Illusion of Time Savings?
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Disclaimer

I'm not a Data Scientist
nor a Machine Learning Engineer
nor a AI Expert

I'm a AI user
Poll

How many Developers?
How many Data Scientists?
How many Machine Learning Engineer?
How many Ops?
How many Managers?
How many non Tech Persons?
What is GitLab?

A collaborative tool to work on source code, documentation, ...

And accelerate innovation
A Developer Oriented Platform? Not only
**Fix caching to cover whole Service Ping payload:** [gitlab-org/gitlab#114992 (merged)]

During review:
- Approved as-is, I did not add any comments.

Post-review:
- Merged as-is

@tarrichu Please add feedback, and compare this review to the average maintainer review.

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@hraghuvanshi Change was small, so I felt ok merging after testing it and looking at specs. Only advice I have is to manually test or ask for a domain expert review before merging if you're in an area you are unfamiliar with.

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Hitesh Raghuvanshi @hraghuvanshi · 2 months ago

Thanks for the feedback, I will keep that in mind.

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**Add user toggle for achievements:** [gitlab-org/gitlab#116258 (merged)]

During review:
- Backend changes approved as is.
Merge requests

Alissa Meeks @ameeks started a thread on an old version of the diff 3 days ago
Resolved 3 days ago by Giuliana Lucchesi

Giuliana Lucchesi resolved all threads 3 days ago
Giuliana Lucchesi added 1 commit 3 days ago
- 513b25e6 - Apply 1 suggestion(s) to 1 file(s)

Compare with previous version

Phil Calder @pcalder started a thread on the diff 3 days ago

Regardless of the promotion level, it is critical that leaders work with their People Business Partner, Total Rewards, and FP&A to identify tradeoffs we can review to fund the promotion.

<table>
<thead>
<tr>
<th>257</th>
<th>258</th>
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<tbody>
<tr>
<td>257</td>
<td>258</td>
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</table>

- #333 Greenhouse Promotions/Transfers Process
- #333 Transfers: Greenhouse or Workday
- #333 Greenhouse

The following types of promotions/transfers can be processed through Greenhouse:
- Intern roles: Intern roles at all levels should go through the Greenhouse interview process (regardless of the number of applicants for the role).
- Example: Senior Backend Engineer applies to become a Manager, Engineering (Internship)
Automatic Code Generation by AI
Illusion of Time Savings?
Some brief definitions reminders about AI for dummies (like me)
Some brief definitions reminders

- **A machine learning model** is a computer program that is used to recognize patterns in data or make predictions.
- **Machine learning for source code generation** is a field that uses machine learning models to write computer code from various inputs, such as natural language descriptions, incomplete code...
- **AI code generation** is a process of using machine learning models to write code from input that describes what the code should do.
Relevance of ML models for AI Code Generation
Do you know Chat GPT?
Hello Bing; I need you to create me a cooking recipe based on the following elements: tomatoes, potatoes, sausages, basil, and chives. Can you please help me?
Hello, this is Bing. I can help you create a cooking recipe based on the following elements: tomatoes, potatoes, sausages, basil, and chives. Here is a possible recipe:

**Potato and sausage bake with tomatoes**

**Ingredients:**

- 2 lbs of potatoes
- 4 sausages of your choice
- 4 tomatoes
- 1 cup of heavy cream
- 1 cup of shredded cheese
- A few basil leaves
- A few chives
- Salt, pepper, olive oil

**Directions:**

- Preheat the oven to 350°F (177°C).
- Peel and slice the potatoes thinly. Cook them in a pot of boiling salted water for 15 minutes. Drain and set aside.
- Cut the sausages into pieces. Cook them in a skillet with some olive oil for 10 minutes. Set aside.
- Wash and slice the tomatoes. Chop the basil and the chives.
- In a baking dish, layer some potatoes, then some sausages, then some tomatoes. Season with salt, pepper and herbs. Repeat until all the ingredients are used up.
- Pour the heavy cream over the bake and sprinkle with cheese.
From a Developer perspective

Will AI code generation help me?
I did some tests (with Bing / Chat GPT4)

