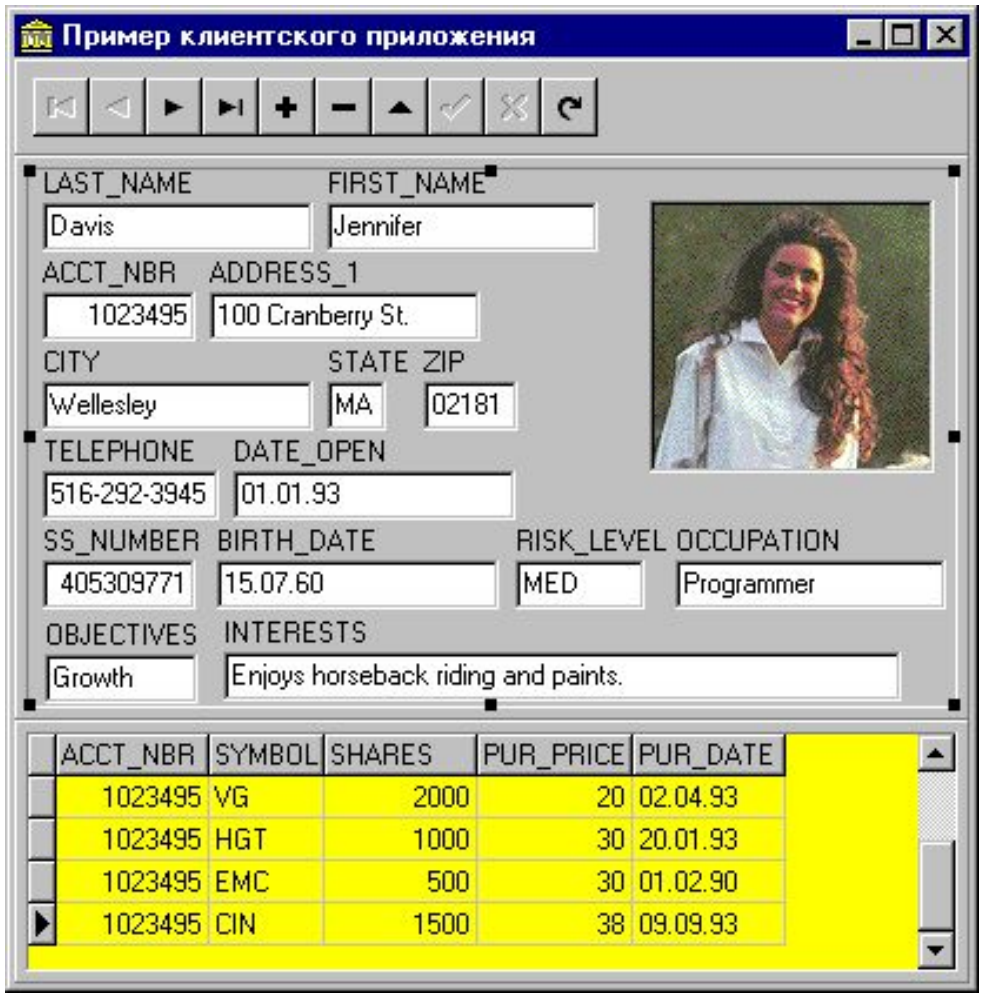
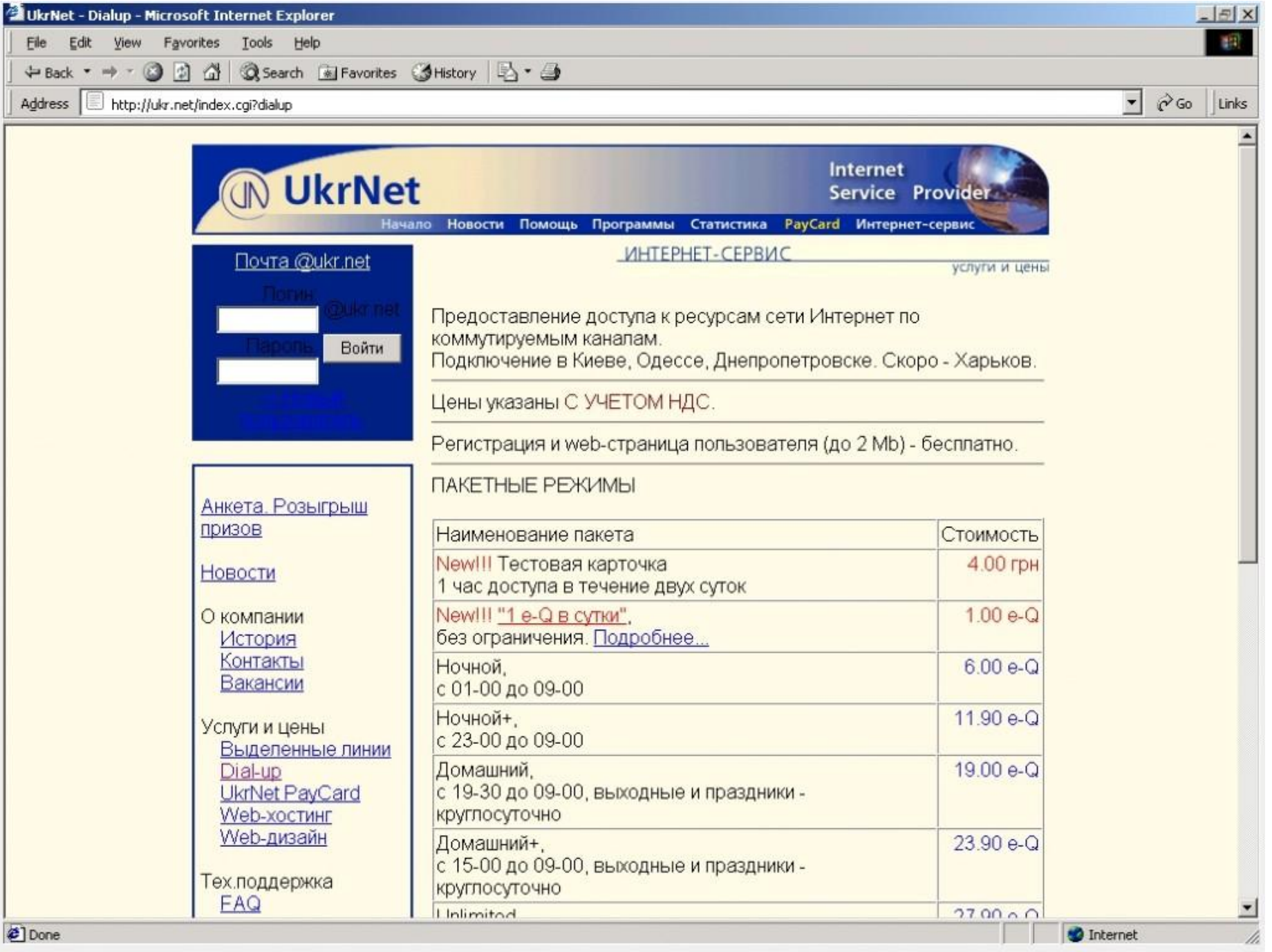
# Реквием по фронту

