## Sharing DICOM studies with Orthanc

Alain Mazy, Orthanc Team



Community:

- Public support + doc
- Orthanc dev
- Plugin dev
- Stone Viewer plugin

Funding:

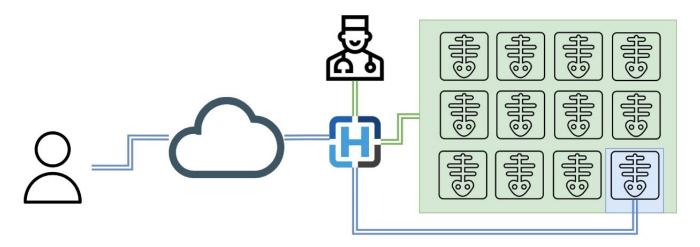
- Osimis
- Open Collective
- Customers

Customers:

- Dedicated support
- Orthanc + plugin dev
- Inter-hospitals transfers + CD-ROM importer
- Orthanc as a mini-pacs including ability to share studies

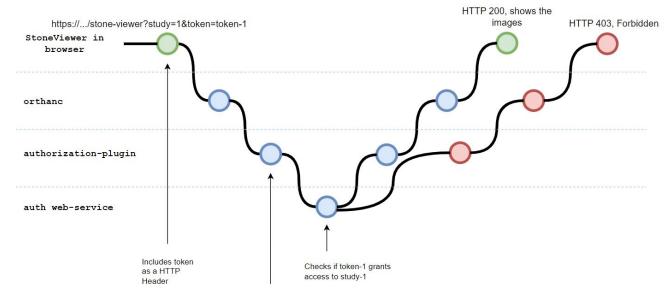
## Sharing DICOM studies

- Share a secure link granting access to a single study
- Do not expose your full Orthanc to the world



## **Orthanc Authorization plugin**

- Replaces basic authentication
- Based on HTTP headers
- Identifies the resource being accessed
- Delegates authorization to an external web-service



OrthancCon 2022, Nov 1

Calls the auth-web-service via a Rest API call

#### Authorization web-service

```
@app.post("/auth/validate")
def validate_authorization(validation_request: AuthValidationRequest, auth_header = Header(default=None)):
    granted = False
    if validation_request.dicom_uid == "1" and validation_request.token_value == "token-1":
        granted = True
    response = AuthValidationResponse(
        granted=granted,
       validity=60
    return response
```

## More security: Json Web Token (JWT)

Encoded paste a token here

eyJhbGci0iJIUzI1NiIsInR5cCI6IkpXVCJ9.ey JkaWNvbS1pZCI6IjEifQ.LFJxSnJLDQdQtGL- ZBnkh3JtcBCKAtNhXH6FSr4ZQHM

Decoded Edit THE PAYLOAD AND SECRET

HEADER: ALGORITHM & TOKEN TYPE	
{ "alg": "HS256", "typ": "JWT" }	
PAYLOAD: DATA	
{ "dicom-id": "1" }	
VERIFY SIGNATURE	
HMACSHA256( base64UrlEncode(header) + "." + base64UrlEncode(payload), my-secret-key ) □ secret base64 encoded	

#### Signature Verified

#### More security: token validation

```
@app.post("/auth/validate")
def validate_authorization(validation_request: AuthValidationRequest, auth_header = Header(default=None)):
    granted = False
    token_payload = jwt.decode(validation_request.token_value, "my-secret-key", algorithms="HS256")
    granted = validation_request.dicom_uid == token_payload["dicom-id"]
    response = AuthValidationResponse(
        granted=granted,
        validity=60
    )
    return response
```

#### More security: token generation

```
@app.post("/generate-token")
def generate_token(dicom_uid: str):
    token_payload = {
        "dicom-id": dicom_uid
     }
     token = jwt.encode(token_payload, "my-secret-key", algorithms="HS256")
     return token
```

#### Do not expose this web-service !!!!

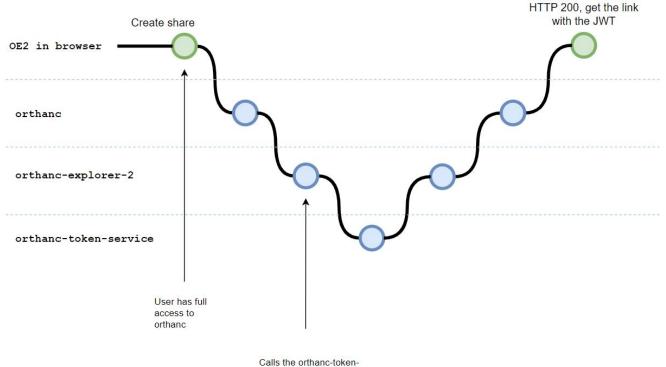
#### Need something more user friendly to generate tokens: OE2

