

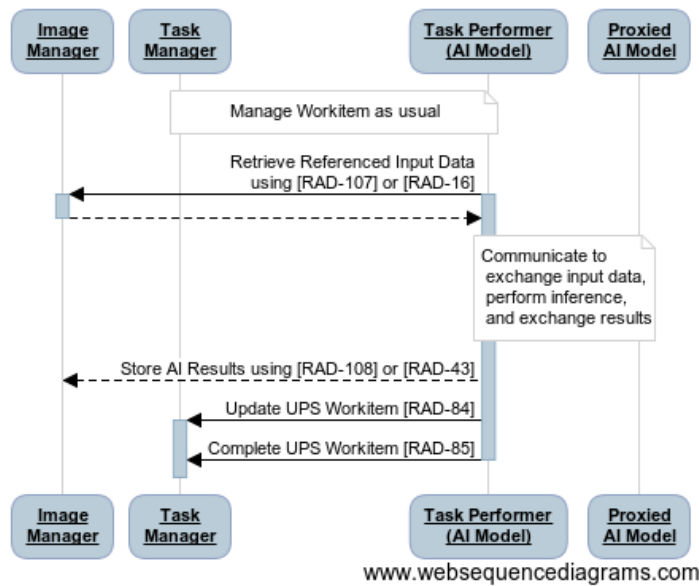
Hackathon Directions

API Background for Testers

The American College of Radiology's Data Science Institute (ACR DSI) has drafted a model API in collaboration with industry, organizational and other partners to lower the barrier for entry for developers looking to enter the healthcare space, and help to standardize communications to the models created by allowing them to be platform agnostic.

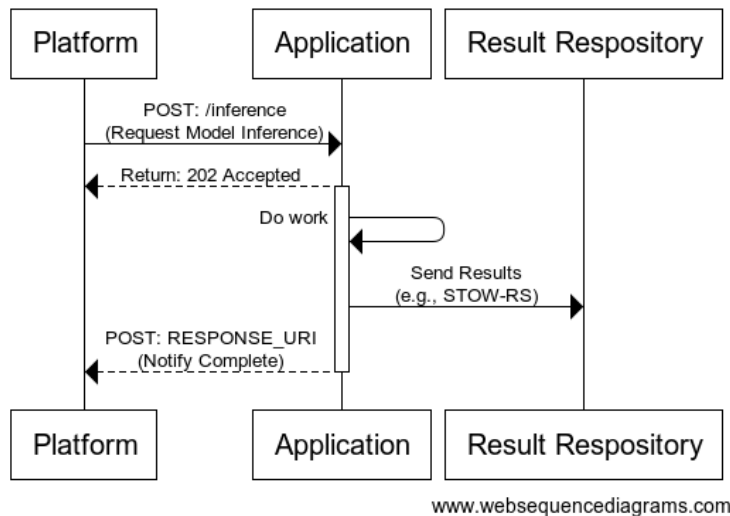
The work on this API is seen as complementary to the supplement in the proxy-based inference workflow. It standardizes the interface that communicates to exchange input data, perform inference and exchange results as it crosses the DICOM UPS communication and workflow boundary, such as in cloud-based inference.

Below is the diagram from the [AIW-I supplement](#).



As this cross-boundary communication can happen at different stages of the workflow, the ACR model API considers the IHE Task Performer to be an example of a Platform and the Proxied AI Model an Application example.

ACR's Platform-Model Communication for AI



Hackathon Site Directions

The site being used for the Hackathon is <https://hackathon-dsi.acr.org>

On the welcome page start by clicking on the new system link in the middle of the page or the System tab at the top of the page.

Please get started by creating a [new system](#). Returning users choose the system tab

Home System

From the System tab you can Create New System

[Create New System](#)

On this tab you will be asked to enter information about your system. There is a description for each field that lets you know what information is needed. Some of these fields will be used in the API POSTs to your systems endpoint.

Systems cannot be modified once created. To change the information about your system, please register another system with a unique system name.

System Name

Unique system name. You may register multiples.

Company

Name of the company the system belongs to.

User

Name of the person to which messages should be addressed.

Email Contact

Email to use for communication regarding the system.

Phone Number

Phone number to use for communication regarding the system – (optional).

Internet Facing System URI Endpoint for requests

This is where the POST of the inference request will be sent.

Internet Facing System URI Endpoint for liveliness

GET /health/live

Internet Facing System URI Endpoint for readiness

GET /health/ready

Header Authorization Token (Optional)

If your system requires an authorization token in the header request to be POSTed, enter that token here and it will be included.