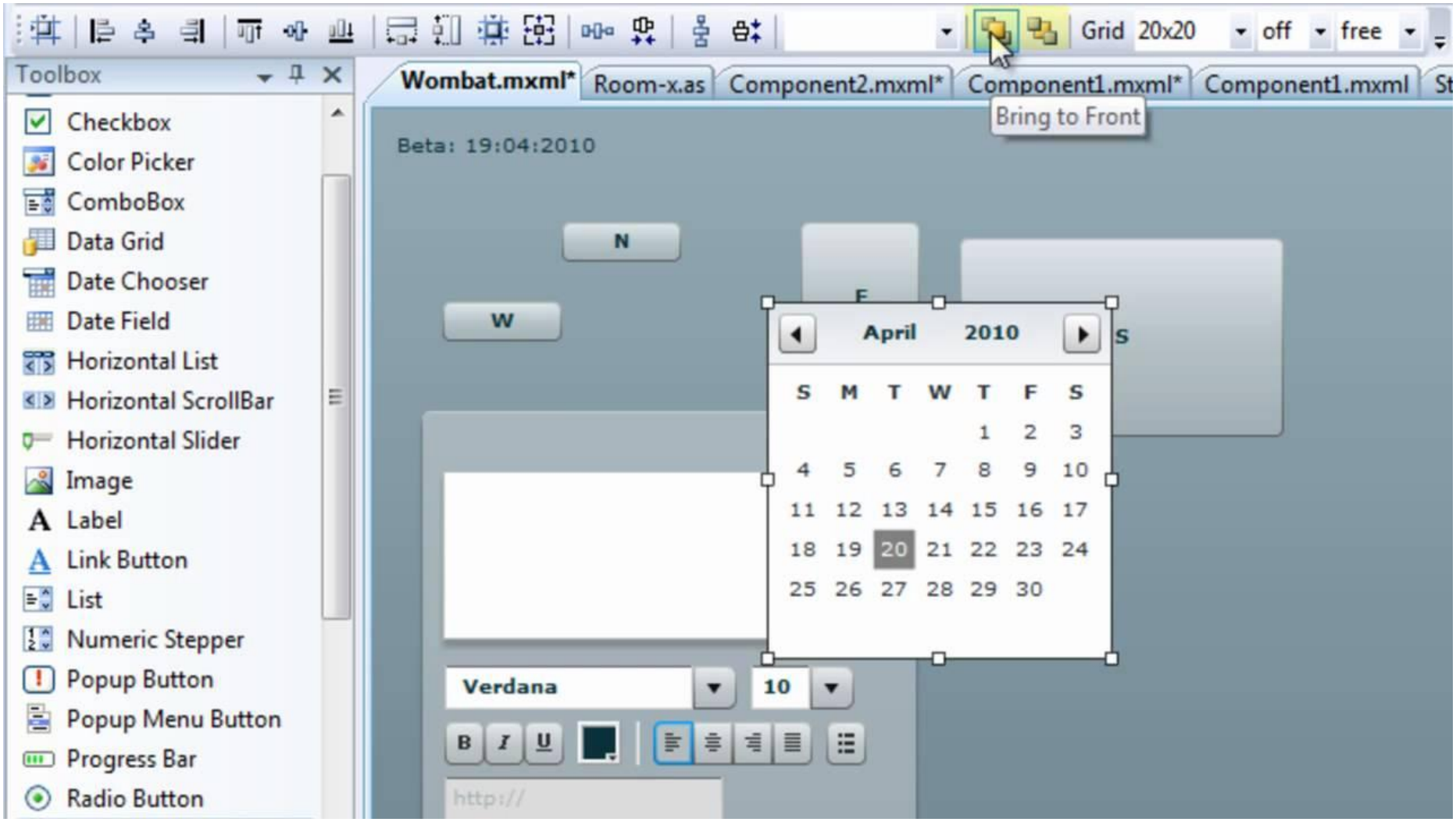
## библиотека Korolev

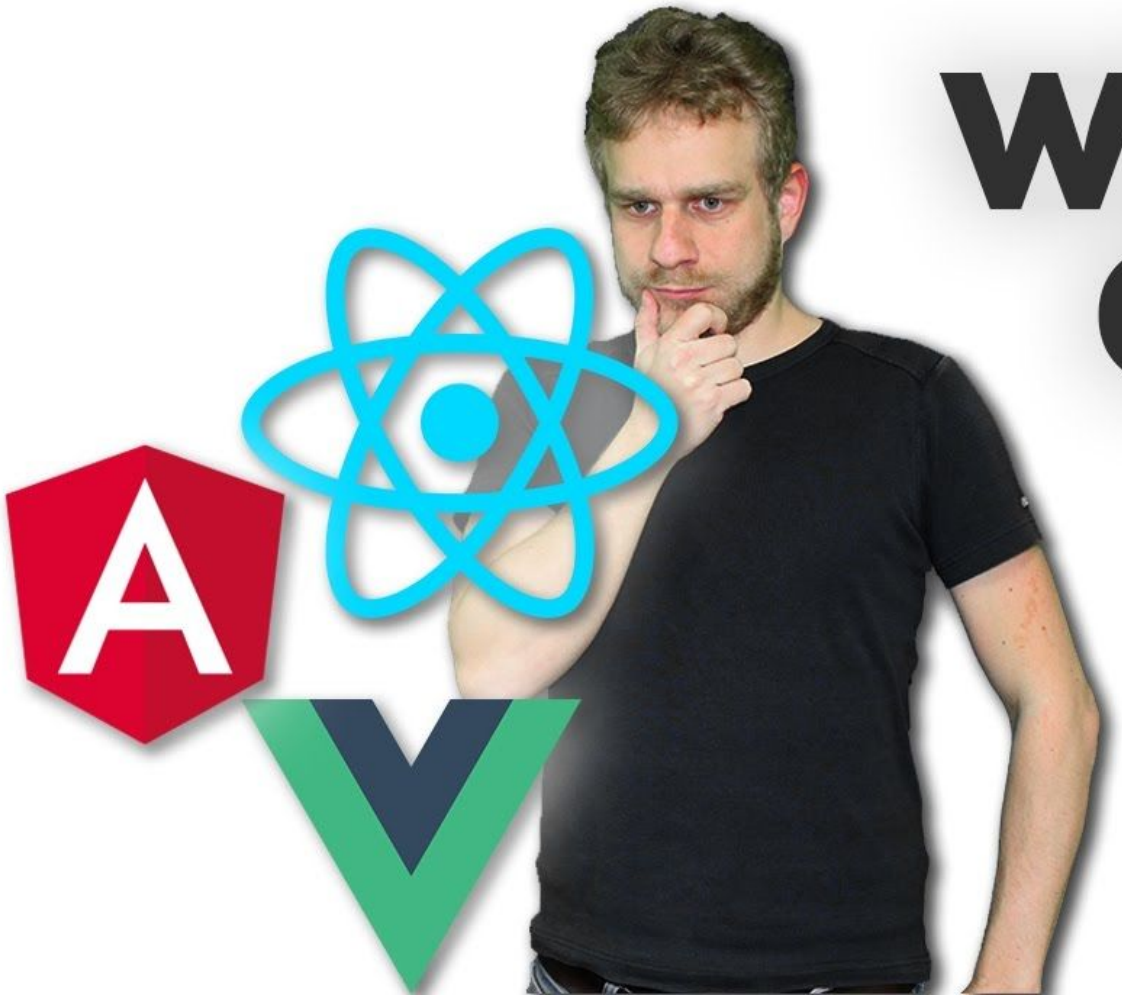
Андрей Михеев

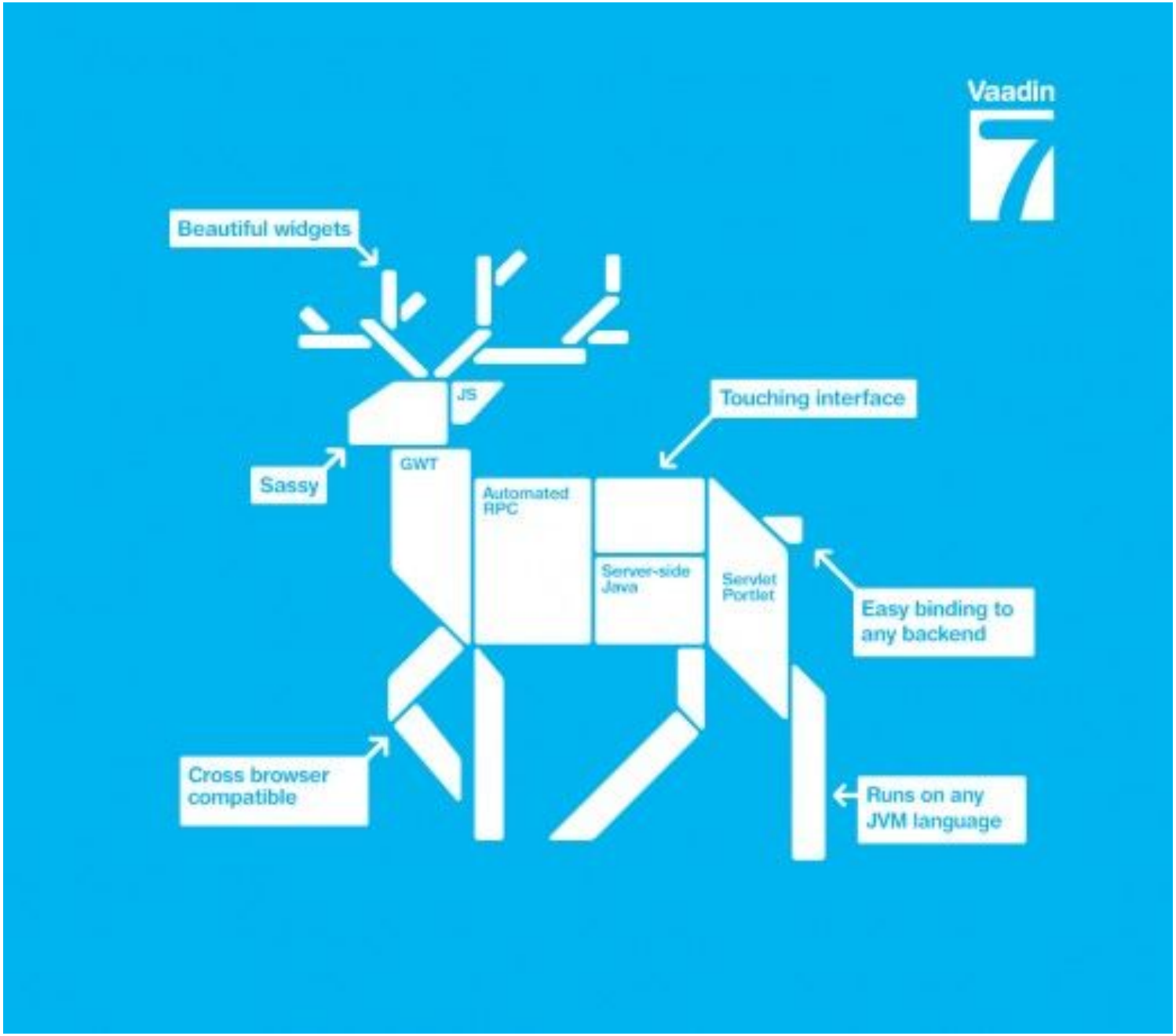
Jjoy @ Рязань 2018


Пример клиентского приложения
LAST_NAME
Davis
FIRST_NAME
Jennifer
ACCT_NBR
1023495
ADDRESS_1
100 Cranberry St.
CITY
Wellesley
STATE
MA
ZIP
02181
TELEPHONE
516-292-3945
DATE_OPEN
01.01.93
SS_NUMBER
405309771
BIRTH_DATE
15.07.60
RISK_LEVEL
MED
OCCUPATION
Programmer
OBJECTIVES
Growth
INTERESTS
Enjoys horseback riding and paints.
ACCT_NBR SYMBOL SHARES PUR_PRICE PUR_DATE
1023495 VG 2000 20 02.04.93
1023495 HGT 1000 30 20.01.93
1023495 EMC 500 30 01.02.90
1023495 CIN 1500 38 09.09.93


UkrNet - Dialup - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Back Search Favorites History
Address http://ukr.net/index.cgi?dialup
Go Links
UkrNet
Internet Service Provider
Начало Новости Помощь Программы Статистика PayCard Интернет-сервис
Почта @ukr.net
Логин: @ukr.net
Пароль:
Войти
ИНТЕРНЕТ-СЕРВИС
услуги и цены
Предоставление доступа к ресурсам сети Интернет по коммутируемым каналам.
Подключение в Киеве, Одессе, Днепропетровске. Скоро - Харьков.
Цены указаны С УЧЕТОМ НДС.
Регистрация и web-страница пользователя (до 2 Mb) - бесплатно.
ПАКЕТНЫЕ РЕЖИМЫ
Наименование пакета
Стоимость
New!!! Тестовая карточка
1 час доступа в течение двух суток
4.00 грн
New!!! "1 e-Q в сутки",
без ограничения. Подробнее...
1.00 e-Q
Ночной,
с 01-00 до 09-00
6.00 e-Q
Ночной+,
с 23-00 до 09-00
11.90 e-Q
Домашний,
