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NIH System to System (S2S) “Client” Transactions Guide

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INTRODUCTION

Background

The System-to-System (S2S) interface provides the means for external systems to interact via direct requests to the NIH eRA Exchange system to perform various business functions. These business functions vary in purpose from obtaining Funding Opportunity Announcement (FOA) information to querying the status of grant applications, retrieving validation error/warning messages resulting from grant application processing, verifying person information details, and retrieve machine readable Notice of Award (NoA).

All services are offered as standards-based web services and published via WSDL and/or RESTful endpoints (YAML based), allowing client stubs to be auto generated.

This document provides software developers with transaction level details for the eRA Exchange System-to-System transactions. The aim is to supplement the WSDL/YAML definitions that themselves provide structural layout and content level data typing information with field level content descriptions. Also typical usage patterns are described. Brief details of the interaction processing are provided along with details of the incoming request messages and outgoing responses.

The security considerations and requirements that ensure that response information is only returned to requesters who are authorized to receive that information are also outlined.

In summary this guide is intended to assist external organizations with the creation and processing of the transactions, their formatting and content, for the S2S exchanges currently implemented and available for use. This document is a supplemental document from, and a subset of, the formal internal NIH requirements documentation.

Relationship to NIH eRA Commons system

The NIH eRA Commons web site allows external users to enter and manage their profile information and track grant applications in the Commons. The system-to-system web services provide alternate means to get profile, status, and other information directly via system-to-system transactions.

Business Process Operations

The following table shows the current business process operations supported.

Each operation is only permitted if all the security validations are passed (see following section for detailed security handling). This includes transport level checking (valid certificate uniquely identifying external party's system); process level authorization checks, and valid association between the requestor and the DUNS ID associated with the information exchange (permitted to access that owner organizations information). The transactions are not constrained to only information associated with eSubmission data, so information may have originated from previous paper or online web entry processing. Each request is followed by a matching response

transaction, or an error transaction. Within response transactions the mandatory elements could be present but as empty tags if no corresponding data is found in the database.

The operations available to external users are organized into following separate services:

- **Submission Validation Service (SVS):** Provides operations to validate a multi-project application submission or a single project. SVS also provides operations to validate specified components within a multi-project application submission against NIH business rules.
- **Submission Agency Data Service (SADS):** Provides operations for retrieving NIH data supporting electronic submissions.
- **SIL:** Provides operations to generate PDF images for Face Page, Budget, Grant Image etc.
- **RFA PA service :** Provides operation for inserting the FOA information
- **Machine Readable NoA Retrieval Service:** Provides set of operations to retrieve machine readable NoA details based on DUNS Number and other grant parameters

Service	Operation	Description
Submission Validation Service (SVS)	Validate Application	Validates an application against agency business rules. Can be used run validations pre-submission to Grants.gov
Submission Validation Service (SVS)	Validate Component	Validates an application against agency business rules. Currently only applies for multi-project applications.
Submission Agency Data Service (SADS)	Application Status Request	Request of grant application status. Requestor provides the Grant application reference number and must have permission to access that organizations application.
Submission Agency Data Service (SADS)	Application validation messages request	Allows the receipt of agency validation error and/or warning messages resulting from the processing of an electronic grant application submitted to Grants.gov. Request contains either the Grants.gov tracking number or the NIH accession number and requestor must have permission to the application. The response contains a list of agency error and/or warning messages that resulted from processing the grant application.
Submission Agency Data Service (SADS)	Person Information Request	Request of Commons User Account information based on the Account ID value; returns person, degree, address and affiliation information. Requestor must have permission to access accounts for the associated organization. Response contains information supported by the transaction schema and on file.
Submission Agency Data Service (SADS)	Organization Information Request	Provide information regarding a specific organization.
Submission Agency Data Service (SADS)	Previous Submission Request	Provide information for a previous submission that matches the current submission.
Submission Agency Data Service (SADS)	Prior Grant Request	Provide information for a prior grant that matched the current submission.

Submission Agency Data Service (SADS)	FOA Information Request	Provide information regarding a specific opportunity.
Submission Agency Data Service (SADS)	Stem Cell Line Status Request	Provide indicators whether identified stem cell lines are valid.
Submission Agency Data Service (SADS)	Person Info With Employment Request	Request of Commons User Account information based on the Account ID value; returns person, degree, address, employments and affiliation information. Requestor must have permission to access accounts for the associated organization. Response contains information supported by the transaction schema and on file.
Submission Agency Data Service (SADS)	Credential Request	Request for Commons User ID based on the last name and email address of a person. Returns the list of User IDs that match the last name and email in commons. Requestor must have permission to access information for the person whose credentials are being requested for the associated organization.
Submission Agency Data Service (SADS)	SAM Org Info Request	Request for SAM registration details.
Submission Image Service (SIL)	Generate Grant Image	Generates Grant Image for Single and Complex Grant Applications and expects the PDF attachments being sent as Streams
Submission Image Service (SIL)	Generate Component Image	Generates Image for a component of a Complex Grant Application and expects PDF attachments being sent as Streams
Submission Image Service (SIL)	Generate Form Image	Generates Image for a Form of either a Single or Complex Grant Application and expects PDF attachments being sent as Streams
Submission Image Service (SIL)	Generate Clinical Trials Form Image	Generates Image for a filled in Clinical Trial Forms PDF and expects PDF attachment being sent as Streams
RFA PA service (XCH)	Process Rfa Pa Notice	Inserts the FOA information into RFA_PA_NOTICES_T,

		RFA_PA_ACTIVITIES_T, RFA_PA_ICDS_T and RFA_PA_COMPONENTS_T
NoA Retrieval Service	Retrieve machine readable NoA details	Retrieve machine readable NoA details based on DUNS Number, Award Number, Grant Number and Awarded date range. The response contains NoA details in industry standard JSON format

Security Considerations

Each request contains the DUNS organization number associated with the data requested. The DUNS number must be registered and associated with the digital certificate used to make the request. When a mismatch occurs between data requested and authorized, the failed attempt is recorded and may be construed as an attempt to access un-authorized information. The partner is responsible for acquiring and setting up their own digital certificate for use with SSL communications.

The submitting organization is given access to all applications, grants and person data within that organization.

However for calling SIL Operations, there is no restriction to use a different certificate for different organization. The trading partner can register themselves in COMMONS, obtain a certificate and register that certificate with eRA and assign necessary roles to access SIL operations. AMS (account management services) application can be used for this purpose..

The following table summarizes the Roles necessary to access each of the services.

Service Name	Role	Role Context
Submission Validation Service	SVS_APPLICANT_DATA_SERV	Institution
Submission Agency Data Service	APPLICANT_RETRIEVAL_DATA_SERV	Institution
Submission Image Service	SERVICE_PROVIDER_ROLE	Global
Rfa Pa Service	APPLICANT_RFAPA_SERV	Global
NoA Retrieval Service	NOA_DOCUMENT_SERVICE_ACCESS_ROLE	Institution

Transactions and Field Level Details

Validate Application

VALIDATE APPLICATION REQUEST MESSAGE (incoming)		
FIELD	DESCRIPTION	VALIDATION
Grant Application XML	The XML for the submission	Must conform to the opportunity schema
Attachment Meta Data:	Meta data for attachments, include document type, page count and size <i>Note: See Appendix A: Attachment Meta Data Notes</i>	Must contain meta data for each attachment referenced in the Grant Application XML
File name	File name	
Mime Type	Mime Type	
File Location	File Location	
Size in Bytes	Size in Bytes	
Page Count	Page Count	
Number of Lines	Number of Lines	Some attachments have validation to be under certain number of lines.
Is Resizing Required	Is Resizing Required	
Is Encrypted Attachment	Is Encrypted Attachment	
Is Password Protected	Is Password Protected	
Is Secure	Is Secure	
Pdf Error	Pdf Error	
Is XFA PDF	Is XFA PDF	Currently eRA does not support XFA (XML Forms Architecture) forms in PDF attachments.

VALIDATE APPLICATION RESPONSE MESSAGE (outgoing)	
Data Element	Description
Validation Messages:	Messages repeated for each error/warning
Sub Application Group ID	This identifies Component Type, currently only applicable for multi-project applications. (E.g., Overall, Core, Project, etc.)

