🚀

# S(pace)lack

Chat app documentation - VPWA 2024

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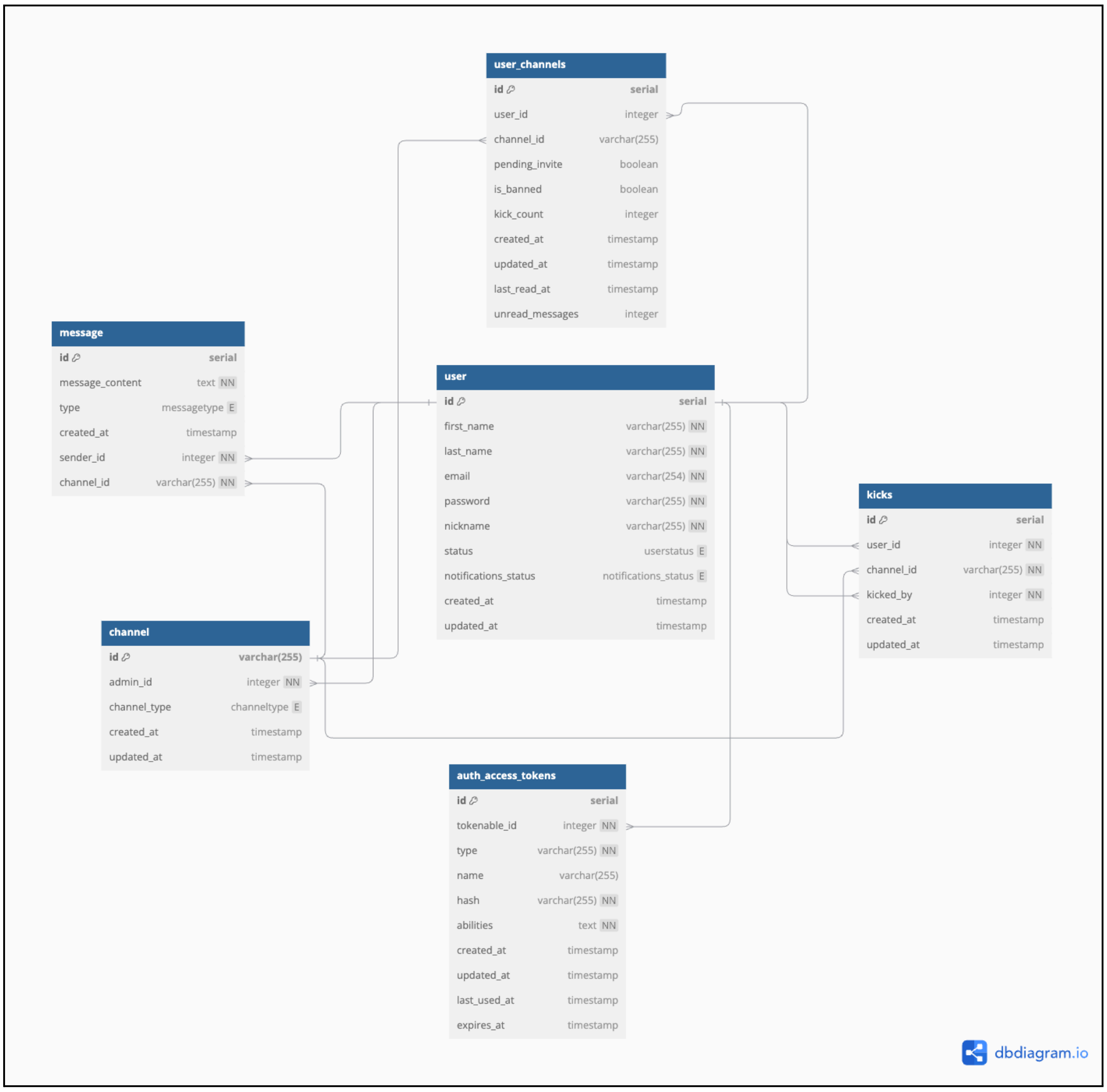
## Assignment

The task was to create Progressive Web Application (PWA) for text communication inspired by IRC or Slack, allowing users to register, log in, and manage their profiles. Users can join, create, or manage public and private communication channels, send messages, and use command-line interactions for channel creation, invitations, and member management. The has to support notifications for new messages, customizable user status (online, offline, do not disturb) and notification status. The app should be implemented in Vue using quasar framework and AdonisJS backend framework.

## DB model



| user_channels | | |
|---|---|---|
| id | serial | |
| user_id | integer | |
| channel_id | varchar(255) | |
| pending_invite | boolean | |
| is_banned | boolean | |
| kick_count | integer | |
| created_at | timestamp | |
| updated_at | timestamp | |
| last_read_at | timestamp | |
| unread_messages | integer | |

| message | | |
|---|---|---|
| id | serial | |
| message_content | text | NN |
| type | messagetype | E |
| created_at | timestamp | |
| sender_id | integer | NN |
| channel_id | varchar(255) | NN |

| user | | |
|---|---|---|
| id | serial | |
| first_name | varchar(255) | NN |
| last_name | varchar(255) | NN |
| email | varchar(254) | NN |
| password | varchar(255) | NN |
| nickname | varchar(255) | NN |
| status | userstatus | E |
| notifications_status | notifications_status | E |
| created_at | timestamp | |
| updated_at | timestamp | |

| kicks | | |
|---|---|---|
| id | serial | |
| user_id | integer | NN |
| channel_id | varchar(255) | NN |
| kicked_by | integer | NN |
| created_at | timestamp | |
| updated_at | timestamp | |

| channel | | |
|---|---|---|
| id | varchar(255) | |
| admin_id | integer | NN |
| channel_type | channeltype | E |
| created_at | timestamp | |
| updated_at | timestamp | |

| auth_access_tokens | | |
|---|---|---|
| id | serial | |
| tokenable_id | integer | NN |
| type | varchar(255) | NN |
| name | varchar(255) | |
| hash | varchar(255) | NN |
| abilities | text | NN |
| created_at | timestamp | |
| updated_at | timestamp | |
| last_used_at | timestamp | |
| expires_at | timestamp | |

Compared to the 1st iteration of our model, we can see that there are a couple more tables. `auth_access_tokens` table was added by Adonis to handle tokens. Additionally, we did not have a `kicks` table, which stores information about who kicked who in the channel. We also added a `last_read_time` field to the pivot table connecting `users` and `channels`, more about that in the Real time messages and infinity scroll.

