National Research University
Higher School of Economics

Faculty of Business and Management

Department
for Management of Information Systems and Digital Infrastructure

Programming course team project
“VK Audio Telegram Bot”

Team members: Shilov Vladimir (154(2) gr.)
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Supervisor: Sergey G. Efremov,
senior lecturer

Moscow, 2016

Annotation

The developed service consists of a Telegram bot, a database and logic, which connects the bot to the database, builds requests to the music service http://www.mp3.cc and allows the user to listen to found tracks directly from Telegram and save them into their playlists. Initially it was meant that the bot would make requests through VK API in order to get music from VK servers as VK has one of the largest open audio libraries. VK API logic had been implemented and the service had worked great until the 16th of December, when VK closed access to their audio files. That is why it was decided to switch to mp3.cc music service. The main feature of the bot is that the user can build a text or voice request, then the program will parse it and show all found tracks grouped by 10 per list. Then the user can choose a track by pushing on it, the bot will let him download it. As a result it is possible to make a request, get a list of tracks, choose a track, download it, then listen to it and, if the user wants, save it to a playlist.

Central repository address

https://github.com/vldplcd/VkAudioToTelegram

Members of the team and their roles

Shilov Vladimir - developing of BotServerUI (WPF window to manage the bot), Telegram part (actions and interface, main logic of the bot), Windows Service, database (MongoDB), interconnection of all parts of the project.

Zelinskiy Anton - developing of BotServerUI (WPF window to manage the bot), VK part (VK API, automatic authorization), migrating to mp3.cc, parsing HTML to get a response from mp3.cc, providing data for the Telegram part, implementation of speech recognition through Yandex services, manual testing.

Classes and their short description

- **BotServerUI project:**

MainWindow.xaml.cs - a class which implements turning the bot on and off, provides logging of users` actions, allows to send messages to one or all users. To say so, the front-end for the VK_Audio_Bot.BotManager project.

- **VK_Audio_Bot.BotManager project:**

BotManager.cs - a class to manage bot actions such as start/stop receiving data, handle receiving and sending messages. Logic class, back-end.

TelegramActions.cs - a class to manage user`s actions while talking to the bot. Implementation of showing tracks, playlists, buttons, service messages and so on.

- **VK_Audio_Bot.Service project:**

BotService.cs - a class to describe service behaviour on usual Windows Service events: OnStart, OnPause, OnContinue, OnStop and OnShutdown. Also manages log writing.

Program.cs - auto-generated class. Runs service when the program is executed.

ProjectInstaller.cs - a class that describes service installation and sets different options to it.

The project and its classes allow to start the bot and let it work in background mode.

- **VK_Audio_Bot.SpeechRecognition project:**

SpeechRepository.cs - a class which implements parsing of a voice message sent by user (different methods generate information required for a request, another one returns the result of recognition).
At the moment when this text was being written, there was a problem with recognizing voice sent from Apple devices.

- **VKAudioDB project:**

Its classes provide access from the project to the database data.

ak.cs - account attributes.

Queries.cs - implementation of methods that get chat ids. keys. saved information about users and so on.

SavedInfo.cs - access to different saved info.

Track.cs - track info.

Update.cs - allows to insert new users, insert or delete user`s tracks, info and so on.

User.cs - chat id and tracks of each user.

vkAudio_Context.cs - a disposable context class to integrate database with logic.

- **VKAudioInfoGetter project:**

DTO classes provide processing requests (classes VKRequest and VKIdRequest) to VK API and its responses (classes VKResponse, TrackInfo, Item). Requests could be made as usual and by the Id of the song. Response contained a list of items, each item had several properties.

Model classes contain implementation for building a request to VK (usual and by Id) and building information about each returned track (AudioInfo).

AuthorizationForm.cs - a class which allows to get VK access token automatically.

GetterFactory.cs - here it is possible to choose between VK and mp3.cc information getters.

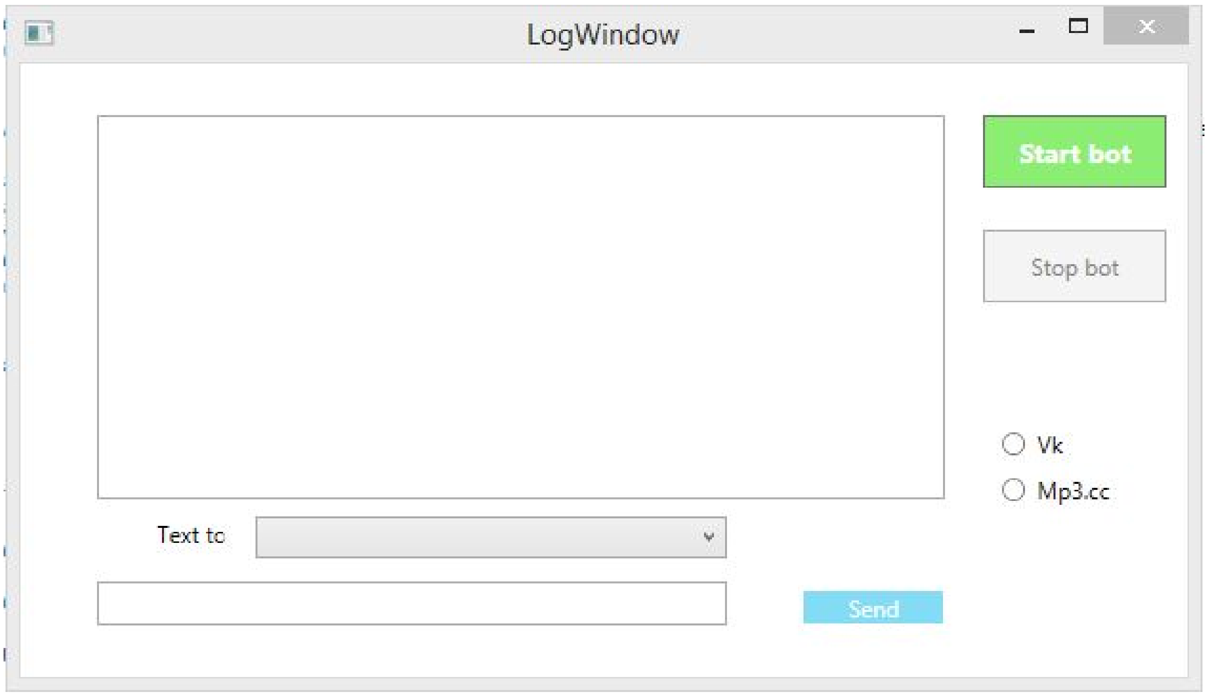
IInfoGetter.cs - an interface, which states a GetMusic method with a string request as an argument and a getting API key event for all InfoGetters.