VALIDATE APPLICATION RESPONSE MESSAGE (outgoing)	
Data Element	Description
Validation Messages:	Messages repeated for each error/warning
Sub Application ID	This identifies Component Identifier, a unique identifier for component types, currently only applicable for multi-project applications. Expected format: 3 digit unique number (unique for the application) and the SubApplicationGroupId (component type) separated by a dash (E.g., 328-Core). Note: See Appendix B: Sub Application ID Sample
Message Rule Number	The rule number associated with the message
Message Severity	E (Error) or W (Warning)
Message Text	Validation message text
Message ID	A unique identifier for the message
Form Name	Form name where validation is applicable

Validate Component

VALIDATE COMPONENT REQUEST MESSAGE (incoming)		
FIELD	DESCRIPTION	VALIDATION
Grant Application XML	The XML for the submission	Must conform to the opportunity schema
Attachment Meta Data:	Meta data for attachments, include document type, page count and size Note: See Appendix A: Attachment Meta Data Notes	Must contain meta data for each attachment referenced in the Grant Application XML
File name	File name	
Mime Type	Mime Type	
File Location	File Location	
Size in Bytes	Size in Bytes	
Page Count	Page Count	
Number of Lines	Number of Lines	Some attachments have validation to be under certain number of lines.
Is Resizing Required	Is Resizing Required	
Is Encrypted Attachment	Is Encrypted Attachment	
Is Password Protected	Is Password Protected	

VALIDATE COMPONENT REQUEST MESSAGE (incoming)		
FIELD	DESCRIPTION	VALIDATION
Is Secure	Is Secure	
Pdf Error	Pdf Error	
Is XFA PDF	Is XFA PDF	Currently eRA does not support XFA (XML Forms Architecture) forms in PDF attachments.
Opportunity ID	Opportunity ID	

VALIDATE COMPONENT RESPONSE MESSAGE (outgoing)	
Data Element	Description
Validation Messages:	Messages repeated for each error/warning
Sub Application Group ID	This identifies Component Type, currently only applicable for multi-project applications. (E.g., Overall, Core, Project, etc.)
Sub Application ID	This identifies Component Identifier, a unique identifier for component types, currently only applicable for multi-project applications. Note: Though SVS will simply return the Sub Application ID that is specified in the XML, upon submission NIH expects the following format: 3 digit unique number (unique for the application) and the SubApplicationGroupId (component type) separated by a dash (E.g., 328-Core). See <i>Appendix B: Sub Application ID Sample</i>
Message Rule Number	The rule number associated with the message
Message Severity	E (Error) or W (Warning)
Message Text	Validation message text
Message ID	A unique identifier for the message
Form Name	Form name where validation is applicable

Grant Status Request

APPLICATION STATUS REQUEST MESSAGE (incoming)		
FIELD (Tag)	DESCRIPTION	VALIDATION
Tracking Number (trackingNumber)	Grants.gov tracking number of grant application (E.g., GRANT12345678)	Optional
Accession Number (accessionNumber)	NIH Accession Number (E.g., 1234567) that has been reserved for the application package	Optional
Project Title (projectTitle)	Project Title of grant application	Optional
Grant Number (grantNumber)	All components of the grant number. Grant Number must be supplied as a series of components, some required and some not. The series of components shown below comprise the full grant number specification:	Grant Number itself (as a whole) is Optional. However, if supplied, certain components cannot be blank. These are indicated as such below.
Grant Number: Application Type (applicationTypeCode)	First character of the grant number.	Must be a digit (1..9). Cannot be blank.
Grant Number: Activity Code (activityCode)	Bytes 2-4 of the grant number, i.e. "R01"	Alphanumeric. Cannot be blank.
Grant Number: Administering PHS Organization (PHSOrgCode)	Bytes 5-6 of the grant number, i.e. "MH"	Alphabetic. Cannot be blank.
Grant Number: Serial Number (serialNumber)	Bytes 7-12 of the grant number, i.e. 000123	Numeric. Cannot be blank.
Grant Number: Support Year (supportYear)	Bytes 14-15 of the grant number (immediately following the dash)	Numeric. Cannot be blank.
Grant Number: Suffix	Bytes 16-19 of the grant number.	Alphanumeric. Blanks are allowed.

Notes:

This status request is designed to retrieve a single year of a data.

At least one identifier needs to be provided. The identifiers and their order of precedence are:

Accession Number
Tracking Number
Grant Number

Project Title

If more than one identifier is supplied, the first based on the precedence indicated above is used. There is no consistency check within identifiers. The application identified must be one that was previously electronically submitted by the trading partner for the submitting organization.

APPLICATION STATUS RESPONSE MESSAGE (outgoing)	
Data Element (Tag)	Description
E-Submission Status (ESubmissionStatus)	A status code indicating the state of the message in the electronic receipt process before functional processing by NIH users. <ul style="list-style-type: none"> ○ Grant application downloaded in the exchange ○ Grant application successfully validated by the exchange ○ Grant application failed format validation ○ Grant application successfully loaded in eRA database ○ Grant application failed content validation ○ E-application submission complete: Application in process
E-Submission status date (ESubmissionStatusDate)	Date of the latest E-Submission Status, above.
Grant status (grantStatus)	Grant application status post intake. This is the official grant status throughout the life cycle of the application and grant
Grant status date (grantStatusDate)	Date of the latest Grant Status, above.
Grant Number (grantNumber)	All components of the grant number. The Grant Number (E.g., 2R01MH000123-01S1) must be supplied as a series of components. The series of components shown below comprise the full grant number specification. Please note that any or all of these components may be blank, since the assignment of grant number occurs <i>after</i> application receipt, and might be at any stage of completion when the status request is received.
Grant Number: Application Type (applicationTypeCode)	First character of the grant number, i.e. "2"
Grant Number: Activity Code (activityCode)	Bytes 2-4 of the grant number, i.e. "R01"
Grant Number: Administering PHS Organization (PHSOrgCode)	Bytes 5-6 of the grant number, i.e. "MH"
Grant Number: Serial Number	Bytes 7-12 of the grant number, i.e. 000123
Grant Number: Support Year (supportYear)	Bytes 14-15 of the grant number (immediately following the dash), i.e "01"

APPLICATION STATUS RESPONSE MESSAGE (outgoing)	
Data Element (Tag)	Description
Grant Number: Suffix	Bytes 16-19 of the grant number, i.e. "S1"
Grant title (projectTitle)	Project title
Accession Number (accessionNumber)	NIH internal key assigned before the grant number
Submitter grant application identifier	Submitter internal id for the application
Application Receipt Date (proposalReceiptDate)	Date the application was successfully received by NIH.
SRO Contact	Scientific Review Administrator contact information
SRO Name (name)	First, last name of Scientific Review Administrator (SRO)
SRO Phone Number (phone)	Phone number for SRO contact
SRO E-Mail (email)	Email for SRO contact
IRG Assignment (IRGAssignment)	Identifies Integrated Review Group (IRG) to which application has been assigned. (E.g., ZNS1)
Study Section Meeting Date	Date on which review study section met / will meet.
Study Section Meeting Location	Location of study section review meeting
Study Section Roster	List of members who serve on the assigned study section.
Council Meeting Date	Identifies the council round assigned to this application (year and month).
GMS Contact (GMSContact)	Grants Management Specialist contact information
GMS Name (name)	Grants Management Specialist name
GMS Phone (phone)	Grants Management Specialist phone number
GMS E-Mail (email)	Grants Management Specialist Email
PO Contact (POContact)	Project Official Contact information
PO Name (name)	Program Official Name
PO Phone (phone)	Program Official Phone Number
PO E-mail (email)	Program Official Email
Advisory Council Meeting Date	Date of council meeting
Advisory Council Meeting Location	Location of council meeting

Application Validation Messages Request

APPLICATION VALIDATION MESSAGES REQUEST MESSAGE (incoming)		
FIELD (Tag)	DESCRIPTION	VALIDATION
Tracking Number (trackingNumber)	Grants.gov tracking number of grant application (E.g., GRANT12345678)	Optional
Accession Number (accessionNumber)	NIH Accession Number that has been reserved for the application package (E.g., 1234567)	Optional

Notes:

At least one identifier needs to be provided. The identifiers and their order of precedence are:

Accession Number

Tracking Number

If more than one identifier is supplied, the first based on the precedence indicated above is used. There is no consistency check within identifiers. The application identified must be one that was previously electronically submitted by the trading partner for the submitting organization.