с 19-30 до 09-00, выходные и праздники - круглосуточно
19.00 e-Q
Домашний+,
с 15-00 до 09-00, выходные и праздники - круглосуточно
23.90 e-Q
Анкета. Розыгрыш призов
Новости
О компании
История
Контакты
Вакансии
Услуги и цены
Выделенные линии
Dial-up
UkrNet PayCard
Web-хостинг
Web-дизайн
Тех.поддержка
FAQ
Done
Internet


Grid 20x20
off
free
Toolbox
Checkbox
Color Picker
ComboBox
Data Grid
Date Chooser
Date Field
Horizontal List
Horizontal ScrollBar
Horizontal Slider
Image
Label
Link Button
List
Numeric Stepper
Popup Button
Popup Menu Button
Progress Bar
Radio Button
Wombat.mxml*
Room-x.as
Component2.mxml*
Component1.mxml*
Component1.mxml
Bring to Front
Beta: 19:04:2010
N
W
E
S
April 2010
S M T W T F S
1 2 3
4 5 6 7 8 9 10
11 12 13 14 15 16 17
18 19 20 21 22 23 24
25 26 27 28 29 30
Verdana
10
B
I
U
http://


WHICH
ONE?


Vaadin
Beautiful widgets
JS
Sassy
GWT
Automated RPC
Server-side Java
Servlet Portlet
Touching interface
Easy binding to any backend
Cross browser compatible
Runs on any JVM language


JAVA & BOOTSTRAP

# Проблемы

- Многомегабайтные клиенты
- Тормоза, особенно на мобильных устройствах
- Время на разработку, согласование и поддержку Rest API
- Сложная кастомизация

# Korolev

- В честь Сергея Павловича Королёва
- Библиотека для построения SPA
- Полностью на сервере
- Написана в функциональном стиле

# Korolev

- Алексей Фомкин
- https://github.com/fomkin/korolev
- https://github.com/fomkin/levsha
- https://t.me/korolev_io
- https://gitter.im/fomkin/korolev

