Digital Signatures Decoded Crafting an In-House E-Signing Microservice

Amol Gote
Innova Solutions – Consultant,
Solutions Architect at iCreditWorks

Agenda

- Introduction
- Demo, Key Takeaways.
- Regulatory Standards
- Case study - iCreditWorks
- Building an in-house e-signing microservice
- Security Measures
- Open-source availability

About Myself

- Working at iCreditWorks - FinTech
- Expertise – Building Microservices and Event driven services.
- Online Contributions – DZone, InfoQ, Baeldung, Personal Blog, Research papers.
- Judge – Industry awards, Hackathons.
- Prior Experience
  - Morgan Stanley, Associated Press, Bank Of America
  - Microsoft Consulting.

Demo

- Native Mobile Application
- Web Application

Regulatory Standards

E-Sign Act

- *The act provides a general rule of validity for electronic records and signatures for transactions in or affecting interstate or foreign commerce. The Act ensures that electronic signatures hold the same weight and legal effect as traditional paper documents and handwritten signatures.*
- Link to the law
- Record Retention

Compliance measures

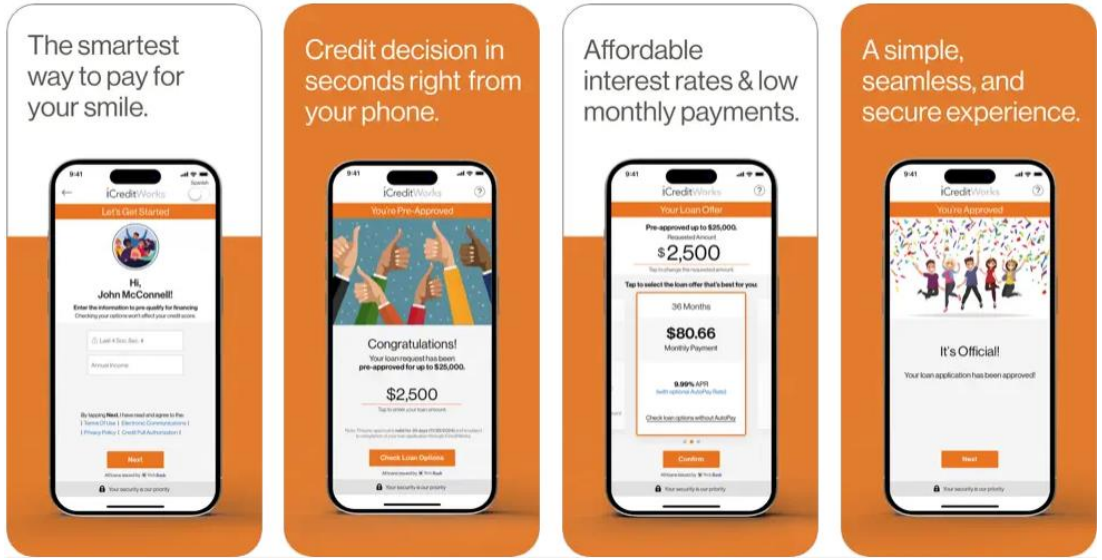
- Signed Document
  - Immutable,
  - Integrity and authenticity of the signed document.
  - Uniquely linked to the signatory

Case for building an in-house E-Signing service

Building an in-house e-signing service is not merely a technical decision but a strategic one. compelling reasons that make a case for building an in-house e-signing service:

- Cost Efficiency
- Reduced External Dependencies
- Enhanced UI Customizations

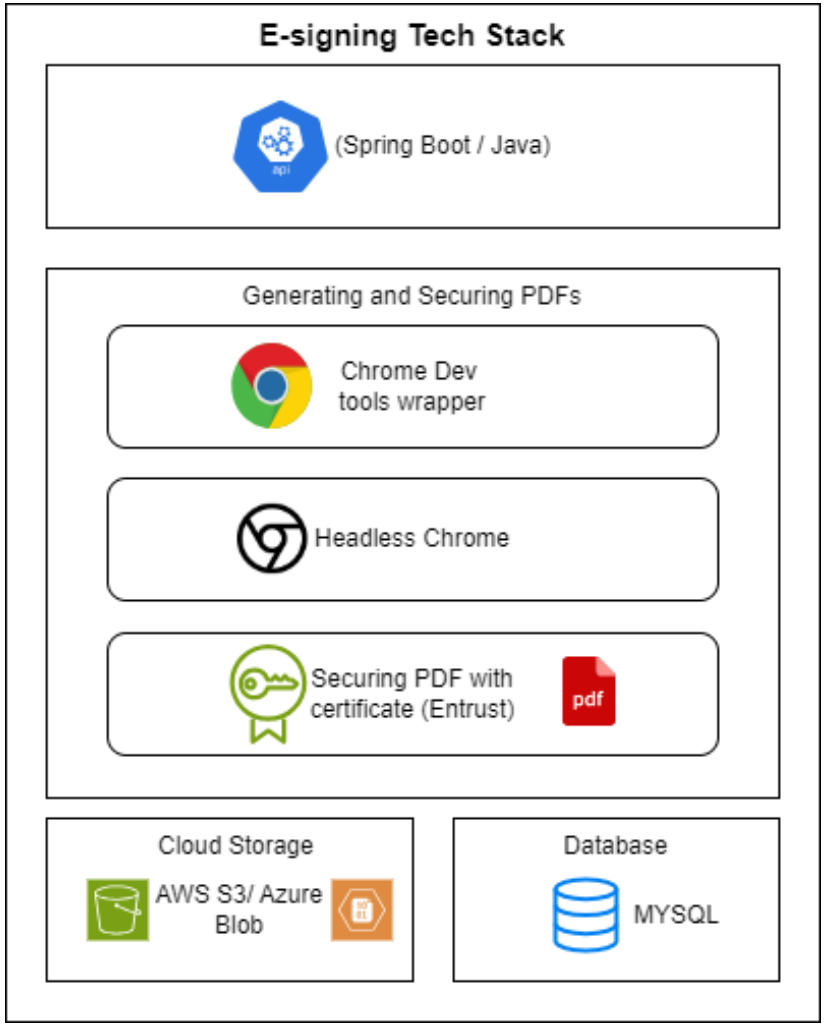
- Background
- Challenges
- Solution
- Processed documents.



Case study - iCreditWorks

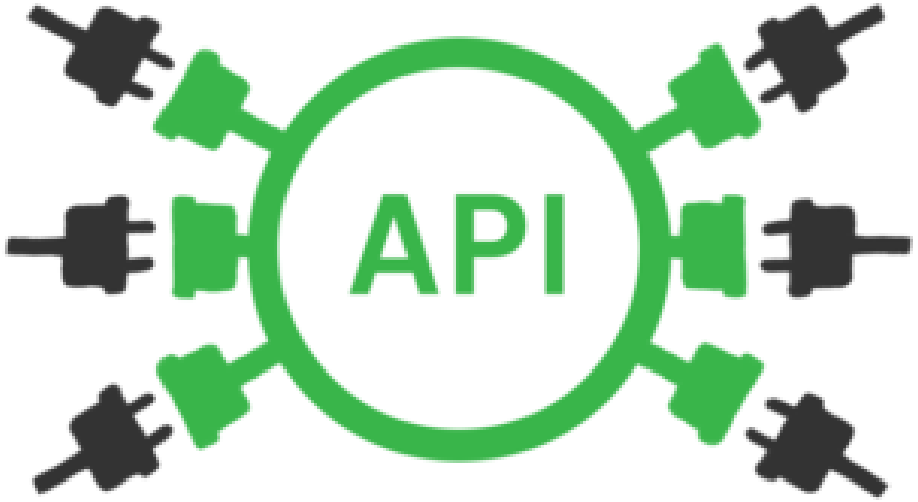
Building an in-house E-Signing microservice – Tech Stack

- Spring Boot with Java
- Generating and Securing PDFs
- Cloud Storage (AWS S3 or Azure Blob)
- Database (MySQL).



