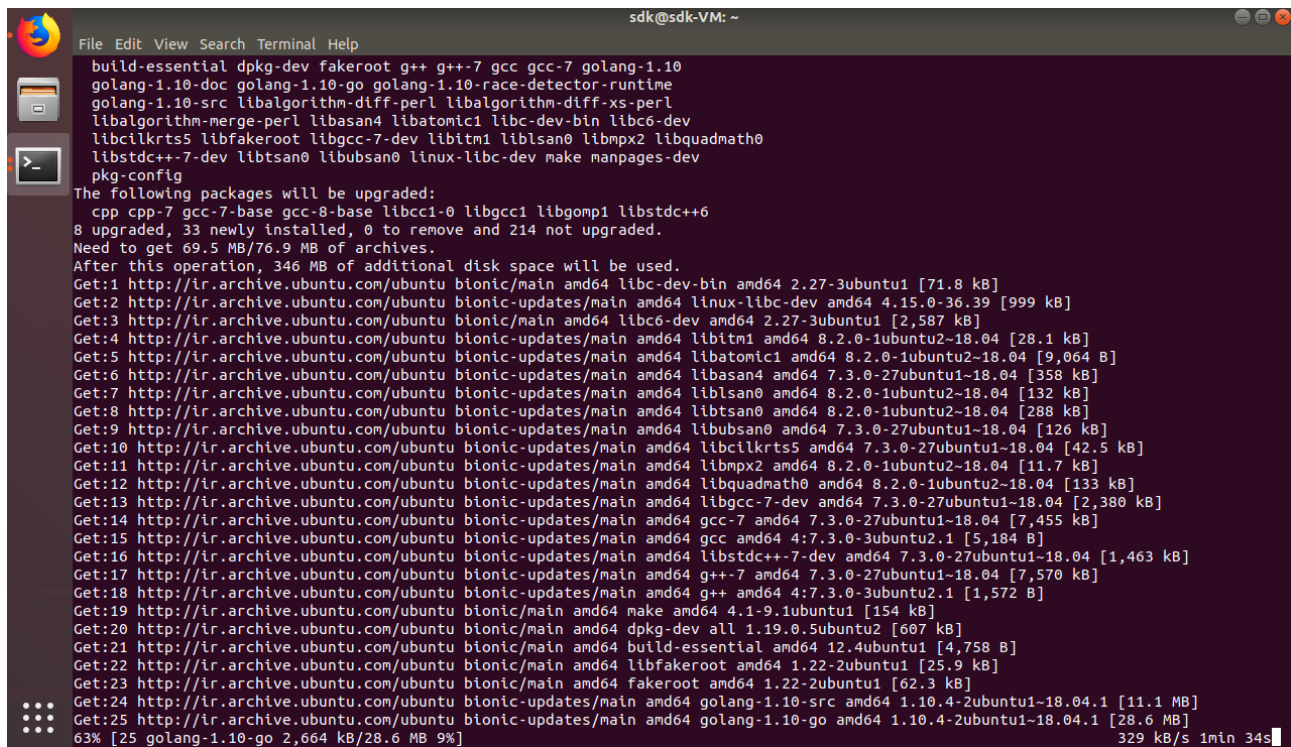


Install golang on Ubuntu 18.04 desktop

The Go project's official download page is at <https://golang.org/dl/>

There are some other options for Debian based systems like Ubuntu. These packages were not created by the Go project, but make installation process easy.

```
$ sudo add-apt-repository ppa:gophers/archive
$ sudo apt-get update
$ sudo apt-get install -y golang-go
```



```
sdk@sdk-VM: ~
File Edit View Search Terminal Help

build-essential dpkg-dev fakeroot g++ g++-7 gcc gcc-7 golang-1.10
golang-1.10-doc golang-1.10-go golang-1.10-race-detector-runtime
golang-1.10-src libalgorithm-diff-perl libalgorithm-diff-xs-perl
libalgorithm-merge-perl libasan4 libatomic1 libc-dev-bin libc6-dev
libcilkrts5 libfakeroot libgcc-7-dev libitm1 liblsan0 libmpx2 libquadmath0
libstdc++-7-dev libtsan0 libubsan0 linux-libc-dev make manpages-dev
pkg-config

The following packages will be upgraded:
  cpp cpp-7 gcc-7-base gcc-8-base libcc1-0 libgcc1 libgomp1 libstdc++6
8 upgraded, 33 newly installed, 0 to remove and 214 not upgraded.
Need to get 69.5 MB/76.9 MB of archives.
After this operation, 346 MB of additional disk space will be used.
Get:1 http://ir.archive.ubuntu.com/ubuntu bionic/main amd64 libc-dev-bin amd64 2.27-3ubuntu1 [71.8 kB]
Get:2 http://ir.archive.ubuntu.com/ubuntu bionic-updates/main amd64 linux-libc-dev amd64 4.15.0-36.39 [999 kB]
Get:3 http://ir.archive.ubuntu.com/ubuntu bionic/main amd64 libc6-dev amd64 2.27-3ubuntu1 [2,587 kB]
Get:4 http://ir.archive.ubuntu.com/ubuntu bionic-updates/main amd64 libitm1 amd64 8.2.0-1ubuntu2-18.04 [28.1 kB]
Get:5 http://ir.archive.ubuntu.com/ubuntu bionic-updates/main amd64 libatomic1 amd64 8.2.0-1ubuntu2-18.04 [9,064 B]
Get:6 http://ir.archive.ubuntu.com/ubuntu bionic-updates/main amd64 libasan4 amd64 7.3.0-27ubuntu1-18.04 [358 kB]
Get:7 http://ir.archive.ubuntu.com/ubuntu bionic-updates/main amd64 liblsan0 amd64 8.2.0-1ubuntu2-18.04 [132 kB]
Get:8 http://ir.archive.ubuntu.com/ubuntu bionic-updates/main amd64 libtsan0 amd64 8.2.0-1ubuntu2-18.04 [288 kB]
