



linphone

OAUTH AUTHENTICATION AND IDENTITY VALIDATION IN SIP SYSTEMS

February 1st, 2025

SPEAKERS AT FOSDEM



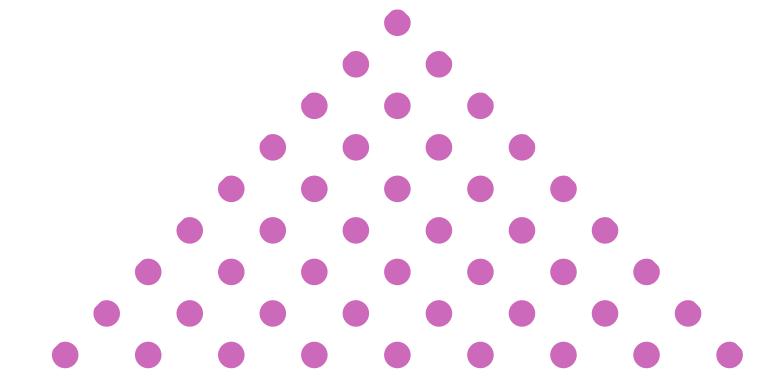
JEHAN MONNIER
Linphone team

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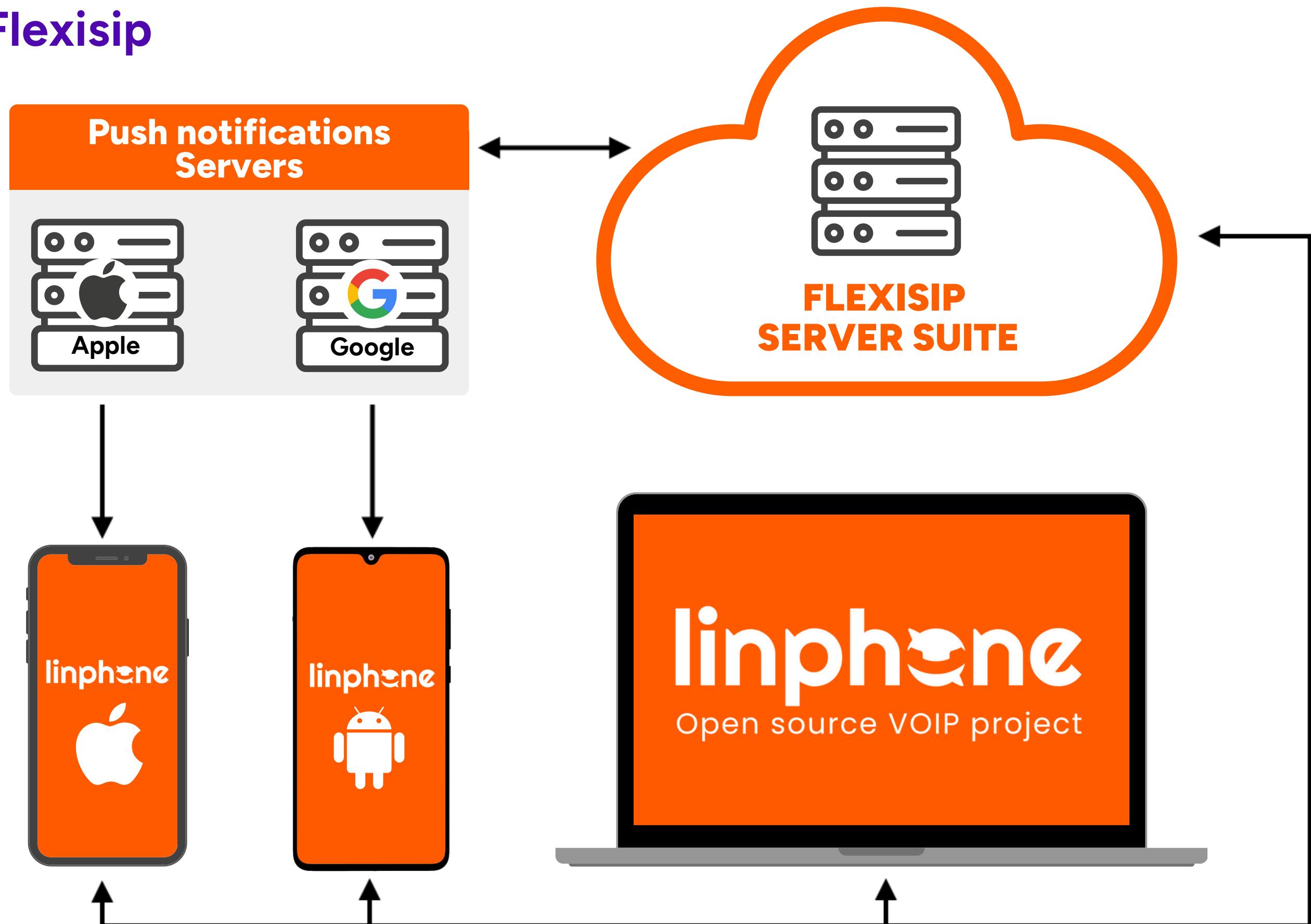
- 1 **Introduction:** What is authentication, and why is it important?
- 2 **History and evolution** of authentication solutions
- 3 **Specific case:** OAuth and JWT for VoIP
- 4 **Case studies:** Integration and practical demonstration
- 5 **Conclusion and questions**



