Introduction to Gitlab

What is GitLab

GitLab is a complete DevOps platform, delivered as a single application. This makes GitLab unique and creates a streamlined software workflow, unlocking your organization from the constraints of a pieced together toolchain. Learn how GitLab offers unmatched visibility and higher levels of efficiency in a single application across the DevOps lifecycle.

GitLab started as an open source project to help teams collaborate on software development. GitLab's mission is to provide a place where everyone can contribute. Each team member uses our product internally and directly impacts the company roadmap. This exceptional approach works because we're a team of passionate people who want to see each other, the company, and the broader GitLab community succeed and we have the platform to make that possible. From about gitlab.

Gitlab project

A GitLab project has at its center a git repository and a few services that evolve around said repository. Such as an issue tracker, contributions from other developers via **merge requests** and to do lists among others.

Create a new project

In the following steps a new personal public repository is created. The process of creating a new project is assisted and straight forward.

The creation starts with clicking on the boxed plus sign left to the search field.



Figure 1. Create a new project from the top navigation bar

1 Choose **New project/repository** to open the initial starting point.



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Figure 2. Choose project's starting point **1** Select **Create blank project** to open the creation form.

₩		+ 😌	Your work / Projects / New project / Create blank project
D 1 Q Searc Your work	៖រ h or go to	⊡ 1 	Create blank project Create a blank project to store your files, plan your work, and collaborate on code, among other things.
Projects			Project name
% Groups			gitlab-project 1
Issues		1	Must start with a lowercase or uppercase letter, digit, emoji, or underscore. Can also contain dots, pluses, dashes, or spaces.
រឹង Merge requ	lests	>	Project URL Project slug
🗹 To-Do List		1	http://gitlab.local:9480/ jdev 2 ~ / gitlab-project 3
③ Milestones			Want to organize several dependent projects under the same namespace? Create a group.
X Snippets			Visibility Level 🕜
 Activity 		4	 A Private Project access must be granted explicitly to each user. If this project is part of a group, access is granted to members of the group. ① Internal The project can be accessed by any logged in user except external users. ④ Public The project can be accessed without any authentication.
			Project Configuration
		5	Initialize repository with a README Allows you to immediately clone this project's repository. Skip this if you plan to push up an existing repository.
		6	Enable Static Application Security Testing (SAST) Analyze your source code for known security vulnerabilities. Learn more.
		7	Create project Cancel

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Figure 3. Fill in the required information

- 1 Use gitlab-project for **Project name**
- 2 Is the base URL for accessing the repository, can't be modified.
- S Project slug is pre-filled base on the project name. May be modified but is usually left as is.
- 4 Choose Public as the visibility layer.
- 6 Check Initialize repository with a README this creates a bare bone README.md file in the root of the repository.

- 6 Enable Static Application Security Testing (SAST). This checks the code for vulnerabilities and plain text passwords among other things.
- To finish hit the [Create project] button.

Navigate new project

Right after the project is created the next screen is the project overview. For a first time visitor the screen has quite a few elements and is probably confusing at first sight.

Here the various elements are explained shortly to provide and initial overview where to find which functionality.

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G gitlab-project	This is a gitlab project for the introduction course.
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ḋ Plan >	
Code	main v gitlab-project / + v 4
🕼 Build >	🖹 README 🔞 Auto DevOps enabled 🗈 Add LICENSE 🗇 Add CHANGELOG 🕞 Add CONTRIBUTING 🔄 Add Kubernetes cluster
♥ Secure >	Add Wiki I R Configure Integrations
Deploy >	
	Name Last commit Last update
똎 Monitor >	reference README.md 7 Initial commit 2 years ago
in Analyze >	
Settings >	B README.md
	gitlab-project This is a gitlab project for the introduction course.

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Figure 4. Initial project overview screen.

- 1 Project name and visibility level marked by icon on the right hand side of the project name.
- 2 Notification, star and fork buttons for other developers interested in the project.
- Git repository statistics with regards to number of commits, branches tags and storage used.
- **4** Branch navigation and file, branch and tag creation.
- Solution Miscellaneous functionally such as file modification with Web IDE, archive downloads and clone addresses for the repository.
- 6 Current git revision number in shortened SHA1 format.
- 7 File browser area, list and navigate files and directories in the project.
- 8 HTML rendered content of **README.md**.
- **9** Navigation of further functionality and access to project settings.

Clone project

GitLab has quite a few tools allowing for changes to the git repository data via the web interface. But for most purposes the content of the git repository is worked on with an IDE or on the command line externally.

In this exercise the previously created **gitlab-project** is cloned from the command line.

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Ì	Plan	>					
	Code	>	main ~ gitlab-project /	+ ~	History	Find file Edit ~ ⊻ ~ Clone ~	
B	Build	>	README 🙆 Auto DevOp	s enabled Add LICENSE Add CHANGELOG	Add CO	Clone with SSH	2
Φ	Secure	>				ssh://git@gitlab.local:8422/jde	
ß	Deploy	>				Clone with HTTP Copy UR	RL.
6	Operate	>	Name	Last commit		http://gitlab.local:8480/jdev/g	Π
<u></u>	Monitor	>	M* README.md	Initial commit		Open in your IDE	
<u>þ.h</u>	Analyze	>				Visual Studio Code (SSH)	
Ø	Settings	>	README.md			Visual Studio Code (HTTPS)	
			attal a la superior a t			IntelliJ IDEA (SSH)	
			gitlap-project			IntelliJ IDEA (HTTPS)	
			This is a gitlab project for th	e introduction course.			