Get:9 http://ir.archive.ubuntu.com/ubuntu bionic-updates/main amd64 libubsan0 amd64 7.3.0-27ubuntu1-18.04 [126 kB]
Get:10 http://ir.archive.ubuntu.com/ubuntu bionic-updates/main amd64 libcilkrts5 amd64 7.3.0-27ubuntu1-18.04 [42.5 kB]
Get:11 http://ir.archive.ubuntu.com/ubuntu bionic-updates/main amd64 libmpx2 amd64 8.2.0-1ubuntu2-18.04 [11.7 kB]
Get:12 http://ir.archive.ubuntu.com/ubuntu bionic-updates/main amd64 libquadmath0 amd64 8.2.0-1ubuntu2-18.04 [133 kB]
Get:13 http://ir.archive.ubuntu.com/ubuntu bionic-updates/main amd64 libgcc-7-dev amd64 7.3.0-27ubuntu1-18.04 [2,380 kB]
Get:14 http://ir.archive.ubuntu.com/ubuntu bionic-updates/main amd64 gcc-7 amd64 7.3.0-27ubuntu1-18.04 [7,455 kB]
Get:15 http://ir.archive.ubuntu.com/ubuntu bionic-updates/main amd64 gcc amd64 4:7.3.0-3ubuntu2.1 [5,184 B]
Get:16 http://ir.archive.ubuntu.com/ubuntu bionic-updates/main amd64 libstdc++-7-dev amd64 7.3.0-27ubuntu1-18.04 [1,463 kB]
Get:17 http://ir.archive.ubuntu.com/ubuntu bionic-updates/main amd64 g++-7 amd64 7.3.0-27ubuntu1-18.04 [7,570 kB]
Get:18 http://ir.archive.ubuntu.com/ubuntu bionic-updates/main amd64 g++ amd64 4:7.3.0-3ubuntu2.1 [1,572 B]
Get:19 http://ir.archive.ubuntu.com/ubuntu bionic/main amd64 make amd64 4.1-9.1ubuntu1 [154 kB]
Get:20 http://ir.archive.ubuntu.com/ubuntu bionic/main amd64 dpkg-dev all 1.19.0.5ubuntu2 [607 kB]
Get:21 http://ir.archive.ubuntu.com/ubuntu bionic/main amd64 build-essential amd64 12.4ubuntu1 [4,758 B]
Get:22 http://ir.archive.ubuntu.com/ubuntu bionic/main amd64 libfakeroot amd64 1.22-2ubuntu1 [25.9 kB]
Get:23 http://ir.archive.ubuntu.com/ubuntu bionic/main amd64 fakeroot amd64 1.22-2ubuntu1 [62.3 kB]
Get:24 http://ir.archive.ubuntu.com/ubuntu bionic-updates/main amd64 golang-1.10-src amd64 1.10.4-2ubuntu1-18.04.1 [11.1 MB]
Get:25 http://ir.archive.ubuntu.com/ubuntu bionic-updates/main amd64 golang-1.10-go amd64 1.10.4-2ubuntu1-18.04.1 [28.6 MB]
63% [25 golang-1.10-go 2,664 kB/28.6 MB 9%] 329 kB/s 1min 34s
```