SIIM API Token for System

If your system has been issued a token by SIIM, delete the default token and enter it here. See information above to obtain one. A default token is used during Hackathon but will be invalid outside Hackathon and a system specific token will be required.

[Create](#) [Cancel](#)

Please note the following:

- Once a system is defined it can be reused but cannot be edited. If you need to edit your system details, you will need to create a new system with a unique System Name. This was done to keep information private.
- The Internet Facing System URI Endpoint for requests is where the POST of the API will be sent. If A Header Authorization Token is input in the system definition, this will be sent to your system as Bearer Token.
- Although liveliness and readiness endpoints are asked for. The site will not be using them at this time.
- A default token for the SIIM DICOMweb and FHIR servers has been placed in the SIIM API Token field. This will only work during the Hackathon. Please register for a Token following the directions on the site. If you have a Token already, you can use it for this event and replace the default entry when defining your system.

Once a system is defined it will be visible on the Systems List page and can now be used to submit and view the progress of transactions. As there may be a significant number of registered systems, search is available.

Name	Company	Contact	Actions
System One	Company One	User One	Submit Transaction View Transactions

The submit transaction link allows you to define the Use Case as well as the input and output mechanism for data for your system processing. The following Use Cases are available for this event:

- Pulmonary Nodules on CT
- Pulmonary Nodules on CR
- COVID19 on CT
- COVID19 on CR
- Subdural Hematoma on CT
- Subdural Hematoma on MR

A DICOM StudyUID will be given to you for each case as well as endpoint details as described in the API. For those who would also like to get FHIR details, a Patient and ImagingStudy resource will be available for each use case as well. Input mechanisms that will be available for Systems during this event are:

- DIMSE
- DICOMweb
- S3 compatible bucket

Output mechanisms for artifacts created by systems are:

- DIMSE
- DICOMweb
- S3 compatible bucket
- FHIR

For those who may wish to test creating a supplement 219 compliant SR to assist DICOM WG 23, you may either select the S3 compatible bucket in addition to the DICOM endpoint or email a copy of the object to bbialecki@acr.org. Also, those creating FHIR resources, it would be helpful if you linked your observation to the Patient and ImagingStudy resources that are currently contained on the SIIM FHIR server for each use case. This would be helpful to DICOM WG 20 and FHIR Imaging Integration.

Submit Transaction

Use Case

COVID19 CR TWO

The ACR DSI website has specific Use Case information

Select the image input mechanism used by your system

DICOM Web

In addition to the image endpoint information, would you like the FHIR endpoint information sent as an input resource to your system? A Patient and ImagingStudy resource are available for each use case.

Yes

Select the output mechanism(s) used by your system to store artifacts (Ctrl + Click for multi select)


- DIMSE
- DICOM Web**
- S3 Compatible Bucket
- FHIR Observation

For those who may wish to test creating a supplement 219 compliant SR, you may either select the S3 compatible bucket in addition to the DICOM endpoint or email a copy of the object to bbialecki@acr.org

Upon selecting submit a POST request will be made to the Internet Facing System URI Endpoint for requests entered above. All additional information will be part of the request. If you entered a new system, the information will be saved and can be used for subsequent requests. Each submission will be given a unique transaction ID. For additional information or to discuss results, please email bbialecki@acr.org.

Upon clicking Submit a POST will immediately be sent to your Systems request endpoint.

Finally, the site will keep track of submitted transactions. Transactions can be submitted as many times as you wish for testing, but each will be given a unique ID. To see the status, click on View Transactions for your system.

<input type="text" value="Search..."/>				Create New System
Name	Company	Contact	Actions	
System One	Company One	User One	Submit Transaction View Transactions	

Here you will see your systems transaction IDs as well as the status of each transaction. The statuses are as follows:


- Request Failed – Unable to post a request successfully to the endpoint specified in the system description
- Waiting Response – A post request was successfully made for the transaction ID and the system is awaiting a successful response with the specified transaction ID to the API response URI
- Response Received – A response was received successfully to the response URI for this transaction ID and was successfully stored. For this to happen the response URI and response token that were in the request must be used

On this screen you are also able to jump to the Submit transaction screen for your system as well.

Transaction List

[Back to System List](#)

[Submit New Transaction](#)

Id	Transaction Time	Status 
16226	9/24/2020 11:48:55 AM	Waiting Response

Conclusion

Thank you for your participation. Any questions or comments can be directed to bbialecki@acr.org