RIPE NCC
RIPE NETWORK COORDINATION CENTER

OAuth 2.0 Authentication

Adonis Stergiopoulos

Why OAuth 2.0?

What is OAuth 2.0?

OAuth 2.0 is a standard designed to access resources hosted by other web apps on behalf of a user

OAuth 2.0 provides a **standardised** and **secure** mechanism for applications to access our external APIs, without exposing user credentials.

- Security
- Flexibility
- Access Control

API Keys and OAuth 2.0

January 2025:

Introduction of API keys to authenticate updates in the RIPE Database

- Our aim is to offer solutions that enable third-party applications to securely integrate with the RIPE Database
- OAuth 2.0 is being implemented **as an alternative to using API keys** for authentication
- API keys and the OAuth 2.0 solution are complementary.

API Keys vs OAuth 2.0

Feature	API Keys	OAuth 2.0
Credentials	Managed by user	Managed by third-party applications
App identity	❌	✅
Scopes	✅	✅
Session lifetime	Lifetime is configurable up to 1 year	Access token is valid for 1 hour. Refresh token is valid for 365 days.

Authorisation Flows

Authorisation Flows

What are they?

Authorisation Flows are the process by which a **Client App** obtains authorisation from a **User** to access their protected data on a **Resource Server**.

OAuth 2.0 provides different flows depending on:

- Type of client
- Security requirements

User Interviews

1.	Ability to authenticate on behalf of other users
2.	Provide support for Web Applications
3.	Provide support for simple Command Line scripts
4.	Minimise the need for user intervention
5.	Provide support for ‘scopes’

Authorisation Flows

Authorisation Code Flow (with PKCE)

Recommended for: Web apps, Mobile apps and SPAs

+ Built-in security (*client_secret*, *redirect_uri,* PKCE)
- Needs public URL for r*edirect_uri*
- Client Apps must support PKCE

Device Code Flow

Recommended for: Limited input devices (e.g. CLI)

+ Would work for CLI clients authenticating for themselves
+ Less development work for Client App
- Less secure due to lack of *redirect_uri*
- Vulnerable to phishing attacks

Client Credentials Flow (with Token Exchange)

Recommended for: Machine to machine communication

+ High level of flexibility in Token Exchange
+ Less development work for Client App
- Not suitable for public clients
- Significant RIPE NCC development required to ensure the Token Exchange is secure

User Requirements

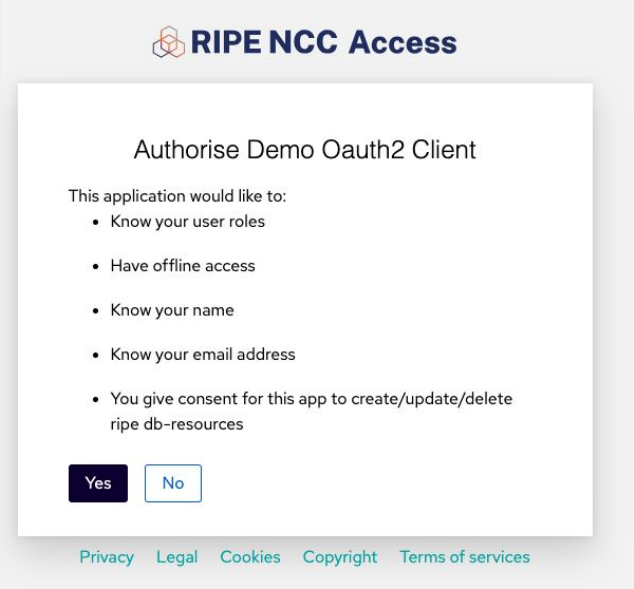
	Authorisation Code Flow (PKCE)	Device Code Flow	Client Credentials Flow (with Token Exchange)
Web Applications	✅	✅	✅
Command Line Scripts	✅*	✅	✅
Authenticate on behalf of other Users	✅	❌	✅
Minimise User intervention	?	?	?
Support for scopes	✅	✅	✅

*some limitations are applicable

Authorisation Code Flow (with PKCE)

Recommended solution

- **Features:**
  - Supports both interactive and offline use
  - Sessions can be app-specific (Whois, RPKI, etc.)
- **User friendliness:**
  - Simply requires the User to click on a login button, provide their credentials and give consent for scope security
- **Development:**
  - Comes out of the box with Keycloak (SSO)
  - Exploring possibilities for command line scripts
- **Security:**
  - Offers PKCE for additional security