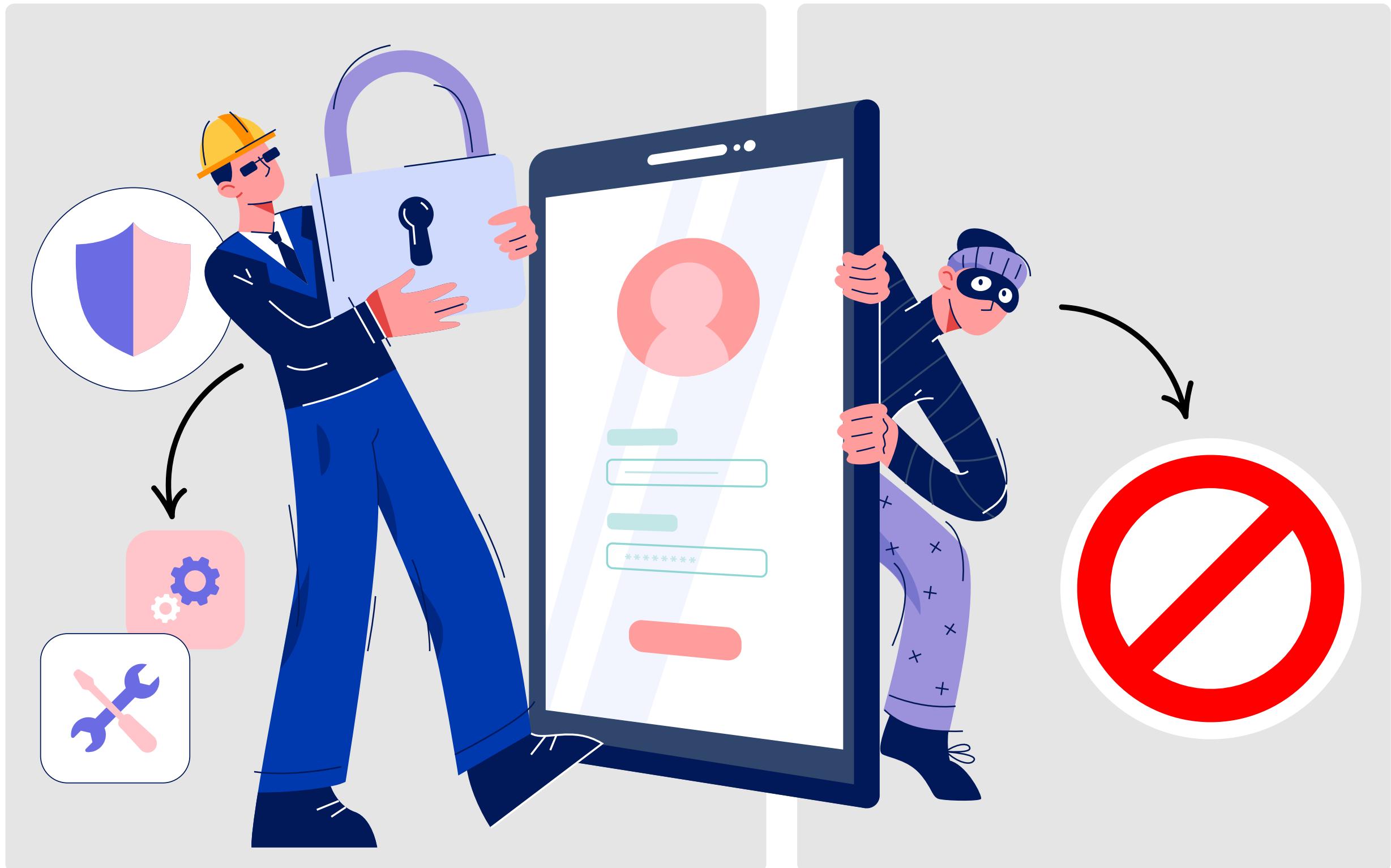
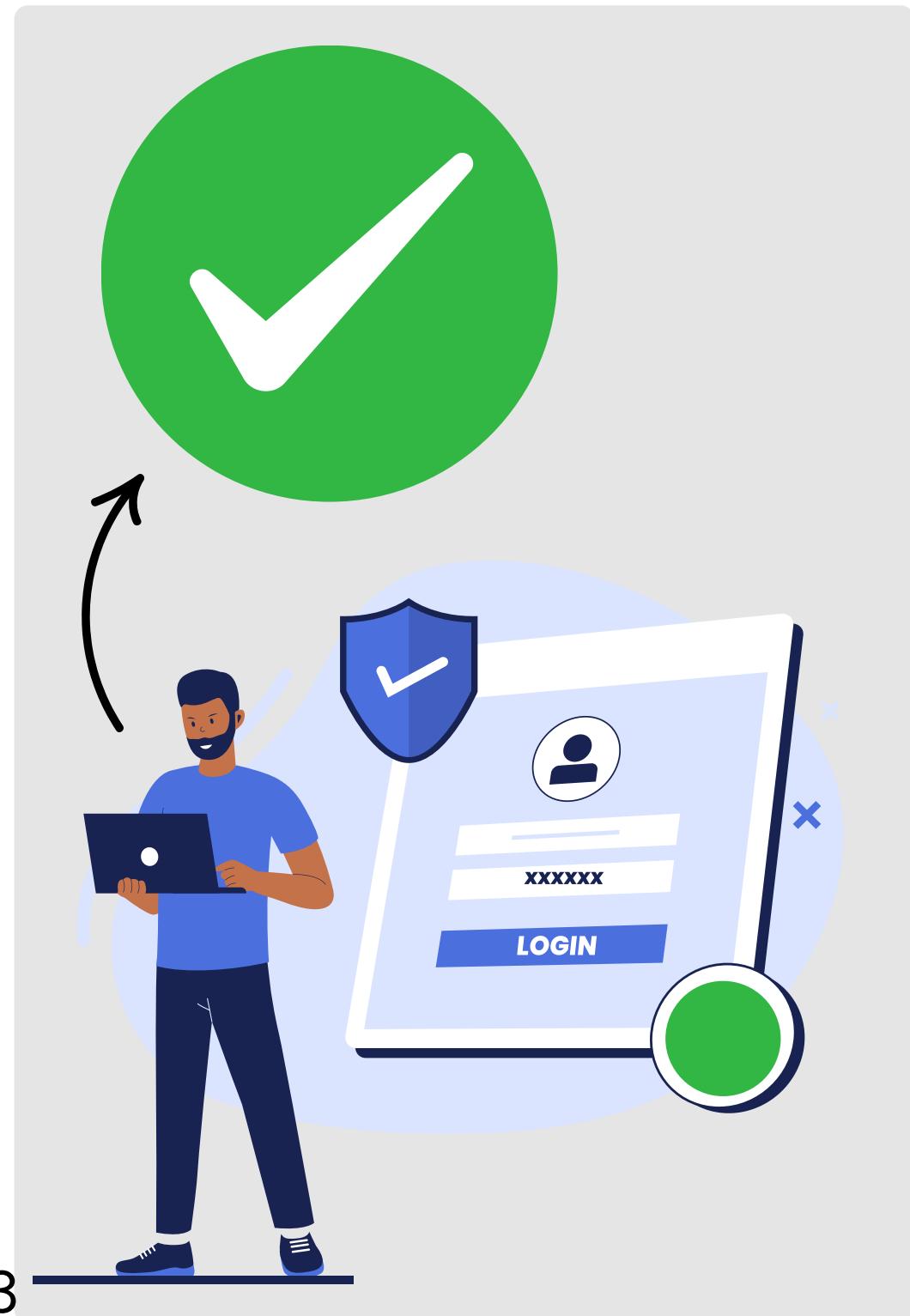
DISCOVER LINPHONE



Zoom on Flexisip

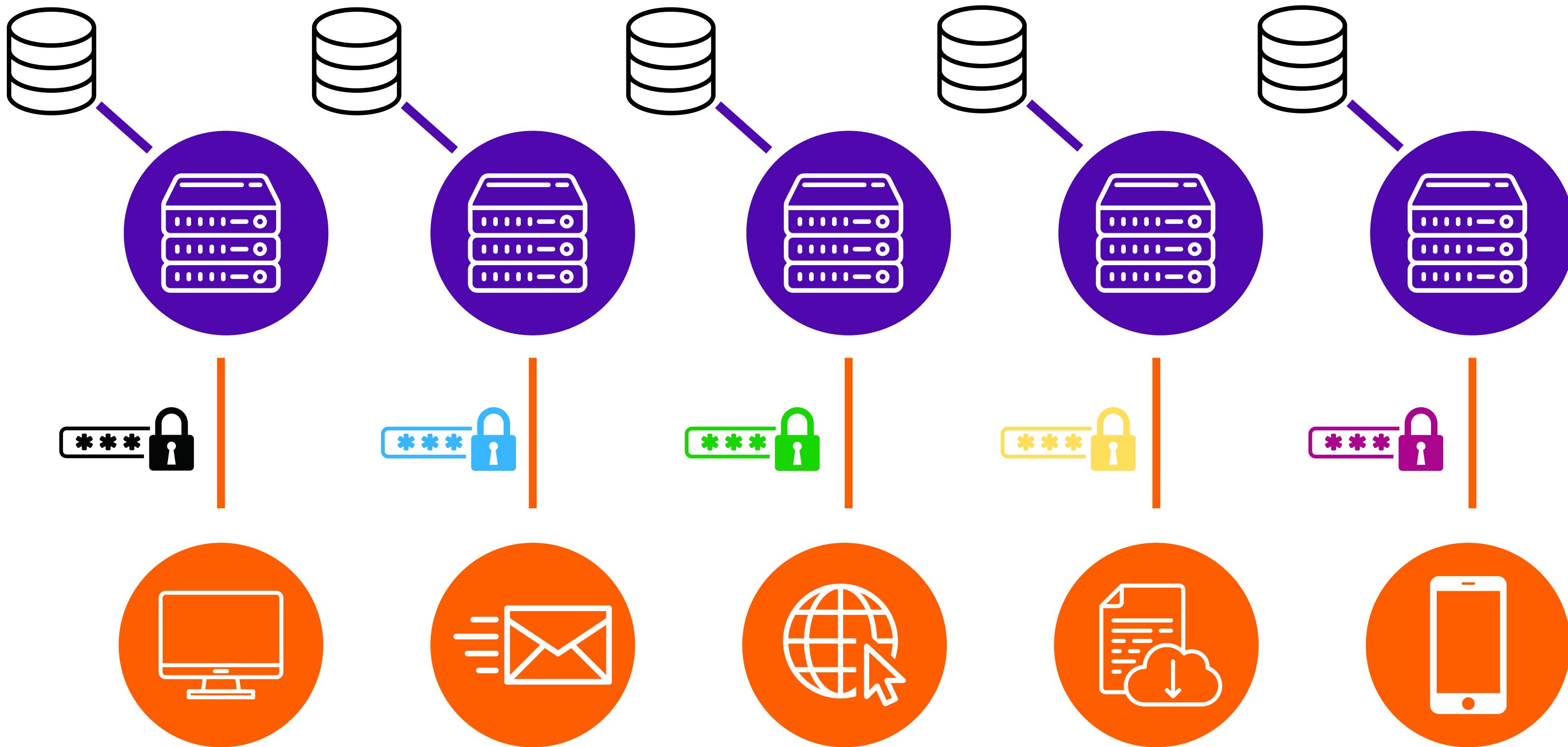


What is authentication?