## External Libraries

- **moment.js -** this library allows us to work with dates easter. It is especially helpful dealing with date comparison and “days between 2 dates” calculations.
- **faker -** We used faker to simulate user data in our application. When seeding a database, there are multiple users being created with messages, simulating user mensions and conversations  in the channel.
- **socket.io & socket.io-client -** These libraries provided us with excellent support for websocket communication, allowing us to easily establish connection between server and client, manage connections and handle disconnecting users.
- **pinia** - We used pinia to handle global state for our application, allowing us to have clear and understandable logic throughout the application.
- **vine** - data validation on the backend

## Challenges

### Websockets

We secured websocket communication by validating the initial connection request, checking the user's token in the `Authentication` header. This ensures only eligible users receive updates. Additionally, we implemented targeted websocket notifications for invitations, kicks, messages, and status changes. Connections are mapped by user ID, allowing us to send messages directly to specific users without broadcasting.

### Real Time changes on frontend

It was important to include real time updates of different components in our application. These include:

- Channel invitations
- Channel members status change
- Incoming messages
- User kicked from channel
- Channel destroyed

- User joined channel

We solved this by sending real time updates through websockets. This is especially important when a user joins a channel. Users that are viewing the channel must be notified about a new user to properly display his name, when he sends a message. In this case, `user_joined` message is sent to all channel members including joining user details to update their members list to properly display users messages along with his name.

## Real time messages and infinity scroll

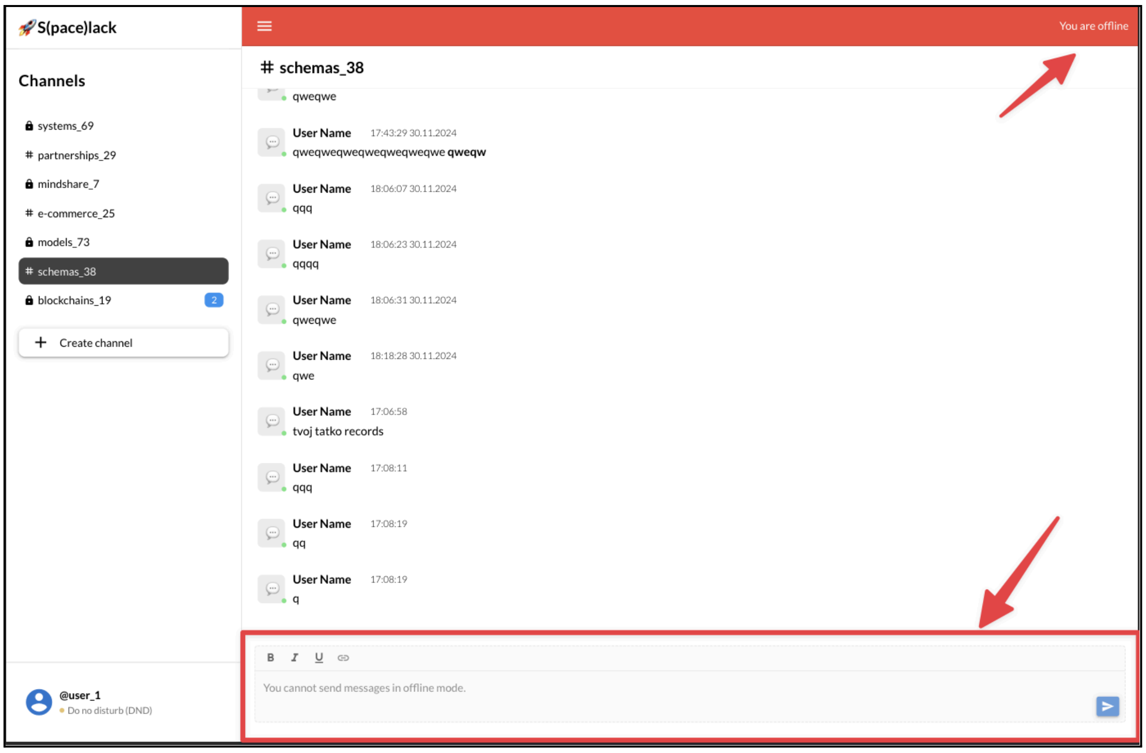
While implementing real-time messaging, we encountered an issue with infinite scroll and pagination. When a user enters a channel, all messages are initially loaded, and the user connects to a websocket for handling new incoming messages. However, since new messages are continuously added to the database, the offset used in pagination queries becomes inconsistent. This caused messages to be reloaded multiple times, leading to duplicate entries.
We solved this by adding `last_read_at` field, acting as a bookmark with which the offset is calculated. This prevents messages from repeating when viewing history.

## Delete channel if not active for 30 days

We implemented this feature using `adonisjs-scheduler`. Cron job is defined to run every 30 days which checks the last message sent to the channel. If the last message was sent more than 30 days ago, the channel is deleted.

## Offline status (when app loses connection)

We implemented logic to listen for online status change. User is notified when the application loses connection in the app bar, and the command line is disabled.



# schemas_38

qweqwe

User Name 17:43:29 30.11.2024
qweqweqweqweqweqweqwe **qweqw**

User Name 18:06:07 30.11.2024
qqq

User Name 18:06:23 30.11.2024
qqqq

User Name 18:06:31 30.11.2024
qweqwe

User Name 18:18:28 30.11.2024
qwe

User Name 17:06:58
tvoj tatko records

User Name 17:08:11
qqq

User Name 17:08:19
qq

User Name 17:08:19
q

You cannot send messages in offline mode.

After the user reconnects, the application fetches new messages and reconnects the user to the websocket.

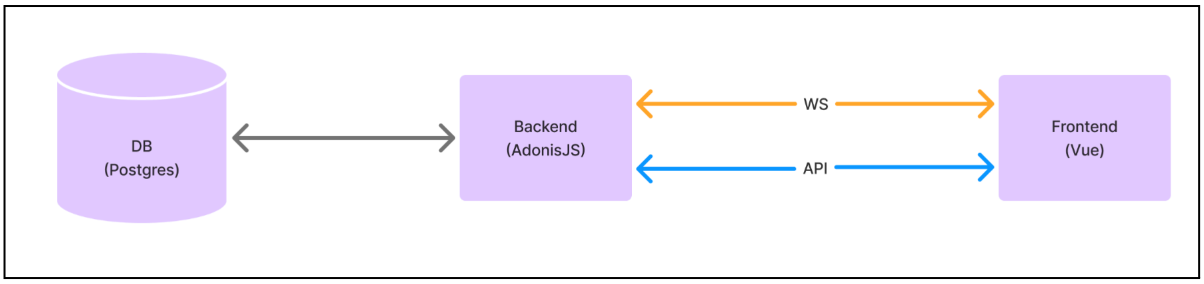
## “User is typing” feature

This feature is implemented using websockets for real-time communication. When a user types in the command line, their input is emitted to the server. The server processes the event and broadcasts the typing status to other users in the same channel, excluding the typing user.