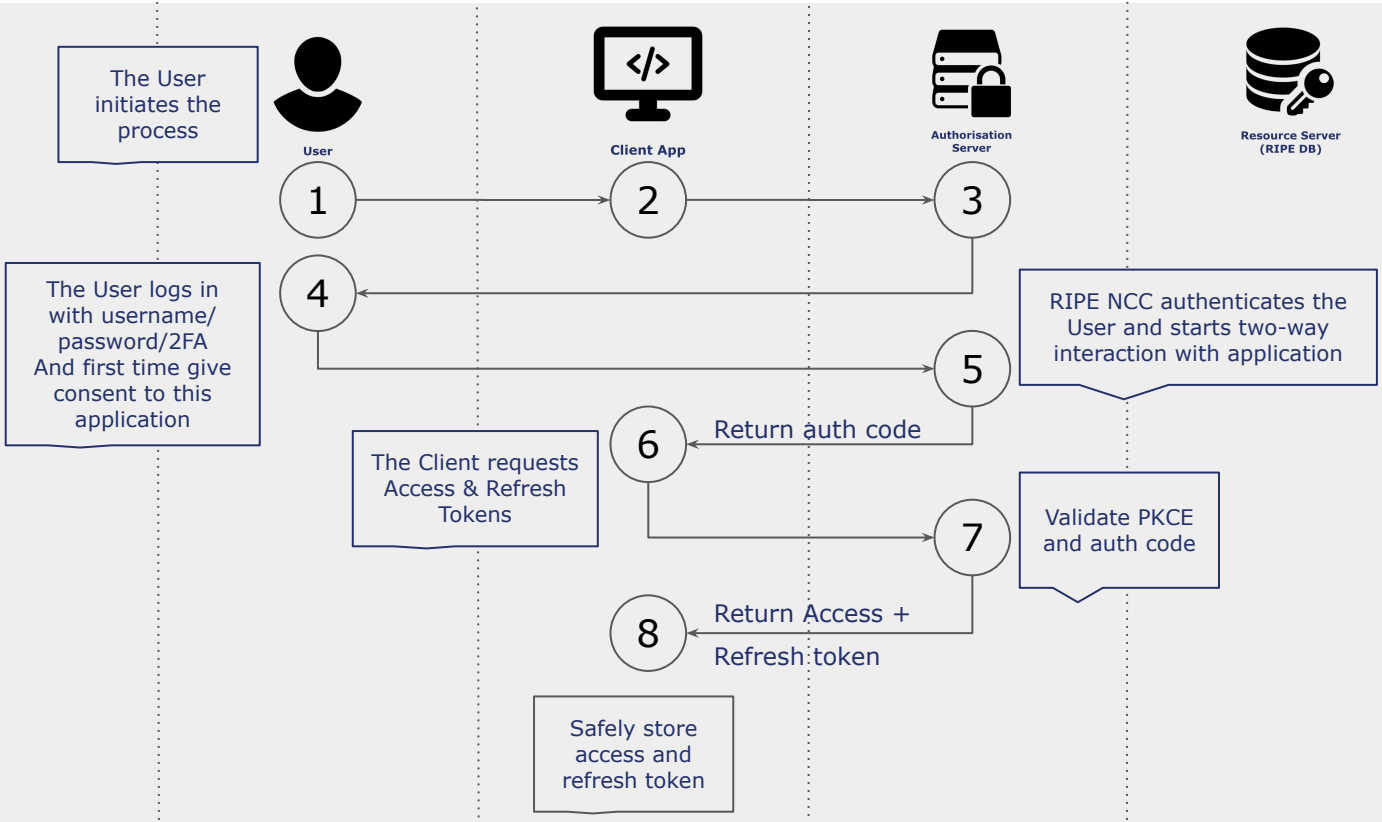
Preview of an OAuth 2.0 authorisation window

Next steps

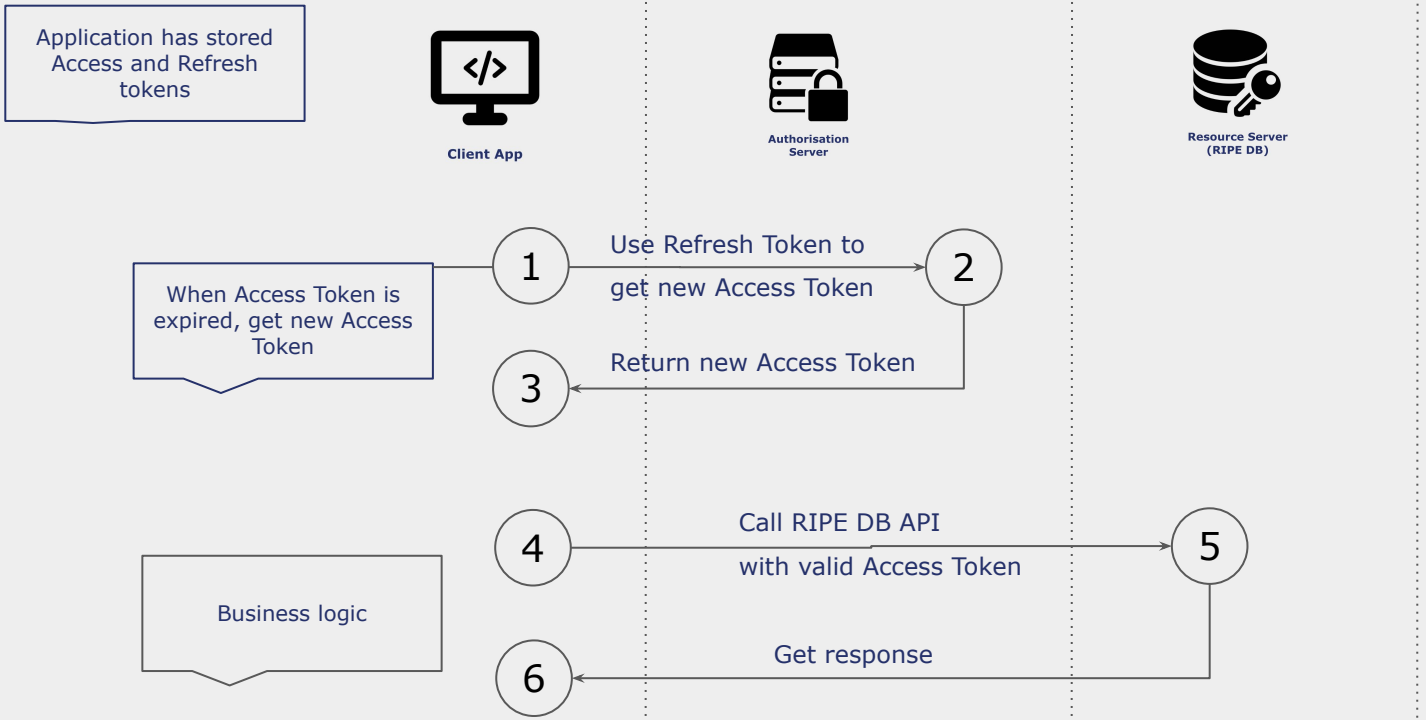
- Phase 1 will be delivered in mid-2025

Authorisation Code Flow Architecture

Getting Tokens with Authorisation Code Flow (with PKCE)



Using OAuth 2.0 Tokens to Call the RIPE Database API



Tokens

Tokens in OAuth 2.0

OAuth 2.0 defines two main type of tokens:

Access tokens
(default)

- Short-lived credential
- Grants access to protected resources
- Is sent with each API request (in http header)
- Proposed lifetime: 1 hour

Refresh tokens
(optional)

- A long lived credential
- Used to obtain a new access token when that expires.
- Is NOT sent to normal API request (stored in a safe location instead)
- Proposed lifetime: 365 days

Expiration Time of Tokens

The expiry time of a token has no standards in OAuth 2.0. It's always a trade-off between security and usability.