Building an in-house E-Signing microservice – APIs

1. Generate documents for signing
2. Post-signature and get a signed document



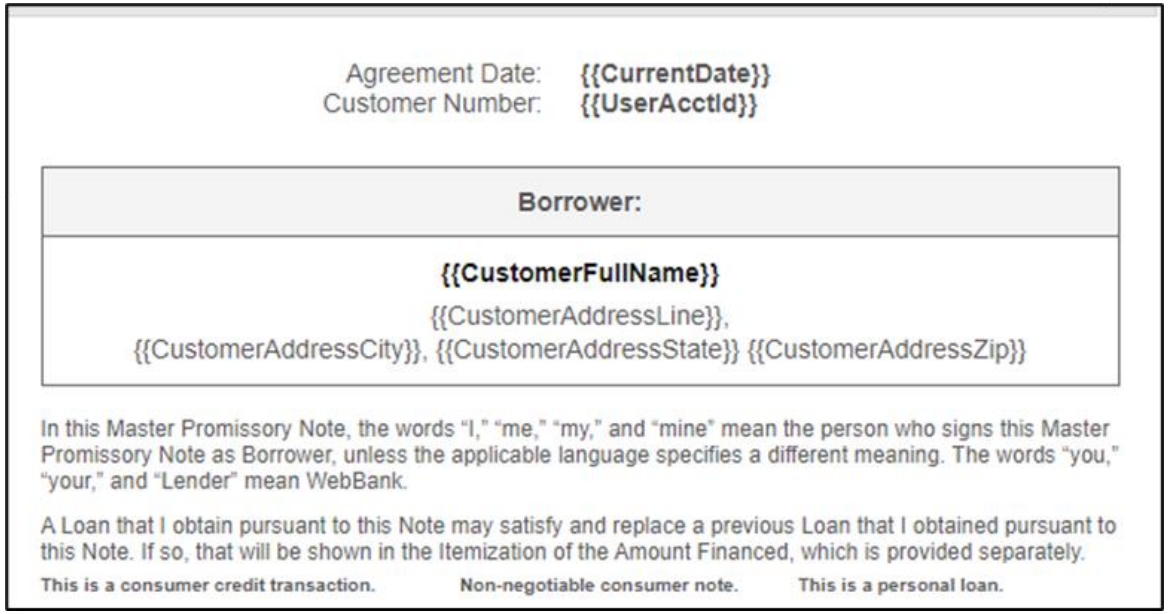
Building E-Signing microservice – Generate Document - 1

- Templates
  - Multiple templates to carter to different document types.
  - Templated variables {{CustomerAddressCity}}, {{CustomerAddressState}}, {{CustomerAddressZip}}).
- API Details

POST {{baseUrl}}/api/e-sign/v1/document/{contentType}

Request Body

```
{
   "docCode": "GEN-MPN-01",
   "contextId": "LN-1000109-01",
   "localePreference": "en-US",
   "fields": {
      "CurrentDate": "09/03/2023",
      "UserAcctId": "LN-1000109-01",
      "CustomerFullName": "John Doe",
      "CustomerAddressLine": "1100 Fox Run Dr",
      "CustomerAddressCity": "Iselin",
      "CustomerAddressState": "NJ",
      "CustomerAddressZip": "08050"
   }
}
```



Agreement Date: **{{CurrentDate}}**
Customer Number: **{{UserAcctId}}**

Borrower:

{{CustomerFullName}}
{{CustomerAddressLine}},
{{CustomerAddressCity}}, {{CustomerAddressState}} {{CustomerAddressZip}}