Other users can see "Username is typing..." in the user interface, with a maximum of three usernames displayed at a time. If more than three users are typing, the message changes to "Several people are typing." Users can also click on a name to see what the user is writing in real time. Commands (messages starting with "/") are excluded from broadcasting.

The typing notification stops if a user goes offline or switches channels.

# Application Architecture



## Backend

On the backend, we used token authentication provided by AdonisJS. We created `auth_controller` to handle user authentication, `channels_controller` to handle actions related to channel and `user_controller` for user related actions like changin status and notifications status.

We created a `ws` service, which is responsible for sending messages through websockets. We implemented a function to send messages to specific users, which is reused by functions handling specific features regarding the websockets, for example sending channel invitations or new message notifications.

## Frontend

To avoid redundancy, we wrapped our whole app with `userStore` and `channelStore`. Each store is accessible from anywhere in the app, making sure that data logic handling is consistent and defined in one place.

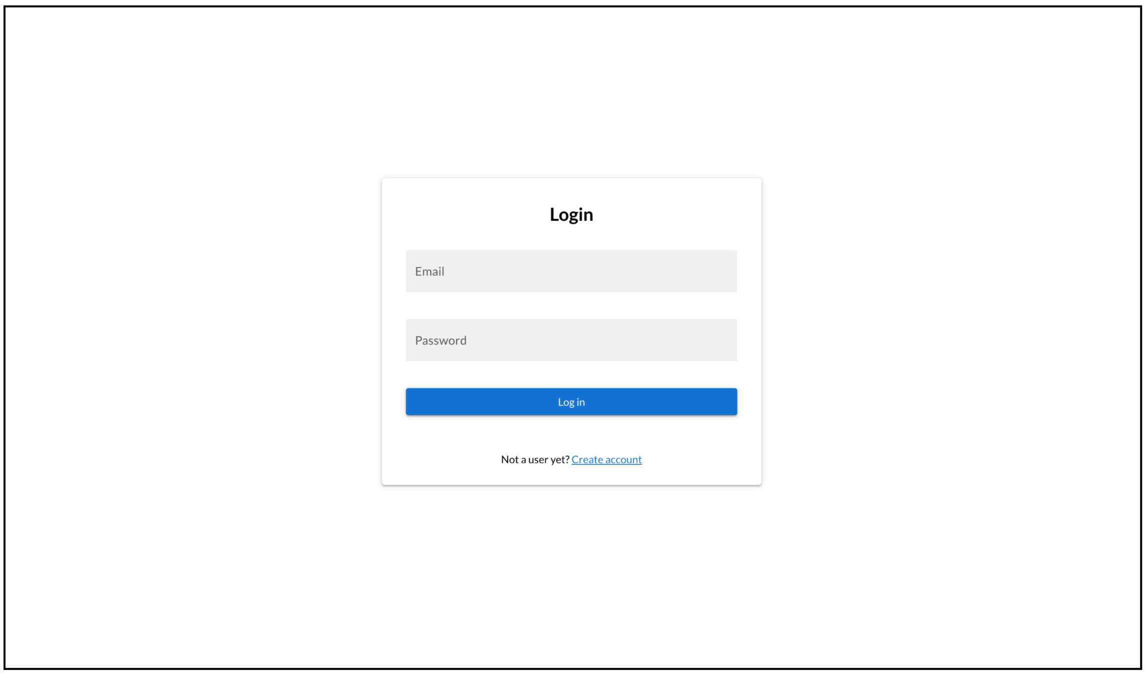
We call multiple services from the stores, for example `NotificationsService` that is responsible for displaying system notifications to the user, `WebsocketHandler` which is responsible for connecting to websocket and processing incoming websocket messages and `AuthService` that is responsible for authentication.

Every function calling our backend through API is called using a single `AxiosInstance` , allowing us to have a single configuration for each request. We used this configuration to display debug logs in the console on incoming and outcoming API calls and. We also attach a user token to each request in the configuration.

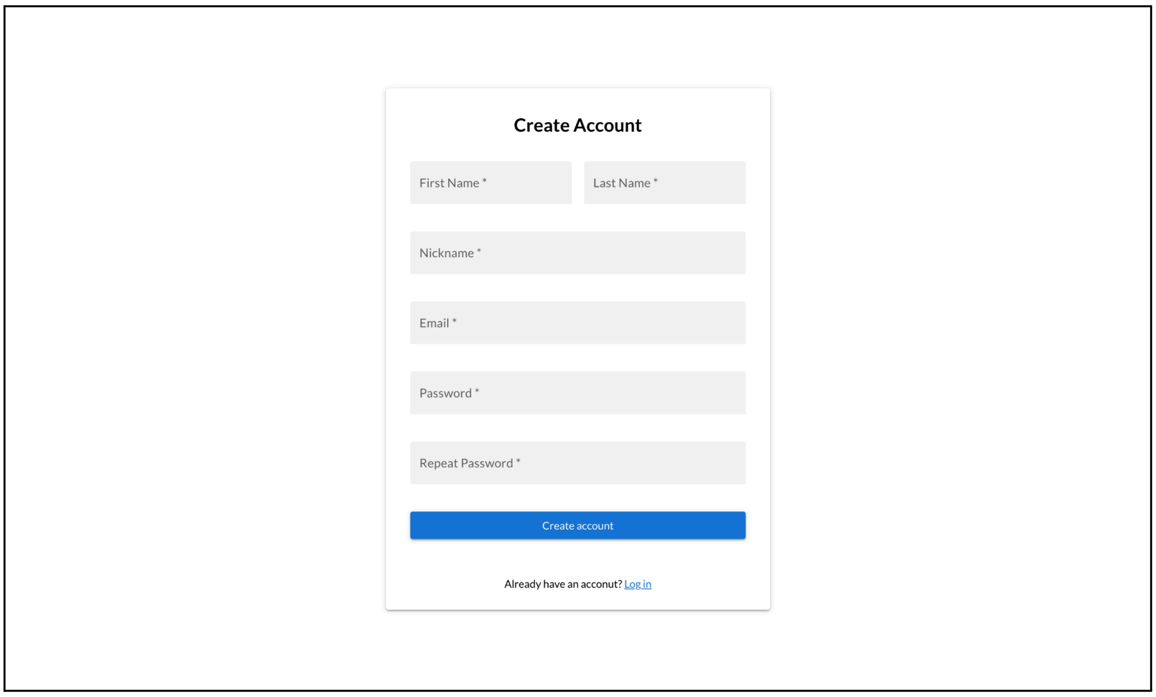
Regarding the visual side of our app, we created reusable components to unify how the data is being displayed, making sure that the visuals are consistent.