Can you please generate a program with a Golang function that returns a unique string Id, and call this function from the main function?
It works! 😊

```go
// Import the time, rand and fmt packages
import {
    "time"
    "math/rand"
    "fmt"
}

// GenerateID returns a unique string Id using the current time
// and a random number
func GenerateID() string {
    // Get the current time in nanoseconds
    t := time.Now().UnixNano()
    // Generate a random number between 0 and 9999
    r := rand.Intn(10000)
    // Format the time and the random number as a string with
    // four digits
    return fmt.Sprintf("%d%d", t, r)
}

// Main function
func main() {
    // Call the GenerateID function and print the result
    id := GenerateID()
    fmt.Println("The generated Id is:", id)
}
```

- **09:52:41** ubuntu@extism-web-ide demo ± |main x| → go run main.go
  16875067660978139916216
- **09:52:46** ubuntu@extism-web-ide demo ± |main x| → go run main.go
  16875067683180224426363
- **09:52:48** ubuntu@extism-web-ide demo ± |main x| → go run main.go
  The generated Id is: 16875069079794269330435
- **09:55:07** ubuntu@extism-web-ide demo ± |main x| → go run main.go
  The generated Id is: 1687506904650940489979
- **09:55:09** ubuntu@extism-web-ide demo ± |main x| → go run main.go
  The generated Id is: 1687506911085951584186
- **09:55:11** ubuntu@extism-web-ide demo ± |main x| → go run main.go
  The generated Id is: 16875069121807986866406
- **09:55:12** ubuntu@extism-web-ide demo ± |main x| → go run main.go
  The generated Id is: 16875072427962229887303
- **10:00:42** ubuntu@extism-web-ide demo ± |main x| → [ ]
I did other tests (with Bing / Chat GPT4)

Can you please generate in GoLang the source code of an HTTP server with a "/users" route. For this route if the HTTP method is POST it will create a user and if the HTTP method is GET it will get the list of the users. And I need a "/hello" route to get a greetings message.
It works again! 😍🥰

```go
func SayHello(w http.ResponseWriter, r *http.Request) {
    // Set the content type of the response to plain text
    w.Header().Set("Content-Type", "text/plain")
    // Check if the request method is GET
    if r.Method == "GET" {
        // Write an ok status to the response
        w.WriteHeader(http.StatusOK)
        // Write a greetings message to the response body
        w.Write([]byte("Hello, welcome to my HTTP server!"))
    } else {
        // If the request method is not GET, write a method not allowed status and return
        w.WriteHeader(http.StatusMethodNotAllowed)
    }
}
```

```bash
$ curl -X POST http://localhost:8080/users -H 'Content-Type: application/json; charset=utf-8' -d "{"name":"Bob Morane","email":"bob.gitlab.com"}"
$ curl -X POST http://localhost:8080/users -H 'Content-Type: application/json; charset=utf-8' -d "{"name":"Bill Balantine","email":"bill.gitlab.com"}"
$ curl http://localhost:8080/users
```

// Main function
```go
func main() {
    // Initialize an empty Users slice
    Users := []User{}
    // Register the handler functions for each route with the default ServeMux
    http.HandleFunc("/users", HandleUsers)
    http.HandleFunc("/hello", SayHello)
    // Start listening for HTTP requests on port 8080 using the default ServeMux
    http.ListenAndServe(":8080", nil)
}
```
But, the life of a Developer is often more complicated...
Requirement: WebAssembly plugins

- WebAssembly?
- Requirement: Run WASM functions from the Host
- Why: Efficiency, Speed, Safe >>> FaaS

>>> write an application that runs WASM programs
Problem

- The specification is half-baked (but in progress)
- Usually simple things are complicated to do
- Reinvent the wheel
I worked several days(weeks) to implement a solution

- Read the documentation
- Read the samples
- It works! 🎉
- I improved my **expertise** 💪 >>> 📝 blog posts
- I can reuse it 📦
But let's imagine that I don't have the solution

I'm lazy sometimes...
The logic is not bad
Some statements are false
Some references are not relevant
The code does not compile

I use the Wazero framework to make an application in Go that loads a wasm module developed in TinyGo, I need to call a "hello" function of the wasm module by passing it a character string (call the parameter variable "name"), and the result should be a string equal to the concatenation of "Greetings" and the name variable. Knowing that I have to use the WASI specification to do this, can you generate me a code for both the host application and the wasm module? According to the WASI specification, a WASM function can only take numbers as parameters and can only return only one number. So, I need the helpers to copy the string values in memory from the host and the helpers to read memory from the WASM module.
So, ChatGPT 🐾 useful or not?