APPLICATION VALIDATION MESSAGES RESPONSE MESSAGE (outgoing)	
Data Element (Tag)	Description
Message Location (componentID, formName)	Identifies component and form that generated message. Currently only applicable for multi-project applications. Will be empty for single project applications. (E.g., 661-Core, RR_OtherProjectInfo)
Message Severity (severity)	E (Error) or W (Warning)
Message Text (messageText)	Validation message text
Message Rule Number (ruleNum)	The rule number associated with the message (E.g., 004.22.1)

Person Information Request

PERSON INFORMATION REQUEST MESSAGE (incoming)		
FIELD (Tag)	DESCRIPTION	VALIDATION
Organization identifier (dunsID)	The identifier of the organization about which the information is requested. This identifier is the DUNS Number.	Must be serviced by the certificate associated with the caller
COMMONS User ID (userID)	The COMMONS user id of the person the information is requested for	The person must be affiliated with the organization for which the information is requested If not, display the following

PERSON INFORMATION REQUEST MESSAGE (incoming)		
FIELD (Tag)	DESCRIPTION	VALIDATION
		message: There is no Commons Username <Commons User ID> associated with the institution identified as DUNS < Organization Identifier> Mandatory field

PERSON INFORMATION RESPONSE MESSAGE (outgoing)	
Data Element (Tag)	Description
COMMONS User ID (commonsUserId)	The person commons account id submitted in the request
Affiliations (roles)	Role, system organization id and DUNS for each affiliation
Organization ID (dunsId)	Organization ID provided in the request (DUNS Number)
External Organization ID (externalOrgId)	Organization Identifier used in NIH database (e.g., 123456)
Role type (role)	The code which indicates the role type in the eRA database. If multiple roles are associated with the provided Commons User Id, the PI role will be returned if the user has a PI role. (E.g., PI)
Person Name (personName)	Name as entered in Commons personal profile
Person Prefix Name (namePrefix)	From the profile
Person First Name (firstName)	From the profile
Person Middle Name (middleName)	From the profile
Person Last Name (lastName)	From the profile
Person Suffix Name (nameSuffix)	From the profile
Person employment address (employmentAddress)	The address data group related to that affiliation
Line address 1 (lineAddress1)	From the profile
Line address 2 (lineAddress2)	From the profile
Line address 3 (lineAddress3)	From the profile
Line address 4 (lineAddress4)	From the profile
City (city)	City
State (state)	If country is Canada, will return Canadian province code. For countries other than US and Canada will be blank.

PERSON INFORMATION RESPONSE MESSAGE (outgoing)	
Data Element (Tag)	Description
Postal Code (postalCode)	Equivalent to “zip code” in the eRA database. Returns 9 digits (zip+four). If only 5 digits of zip code are available, will pad with zeros (e.g., 208171814, 265060000)
Country (countryCode)	This is the ISO-3166 country code (Alpha-3 format) (E.g., USA)
Contact Information (contact)	Phone, email, and fax contact information from Commons personal profile
Phone number (phone)	Phone number
Fax Number (fax)	Fax number
E-mail address (email)	Email address
Preferred address code (preferredAddressCode)	(true/false)
Degree (degree)	This is a repeating element of the degree and degree text if degree is “other”.
Position Title (positionTitle)	Position title for this affiliation
List of prior awarded grants for that person and that organization (priorAwardedGrants)	This is a repeating element where each element provides the full grant number with all components including the amendments and multi year awards. Subprojects are not included.
Application Type Code (applicationTypeCode)	Grant Application Type Code (E.g., 1 for New, 2 for Renewal, 3 for Revision, 4 for Extension, 5 for Non-competing Continuation, 6 for Change of Organization Status, 7 for Change of Grantee or Training Institution, 8 for Non-Competing Continuation Change of Institute or Division, 9 for Competing Continuation Change of Institute or Division)
Activity Code (activityCode)	Grant activity code (E.g., R01)
PHS Organization (PHSOrgCode)	Awarding Institute code (E.g., MH)
Serial Number (serialNumber)	Grant serial number (E.g., 000123)
Support Year	Grant support year (E.g., 2)

Organization Information Request

ORGANIZATION INFORMATION REQUEST MESSAGE (incoming)		
FIELD (Tag)	DESCRIPTION	VALIDATION
Organization identifier (dunsID)	The identifier of the organization about which the information is requested. This identifier is the DUNS Number.	Must be serviced by the certificate associated with the caller

ORGANIZATION INFORMATION RESPONSE MESSAGE (outgoing)	
Data Element (Tag)	Description
External Organization ID (externalOrgId)	Organization Identifier used in NIH database (e.g., 123456)
Organization Name (organizationName)	Name of the organization.
Organization EIN (ein)	EIN for the organization
Organization Address (address)	The profile address for the organization
Line address 1 (lineAddress1)	From the profile
Line address 2 (lineAddress2)	From the profile
Line address 3 (lineAddress3)	From the profile
Line address 4 (lineAddress4)	From the profile
City (city)	City
State (state)	If country is Canada, will return Canadian province code. For countries other than US and Canada will be blank.
Postal Code (postalCode)	Equivalent to “zip code” in the eRA database. Returns 9 digits (zip+four). If only 5 digits of zip code are available, will pad with zeros (e.g., 208171814, 265060000)
Country (countryCode)	This is the ISO-3166 country code (Alpha-3 format) (E.g., USA)
Organization Status (status)	Indicates whether organization is ACTIVE (A) or Closed (C)
Human Subject Assurance Number (humanSubjectAssuranceNumber)	Human Subject Assurance Number (E.g., FWA00001234)
Animal Welfare Assurance Number	Animal Welfare Assurance Number If there is more than one Animal Welfare Assurance Number associated with this organization they will be returned as a list. For example: <AnimalWelfareAssuranceNumber>Assurance number 1</AnimalWelfareAssuranceNumber> <AnimalWelfareAssuranceNumber>Assurance number 2</AnimalWelfareAssuranceNumber> <AnimalWelfareAssuranceNumber>Assurance number 3</AnimalWelfareAssuranceNumber>
NIH Policy Accepted Flag (nihPolicyAcceptedFlag)	Flag indicating whether applicant organization read and acknowledged NIH submission policy statement or not(Y/N). A “Y” value is needed to successfully submit an NIH application per Submission Validation Service validation 000.44.

Previous Submission Request

PREVIOUS SUBMISSION REQUEST MESSAGE (incoming)		
FIELD (Tag)	DESCRIPTION	VALIDATION
Organization identifier (dunsID)	The DUNS associated with the current submission	Must be serviced by the certificate associated with the caller
COMMONS User ID (userID)	The COMMONS user id of the PI for the current submission	The person must be affiliated with the organization for which the information is requested.
Project Title (projectTitle)	The project title of the current submission	
Council Round (councilRound)	The council round of the current submission	

PREVIOUS SUBMISSION RESPONSE MESSAGE (outgoing)	
Data Element (Tag)	Description
Grant Status (grantStatus)	Grant application status post intake. This is the official grant status throughout the life cycle of the application and grant (E.g., Pending IRG Review)
Opportunity identifier (rfapaNumber)	The opportunity under which the previous submission was submitted. Note: The Opportunity ID format stored in the NIH database is slightly different than what appears in the NIH Guide for Grants & Contracts or in Grants.gov. For example: the database stores PA11-096 for FOA PA-11-096 and NS13-006 for RFA-NS-13-006).
Accession Number (accessionNum)	NIH internal key assigned before the grant number (E.g., 1234567)
Activity Code (activityCode)	Activity code for the previous submission (E.g., R01)
Application Type (applicationTypeCode)	The application type code for the previous submission (E.g., 1 for New, 2 for Renewal, 3 for Revision, 4 for Extension, 5 for Non-competing Continuation, 6 for Change of Organization Status, 7 for Change of Grantee or Training Institution, 8 for Non-Competing Continuation Change of Institute or Division, 9 for Competing Continuation Change of Institute or Division)

PREVIOUS SUBMISSION RESPONSE MESSAGE (outgoing)	
Data Element (Tag)	Description
Interim Funding	Indicator if the previous submission received interim funding.
Suffix Code	Suffix code for the previous submission
Grant Title (projectTitle)	Project title for the previous submission
Application Receipt Date (appReceivedDate)	Date the previous submission was successfully received by NIH
Project Start Date (projectStartDate)	Previous submission start date
Project End Date (projectEndDate)	Previous submission end date
Grant Number (grantNum)	Previous submission number
Support Year (supportYear)	Previous submission support year
Organization Identifier (dunsID)	DUNS of the submitting organization for the previous submission
Award Doc Num (awdDocNum)	Award document Id number
Budget Modular Indicator (isBudgetModular)	An indicator if the previous submission has a modular budget (true/false)
Summary Statement Indicator	An indicator if a summary statement has been generated for the previous submission
Application Awarded Indicator	An indicator if the previous submission has been awarded
Application Verified Indicator (isVerified)	An indicator if the previous submission has been verified (true/false)
COMMONS User Id (piCommonsID)	The Commons User Id of the PI on the previous submission
PI Last Name (existingTransLastName)	The last name of the PI on the previous submission

Prior Grant Request

PRIOR GRANT REQUEST MESSAGE (incoming)		
FIELD (Tag)	DESCRIPTION	VALIDATION
Federal Identifier (federalID)	The federal identifier from the SF 424 Form	Must include only IC and serial number (e.g. CA987654).
Application Type (applicationType)	The application type from the SF 424 Form <Renewal, Resubmission, Revision>	
Project Start Date (projectStartDate)	The project start date from the SF 424 Form. Format <YYYY-MM-DD or no data between tags>	
Project End Date (projectEndDate)	The project end date from the SF 424 Form. Optional.	