InfoGetter.cs - implements building usual and by audio file Id requests through VK API.

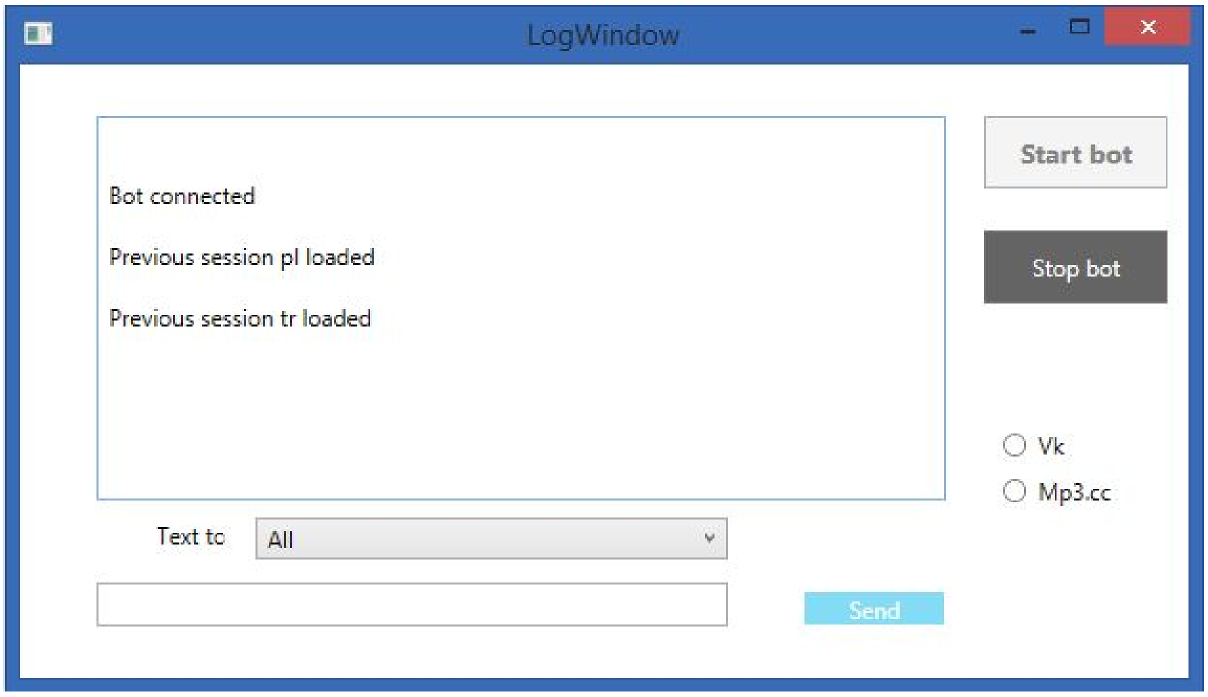
Mp3CCInfoGetter.cs - implements building a request and parsing an HTML response from mp3.cc web service (HtmlAgilityPack used). Gets information about found music files.

Repository.cs - the class implements sending requests to VK API, it converts data from Model to DTO and backwards, its methods return a received from API collection of AudioInfo.

Program interface

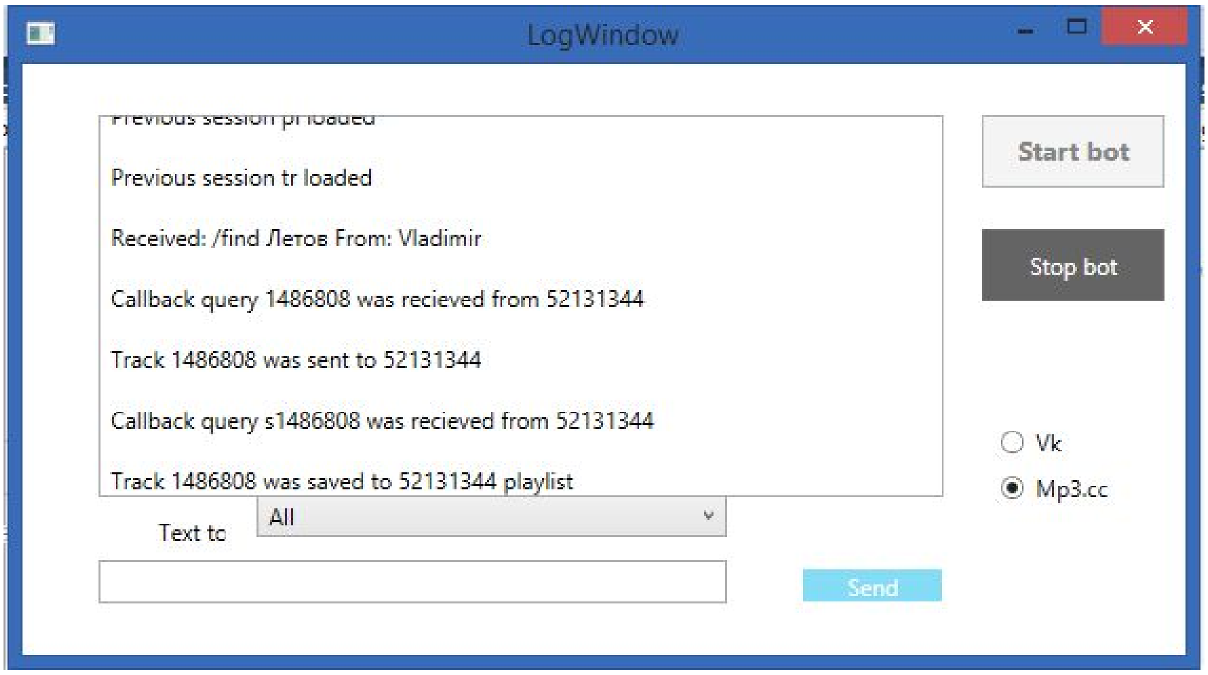


pic 1. BotServiceUI window. On initialize.



```
Bot connected
Previous session pl loaded
Previous session tr loaded
```