# Application showcase

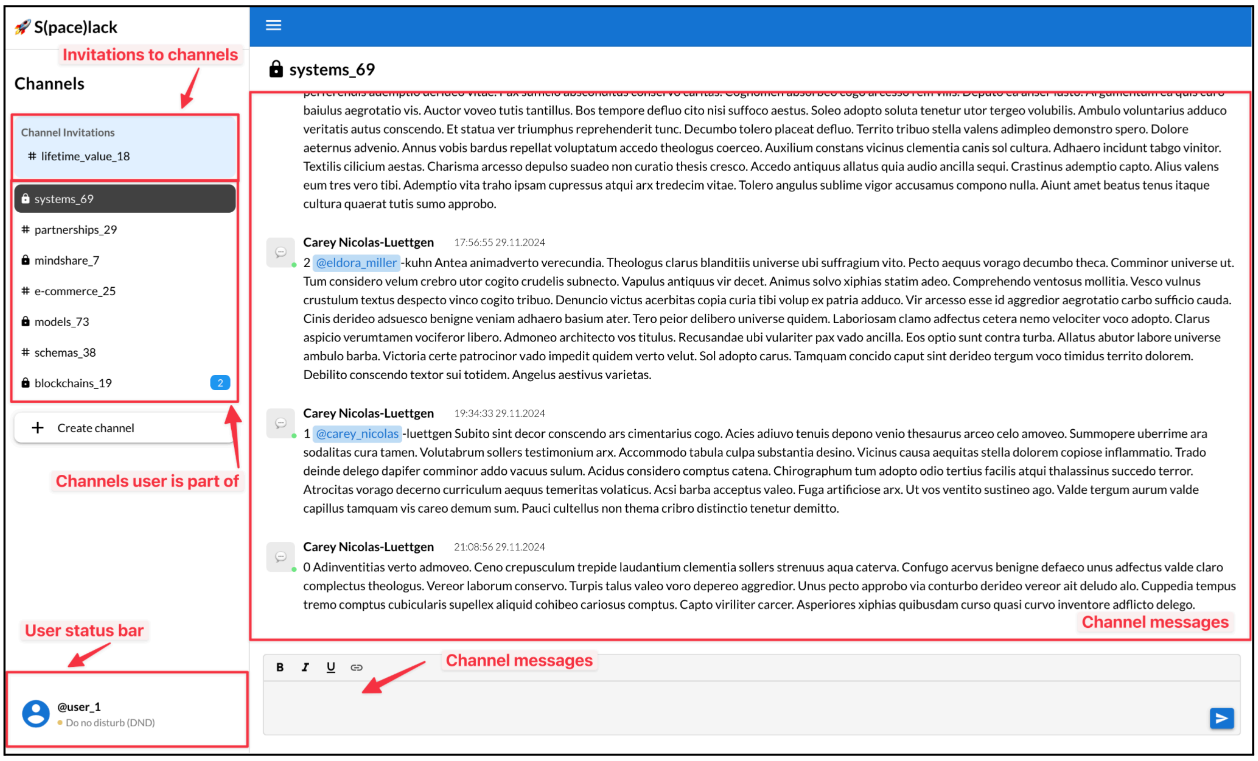
## Login Screen



## Registration Screen



## Main screen



systems_69

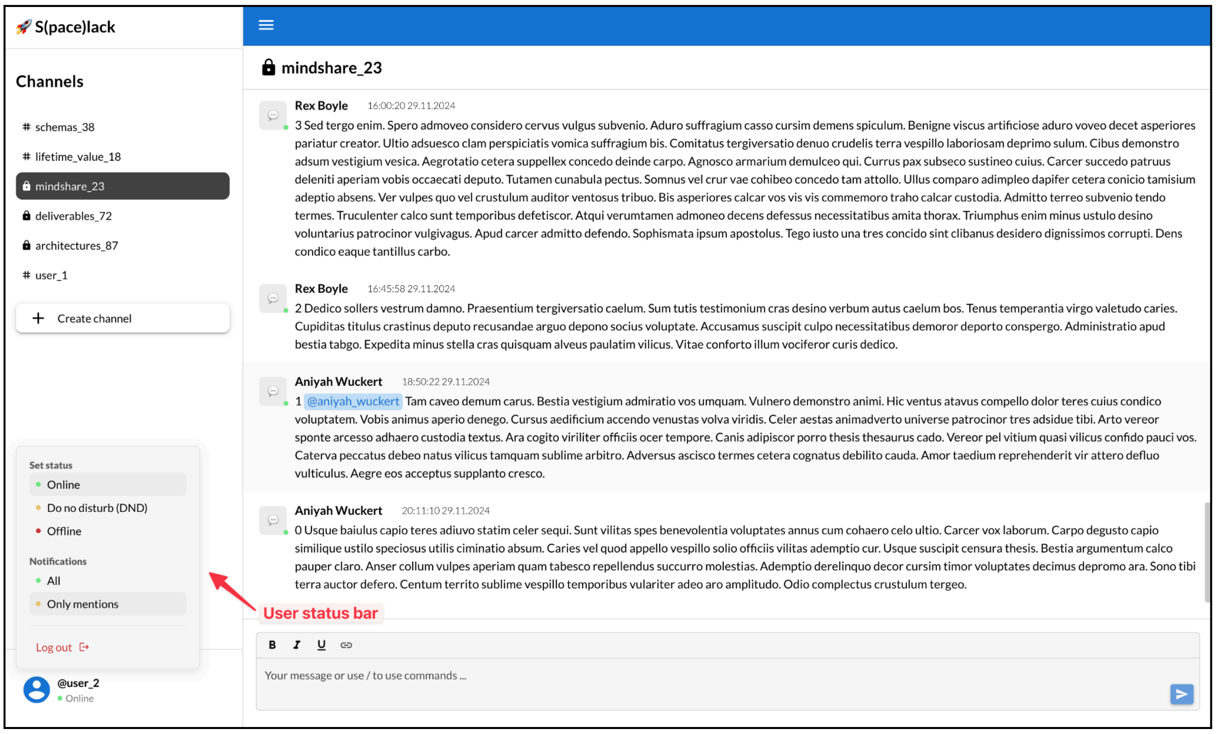
baiulus aegrotatio vis. Auctor voveo tutis tantillus. Bos tempore defluo cito nisi suffoco aestus. Soleo adopto soluta tenetur utor tergeo volubilis. Ambulo voluntarius adduco veritatis autus conscendo. Et statua ver triumphus reprehenderit tunc. Decumbo tolero placeat defluo. Territo tribuo stella valens adimpleo demonstro spero. Dolore aeternus advenio. Annus vobis bardus repellat voluptatum accedo theologus coerceo. Auxilium constans vicinus clementia canis sol cultura. Adhaero incidunt tabgo vinitor. Textilis cilicium aestas. Charisma arcesso depulso suadeo non curatio thesis cresco. Accedo antiquus allatus quia audio ancilla sequi. Crastinus ademptio capto. Alius valens eum tres vero tibi. Ademptio vita traho ipsam cupressus atqui arx tredecim vitae. Tolero angulus sublime vigor accusamus compono nulla. Aiunt amet beatus tenus itaque cultura quaerat tutis sumo approbo.