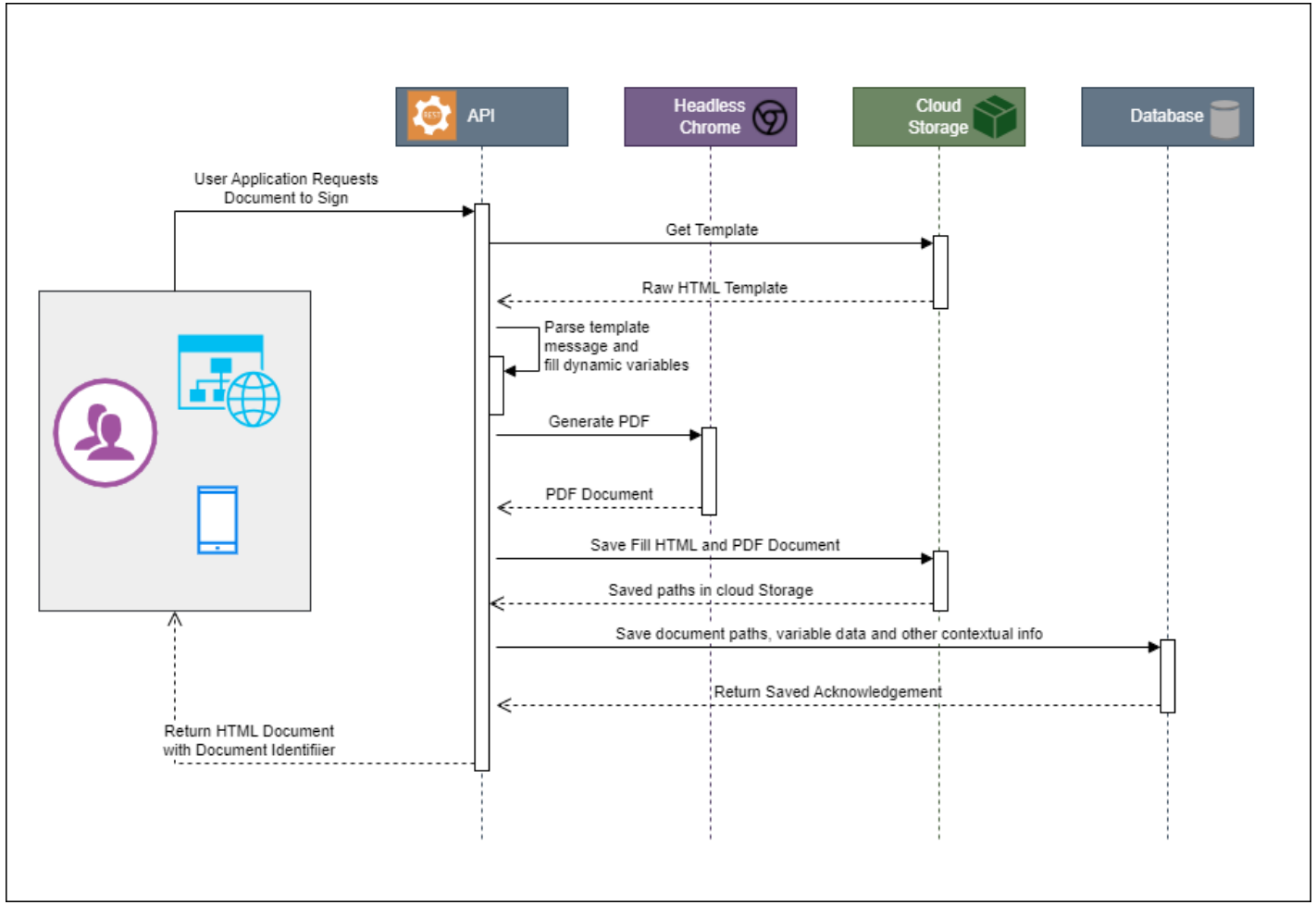
In this Master Promissory Note, the words "I," "me," "my," and "mine" mean the person who signs this Master Promissory Note as Borrower, unless the applicable language specifies a different meaning. The words "you," "your," and "Lender" mean WebBank.

A Loan that I obtain pursuant to this Note may satisfy and replace a previous Loan that I obtained pursuant to this Note. If so, that will be shown in the Itemization of the Amount Financed, which is provided separately.

