Monday, May 4, 2015

FLVC message director

Institution Developer Guide

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# System Overview

## Introduction

The FLVC Message Director is a rewrite of the FACTS Message Director, developed for Florida Virtual Campus, to support the interchange of messages between Florida Virtual Campus systems and participating institutions. The exchanged messages allow students of participating Florida higher education institutions to perform self-service progress checks, transfer evaluations, and apply as a transient student to take courses at another institution.

The 2015 version of the FLVC Message Director (henceforth referred to as Message Director) is built on top of the following technology stack:

* Java 1.8
* Spring 4.1 (public front-end) / Project Grizzly (internal component APIs)
* SQL Server 2014
* NHibernate
* Grizzly

Three components serve as the core of the 2015 version of the Message Director:

* **Message Director Web Front-end**, an application built using Spring 4.1 to run on top of Apache Tomcat
* **Message Director Server**, a standalone continuously running service to facilitate the communication of simple and complex messages between clients and institution student information systems (Site Hosts)
* **Socket Adapters**, a translation layer that bridges communications between the Message Director, via JSON, and Site Hosts, via a proprietary Electronic Data Interchange (EDI) format.

Each component fulfills the following roles:

**Message Director Web Front-end**

* Accepts incoming JSON API calls from external clients on behalf of students.
* Accepts incoming URL Redirects from the Florida Virtual Campus advising system.
* Provides an administrative interface to monitor system health, perform minor configuration changes, and investigate problems.

**Message Director Server**

* Monitors incoming request queues written to by the Message Director Web Front-end.
* Translates incoming requests into constituent requests that are then sent to one or more Site Host.
* Monitors incoming Site Host responses for delivery back to the client, or further processing.
* Manages an outgoing response queue containing fully-processed Site Host responses for each message.

**Socket Adapter**

* Facilitate communications between the Message Director and one or more Site Hosts.
* Accepts incoming JSON calls via a private API from the Message Director Server and translates them to EDI Requests.
* Accepts incoming EDI responses from Site Hosts and translates them to Message Director Responses.
* Accepts incoming EDI messages from Site Hosts and translates them to Message Director Requests (“listener mode”).
* Accepts incoming JSON responses from the Message Director, and delivers them to the originating requestor (“listener mode”).

## Systems Map and Applications Flow

The Message Director accepts incoming requests from clients, translates them to EDI format, and then routes them to a specific Site Host for fulfillment.

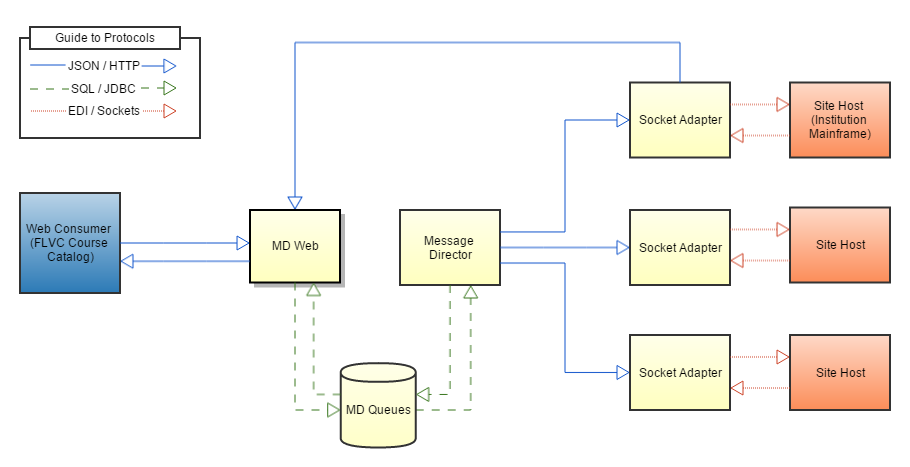


Figure - The Message Director communicating with a JSON client

In the figure above, a consumer makes a request to the Message Director. Given a hypothetical VERIFY request, where the consumer wants to validate that the student’s entered student ID and password match what’s on file at that student’s home institution, the consumer posts a VERIFY request to the Message Director JSON API. The following then takes place:

1. The Message Director Web (MD Web) validates the content of the request, informing the consumer of any missing or invalid parameters.
2. MD Web then places the successfully validated request into a queue, assigning a Conversation ID to the request.
3. The Message Director Service (Message Director) is continuously monitoring all application queues. It picks up the request from the queue and determines the first step in processing it.
4. As the request is a VERIFY request, the only step is to deliver it to the destination Site Host and await a response. The Message Director looks up the Socket Adapter, protocol info, IP Address, and Port associated with that Institution and Message Type to determine how to deliver it to an institution.
5. The Message Director calls a private API at the institution’s Socket Adapter. The payload of the request contains both the information provided to the Message Director by the consumer (i.e. student id, password), as well as instructions on how to communicate with the Institution that will fulfill that request.
6. The Socket Adapter translates the JSON request into EDI.
7. The Socket Adapter opens a raw socket connection to the institution specified in its request parameters, delivering the request as EDI.
8. The Socket Adapter then waits for a response from the institution.
9. When the institution provides its response, it echoes the original request, changing only specific fields to formulate a response. As the request contained enough information to communicate back to the Message Director with an answer to this request, so does the response.
10. The Socket Adapter then inspects the response, and translates it back into JSON.
11. The Socket Adapter delivers the message to a private response API on MD Web.
12. MD Web places the response data into a Socket Response Queue.
13. The Message Director, monitoring the Socket Response queue, picks that there is a new response to a previously requested message.
14. The Message Director reassembles the original request and the response to a Conversation, and determines if any further processing is necessary in that Conversation for the VERIFY message type.
15. As VERIFY requests are comprised of only a single request and response, the Conversation is complete, and the Message Director places the completed response into the Response queue.
16. The consumer of the VERIFY request is returned its request based on the settings it passed to the API:
    1. If the consumer made a synchronous request, the response is then transmitted synchronously as the HTTP response.
    2. If the consumer made an asynchronous request, then a URL is returned in the response. The client can make a GET to this URL to see the completion state of the message.

To allow compatibility with existing Florida Virtual Campus systems -- the Student Admissions system, as well as the Transient Student Admissions Application (TSAA) -- without modification to these systems, the new Message Director’s system design provides for an additional instance of a Socket Adapter to help these systems make requests.

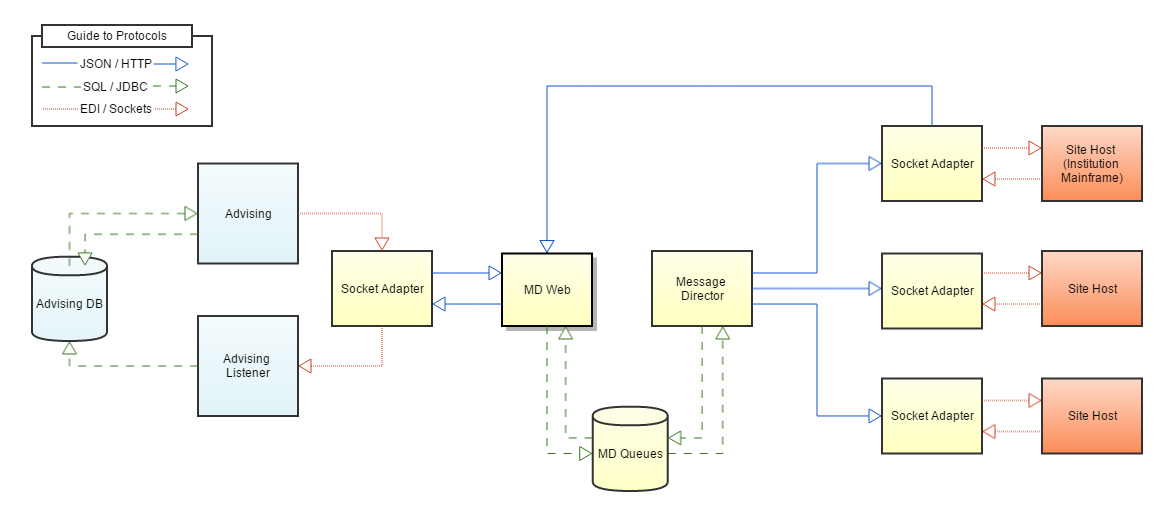
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Figure - The Message Director communicating with the Advising (or Admissions) system

