



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

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INTRODUCTION

Background

The System-to-System (S2S) interfacing 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 are not restricted to only eSubmission related information. They include support for such mechanisms as querying the status of grant applications, retrieving validation error and/or warning messages resulting from grant application processing, verifying person information details, and updating person information details.

All services are offered as standards based web services and published via WSDL, 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 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

Currently a web site allows the external users to enter and manage their profile information and track grant applications in the Commons. The Commons instructions for personal profile maintenance can be found at the Commons Web site at on-line help at <https://commons.era.nih.gov/commons-help/215.htm>. The system to system web services provide alternate means to get profile, status, and other information directly via system to system transactions.

Business Process Interactions

The following table shows the current business process interactions supported.

Each interaction 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.

| Process | Description | Request Transaction | Response |
|---|--|-------------------------|--------------------------|
| Application Status Request | Request of grant application status. Requestor provides the Grant application reference number and must have permission to access that organizations application. | GrantStatusRequest | GrantStatusResponse |
| 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. | PersonInfoRequest | PersonInfoResponse |
| Person Information Update | Allows updating of Commons User Account information based on specified Account ID value. Allows changing of person, degree, address and affiliation details. Requestor must have permission to access accounts for the associated organization. A confirmation message is sent verifying the new person information details. | PersonInfoUpdateRequest | PersonInfoUpdateResponse |
| Request Grant Application validation messages | Allows the receipt of validation error and/or warning messages resulting from the processing of an | ValidationMsgsRequest | ValidationMsgsResponse |

| | | | |
|--|---|--|--|
| | <p>electronic grant application. Request contains either the Grants.gov tracking number or the NIH accession number. The response contains a list of error and/or warning messages that resulted from processing the grant application.</p> | | |
|--|---|--|--|

Security Considerations

Each request transaction now has a credential section. This contains the DUNS organization number of the requestor and the Trading Partner ID assigned by NIH for use by the service provider when connecting to NIH systems (see XML fragment below). The DUNS number must be registered and associated with that Trading Partner ID otherwise the request will be rejected. The Trading Partner ID is also used to reference the associated DUNS number of the content requested. If these do not match the stored NIH company affiliations records then the request is rejected.

```
<complexType name="Credential">
  <sequence>
    <element name="password" type="string" nillable="true"/>
    <element name="dunsId" type="string" nillable="true"/>
    <element name="tradingPartnerId" type="string" nillable="true"/>
  </sequence>
</complexType>
```

These security measures are on top of Secure Socket Layer (SSL) digital certificate checking at the transaction messaging transport level.

The partner is responsible for acquiring and setting up their own digital certificate for use with SSL communications.

Transactions and Field Level Details

Grant Status Request

| |
|-----------------------------------|
| STATUS REQUEST MESSAGE (incoming) |
|-----------------------------------|

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| FIELD | DESCRIPTION | VALIDATION |
|--|---|--|
| Trading Partner Identifier | The identifier of the registered system that request the status | Will be validated against the NIH Exchange database |
| Submitting organization identifier | The identifier of the organization requesting the status | Must be serviced by the trading partner exchange provided |
| Trading Partner Password | Password of the Trading Partner system | Must match password on record with eRA Exchange for Trading Partner Id |
| Tracking Number | Grants.gov tracking number of grant application | Optional |
| Accession Number | NIH Accession Number that has been reserved for the application package | Optional |
| Grant Number | 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 | First character of the grant number. | Must be a digit (1..9). Cannot be blank. |
| Grant Number: Activity Code | Bytes 2-4 of the grant number, i.e. "R01" | Alphanumeric. Cannot be blank. |
| Grant Number: Administering PHS Organization | Bytes 5-6 of the grant number, i.e. "MH" | Alphabetic. Cannot be blank. |
| Grant Number: Serial Number | Bytes 7-12 of the grant number, i.e. 000123 | Numeric. Cannot be blank. |
| Grant Number: Support Year | 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. |
| Timestamp | Date/Time of ticket response | |

Notes:

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

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

Accession Number

Tracking Number

Grant 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.

Security:

The submitter system must handle the security inside the submitting organization. The submitting organization is given access to all grants within that organization. The Organization hierarchy is obtained from the COMMONS.