This is a consumer credit transaction. **Non-negotiable consumer note.** **This is a personal loan.**

Building E-Signing microservice – Generate Document - 1

1. Fetch the template and prepare final content
2. Convert the HTML file into a PDF document.
3. Save Document and metadata
4. Return HTML Response with unique Identifier



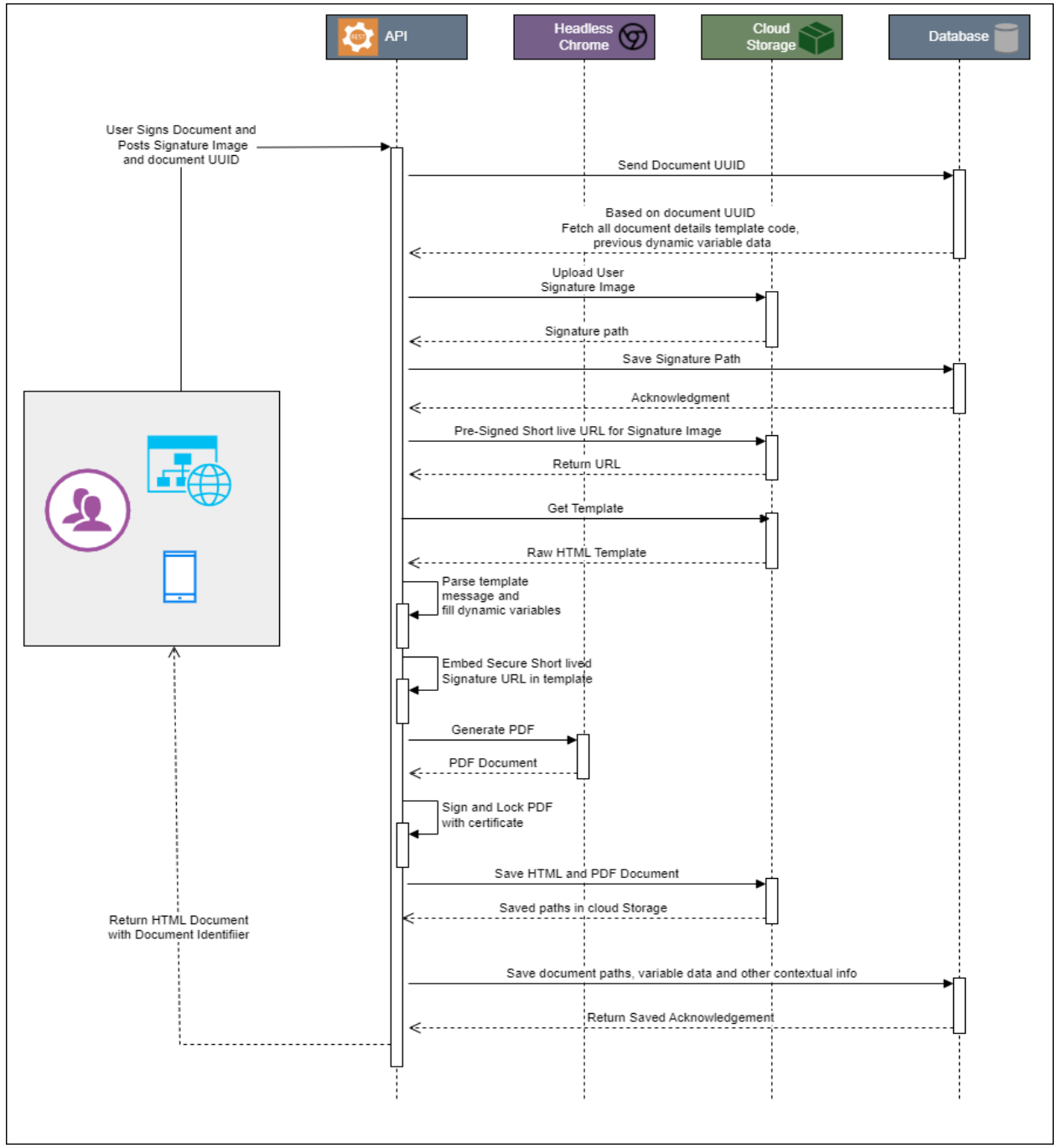
Building E-Signing microservice – Post-signature and get signed document -2

- POST {{baseUrl}}/api/e-sign/v1/document/signature/{{eSignDocumentUUID}}/html
  - Request Body (form- Data):
    - Key: "signature"
    - Value: "User’s signed image"

Building E-Signing microservice – Post-signature and get signed document -2

- Document UUID
- User's signature image
- Regenerate Template with dynamic data.
- Pre-Signed URL