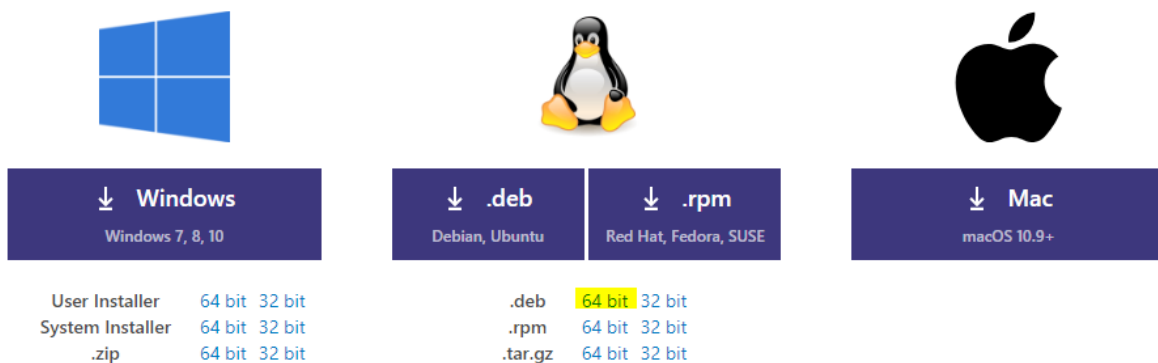
```
$ go version
$ go env
```

```
sdk@sdk-VM:~$ go version
go version go1.10.4 linux/amd64
sdk@sdk-VM:~$ go env
GOARCH="amd64"
GOBIN=""
GOCACHE="/home/sdk/.cache/go-build"
GOEXE=""
GOHOSTARCH="amd64"
GOHOSTOS="linux"
GOOS="linux"
GOPATH="/home/sdk/go"
GORACE=""
GOROOT="/usr/lib/go-1.10"
GOTMPDIR=""
GOTOOLDIR="/usr/lib/go-1.10/pkg/tool/linux_amd64"
GCCGO="gccgo"
CC="gcc"
CXX="g++"
CGO_ENABLED="1"
CGO_CFLAGS="-g -O2"
CGO_CPPFLAGS=""
CGO_CXXFLAGS="-g -O2"
CGO_FFLAGS="-g -O2"
CGO_LDFLAGS="-g -O2"
PKG_CONFIG="pkg-config"
GOGCCFLAGS="-fPIC -m64 -pthread -fmessage-length=0 -fdebug-prefix-map=/tmp/go-build627875099=/tmp/go-build -gno-record-gcc-switches"
sdk@sdk-VM:~$
```

Install Visual Studio Code on Ubuntu 18.04 desktop

The Visual Studio Code official download page is at <https://code.visualstudio.com/Download>

Open your browser and go to the Visual Studio Code download page.
Click on the .deb link for Linux 64 Bit.



If prompted, click on Save File.