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Figure 5. Copy project address for git clone operation.

1 Press the [Clone] button.

2 Copy the ssh address.

Change to terminal window and execute

```
$ git clone ssh://git@gitlab.local:8422/jdev/gitlab-project.git ①
Cloning into 'gitlab-project'...
X11 forwarding request failed on channel 0
remote: Enumerating objects: 3, done.
remote: Counting objects: 100% (3/3), done.
remote: Compressing objects: 100% (2/2), done.
remote: Total 3 (delta 0), reused 0 (delta 0), pack-reused 0
Receiving objects: 100% (3/3), done.
```

```
$ cd gitlab-project 2
$ git log 3
commit 3651309571108055dcafb3dacaf9678e90c91291 (HEAD -> main, origin/main,
origin/HEAD) 4
Author: Joe Developer <joe.developer@gitlab.local>
Date: Mon Nov 9 12:10:30 2020 +0000
```

Initial commit

- 1 Clone the repository with the copied URL.
- **2** Chang into the freshly created **gitlab-project** directory.
- **3** Inspect the commit history with **git log**.
- **4** Verify the commit hash matches with the one displayed in the project overview.

Navigate plan

Besides the managing repositories Gitlab also sports tools to plan like manage issues and kanban boards among others for the project.



Figure 7. Issue Boards view

- 1 Navigate to **Issue boards** for overview.
- Open issue assigned to user.
- **3** Toggle show assigned labels other than from the defined lanes.

• Change the name and a few basic settings of the current board.

5 Add a new lane to the board.

🦊 GitLab Projects ~ Gi	roups 🗸 More 🗸	🖶 🐱 Search or j	ump to	۹	D	1, I	⊻ 0 ~	2 📀
G gitlab-project	Joe Developer > gitlab-project > Issues > New							
✿ Project overview	New Issue							
Repository								
D Issues 1 0	2 Title Bug in Software Add description temp	plates to help your contributors	communicate effectively!					
Boards	3 Type Issue	~						
Labels	Description Write Preview		В	I 9	9	@ ∷		≣ <i>⊾</i> ″
Service Desk	4 There is a bug	in the code.						
Milestones								
្រា Merge Requests 0								
🥝 CI/CD	Markdown and qui	ick actions are supported					🗈 Att	ach a file
Operations								
Packages & Registries	This issue is confident of the confidence of	dential and should only be visi	ble to team members with at leas	st Repor	ter acce	ISS.		
Lu Analytics	5 Assignee Joe Developer	~	9 Due date 2	2021-07-	23			
🖞 Wiki	6							
🔏 Snippets	Milestone	~						
8 Members	Labels Labels	~						
Settings	Submit issue							Cancel

Figure 8. Create new issue

- **1** Navigate to **Issues** for overview.
- 2 Enter title.
- **3** Choose type **Issue** or **Incident**.
- **4** Provide a description.
- **5** Choose **Assignee**; Optional.
- 6 Assign or create Milestone; Optional.
- **7** Assign or create **Label**; Optional.
- 8 Choose **Due date**; Optional.

Navigate code

There are a few tools to get a better insight of what is happening with the code both in and around the repository.



Figure 9. Merge requests overview

- 1 Menu item for viewing Merge requests for current project.
- **2** Global indicator for all assigned merge request.
- **3** Quick filter for current and previous merge requests.
- 4 Search to filter merge request by author and labels among other criteria.

₩ 🛛 + 😌	Joe Developer > gitlab-project > Repository	
D 1 \$% ⊠ 1 Q Search or go to	initial commit Joe Developer authored 2 years ago	
Project		
G gitiab-project		1
Your ninned items annoar here	Name Last commit Last update	
Po Manage	README.md Initial commit 2 years ago	
B Manage >		
	E KEAUME.mo	
Merge requests 0	gitlab-project	
Repository	This is a gitlab project for the introduction course.	
Branches		
Commits		
Tags		
Repository graph		
Compare revisions		
Snippets Snippets		
⊕ Secure >		
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() Help		

Figure 10. Repository view

1 Repository presents a similar layout as the project overview but in a slightly more compact format.



Arge branch 'add-submodule' into 'master' 🐽

8ac6eb29 🛱 🗁

Figure 12. Repository Commits view

- Navigate to Commits for overview.
- 2 Filter by one or more authors.
- **3** List of commits in default branch **main** equivalent of **git log** on the command line.
- 4 Display tags assigned to commit.



Figure 14. Repository graph view

- 1 Navigate to Graph for overview.
- 2 Choose branch or tag to display.
- **3** Filter by specific commit hash.