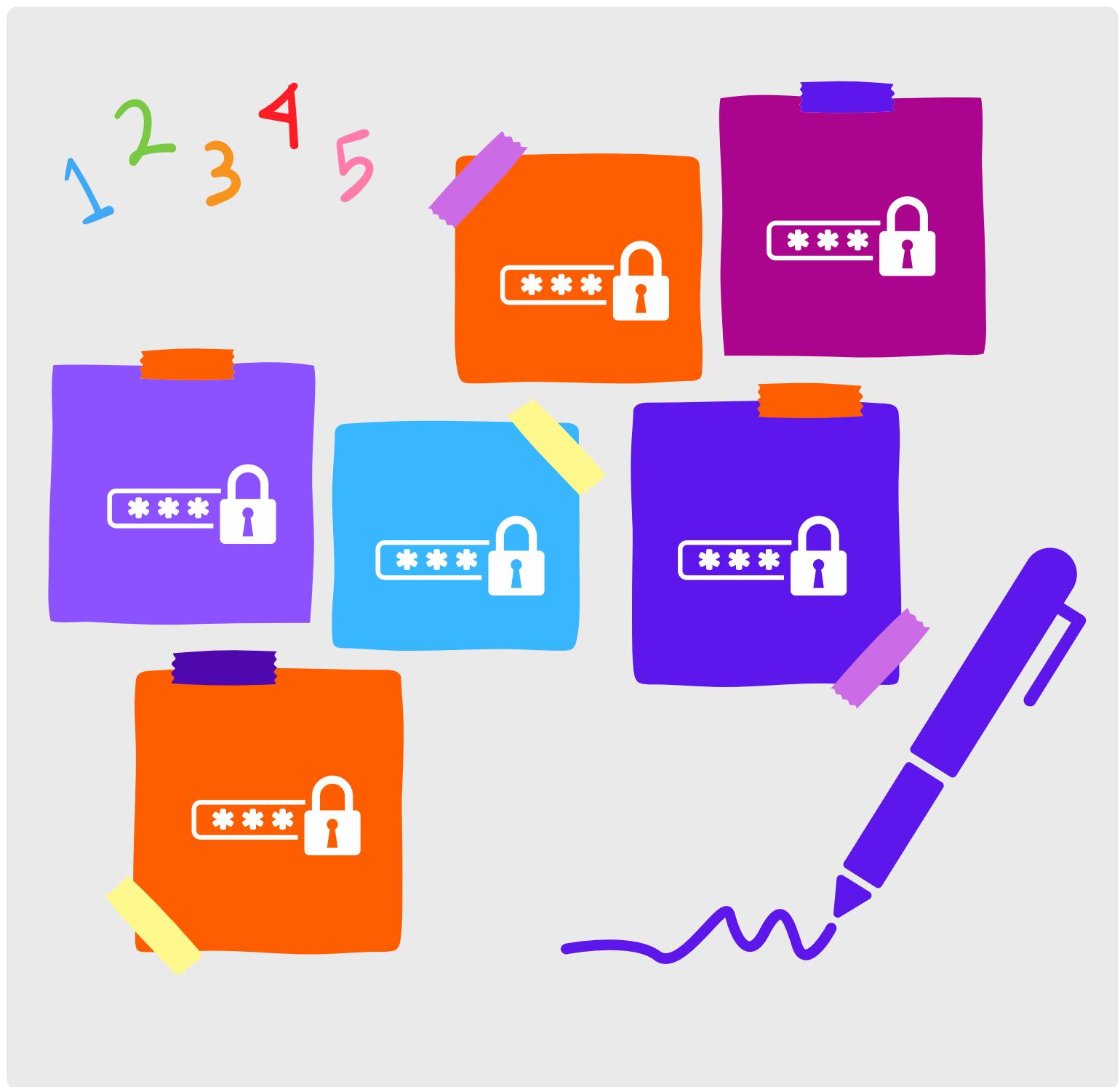


Authentication challenges

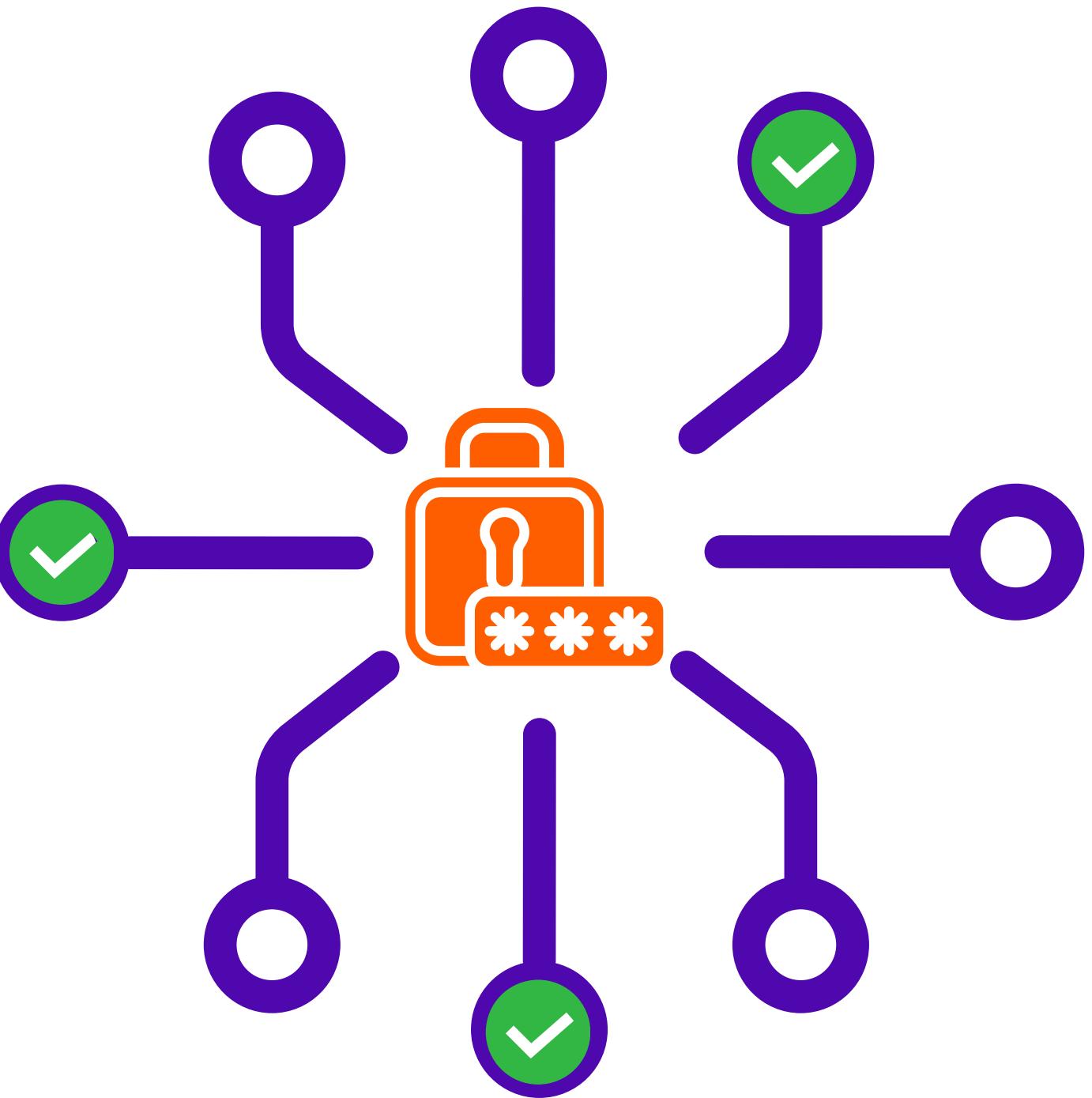
Diagram of the Compartmentalized Model



Why single sign on ?