PRIOR GRANT REQUEST MESSAGE (incoming)		
FIELD (Tag)	DESCRIPTION	VALIDATION
	Format <YYYY-MM-DD or no data between tags>	

PRIOR GRANT RESPONSE MESSAGE (outgoing)	
Data Element (Tag)	Description
Accession Number (accessionNum)	NIH internal key assigned before the grant number
Grant Status (grantStatus)	Grant application status post intake. This is the official grant status throughout the life cycle of the application and grant (E.g., Awarded. Non-fellowships only)
Opportunity identifier (rfapaNumber)	The opportunity under which the prior grant was submitted. Note: The Opportunity ID format stored in the NIH database is slightly different than what appears in the NIH Guide for Grants & Contracts or in Grants.gov. For example: the database stores PA11-096 for FOA PA-11-096 and NS13-006 for RFA-NS-13-006).
Activity Code (activityCode)	Activity code for the prior grant (E.g., R01)
Application Type (applicationTypeCode)	The application type code for the prior grant (E.g., 1 for New, 2 for Renewal, 3 for Revision, 4 for Extension, 5 for Non-competing Continuation, 6 for Change of Organization Status, 7 for Change of Grantee or Training Institution, 8 for Non-Competing Continuation Change of Institute or Division, 9 for Competing Continuation Change of Institute or Division)
Interim Funding (interimFundingCode)	Indicator if the prior grant received interim funding.
Suffix Code (suffixCode)	Suffix code for the prior grant
Grant Title (projectTitle)	Project title for the prior grant
Application Receipt Date (applReceiveDate)	Date the prior grant was successfully received by NIH
Project Start Date (projectStartDate)	Prior grant start date
Project End Date (projectEndDate)	Prior grant end date
Grant Number (grantNum)	Prior grant number (E.g., R44MD987654-03)
Support Year (supportYear)	Prior grant support year (E.g., 3)
Organization Identifier (dunsID)	DUNS of the submitting organization for the prior grant

PRIOR GRANT RESPONSE MESSAGE (outgoing)	
Data Element (Tag)	Description
Award Doc Num (awdDocNum)	Award document Id number
Budget Modular Indicator (isBudgetModular)	An indicator if the prior grant has a modular budget (true/false)
Summary Statement Indicator (doesSummaryStatementExist)	An indicator if a summary statement has been generated for the prior grant
Application Awarded Indicator (isAppAwarded)	An indicator if the prior grant has been awarded (true/false)
Application Verified Indicator (isVerified)	An indicator if the prior grant has been verified (true/false)
COMMONS User Id (piCommonsID)	The Commons User Id of the PI on the prior grant
PI Last Name (existingTransLastName)	The last name of the PI on the prior grant
SBIR STTR process code(SBIRSTTRProcessCode)	Enumeration indicating the SBIR STTR process code. Possible values: Phase I Phase II Fast-Track Direct Phase II Phase IIA Phase IIB Commercialization Readiness Program

FOA Information Request

FOA INFORMATION REQUEST MESSAGE (incoming)		
FIELD (Tag)	DESCRIPTION	VALIDATION
Opportunity identifier (rfapaNumber)	The opportunity for the current submission (e.g., RFA-NS-13-006, PA- 12-150)	Optional. Either Opportunity Identifier or Package Id must be supplied
Package Id(packageId)	The package ID is defined in grants.gov. (e.g., PKG12345678)	Optional. Either Opportunity Identifier or Package Id must be supplied.
Proposal Receipt Date (receiptDate)	Date the prior grant was or will be successfully received by NIH. Format <YYYY-MM-DD>	Optional. If omitted will default to current date.

FOA INFORMATION RESPONSE MESSAGE (outgoing)	
Data Element (Tag)	Description
Funding Opportunity Number(fundingOpportunityNumber)	Full funding opportunity number returned from grants.gov for a given package ID.
Activity Code (activityCode)	Activity code associated with opportunity Combined activity codes (e.g., R21/R33) are identified by the isCombinedMechanism flag. When the isCombinedMechanism flag is true, the first of the two activity codes would be listed in this tag (e.g., R21 of R21/R33).
Administering PHS Organization (phsOrgCode)	Institute/Center within Agency sponsoring opportunity
Opt-out Flag (optOutCode)	There is a limited set of activity-code specific validations that, although standard values are assigned, NIH Institutes and Centers (IC) may choose not to have eRA systems enforce applicant compliance with these standard values in order to allow alternative values specified in a Funding Opportunity Announcements to be accepted. When this happens we call it “ opting-out of limited validations ”. (Y/N)
Combined Mechanism Indicator (isCombinedMechanism)	Indicator if opportunity uses combined mechanism (true/false) E.g., R21/R33, UH2/UH3 When true, the activity codes are listed in the activityCode and combinedActivityCode tags.
Program Type (programTypeCode)	Program Type for opportunity (STTR, SBIR)
Direct Phase II (directPhaseII)	Indicator that FOA allows Direct Phase II applications. (Y/N)
Opportunity Title (noticeTitle)	Title of opportunity
Notice Type (noticeTypeCode)	Notice Type for opportunity ‘P’ = PA (Program Announcement) ‘B’ = PAR (PA with special Receipt, Referral and/or Review consideration) ‘P’ = PAS (PA with Set-aside funds) ‘R’ = RFA (Request For Applications)
Collaborative Type (collaborativeTypeCode)	Collaborative Type for opportunity. Set to ‘01/ when the activity code is followed by the string ‘Collab’.

FOA INFORMATION RESPONSE MESSAGE (outgoing)	
Data Element (Tag)	Description
Council Round (councilMeetingDate)	Council round for opportunity (yyyymm) Note: If a Council Round does not exist for the requested FOA, the expected Council Round is calculated based on the Proposal Receipt Date. If omitted, the Council Round will be calculated based on the current date.
Agency (agency)	Agency sponsoring opportunity (e.g., NIH)
AIDS Related Code (aidsRelatedCode)	AIDS Related Code for opportunity (Y/N)
Multi-project indicator (isComplex)	Indicator for multi-project opportunity (true/false)
Project Period Exception (projectPeriodExceptionFlag)	Set to 'Y' if the FOA has been approved to allow more than 5 budget periods. Set to 'N' otherwise.
Component Labels (component)	Agency defined labels used for expected component types for an opportunity (applies to multi-project submissions only) E.g., Project, Core
Page Limits (pageLimit)	Page limits for research strategy (applies to multi-project submissions only.)
Component Iterations (minIterationNum, maxIterationNum)	Minimum and maximum number of iterations for each expected component type (applies to multi-project submissions only.) Note: limits may be more restrictive than indicated in Grants.gov opportunity schema.
projectCostExceptionFlag	When projectCostExceptionFlag is set to 'Y' then the direct cost limits must be followed as stated in the FOA, not systematically validated for the standard value for the activity code. For example, R03 FOA that allows more than \$50,000 in direct costs per budget period.
pageLimitExceptionFlag	When pageLimitExceptionFlag is set to 'Y' then the page limits for that attachment must be followed as stated in the FOA, not systematically validated for the standard value for the activity code. For example, an R01 FOA that allows a 30 page research strategy instead of the standard 12 page limit.

FOA INFORMATION RESPONSE MESSAGE (outgoing)	
Data Element (Tag)	Description
projectPeriodExcepLT5YFlag	When projectPeriodExcepLT5Yflag is set to 'Y' then the project period may be greater than the standard project period for the activity code. For example, R21 FOA that allows more than 2 budget periods. This flag is applicable for activity codes (R03, R21, R36, UH2) that require project period less than 5 years whereas projectPeriodExceptionFlag listed above is applicable for activity codes (For example R01) that require project period 5 years or more.
diversityFlag	When diversityFlag is set to 'Y' on the FOA, then all senior key persons specified on the form must provide a valid Commons Credential.
clinicalTrialCode	Indicates whether the FOA supports a clinical trial etc. This is a string with possible values: N, O, R and I. N stands for 'Not-Allowed' O stands for Optional R stands for Required I stands for Required (Infrastructure)
Combined Activity Code (combinedActivityCode)	Combined activity codes (e.g., R21/R33) are identified by the isCombinedMechanism flag. When the isCombinedMechanism flag is true, the second of the two activity codes would be listed in this tag (e.g., R33 of R21/R33).

