GitLab Duo with Amazon Q

/Artificial Intelligence/

How DevSecOps is Evolving in the Age of Agentic AI

Transforming software development using
GitLab Duo with Amazon Q

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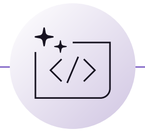
The new development paradigm: Why DevSecOps is evolving

Increasingly distributed teams, complex toolchains with minimal operability, and heightened vulnerability concerns are the hallmarks of modern software development. As a result, managing the entire software development lifecycle is more complex than ever. It's time for a change.

Why evolution is critical

Teams are feeling immense pressure to deliver secure code faster while addressing pain points such as:



Too many tools

In GitLab's 2024 Global DevSecOps Survey, 64 percent of respondents said they want to consolidate their toolchain. Of that 64 percent, 27 percent said that having too many tools negatively impacts developer experience because of too much context-switching from tool to tool.

Innovation bottlenecks

GitLab research also reveals that more than 78% of DevSecOps professionals say they spend at least a quarter of their time maintaining their toolchain instead of coding.

Onboarding challenges

The 2024 GitLab development survey also found that 70% of respondents said it takes more than a month to onboard developers in their organization, up from 66% in 2023.

Trying to accelerate development to address high demand for apps and shorter timelines by haphazardly adding more tools and platforms can affect coding practices, security, and deployment. These are all challenges that traditional development approaches cannot easily or efficiently address.

The limitations of current approaches

Traditional software toolchains often consist of disconnected point solutions that contribute to data silos, force developers into productivity-draining tool switching, and introduce significant operational friction. The automation available as part of these solutions typically addresses isolated tasks rather than end-to-end processes, so that developers often manually coordinate and orchestrate multiple steps across different systems.

Even with existing best practices, scaling security and compliance guardrails can still create development bottlenecks that slow delivery and frustrate development teams. These complex development environments are difficult to manage satisfactorily, driving the need for more intelligent solutions.

Generative AI coding assistants have opened the door and invited us into a world that addresses these issues, and now agentic AI and intelligent DevSecOps are showing us more ways these concerns and worries can become a distant memory. They offer an all-in-one, end-to-end, team collaboration platform that automates and brings consistency to software delivery. This ebook covers the role of generative AI, agentic AI, and an end-to-end platform in intelligent DevSecOps.

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Agentic AI: The next step in the evolution of intelligent DevSecOps

Generative AI coding tools deliver output based on requests and prompts. Agentic AI adds the ability to proactively support development workflows through automation. With visibility and control, agentic AI is a key part of intelligent DevSecOps, along with generative AI.

Introducing the agentic AI opportunity to development

Agentic AI enables systems to independently plan, execute, and orchestrate complex, multi-step tasks and processes, from security checks to compliance reviews, with minimal human supervision. Unlike traditional assistants that help write code, agentic AI combines contextual awareness with the ability to make decisions, interact with agents, and adapt to changing circumstances. This evolution to independent development is expected to have a significant effect on building software.

Transforming development workflows with agentic AI

Agentic AI fundamentally changes how developers interact with tools and projects by automating functionality like code refactoring and modernization to deliver solutions proactively. In addition, agentic AI enables intelligent systems that learn and adapt over time, continuously expanding their understanding of organizational patterns and preferences. This combination of learning and understanding improves the performance of agentic AI and increases the value of its assistance.

With the ability to understand both application code and cloud infrastructure dependencies, these intelligent AI systems enable more holistic optimization of software delivery processes than traditional automation approaches could achieve. And unlike simple assistants, they offer autonomy and proactive delivery throughout the development lifecycle.

Evolving DevSecOps with GitLab Duo with Amazon Q

GitLab Duo with Amazon Q exemplifies this evolution. It brings GitLab's comprehensive DevSecOps platform together with Amazon Q's advanced agents to transform how teams collaborate throughout the software development lifecycle. As a result, processes that used to be barriers to accelerating development are smooth and seamless. The next chapter explains how.