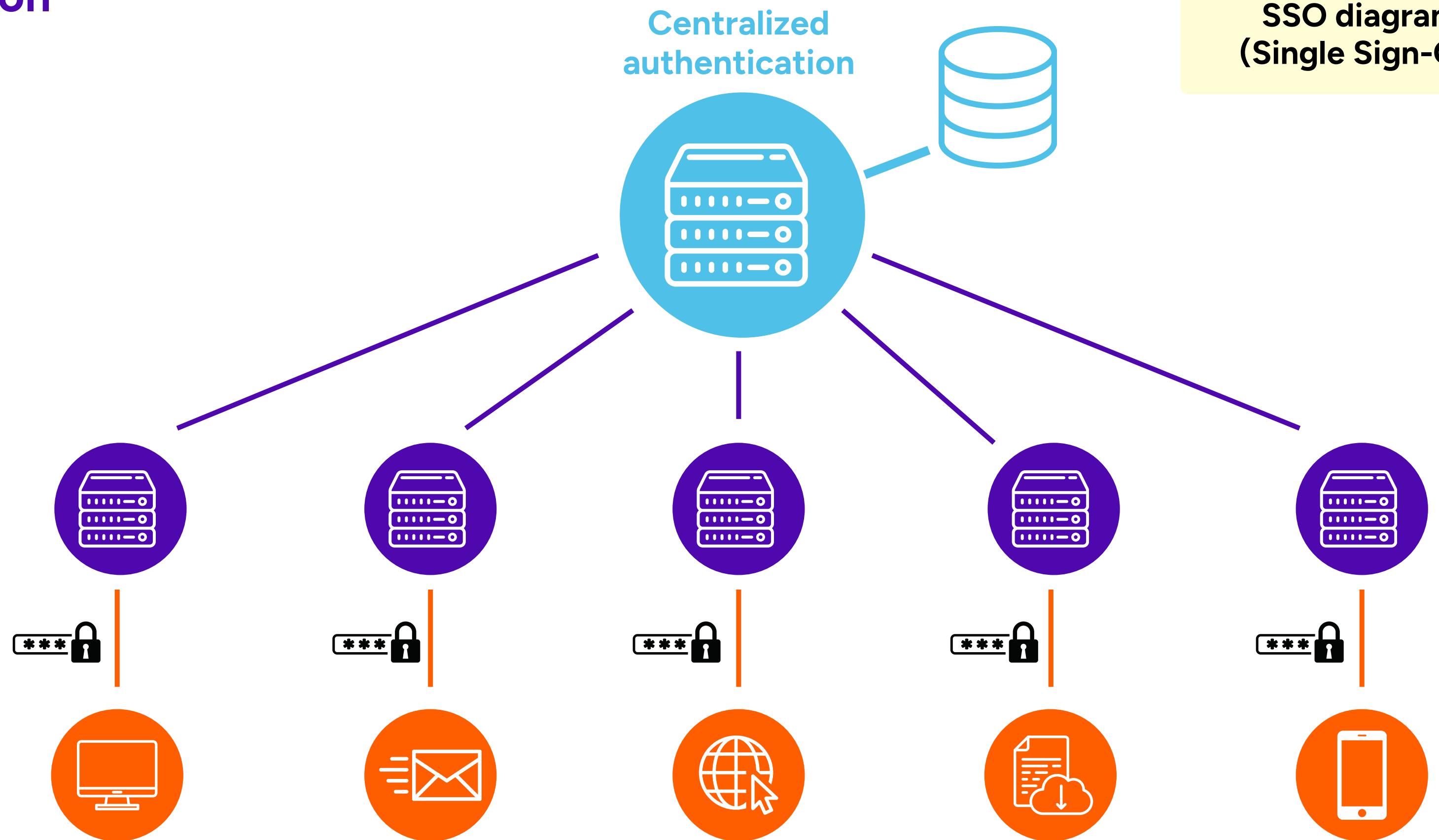
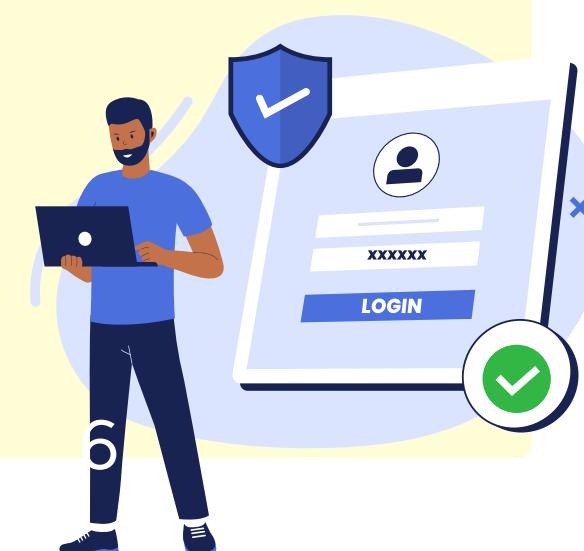
CENTRALIZED
SOLUTION



Single sign on

SSO diagram
(Single Sign-On)

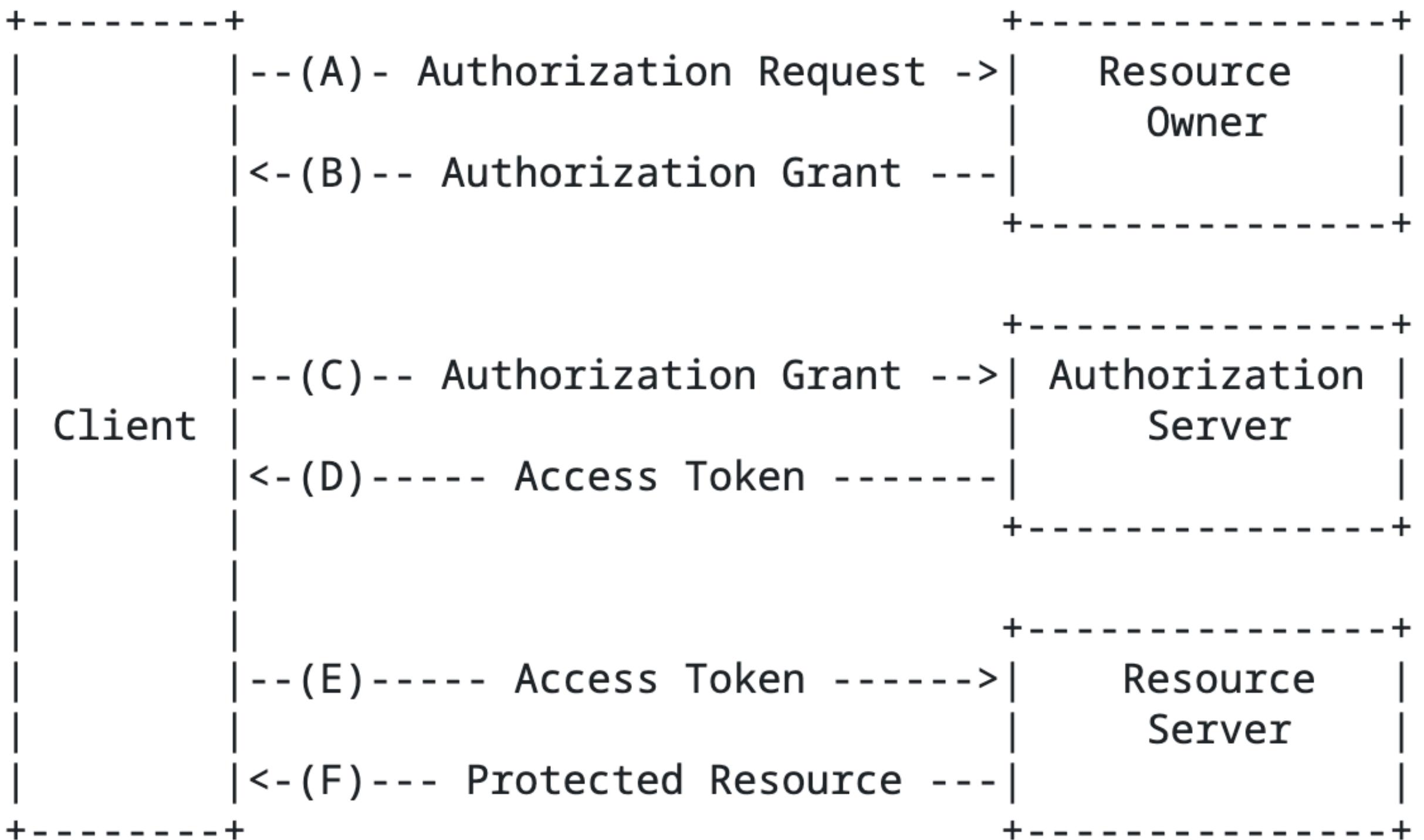
Single sign-on to
a page with one
password to
access all your
applications



OAuth basics?