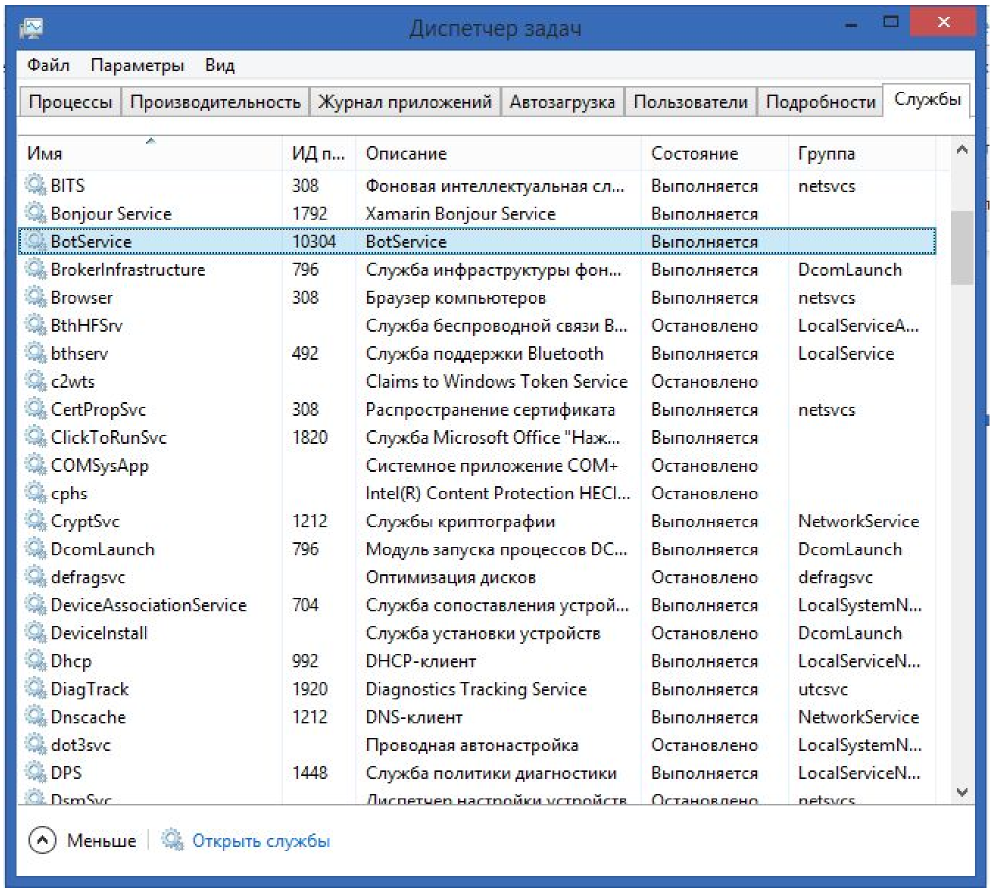
pic 2. BotServiceUI window. After pressing start button.



```
Previous session pl loaded

Previous session tr loaded

Received: /find Летов From: Vladimir

Callback query 1486808 was recieved from 52131344

Track 1486808 was sent to 52131344

Callback query s1486808 was recieved from 52131344

Track 1486808 was saved to 52131344 playlist
```

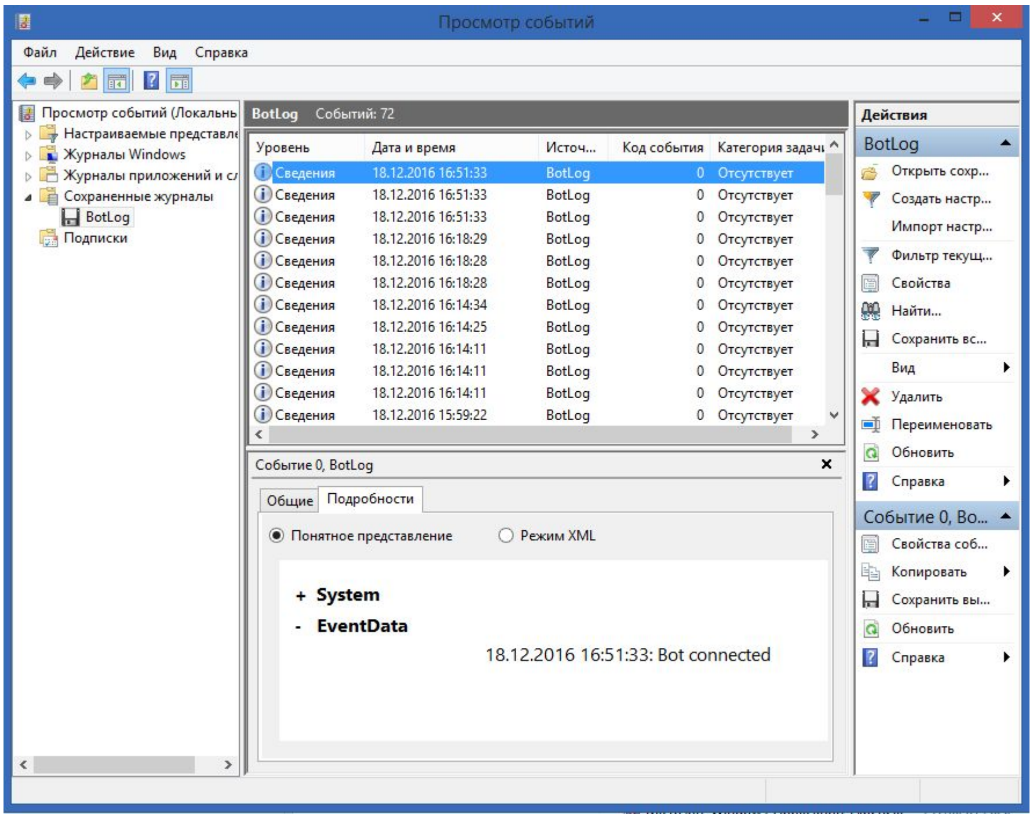
( ) Vk [✓ Mp3.cc]

pic 3. BotServiceUI window. After some queries received.