	Short Expiry (high security)	**Long Expiry** (high usability)
Pros	Stolen token can only be used for a short period.	Users remain logged in for extended periods, reducing the risk of disruptions if a page refresh fails
Cons	More network traffic for generating access tokens.	If token is stolen it can be used longer and it's harder to detect that it's stolen.

Share Your Feedback

- We need your input on the different types of use cases
- We are looking for volunteers to test our proposed Authorisation Code Flow solution
- Book a demo with us while in Lisbon or online from next week

Questions & Comments

astergiopoulos@ripe.net

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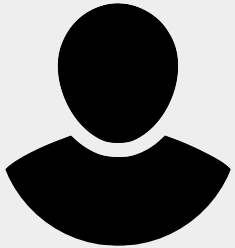
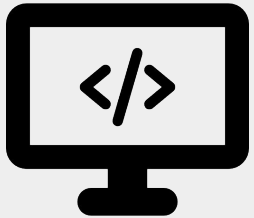
THANK YOU!

OAuth Actors



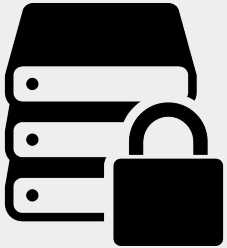
User

Controls Access



Client App

Requests permission



Authorisation Server

Checks identity

Resource Server

RIPE Database

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TITLE OF THE PRESENTATION

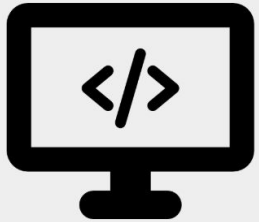
SUBTITLE + DESCRIPTION

Your name here | RIPE NCC | DD Month 2024

Client App Registration

Developer submits Client App details:

- **Client Name:** the name of the application
- **Redirect URIs:** URLs where the application is hosted and Auth Server can send responses to
- **Developer contact details**



Client App

Supported application type first release:

- **Web application that supports OAuth 2.0 Authorisation code flow with PKCE**
- **Confidential Client:** Server-side apps that can store client_secret safely)

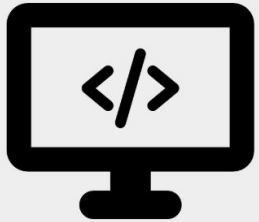
After approval, the RIPE NCC provides for external app:

- ***client_id:*** a public identifier for the Client App
- ***client_secret:*** a confidential key that should be kept secret

Proposal: alternative slide

1. **Request access at RIPE NCC to let your application use Oauth2 to call RIPE NCC api's.**

   Provide your contact details and URL where the app is hosted.



Client App

2. **RIPE NCC will evaluate application**

   Some procedure will take place (f.e. Identification or signing a agreement), then a personal client_id and client_secret are provided to you (which should be kept secret).

3. **Build an application:**

   Now you can build your own web application in the programming language you prefer. This application needs to support:

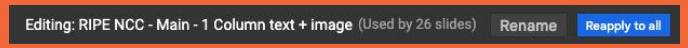
- **OAuth 2.0 Authorisation code flow with PKCE**
- **Confidential Client:** Server-side app that can store client_secret safely
- Host it on the URL that you requested.

HOW TO USE THIS PRESENTATION TEMPLATE

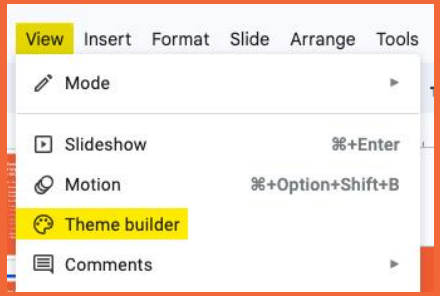
The following slides (from 4 to 16) are the layouts available in this Google Slides theme.

- **Page 4 - Cover Page**
- **Page 5 - Section Divider Page**
- **Page 6 - Table of Contents**
- **Page 7 - Team Page** / 5 Column Images + description
- **Page 8 - Profile Page** / 1 Image **+** 1 Column of text
- **Page 9 -** 1 column of text
- **Page 10 -** 1 column of text with bullets
- **Page 11 -** 1 Column of text + 1 image
- **Page 12 -** 3 Columns of text
- **Page 13 -** 2 Columns of text
- **Page 14** - 3 Columns of text with 3 images
- **Page 15 - Questions & Comments Page**
- **Page 16 - Thank You Page**

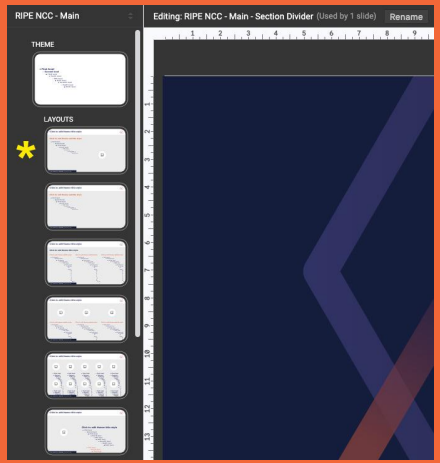
HOW TO UPDATE THE FOOTER



PLEASE NOTE:
On each individual layout, **do not select the "Reapply to all" button** (the blue one), as this will make changes to all the pages, not just the individual layout you want to change.



1. Go to View and then select Theme Builder.



2. Now you are in Editing Mode.

Change the footer description on the first layout (highlighted with a yellow *)

Copy the updated footer to the other layout pages that use a footer.After that, the footer will be automatically updated on all pages once you close the editing mode.