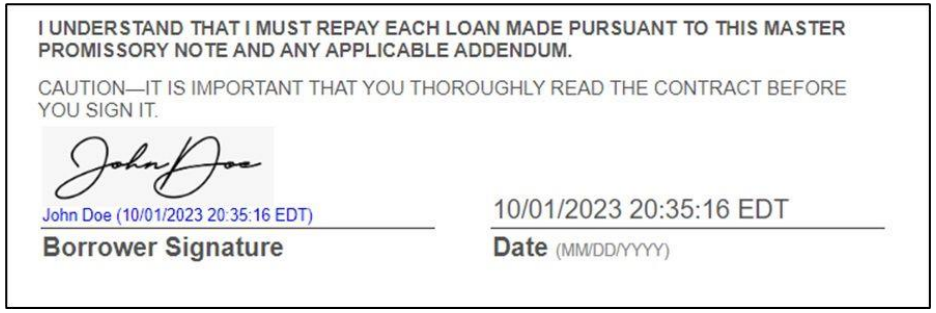
https://{{s3bucketname}}.s3.amazonaws.com/e-sign/LN-1000109/LN-1000109-01/CustomerSignature/2023-10-02T00-25-43-806.customer_signature.jpeg?X-Amz-Algorithm=AWS4-HMAC-SHA256&X-Amz-Date=20231002T002545Z&X-Amz-SignedHeaders=host&X-Amz-Expires=86398&X-Amz-Credential=AKIA46UPUH6Y5RO%2F20231002%2Fus-east-1%2Fs3%2Faws4_request&X-Amz-ignature=a4b3404bba99ac81b39afd31427031adbe9e



Building E-Signing microservice – Post-signature and get signed document -2

- Customer Signature
- Limited time token

  {{baseUrl}}/v1/document/157f55tt-e8d1-4f6e-90bb-dc5341bc4fa4?token=78902bed-60c2-11ee-acd2-0aa24276fac5
- Save Document and metadata
- Return Signed Document HTML Response




```
<tr>
    <td width="47%" height="50px" valign="bottom"
        style="border-bottom: 1px solid #333333;"><img class="signimage"
            src="{{CustomerSignature}}" alt="">
        <div style="{{DisplaySignedNameAndDate}}"><span
                style="font-size:10px;color:#0000FF">{{CustomerFullName}}
                ({{SignedDateTime}})</span></div>
    </td>
    <td width="6%"></td>
    <td width="47%" align="left" valign="bottom" height="50px"
        style="border-bottom: 1px solid #333333;">{{SignedDateTime}}
    </td>
</tr>
```