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Agentic AI and DevSecOps: Turning bottlenecks into efficiency

Balancing speed, security, and quality while operating in competitive markets with limited technical resources can put a strain on your development and IT teams. By refining how teams work, agentic AI and Amazon Q agents help organizations overcome persistent bottlenecks while enhancing their overall security posture and operational efficiency.

Reducing developer productivity constraints

Developers spend only **21 percent of their time** writing new code. Agentic AI can accelerate modernization timelines by 40 to 50 percent, and human oversight can be configured for critical systems. Because these tools automate routine development tasks and provide intelligent assistance, developers can work at a scale never before possible for individuals or teams.

Eliminating context switching and knowledge gaps

Developers typically juggle multiple tools throughout their day, which drains their productivity as they switch between platforms and try to understand complex systems coherently. Agentic AI understands both development environments and cloud infrastructure. Contextual assistance removes silos and enables more efficient cross-functional collaboration. As a result, different agents can work with other specialized agents to do different tasks. They create unified workflows that link all aspects of software creation.

Modernizing legacy code and reducing tech debt

Maintaining and modernizing legacy systems strains resources. Organizations often postpone critical updates because of the complexity and risk associated with major version upgrades and architectural changes. Agentic AI and agents transform this challenging process.

After automatically analyzing existing systems and identifying required changes, agentic AI can create comprehensive modernization plans that consider both application and infrastructure dependencies. It can also generate fully documented implementation artifacts, providing a clear path forward. After humans review the plans and artifacts, agentic AI can handle refactoring tasks and more.

Systematic analysis while preserving critical business logic dramatically reduces risk. By maintaining complete traceability and accelerating modernization timelines from months to days, organizations can confidently evolve their technology landscape without sacrificing stability or compliance.

Integrating security and compliance into dev workflows

Security tests and checks often occur too late in the development process, creating friction when vulnerabilities are discovered. The discovery of issues can drive significant rework that delays delivery and frustrates teams. Specialized AI assistants powered by different models can excel at specific tasks like security analysis and remediation. They can deliver better results than one-size-fits-all solutions while integrating seamlessly into development workflows.

By embedding security throughout the development lifecycle, these agents can:

- Automatically identify vulnerabilities.
- Suggest fixes aligned with best practices.
- Implement remediations that adhere to organizational compliance requirements.

GitLab Duo with Amazon Q

GitLab Duo with Amazon Q delivers the AI-driven DevSecOps needed to make these benefits a reality. Let's see how.

How to prepare for DevSecOps with agentic AI

The evolution of DevSecOps with agentic AI can optimize your software development practices and help you gain a competitive advantage. You can prepare your organization to capitalize on these advancements by checking the state of your current DevSecOps practice and planning your future state.

Assess

Assess your current DevSecOps practices, identifying specific bottlenecks, security challenges, and areas where agentic AI could enhance developer productivity. Document specific use cases where agents could provide the greatest immediate value.

Evaluate

Your goal for your future state should be to prioritize real productivity gains over simply adding new tools. To maximize organizational impact, you need to make sure that DevSecOps powered by agentic AI works for your entire team. Look for solutions with clear approval workflows and configurable guardrails that keep humans in the loop and in control and ensure required compliance and security standards are met.

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How GitLab Duo with Amazon Q can solve today's development challenges

GitLab Duo with Amazon Q provides context-aware agents that work behind the scenes to create an AI-driven experience that fundamentally changes how teams build software. The purpose-built agentic AI provided by GitLab delivers relevant solutions optimized for both development patterns and cloud deployment environments. This result is a unified and seamless experience for developers, which means they don't need to jump between platforms. Let's explore what this critical integration provides and what it can do in more detail.

Providing one solution for the entire software development lifecycle

Using GitLab Duo with Amazon Q, developers benefit from agentic AI support throughout the software development lifecycle. With GitLab's unified data store and Amazon Q's abilities for accelerating and automating software development, complex toolchains are not necessary. Although these agents cover the spectrum of autonomy, you can configure various levels of human oversight based on the task's importance, from independent execution of simple tasks to closely monitored implementation of critical changes. As a result, this single solution can address the following key software delivery challenges.