After the file downloads, open your terminal and go to the Downloads folder.

```
$ cd ~/Downloads
```

Next, run this command to install Visual Studio Code

```
$ sudo dpkg -i code_x.xx.x-xxxxxxxxxx_amd64.deb
```

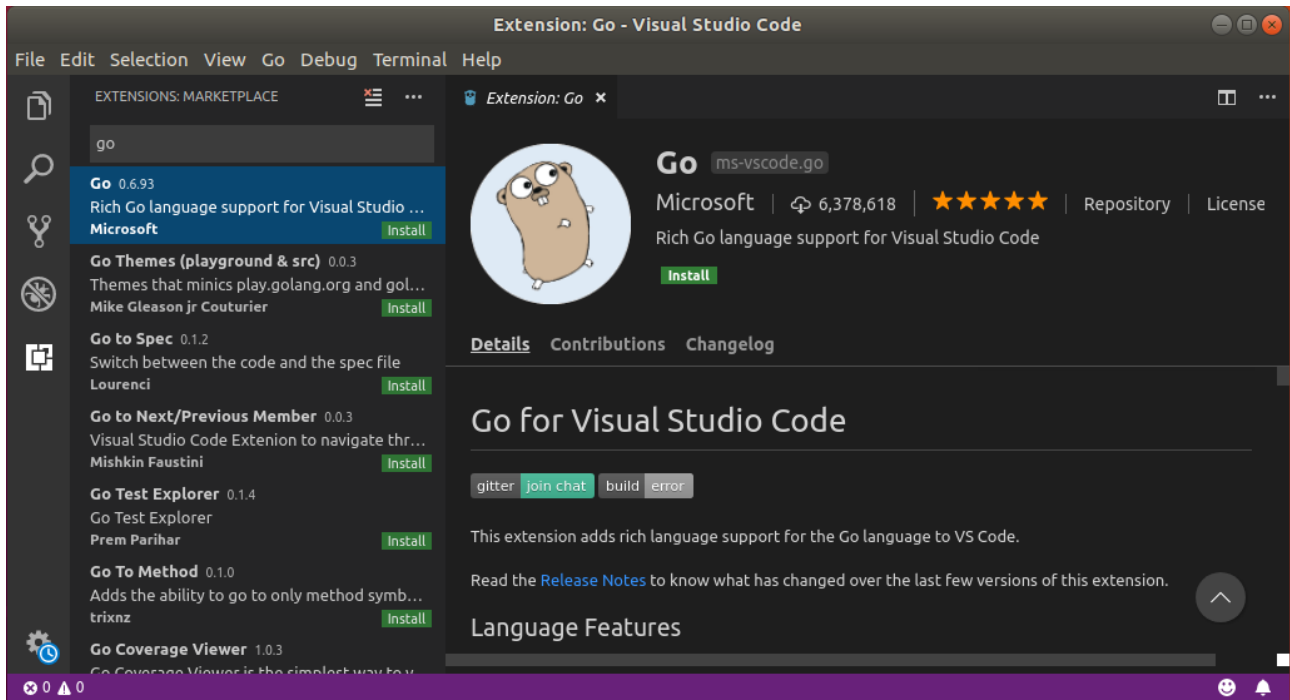
```
sdk@sdk-VM:~$ cd ~/Downloads/
sdk@sdk-VM:~/Downloads$ sudo dpkg -i code_1.28.2-1539735992_amd64.deb
[sudo] password for sdk:
(Reading database ... 177125 files and directories currently installed.)
Preparing to unpack code_1.28.2-1539735992_amd64.deb ...
Unpacking code (1.28.2-1539735992) over (1.28.2-1539735992) ...
Setting up code (1.28.2-1539735992) ...
Processing triggers for gnome-menus (3.13.3-11ubuntu1.1) ...
Processing triggers for desktop-file-utils (0.23-1ubuntu3.18.04.1) ...
Processing triggers for mime-support (3.60ubuntu1) ...
sdk@sdk-VM:~/Downloads$
```

Visual Studio Code is now installed.