RFC 6749

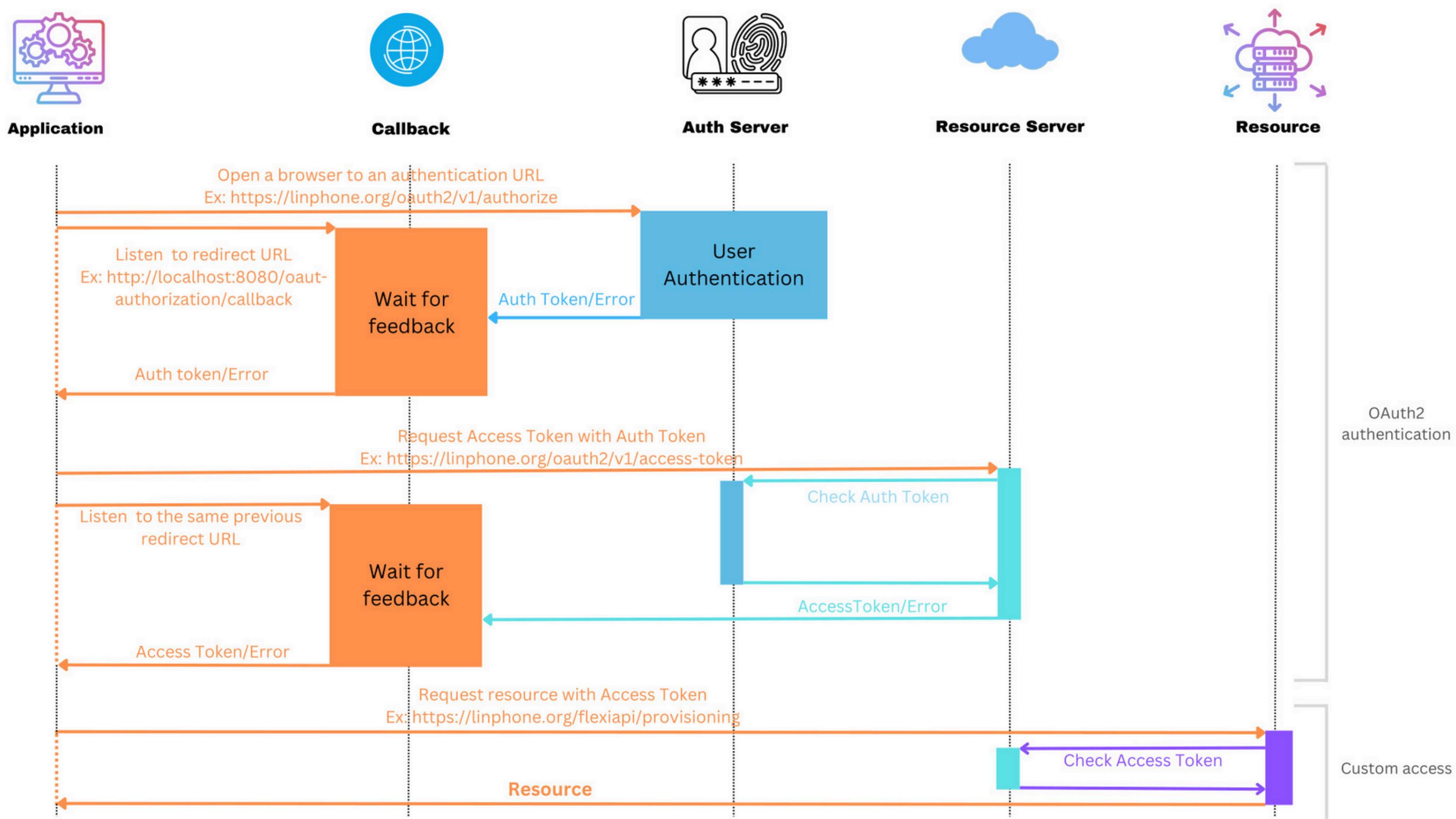
<https://datatracker.ietf.org/doc/html/rfc6749>



OAuth: http case

**Example
with Linphone**

RFC 6749

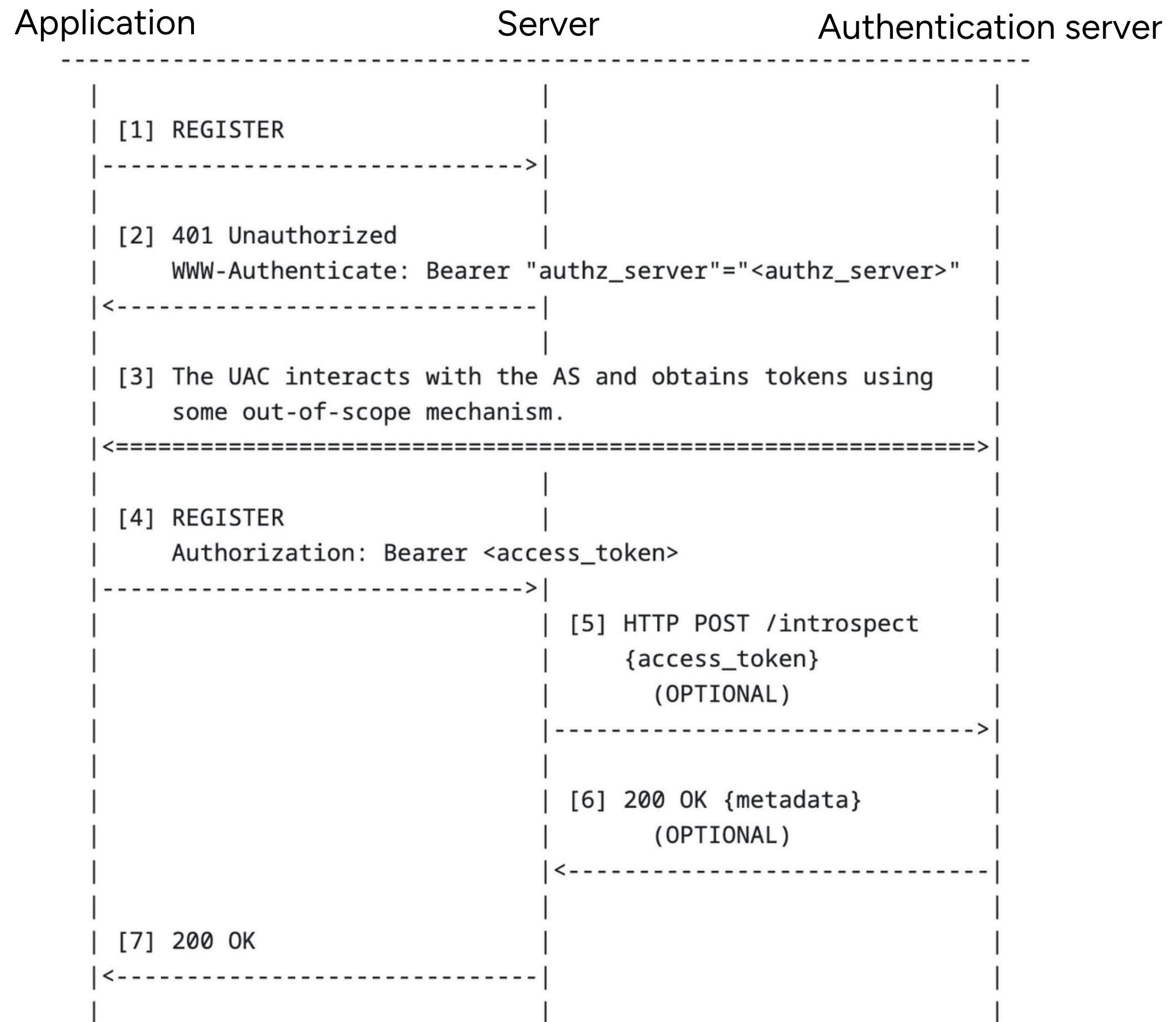


How OAuth works?

Adaptation to VoIP

RFC 8898

<https://datatracker.ietf.org/doc/rfc8898/>



How OAuth works?

SIP auth headers

RFC 8898

<https://datatracker.ietf.org/doc/rfc8898/>

REGISTER sip:kaamelott.hexagone.test
SIP/2.0

SIP/2.0 401 Unauthorized

...

WWW-Authenticate: Bearer
authz_server="https://auth.linphone.org/realms/sip.linphone.org", realm="sip.linphone.org"

REGISTER sip:kaamelott.hexagone.test SIP/2.0

...

Authorization: Bearer
eyJhbGciOiJSUzI1NilsInRSrCS5H9ENGn
sLInEIRU7rCCjAXRSSqoUh_qFLDqvImKyBw,
realm="sip.linphone.org"

Introduction to JSON Web Token (JWT)



Example of encoded JWT

```
eyJhbGciOiJSUzI1NlslmtpZCI6IjEyMzQiLCJOeXAiOiJKV1QifQ.eyJhdWQiO
iJsaW5waG9uZSlsmV4cCl6MTczODI1MzcwMiwiaWF0ljoxNzM4MjUzNjcyL
CJpc3MiOiJodHRwczovL2F1dGhTZXJ2ZXIubGlucGhvbmUub3Jnliwic2lwX
2IkZW50aXR5Ijoic2lwOnVzZXJAbGlucGhvbmUub3Jnliwic3ViljoiZDg2YTE
wZDMtYjM5OC00YTFmLTk1NzgtNjc2ZWY2OWViZml3In0.cx_sd6YLjUJTb
apVlnRkJ2TSJysSA_yFnczyWKHlxT7ZrK61zgFrA9WxGbonb6r_je0IJToz0L
ebHCticesQAmOffVf5kfOHh2ympKZTo1q4iu8tRcJRJEfy4jf8Hmms7XOZb
X2pxwrxFuG7-8sn5dsifxKaIHITVPHYDFObIY8HWN4wS7jOLw8uFxUFhgn-
Fk9OvHXAYGFpprEWyvlr22X4EjnyP6q2jkddBACVqMCvIKRyq1aTy3maChR
k6M6AmXFdlpwID32RKT_MKph5GtezbEZT4cjZl7iLJnc94gDJrFNABwNv2V
TAIwMnJ2qq47OVqNF0yn8n3ccWftXqmyxQnnt6qz9DGfwdh0UthmSgaaX
4FV83vfmWvdPZcb6X4EhnkCx5hhRLph-
PLmdwb2gw241d4hSZCF8TTcRhUfpDtkOAwOJJm4FMNTF1qH8ubDdwD
UgYRtAdh8wKOuA1qwd5OXAE5j23e4ov27wZOi22OUZPTLVEEmRrxvW6c
w-mkh4uzMC_0nQ2ezase_08hFySSr-
IToKbCDt8T2eLR5b7DVgtg5gNkaFIV3W8GIkl-
_AvrG40KtXZ1kIE94siuyQjL30R6o8qhGJ0Kt9Ez-
8t6wzFgC_QONJf6p0BzU28kKAL2hWbmtNo3hBBy1JY9qkDRwQXGv7yzu
vToL_AA
```

Example decoded

1

Header

```
{  
  "alg": "RS256",  
  "kid": "1234",  
  "typ": "JWT"  
}
```

2

Payload

```
{  
  "aud": "linphone",  
  "exp": 1738253732,  
  "iat": 1738253672,  
  "iss": "https://authServer.linphone.org",  
  "sip_identity": "sip:user@linphone.org",  
  "sub": "d86a10d3-b398-4a1f-9578-676ef69ebfb7"  
}
```

3

Signature

<https://jwt.io/>

How does it work with Linphone?