Stem Cell Line Status Request

STEM CELL LINE STATUS REQUEST MESSAGE (incoming)		
FIELD (Tag)	DESCRIPTION	VALIDATION
Stem Cell Lines (stemCellLineCode)	List of proposed stem cell lines (e.g., 0043)	

STEM CELL LINE STATUS RESPONSE MESSAGE (outgoing)	
Data Element (Tag)	Description
Stem Cell Lines w/ indicators (stemCellLine)	List of requested stem cell lines with indicator if each is valid or not
Cell Line Code (stemCellLineCode)	Cell Line code (E.g., 0001)
Valid (valid)	Indicator of whether a cell line is valid or not (true/false)

Credential Request

CREDENTIAL REQUEST MESSAGE (incoming)		
FIELD (Tag)	DESCRIPTION	VALIDATION
Last Name (lastName)	Last name of the person whose Commons Credentials are requested	
Email (email)	Email of the person whose Commons Credentials are requested	

CREDENTIAL RESPONSE MESSAGE (outgoing)	
Data Element (Tag)	Description
Commons User ID (credential)	List of commons user ids that match the lastName and email in the request

SAM Org Info Request

SAM ORG INFO REQUEST MESSAGE (incoming)		
FIELD (Tag)	DESCRIPTION	VALIDATION
DUNS Number (dunsID)	Primary (9 digit) DUNS number of the organization whose SAM registration info is requested.	

SAM ORG INFO RESPONSE MESSAGE (outgoing)	
Data Element (Tag)	Description
SAM Org registration details (SAMOrgInfo)	This is a list of following information. Since an organization can have multiple DUNS Numbers this method returns
samOrgsId	
dunsID	
dunsIDPlus4	
cageCode	
registrationExpirationDate	
legalBusinessName	
dbaName	
companyDivision	
divisionNumber	
samCongressionalDistrict	
entityUrl	
entityStructure	
stateOfIncorporation	
countryOfIncorporation	
businessTypeCounter	
mailingAddressLine1	

SAM ORG INFO RESPONSE MESSAGE (outgoing)	
Data Element (Tag)	Description
mailingAddressLine2	
mailingAddressCity	
mailingAddPostalCode	
mailingAddZipCodePlus4	
mailingAddressCountry	
mailingAddStateOrProvince	
govtBusPocFirstName	
govtBusPocMiddleInitial	
govtBusPocLastName	
govtBusPocTitle	
govtBusPocFaxUsOnly	
elecBusPocFirstName	
elecBusPocMiddleInitial	
elecBusPocLastName	
elecBusPocTitle	
elecBusPocStAdd1	
elecBusPocStAdd2	
elecBusPocCity	
elecBusPocZipPostalCode	
elecBusPocZipPostalCodePlus4	
elecBusPocCountryCode	
elecBusPocStateOrProvince	
elecBusPocUsPhone	
elecBusPocUsPhoneExt	
elecBusPocNonUsPhone	
elecBusPocFaxUsOnly	
elecBusPocEmail	
domesticParentDunsNumber	
domesticParentStAdd1	
domesticParentStAdd2	
domesticParentCity	
domesticParentPostalCode	
domesticParentCountryCode	
domesticParentStateOrProv	
domesticParentPhone	
averageNumberOfEmployees	
delinquentFederalDebtFlag	
exclusionStatusFlag	
lastMonthlyRunDate	
softDeletedFlag	
lastUpdId	
lastUpdDate	

SAM ORG INFO RESPONSE MESSAGE (outgoing)	
Data Element (Tag)	Description
registrationDate	
samAddress1	
samAddress2	
samCity	
samPostalCode	
samProvinceOrState	
samCountryCode	
samZipCodePlus4	

Generate Grant Image

GRANT IMAGE REQUEST MESSAGE (incoming)		
FIELD (Tag)	DESCRIPTION	VALIDATION
Application XML	Grant Application as XML, both Single and Complex Grant application formats are accepted	
Attachments	List: 0 to many	
Reference	The value of “href” attribute in corresponding “FileLocation” sub element in the “Attachment” element in application XML. Please refer Appendix D for details of an “Attachment” element in the XML	This must match one of the href values in the application XML
Content	Actual PDF as Octet Stream	Must be a valid PDF document

GRANT IMAGE RESPONSE MESSAGE (outgoing)	
Data Element (Tag)	Description
Image Content	Generated Image as Octet Stream

Generate Component Image

COMPONENT IMAGE REQUEST MESSAGE (incoming)		
FIELD (Tag)	DESCRIPTION	VALIDATION
componentXML	XML for the Component whose image is requested.	
schemaMetadata	Metadata of the schema associated with the complex application FOA. It contains the following sub fields.	
projectType	Enumeration indicating whether the project associated with this component is 'Complex', 'Single' or 'Nonresearch'.	For this API please pass 'Complex'. SchemaMetadata is a generic construct so project type is expected and since this API makes sense only for ComplexApplication, only use Complex.
formMetadata	Meatadata of forms contained in schema. This is a list and at least one value is expected. Each formMetadata field contains following sub fields.	
formName	Name of the form. Please use name of the root element in the form schema as listed by Grants.gov except version info.	R&R SF424 form schema lists the root element as RR_SF424_2_0. FormName is expected as RR_SF424
nameSpacePrefix	Namespace prefix used for the elements for this form in the xml	Advised to use what is listed in schema. For example, grants.gov schema for R&R SF424 form lists the namespace prefix as RR_SF242_2_0
version	Version of the form	For example, version of R&R SF242 form is 2.0
attachments	List: 0 to many	
reference	The value of "href" attribute in corresponding "FileLocation" sub element in the "Attachment" element in application XML. Please refer Appendix D for details of	This must match one of the href values in the component XML

COMPONENT IMAGE REQUEST MESSAGE (incoming)		
FIELD (Tag)	DESCRIPTION	VALIDATION
	an “Attachment” element in the XML	
Content	Actual PDF as Octet Stream	Must be a valid PDF document
piName	Name of the PI. PI name usually appears in the header.	

COMPONENT IMAGE RESPONSE MESSAGE (outgoing)	
Data Element (Tag)	Description
imageContent	Generated Component Image as Octet Stream

Generate Form Image

FORM IMAGE REQUEST MESSAGE (incoming)		
FIELD (Tag)	DESCRIPTION	VALIDATION
formName	Name of the form. Please use name of the root element in the form schema as listed by Grants.gov except version info.	R&R SF424 form schema lists the root element as RR_SF424_2_0. FormName is expected as RR_SF424
formXML	XML for the Form whose image is requested.	
schemaMetadata	Metadata of the schema associated with the complex application FOA. It contains the following sub fields.	
projectType	Enumeration indicating whether the project associated with this component is ‘Complex’, ‘Single’ or ‘Nonresearch’.	For this API please pass ‘Complex’. SchemaMetadata is a generic construct so project type is expected and since this API makes sense only for ComplexApplication, only use Complex.
formMetadata	Meatadata of forms contained in schema. This is a list and at least one value is expected. Each formMetadata field contains following sub fields.	

FORM IMAGE REQUEST MESSAGE (incoming)		
FIELD (Tag)	DESCRIPTION	VALIDATION
formName	Name of the form. Please use name of the root element in the form schema as listed by Grants.gov except version info.	R&R SF424 form schema lists the root element as RR_SF424_2_0. FormName is expected as RR_SF424
nameSpacePrefix	Namespace prefix used for the elements for this form in the xml	Advised to use what is listed in schema. For example, grants.gov schema for R&R SF424 form lists the namespace prefix as RR_SF242_2_0
version	Version of the form	For example, version of R&R SF242 form is 2.0
attachments	List: 0 to many	
reference	The value of “href” attribute in corresponding “FileLocation” sub element in the “Attachment” element in application XML. Please refer Appendix D for details of an “Attachment” element in the XML	This must match one of the href values in the component XML
Content	Actual PDF as Octet Stream	Must be a valid PDF document
piName	Name of the PI. PI name usually appears in the header.	

FORM IMAGE RESPONSE MESSAGE (outgoing)	
Data Element (Tag)	Description
impageContent	Generated Form Image as Octet Stream

Generate Clinical Trials Form Image

FORM IMAGE REQUEST MESSAGE (incoming)		
FIELD (Tag)	DESCRIPTION	VALIDATION
pdfattachment	1 pdf attachment with details	

FORM IMAGE REQUEST MESSAGE (incoming)		
FIELD (Tag)	DESCRIPTION	VALIDATION
reference	File name of the pdf (PHSHumanSubjectsAndClinicalTrialsInfo-V1.0.pdf, with filled-in data by user). Please refer Appendix E for sample XML for this call.	
Content	Actual PDF as Octet Stream	Must be a valid PDF document

FORM IMAGE RESPONSE MESSAGE (outgoing)	
Data Element (Tag)	Description
imageContent	Generated Clinical Trials Form Image as Octet Stream

Process RFA PA Notice

RFA PA Notice REQUEST MESSAGE (incoming)		
FIELD (Tag)	DESCRIPTION	VALIDATION
activityCode	A code that identifies the subcategory of an extramural activity. It is used for auto assignment of RFA Notice.	Activity code should be valid and be present in Activity_codes_t table
parentIndicator	A code that indicates whether this notice is a parent. Valid values true or false	
coIC	PHS Admin Org Code	IC should be valid in PHS_ORGS_T
RFAPANumber	This is used to uniquely identify RFA or PA issues by IC.	RFAPANumber cannot be empty Notice Type code cannot be empty and it should start with PA or PAR or RFA RFAPANumber cannot be greater than 10
primaryIC	The Primary IC that the RFA belongs to.	IC should be valid in PHS_ORGS_T