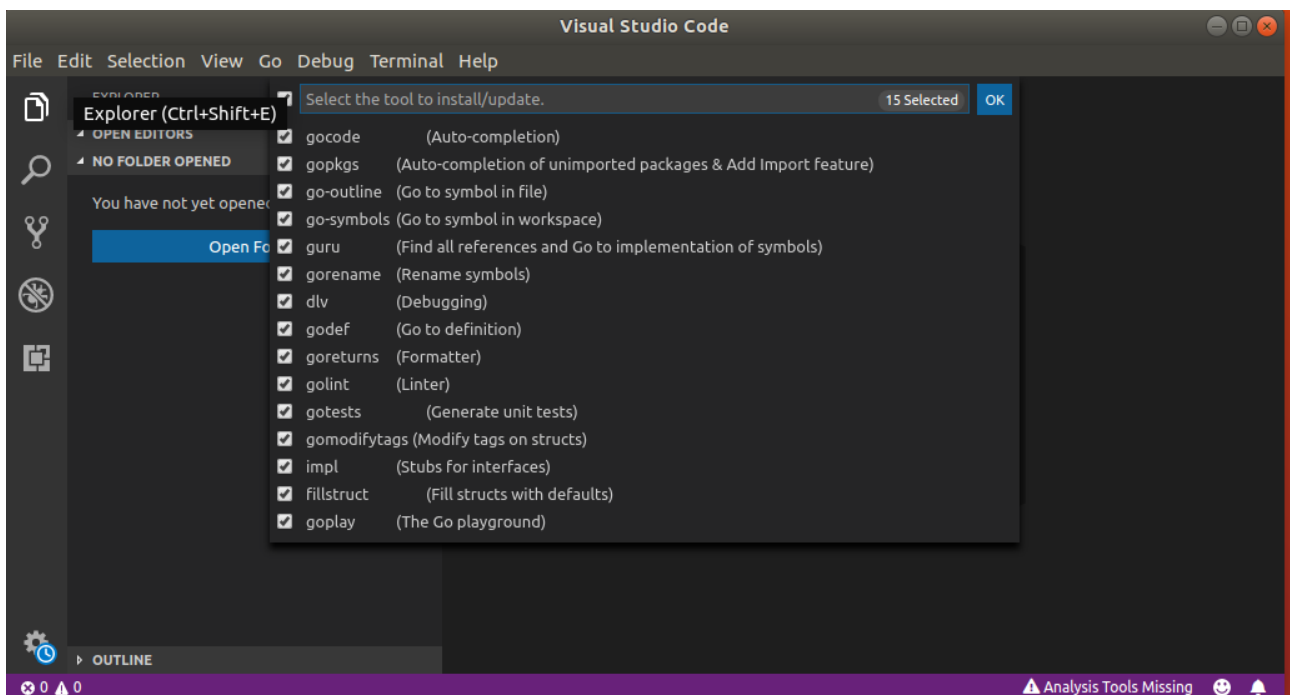
Click on the applications icon and type visual studio code in the Search Box to find it.

Install Go extension and Go tools on VS Code

Open Visual Studio Code select extension tab search for go and install Go extension



Press *Ctrl+Shift+P* to open command bar and type *Go: Install/Update Tools* .
Select all packages and press OK to install



Clone sdk-river project repository

Make sure you have git, you can install it by this command if its not already installed.

```
$ sudo apt install git
```

Now clone project repository from <http://git.ronaksoftware.com/ronak/sdk-river>

```
$ mkdir -p ~/go/src/git.ronaksoftware.com/ronak/  
$ cd ~/go/src/git.ronaksoftware.com/ronak/  
$ git clone http://git.ronaksoftware.com/ronak/sdk-river  
$ cd sdk-river/  
$ git branch -a  
$ git checkout user/q6int  
$ git pull --all
```

```
sdk@sdk-VM:~$ mkdir -p ~/go/src/git.ronaksoftware.com/ronak/  
sdk@sdk-VM:~$ cd ~/go/src/git.ronaksoftware.com/ronak/  
sdk@sdk-VM:~/go/src/git.ronaksoftware.com/ronak$ git clone http://git.ronaksoftware.com/ronak/sdk-river  
Cloning into 'sdk-river'...  
warning: redirecting to http://git.ronaksoftware.com/ronak/sdk-river.git/  
remote: Enumerating objects: 181, done.  
remote: Counting objects: 100% (181/181), done.  
remote: Compressing objects: 100% (93/93), done.  
remote: Total 3080 (delta 105), reused 158 (delta 86)  
Receiving objects: 100% (3080/3080), 12.36 MiB | 382.00 KiB/s, done.  
Resolving deltas: 100% (1569/1569), done.  
sdk@sdk-VM:~/go/src/git.ronaksoftware.com/ronak$ cd sdk-river/  
sdk@sdk-VM:~/go/src/git.ronaksoftware.com/ronak/sdk-river$ git branch -a  
* master  
  remotes/origin/HEAD -> origin/master  
  remotes/origin/ehsan  
  remotes/origin/master  
  remotes/origin/reza  
  remotes/origin/user/q6int  
sdk@sdk-VM:~/go/src/git.ronaksoftware.com/ronak/sdk-river$ git checkout user/q6int  
Branch 'user/q6int' set up to track remote branch 'user/q6int' from 'origin'.  
Switched to a new branch 'user/q6int'  
sdk@sdk-VM:~/go/src/git.ronaksoftware.com/ronak/sdk-river$ git pull --all  
Fetching origin  
warning: redirecting to http://git.ronaksoftware.com/ronak/sdk-river.git/  
Already up to date.  
sdk@sdk-VM:~/go/src/git.ronaksoftware.com/ronak/sdk-river$
```