₩ 🗆 + 😔	Joe Developer > gittab-project > Compare revisions > v1.0.0 to main
D 1 \$3 ⊡ 1 Q Search or go to Project	Compare revisions Changes are shown as if the source revision was being merged into the target revision. Learn more about comparing revisions. Source 2 Target 3
G gitlab-project	jdev/gitlab-project ∨ main ∨ ≒ jdev/gitlab-project ∨ v1.0.0 ∨
🖈 Pinned 🗸 🗸	Show changes
Your pinned items appear here.	Only incoming changes from source
රී8 Manage >	Include changes to target since source was created
ḋ Plan →	Compare
> Code ~	
Merge requests 0	Commits on Source (2)
Repository Branches	New Install instructions 4
Commits	Merge branch 'feature1' into 'master'
Tags	Joe Developer authored 2 years ago
Repository graph	Showing 2 changed files v with 2 additions and 1 deletion Hide whitespace changes Inline Side-by-side
Compare revisions	
Snippets	✓ INSTALL.md 0 → 100644 ✓ 5
	1 + ## How to install gitlab-project
♥ Secure >	✓ P README.md t ^b _D View file @ 63388c0f
ମ୍ଭି Deploy 💦 👌	<pre> @@ -4,5 +4,5 @@ This is a gitlab project for the introduction course. 4 4 5 5 ## Controlutions</pre>

Figure 15. Compare view

- 1 Navigate to **Compare** for input mask.
- 2 Select source repository branch or tag.
- **3** Select target repository branch or tag.
- **4** List of commits only found in source.
- **5** File diffs of the changes.

Repository protection

Among the many settings available for a GitLab project at this stage the one that really matters is the protection of the main branch.

Per default only the maintainer can push and as such also force push changes to the **main** branch. This can be further restricted and no one make changes to main without proper evaluation of the changes.

♦		+ 😔	Joe Developer > gitlab-project > Repository Settings	
D' 1	ເນ	⊡ 1	Protected branches 3 Colla	pse
Q Sea	arch or go to		Keep stable branches secure and force developers to use merge requests. What are protected branches?	
BuildSecureDeploy		>	Giving merge rights to a protected branch also gives elevated permissions for certain CI/CD features. What are the security implications?	I
⊘ Operate		>	Protected branches & 1 By default, protected branches restrict who can modify the branch. Learn more.	
		>	Branch Allowed to merge Allowed to push and Allowed to force push ?	
General Integratio	ons		main default Maintainers V No one V S 5 Unprotect	
Webhook Access T	ks Tokens		Roles Protected tags Developers + Maintainers Maintainers Expandent	and
Repositor Merge re	quests		2 Limit access to creating and updating tags. What are protected tags? Instance admins	
CI/CD Package: Monitor	s and regist		Deploy tokens Deploy tokens allow access to packages, your repository, and registry images.	and
Usage Qi ? Help	uotas		Deploy keys Add deploy keys to grant read/write access to this repository. What are deploy keys?	and

Figure 16. Restrictive main branch settings.

- 1 In the project navigate to **Settings**
- **2** Click on **Repository**.
- **3** Navigate to **Protected Branches** and hit the [Expand] button.
- **4** Go to the box for **main** under allowed to push choose **No one**.
- **5** Toggle for preventing **force pushes** to the branch.

By protecting the main branch from direct pushes one can prevent fat-fingered git pushes where main gets accidentally overwritten with content from another branch. As a disclaimer this never happened to the instructor guiding you currently, ever!!!

Gitlab group

A GitLab group is a way to structure and manage one or more related projects. Groups can also be compared to folders on a file system.

Groups inherit permission to their subgroups and/or projects. Say if someone has access to a group, they also get access to all the projects in the group.

This also includes the issues and merge requests for the projects in the group, and analytics for the group's activity.

Groups allow to communicate with all of the members at once.

Create a new group

In the following steps a new group is created. The process of creating a new group is assisted and straight forward.

The creation starts with clicking on the boxed plus sign left to the search field.



Figure 17. Create a new group from the top navigation bar Choose **New group** to open the creation form.

⊌) + 😔	Your work / Groups / New group			
D' 1 Q Se	ររ earch or go	[] 1 to		Create n	ew group	
Q Se Your work ↓ Project: ☆ Groups ↓ Issues ☆ To-Do I ① Milesto ☆ Snippet ③ Activity	earch or go s requests List nes ts	to 1 1	+	Create n Create group Assemble related projects together and grant members access to several projects at once.	ew group	Import group Import a group and related data from another GitLab instance.
(? Help						

Figure 18. Choose create options

1 Choose **Create** group to create a new empty group.

₩ 🛛 + 😌	Your work / Groups / New group / Create group
D ² 1 \$% ⊡ 1 Q Search or go to Your work ① Projects	Create group Groups allow you to manage and collaborate across multiple projects. Members of a group have access to all of its projects. Groups can also be nested by creating subgroups.
° Groups	Group name
D Issues	acme
11 Merge requests >	Must start with letter, digit, emoji, or underscore. Can also contain periods, dashes, spaces, and parentheses.
☑ To-Do List	Group URL
() Milestones	http://gitlab.local:9480/ acme
🐰 Snippets	Visibility level
S Activity	Who will be able to see this group? View the documentation
	
	The group and any internal projects can be viewed by any logged in user except external users.
	
	Now, personalize your GitLab experience
	We'll use this to help surface the right features and information to you.
	Role
	Software Developer v
	Who will be using this group?
() Help	◯ My company or team ◯ Just me

Figure 19. Fill in the required information

- 1 Use acme as Group name
- **2** Specify the **Group URL**, usually derived from the **Group name**.
- **3** Specify the **Visibility level** of the group. Defaults to **Private**.
- 4 Further optional information for the creation of the group. More questions can be found when scrolling down.