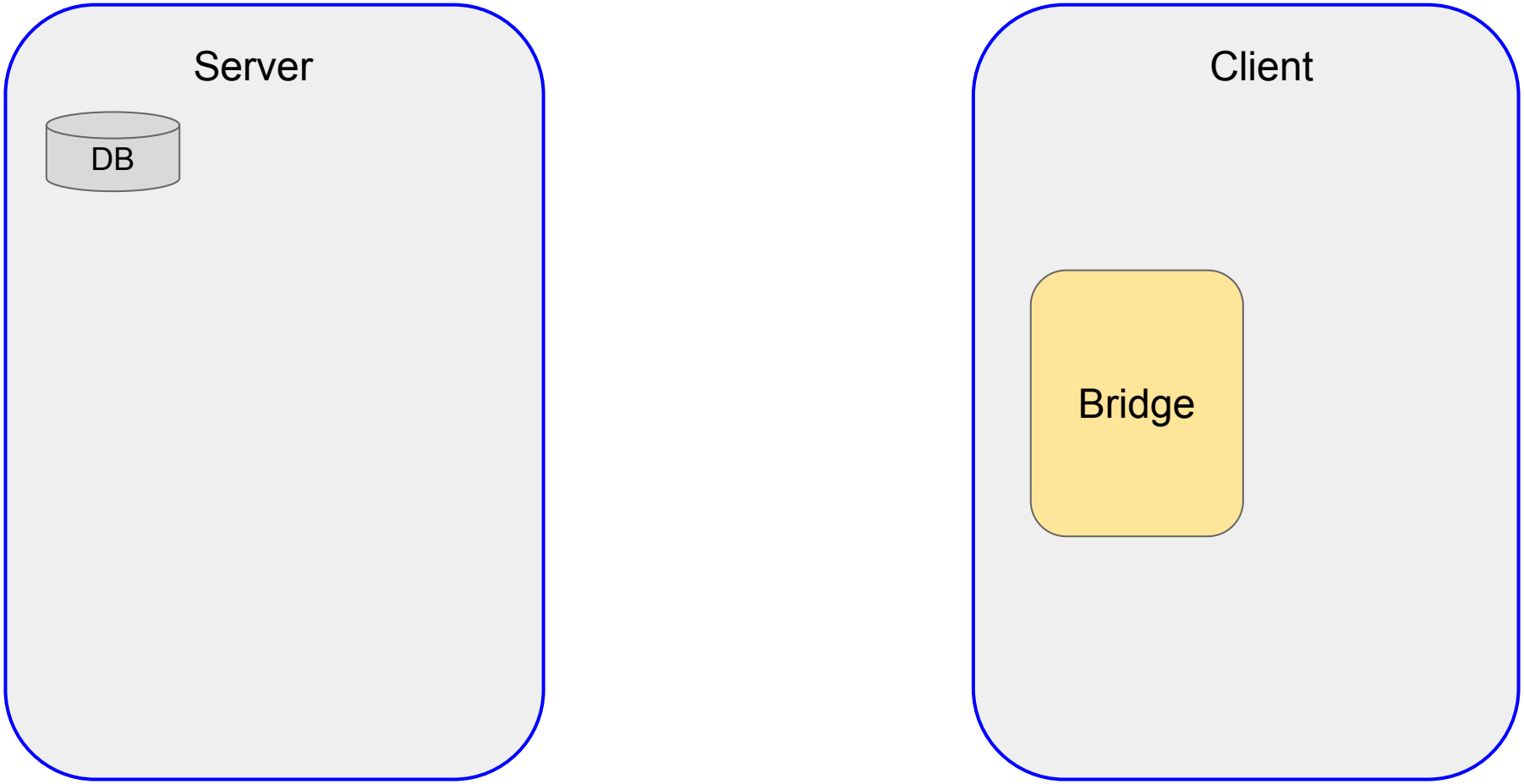
# Korolev

https://mytc.io/

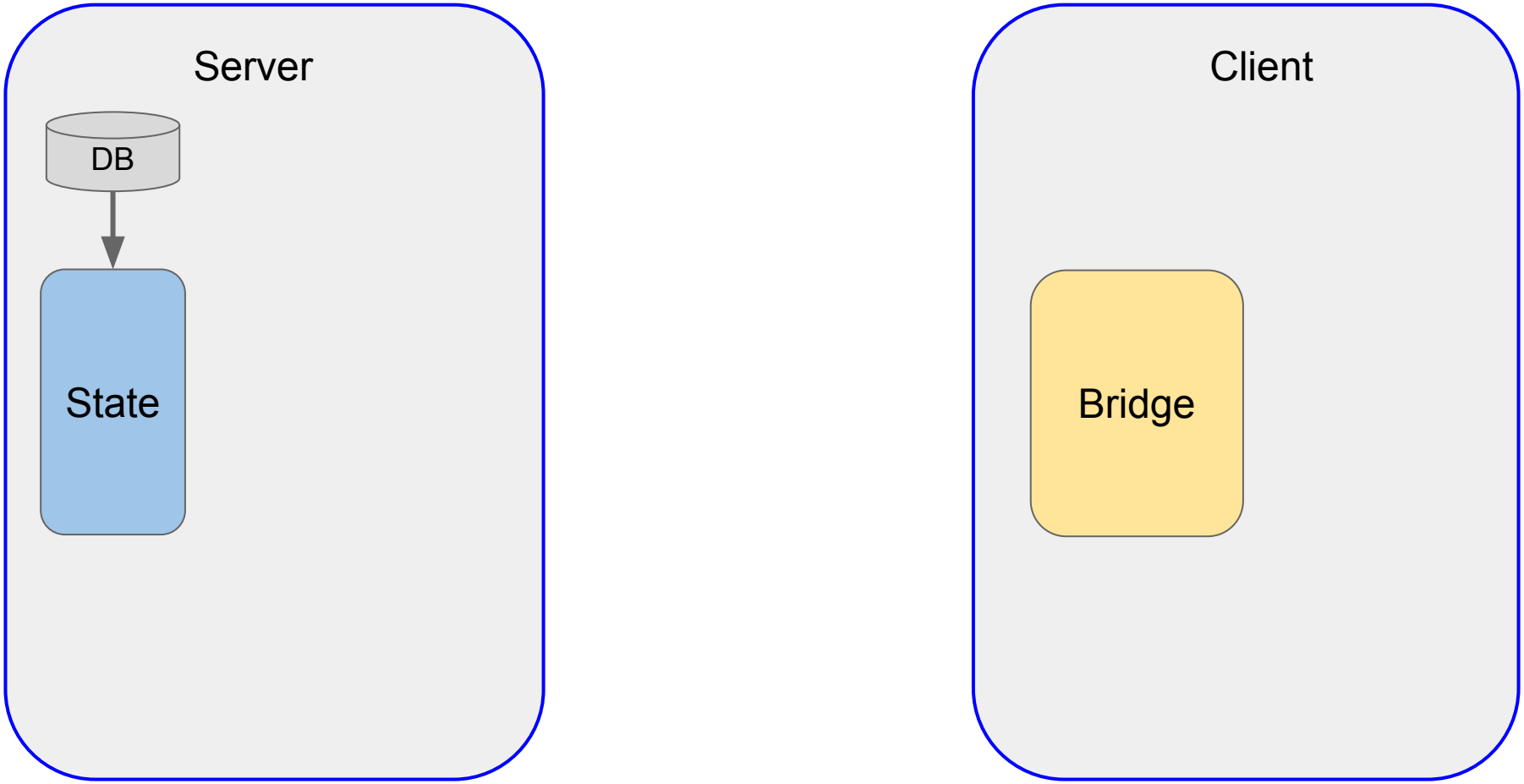
# Korolev

- https://contractpen.com
- Один серьезный банк
- ...