Диспетчер задач
Файл Параметры Вид
Процессы Производительность Журнал приложений Автозагрузка Пользователи Подробности Службы
Меньше
Открыть службы

Имя	ИД п...	Описание	Состояние	Группа
BITS	308	Фоновая интеллектуальная сл...	Выполняется	netsvcs
Bonjour Service	1792	Xamarin Bonjour Service	Выполняется	
BotService	10304	BotService	Выполняется	
BrokerInfrastructure	796	Служба инфраструктуры фон...	Выполняется	DcomLaunch
Browser	308	Браузер компьютеров	Выполняется	netsvcs
BthHFSrv		Служба беспроводной связи B...	Остановлено	LocalServiceA...
bthserv	492	Служба поддержки Bluetooth	Выполняется	LocalService
c2wts		Claims to Windows Token Service	Остановлено	
CertPropSvc	308	Распространение сертификата	Выполняется	netsvcs
ClickToRunSvc	1820	Служба Microsoft Office "Наж...	Выполняется	
COMSysApp		Системное приложение COM+	Остановлено	
cphs		Intel(R) Content Protection HECI...	Остановлено	
CryptSvc	1212	Службы криптографии	Выполняется	NetworkService
DcomLaunch	796	Модуль запуска процессов DC...	Выполняется	DcomLaunch
defragsvc		Оптимизация дисков	Остановлено	defragsvc
DeviceAssociationService	704	Служба сопоставления устрой...	Выполняется	LocalSystemN...
DeviceInstall		Служба установки устройств	Остановлено	DcomLaunch
Dhcp	992	DHCP-клиент	Выполняется	LocalServiceN...
DiagTrack	1920	Diagnostics Tracking Service	Выполняется	utcsvc
Dnscache	1212	DNS-клиент	Выполняется	NetworkService
dot3svc		Проводная автонастройка	Остановлено	LocalSystemN...
DPS	1448	Служба политики диагностики	Выполняется	LocalServiceN...
DsmSvc		Диспетчер настройки устройств	Остановлено	netsvcs

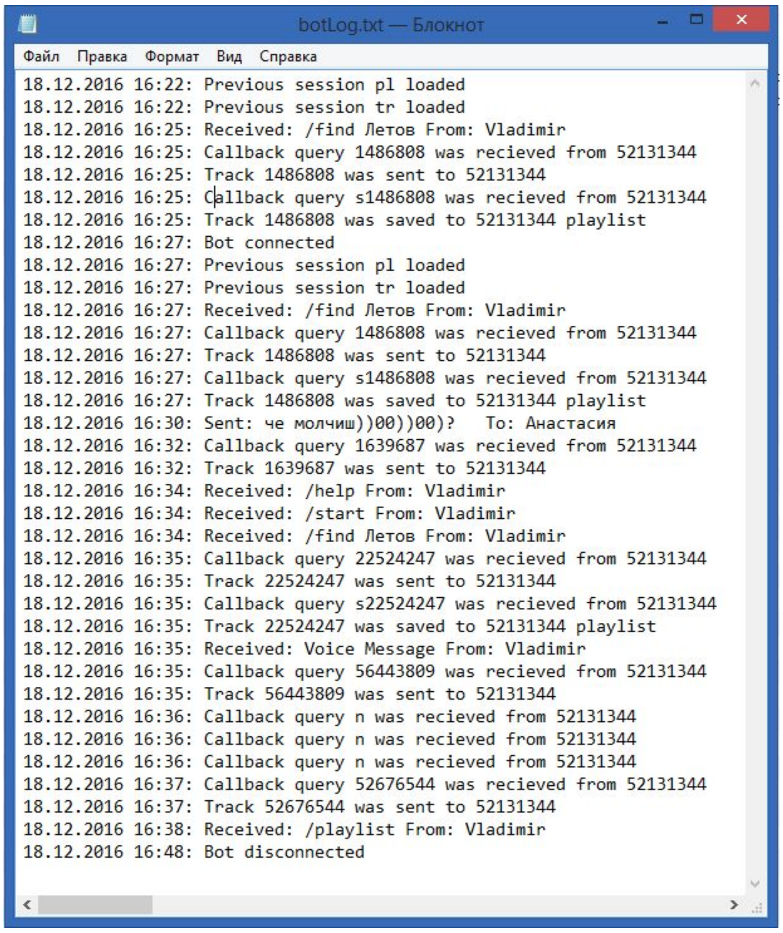
pic 4. Running Windows Service.



Уровень	Дата и время	Источ...	Код события	Категория задачи
Сведения	18.12.2016 16:51:33	BotLog	0	Отсутствует
Сведения	18.12.2016 16:51:33	BotLog	0	Отсутствует
Сведения	18.12.2016 16:51:33	BotLog	0	Отсутствует
Сведения	18.12.2016 16:18:29	BotLog	0	Отсутствует
Сведения	18.12.2016 16:18:28	BotLog	0	Отсутствует
Сведения	18.12.2016 16:18:28	BotLog	0	Отсутствует
Сведения	18.12.2016 16:14:34	BotLog	0	Отсутствует
Сведения	18.12.2016 16:14:25	BotLog	0	Отсутствует
Сведения	18.12.2016 16:14:11	BotLog	0	Отсутствует
Сведения	18.12.2016 16:14:11	BotLog	0	Отсутствует
Сведения	18.12.2016 16:14:11	BotLog	0	Отсутствует
Сведения	18.12.2016 15:59:22	BotLog	0	Отсутствует