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Figure 20. Initial group overview

- 1 Group navigation and configuration.
- 2 Notification and new project or subgroup creation.
- **3** Subgroup and projects tab navigation.
- **4** Creation of new projects or subgroups.

Group members

An integral part of groups is membership management.

The task is very straight forward but has a couple of Gitlab specific settings which need further explanation.

₩ 🛛 + 😌	acme > Group members				
D° 1 ी ⊠ 1 Q Search or go to	Group members You're viewing members	of acme .			Invite a group Invite members
Group A acme	Members 1				
☆ Pinned >	S - Filter membe	rs			Q Account ∽ ↓≞
යි Manage ~ Activity	Account	Source	Max role	Expiration	Activity
Members 2 Labels	Joe Developer (It's you	Direct member	Owner 3	Expiration date	User created: Nov 09, 2020 Access granted: Jun 30, 2021 Last activity: Sep 25, 2023
✓ Plan >	Widev				
Deploy >					
Operate >					
I Settings →					
🕐 Help					

Figure 21. Manage group members

- **1** Group name.
- 2 Member list under Manage.
- **3** List of group members.
- **4** Button to invite new users.

		acme > Group members	acme > Group membe	
	Q Search or go to	Group members Invite a group Invite members You're viewing members of acme.	Group member	ers
Gro	up acme	Members 1	Members 1	
× 88	Pinned Manage	Invite members × You're inviting members to the acme group.	S v Filter m	
L	Activity Members	Account Username or email address Activity Activity Mary Devolops X Select members or type email addresses User created: Nov 09, 2020	Account	
	Labels Plan	Develop (it's you @jdev Select a role Guest C	It's you @jdev	
	Build Sector	Read more about role permissions Access expiration date (optional)		
6	Operate	Cancel Invite		
6				

Figure 22. Manage group members

- 1 List of members to invite.
- **2** Role the members will fill in the group.
- **3** Expiration date. E.g. how long the member will have access to the group.

4 Button to send the invitation.

Merge requests

GitLab's statement about merge requests:

Merge requests are a place to propose changes you've made to a project and discuss those changes with others

Interested parties can even contribute by pushing commits if they want to.

Goals

Learn how to collaborate, review and evaluate changes to a repository before adding the changed to the **main** branch. After a merge request has been put forward for review the process is shown of how evaluate the change comment on particulars in the change and request amendments and finally merge the code.

- Create a merge request from a feature branch.
- Submit a merge request.
- Review changes in a merge request.
- Amend a merge request.
- Merge the request.

Create merge request

Initiate merge request

There is a few ways to initiate a merge request under GitLab. The variations and locations here are listed below.

For a limited time after pushing changes to a repository a message with a button is display in the upper half of the overview page.



Figure 23. After pushing a branch notification appears on the overview page.