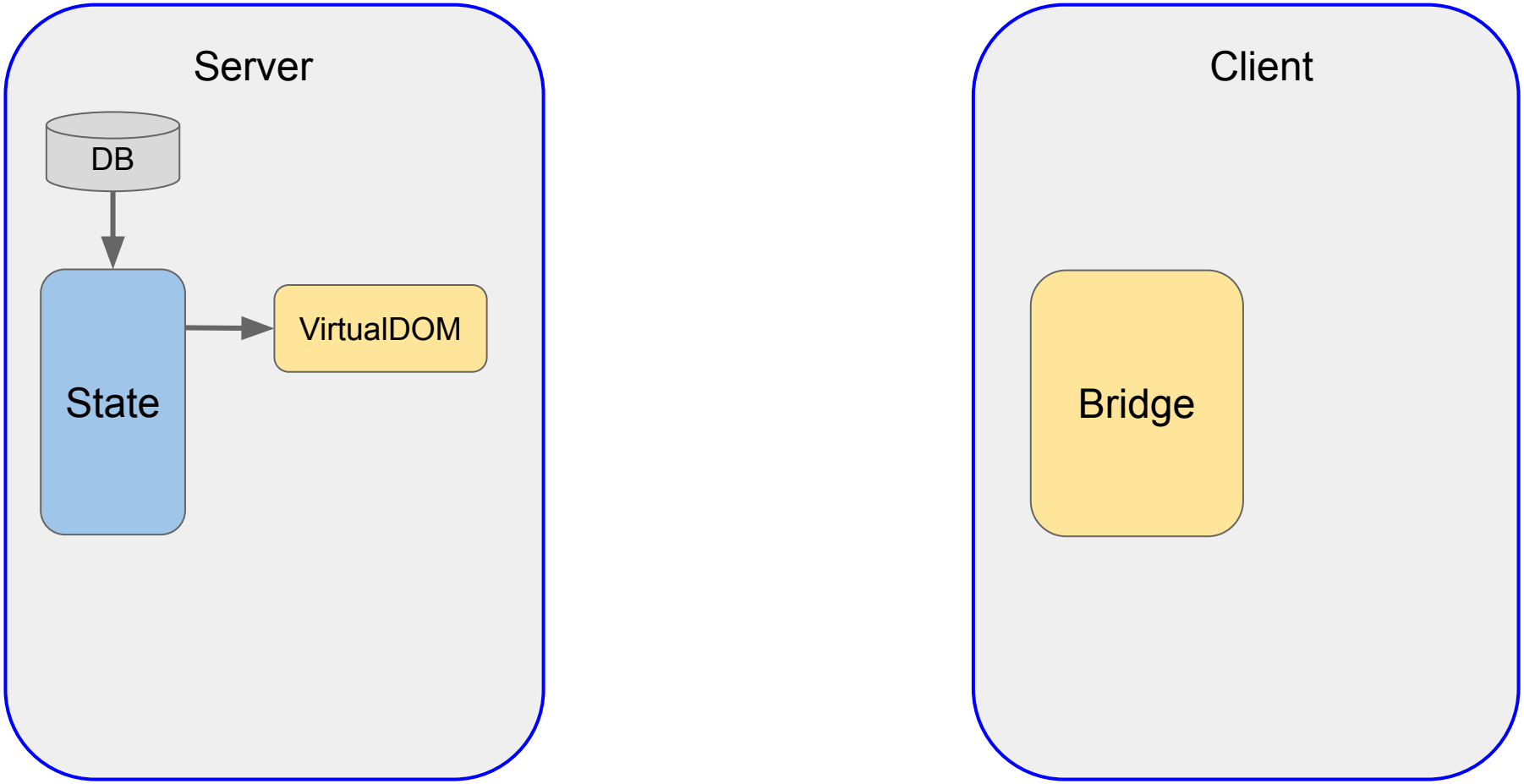
# Korolev



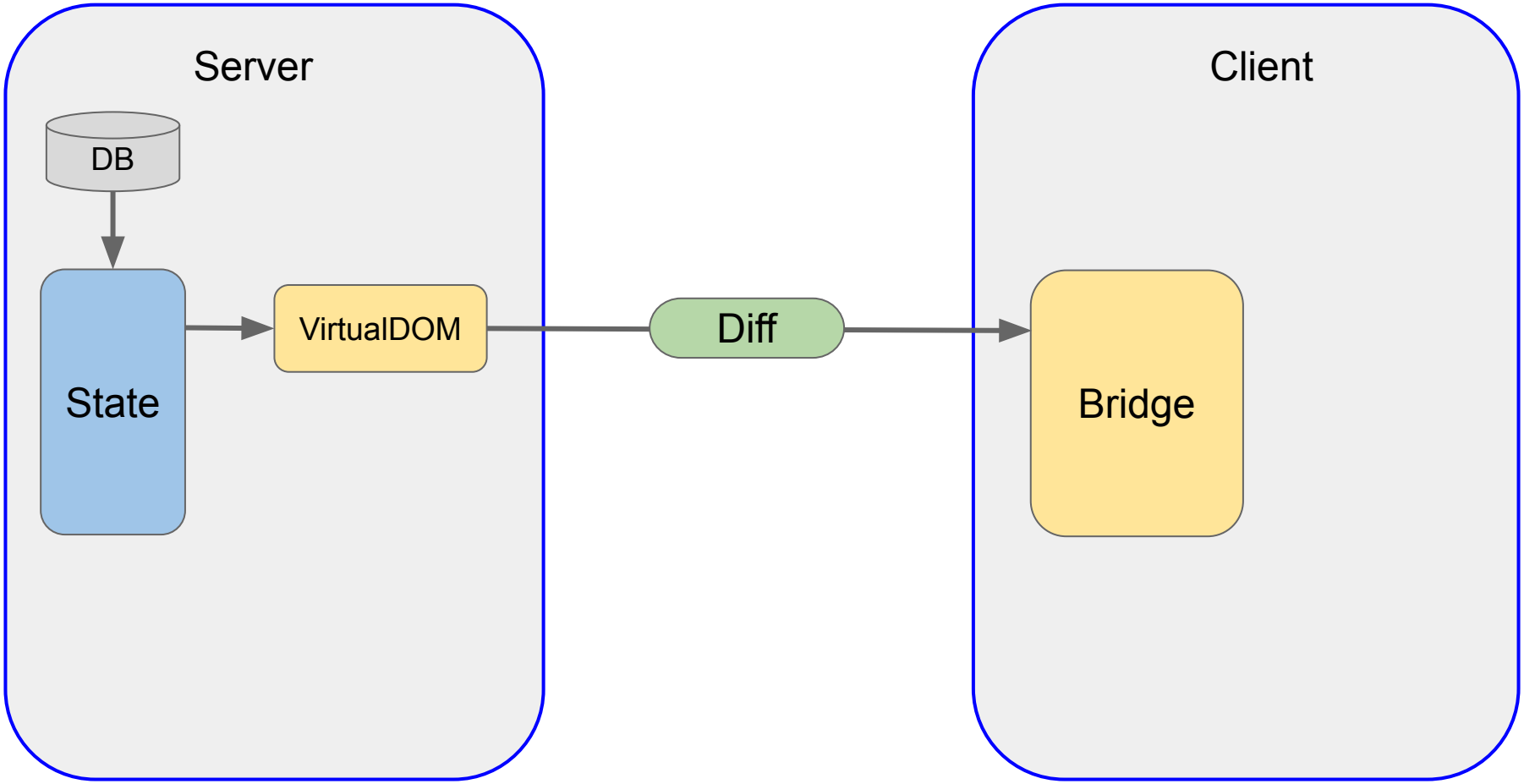
# Korolev



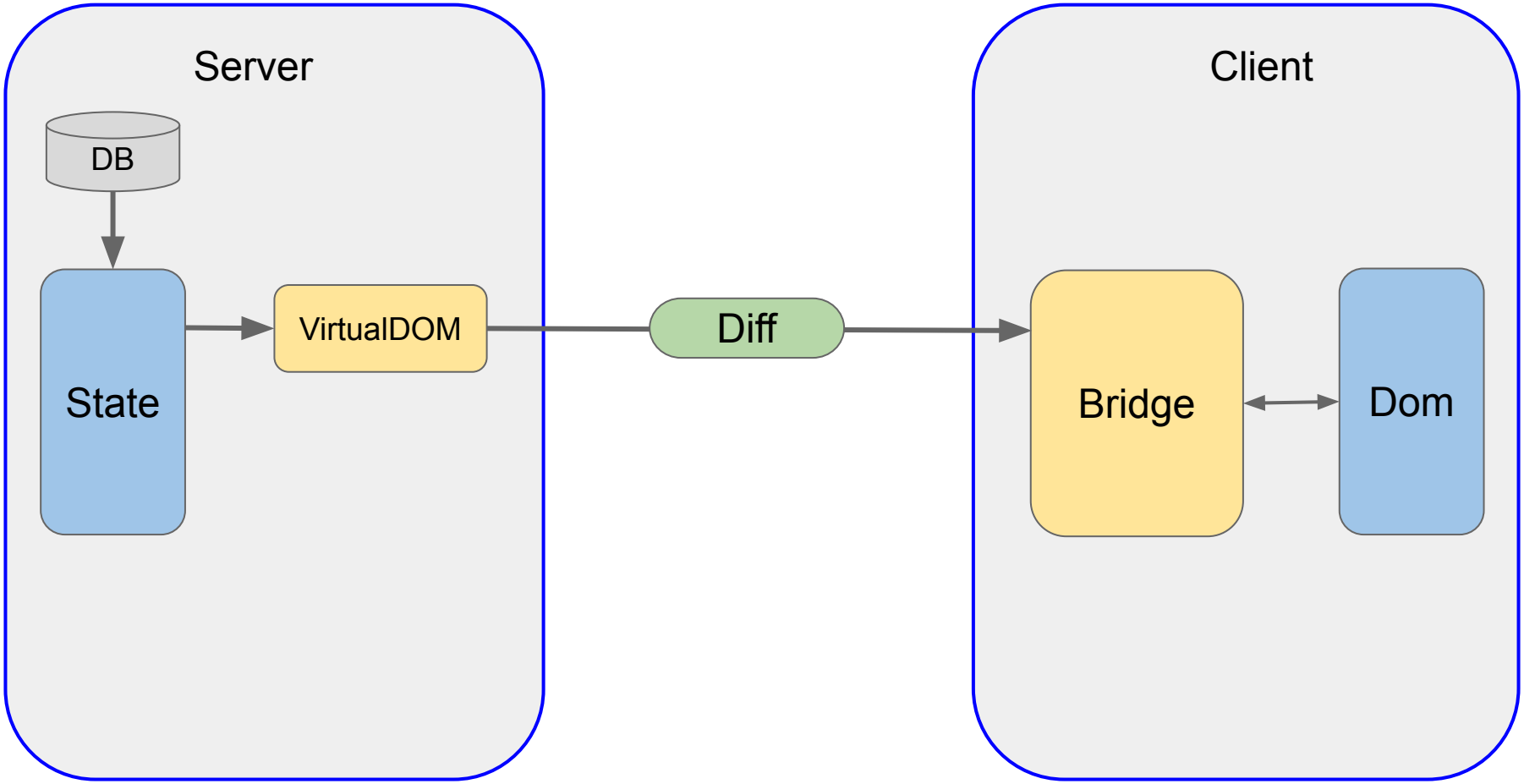
# Korolev



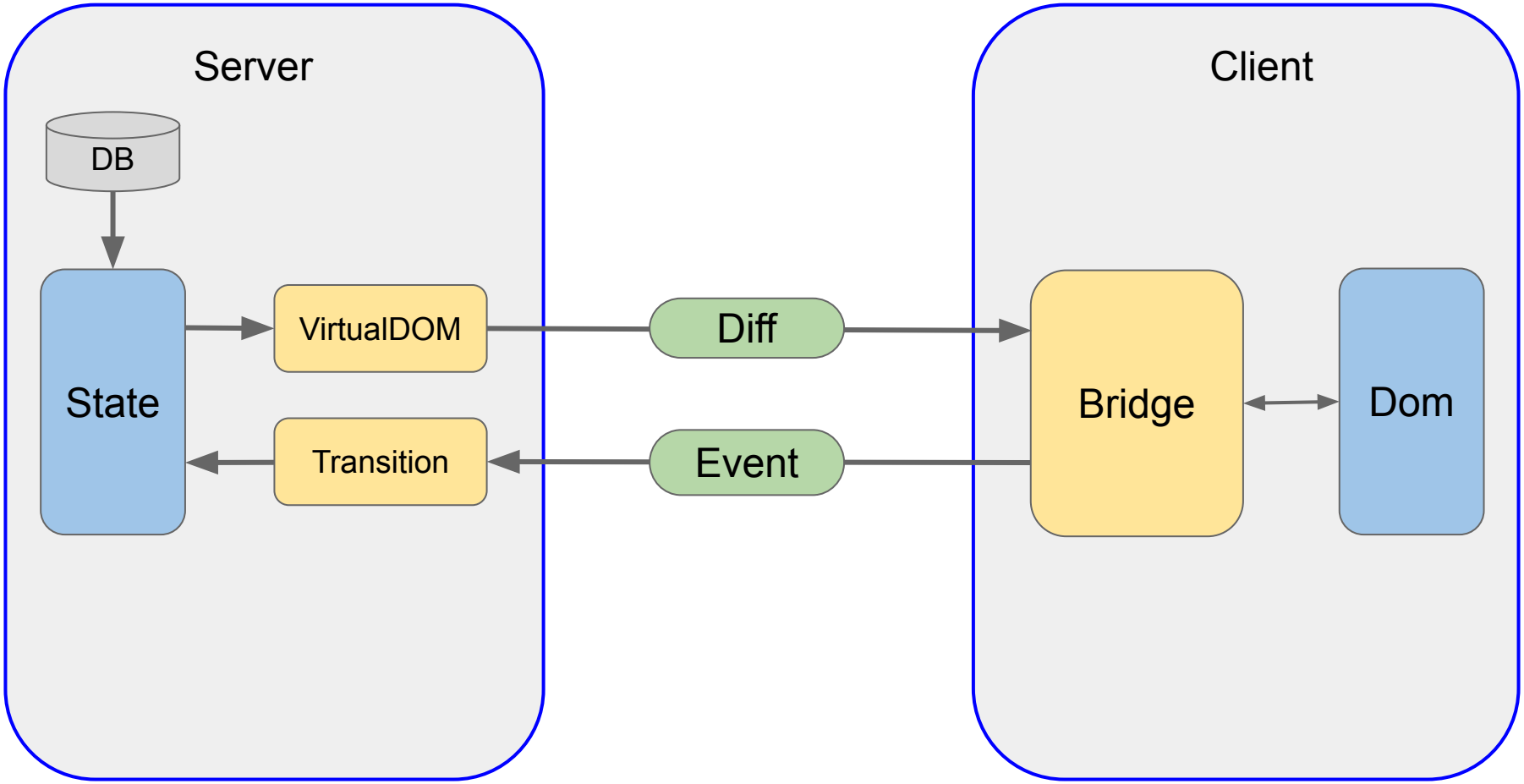
# Korolev



# Korolev



# Korolev

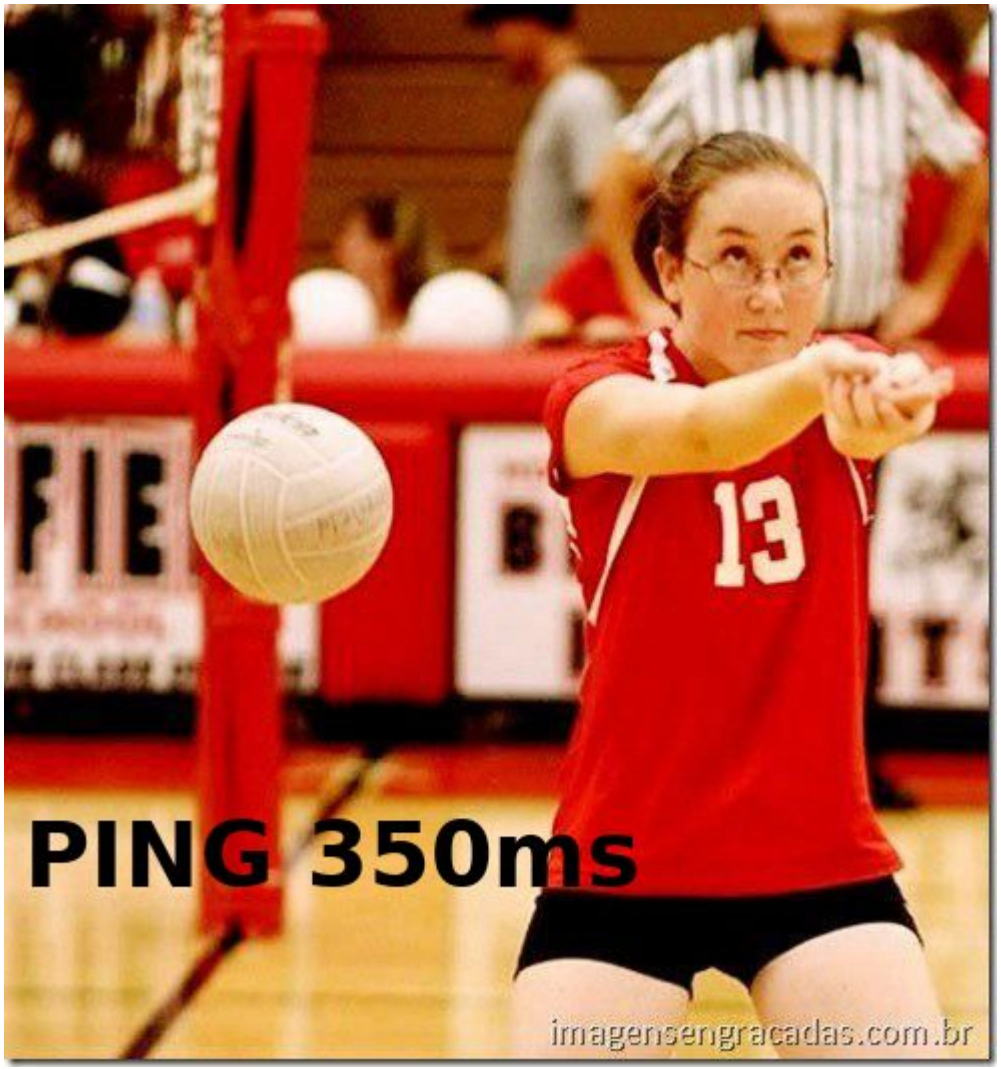

Server
DB
State
VirtualDOM
Transition
Diff
Event
Client
Bridge
Dom

# Преимущества

- Очень маленький размер клиента
- Вся логика на сервере
- На клиент передается только то что видит пользователь
- Сверхнизкое потребление памяти на клиенте
- Не надо делать REST и все что с этим связано.
- Писать на Scala

# Недостатки

# Недостатки



# Недостатки

# Недостатки

- Не работает без интернета
- Чувствительность к пингу
- Высокая нагрузка на GC

# Рабочий пример

```
object AkkaHttpExample extends App {

  private implicit val actorSystem: ActorSystem = ActorSystem()
  private implicit val materializer: Materializer = ActorMaterializer()

  val applicationContext = Context[Future, Boolean, Any]

  import applicationContext._
  import symbolDsl._

  private val config = KorolevServiceConfig[Future, Boolean, Any](
    stateStorage = StateStorage.default( initialState = false),
    router = emptyRouter,
    render = { case _ ⇒ 'div("Hello akka-http") }
  )

  private val route = akkaHttpService(config).apply(AkkaHttpServerConfig())

  Http().bindAndHandle(route,  interface = "0.0.0.0",  port = 8080)
}
```

# State

```
case class State(user: User)