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Local studies 75 / 75		19440409	SEAN^SANDERSON	ID-SEA-SAN-00000169	Study # 00000677	20061015	CR,CT,DX		3
			Anonymized1	e7bed471-33ec-4d10	PUNHO		CR		1
DICOM Modalities		19521007	PIPPA^SKINNER	ID-PIP-SKI-00000053	Study # 00000201	20120418	DX		1
findscu		19860 <mark>41</mark> 1	DIANE^WRIGHT	ID-DIA-WRI-00000347	Study # 00001358	20200518	CR,DX		6
> orthanc-debug X		19401012	VIRGINIA^MORGAN	ID-VIR-MOR-00000278	Study # 00001083	20101006	CR,DX		2
> orthanc4243 X		19660715	ALEXANDRA^DAVIDSON	ID-ALE-DAV-00000122	Study # 00000475	20040121	CR,CT,D		5
> orthanc4244 X		19750523	BERNADETTE^WALLACE	ID-BER-WAL-0000039	Study # 00000150	20131026	CR,DX		2
> radiant 🧹		19521206	LAUREN^FRASER	ID-LAU-FRA-00000409	Study # 00001572	20071104	CR,DX		6
> storescu X		20030828	FRANK^ROSS	ID-FRA-ROS-00000448	Study # 00001719	20001207	CR		1
🍫 Settings		19291213	FIONA^CHURCHILL	ID-FIO-CHU-00000096	Study # 00000375	20211211	CR,DX,MR		5
◀ Legacy UI		20190414	HANNAH^CORNISH	ID-HAN-COR-000000	Study # 00000076	20040814	CT,MR		2
		19680224	TREVOR^OLIVER	ID-TRE-OLI-00000236	Study # 00000917	20000616	CR		2
		19580331	JOSEPH^MORGAN	ID-JOS-MOR-00000175	Study # 00000697	20171202	CR,DX		2
			Anonymized1	b6a45b55-6441-4993	MRI LUMBAR SPINE WO		MR		5

#### Publication link from OE2

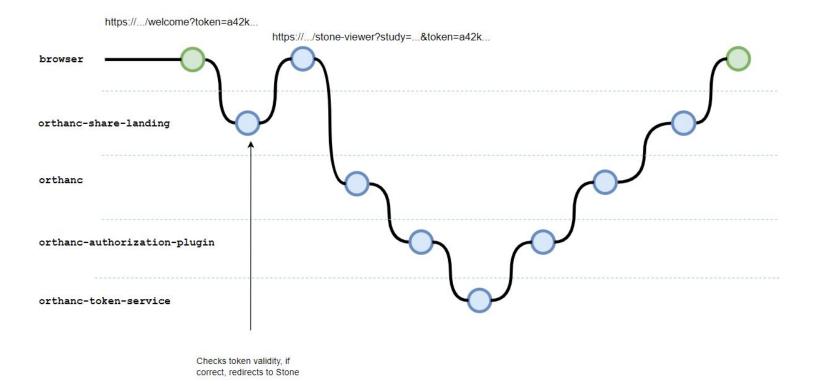
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#### Behind the scene: token generation



service via a Rest API call

#### Behind the scene: token validation



#### https://github.com/orthanc-team/orthanc-share

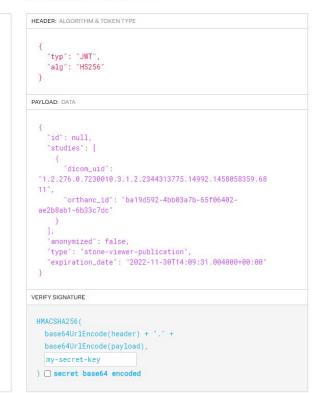
Complete set of web-services:

- orthanc-token-service to generate & validate tokens
- orthanc-share-landing to display user friendly messages if tokens are invalid
- Generates publication links for:
  - Stone Viewer
  - Osimis Viewer
  - MedDream Viewer (commercial CE approved)
- Handles expiration date
- orthanc-anonymizer to handle anonymized publications (still experimental, only works with the Osimis Viewer)
- Full demo setup including integration with Orthanc Explorer 2
- Boilerplate docker-compose.yml to bootstrap a setup
- Used in production

