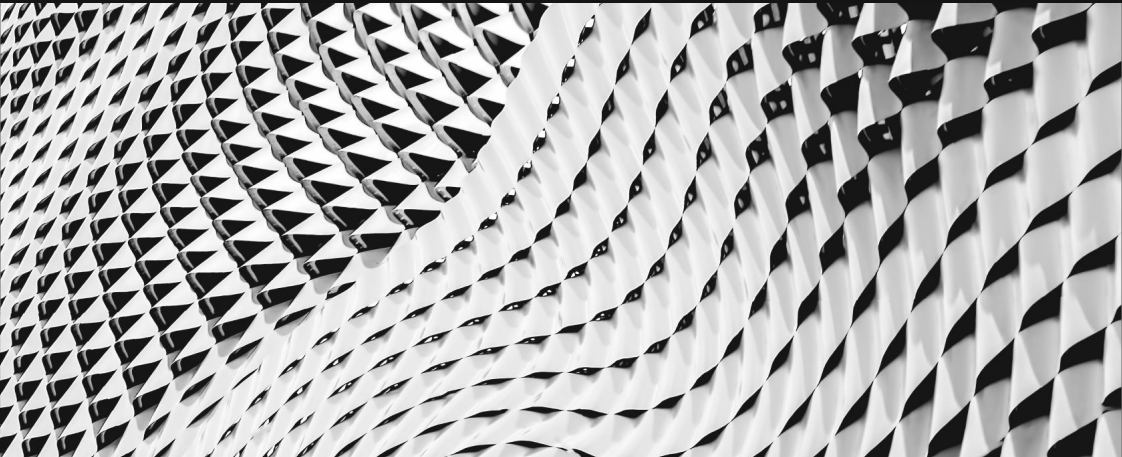


My Teams Should Be Moving Faster!



- Continuous Integration
- Pipelines
- Continuous Testing
- Microservices
- Continuous Delivery
- CHAOS
- Integration Issues
- Misunderstandings
- Waiting
- Blockers



“Reminder: If you're building microservices,
you're building a distributed system.”

- Jez Humble

Why You Should Be Doing Contract-First API Development

Deven Phillips
Senior Consultant
@infosec812

Why Contract-First?

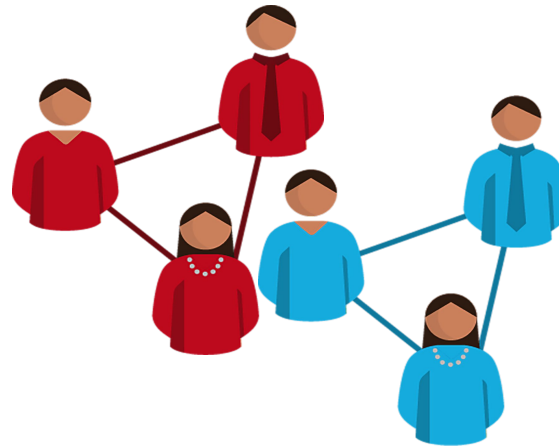
- Because you want to allow people to work independently
- Because you want to ensure consistency
- Because you need strong guarantees about service contracts
- Because you, your team, your colleagues, your customers, and your partners can collaborate
- Because you can save time by using code generators and testing tools

The Traditional Workflow



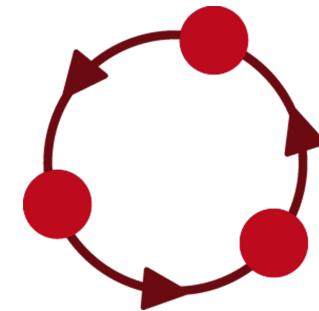
Project Planning

The business experts spend time writing up a project plan for a series of services and potentially a user interface



Send To Developers

The various development teams attempt to interpret the project plan and implement their code so that they are compatible



Iterate And Integrate

The developer teams iteratively try to resolve integration issues and spends lots of time ensuring compatibility

What's The Workflow?



Build An API Specification

Using a tool like **OpenAPI**, write an API specification **FIRST**



Publish The API Specification

Using a tool like **Swagger** or **Apicur.io**, publish the API specification where others have access and can collaborate



Generate Code Contracts

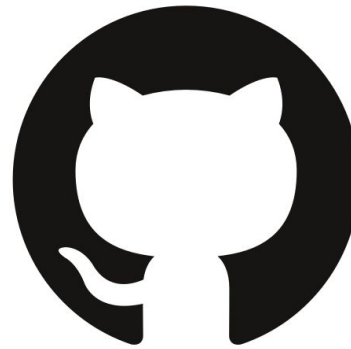
Using a tool like **OpenAPI Generator**, create the API stubs for both client and server applications. You can also generate “mock” services and client SDK libraries!