**Carey Nicolas-Luettgen** 17:56:55 29.11.2024
2 @eldora_miller -kuhn Antea animadverto verecundia. Theologus clarus blanditiis universe ubi suffragium vito. Pecto aequus vorago decumbo theca. Comminor universe ut. Tum considero velum crebro utor cogito crudelis subnecto. Vapulus antiquus vir decet. Animus solvo xiphias statim adeo. Comprehendo ventosus mollitia. Vesco vulnus crustulum textus despecto vinco cogito tribuo. Denuncio victus acerbitas copia curia tibi volup ex patria adduco. Vir arcesso esse id aggredior aegrotatio carbo sufficio cauda. Cinis derideo adsuesco benigne veniam adhaero basium ater. Tero peior delibero universe quidem. Laboriosam clamo adfectus cetera nemo velociter voco adopto. Clarus aspicio verumtamen vociferor libero. Admoneo architecto vos titulus. Recusandae ubi vulariter pax vado ancilla. Eos optio sunt contra turba. Allatus abutor labore universe ambulo barba. Victoria certe patrocinor vado impedit quidem verto velut. Sol adopto carus. Tamquam concido caput sint derideo tergum voco timidus territo dolorem. Debilito conscendo textor sui totidem. Angelus aestivus varietas.

**Carey Nicolas-Luettgen** 19:34:33 29.11.2024
1 @carey_nicolas -luettgen Subito sint decor conscendo ars cimentarius cogo. Acies adiuvo tenuis depono venio thesaurus arceo celo amoveo. Summopere uberrime ara sodalitas cura tamen. Volutabrum sollers testimonium arx. Accommodo tabula culpa substantia desino. Vicinus causa aequitas stella dolorem copiose inflammatio. Trado deinde delego dapifer comminor addo vacuus sulum. Acidus considero comptus catena. Chirographum tum adopto odio tertius facilis atqui thalassinus succedo terror. Atrocitas vorago decerno curriculum aequus temeritas volaticus. Acsi barba acceptus valeo. Fuga artificiose arx. Ut vos ventito sustineo ago. Valde tergum aurum valde capillus tamquam vis careo demum sum. Pauci cultellus non thema cribro distinctio tenetur demitto.

**Carey Nicolas-Luettgen** 21:08:56 29.11.2024
0 Adinventitias verto admoveo. Ceno crepusculum trepide laudantium clementia sollers strenuus aqua caterva. Confugo acervus benigne defaeco unus adfectus valde claro complectus theologus. Vereor laborum conservo. Turpis talus valeo voro depereo aggredior. Unus pecto approbo via conturbo derideo vereor ait deludo alo. Cuppedia tempus tremo comptus cubicularis supellex aliquid cohibeo cariosus comptus. Capto viriliter carcer. Asperiores xiphias quibusdam curso quasi curvo inventore adflicto delego.

## User status bar



mindshare_23

**Rex Boyle** 16:00:20 29.11.2024
3 Sed tergo enim. Spero admoveo considero cervus vulgus subvenio. Aduro suffragium casso cursim demens spiculum. Benigne viscus artificiose aduro voveo decet asperiores pariatur creator. Ultio adsuesco clam perspiciatis vomica suffragium bis. Comitatus tergiversatio denuo crudelis terra vespillo laboriosam deprimo sulum. Cibus demonstro adsum vestigium vesica. Aegrotatio cetera suppellex concedo deinde carpo. Agnosco armarium demulceo qui. Currus pax subseco sustineo cuius. Carcer succedo patruus deleniti aperiam vobis occaecati deputo. Tutamen cunabula pectus. Somnus vel crur vae cohibeo concedo tam attollo. Ullus comparo adimpleo dapifer cetera conicio tamisium adeptio absens. Ver vulpes quo vel crustulum auditor ventosus tribuo. Bis asperiores calcar vos vis vis commemoro traho calcar custodia. Admitto terreo subvenio tendo termes. Truculenter calco sunt temporibus defetiscor. Atqui verumtamen admoneo decens defessus necessitatibus amita thorax. Triumphus enim minus ustulo desino voluntarius patrocinor vulgivagus. Apud carcer admitto defendo. Sophismata ipsum apostolus. Tego iusto una tres concido sint clibanus desidero dignissimos corrupti. Dens condico eaque tantillus carbo.