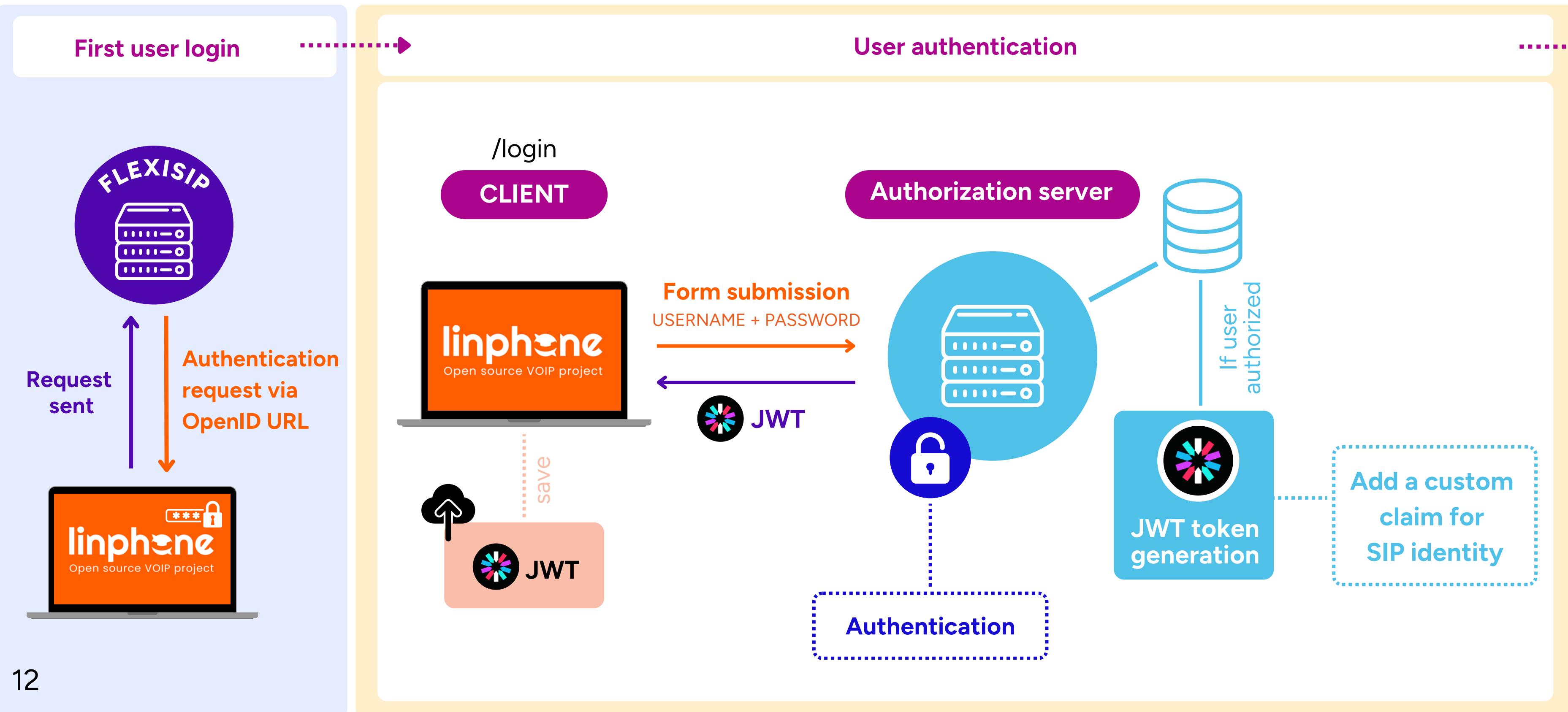
First user login



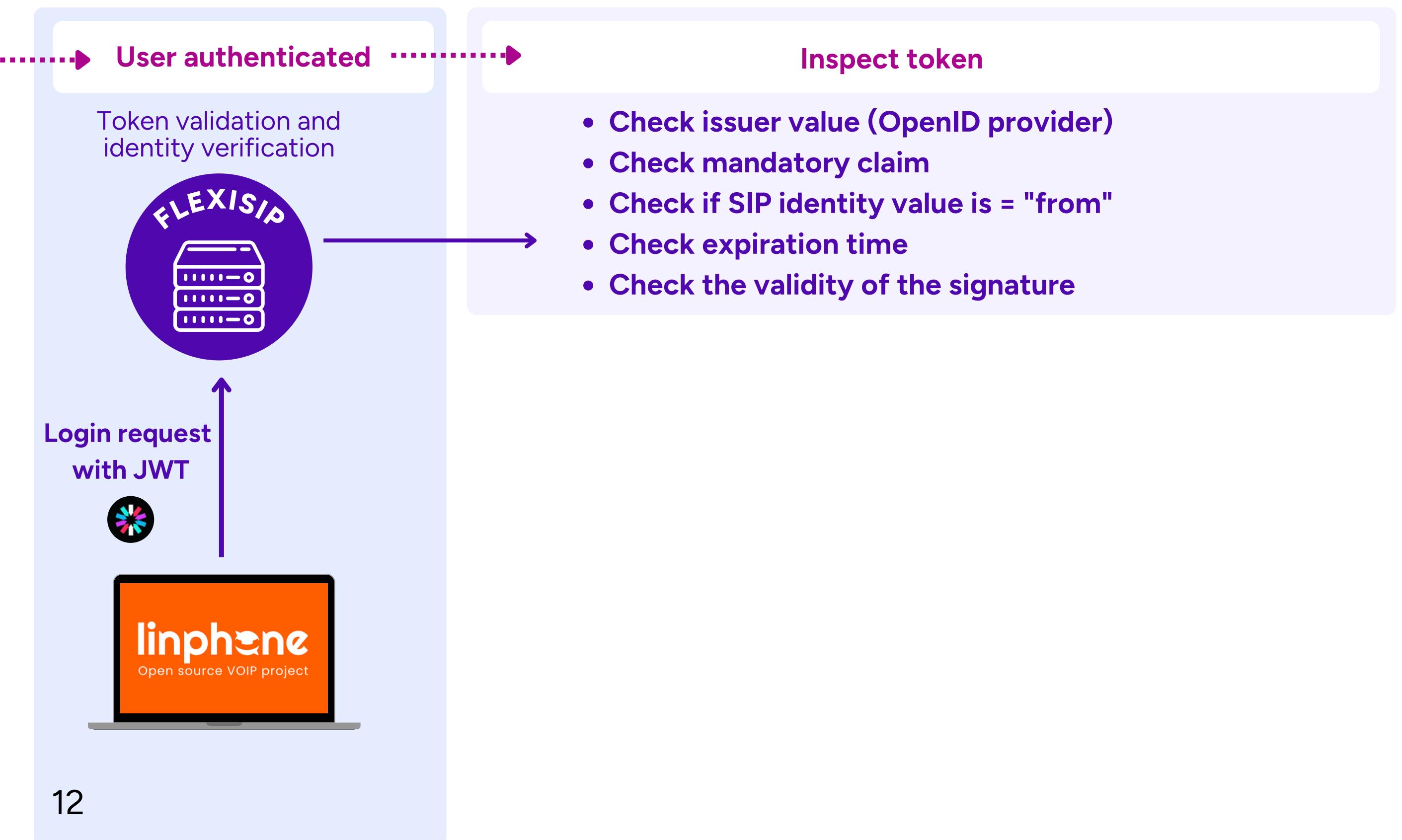
Request sent
Authentication request via OpenID URL