1 Click the [Create merge request] button to initiate.

🔶 🛄 + 🐯 😤	Mary DevOps > gitlab-project > Repository			
D 11 🖂				
Q Search or go to	Add email address to contributors Mary DevOps authored 15 minutes ago			18c1ófd8 [C
Project	2			
G gitlab-project	documentation ~ gitlab-project / + ~		History Find file Edit	✓ Lone ✓ Clone ✓
🖈 Pinned 🗸	Forked from the Developer (citleb project			
Your pinned items appear here.	1 commit ahead of the upstream repository	ι Ι.	3	Create merge request
🖧 Manage >				
🛱 Plan >	Name	Last commit		Last update
Code ✓	💦 submodule @ becó3ae4	Add submodule header		2 years ago
Merge requests 0	♦ .gitmodules	Add submodule		2 years ago
Repository	HINSTALL.md	New Install instructions		2 years ago
Branches	M README.md	Add email address to contributors		15 minutes ago
Tags				
Repository graph	README.md			
Compare revisions				
Snippets	gitlab-project			
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Figure 24 Create n	nerge request via Code	Repository		
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 2 Select the brand 3 Initiate via the [○ I + ○ <l< td=""><td>ch e.g. documentation. Create merge request] bu Mary DevOps > gitlab-project > Repository > Branches Overview Active Stale All Active branches documentation (a) 18c16fd8 - Add email address to contributors - 16 minutes Stale branches recurse (a) 2c34e60f - Merge branch 'submodule' into 'master' - 2 years</td><td>ago</td><td>Q View branch rule</td><td>s New branch : ১৯ New ৬ ~ : ১৯ New ৬ ~ : ৬ ~</td></l<>	ch e.g. documentation. Create merge request] bu Mary DevOps > gitlab-project > Repository > Branches Overview Active Stale All Active branches documentation (a) 18c16fd8 - Add email address to contributors - 16 minutes Stale branches recurse (a) 2c34e60f - Merge branch 'submodule' into 'master' - 2 years	ago	Q View branch rule	s New branch : ১৯ New ৬ ~ : ১৯ New ৬ ~ : ৬ ~
 2 Select the brand 3 Initiate via the [I + I > I > <td>ch e.g. documentation. Create merge request] bu Mary DevOps > gitlab-project > Repository > Branches Overview Active Stale All Active branches documentation (?) 18c16fd8 · Add email address to contributors · 16 minutes Stale branches recurse (?) 2c34e60f f. Merge branch 'submodule' into 'master' · 2 years</td><td>Litton. Filter by branch name ago ago ago</td><td>Q View branch rule</td><td>s New branch : المعالية المعالية الم معالية المعالية المعالي معالية المعالية المع معالية المعالية المعالي معالية المعالية المعالية المعالية المعالية المعالية المعالية المعالي معالية المعالية المعالية المعالية المعالية المعالية</td>	ch e.g. documentation. Create merge request] bu Mary DevOps > gitlab-project > Repository > Branches Overview Active Stale All Active branches documentation (?) 18c16fd8 · Add email address to contributors · 16 minutes Stale branches recurse (?) 2c34e60f f. Merge branch 'submodule' into 'master' · 2 years	Litton. Filter by branch name ago ago ago	Q View branch rule	s New branch : المعالية المعالية الم معالية المعالية المعالي معالية المعالية المع معالية المعالية المعالي معالية المعالية المعالية المعالية المعالية المعالية المعالية المعالي معالية المعالية المعالية المعالية المعالية المعالية
 2 Select the brand 3 Initiate via the [C Search or go to Project g gitlab-project Pinned Your pinned items appear here. Manage Plan Code Merge requests Repository Branches Commits Tags Repository graph Compare revisions Snippets 	ch e.g. documentation. Create merge request] bu Mary DevOps > gitlab-project > Repository > Branches Overview Active Stale All Active branches documentation (?) 18c16fd8 · Add email address to contributors · 16 minutes Stale branches recurse (?) 2c34e609f · Merge branch 'submodule' into 'master' · 2 years main (?) default protected 63388c0f · Merge branch 'feature1' into 'master' · 2 years	Atton. Filter by branch name ago ars ago ago	Q View branch rule oh 2	s New branch : ১১ New ৬ ~ : ১১ New ৬ ~ : ৬ ~
 2 Select the brand 3 Initiate via the [○ Initiate via the point of the po	ch e.g. documentation. Create merge request] bu Mary DevOps > gittab-project > Repository > Branches Overview Active Stale All Active branches documentation (2) 18c16fd8 - Add email address to contributors - 16 minutes Stale branches recurse (2) 2c34e60f - Merge branch 'submodule' into 'master' - 2 years documentation (2) 3588c0f - Merge branch 'feature1' into 'master' - 2 years	ago	Q View branch rule	s New branch : ১১ New ৬ ~ : ১১ New ৬ ~ : ৬ ~
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 2 Select the brand 3 Initiate via the [I + I > I > <td>ch e.g. documentation. Create merge request] bu Mary DevOps > gittab-project > Repository > Branches Overview Active Stale All Active branches documentation (2) 18c16fd8 - Add email address to contributors - 16 minutes Stale branches recurse (2) 2c34e69f - Merge branch 'submodule' into 'master' - 2 years main (2) default protected 63388c6f - Merge branch 'feature1' into 'master' - 2 years</td><td>Atton. Filter by branch name ago ago ago</td><td>Q View branch rule</td><td>s New branch : ১১ New ৬ ~ : ১১ New ৬ ~ : ৬ ~</td>	ch e.g. documentation. Create merge request] bu Mary DevOps > gittab-project > Repository > Branches Overview Active Stale All Active branches documentation (2) 18c16fd8 - Add email address to contributors - 16 minutes Stale branches recurse (2) 2c34e69f - Merge branch 'submodule' into 'master' - 2 years main (2) default protected 63388c6f - Merge branch 'feature1' into 'master' - 2 years	Atton. Filter by branch name ago ago ago	Q View branch rule	s New branch : ১১ New ৬ ~ : ১১ New ৬ ~ : ৬ ~

- **1** Navigate to **Code** \rightarrow **Repository**
- 2 Click on [New] button of the branch to be merged.

🤟 🛛 + 😡 ⇔	Mary DevOps > gitlab-project > Commits	
D 13 🖸	documentation v gitlab-project Author v Create merge request Search by message	۳
	Sep 25, 2023	
Project		
G gitlab-project	Mary DevOps authored 18 minutes ago	18c16fd8 🖺 🗁
🖈 Pinned 🗸 🗸		
Your pinned items appear here.	Jul 01, 2021	
⁸⁸ Manage >	Arrow Merge branch 'feature1' into 'master'	63388c0f 🖧 🗁
兰 Norg	Joe Developer authored 2 years ago	
	Rew Install instructions 🚥	c7b7c334
Code ~	Joe Developer authored 2 years ago	
Merge requests 0		
Repository	Dec 08, 2020	
Branches	Merge branch 'submodule' into 'master' Joe Developer authored 2 years ago	2c34e69f 🛱 🗁
Commits 1		
Tags	Add submodule header Joe Developer authored 2 years ago	1a44056b 🔓 🗁
Repository graph	A Maradan dia tanàn G	
Compare revisions	Joe Developer authored 2 years ago	2a9c154d 🛱 🗁
Snippets	Update README.md	
🥝 Build >	Joe Developer authored 2 years ago	97ab94aa 🖺 🗗
♥ Secure >	💁 Merge branch 'submodule' into 'master' 🚥	
Deploy >	United Sector Se	508/5442 lä
(?) Help	Add submodule header	b4cfd3e5 🛱 🗁

Figure 26. Create merge request via $Code \rightarrow Commits$

1 Navigate to **Code** \rightarrow **Commits**

- **2** Select the branch e.g. **documentation** to be merged.
- **3** Initiate via the [Create merge request] button.