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TITLE OF THE PRESENTATION

SUBTITLE + DESCRIPTION

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SECTION DIVIDER TITLE

Table of contents

1. This is an agenda point
2. This is an agenda point
3. This is an agenda point
4. This is an agenda point
5. This is an agenda point
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Click to add a subheading

Use this section if you have big chunks of text

Click to add a subheading

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Click to add a subheading

A smaller chunk of text plus an image

Questions & Comments

email@email.net

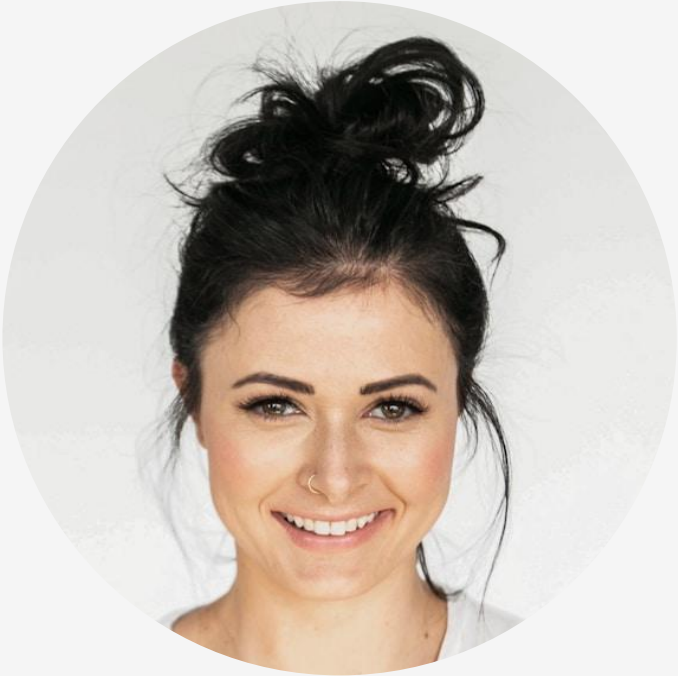
EXAMPLE LAYOUTS

The following slides (from 18 to 46) are examples of possible layouts that you can use.

Feel free to Copy and Paste text boxes, graphics or images to other slides or simply duplicate the slides and make the necessary changes to accommodate your content.

Slides 48 to slide 55 contain references (colours, icons) to use in your presentations.

Hello!

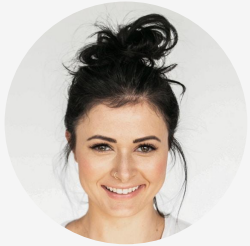


I’m Jane Doe

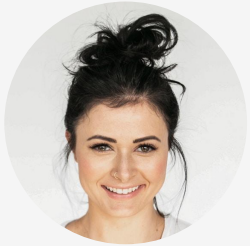
Feel free to edit this small piece of text according to your needs.

email@email.net

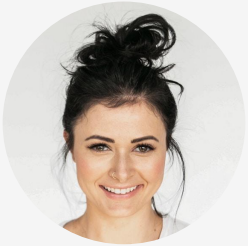
Meet our Team



Jane Doe
Title or Position



Jane Doe
Title or Position



Jane Doe
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Jane Doe
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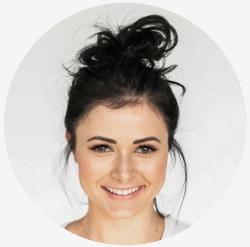
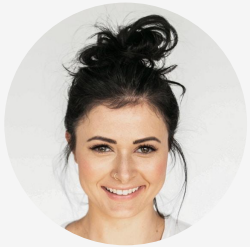


Jane Doe
Title or Position



Jane Doe
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Meet Our Team

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Meet Our Team

Jane Doe
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email@email.net

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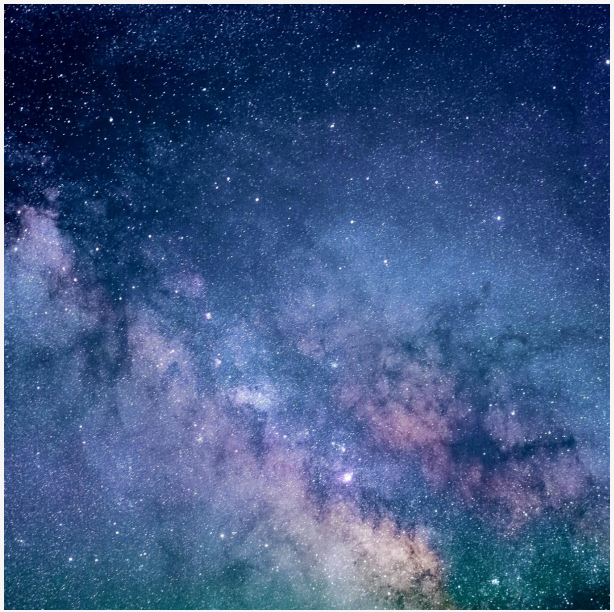

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- 03 Location 03
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- 05 Location 05
- 06 Location 06
- 07 Location 07
- 08 Location 08

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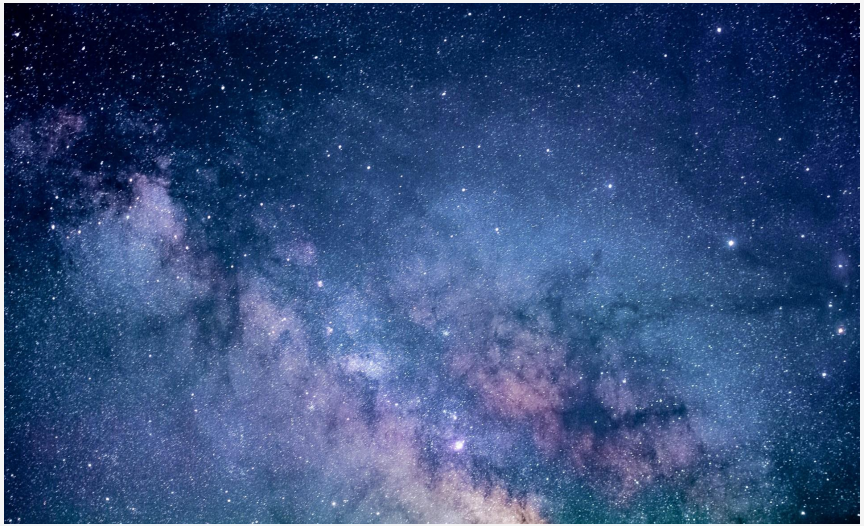