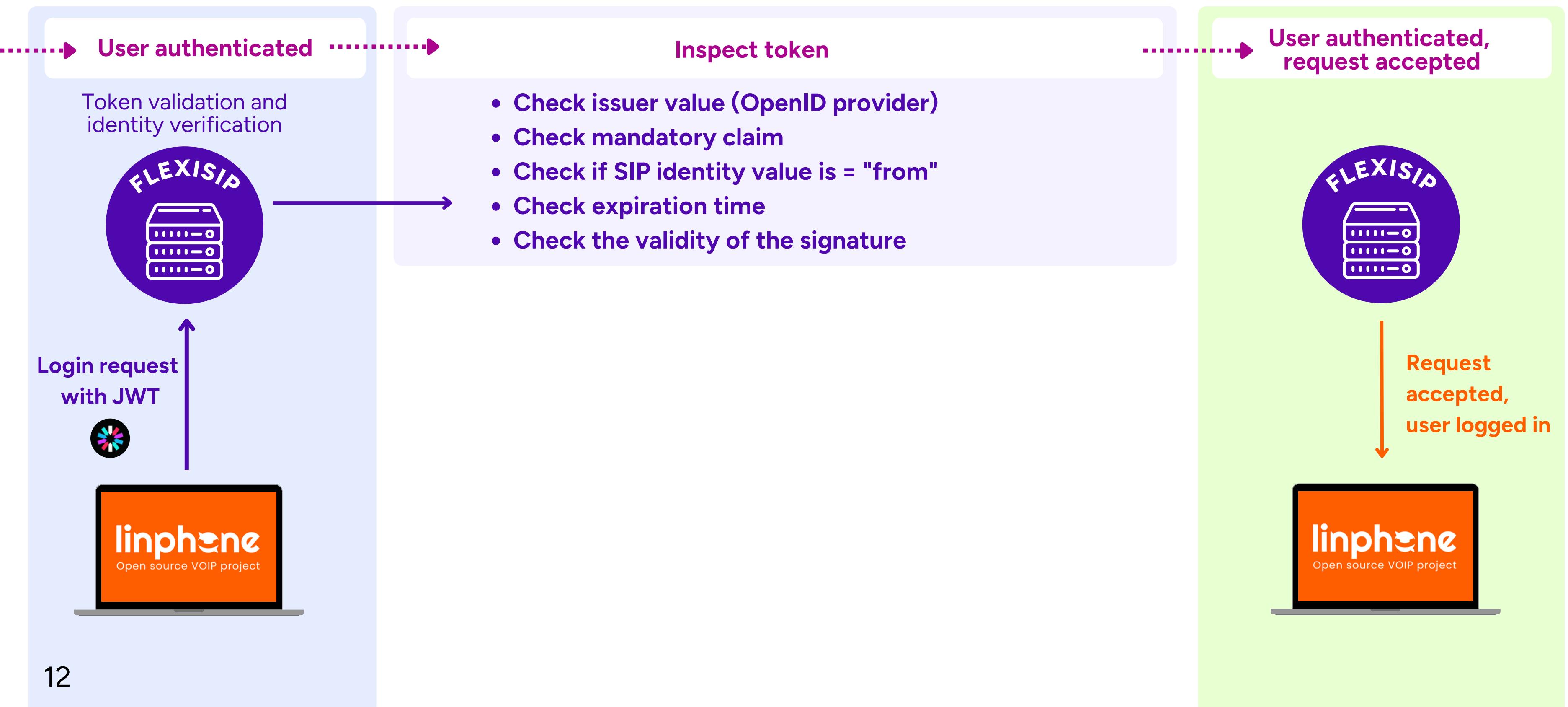
How does it work with Linphone?



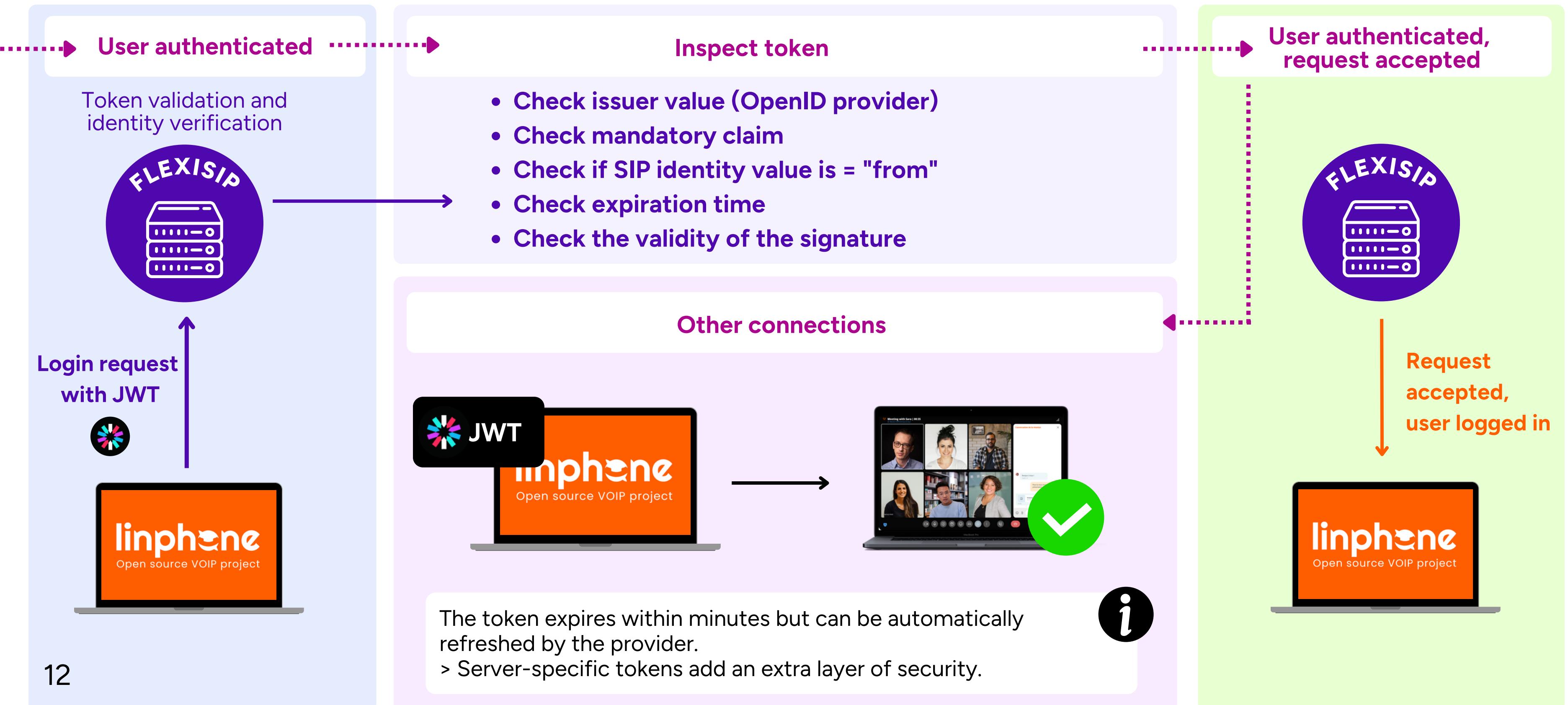
How does it work at Linphone?



How does it work at Linphone?