The process for Advising-to-Message Director communications is similar to the steps above, but has the following variations:

1. The Advising System sends an EDI VERIFY request to the Listener Socket Adapter configured in its configuration settings
2. The Listener Socket Adapter creates a JSON Message Director request from the EDI Verify message. It embeds information in the "callback" field with the IP Address, Port, StateKey, and ReturnData specified by the Advising System.
3. The Listener Socket Adapter transmits the request to the MD Web JSON API, initiating step 1 in the prior process.
4. Steps 1 through 15 of the prior process execute.
5. A secondary process in the Message Director monitors all response messages, ignoring any that do not contain callback data.
6. As the response has associated callback data, the Message Director initiates a callback to the URL specified in the callback data (provided by the Listener Socket Adapter), and provides the parameters (IP Address, Port, StateKey, and ReturnData) originally requested
7. The Listener Socket Adapter receives this response message via its private JSON API, and translates the response message into a response EDI message
8. The Listener Socket Adapter, using the IP Address and Port information provided as part of the   
   callback data, delivers the message back to the Advising system.

# Component Overview

## Message Director Web

The MD Web fulfills three primary roles:

* A JSON web API for incoming Message Director requests
* A redirection component to handle incoming Message Director requests from the FLVC Advising System
* A set of pages that enable administrators to monitor the status of the Message Director and its components

### JSON API Component

The Message Director has a semi-public JSON API (see: REST Interface) available for new applications to make requests on behalf of students. As a result of the JSON API, new applications no longer need to communicate via EDI/Sockets to access Message Director functionality; most functionality is available via making simple JSON POST requests to specific endpoints with a set of credentials; results are then either returned as soon as they’re available (see: Synchronous API), or a URL can be provided immediately so that consumers can call back to check on the progress of a long-running Message Director message (see: Asynchronous/Client calls back).

### Redirection Component

The Message Director has a set of URLs that enable the Advising system to hand-off a student after verification and collecting request parameters has completed.

## Message Director Server

### Overview

The Message Director Server is the core “brains” behind the Message Director. It’s primary task is to monitor all of the application queues, determining how fulfill each request message it receives, and sending messages to the correct institution via choosing the appropriate Socket Adapter and institution configuration.

### Message Processing

Each message that the Message Director Server processes undergoes a set of processing tasks. For most messages, this task simply includes determining message state, then either transmitting a request to an institution via a Socket Adapter, or delivering the response back to the originating requestor. More complex messages, such as Remote Shop and Advise22 may require communications with multiple institutions; as responses to individual requests these messages require are received, the entire “conversation” is re-analyzed to determine present state and next steps. Once all of the expected responses are returned, and any follow-up transformations are applied, the resulting message is then delivered back to the originating requestor.

## Socket Adapter

### Overview

The Socket Adapter exists as a bridge between the Message Director and Institution Site Hosts (as well as systems that were designed to only communicate over EDI messages). As such, it exists to reliably convert Message Director Messages between JSON and EDI, and ensure transmittal between the Site Host and the Message Director. As it is a separate component from the Message Director or Message Director Web, it has its own HTTP(s) endpoint, served via Grizzly.

# Site Host Socket Transmission Protocols

There are four messaging protocols that Message Director supports for communication between a Socket Adapter and a Site Host. They are described below.

**Protocol 1. No Initialization String; Send Message and Break Connection**

This is the protocol used between the Advising System and the Advising listener. Using this protocol, a connection is established to the target system, the EDI message is immediately transmitted, then the connection is broken. An expectation is created that the target system will then establish a response connection to transmit a response. If that expectation is not fulfilled within 10 minutes, then the message is considered “dead”, and any administrative alerts are sent. If that expectation is fulfilled, and the response is returned, then the Socket Adapter transmits it back to the Message Director, using the value in the **RETNDATA** field as a correlation token (“Conversation Id”).