The submitting organization must be serviced by the registered exchange requesting the status. All requests for the submitting organization are limited to grants or applications for that Organization.

| APPLICATION STATUS RESPONSE MESSAGE (outgoing) | |
|---|--|
| Data Element | Description |
| E-Submission Status | 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 awaiting PI and SO sign off ○ E-application submission awaiting PI sign off ○ E-application submission awaiting SO sign off ○ E-application submission complete: Application in process |
| E-Submission status date | Date of the latest E-Submission Status, above. |
| Grant status | Grant application status post intake. This is the official grant status throughout the life cycle of the application and grant |
| Grant status date | Date of the latest Grant Status, above. |
| Grant Number | All components of the grant number. The Grant Number 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 |

| APPLICATION STATUS RESPONSE MESSAGE (outgoing) | |
|---|---|
| Data Element | Description |
| | 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 | First character of the grant number. |
| Grant Number: Activity Code | Bytes 2-4 of the grant number, i.e. "R01" |
| Grant Number: Administering PHS Organization | 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 | Bytes 14-15 of the grant number (immediately following the dash) |
| Grant Number: Suffix | Bytes 16-19 of the grant number. |
| Grant title | Project title |
| Accession Number | NIH internal key assigned before the grant number |
| Submitter grant application identifier | Submitter internal id for the application |
| Proposal Receipt Date | Date the ticket was successfully received by NIH, the paper application was received Or the application was received by E-Grants |
| SRA Name | First, last name of Scientific Review Administrator |
| SRA Phone Number | Phone number for SRA contact |
| SRA E-Mail | Email for SRA contact |
| IRG Assignment | Identifies IRG to which application has been assigned. |
| 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). |
| Progress Report Due Date | Due date for progress report submission |
| GMS Name | Grants Management Specialist name |
| GMS Phone | Grants Management Specialist phone number |
| GMS E-Mail | Grants Management Specialist Email |
| PO Name | Program Official Name |
| PO Phone | Program Official Phone Number |
| PO E-mail | Program Official Email |
| Advisory Council Meeting Date | Date of council meeting |
| Advisory Council Meeting Location | Location of council meeting |

Person Information Request Message

| INFORMATION REQUEST MESSAGE (incoming) | | |
|---|--|---|
| FIELD | DESCRIPTION | VALIDATION |
| Trading Partner Identifier | The identifier of the registered system that request the information | Will be validated against the NIH Exchange database Mandatory field |
| Organization identifier | The identifier of the organization about which the information is requested. This identifier is the DUNS Number. | Must be serviced by the trading partner exchange provided Mandatory field |
| Trading Partner Password | Password of the Trading Partner system | Must match password on record with eRA Exchange for Trading Partner Id |
| COMMONS User ID | 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 message: There is no Commons Username <Commons User ID> associated with the institution identified as DUNS < Organization Identifier> Mandatory field |

Notes: Only the PI role will be addressed.

Security: The submitter system must handle the security inside the submitting organization. The submitting organization is given access to all people affiliated with that organization. The submitting organization must be serviced by the registered exchange requesting the status.

When a mismatch occurs between a user id and an organization, the failed attempt is recorded and may be construed as an attempt to access un-authorized information.

Person Information Request response message

| INFORMATION REQUEST RESPONSE MESSAGE (outgoing) | |
|--|--------------------|
| Data Element | Description |

| INFORMATION REQUEST RESPONSE MESSAGE (outgoing) | |
|--|---|
| Data Element | Description |
| Organization ID | The organization ID provided in the request (DUNS Number) |
| COMMONS User ID | The person commons account id submitted in the request |
| Affiliation type | The code which indicates the affiliation type in the eRA database. |
| Person Prefix Name | From the profile |
| Person First Name | From the profile |
| Person Middle Name | From the profile |
| Person Last Name | From the profile, what is used to match the application |
| Person Suffix Name | From the profile |
| Person employment address | The address data group related to that affiliation |
| Line address 1 | |
| Line address 2 | |
| Line address 3 | |
| Line address 4 | |
| City | |
| State | |
| Postal Code | Equivalent to “zip code” in the eRA database |
| Country | This is the ISO-3166 country code (Alpha-3 format) |
| Phone number | |
| Fax Number | |
| E-mail address | |
| Preferred address code | |
| Degree | This is a repeating element of the degree and degree text if degree is “other”. |
| Position Title | Position title for this affiliation |
| List of prior awarded grants for that person and that organization | 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. |

Person Info Update Request (Incoming)

Validations for the Person Info Update Request should follow the business rules below, plus any additional business rules specified in the Commons Edit PPF Use Case.

| PERSON INFO UPDATE REQUEST (incoming) | | |
|--|--------------------|-------------------|
| FIELD | DESCRIPTION | VALIDATION |

| PERSON INFO UPDATE REQUEST (incoming) | | |
|--|--|---|
| FIELD | DESCRIPTION | VALIDATION |
| Trading Partner Identifier | The identifier of the registered system that request the information | Will be validated against the NIH Exchange database Mandatory field |
| Organization identifier | The identifier of the organization about which the information is requested. This identifier is the DUNS Number. | Must be serviced by the trading partner exchange provided Mandatory field |
| Trading Partner Password | Password of the Trading Partner system | Must match password on record with eRA Exchange for Trading Partner Id |
| COMMONS User ID | 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 Mandatory field |
| Role type | The code which indicates the role type in the eRA database. | Only the PI role will be implemented. |
| Person Prefix Name | From the profile | Char 15 |
| Person First Name | From the profile | Char 30 |
| Person Middle Name | From the profile | Char 30 |
| Person Last Name | From the profile, what is used to match the application | Char 30 |
| Person Suffix Name | From the profile | Char 5 |