Submit merge request

To submit the merge request there are a few questions to be answered generally the defaults are fine most of the time.

₩ □ +	- 👩 🖶	Mary DevOps > gitlab-project > Merge requests > New
D 11	ß	New merge request
Q Search or go	to	From mdevops/gitlab-project:documentation into jdev/gitlab-project:main Change branches
Project		Title (required)
G gitlab-project		Add email address to contributors 2
℅ Pinned Your pinned items app	Ƴ pear here.	Mark as draft Drafts cannot be merged until marked ready.
රී8 Manage	>	Description
🖻 Plan	>	Preview B I \S \models \checkmark \models \models \models \models \blacksquare $@$ \square μ
> Code	>	4 ribe the goal of the changes and what reviewers should be aware of.
😨 Build	>	
① Secure	>	
ව Deploy	>	
Operate	>	Switch to rich text editing
🖳 Monitor	>	Merge options
屾 Analyze	>	Delete source branch when merge request is accepted.
Settings	>	Squash commits when merge request is accepted. (?)
0 [°] Heln		Contribution Commits from members who can merge to the target branch. About this feature. Create merge request Cancel Cancel Cancel

Figure 27. Create merge request via Branches

- 1 Change the source or / and destination branch for the merge request.
- 2 Change the title of the merge request. By default the title is the first line of the commit message.
- **3** Mark as draft to prevent them from being merged before review.
- 4 Add a description. Per default it is filled from the commit message starting at line 2 and greater.
- 6 Deletes the source branch after the merge is done. This is checked by default and prevents out of date branches lingering around too long.
- 6 When a merge request contains more than one commit the commits are squashed into a single commit before applying to the target branch.
- Allows members of the target project to submit adjustments to the request before merging.
- 8 Submit the merge request to the target branch owner.

Review merge requests

View merge request

Once the merge request is submitted the other members of the project can view, comment and give suggestions for minor code changes.

¥	🗆 🗆 + 🧔 🗧	Joe Developer > gitlab-project > Merge requests > 18	
	D 11 도 Q Search or go to	Add email address to contributors	1 Edit Code -
Pro G	gitlab-project	Overview 0 Commits 1 Pipelines 0 Changes 1	Add a to do
Ŕ	Pinned	× <mark>↓0 ♥0</mark> ☺	0 Assignees None
රිපි	Manage	Members who can merge are allowed to add commits.	0 Reviewers None
豆 >	Plan Code	8~ Approval is optional	Labels None
I	Merge requests	Ready to merge by members who can write to the target branch.	Milestone None
	Branches	1 commit and 1 merge commit will be added to main.Source branch will be deleted.	Time tracking No estimate or time spent
	Tags	Activity All activity ~ 1=	1 Participant
	Repository graph Compare revisions	Preview B I € I≡ ↓	(p)
6	Snippets	3 Write a comment or drag your files here	
ي م	Deploy	>	
6	Operate	>	
	Monitor	> Switch to rich text editing	
?	Help	Comment - Close merge request	

Figure 28. Merge request right after submission.

- 1 With [Edit] the title and message can be amended.
- 2 Used to [Approve] the change. Under the GitLab community edition this is gratuitous. The enterprise edition can enforce approval from stakeholders.
- **3** Add comments to the request.
- ④ [Close merge request] is another term for canceling the request. Note the request stays in history and can be reopened if required.

Add comment

Other users in the group are encouraged to review the changes and add comments. Commenting under the [Changes] tab a reviewer can mark the lines of code the comment is referring to.

₩ 🗆 + 😌	Joe Developer > gitlab-project > Merge requests > 18
다 1 않 또 1 Q Search or go to	Add email address to contributors Edit Code Edit Edit Edit Edit Edit Edit Edit Edit
Project G gitlab-project ☆ Pinned >>	Overview 0 Commits 1 Pipelines 0 Changes 1 2 Add a to do Eg Compare main ~ and latest version ~ Eg 1 file +2 -2 @ ~
රිස Manage >	~ README.md ^a / _b +2 -2 ○ Viewed □ ⋮
ḋ Plan >	<u>↑</u> @@ -3,6 +3,6 @@
> Code ~	3 3 This is a gitlab project for the introduction course.
Merge requests	5 5 ## Contributors
Repository	6 - * Joe Developer (Maintainer) 7 - * Mary DevOps (Developer)
Branches	6 + * Joe Developer (Maintainer) <jdev@acme.com> 7 + * Mary Dev0ps (Developer) <mdevops@acme.com></mdevops@acme.com></jdev@acme.com>
Commits	Commenting on lines $+6 \sim$ to $+7$
Tags	
Repository graph	Preview $\[\] \mathbf{B} I \S \models \ \checkmark \rangle \mathscr{O} \models \ \not\models $
Compare revisions	Love it thanks Mary.
Snippets	
ت Deploy >	Switch to rich taxt addition
Operate >	Start a review Add comment now Cancel
🕐 Help	8 8 ## Now with submodule

Figure 29. User Joe Developer adds a comment under changes.