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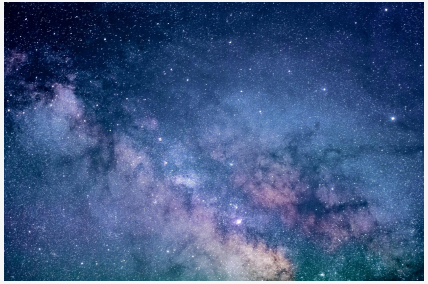

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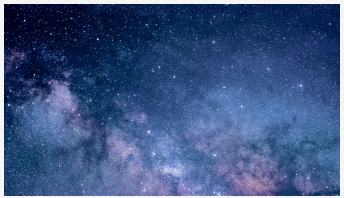

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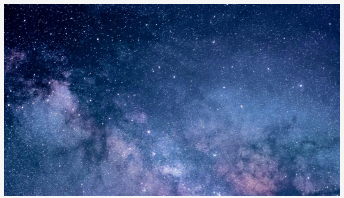

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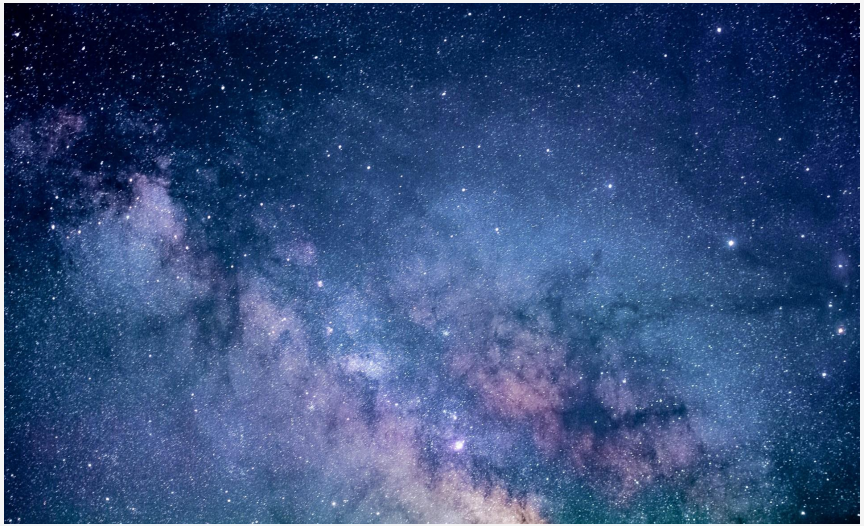

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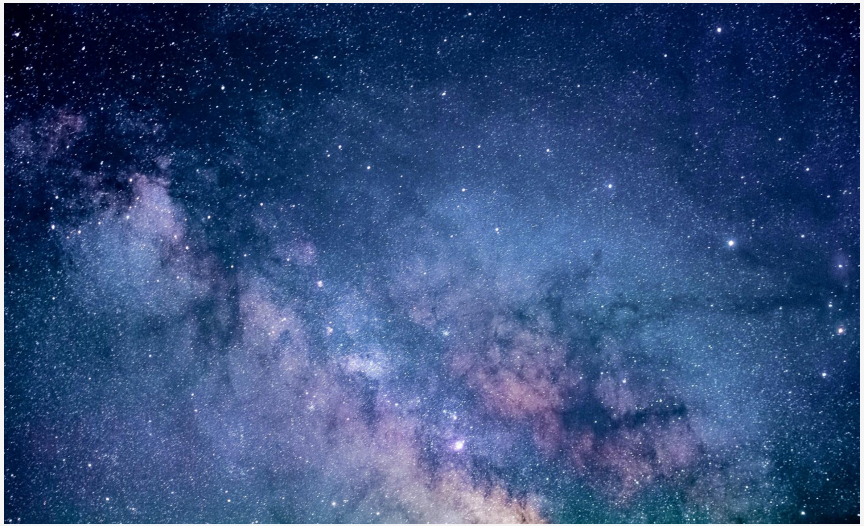

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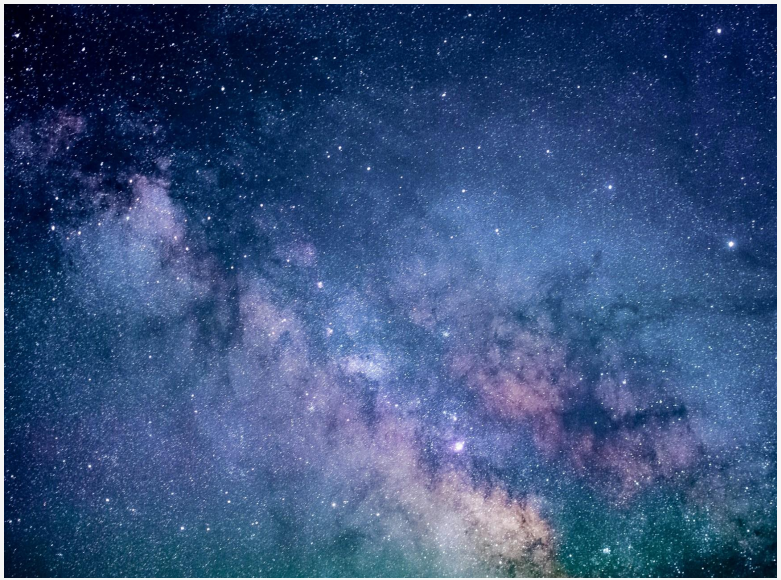