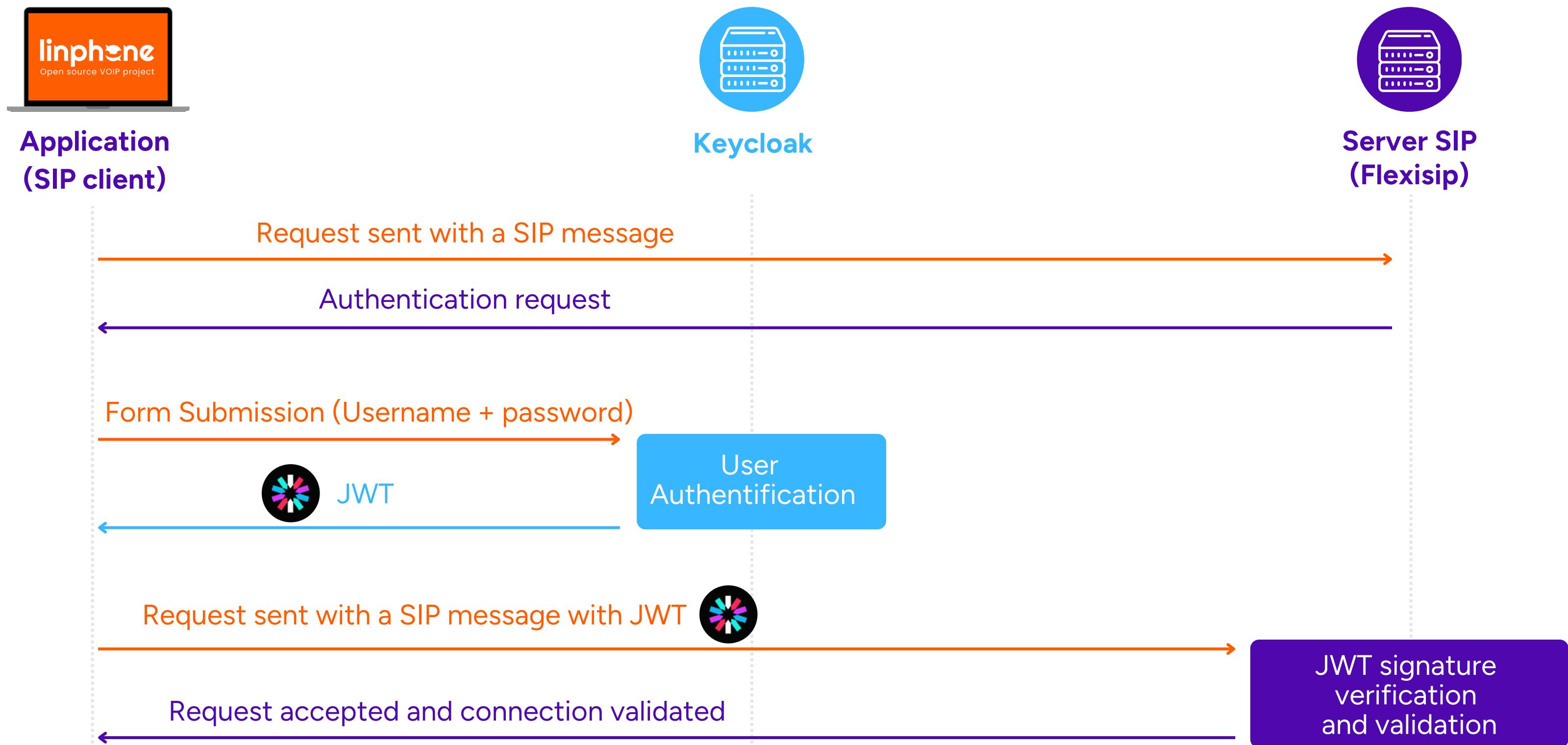


How does it work at Linphone?



Integrating Keycloak with Flexisip? It's possible!

Authentication using JWT & sip account



How do you configure this in Flexisip?

Configuration example, available starting from Flexisip 2.4

[More information here](#)

[module::AuthOpenIDConnect]

enabled=true

The HTTPS URL of the OpenID Provider.

This parameter MUST be set.

Default:

authorization-server=https://example.org/realm EXAMPLE

The realm to use for the OpenID Connect authentication.

This parameter MUST be set.

Default:

realm=EXAMPLE

The name of the service to expect in the audience claim.

This parameter MUST be set.

Default:

audience=linphone

The name of the claim to inspect in the token to extract the user's

SIP identity.

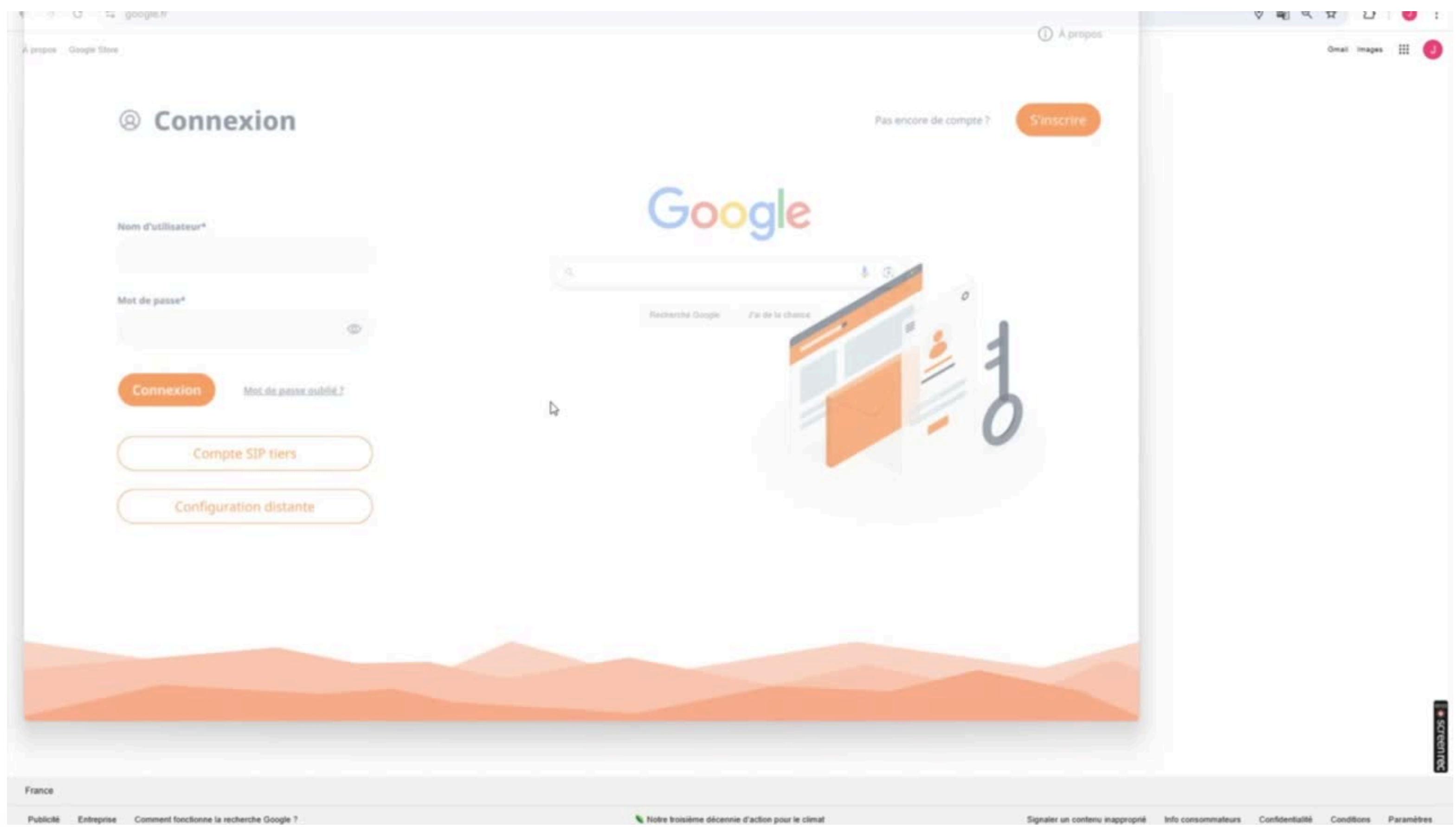
This parameter MUST be set.

Default:

sip-id-claim=sip_identity

DEMONSTRATION

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CONCLUSION

SECURITY

SIMPLICITY

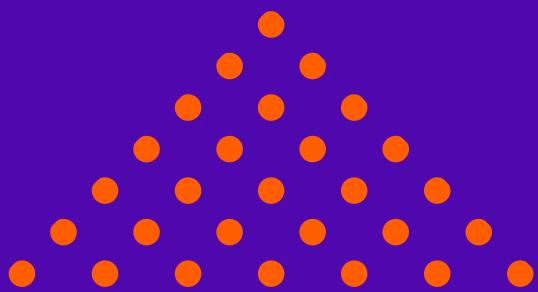
**Single Sign-On is the solution
to authentication challenges**

INTEROPERABILITY

SCALABILITY



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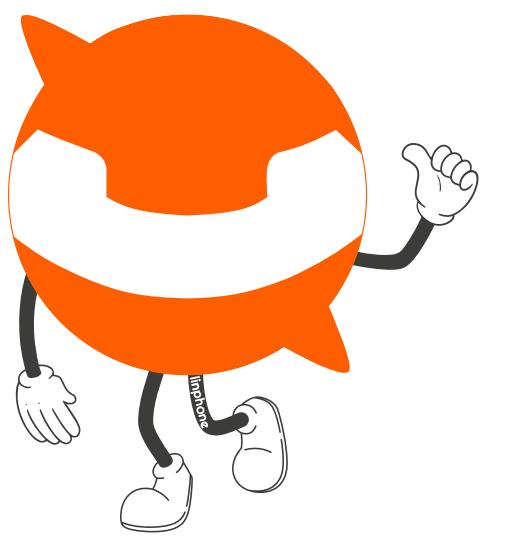


**DO YOU HAVE ANY
QUESTIONS ?**





THANK YOU !



FOR MORE INFORMATION



<https://www.linphone.org>



<https://gitlab.linphone.org/BC/public/flexisip>



<https://datatracker.ietf.org/doc/rfc8898/>