What's The Workflow?



Build An API Specification

Using a tool like **gRPC**, write an API specification
FIRST



Publish The API Specification

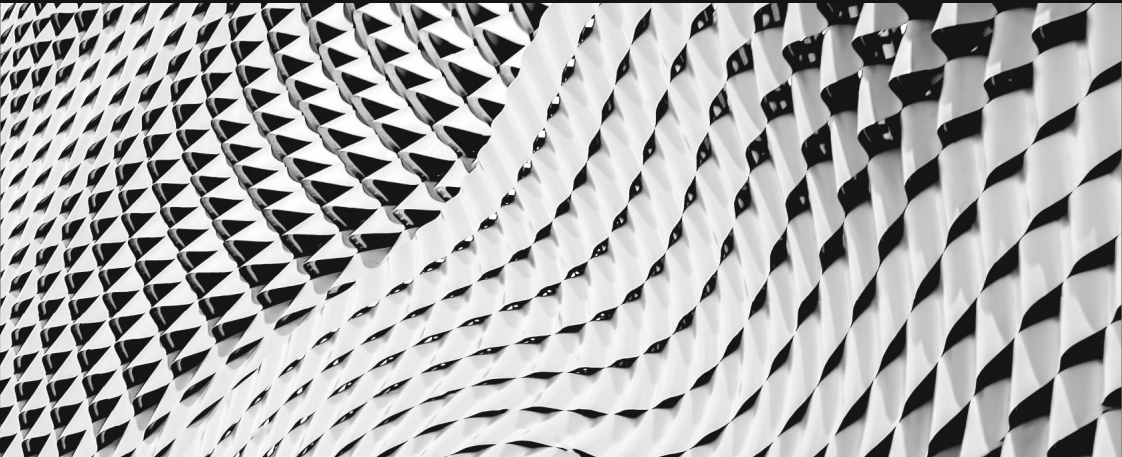
Write your specification in `protoc` format and
publish it to a public repository



Generate Code Contracts

Using a tool like **protoc**, create the API stubs for
both client and server applications. You can also
generate “mock” services and client SDK
libraries!

Learning OpenAPI



- Types
- Endpoints
- Verbs
- Parameters
- Security
- Extensions

API Description:

```
---
openapi: 3.0.2
info:
  title: Petstore
  description: 'This is a sample Petstore API.'
  termsOfService: http://redhat.com/terms/
  contact:
    email: open-innovation-labs@redhat.com
  license:
    name: Apache 2.0
    url: http://apache.org/licenses/LICENSE-2.0
version: 1.0.0
```

```
externalDocs:
  description: Find out more about OpenAPI
  url: http://swagger.io
servers:
- url: https://petstore.swagger.io/v2
- url: http://petstore.swagger.io/v2
tags:
- name: pet
  description: Everything about your Pets
  externalDocs:
    description: Find out more
    url: http://swagger.io
```

Type Definitions:

```
components:  
  schemas:  
    Order:  
      type: object  
      required:  
        - id  
        - petId  
      properties:  
        id:  
          type: string  
          format: uuid  
        petId:  
          type: integer  
          format: int64  
        quantity:  
          type: integer  
          format: int32
```

```
  shipDate:  
    type: string  
    format: date-time  
  status:  
    type: string  
    description: Order Status  
    enum:  
      - placed  
      - approved  
      - delivered  
  complete:  
    type: boolean  
    default: false  
  xml:  
    name: Order
```

Endpoints:

```

/store/order:
  post:
    tags:
      - store
    summary: Place an order for a pet
    operationId: placeOrder
    requestBody:
      description: order placed
      content:
        '*/*':
          schema:
            $ref: '#/components/schemas/Order'
      required: true
  
```

```

    responses:
      200:
        description: successful operation
        content:
          application/xml:
            schema:
              $ref:
                '#/components/schemas/Order'
          application/json:
            schema:
              $ref:
                '#/components/schemas/Order'
      400:
        description: Invalid Order
        content: {}
  
```

Parameters:

```
/store/order:
```

```
  get:
```

```
    summary: Retrieve all orders
```

```
    operationId: getOrders
```

```
    parameters:
```

```
      - in: query
        name: startDate
        required: false
        schema:
          type: string
          format: datetime
```

```
      - in: query
        name: endDate
        required: false
        schema:
          type: string
          format: datetime
```

```
/store/order/{orderId}:
```

```
  get:
```

```
    summary: Retrieve all orders
```

```
    operationId: getOrderById
```

```
    parameters:
```

```
      - in: path
        name: orderId
        required: true
        schema:
          type: string
          format: uuid
```