- **()** Navigate to $Code \rightarrow Merge requests$
- **2** Switched to tab [Changes].
- **3** Marking lines $+6 \sim +7$ as relevant to the comment.
- **4** Writing message about the previously marked lines.
- **(5)** If this change should be started as a review the [Start a review] button is clicked.
- **6** In this particular case it is a comment so [Add comment now] is clicked.

Once the comment is submitted the others can chime in. Since it is only a comment Mary DevOps is resolving the thread.



Figure 30. Mary DevOps views comment and resolves thread.

- 1 Resolving the thread via the circled check mark.
- **2** Alternatively via the button [Resolve thread].

Amend request

Maintainers have the option to make small amendments to the merge request. This can be done entirely within the merge request page.

₩ □ + 🕹	Joe Developer > gitlab-project > Merge requests > 18	
D°1 \$\$ ⊡1	\mathfrak{N} Open Add email address to contributors documentation $\mathfrak{l}^{\mathfrak{N}}_{\mathfrak{O}}$ into main	
Q Search or go to	Overview 1 Commits 1 Pipelines 0 Changes 1	All threads resolved! • Add a to do
Project	\sim README.md ($_{\rm C}^{\rm e_1}$	+2 -2 🗌 Viewed 📮 🚦
6 gitlab-project ★ Pinned ▲ Manage ★ Plan ✓ Code ✓ Merge requests	6 - * Joe Developer (Maintainer) 7 - * Mary DevOps (Developer) 6 + * Joe Developer (Maintainer) < jdev@acme.com> 7 + * Mary DevOps (Developer) Comment on lines +6 to +7 Image: Solution of the second sec	Owner ❷ ☺ ᠳ ⊘ ⋮
Repository Branches Commits Tags Repository graph Compare revisions Snippets Ø Build > Q Secure > Qeploy > Q Qperate	Reply Commenting on lines +6 ~ to +7 2 Preview B I § I= <> Ø I=	Unresolve thread
() Help	Start a review Add comment now Cancel	MA

Figure 31. Create a suggestion

- Select target lines.
- Olick on the insert suggestion icon.
- 3 Modify the selected code.
- ④ [Start a review] to submit the suggestion.



Amendments are only available if the option for **Allow commits from member who**

can manage the target branch has been checked during merge requestion submission.

Once the suggestion has been submitted other maintainers can further review the new amendment and comment.



Figure 32. Suggestion ready for review or application.

- 1 Clicking on [Apply suggestion] will create a new commit to the merge request.
- 2 The diff of the suggestion is shown to make suggestion review easy.
- **3** Further comments can be appended to the suggestion.

□ + Joe Developer > gitlab-project > Merge requests > 18 Add email address to contributors Edit : Code ~ Q Search or go to. 🗱 Open Mary DevOps requested to merge 😵 mdevops/gitlab-project:d... 🛱 into main 47 minutes ago Project Overview 2 Commits 2 Pipelines 0 Changes 1 All threads resolved! Add a to do G gitlab-project Sep 26, 2023 🖈 Pinned Apply 1 suggestion(s) to 1 file(s) 6af17871 [රීපී Manage Joe Developer authored 1 minute ago and @ Mary DevOps committed 1 minute ago 🖻 Plan Sep 25, 2023 </>
 Code Add email address to contributors Merge requests 1 18c16fd8 [입 Mary DevOps authored 1 hour ago Repository Branches Add previously merged commits Commits Tags Repository graph Compare revisions Snippets Ø Build ⑦ Secure Deploy Operate 🕐 Help

Figure 33. After suggestions have been applied two commits are present

1 The Commits tab shows now 2 commits in the indicator.

2 The addtional commit now listed.

¥	● □ + 🚭 📾	Joe Developer > gitlab-project > Merge requests > 18	
	다 않 도	Add email address to contributors	Edit Code ~
G	ject gitlab-project	Overview 2 Commits 2 Pipelines 0 Changes 1	All threads resolved! : Add a to do
×	Pinned Vour pinned items appear here.	Lg Compare main ∨ and latest version ∨ ∨ README.md ℓ _D	≥ 1 file +4 -2 +4 -2 Viewed ↓
රිපි	Manage	<u>↑</u> @@ -3,6 +3,8 @@	
臣	Plan	3 3 This is a gitlab project for the introduction course.	
45	0 - d-	5 5 ## Contributors	
<	Code	6 - * Joe Developer (Maintainer)	
	Merge requests	7 - * Mary DevOps (Developer)	
	Repository	7 + I	
	Branches	8 + Joe Developer Maintainer jdev@acme.com	
	Commite	8 10 ## Now with submodule	
	T		
	lags		
	Repository graph		
	Compare revisions		
	Snippets		
Q	Build		
D	Deploy		
ଚ	Operate		
<u></u>	Monitor		
?	Help		

Figure 34. The suggestions is now part of the merge request

- 1 There is still only one changed file.
- 2 The markdown table has been applied.

Merge the request

Once the stakeholders are satisfied with the changes, suggestions and amendments the request can be merged by a maintainer.