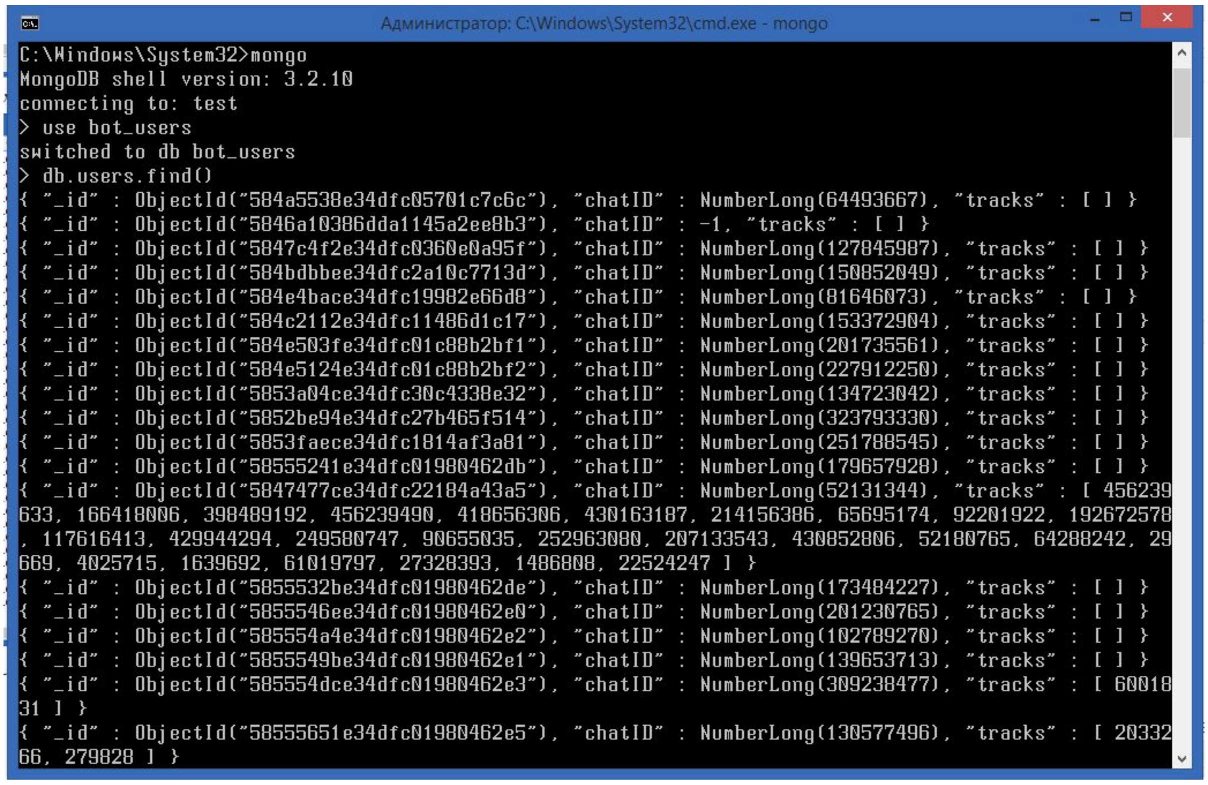
```
18.12.2016 16:51:33: Bot connected
```

pic 5. Service Log



```
18.12.2016 16:22: Previous session pl loaded
18.12.2016 16:22: Previous session tr loaded
18.12.2016 16:25: Received: /find Летов From: Vladimir
18.12.2016 16:25: Callback query 1486808 was recieved from 52131344
18.12.2016 16:25: Track 1486808 was sent to 52131344
18.12.2016 16:25: Callback query s1486808 was recieved from 52131344
18.12.2016 16:25: Track 1486808 was saved to 52131344 playlist
18.12.2016 16:27: Bot connected
18.12.2016 16:27: Previous session pl loaded
18.12.2016 16:27: Previous session tr loaded
18.12.2016 16:27: Received: /find Летов From: Vladimir
18.12.2016 16:27: Callback query 1486808 was recieved from 52131344
18.12.2016 16:27: Track 1486808 was sent to 52131344
18.12.2016 16:27: Callback query s1486808 was recieved from 52131344
18.12.2016 16:27: Track 1486808 was saved to 52131344 playlist
18.12.2016 16:30: Sent: че молчиш))00))00)?    To: Анастасия
18.12.2016 16:32: Callback query 1639687 was recieved from 52131344
18.12.2016 16:32: Track 1639687 was sent to 52131344
18.12.2016 16:34: Received: /help From: Vladimir
18.12.2016 16:34: Received: /start From: Vladimir
18.12.2016 16:34: Received: /find Летов From: Vladimir
18.12.2016 16:35: Callback query 22524247 was recieved from 52131344
18.12.2016 16:35: Track 22524247 was sent to 52131344
18.12.2016 16:35: Callback query s22524247 was recieved from 52131344
18.12.2016 16:35: Track 22524247 was saved to 52131344 playlist
18.12.2016 16:35: Received: Voice Message From: Vladimir
18.12.2016 16:35: Callback query 56443809 was recieved from 52131344
18.12.2016 16:35: Track 56443809 was sent to 52131344
18.12.2016 16:36: Callback query n was recieved from 52131344
18.12.2016 16:36: Callback query n was recieved from 52131344
18.12.2016 16:36: Callback query n was recieved from 52131344
18.12.2016 16:37: Callback query 52676544 was recieved from 52131344
18.12.2016 16:37: Track 52676544 was sent to 52131344
18.12.2016 16:38: Received: /playlist From: Vladimir
18.12.2016 16:48: Bot disconnected
```