- Without **expertise**, it could be a wasted time
- You need to understand why it does not work
- As a Junior developer, you don’t know if your code is **optimized**
Before using ChatGPT 😈
For complex use cases

- Read the documentation
- First search tutorials on the internet
- Ask Senior Developers
I found some resources that might help you with your task. Here are some summaries:

- **GitHub - tetratelabs/wazero: wazero: the zero dependency WebAssembly runtime for Go developers**: This is the official repository of wazero, a WebAssembly runtime written in Go that supports WASI specifications. You can find examples, documentation, and installation instructions here.

- **Wazero Cookbook - Part One: WASM function & Host application**: This is a blog post that shows how to write a simple wasm function in Rust and call it from a Go host application using wazero. It explains how to pass a string value to the wasm function and get a string value back from the return value using the WASM memory buffer.

- **Wazero Cookbook - Part Two: Host functions**: This is another blog post that shows how to write host functions in Go and register them with wazero. It also shows how to pass and return string values between the host functions and the wasm functions using the WASM memory buffer.

I hope these resources are useful for you 😊
ChatGPT 😈, Risks

- **Productivity** of Junior developers will **not increase** (it may even be worse)
- Junior developers will produce **poor** quality code **faster**
- Senior developers will spend more time to fix the source code of the other developers
🤔 So, are you telling me AI is useless?
No! 😁

AI is great, and it's only the beginning
The real opportunity goes beyond creating code.

How developers spend their time:

- **39%**
  - Understanding code, writing new code or improving existing code

- **61%**
  - Everything else

Source: Tidelift
How to helps developers for real with AI features?
How to helps GitLab users for real with AI features?
What is my day-to-day job at GitLab?

CSM, CSE, Developer... And the others

Epics
Read, understand, summarize for the customer

Milestones

Issues
Read, understand, summarize for the customer

Assign Issue

Push Code
Understand, change

Automated Test
Write tests

Scan
Fix the vulnerability
How?

Collaboration & review
Understand, discuss

Create a merge request
Understand, discuss

Approval

Merge
Accepted

Release

Deploy
AI-assisted features
From a developer perspective
I want ...
AI Assisted code suggestions
Suggested Reviewers
Find the best person to review your code changes
Explain this code

Inline code explanations
Generate Tests 😬
in MR
quickly add unit tests to merge requests
Summarize my MR Review

Quickly summarize changes you recommend making
```java
public class TemplateInjection {

    VelocityContext context = new VelocityContext();
    StringWriter swOut = new StringWriter();

    Velocity.evaluate(context, swOut, "test", inputStream.toString());

    Velocity.evaluate(context, swOut, "test", FileReader);
    Velocity.evaluate(context, swOut, "test", template);
}
```

Philippe Charrière @k33g Pending

Why only remove the code? It's useless

I'm not sure that using a template is a good idea
Philippe Charrière assigned to @k33g 1 hour ago

Philippe Charrière added 1 commit 1 hour ago

- 78701697 - Update file TemplateInjection.java
  Compare with previous version

Philippe Charrière @k33g Pending

Here's a quick summary of the code review:

- java/src/main/TemplateInjection.java: Consider alternative solutions to using a template.
- java/src/main/TemplateInjection.java: Remove unnecessary code instead of commenting it out.

This comment was generated by AI
From a Security perspective
I want ...
Explain this vulnerability

Continuous security improvements
What is the vulnerability?

The vulnerability is that the code allows an attacker to inject arbitrary code into the template engine. This can be done by providing malicious input to the `inputStream` parameter. The attacker can then execute arbitrary code on the server.

How can an attacker take advantage of the vulnerability?

The attacker can take advantage of the vulnerability by providing malicious input to the `inputStream` parameter. For example, the attacker could provide a string that contains a malicious script. When the code is executed, the malicious script will be executed on the server.

How can it be fixed?