Security:

```
components:  
  securitySchemes:  
    BasicAuth:  
      type: http  
      scheme: basic  
    BearerAuth:  
      type: http  
      scheme: bearer  
    ApiKeyAuth:  
      type: apiKey  
      in: header  
      name: X-API-Key  
    OpenID:  
      type: openIdConnect  
      openIdConnectUrl: https://ex.io/oid-config
```

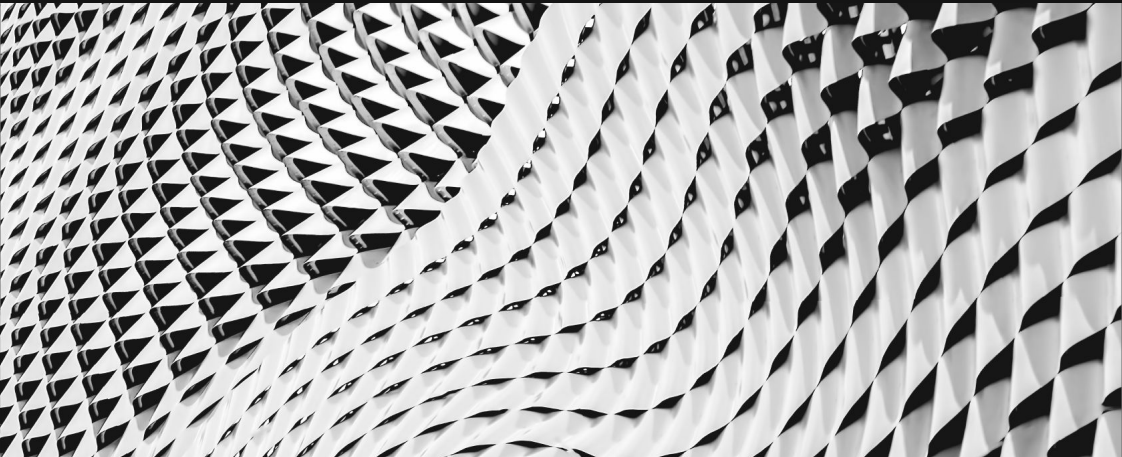
```
OAuth2:  
  type: oauth2  
  flows:  
    authorizationCode:  
      authorizationUrl: https://ex.io/oauth/auth  
      tokenUrl: https://ex.io/oauth/token  
      scopes:  
        read: Grants read access  
        write: Grants write access  
        admin: Grants admin access
```

Extensions:

```
/store/order:
  post:
    tags:
      - store
    summary: Place an order for a pet
    operationId: placeOrder
    x-vertx-event-bus:
      address: com.myapp.store.order
    requestBody:
      description: order placed
      content:
        '*/*':
          schema:
            $ref: '#/components/schemas/Order'
      required: true
```

```
responses:
  200:
    description: successful operation
    content:
      application/xml:
        schema:
          $ref:
            '#/components/schemas/Order'
      application/json:
        schema:
          $ref:
            '#/components/schemas/Order'
  400:
    description: Invalid Order
    content: {}
```

OpenAPI Tools



- Editors
- Server Implementations
- Client Implementations
- Testing Tools
- Mocking Tools

Editors:

- APICurio (apicur.io)
- Swagger Editor (editor.swagger.io)
- VSCode
- IntelliJ
- Eclipse

Server Implementations:

- OpenAPI Generator
- Vert.x Web API Contract/Web API Service
- MicroTS
- @smartrecruiters/openapi-first

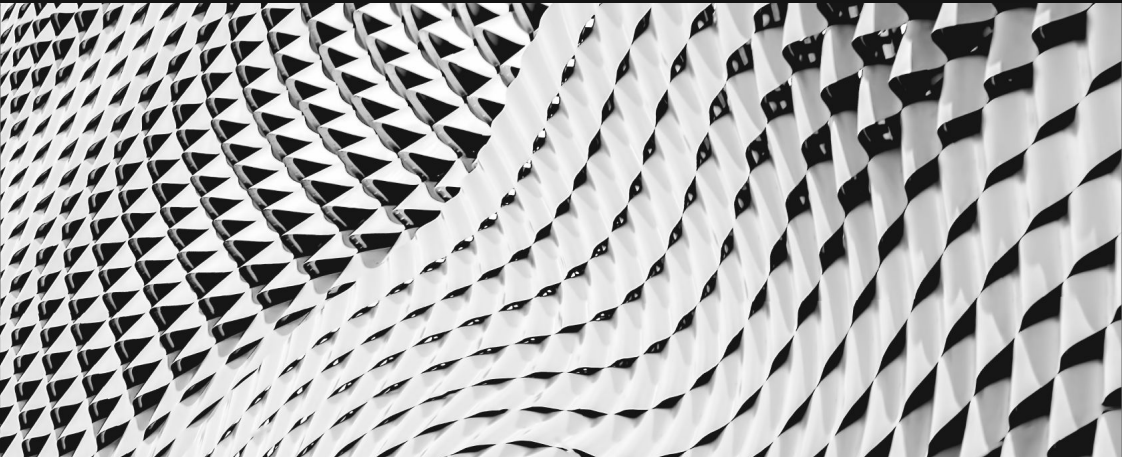
Client Implementations:

- OpenAPI Generator
- Vert.x Web API Contract
- APIMATIC
- openapi-client-axios

Testing Tools:

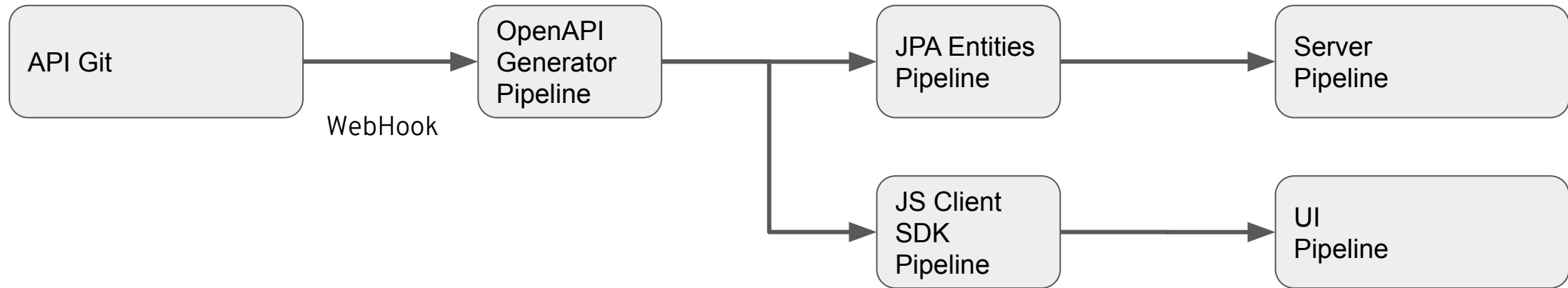
- Dredd
- Chai OpenAPI Response Validator
- hikaku
- Assertible

Demonstration



- Writing A Specification
- Server Implementation
- Client Implementation
- Testing
- Mocking

CI/CD For API:



Thank you

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Presenter's Name
Title

Thank you

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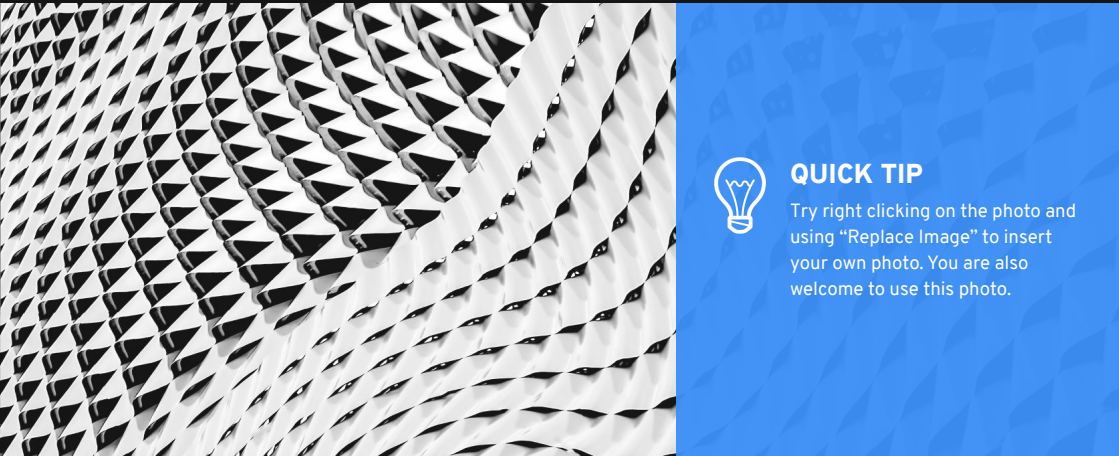
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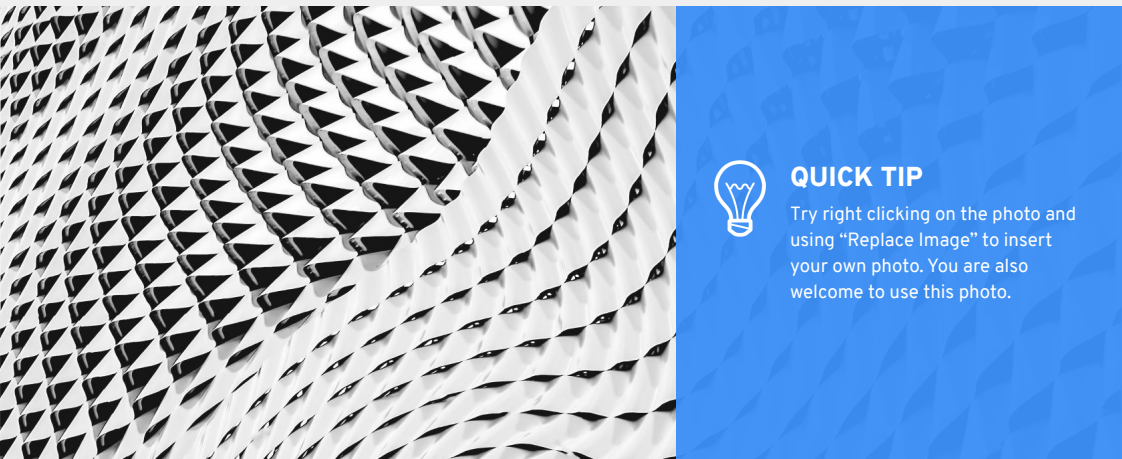
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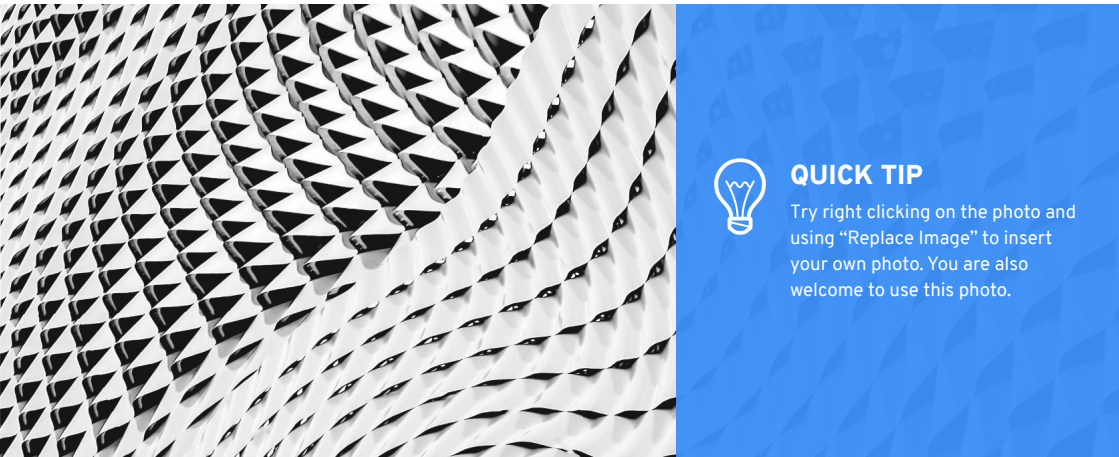
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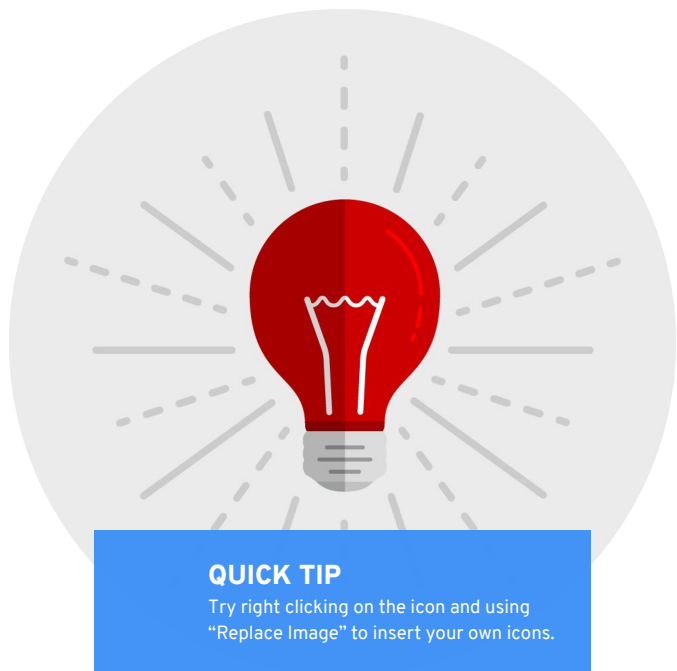
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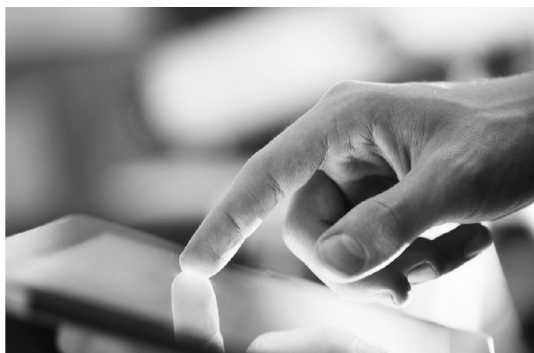
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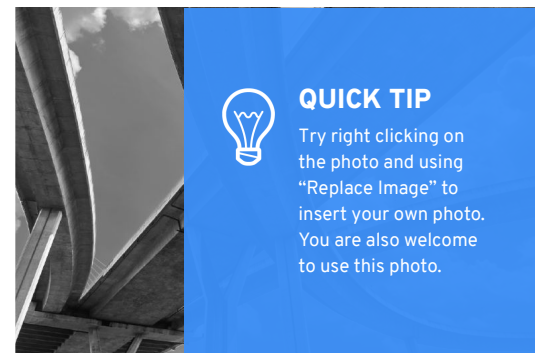
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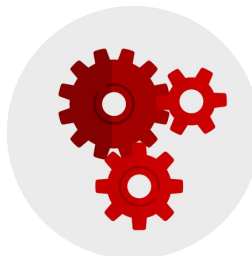