RFA PA Notice REQUEST MESSAGE (incoming)		
FIELD (Tag)	DESCRIPTION	VALIDATION
receiptDate	The anticipated receipt date for responses to an RFA or PA.	
optOutIndicator	A code that identifies if PAR or RFA would like to opt out Limited Validation.	
clinicalTrialCode	Clinical trial code like N, O, R, I	
expirationDate	The expiration date of RFA or PA.	
openingDate	The date that RFA/PA notice is open.	
FOATitle	The title given to the RFA/PA notice.	
projectPeriodExceptionFlag	Flag indicating if FOA allows project period to be longer than 5 years: 'Y' - FOA allows project period be longer than 5 years; 'N' - does not allow	
directPhaseTwoFlag	Flag indicating if FOA is an SBIR/STTR direct phase 2; 'Y' - FOA is an SBIR/STTR in Direct phase 2 'N' - FOA is an SBIR/STTR NOT in Direct phase 2	
standardDueDateFlag	Flag indicating if FOA uses standard date: 'Y' - FOA uses standard date, 'N' - FOA does not use standard date	
graceDate	The date when FOA is still valid beyond the expiration date.	
ReviewCriteriaLabel	A unique number identifying the label set	
projectCostExceptionFlag	Flag = Y to indicate Funding Opportunity Announcement allows Project Cost limit exception Flag = N to indicate FOA does not allow Project Cost limit exception	
pageLimitExceptionFlag	Flag = Y to indicate Funding Opportunity Announcement allows Project Cost limit exception Flag = N to indicate Funding Opportunity Announcement does not allow Project Cost limit exception	
projectPeriodExcepLT5YFlag	Flag = 'Y' to indicate Funding Opportunity Announcement Flag = 'Y' to indicate Funding Opportunity Announcement allows Project Period Exception less than 5 years exception Flag = 'N' to indicate Funding Opportunity Announcement does not	

RFA PA Notice REQUEST MESSAGE (incoming)		
FIELD (Tag)	DESCRIPTION	VALIDATION
	allow Project Period Exception less than 5 years exception	
diversityFlag	Flag = 'Y' to indicate Parent Type 3 Diversity FOA, possible values are Y, N and null	
component		Components should not be duplicate
componentLabel	Label for the component	
pageLimit	Maximum no of pages for the component	
minIterationNum	Minimum no of times the component can be present	
maxIterationNum	Maximum no of times the component can be present	

RFA PA Notice RESPONSE MESSAGE (outgoing)	
Data Element (Tag)	Description
Successful	Boolean stating if the RFA PA request information is successfully persisted to DB

Retrieve NOA Service

Retrieve/Search NoA		
Operation	Input	Validation
Search NoA by DUNS Number	DUNS Number	DUNS Number should be valid within the organization context of the role associated with caller's certificate
Search NoA by DUNS Number and Award Number	DUNS Number, Award Number	<ul style="list-style-type: none"> • DUNS Number validation • Award Number should be valid for given DUNS Number • Grant should be in awarded status
Search NoA by DUNS Number and Grant Number	DUNS Number, Grant Number	<ul style="list-style-type: none"> • DUNS Number validation • Grant Number should be valid for given DUNS Number • Grant should be in awarded status
Search NoA by DUNS Number and Awarded date range	DUNS Number, Start Date, End Date	<ul style="list-style-type: none"> • DUNS Number validation • Start and End date should be a valid date in MMddyyyy format • Start and End date should not be in the future

		<ul style="list-style-type: none"> End date should be greater than or equal to Start date
--	--	--

Web service YAML:

UAT - <https://services.external.uat.era.nih.gov/gmws/swagger/nea.yaml>

Prod - <https://services.external.era.nih.gov/gmws/swagger/nea.yaml>

NoA Retrieval Service End Points		
Operation	Service URL	Method
Search NoA by DUNS number	https://services.external.era.nih.gov/gmws/dataservice/nea/search?dunsNumber={dunsNumber}	GET
Search NoA by DUNS number and award number	https://services.external.era.nih.gov/gmws/dataservice/nea/search?dunsNumber={dunsNumber}&awardNumber={awardNumber}	GET
Search NoA by DUNS number and grant number	https://services.external.era.nih.gov/gmws/dataservice/nea/search?dunsNumber={dunsNumber}&grantNumber={grantNumber}	GET
Search NoA by DUNS number and awarded date range	https://services.external.era.nih.gov/gmws/dataservice/nea/search?dunsNumber={dunsNumber}&startDate={startDate}&endDate={endDate}	GET

Appendices

Appendix A: Attachment Meta Data Notes

NIH uses ASPOSE pdf library to generate meta data for attachments

If the PDF size is 8.5 x 11 or 11 x 8.5 then we indicate resizing is not required.

--Attachment in xml file:

```
<PHS398_ResearchPlan_1_3:attFile>
  <att:FileName>1-AddBioSketchA.pdf</att:FileName>
  <att:MimeType>application/pdf</att:MimeType>
  <att:FileLocation att:href="1-AddBioSketchA.pdf.81"/>
  <glob:HashValue glob:hashAlgorithm="SHA-
1">yKdg68TocrfWwagB79Fn5bNm3yA=</glob:HashValue>
</PHS398_ResearchPlan_1_3:attFile>
```

--Sample of metadata

```
<typ:AttachmentMetaData>
  <typ:FileName>1-AddBioSketchA.pdf</typ:FileName>
  <typ:MimeType>application/pdf</typ:MimeType>
  <typ:FileLocation>1-AddBioSketchA.pdf.81</typ:FileLocation>
  <typ:SizeInBytes>8703</typ:SizeInBytes>
  <typ:PageCount>1</typ:PageCount>
  <typ:numberofLines>40</typ:numberofLines>
  <typ:isResizingRequired>>false</typ:isResizingRequired>
  <typ:isEncryptedAttachment>>false</typ:isEncryptedAttachment>
  <typ:ispasswordProtectedAttachment>>false</typ:ispasswordProtectedAttachment>
  <typ:isSecure>>false</typ:isSecure>
  <typ:pdfError>>false</typ:pdfError>
  <typ:isXfaPdf>>false</typ:isXfaPdf>
</typ:AttachmentMetaData>
```

What are XFA forms and how they are different from AcroForms:

XFA stands for XML Forms Architecture (XFA) also known as LiveCycle forms

This link explains the differences well: <https://appligent.com/what-is-the-difference-between-acroforms-and-xfa/>

Relevant text from this link:

AcroForms are the original PDF forms technology, first introduced in 1998. AcroForms accept input in both Forms Data Format (FDF) and XML Forms Data Format (xPDF). Many 3rd party vendors support AcroForms.

Adobe's acquisition of Accelio in 2003 brought that company's XFA forms technology to Adobe, where it is made available via Acrobat LiveCycle Designer. XFA forms are inherently XML rather than PDF, and are incompatible with conventional PDF files. XFA forms "break" Adobe's Acrobat software, in the sense that Acrobat cannot be used to modify a LiveCycle Designer-created document. XFA forms are not yet fully supported by third party PDF viewers' vendors. Currently Adobe LiveCycle server software is required to process XFA forms in a server environment.

How to determine if a PDF is an XFA form:

Open the document in Acrobat Reader or Acrobat Pro.

Select File->Properties from the menu.

In the 'Description' tab, look for PDF Producer in the 'Advanced Group'.

It will be a version of 'Adobe LiveCycle Designer' if the PDF is an XFA form.

Appendix B: Sub Application ID Sample

--Sample XML snippet with sub application id

```
<Admin-Core:SubApplicationGroup xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xmlns:Admin-Core="http://apply.grants.gov/system/MetaMultiGrantApplication/Admin-
Core"
xsi:schemaLocation="http://apply.grants.gov/system/MetaMultiGrantApplication/Admin-
Core http://apply07.grants.gov/apply/opportunities/schemas/applicant/oppPA-60-999-
cidMULTI-PROJECT-PILOT/Admin-Core.xsd"><Admin-Core:SubApplicationGroupHeader>
<Admin-Core:SubApplicationGroupID>Admin-Core</Admin-Core:SubApplicationGroupID>
</Admin-Core:SubApplicationGroupHeader>
<Admin-Core:SubApplication>
<Admin-Core:SubApplicationHeader>
<Admin-Core:SubApplicationID>687-Admin-Core</Admin-Core:SubApplicationID>
</Admin-Core:SubApplicationHeader>
<Admin-Core:GrantApplication>
```

Appendix C: Testing Services

If you have a method of creating a client program to test the services, it is recommended to use that for accessing and testing these services. Alternatively all the services listed in this document can be tested using SOAP UI. You can follow these instructions on how to import a wsdl file and test a service.