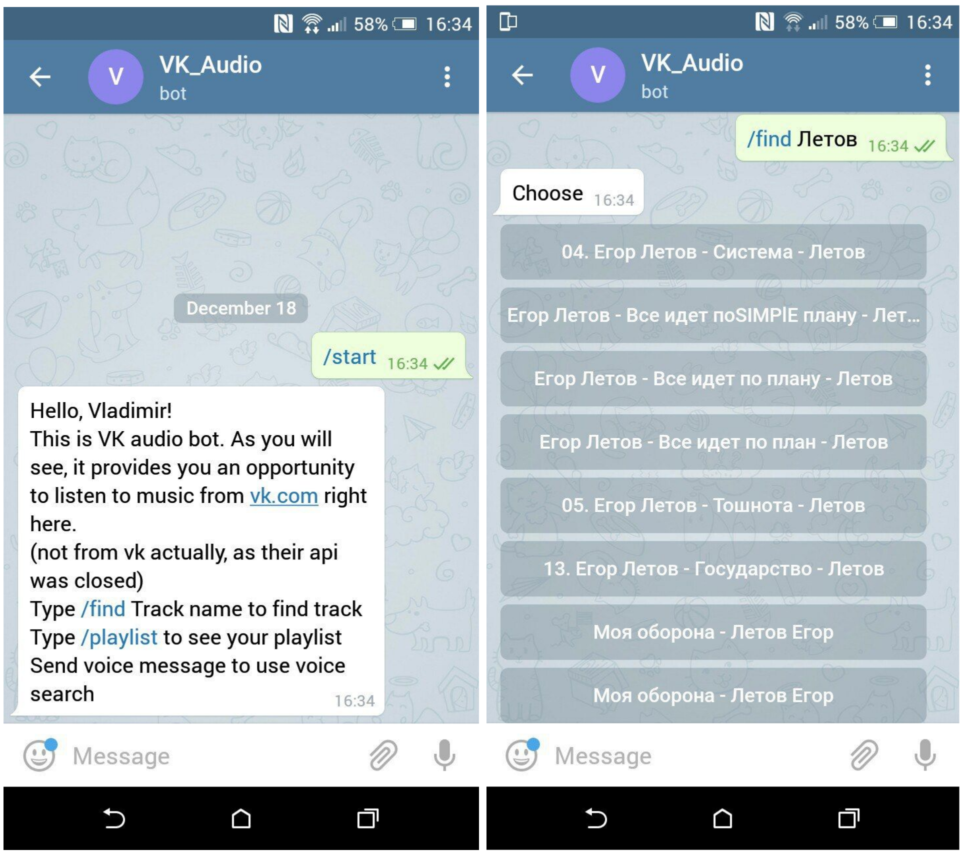
pic 6. Log file



```
C:\Windows\System32>mongo
MongoDB shell version: 3.2.10
connecting to: test
> use bot_users
switched to db bot_users
> db.users.find()
{ "_id" : ObjectId("584a5538e34dfc05701c7c6c"), "chatID" : NumberLong(64493667), "tracks" : [ ] }
{ "_id" : ObjectId("5846a10386dda1145a2ee8b3"), "chatID" : -1, "tracks" : [ ] }
{ "_id" : ObjectId("5847c4f2e34dfc0360e0a95f"), "chatID" : NumberLong(127845987), "tracks" : [ ] }
{ "_id" : ObjectId("584bdbbee34dfc2a10c7713d"), "chatID" : NumberLong(150852049), "tracks" : [ ] }
{ "_id" : ObjectId("584e4bace34dfc19982e66d8"), "chatID" : NumberLong(81646073), "tracks" : [ ] }
{ "_id" : ObjectId("584c2112e34dfc11486d1c17"), "chatID" : NumberLong(153372904), "tracks" : [ ] }
{ "_id" : ObjectId("584e503fe34dfc01c88b2bf1"), "chatID" : NumberLong(201735561), "tracks" : [ ] }
{ "_id" : ObjectId("584e5124e34dfc01c88b2bf2"), "chatID" : NumberLong(227912250), "tracks" : [ ] }
{ "_id" : ObjectId("5853a04ce34dfc30c4338e32"), "chatID" : NumberLong(134723042), "tracks" : [ ] }
{ "_id" : ObjectId("5852be94e34dfc27b465f514"), "chatID" : NumberLong(323793330), "tracks" : [ ] }
{ "_id" : ObjectId("5853faece34dfc1814af3a81"), "chatID" : NumberLong(251788545), "tracks" : [ ] }
{ "_id" : ObjectId("58555241e34dfc01980462db"), "chatID" : NumberLong(179657928), "tracks" : [ ] }
{ "_id" : ObjectId("5847477ce34dfc22184a43a5"), "chatID" : NumberLong(52131344), "tracks" : [ 456239
633, 166418006, 398489192, 456239490, 418656306, 430163187, 214156386, 65695174, 92201922, 192672578
, 117616413, 429944294, 249580747, 90655035, 252963080, 207133543, 430852806, 52180765, 64288242, 29
669, 4025715, 1639692, 61019797, 27328393, 1486808, 22524247 ] }
{ "_id" : ObjectId("5855532be34dfc01980462de"), "chatID" : NumberLong(173484227), "tracks" : [ ] }
{ "_id" : ObjectId("5855546ee34dfc01980462e0"), "chatID" : NumberLong(201230765), "tracks" : [ ] }
{ "_id" : ObjectId("585554a4e34dfc01980462e2"), "chatID" : NumberLong(102789270), "tracks" : [ ] }
{ "_id" : ObjectId("5855549be34dfc01980462e1"), "chatID" : NumberLong(139653713), "tracks" : [ ] }
{ "_id" : ObjectId("585554dce34dfc01980462e3"), "chatID" : NumberLong(309238477), "tracks" : [ 60018
31 ] }
{ "_id" : ObjectId("58555651e34dfc01980462e5"), "chatID" : NumberLong(130577496), "tracks" : [ 20332
66, 279828 ] }
```

pic 7. How data in MongoDB stored. Users collection in bot_users db.

pics group 1. What user sees:



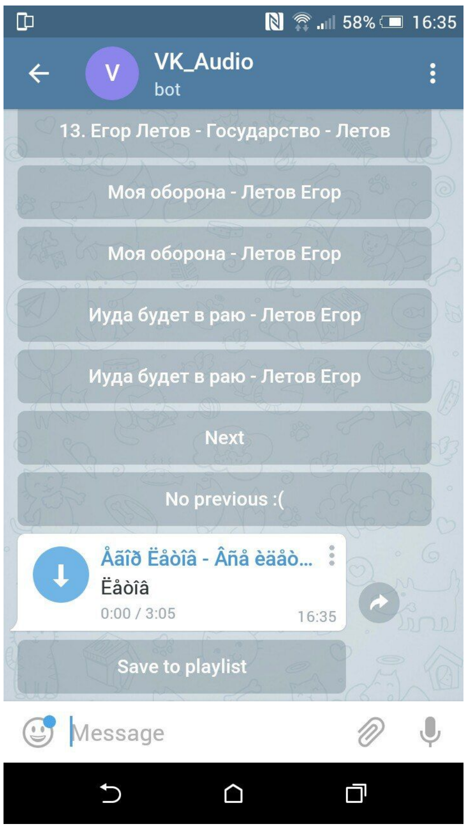
/start 16:34

Hello, Vladimir!
This is VK audio bot. As you will see, it provides you an opportunity to listen to music from vk.com right here.
(not from vk actually, as their api was closed)
Type /find Track name to find track
Type /playlist to see your playlist
Send voice message to use voice search 16:34

/find Летов 16:34

Choose 16:34

04. Егор Летов - Система - Летов
Егор Летов - Все идет поSIMPlE плану - Лет...
Егор Летов - Все идет по плану - Летов
Егор Летов - Все идет по план - Летов
05. Егор Летов - Тошнота - Летов
13. Егор Летов - Государство - Летов
Моя оборона - Летов Егор
Моя оборона - Летов Егор


58% 16:35

VK_Audio
bot

13. Егор Летов - Государство - Летов

Моя оборона - Летов Егор

Моя оборона - Летов Егор

Иуда будет в раю - Летов Егор

Иуда будет в раю - Летов Егор

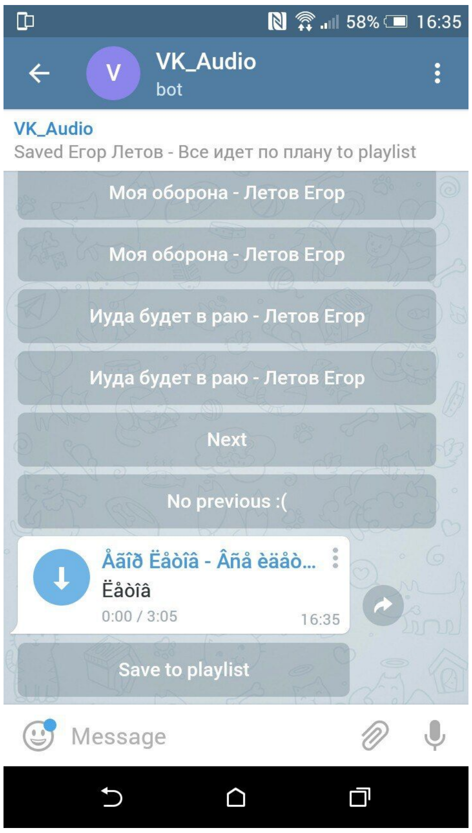
Next

No previous :(

Åãîð Ëåòîâ - Âñå èäåò...
Ëåòîâ
0:00 / 3:05 16:35

Save to playlist

Message


58% 16:35

VK_Audio
bot

VK_Audio
Saved Егор Летов - Все идет по плану to playlist

Моя оборона - Летов Егор

Моя оборона - Летов Егор

Иуда будет в раю - Летов Егор

Иуда будет в раю - Летов Егор

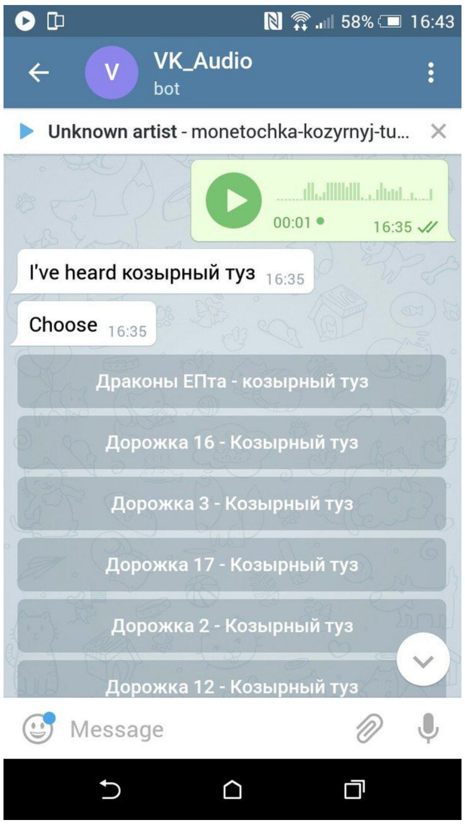
Next

No previous :(

Åãîð Ëåòîâ - Âñå èäåò...
Ëåòîâ
0:00 / 3:05 16:35

Save to playlist

Message


58% 16:43

VK_Audio
bot

Unknown artist - monetochka-kozyrnyj-tu...

00:01 16:35

I've heard козырный туз 16:35

Choose 16:35

Драконы ЕПта - козырный туз

Дорожка 16 - Козырный туз

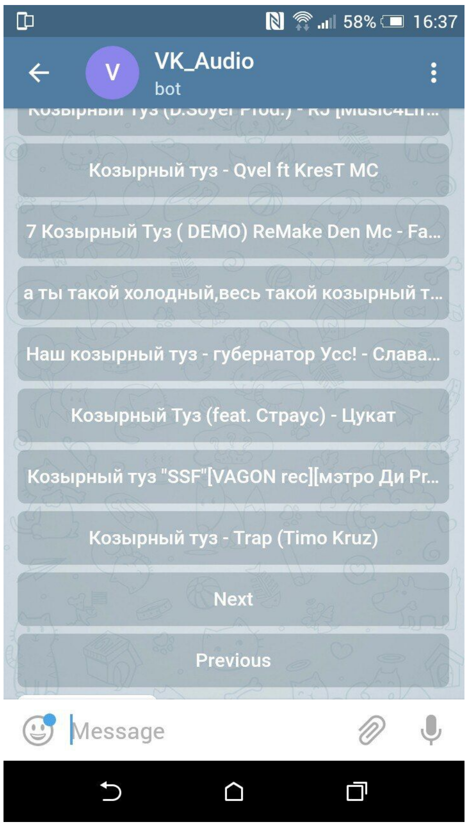
Дорожка 3 - Козырный туз

Дорожка 17 - Козырный туз

Дорожка 2 - Козырный туз

Дорожка 12 - Козырный туз

Message


58% 16:37

VK_Audio
bot

Козырный туз (D.Soyer Prod.) - KJ [Music4Li...