Install/Update govendor and dependencies

Install govendor and update dependencies by this commands

```
$ cd ~/go/git.ronaksoftware.com/ronak/sdk-river
$ rm -R vendor
$ env GIT_TERMINAL_PROMPT=1 go get -v --insecure
$ sudo apt-get install govendor
$ govendor init
$ govendor remove +u
$ govendor add +e
$ govendor update +v
```

```
sdk@sdk-VM:~$ cd ~/go/src/git.ronaksoftware.com/ronak/sdk-river/
sdk@sdk-VM:~/go/src/git.ronaksoftware.com/ronak/sdk-river$ rm -R vendor/
sdk@sdk-VM:~/go/src/git.ronaksoftware.com/ronak/sdk-river$ env GIT_TERMINAL_PROMPT=1 go get -v --insecure
github.com/beeker1121/goque/vendor/github.com/syndtr/goleveldb/leveldb/util
github.com/beeker1121/goque/vendor/github.com/syndtr/goleveldb/leveldb/comparer
github.com/beeker1121/goque/vendor/github.com/syndtr/goleveldb/leveldb/storage
github.com/beeker1121/goque/vendor/github.com/syndtr/goleveldb/leveldb/cache
github.com/beeker1121/goque/vendor/github.com/syndtr/goleveldb/leveldb/filter
github.com/beeker1121/goque/vendor/github.com/syndtr/goleveldb/leveldb/opt
github.com/beeker1121/goque/vendor/github.com/golang/snappy
github.com/beeker1121/goque/vendor/github.com/syndtr/goleveldb/leveldb/errors
github.com/beeker1121/goque/vendor/github.com/syndtr/goleveldb/leveldb/iterator
github.com/beeker1121/goque/vendor/github.com/syndtr/goleveldb/leveldb/journal
github.com/dustin/go-humanize
github.com/beeker1121/goque/vendor/github.com/syndtr/goleveldb/leveldb/memdb
github.com/beeker1121/goque/vendor/github.com/syndtr/goleveldb/leveldb/table
github.com/gorilla/websocket
github.com/beeker1121/goque/vendor/github.com/syndtr/goleveldb/leveldb
github.com/jinzhu/inflection
github.com/jinzhu/gorm
github.com/beeker1121/goque
github.com/juju/ratelimit
github.com/mailru/easyjson/jlexer
github.com/mailru/easyjson/buffer
github.com/mailru/easyjson/jwriter
github.com/mailru/easyjson
github.com/mattn/go-sqlite3
github.com/monnand/dhcx
go.uber.org/atomic
go.uber.org/multierr
go.uber.org/zap/buffer
go.uber.org/zap/internal/bufferpool
go.uber.org/zap/internal/color
go.uber.org/zap/internal/exit
go.uber.org/zap/zapcore
go.uber.org/zap
git.ronaksoftware.com/ronak/sdk-river
sdk@sdk-VM:~/go/src/git.ronaksoftware.com/ronak/sdk-river$ govendor init
sdk@sdk-VM:~/go/src/git.ronaksoftware.com/ronak/sdk-river$ govendor remove +u
sdk@sdk-VM:~/go/src/git.ronaksoftware.com/ronak/sdk-river$ govendor add +e
sdk@sdk-VM:~/go/src/git.ronaksoftware.com/ronak/sdk-river$ govendor update +v
sdk@sdk-VM:~/go/src/git.ronaksoftware.com/ronak/sdk-river$
```