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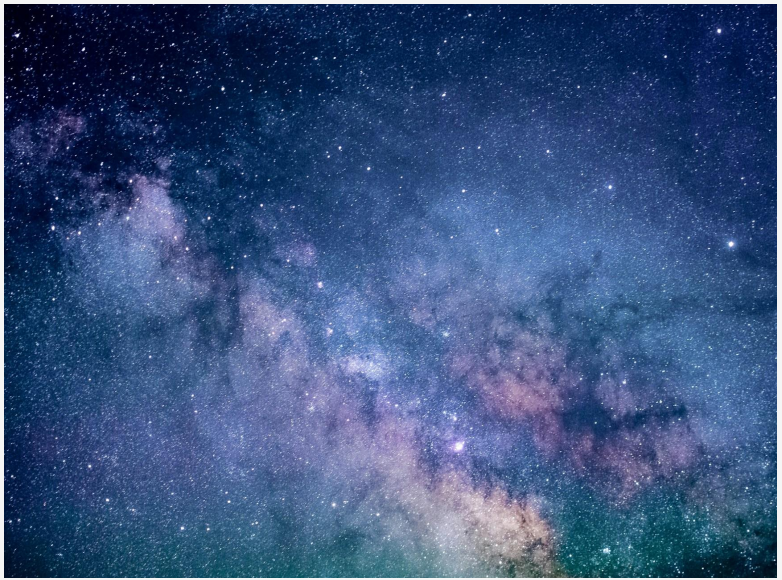

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This is a small table with data

Year	2013	2019	Change
LIRs	25,100	23,400	-7%
Total Cost	EUR 32M	EUR 35M	9%
Inflation	-	-	17%
Cost/LIR	EUR 1,278	EUR 1,480	16%

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3.	Feel free to edit this piece of text
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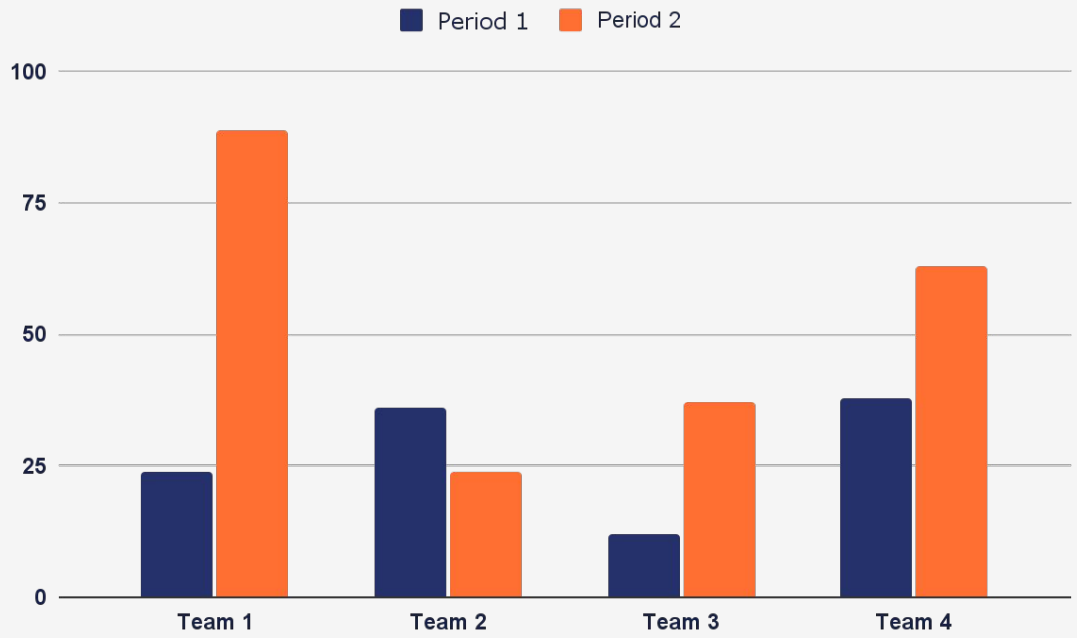