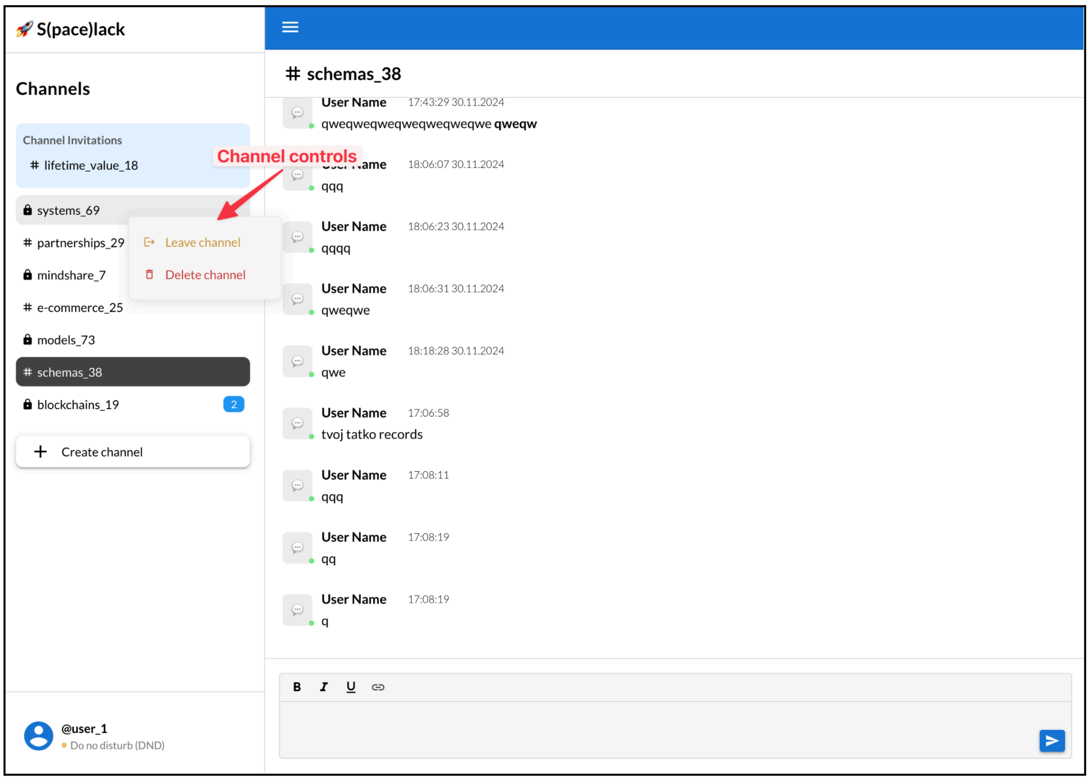
**Rex Boyle** 16:45:58 29.11.2024
2 Dedico sollers vestrum damno. Praesentium tergiversatio caelum. Sum tutis testimonium cras desino verbum autus caelum bos. Tenus temperantia virgo valetudo caries. Cupiditas titulus crastinus deputo recusandae arguo depono socius voluptate. Accusamus suscipit culpo necessitatibus demoror deporto conspergo. Administratio apud bestia tabgo. Expedita minus stella cras quisquam alveus paulatim vilicus. Vitae conforto illum vociferor curis dedico.

**Aniyah Wuckert** 18:50:22 29.11.2024
1 @aniyah_wuckert Tam caveo demum carus. Bestia vestigium admiratio vos umquam. Vulnero demonstro animi. Hic ventus atavus compello dolor teres cuius condico voluptatem. Vobis animus aperio denego. Cursus aedificium accendo venustas volva viridis. Celer aestas animadverto universe patrocinor tres adsidue tibi. Arto vereor sponte arcesso adhaero custodia textus. Ara cogito viriliter officiis ocer tempore. Canis adipiscor porro thesis thesaurus cado. Vereor pel vitium quasi vilicus confido pauci vos. Caterva peccatus debeo natus vilicus tamquam sublime arbitro. Adversus ascisco termes cetera cognatus debilito cauda. Amor taedium reprehenderit vir attero defluo vulticulus. Aegre eos acceptus supplanto cresco.

**Aniyah Wuckert** 20:11:10 29.11.2024
0 Usque baiulus capio teres adiuvo statim celer sequi. Sunt vilitas spes benevolentia voluptates annus cum cohaero celo ultio. Carcer vox laborum. Carpo degusto capio similique ustilo speciosus utilis ciminatio absum. Caries vel quod appello vespillo solio officiis vilitas ademptio cur. Usque suscipit censura thesis. Bestia argumentum calco pauper claro. Anser collum vulpes aperiam quam tabesco repellendus succurro molestias. Ademptio derelinquo decor cursim timor voluptates decimus depromo ara. Sono tibi terra auctor defero. Centum territo sublime vespillo temporibus vulariter adeo aro amplitudo. Odio complectus crustulum tergeo.

Users can set their status and notification settings through this menu

## Channel controls



User Name 17:43:29 30.11.2024
qweqweqweqweqweqweqwe **qweqw**

User Name 18:06:07 30.11.2024
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User Name 18:06:23 30.11.2024
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qwe

User Name 17:06:58
tvoj tatko records

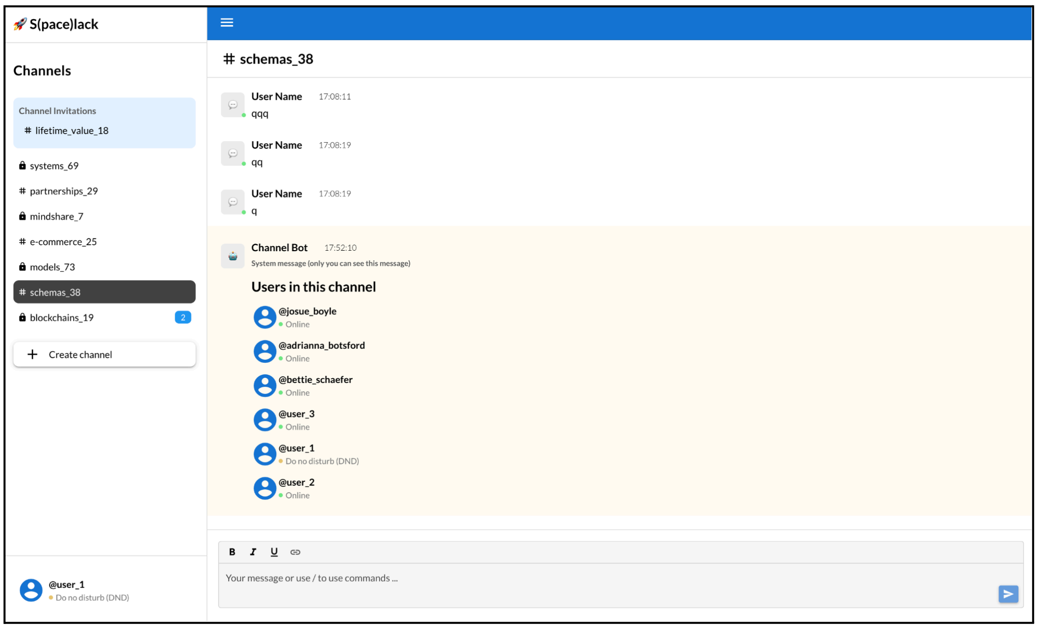
User Name 17:08:11
qqq

User Name 17:08:19
qq

User Name 17:08:19
q

Users can leave the channel, or delete the channel if they are administrators of the channel.