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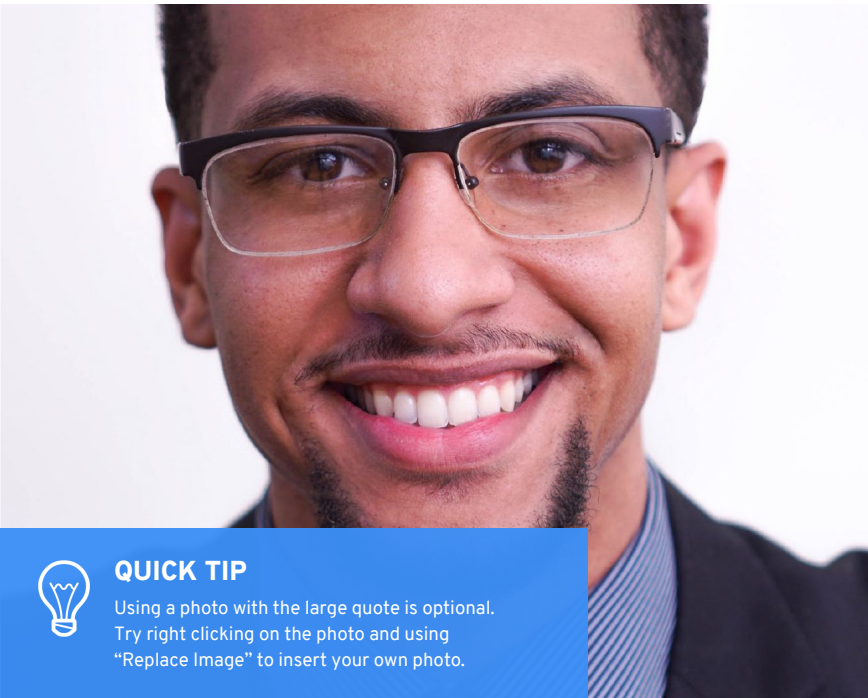