### Real-life JWT from orthanc-share

Encoded PASTE A TOKEN HERE

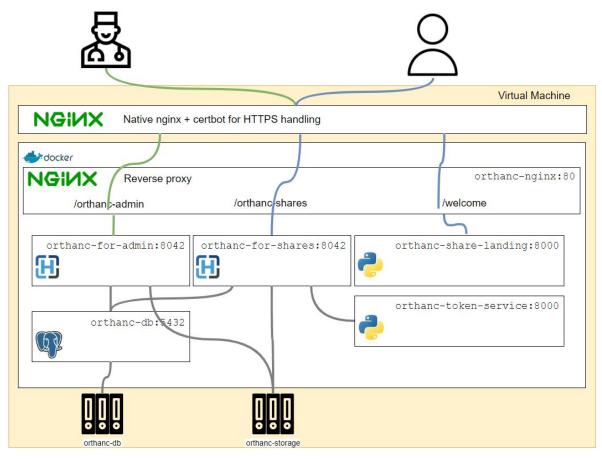
eyJ0eXAiOiJKV1QiLCJhbGciOiJIUzI1NiJ9.ey JpZCI6bnVsbCwic3R1ZGllcyI6W3siZGljb21fd WlkIjoiMS4yLjI3Ni4wLjcyMzAwMTAuMy4xLjIu MjM0NDMxMzc3NS4xNDk5Mi4xNDU4MDU4MzU5LjY 4MTEiLCJvcnRoYW5jX2lkIjoiYmExOWQ10TItNG JiMDNhN2ItNjVmMDY0MDItYWUyYjhhYjEtNmIzM 2M3ZGMifV0sImFub255bWl6ZWQi0mZhbHNLLCJ0 eXBIIjoic3RvbmUtdmlld2VyLXB1YmxpY2F0aW9 uIiwiZXhwaXJhdGlvb19kYXRIIjoiMjAyMi0xMS 0zMFQxNDowOTozMS4wMDQwMDArMDA6MDAifQ.bd bPIOHezc943DLhw004KlceeomLhLnTDcYxY6Upk T8 Decoded EDIT THE PAYLOAD AND SECRET



 $\odot$  Signature Verified

SHARE JWT

#### Full setup with Docker



#### Boilerplate docker-compose.yml

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36       0.1       0.1       1.1       0.1       1.	35	"TokenService" : {				
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39     Image: Constraints and an observation of the constraints and an observation	38	"Type": "stone-viewer-publication",				
40     7     87     POSTGRES_HOST_AUTH_METHOD: "trust"       41     }     88     89     volumes:       42     "admin": "admin"     89     orthanc-storage:       43     }     90     orthanc-db:       45     }     91     orthanc-db:	39	"EnableStandardShares": true				
41     7       42     "RegisteredUsers": {       43             44             45     }         45     }         41     1         42     1         43     1         44     1         45     3         45     3         46     1         47     1         48         49     0         41     1         42     1         43     1         44     1         45     3         45     3         45     1         45     1         46         47         48         49         41         42         43         44         45         45         46         47         48         49         49        40          41 <td>40</td> <td></td> <td></td> <td></td> <td></td> <td></td>	40					
42     "RegisteredUsers": {     88       43     "admin": "admin"     89       44     }     90     orthanc-storage:       45     }     91     orthanc-db:	41				POSIGRES_HOST_AUTH_METHOD: "trust"	
45     90     orthanc-storage:       44     91     orthanc-db:	42					
44         }         90         orthanc-storage:           45         }         91         orthanc-db:	43	"admin": "admin"				
	44					
46 92	45				orthanc-db:	
	46			92		

#### Future steps for orthanc-share project

- Add extra validations when opening the link: password, patient birth-date
- Generates access codes that human can type (requires an additional DB)
- Reduce the number of web-services to ease deployment. 2 Orthanc on same DB -> can not use SQLite
- Include LetsEncrypt certificate renewal in orthanc-nginx
- Send mail with the publication link

### Future steps for Orthanc Explorer 2

- Multi-language support
- Actions on multiple selections
- Edit DICOM Tags, split & merge
- Handle predefined user roles
- Handle external users (from KeyCloack ?)
- Edit modalities, peers, dicomweb-servers
- Labels

#### **Questions**?

#### Using Orthanc as part of your commercial activity ?

#### Why not support us on

# c open collective

https://opencollective.com/orthanc