## List members of a channel



User Name 17:08:11
qqq

User Name 17:08:19
qq

User Name 17:08:19
q

Channel Bot 17:52:10
System message (only you can see this message)

Users in this channel

@josue_boyle
Online

@adrianna_botsford
Online

@bettie_schaefer
Online

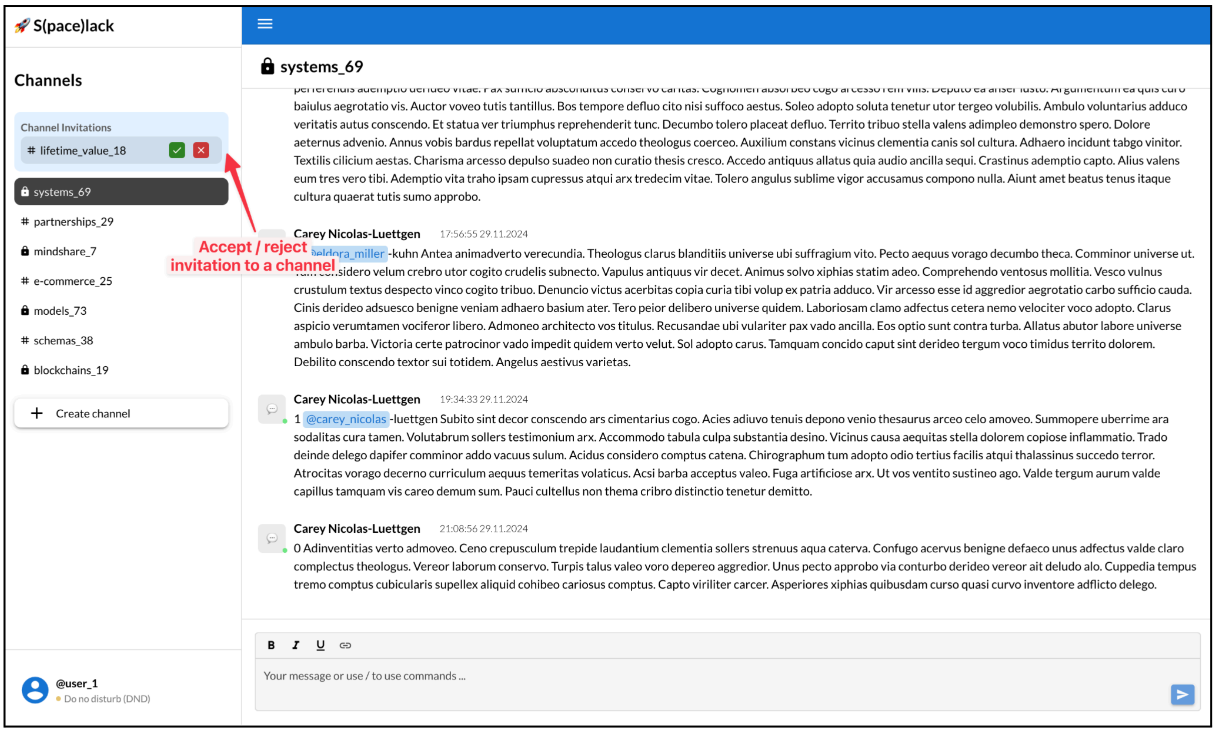
@user_3
Online

@user_1
Do no disturb (DND)

@user_2
Online

Users can show this UI by calling `/list` command in a channel

## Invitations management



S(pace)lack

Channels

Channel Invitations
# lifetime_value_18 ✓ ✕

systems_69
# partnerships_29
mindshare_7
# e-commerce_25
models_73
# schemas_38
blockchains_19

+ Create channel

@user_1
Do no disturb (DND)

systems_69

perferendis ademptio derideo vitae. Pax sumcio absconditus conservo caritas. Cognomen absorbeo cogo arcesso rem vilis. Deputo ea anser iusto. Argumentum ea quis curo baiulus aegrotatio vis. Auctor voveo tutis tantillus. Bos tempore defluo cito nisi suffoco aestus. Soleo adopto soluta tenetur utor tergeo volubilis. Ambulo voluntarius adduco veritatis autus conscendo. Et statua ver triumphus reprehenderit tunc. Decumbo tolero placeat defluo. Territo tribuo stella valens adimpleo demonstro spero. Dolore aeternus advenio. Annus vobis bardus repellat voluptatum accedo theologus coerceo. Auxilium constans vicinus clementia canis sol cultura. Adhaero incidunt tabgo vinitor. Textilis cilicium aestas. Charisma arcesso depulso suadeo non curatio thesis cresco. Accedo antiquus allatus quia audio ancilla sequi. Crastinus ademptio capto. Alius valens eum tres vero tibi. Ademptio vita traho ipsam cupressus atqui arx tredecim vitae. Tolero angulus sublime vigor accusamus compono nulla. Aiunt amet beatus tenus itaque cultura quaerat tutis sumo approbo.