case class User(name: String, role: String)
```

# State

```
sealed trait MyState

case class Anonymous(deviceId: DeviceId) extends MyState

case class Authorized(deviceId: DeviceId, user: User) extends MyState

case class User(id: String, name: String, friends: Seq[String])
```

# State

```
val stateStorage: StateStorage[Future, UiState] =
  StateStorage.forDeviceId[Future, UiState] {
    deviceId ⇒ StateService.forDevice(deviceId)
}
```

# Transition

```
type Transition[State] = State ⇒ State
```

# Transition

```
val newFriend = "Karl Heinrich Marx"
userService.addFriend(user.id, newFriend) flatMap { _ =>
  access.transition { case
    state: Authorized(_, user) =>
      state.copy(user = user.copy(user.friends :+ newFriend))
  }
}
```

# Transition

```
'a ("Login", 'class /= "button",
  event( name = 'click)(loginClick)
)

def loginClick: Access ⇒ EventResult = { access ⇒
  access.transition {
    case state: NotAuthorizedState ⇒
      StateService.registerDevice(state.deviceId)
  }
}
```

# Render

```
PartialFunction[State, Node] = State ⇒ Node
```

# Render

```
val render: Render = {
  case Anonymous(_) ⇒
    'body(
      'form(
        'input('placeholder /= "Login"),
        'input('placeholder /= "Password"),
        'button("Submit")
      )
    )
  case Authorized(_, User(name, friends)) ⇒
    'body(
      'div(s"Your name is $name. Your friends:"),
      'ul(
        friends map { friend ⇒
          'li(friend)
        }
      )
    )
}
```