1. Create a new project in SOAP UI and select the wsdl file for which the project is being created. If you are testing SADS service in UAT, you would use the URL:
<https://services.external.uat.era.nih.gov/eraexchange/services/SubmissionAgencyDataService?wsdl>
2. Click OK, SOAP UI will create the project and generate sample requests for all operations supported by the service.
3. Open the request for the service method that needs to be tested and edit the request supplying all necessary data
4. Make sure the end point, points to the correct service end point in appropriate environment. For example for the service mentioned in step 1, the end point is
<https://services.external.uat.era.nih.gov/eraexchange/services/SubmissionAgencyDataService>
5. Set up the certificate: (assumption is that the certificate is already registered with eRA and necessary roles have been added to the account that the certificate is mapped to)
 - a. Double click on the project and select WS-Security Configurations tab and select Keystores sub tab
 - b. Add the java key store file associated with the certificate in this tab and provide required credentials
 - c. Also configure SSL Keystore property in “request properties” window to point to the same key store file used in 5b
 - d. Submit the request
6. Response window shall show the response from the service.

Additional instructions for testing SIL:

Since SIL deals with PDF attachments in the request and the response is a PDF stream, a few more steps are involved:

1. To add attachment, please click on the Attachment... button at the bottom of the Request window.
2. Choose the file that will be an attachment in the request. It will show up in the request window.
3. Change the name to match “href” element for the corresponding element in the XML as well as the “reference” element in the “attachments” section of the request.
4. Submit the request.
5. If the image is generated successfully, the response will show a reference to the file that is downloaded.
6. To see the image, click the Attachments button at the bottom of the response window, which will open the grant image in a pdf reader.

Sample XML:

Attachment element in XML:

```

<RR_SF424_2_0:SFLLLAttachment>
  <att:FileName>SFLLLAttachment</att:FileName>
  <att:MimeType>application/pdf</att:MimeType>
  <att:FileLocation att:href="sflllattachment"/>
  <glob:HashValue glob:hashAlgorithm="">MA==</glob:HashValue>
</RR_SF424_2_0:SFLLLAttachment>

```

Corresponding attachment stream map in the request:

```

<sub:attachments>
  <sub:reference>sflllattachment</sub:reference>
  <!--Optional:-->
  <sub:content>cid:sflllattachment.pdf</sub:content>
</sub:attachments>

```

Response

```

<soap:Body>
  <ImageResponse xmlns="http://era.nih.gov/submissionimageservice">
    <imageContent>
      <xop:Include href="cid:10a77a26-52c8-43fd-a6bb-37ec4e41696a-6@era.nih.gov"
xmlns:xop="http://www.w3.org/2004/08/xop/include"/>
    </imageContent>
  </ImageResponse>
</soap:Body>

```

Screenshot of SOAP UI showing, part of request, response, Attachments details (both for request and response):

The screenshot displays a SOAP request and response in a browser window. The request XML is as follows:

```

<globLib:Country>USA: UNITED STATES</globLib:Country>
</RR_SF424_2_0:Address>
<RR_SF424_2_0:Phone>3334441234</RR_SF424_2_0:Phone>
<RR_SF424_2_0:Email>ap@org.org</RR_SF424_2_0:Email>
<RR_SF424_2_0:OrganizationName>Organization</RR_SF424_2_0:OrganizationName>
</RR_SF424_2_0:AORInfo>
<RR_SF424_2_0:AOR_Signature>Test Applicant</RR_SF424_2_0:AOR_Signature>
<RR_SF424_2_0:AOR_SignedDate>2014-07-08</RR_SF424_2_0:AOR_SignedDate>
</RR_SF424_2_0:RR_SF424_2_0>

</Overall:Forms>
</Overall:GrantApplication>
</Overall:OverallApplication>
</mpgrant:ApplicationPackage>
</mpgrant:Application>

]]</sub:applicationXML>
<!--Zero or more repetitions:-->
<sub:attachments>
  <sub:reference>sfllattachment</sub:reference>
  <!--Optional:-->
  <sub:content>cid:sfllattachment.pdf</sub:content>
</sub:attachments>

```

The response XML is:

```

<soap:Envelope xmlns:soap="http://schemas.xmlsoap.org/soap/envelope/">
  <soap:Body>
    <ImageResponse xmlns="http://era.nih.gov/submissionimageservice">
      <xop:Include href="cid:10a77a26-52c8-43f8-9123-456789012345">
        </xop:Include>
      </ImageResponse>
    </soap:Body>
  </soap:Envelope>

```

Below the XML, a table lists attachments:

Name	Content type	Size	Part	Type	ContentID	Cac...
sfllattachment.pdf	application/pdf	6700	UNK...	sflla...		<input checked="" type="checkbox"/>

The status bar at the bottom shows: response time: 2879ms (56969 bytes). The bottom right corner shows '2:1'.

Appendix D: Sample XML for Generate Form Image API:

Sample XML and Attachment Info for generateFormImage API is listed below. Input for component image is similar.

```

<soapenv:Envelope
xmlns:soapenv="http://schemas.xmlsoap.org/soap/envelope/"
xmlns:sub="http://era.nih.gov/submissionimageservice">
  <soapenv:Header/>
  <soapenv:Body>
    <sub:FormWithAttachmentsRequest>
      <sub:formName>RR_KeyPersonExpanded</sub:formName>

```

```

<sub:formXML><![CDATA[<RR_KeyPersonExpanded_2_0:RR_KeyPersonExpanded_2_0
xmlns:RR_KeyPersonExpanded_2_0="http://apply.grants.gov/forms/RR_KeyPe

```

```

rsonExpanded_2_0-V2.0"
xmlns:att="http://apply.grants.gov/system/Attachments-V1.0"
xmlns:glob="http://apply.grants.gov/system/Global-V1.0"
xmlns:globLib="http://apply.grants.gov/system/GlobalLibrary-V2.0"
RR_KeyPersonExpanded_2_0:FormVersion="2.0">
  <RR_KeyPersonExpanded_2_0:PDPI>
    <RR_KeyPersonExpanded_2_0:Profile>
      <RR_KeyPersonExpanded_2_0:Name>
        <globLib:FirstName>Weerakoon Mudiyansele</globLib:FirstName>
        <globLib:MiddleName>Thushantha Harshi</globLib:MiddleName>
        <globLib:LastName>Weerasinghe</globLib:LastName>
      </RR_KeyPersonExpanded_2_0:Name>
      <RR_KeyPersonExpanded_2_0:Address>
        <globLib:Street1>FQUBED, INC.</globLib:Street1>
        <globLib:Street2>6330 NANCY RIDGE DR, STE
107</globLib:Street2>
        <globLib:City>SAN DIEGO</globLib:City>
        <globLib:State>CA: California</globLib:State>
        <globLib:ZipPostalCode>921213220</globLib:ZipPostalCode>
        <globLib:Country>USA: UNITED STATES</globLib:Country>
      </RR_KeyPersonExpanded_2_0:Address>
      <RR_KeyPersonExpanded_2_0:Phone>858-677-
6733</RR_KeyPersonExpanded_2_0:Phone>
      <RR_KeyPersonExpanded_2_0:Fax>858-677-
6737</RR_KeyPersonExpanded_2_0:Fax>

      <RR_KeyPersonExpanded_2_0:Email>eRADev@mail.nih.gov</RR_KeyPersonExpanded_2_0:Email>
      <RR_KeyPersonExpanded_2_0:OrganizationName>FQUBED,
INC.</RR_KeyPersonExpanded_2_0:OrganizationName>

      <RR_KeyPersonExpanded_2_0:Credential>john.newsam</RR_KeyPersonExpanded_2_0:Credential>
      <RR_KeyPersonExpanded_2_0:ProjectRole>Other
(Specify)</RR_KeyPersonExpanded_2_0:ProjectRole>
      <RR_KeyPersonExpanded_2_0:OtherProjectRoleCategory>Project
Lead</RR_KeyPersonExpanded_2_0:OtherProjectRoleCategory>

      <RR_KeyPersonExpanded_2_0:DegreeType>DPHIL, DPH, MA, BA</RR_KeyPersonExpanded_2_0:DegreeType>
      <RR_KeyPersonExpanded_2_0:BioSketchsAttached>
        <RR_KeyPersonExpanded_2_0:BioSketchAttached>
          <att:FileName>1-AddBioSketchA.pdf</att:FileName>
          <att:MimeType>application/pdf</att:MimeType>
          <att:FileLocation att:href="1-AddBioSketchA.pdf.42859" />
          <glob:HashValue glob:hashAlgorithm="SHA-
1">WVHHJ/W0G6RzIs4UpZC44ejSuUw=</glob:HashValue>
        </RR_KeyPersonExpanded_2_0:BioSketchAttached>
      </RR_KeyPersonExpanded_2_0:BioSketchsAttached>
    </RR_KeyPersonExpanded_2_0:Profile>
  </RR_KeyPersonExpanded_2_0:PDPI>

