The VP of Engineering praised Conductor's impact, stating, "Conductor has changed the ROI equation for us to take care of these errors, now and in the future." The successful resolution of the immediate technical debt mitigated current risks and laid a robust foundation for future error handling and code maintenance. The client is now positioned to handle similar challenges more efficiently, demonstrating the long-term value and transformative potential of integrating GenAI and Docker into their development processes.

> "The speed and accuracy of Stride Conductor in resolving errors have significantly improved our development process."
>
> **CTO**

> "Docker's secure and efficient onboarding process allowed us to start seeing value within a day."
>
> **Security Lead**

> "The integration of Conductor into our workflow was seamless and efficient, drastically cutting down our manual efforts."
>
> **Lead Developer**