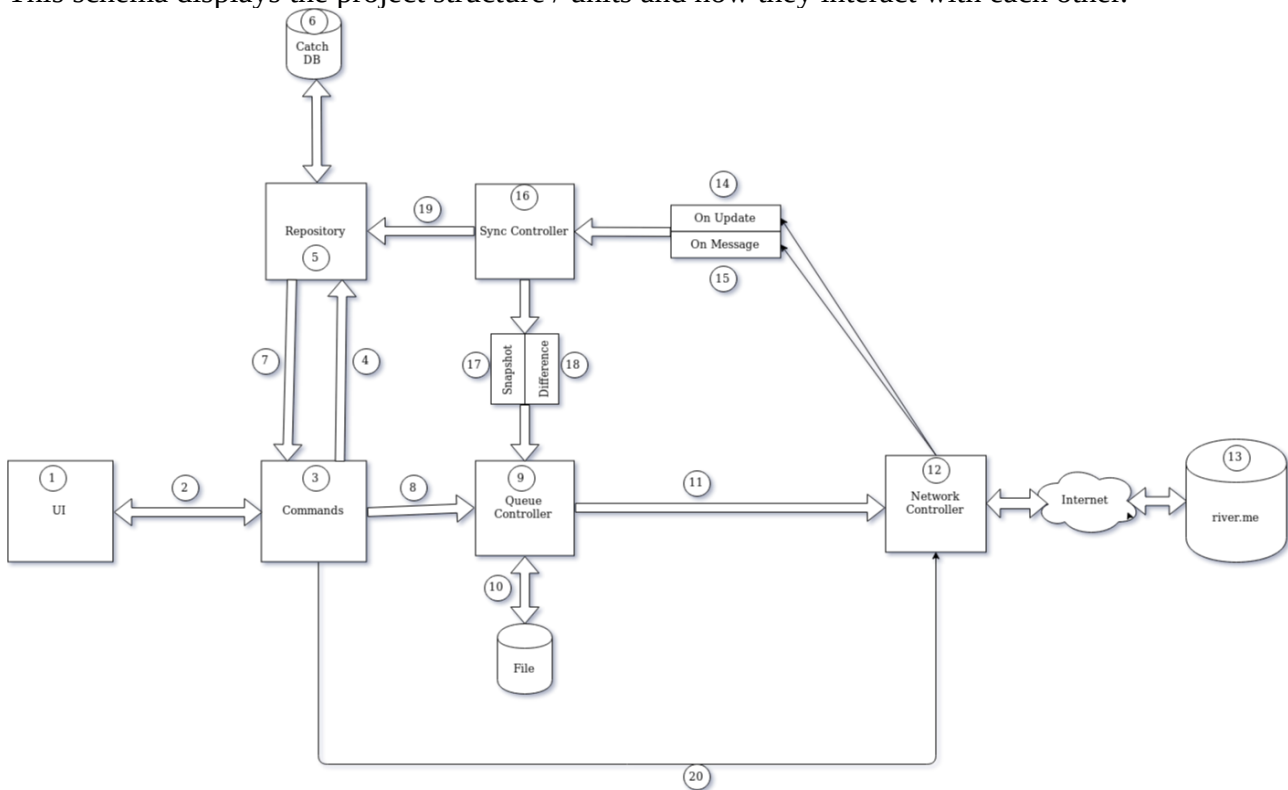
Project and it's all dependencies has been pulled and installed.

In order to open project with Visual Studio Code open terminal and enter this command

```
$ code ~/go/src/git.ronaksoftware.com/ronak/sdk-river
```

SDK-River Flow Diagram

This schema displays the project structure / units and how they interact with each other.