GitLab Duo

About GitLab Duo

From planning and coding to securing and deploying, GitLab Duo is the only AI solution that supports developers at every stage of their workflow. It automates routine tasks and accelerates development cycles. Your teams can write secure code faster with AI-powered suggestions in over 20 languages, available in their favorite IDE. The result? You can ship more secure software faster with AI throughout the entire software development lifecycle.

Accelerating feature development

GitLab Duo with Amazon Q helps product teams and developers implement new features more efficiently while ensuring consistency in development patterns and adherence to best practices. Using GitLab Duo with Amazon Q, requirements can be turned into production-ready code faster. It analyzes issues and, without human intervention, implements features that align with your development patterns and AWS infrastructure, accelerating your path from idea to deployment. On the merge request review page, it can even add comments that provide context about the request with instructions for how to request changes if you want to keep iterating.

Your organization benefits from accelerated feature implementation cycles, consistent code, a reduction in the time from idea to production, and intelligent merge reviews that understand both your development standards and AWS best practices. GitLab Duo with Amazon Q provides instant suggestions that improve both application performance and cloud efficiency. The result is a boost in overall developer productivity without compromising quality or security.

Boosting quality assurance

Development teams and QA engineers need help maintaining comprehensive test coverage across growing applications while balancing time constraints and resource limitations. GitLab Duo offers enhanced capabilities for code review and unit testing, all in the same familiar GitLab platform. It automatically generates comprehensive unit tests that understand your application logic and AWS services, which boosts code quality and coverage. By automatically identifying potential issues and suggesting improvements based on your standards, teams can maintain high-quality code while dramatically reducing review cycles. Now your teams can ship with confidence while saving engineering time.

Remediating vulnerabilities

GitLab Duo with Amazon Q helps security engineers and development teams efficiently identify, prioritize, and remediate vulnerabilities without disrupting development workflows or delaying critical releases. It delivers intelligent improvements based on development standards and highlights security and performance considerations. Its inline capabilities accept suggestions and fix vulnerabilities directly. As a result, it reduces the time between vulnerability detection and fixes, thereby accelerating security remediation cycles.

Modernizing Java applications

GitLab Duo with Amazon Q brings your Java codebases into the present. It automatically analyzes existing Java 8 and 11 codebases, identifies required changes, and creates comprehensive plans for upgrading to Java 17 that consider AWS infrastructure dependencies. Then it generates merge requests with all necessary code changes. This intelligent approach reduces Java upgrade time from weeks to minutes, minimizes risk through automated analysis, maintains application performance during upgrades, and provides clear audit trails of all transformations. In addition, it enhances architectural patterns during modernization by applying best practices, which reduces technical debt. Intelligent analysis and context-aware decision-making help ensure business logic integrity throughout the upgrade process.

As this chapter has shown, GitLab Duo with Amazon Q addresses use cases that developers face every day with automation and guidance while keeping humans in the loop. So, how can you get started? The next chapter has ideas for your next steps.

Amazon Q

About Amazon Q agents

To accelerate building across the entire software development lifecycle, Amazon Q agents can perform a range of tasks—everything from implementing features, documenting, testing, reviewing, and refactoring code to performing software upgrades. Amazon Q also adds automated root-cause analysis, vulnerability explanations, and specific actions for remediation to the SDLC.

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Next steps: Preparing your organization for DevSecOps with agentic AI

GitLab and AWS have established a strategic collaboration that delivers a comprehensive DevSecOps platform with advanced agents. It is an integrated experience that offers immediate value while continually evolving with new capabilities. This combined solution delivers a seamless developer experience that boosts productivity, accelerates software development, and enables better products to be delivered faster.

Learn more about how GitLab Duo with Amazon Q can transform your organization's approach to DevSecOps by visiting **the GitLab and AWS page**.

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