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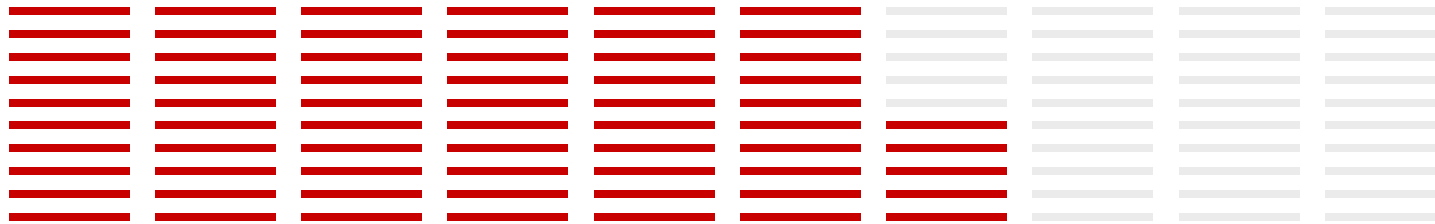
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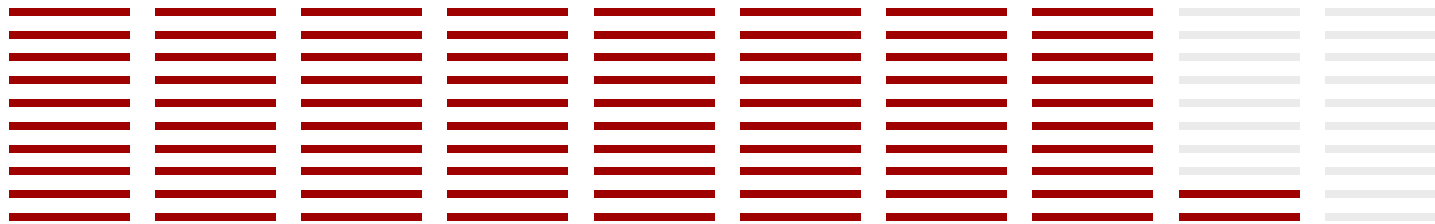
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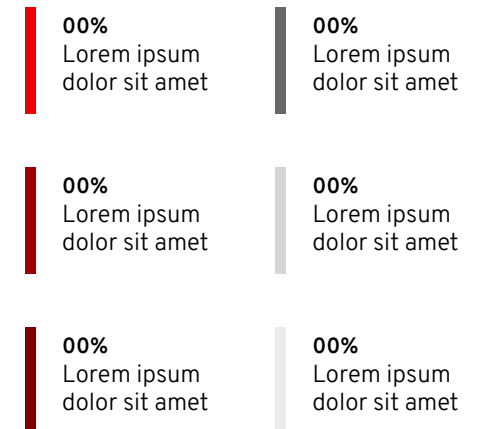
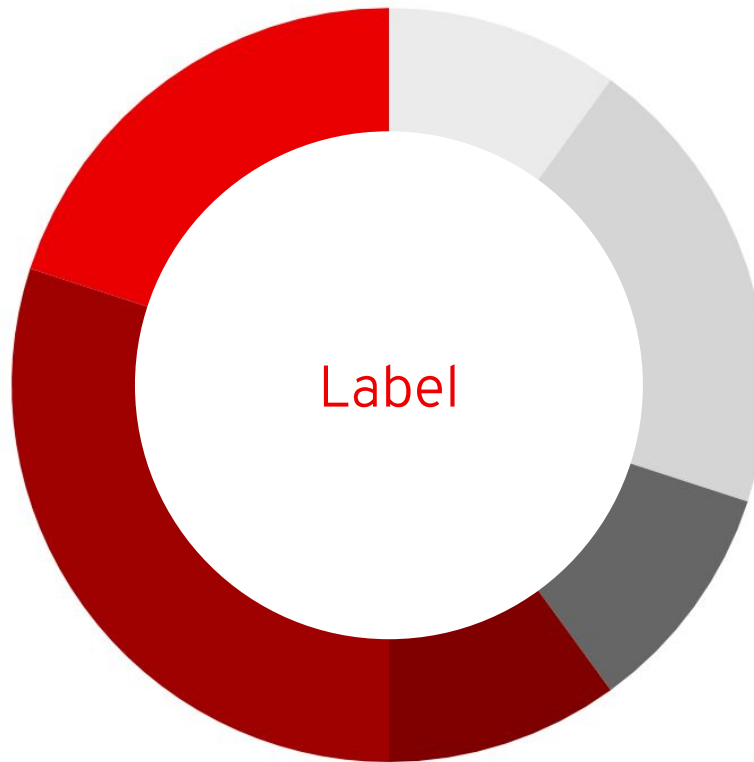