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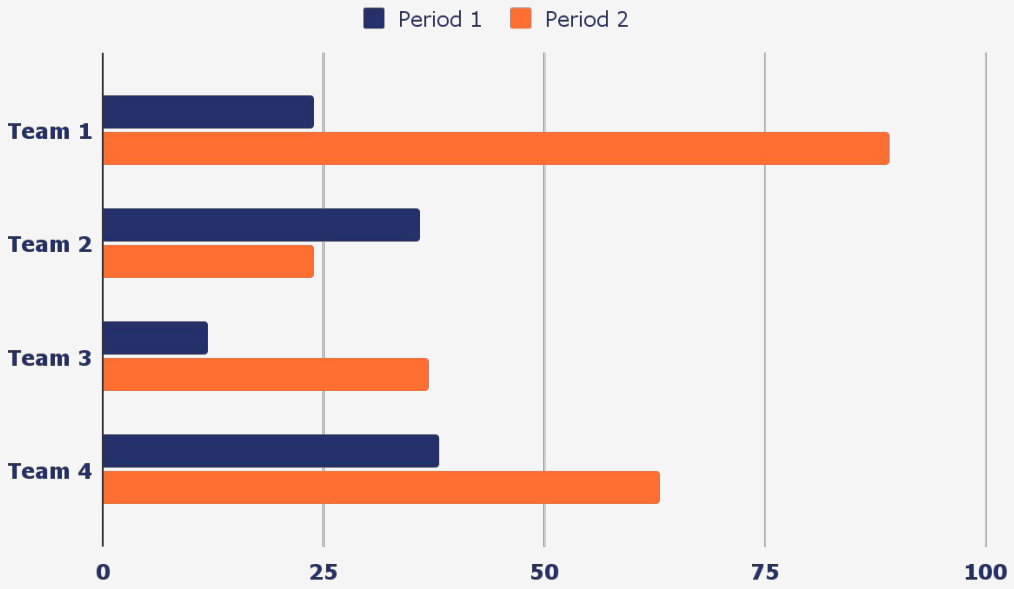
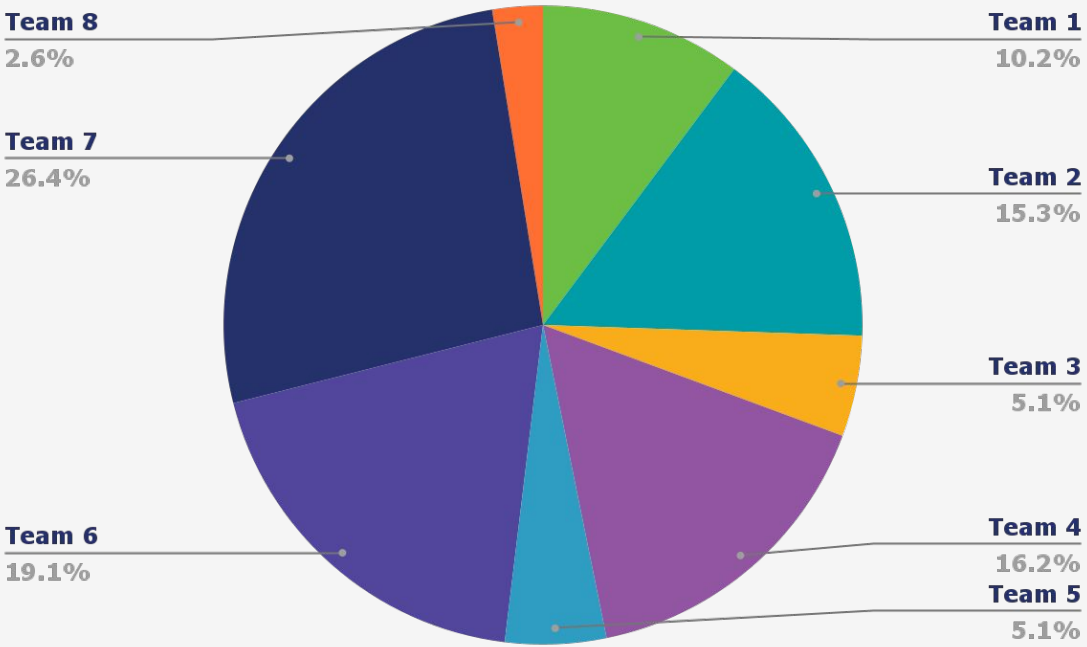
This is a small table

This is a subtitle

This is a small description of the table data this is a small description of the table data.



This is a small table



This is a small description of the table data this is a small description of the table data.

How was your meeting?

We kindly ask for a moment of your time to complete this short survey. It's quick and easy, taking just a few minutes.

RIPE NCC
RIPE NETWORK COORDINATION CENTER

THANK YOU!

RESOURCE PAGES

The following slides (from 48 to 55) have all the necessary references (colors, icons) you will need in your presentations.

This presentation template uses the following fonts:

Titles - Verdana Bold

Subtitles - Verdana Bold

Body Copy - Verdana

Colour Palette Used

Main colours

RGB:
19, 31, 72
Hex:
#131f48

RGB:
42, 69, 135
Hex:
#2a4587

RGB:
243, 107, 33
Hex:
#f36b21

RGB:
108, 190, 69
Hex:
#6cbe45

RGB:
0, 156, 167
Hex:
#009ca7

RGB:
37, 49, 106
Hex:
#25316a

RGB
143, 183, 225
Hex:
#8fb7e1

RGB:
53, 107, 180
Hex:
#356bb4

RGB:
82, 69, 156
Hex:
#52459c

Extra colours

RGB:
213, 42, 39
Hex:
#d52a27

RGB:
250, 173, 27
Hex:
#faad1b

RGB:
39, 176, 75
Hex:
#27b04b

RGB:
101, 101, 101
Hex:
#c9c9c9

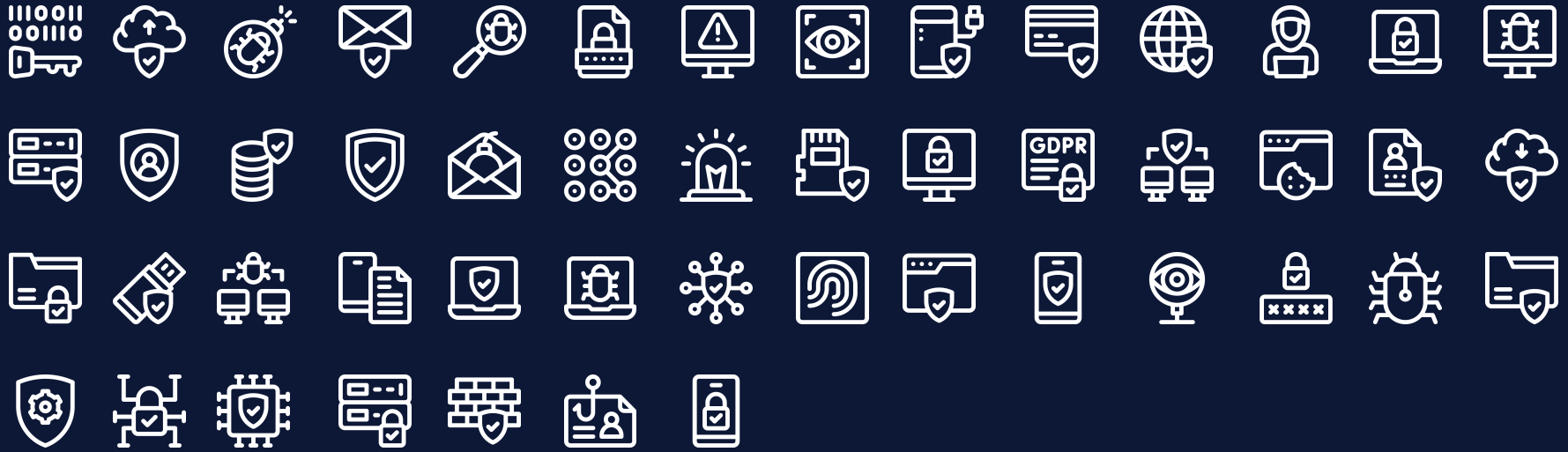
RGB:
3, 92, 84
Hex:
#035c54

RGB:
47, 157, 193
Hex:
#2f9dc1

RGB:
145, 84, 182
Hex:
#9155a2

RGB:
199, 41, 141
Hex:
#c7298d

Icons resource page | data protection

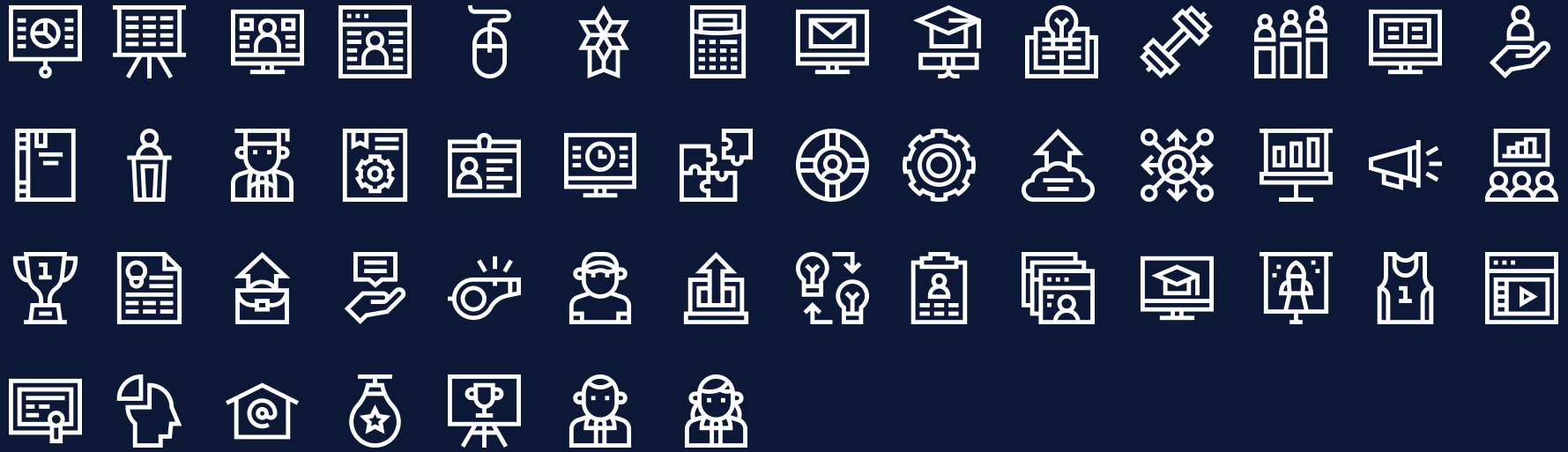


Icons resource page | networking

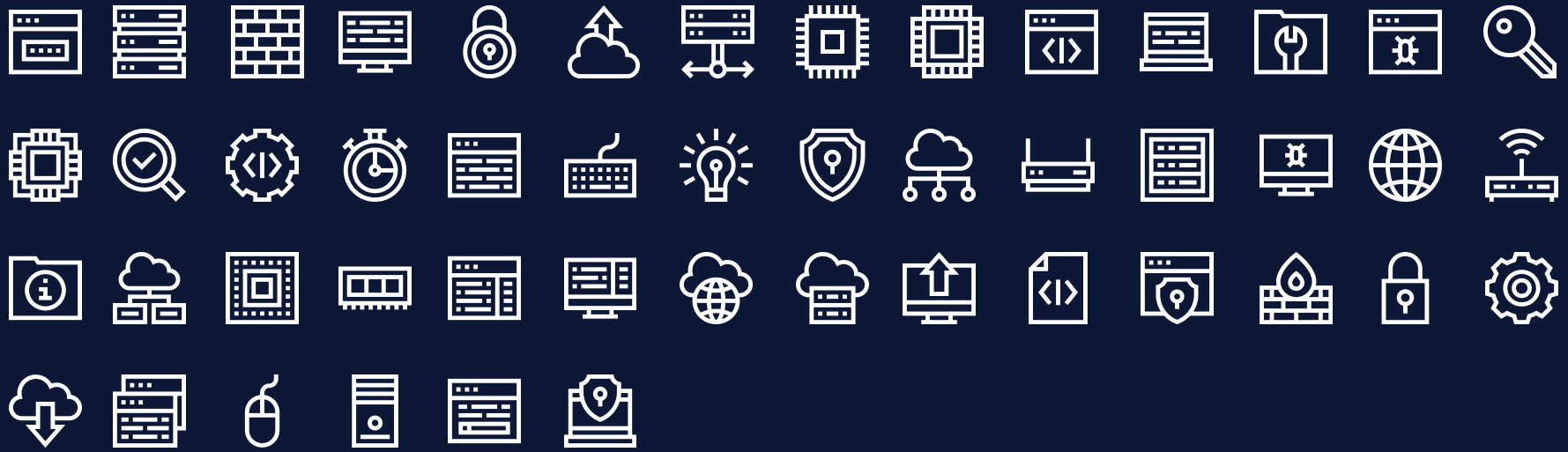
Icons resource page | ethics

Icons resource page | strategy

Icons resource page | training and coaching



Icons resource page | programming



Icons resource page | contact us

User Interviews

1.	Ability to authenticate on behalf of other users
2.	Provide support for Web Applications
3.	Provide support for simple Command Line scripts
4.	Minimise the need for user intervention
5.	Provide support for ‘scopes’