```

```

</RR_KeyPersonExpanded_2_0:RR_KeyPersonExpanded_2_0>]]></sub:formXML>
  <sub:schemaMetadata>
    <sub:projectType>Complex</sub:projectType>
    <!--1 or more repetitions:-->
    <sub:formMetadata>
      <sub:formName>RR_KeyPersonExpanded</sub:formName>
    </sub:formMetadata>
  </sub:schemaMetadata>
<sub:nameSpacePrefix>RR_KeyPersonExpanded_2_0</sub:nameSpacePrefix>
  <sub:version>2.0</sub:version>
</sub:formMetadata>
</sub:schemaMetadata>
<!--Zero or more repetitions:-->
<sub:attachments>
  <sub:reference>1-AddBioSketchA.pdf.42859</sub:reference>
  <sub:content>cid:1-AddBioSketchA.pdf</sub:content>
</sub:attachments>

  <sub:piName>TEST_PI</sub:piName>
</sub:FormWithAttachmentsRequest>
</soapenv:Body>
</soapenv:Envelope>

```

Appendix E: Sample XML for Generate Clinical Trials Form Image API:

Sample XML and Attachment Info for generateClinicalTrialsFormImage API is listed below.

```

<soapenv:Envelope xmlns:soapenv="http://schemas.xmlsoap.org/soap/envelope/"
xmlns:sub="http://era.nih.gov/submissionimageservice">
  <soapenv:Header/>
  <soapenv:Body>
    <sub:PdfWithAttachmentsRequest>
      <sub:pdfattachment>
        <sub:reference>Scenario1a_updated.pdf</sub:reference>
        <sub:content>cid:Scenario1a_updated.pdf</sub:content>
      </sub:pdfattachment>
    </sub:PdfWithAttachmentsRequest>
  </soapenv:Body>
</soapenv:Envelope>

```

Appendix F: Sample XML for FOA Information Request with package ID:

```

<soapenv:Envelope xmlns:soapenv="http://schemas.xmlsoap.org/soap/envelope/"
xmlns:typ="http://era.nih.gov/sads/types">
  <soapenv:Header/>
  <soapenv:Body>
    <typ:GetFOAInfoRequest>
      <typ:packageId>PKG00044588</typ:packageId>
    </typ:GetFOAInfoRequest>
  </soapenv:Body>
</soapenv:Envelope>

```

Appendix G: Sample XML for RFA PA Notice Request

```

<soapenv:Envelope xmlns:soapenv="http://schemas.xmlsoap.org/soap/envelope/"
xmlns:ws="http://ws.eraexchange.nih.gov/" xmlns:typ="http://types.ws.eraexchange.nih.gov/">
  <soapenv:Header/>
  <soapenv:Body>
    <ws:processRfaPaNoticeElement>
      <typ:activityCode>U19</typ:activityCode>
      <typ:parentIndicator>>false</typ:parentIndicator>
      <typ:RFAPANumber>PAR-19-276</typ:RFAPANumber>
      <typ:transactionIndicator/>
      <typ:primaryIC>NIA</typ:primaryIC>
      <typ:receiptDate>2022-09-25T11:32:58Z</typ:receiptDate>
      <typ:optOutIndicator>>false</typ:optOutIndicator>
      <typ:clinicalTrialCode>O</typ:clinicalTrialCode>
      <typ:expirationDate>2022-09-26T11:32:58Z</typ:expirationDate>
      <typ:openingDate>2019-12-25T11:32:58Z</typ:openingDate>
      <typ:FOATitle>Complex Integrated Multi-Component Projects in Aging
Research (U19 Clinical Trial Optional)</typ:FOATitle>
      <typ:projectPeriodExceptionFlag>>false</typ:projectPeriodExceptionFlag>
      <typ:directPhaseTwoFlag>>false</typ:directPhaseTwoFlag>
      <typ:standardDueDateFlag>>true</typ:standardDueDateFlag>
      <typ:graceDate>2022-10-30T11:32:58Z</typ:graceDate>
      <typ:ReviewCriteriaLabel/>
      <typ:component>
        <typ:componentLabel>Overall</typ:componentLabel>
        <typ:pageLimit>12</typ:pageLimit>
        <typ:minIterationNum>1</typ:minIterationNum>
        <typ:maxIterationNum>1</typ:maxIterationNum>
      </typ:component>
      <typ:component>
        <typ:componentLabel>Admin Core</typ:componentLabel>

```

```

        <typ:pageLimit>6</typ:pageLimit>
        <typ:minIterationNum>1</typ:minIterationNum>
        <typ:maxIterationNum>1</typ:maxIterationNum>
    </typ:component>
    <typ:component>
        <typ:componentLabel>Core</typ:componentLabel>
        <typ:pageLimit>6</typ:pageLimit>
        <typ:minIterationNum/>
        <typ:maxIterationNum>9</typ:maxIterationNum>
    </typ:component>
    <typ:component>
        <typ:componentLabel>Project</typ:componentLabel>
        <typ:pageLimit>12</typ:pageLimit>
        <typ:minIterationNum>1</typ:minIterationNum>
        <typ:maxIterationNum>9</typ:maxIterationNum>
    </typ:component>
    <typ:projectCostExceptionFlag>N</typ:projectCostExceptionFlag>
    <typ:pageLimitExceptionFlag>N</typ:pageLimitExceptionFlag>

    <typ:projectPeriodExcepLT5YFlag>N</typ:projectPeriodExcepLT5YFlag>
        <typ:diversityFlag/>
    </ws:processRfaPaNoticeElement>
</soapenv:Body>
</soapenv:Envelope>

```

Document History

Document Location

The NIH internal source document is located in ClearCase under “External\eRAExchange\docs\6.deployment\user_guide\”.

Revision History

Version Number	Revision Date	Author	Summary of Changes
0.0	May-06	eRA Dev Team	Document creation
2.0	Jan-08	eRA Dev Team	Updates for migration to WSDL
3.0	Jan-12	eRA Dev Team (AD)	Updates for Complex Project
4.0	May-13	eRA Dev Team (KM)	Removed Person Info Update Request & Degree Code Lookup Values. Updates Input/Outputs for Complex Project.
4.0.1	May-13	eRA Team (SC)	Provided additional context (tag names, improved descriptions, examples, samples)

4.0.2	Dec-13	eRA Team (SC)	Removed 'DRAFT' watermark and updated logo. Updated Get FOA Information request to include Project Period Exception indicator. Clarified that the SVS service is not yet available.
4.0.3	Jan-13	eRA Team (SC)	Updated Get FOA Information request to include Direct Phase II indicator.
4.0.4	Jan-15	eRA Team	Updated SVS and SADS service details, added details for SIL
4.0.5	Mar-17	eRA Team	Updated SADS service details.
4.0.6	July-15	eRA Team	Updated combined activity code information for tags: isCombinedMechanism, activityCode, and combinedActivityCode.
4.0.7	Oct-15	eRA Team	Updated FOA Response to reflect diversity flag and other exception flags.
4.0.8	Nov-15	eRA Team	Updated Submission Image Generation Service details to reflect the changes to remove Submission Identifier and isNIHApp
4.0.9	May-16	eRA Team	Added two new SADS API getCredential and getSAMOrgInfo
4.2	Jan-17	eRA Team	Added 2 new API for Submission Image Generation Service. These API are generateComponentImage and generateFormImage. A new flag 'clinicalTrialFlag' has been added to getFOAInfo response.
4.3	Feb-17	eRA Team	Added 2 new elements to AttachmentMetadata for SubmissionValidationService methods
4.4	Aug-17	eRA Team	Removed the following methods from the SADS service: <ul style="list-style-type: none"> • Non research Amendment Types request • Non research Amendment Forms request • Non research Grant Details request Removed the flag isSBIRSTTRPhaseIIBAAwarded from Prior Grant Response and added SBIR STTR Process code which is an enumeration FOAInformation Response:

			Removed the clinicalTrialFlag and added ClinicalTrialCode
4.5	July-18	eRATeam	Updated Organization Information response. A new flag nihPolicyAcceptedFlag has been added to the response
4.6	Aug-18	eRATeam	Updated new API (generateClinicalTrialsFormImage) for Submission Image Generation Service.
4.7	Sep-18	eRATeam	Update the existing API getFOAInfo for SubmissionAgencyDataService
4.8	July-20	eRATeam	Added RFA PA Notice service
4.9	Spet-20	eRATeam	Added details about NoA retrieval service