Козырный туз - Qvel ft KresT MC

7 Козырный Туз (DEMO) ReMake Den Mc - Fa...

а ты такой холодный,весь такой козырный т...

Наш козырный туз - губернатор Усс! - Слава...

Козырный Туз (feat. Страус) - Цукат

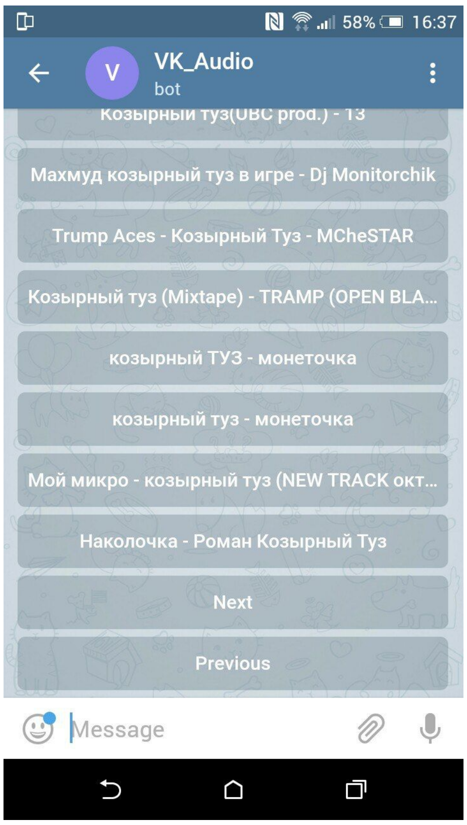
Козырный туз "SSF"[VAGON rec][мэтро Ди Pr...

Козырный туз - Trap (Timo Kruz)

Next

Previous

Message


VK_Audio
bot

Козырный туз(UBC prod.) - 13

Махмуд козырный туз в игре - Dj Monitorchik

Trump Aces - Козырный Туз - MCheSTAR

Козырный туз (Mixtape) - TRAMP (OPEN BLA...

козырный ТУЗ - монеточка

козырный туз - монеточка

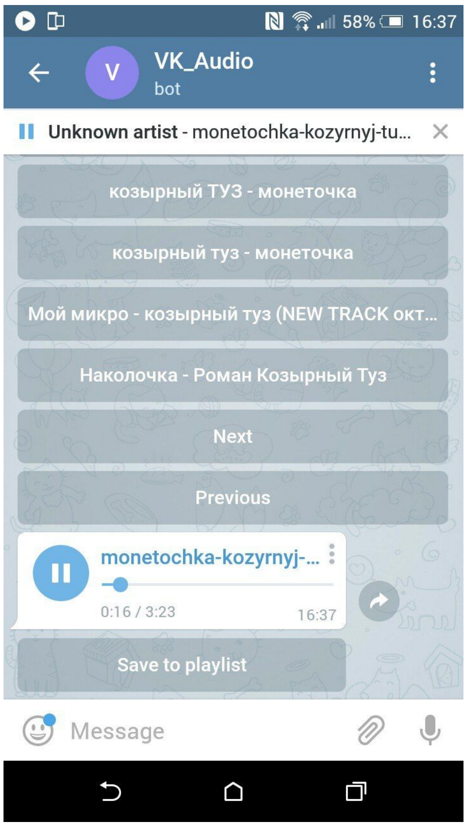
Мой микро - козырный туз (NEW TRACK окт...

Наколочка - Роман Козырный Туз

Next

Previous

Message


VK_Audio
bot

Unknown artist - monetochka-kozyrnyj-tu...

козырный ТУЗ - монеточка

козырный туз - монеточка

Мой микро - козырный туз (NEW TRACK окт...

Наколочка - Роман Козырный Туз

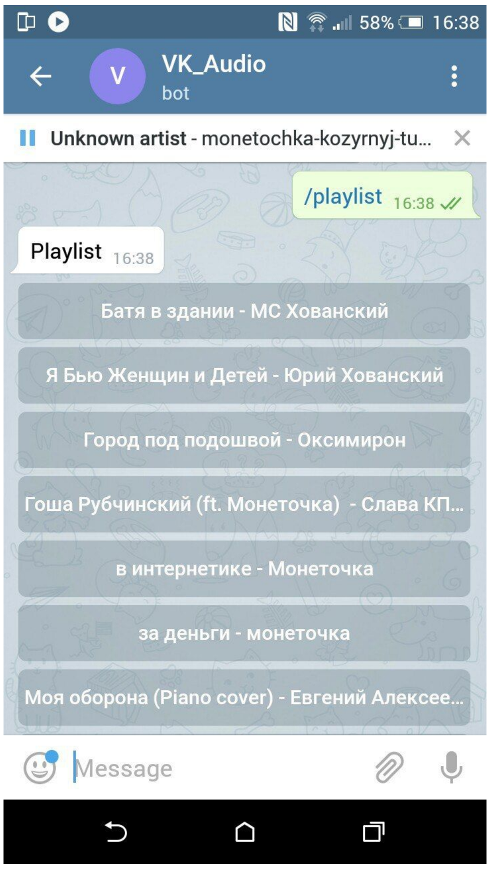
Next

Previous

monetochka-kozyrnyj-...
0:16 / 3:23 16:37

Save to playlist

Message


VK_Audio
bot

Unknown artist - monetochka-kozyrnyj-tu...

/playlist 16:38

Playlist 16:38

Батя в здании - МС Хованский

Я Бью Женщин и Детей - Юрий Хованский

Город под подошвой - Оксимирон

Гоша Рубчинский (ft. Монеточка) - Слава КП...

в интернетике - Монеточка

за деньги - монеточка

Моя оборона (Piano cover) - Евгений Алексее...

Message