# Template DSL

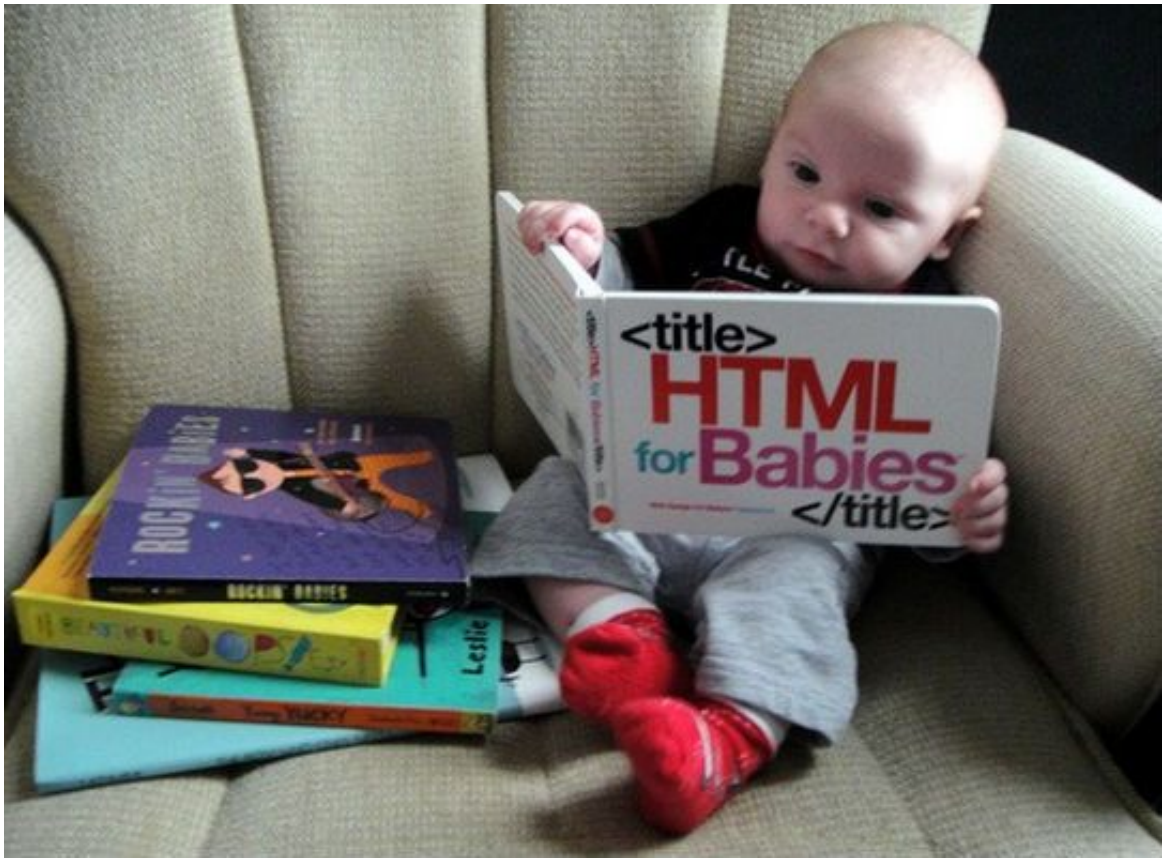
```
'div(
  'backgroundColor @= "yellow",
  'input('type /= "text")
)

<div style="background-color: yellow">
  <input type="text"></input>
</div>
```

# Template DSL

```
'body (
  'section ('class /= "hero is-success is-fullheight",
    'div ('class /= "hero-body",
      'div ('class /= "container has-text-centered",
        'div ('class /= "column is-4 is-offset-4",
          'h3 ("Login", 'class /= "title has-text-grey"),
          'p ("Please login to proceed.", 'class /= "subtitle has-text-grey"),
          'div ('class /= "box",
            'figure ('class /= "avatar", 'img ('src /= "/img/avatar.png")),
            'div (
              'div ('class /= "field",
                'div ('class /= "control",
                  'input (
                    'class /= "input is-large",
                    'type /= "email",
                    'placeholder /= "Your Email",
                    'autofocus /= ""
                  )
                )
              ),
              'div ('class /= "field", 'label ('class /= "checkbox", 'input ("Remember me", 'type /= "checkbox"))),
              'a ("Login", 'class /= "button is-block is-info is-large", event('click)(loginClick))
            )
          ),
          'p ('class /= "has-text-grey",
            'a ("Sign Up", 'href /= "../", " · "),
            'a ("Forgot Password", 'href /= "../", " · "),
            'a ("Need Help?", 'href /= "../")
          )
        )
      )
    )
  )
)
```

# Template DSL



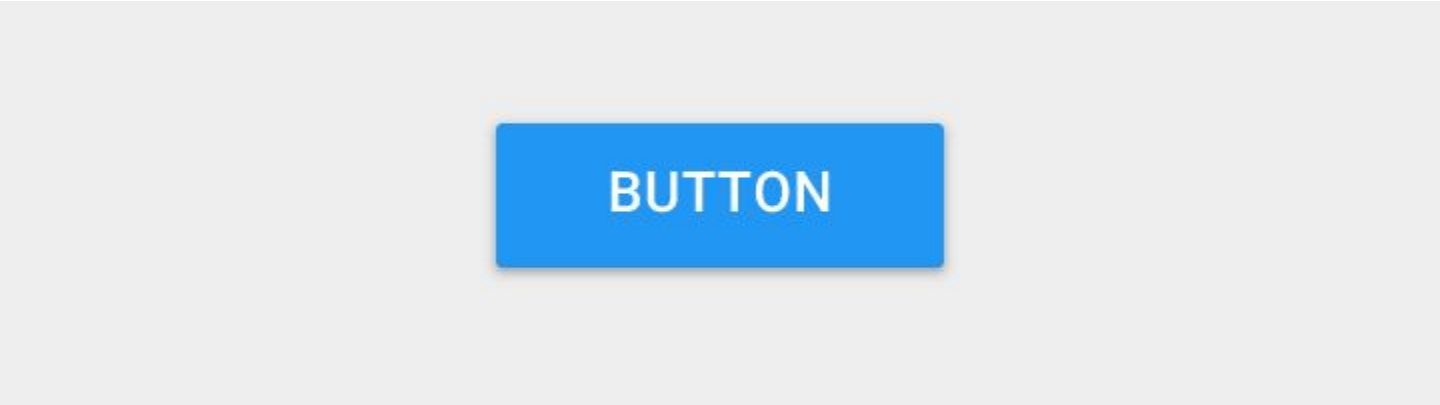
# Template DSL converter

```
<body>
    <section class="hero is-success is-fullheight">
        <div class="hero-body">
            <div class="container has-text-centered">
                <div class="column is-4 is-offset-4">
                    <h3 class="title has-text-
grey">Login</h3>
                    <p class="subtitle has-text-
grey">Please login to proceed.</p>
                    <div class="box">
                        <figure class="avatar">
                            <img
src="https://placehold.it/128x128">
                        </figure>
                        <form>
                            <div class="field">
                                <div class="control">
                                    <input class="input
is-large" type="email" placeholder="Your Email"
autofocus="">
                                </div>
                            </div>

                            <div class="field">
                                <div class="control">
                                    <input class="input
is-large" type="password" placeholder="Your Password">
                                </div>
                            </div>
                            <div class="field">
                                <label
class="checkbox">
                  <input type="checkbox">
                  Remember me
                </label>
                            </div>
```

```
,
'section(
  'class /= "hero is-success is-fullheight",
  'div(
    'class /= "hero-body",
    'div(
      'class /= "container has-text-centered",
      'div(
        'class /= "column is-4 is-offset-4",
        'h3(
          'class /= "title has-text-grey",
          "Login"
        ),
        'p(
          'class /= "subtitle has-text-grey",
          "Please login to proceed."
        ),
        'div(
          'class /= "box",
          'figure(
            'class /= "avatar",
            'img(
              'src /= "https://placehold.it/128x128"
            )
          ),
          'form(
            'div(
              'class /= "field",
              'div(
```

# Template DSL




```
def button(title: String, effect: Access ⇒ EventResult): Node =
  'button ('class := "button is-info is-large", title, event( name = 'click)(effect))
```

# Template DSL

# Template DSL

```
trait PanelState {
  def tabs: TabState
}

trait Panel {
  def render(clazz: String, state: PanelState, filter: Boolean): Node =
    'nav (
      'class /= "panel ",
      'div ('class /= "tab-content",
        'div ('class /= "tabs is-boxed",
          'ul (
            tabHeader(state)
          )
        ),
        tabContent(state)
      )
    )

  def tabHeader(state: PanelState): Node

  def tabContent(state: PanelState): Node

  def tabClick(tab: TabPane): Access ⇒ EventResult
}
```

# Events

```
case class MyState(i: String)

val renderAnonymous: Render = {
  case MyState(i) =>
    'body(
      i.toString,
      'button("Increment",
        event('click) { access =>
          access.transition {
            case MyState(i) =>
              state.copy(i = i + 1)
          }
        }
      )
    )
}
```

# Events

```
<- [6]
-> [9]
<- [0,"7:1_1_2_2_2_1_1_2_1:click"]
-> [4,3,"1_1_2_2_2_1_1_1",0,"class","",false,3,"1_1_2_2_2_1_1_2",0,"class","is-active",false,1,"1_1_2_2_2_2","1_1_2_2_2_2_1","We are the Tab4" ]
-> [0,8 ]
<- [0,"8:1_1_2_2_2_1_1_3_1:click"]
-> [4,3,"1_1_2_2_2_1_1_2",0,"class","",false,3,"1_1_2_2_2_1_1_3",0,"class","is-active",false,1,"1_1_2_2_2_2","1_1_2_2_2_2_1","We are the Tab5" ]
-> [0,9 ]
<- [6]
-> [9]
<- [6]
-> [9]
<- [0,"9:1_1_2_2_2_1_1_2_1:click"]
-> [4,3,"1_1_2_2_2_1_1_2",0,"class","is-active",false,3,"1_1_2_2_2_1_1_3",0,"class","",false,1,"1_1_2_2_2_2","1_1_2_2_2_2_1","We are the Tab4" ]
-> [0,10 ]
<- [6]
-> [9]
<- [0,"10:1:resize"]
<- [6]
<- [0,"10:1:resize"]
```