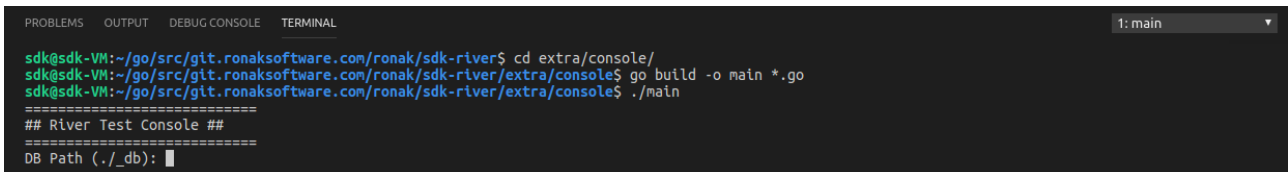
- (1) Android / IOS / Web Clients
- (2) UI passes its request to Command unit / Receive update notification
- (3) Command unit process UI request and also it notify UI from new updates, also it'll check if UI request already cached or not if not cached it'll pass request to Queue Unit to hand it over network
- (4) Check request is already cached or not
- (5) Repository layer to store and fetch data from cache
- (6) Cache DB currently using Sqlite database
- (7) cached response or received new updates that already been saved in DB
- (8) requests that does not exist in cache DB should be sent to server
- (9) Queue unit is persistent that saves requests to disk and pass them to Network unit
- (10) Persistent storage to save queued items currently using LevelDB
- (11) Queued request that handed over to Network unit
- (12) Network unit role is to receive and send request from/to server
- (13) River server
- (14) Updates from server that are sent in response of other sessions/users request related to you
- (15) Updates from server that are direct response of this session requests
- (16) Sync unit role is to sync/cache client with server
- (17) Snapshot sync occurs when client needs a state point in order to check its state from that point forward/backward to cache requests/updates
- (18) Difference sync occurs when there is a minor changes from snapshot point, less than 1000 updates
- (19) Pass received updates from server to Repository unit in order to be cached and notify UI to change itself
- (20) Real time requests that should not be queued and handed over to network directly

River CLI Test Console

There is a CLI for test and interact with river server through SDK.

Compile CLI:

```
$ cd ~/go/src/git.ronaksoftware.com/ronak/sdk-river/extra/console
$ go build -o main *.go
$ ./main
```

A screenshot of a terminal window with a dark background. The terminal shows the following commands and output:

```
sdksdk-VM:~/go/src/git.ronaksoftware.com/ronak/sdk-river$ cd extra/console/
sdksdk-VM:~/go/src/git.ronaksoftware.com/ronak/sdk-river/extra/console$ go build -o main *.go
sdksdk-VM:~/go/src/git.ronaksoftware.com/ronak/sdk-river/extra/console$ ./main
=====
## River Test Console ##
=====
DB Path (./_db):
```

 The terminal window has tabs for PROBLEMS, OUTPUT, DEBUG CONSOLE, and TERMINAL. The current tab is TERMINAL. The prompt is 1: main.

Registration

```
$ >>> Auth SendCode
$ Phone : XXXXXXXXXXXX
$ Phone, PhoneCodeHash: XXXXXXXXXXXX, 5oRljahb
$ $ >>> Auth Register
$ Phone: XXXXXXXXXXXX
$ Phone Code: YYYY
$ Phone Code Hash: 5oRljahb
$ First Name: FName
$ Last Name: LName
$ FName LName (35013678194907)
```

Login

```
$ >>> Auth SendCode
$ Phone : XXXXXXXXXXXX
$ Phone, PhoneCodeHash: XXXXXXXXXXXX, uKFfAA0J
$ $ >>> Auth Login
$ Phone: XXXXXXXXXXXX
$ Phone Code: YYYY
$ Phone Code Hash: uKFfAA0J
$ FName LName (35013678194907)
```

In order to see / select other command / options press Tab in CLI.

CLI Console Commands

Auth :

SendCode	returns a hash code and send a code via sms
Register	register new account
Login	login with existing account
Logout	logout
Recall	send recall request to receive update via websocket
Init	create new auth key

Contact :

Import	add new contact
Get	display existing contacts

Messages :

Send	send new message
GetDialogs	display all existing chat dialogs
GetDialog	display certain chat dialogs
MessageGetHistory	display messages by MinID and MaxID
MessageReadHistory	send message seen request
MessageSetTyping	send is typing request
MessagesGet	get certain message by its id

SDK :

ConnInfo	display connection info
SetLogLevel	change logs level to see more/less details
GetDiffrence	sync request

User :

UsersGet	get certain user by its id
----------	----------------------------

Debug :

SendTyping	burst set typing requests
MessageSendByNetwork	burst send message requests directly on wire
MessageSendByQueue	burst send message requests to queue