The vulnerability can be fixed by sanitizing the input to the `inputStream` parameter. This can be done by using a whitelist of allowed characters. For example, the code could only allow characters that are allowed in HTML.

Example of vulnerable code

The following is an example of vulnerable code:
From a CSM & CSE perspective (and more)

I want ...
Issue summaries

Summarize long issue and merge request comment threads

Summary of Issue Comments

- Request for list of checks for Kubernetes pod level checks
- Links to resources for understanding liveness, readiness, and startup probes
- Update made to description with more details on what each probe should verify
- Request for help with readiness/startup probe
- Question about time expectation for completing the issue
- Confirmation that readiness and startup probes are needed
- Offer to work on the issue
- Concerns about all 3 probes hitting the same endpoint and dependency on Triton server’s liveness for /healthz endpoint
- Suggestion to add separate liveness probe/alerting for Triton server
- Strong suggestion to pull /healthz endpoint until a more appropriate solution can be created
- Status update on finding correct liveness/readiness probes for Triton server

Note: UX may not represent final design
Summarize MR Changes

Drive alignment and understanding of changes
GitLab Chat

Ask questions rather than search for answers
Activity

- Phil Calder added to epic #10284 (closed) 2 months ago
- Phil Calder changed title from Feedback issue for: [AI Proposal] Explain this Vulnerability to Feedback issue for: [AI Proposal] Explain this Vulnerability - mega 2 months ago
- Phil Calder changed the description 2 months ago
- Phil Calder added group: threat insights, desc: opsec, sec: labels 2 months ago
- Phil Calder added wrg: integration, wrg: integration - prioritized.prototype labels 2 months ago
- Phil Calder changed title from Feedback issue for: [AI Proposal] Explain this Vulnerability - mega to Feedback issue for: [AI Proposal] Explain this Vulnerability - mega 2 months ago
- Phil Calder mentioned in design management/design #407124 (closed) design_1681421934437.png 2 months ago
- Becka Lippert mentioned in design management/design #407124 (closed) design_1681485526372.png 2 months ago
- Alana Bellucci changed title from Feedback issue for: [AI Proposal] Explain this Vulnerability - to (Feedback issue for: [AI Proposal] Mitigate Vulnerability with AI 1 month ago
- Alana Bellucci changed the description 1 month ago
- Becka Lippert mentioned in design management/design #407124 (closed) design_1681420879588.png 1 month ago
- Becka Lippert mentioned in design management/design #407124 (closed) design_168146032408.png 1 month ago
- Becka Lippert mentioned in design management/design #407124 (closed) design_1681921959398.png 1 month ago
- Alana Bellucci made the issue visible to everyone 1 month ago
I’m a happy 😊 CSM/CSE/Developer
GitLab Duo

The suite of AI capabilities powering your workflows
GitLab Duo: AI-assisted capabilities for everyone involved in the software development lifecycle

**Developer Teams**
- Code Suggestions
  - AI paired programming
- Suggested Reviewers
  - Better code reviews
- Summarize MR Changes
  - Drive alignment and action
- Summarize My MR Review
  - Get your point across
- Help with Git Commands
  - Natural language CLI assistant

**Security & Operations**
- Explain This Vulnerability
  - Remediate security issues
- Generate Tests in MRs
  - Automate repetitive tasks
- Explain This Code
  - Uplevel and understand

**For Everyone**
- Issue Comment Summaries
  - Understand and take action
- GitLab Chat
  - Get help fast
- Value Stream Forecasting
  - Predict the future

Available features:
- [Experimental]
- [Beta]
- [General Availability]
GitLab AI Vision

AI-assisted features

- Improved security
- Enhanced quality assurance
- Predictive analytics
- Intelligent monitoring
- Faster deployments
- Intelligent alerting
- Enhanced quality assurance

10X Improvement
GitLab Duo

Capabilities coming Soon

- Generate Planning Descriptions
- Natural Language Chart Generation
- Suggest A Fix For Failed Tests
- CI/CD Pipeline Failure Resolution
- Suspicious Activity Alerting
- Vulnerability Report Summary
- Merge Request Assistance
- Natural Language CI Configuration
GitLab AI Roadmap:

Next step: ModelOps

Stay tuned
Thank you for your attention
Question time

Only simple questions :)

GitLab