⊌ □	+ 🕹	Joe Developer > gitlab-project > Merge requests > 18		
D 1 ដំរ	🖸 1	$\label{eq:open_state} \begin{tabular}{lllllllllllllllllllllllllllllllllll$		
Q Search or go to		Overview 2 Commits 2 Pipelines 0 Changes 1	All threads resolved!	Add a to do
Project G gitlab-project		8~ Approve Approval is optional ⑦	0 Assignees None - assign yourself	Edit
🖈 Pinned	>	Ready to merge!	0 Reviewers None - assign yourself	Edit
රීස Manage ඕ Plan	>	2 Squash commits ⑦ 🖌 Edit commit message	Labels	Edit
> Code	~	Squash commit message Use an existing commit message ~	NUTE	
Merge requests	1	Add email address to contributors 4	Milestone None	Edit
Repository				
Branches			Time tracking No estimate or time spent	() +
Commits				
Tags		Merge commit message	2 Participants	
Repository graph		Merge branch 'documentation' into 'main' 5	• •	
Compare revisions Snippets		Add email address to contributors		
@ Build	>	See merge request jdev/gitlab-project!8		
① Secure	>			
Deploy	>	To change these default messages, edit the templates for both the merge and squash commit		
Operate	>	messages. Learn more.		
() Help		1 commit and 1 merge commit will be added to main (squashes 2 commits).		

Figure 35. Merge the request

- 1 Approval of a merge request is not a requirement but can be a helpful tool to determine who has reviewed the change.
- With the applied suggestion the Squash commits checkbox can be activated to only have one commit at merge time.
- **3** The commit message can be adjusted as well by checking **Edit the commit message**.
- **4** The textarea to adjust the commit message.
- **5** The textarea to change the merge messsage.
- 6 The [Merge] button to execute the merge.

Post merge review

Eventually the merge request was merged in this particular case with the **Squash commits** option checked.

It is now time to find out how the project repository changed.

Web UI post merge review

In the Web UI the changes are very subtle and the complexity of the process is masked.



Figure 36. Project overview page post merge.

- 1 The commit SHA1 is different to the one from Mary DevOps when submitting the merge request.
- 2 The changes including the suggestion from Joe Developer have are displayed in the rendered README.md.

₩ 🗆 + 😔	Joe Developer > gittab-project > Commits	
다 1 않 또 1 Q Search or go to	main ~ gitlab-project Author ~ Search by message	9
Dualaat	Sep 26, 2023	
G gitlab-project	Merge branch 'documentation' into 'main' 1 Joe Developer authored 4 minutes ago	6 🖻
	Add email address to contributors	2 6
රීස Manage >	Mary DevOps authored 4 minutes ago and 🔮 Joe Developer committed 4 minutes ago	
包 Plan >	Jul 01, 2021	
Code V	Merge branch 'feature1' into 'master'	
Merge requests 0	Joe Developer authored 2 years ago	3 10

Figure 37. Review of the commits present.

- 1 A new commit with a commit message never entered during the process is now the **HEAD** of the repository.
- **2** The commit hash changed compared to the submitted one. What happened?

git command post merge review

It is sometime easier to review the changes that look confusing in the Web UI on the command line.

```
$ git pull origin main ①
remote: Enumerating objects: 6, done.
remote: Counting objects: 100% (6/6), done.
remote: Compressing objects: 100% (4/4), done.
remote: Total 4 (delta 1), reused 2 (delta 0), pack-reused 0
Unpacking objects: 100% (4/4), 664 bytes | 664.00 KiB/s, done.
```

```
From https://gitlab.local:9480/jdev/gitlab-project
 * branch
                     main
                               -> FETCH HEAD
   63388c0..a343d37 main
                               -> origin/main
Updating 63388c0..a343d37
Fast-forward
 README.md | 6 ++++2
 1 file changed, 4 insertions(+), 2 deletions(-)
$ git log 3
commit a343d37672c6c73efea85a7100340057ca7a4858 (HEAD -> main, origin/main,
origin/HEAD)
Merge: 63388c0 2142406 4
Author: Joe Developer <joe.developer@gitlab.local>
Date: Tue Sep 26 00:40:53 2023 +0000
    Merge branch 'documentation' into 'main'
    Add email address to contributors
    See merge request jdev/gitlab-project!8
commit 214240696453302969ee67e364fa206d5dda5e65
Author: Mary DevOps <mary.devops@gitlab.local>
Date: Tue Sep 26 00:40:53 2023 +0000
    Add email address to contributors
commit 63388c0fd88b803af36e8c158139edde98c05830
Merge: 2c34e69 c7b7c33
Author: Joe Developer <joe.developer@gitlab.local>
Date: Thu Jul 1 09:55:50 2021 +0000
    Merge branch 'feature1' into 'master'
    New Install instructions 123
    See merge request jdev/gitlab-project!7
[.notes]
<1> Pull the changes from the GitLab project to the previously
    created repository.
<2> The file `README.md` is updated during this procedure.
<3> The `git log` command displays a bit more information about
    commit `5717883`. This is a merge commit with multiple parents.
<4> The merge line display all the parents this particular commit has.
    Merge commits can be prevented in under `Settings` -> `General` ->
    `Merge requests` -> (*) Fast-forward merge.
// vim: set colorcolumn=80 textwidth=80 spell spelllang=en_us :
// vim: set colorcolumn=80 textwidth=80 spell spelllang=en_us :
```

```
<<<
```