Security measures in E-Signing

- E-signing Certificate

- Storage Security

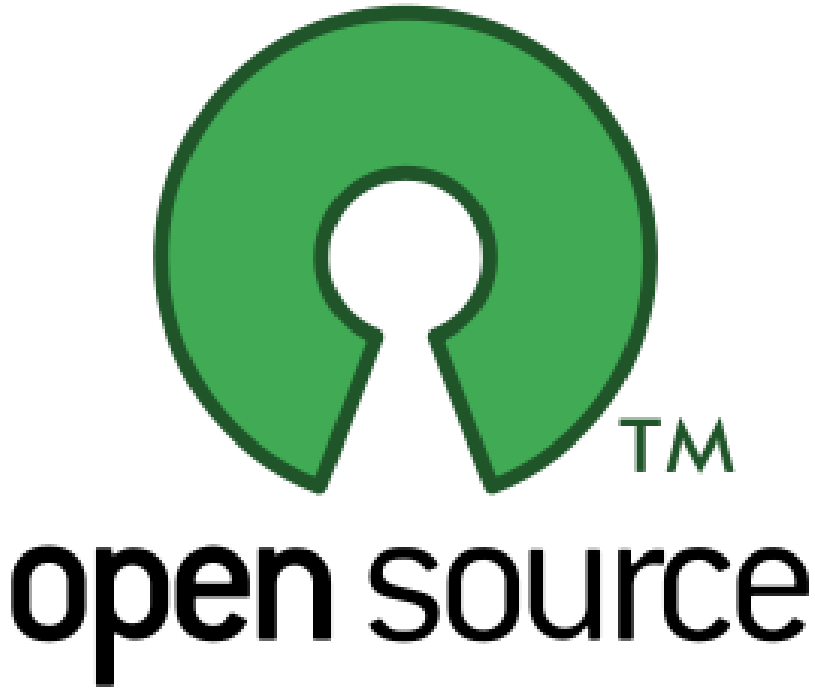
- Handshake Protocol

Open-Source Availability

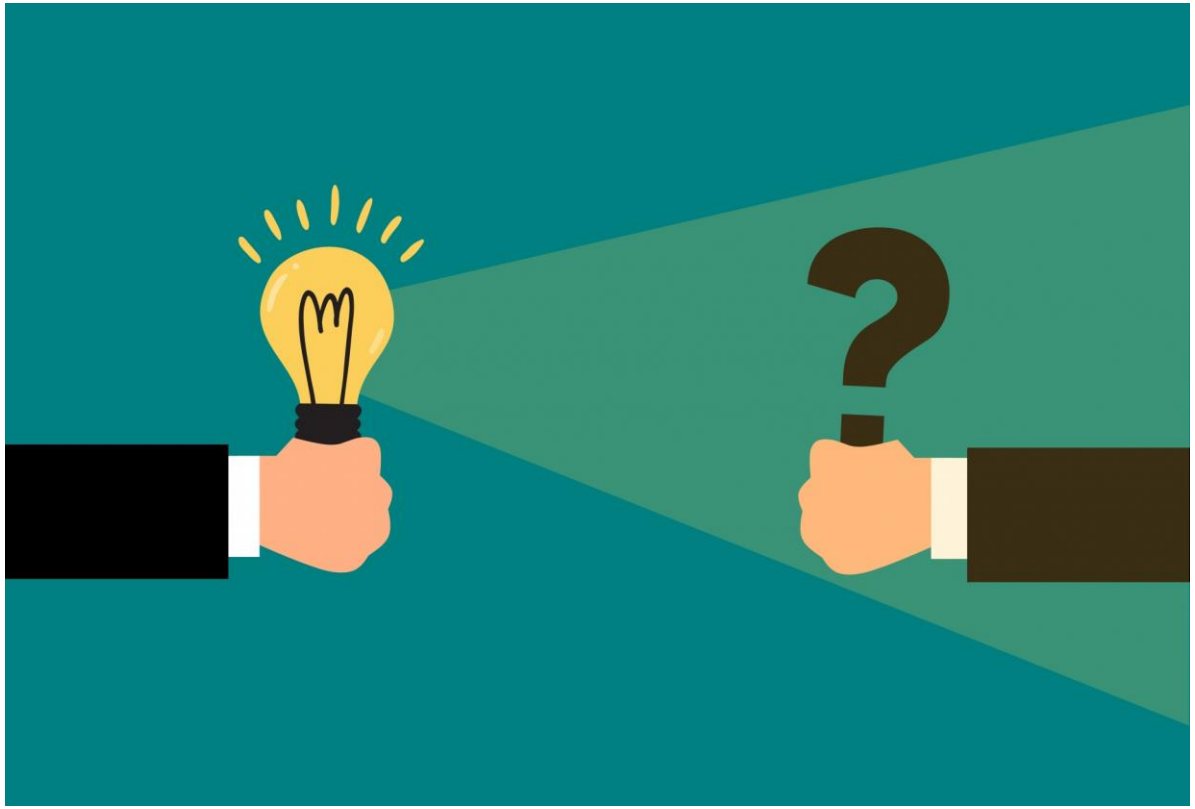
- E-signing microservice’s codebase is available on GitHub.

  https://github.com/iCreateWorks/esigning

- Aim is to benefit
  - FinTech Start Ups
  - Other Star Ups



Conclusion and Q&A



Be in touch

Amol Gote

https://www.linkedin.com/in/aamolgote

www.amolgote.com

https://dzone.com/users/4953252/aamolgote.html

https://www.baeldung.com/author/aamolgote