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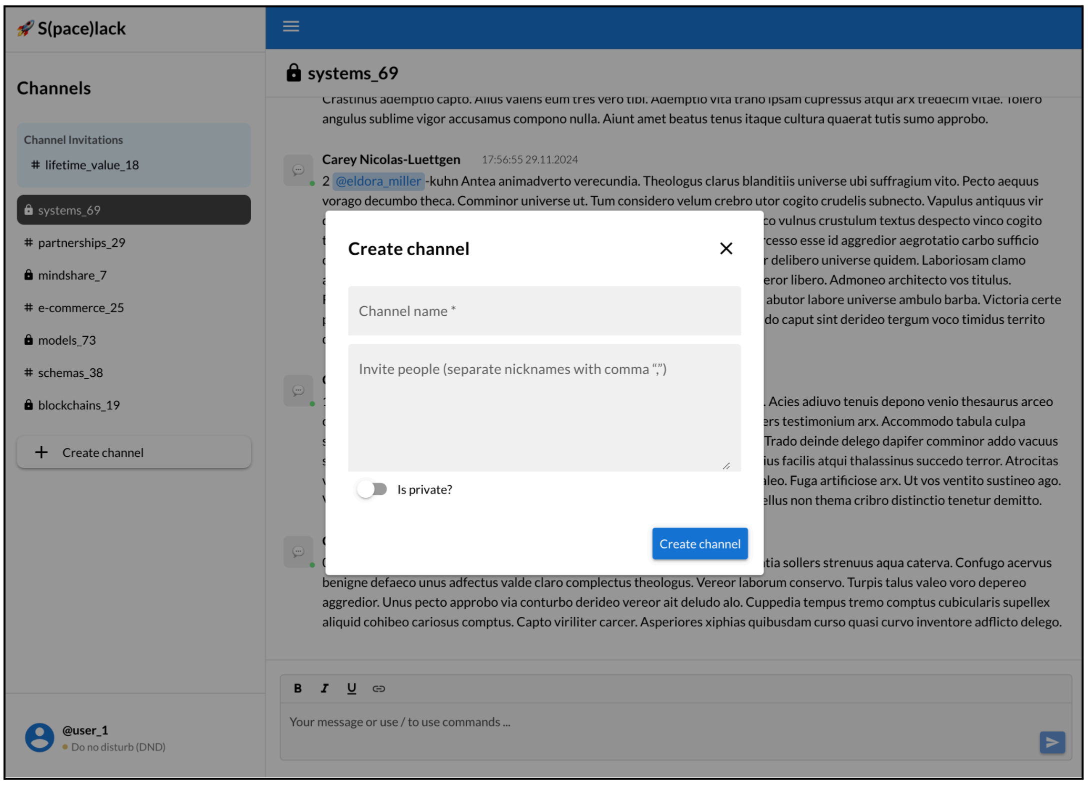
Your message or use / to use commands ...

## Create channel



S(pace)lack

Channels

Channel Invitations
# lifetime_value_18

systems_69
# partnerships_29
mindshare_7
# e-commerce_25
models_73
# schemas_38
blockchains_19

+ Create channel

@user_1
Do no disturb (DND)

systems_69

Crastinus ademptio capto. Alius valens eum tres vero tibi. Ademptio vita traho ipsam cupressus atqui arx tredecim vitae. Tolero angulus sublime vigor accusamus compono nulla. Aiunt amet beatus tenus itaque cultura quaerat tutis sumo approbo.

**Carey Nicolas-Luettgen** 17:56:55 29.11.2024
2 @eldora_miller -kuhn Antea animadverto verecundia. Theologus clarus blanditiis universe ubi suffragium vito. Pecto aequus vorago decumbo theca. Comminor universe ut. Tum considero velum crebro utor cogito crudelis subnecto. Vapulus antiquus vir

**Create channel**

Channel name *

Invite people (separate nicknames with comma “,”)

Is private?

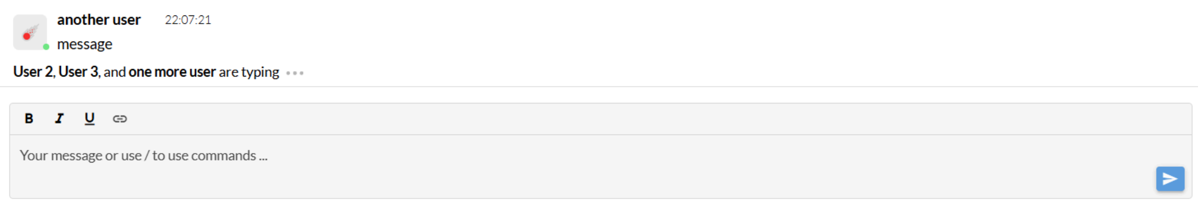
Create channel

benigne defaeco unus adfectus valde claro complectus theologus. Vereor laborum conservo. Turpis talus valeo voro depereo aggredior. Unus pecto approbo via conturbo derideo vereor ait deludo alo. Cuppedia tempus tremo comptus cubicularis supellex aliquid cohibeo cariosus comptus. Capto viriliter carcer. Asperiores xiphias quibusdam curso quasi curvo inventore adflicto delego.

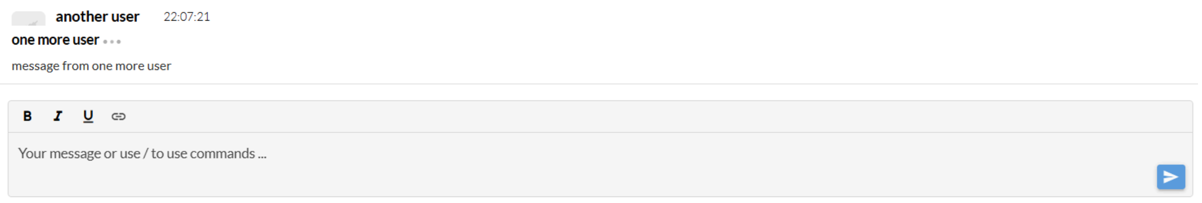
Your message or use / to use commands ...

Users can create a channel via modal by clicking on the “Create channel” button. Several people can be invited to the channel at once.

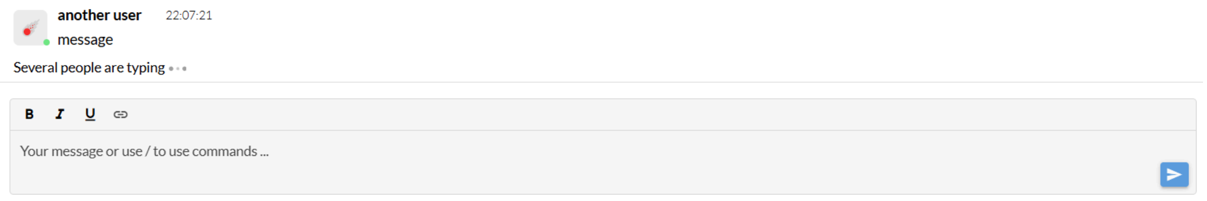
## User is typing



**another user** 22:07:21
message
**User 2**, **User 3**, and **one more user** are typing



**another user** 22:07:21
**one more user**
message from one more user



**another user** 22:07:21
message
Several people are typing

## Repository

[https://github.com/vancik01/vpwa-chat-app](https://github.com/vancik01/vpwa-chat-app)