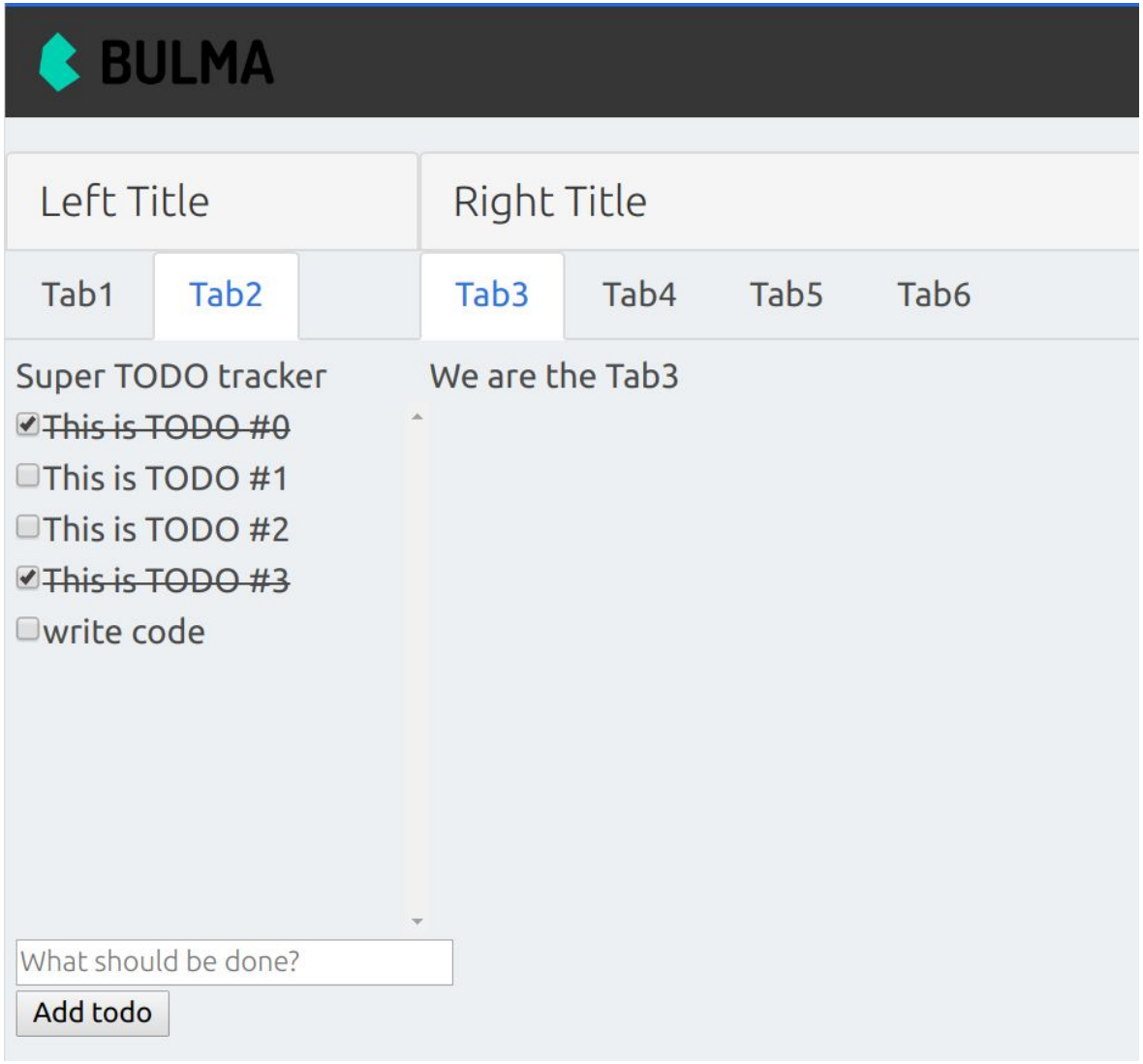
# Events


BULMA
Left Title
Right Title
Tab1
Tab2
Tab3
Tab4
Tab5
Tab6
We are the Tab1
We are the Tab3

# Events

```
<- [0,"6:1_1_2_1_2_1_1_1_1:click"]
-> [4,3,"1_1_2_1_2_1_1_1",0,"class","is-active",false,3,"1_1_2_1_2_1_1_2",0
```

# Events


BULMA
Left Title
Right Title
Tab1
Tab2
Tab3
Tab4
Tab5
Tab6
Super TODO tracker
This is TODO #0
This is TODO #1
This is TODO #2
This is TODO #3
write code
We are the Tab3
What should be done?
Add todo

# Events

```
<- [0,"2:1_1_2_1_2_1_1_2_1:click"]
```

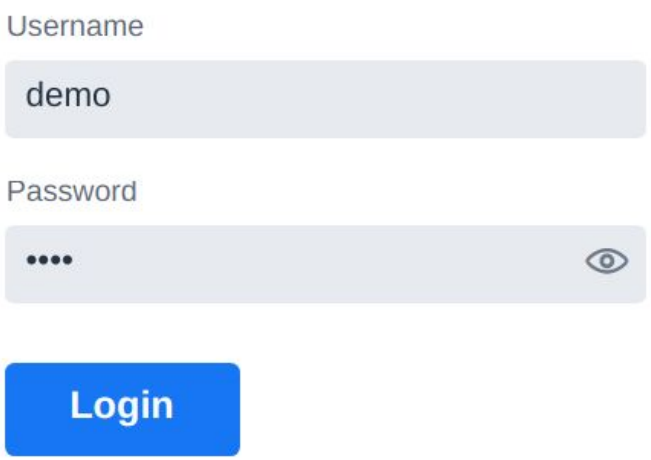
```
->
[4,3,"1_1_2_1_2_1_1_1",0,"class","",false,3,"1_1_2_1_2_1_1_2",0,"class"
active",false,0,"1_1_2_1_2_2","1_1_2_1_2_2_1",0,"div",1,"1_1_2_1_2_2_1"
_1","Super TODO
tracker",0,"1_1_2_1_2_2_1","1_1_2_1_2_2_1_2",0,"div",5,"1_1_2_1_2_2_1_2
scroll",5,"1_1_2_1_2_2_1_2","height","250px",0,"1_1_2_1_2_2_1_2","1_1_2
,"div",0,"1_1_2_1_2_2_1_2_1","1_1_2_1_2_2_1_2_1_1",0,"input",3,"1_1_2_1
,"type","checkbox",false,0,"1_1_2_1_2_2_1_2_1","1_1_2_1_2_2_1_2_1_2",0,"
_1_2_2_1_2_1_2","1_1_2_1_2_2_1_2_1_2_1","This is TODO
#0",0,"1_1_2_1_2_2_1_2","1_1_2_1_2_2_1_2_2",0,"div",0,"1_1_2_1_2_2_1_2_2
_1_2_2_1",0,"input",3,"1_1_2_1_2_2_1_2_2_1",0,"type","checkbox",false,0,
_2_2","1_1_2_1_2_2_1_2_2_2",0,"span",1,"1_1_2_1_2_2_1_2_2_2","1_1_2_1_2_
This is TODO
```

# Events

```
val loginField = elementId()
val passwordField = elementId()

val renderAnonymous: Render = {
  case Anonymous(_) =>
    'body(
      'form(
        'input('placeholder /= "Login", loginField),
        'input('placeholder /= "Password", passwordField),
        'button("Submit"),
        event('submit) { access =>
          for {
            login <- access.property(loginField, 'value)
            password <- access.property(passwordField, 'value)
            user <- authService.authorize(login, password)
            _ <- access.transition {
              case Anonymous(deviceId) =>
                Authorized(deviceId, user)
            }
          } yield ()
        }
      )
    )
}
```

# Web Components




```
'div('class /= "login", 'theme /= "dark",
  'vaadinTextField('label /= "Username", 'name /= "username", 'value /= "demo"),
  'vaadinPasswordField('label /= "Password", 'name /= "password", 'value /= "demo"),
  'span('class /= "error-message", ""),
  'vaadinButton("Login", 'id /= "login-button", 'theme /= "primary", event('click))
)
```

# Спасибо за внимание!

## Вопросы ?

solver.it@gmail.com

https://github.com/solverit/korolev-demo