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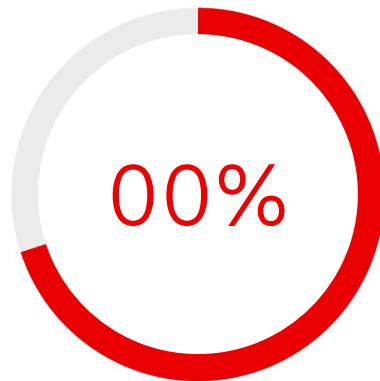
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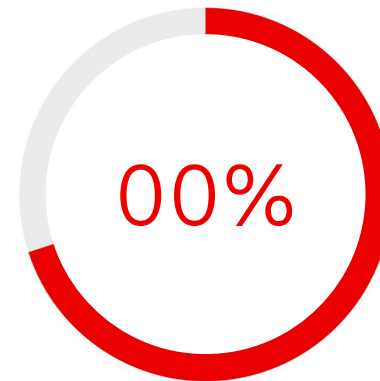
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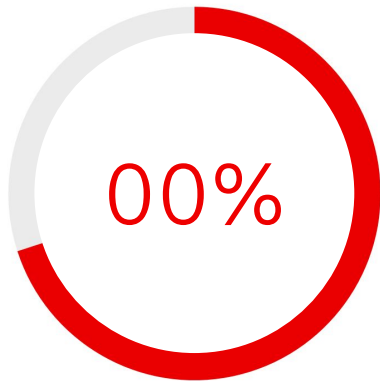
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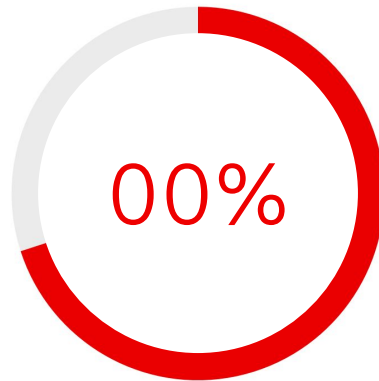
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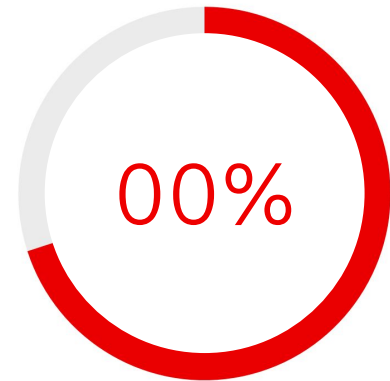
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 **QUICK TIP**
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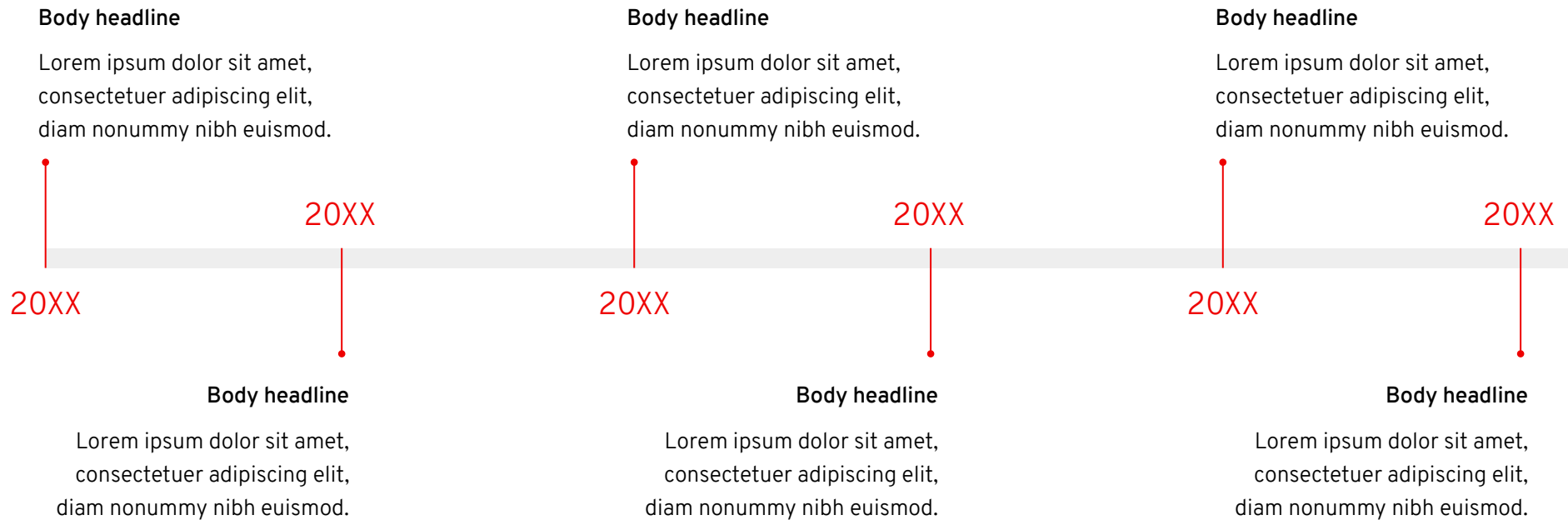
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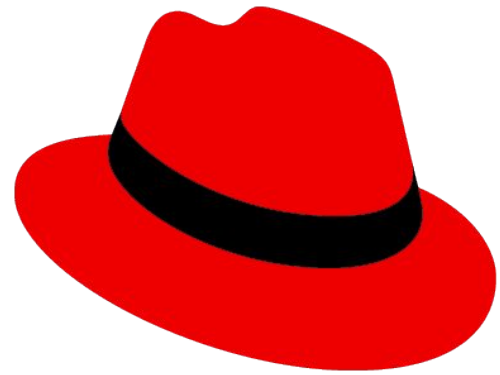
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