| PERSON INFO UPDATE REQUEST (incoming) | | |
|--|--|---|
| FIELD | DESCRIPTION | VALIDATION |
| Person employment address <ul style="list-style-type: none"> • Line address 1(char 50) • Line address 2 (char 50) • Line address 3 (char 50) • Line address 4 (char 50) • City (char 35) • State (char 2) • Postal Code (Equivalent to “zip code” in the eRA database) (char 9) • Country (This is the ISO-3166 country code, Alpha-3 format) • Phone number (char 25) • Fax Number (char 25) • E-mail address (changes to this email address should be kept in synch with email address in accounts_t) (char 80) • Position Title (char 40) | The address data group related to that affiliation. The incoming message should indicate if this an update or an insert of new address | |
| Preferred address code | The address updated should be the preferred address. | This field should be hidden from the user and defaulted to ‘Y’ |
| Degree <ul style="list-style-type: none"> • Degree (char 4) • Other degree text (char 10) • Degree Earned (char 1) (Y/N) • Date of Degree (Date) • Institution (char 40) | | Degree field should be a degree code lookup value based on the table in section 12.8.1 <i>Degree Code Lookup Values</i> If the degree is not listed; then the following degree codes must be used OTH, BOTH, MOTH, DOTH, MDOT, VDOT, DDOT. In this case the Other degree text field should be populated with degree description. |

Degree Code Lookup Values

| Degree Code | Description |
|--------------------|-------------------------------------|
| AB | BACHELOR OF ARTS |
| BA | BACHELOR OF ARTS |
| BS | BACHELOR OF SCIENCE |
| DDS | DOCTOR OF DENTAL SURGERY |
| DMD | DOCTOR OF MEDICAL DENTISTRY |
| DPH | DOCTOR OF PUBLIC HEALTH |
| DSC | DOCTOR OF SCIENCE |
| DVM | DOCTOR OF VETERINARY MEDICINE |
| EDD | DOCTOR OF EDUCATION |
| MA | MASTER OF ARTS |
| | FOREIGN - BACHELOR OF MEDICINE AND |
| MBBS | SURGERY |
| MD | DOCTOR OF MEDICINE |
| MPH | MASTER OF PUBLIC HEALTH |
| MS | MASTER OF SCIENCE |
| PHD | DOCTOR OF PHILOSOPHY |
| RN | REGISTERED NURSE |
| SCD | DOCTOR OF SCIENCE |
| VMD | DOCTOR OF VETERINARY MEDICINE |
| DRPH | DOCTOR OF PUBLIC HEALTH |
| BSN | BACHELOR OF SCIENCE IN NURSING |
| DC | DOCTOR OF CHIROPRACTIC |
| DNSC | DOCTOR OF NURSING SCIENCE |
| DO | DOCTOR OF OSTEOPATHY |
| | FELLOW OF THE AMERICAN ACADEMY OF |
| FAAN | NURSING |
| JD | DOCTOR OF JURIS PRUDENCE |
| MB | FOREIGN - BACHELOR OF MEDICINE |
| MBA | MASTER OF BUSINESS ADMINISTRATION |
| MLS | MASTER OF LIBRARY SCIENCE |
| MPA | MASTER OF PUBLIC ADMINISTRATION |
| MSN | MASTER OF SCIENCE IN NURSING |
| OD | DOCTOR OF OPTOMETRY |
| OTH | OTHER |
| BOTH | OTHER BACCALAUREATE |
| MOTH | OTHER MASTERS |
| DOTH | OTHER DOCTORATE |
| MDOT | OTHER DOCTOR OF MEDICINE |
| VDOT | OTHER DOCTOR OF VETERINARY MEDICINE |
| DDOT | OTHER DOCTOR OF MEDICAL DENTISTRY |

Document History

Document Location

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Revision History

| Version Number | Revision Date | Author | Summary of Changes |
|----------------|---------------|-----------------|-------------------------------|
| 0.0 | May-06 | David RR Webber | Document creation |
| 2.0 | Jan-08 | Jody Schraden | Updates for migration to WSDL |
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NIH eRA Team Reviews

| Name | Team/Role | Date Reviewed | Reviewer's Signature |
|-----------------|------------------|---------------|----------------------|
| Ramesh Nagella | Technical Review | | |
| Ashique Tanveer | Technical Review | | |
| Jody Schraden | Technical Review | | |
| Adam Levy | Content Review | | |

Reference Documents

| Document Name | Version |
|------------------------------------|---------|
| eRA Exchange Software Architecture | 1.1 |
| | |