The configuration of the entry in the msgdir.SiteHosts determines whether this protocol is used:

|  |  |
| --- | --- |
| **SiteHostInitString** | NULL |
| **SiteHostResponseTimeout** | 0 |

**Protocol 2. No Initialization String; Send Message and Wait for Response**

Using this protocol, a connection is established to the target system, the EDI message is immediately transmitted, and then the Socket Adapter waits for a predetermined amount of milliseconds expecting a response. If the response is not transmitted within the expected number of milliseconds, then the connection is broken, the message is considered “dead”, and any administrative alerts are sent. If the response is transmitted, then the Socket Adapter transmits it back to the Message Director, using the value in the **RETNDATA** field as a correlation token (“Conversation Id”).

The configuration of the entry in the msgdir.SiteHosts determines whether this protocol is used:

|  |  |
| --- | --- |
| **SiteHostInitString** | NULL |
| **SiteHostResponseTimeout** | Any integer value above 0 |

**Protocol 3. Send Initialization String; Send Message and Break Connection**

Using this protocol, a connection is established to the target system, an initialization string is transmitted, then the EDI message is transmitted following the initialization string, then the connection is broken. An expectation is created that the target system will then establish a response connection to transmit a response. If that expectation is not fulfilled within 10 minutes, then the message is considered “dead”, and any administrative alerts are sent. If that expectation is fulfilled, and the response is returned, then the Socket Adapter transmits it back to the Message Director, using the value in the **RETNDATA** field as a correlation token (“Conversation Id”).

The configuration of the entry in the msgdir.SiteHosts determines whether this protocol is used:

|  |  |
| --- | --- |
| **SiteHostInitString** | <Any value> |
| **SiteHostResponseTimeout** | 0 |

**Protocol 4. Send Initialization String; Send Message and Wait for Response**

Using this protocol, a connection is established to the target system, an initialization string is transmitted, then the EDI message is transmitted following the initialization string, then the connection is broken. If the response is not transmitted within the expected number of milliseconds, then the connection is broken, the message is considered “dead”, and any administrative alerts are sent. If the response is transmitted, then the Socket Adapter transmits it back to the Message Director, using the value in the **RETNDATA** field as a correlation token (“Conversation Id”).

The configuration of the entry in the msgdir.SiteHosts determines whether this protocol is used:

|  |  |
| --- | --- |
| **SiteHostInitString** | <Any value> |
| **SiteHostResponseTimeout** | Any integer value above 0 |

# EDI Message Structure

The Message Director uses a Message Director-specific Electronic Data Interchange (EDI) message format for all of its transactions (processes). Each message is made up of two core components:

|  |  |
| --- | --- |
| **Control Block (C)** | The Control Block describes the content “metadata” of the message. |
| **Standard Data Block (SD)** | The Standard Data block defines which type of message is being transmitted, instructions to the receiving system for transmitting a response back to the sending system, and basic information about the user represented by the message. |

In addition, each message may be made up of one or more additional components, depending on the message type:

|  |  |
| --- | --- |
| **Audit Request Block (AR)** | Contains data (student’s major, calendar year) necessary for performing audits on behalf of the student. |
| **Audit Response Block (AA)** | Contains the HTML response from the institution |
| **Course List Block (CL)** | The Course list block contains data (student’s courses, taken tests/exams, and demographic data) necessary for performing “what-if” scenarios on behalf of the student. This data is then re-transmitted to another institution via another message (e.g., REMOTESHOP, ADVISE22) |
| **Admissions Request Block (DR)** | Contains the XML structure necessary for an institution to process a transient admissions request on behalf of a student |
| **Admissions Response Block (DA)** | Contains the confirmation code (in XML) back from the institution |
| **Advise22 Response Block (22A)** | Contains the structured 2+2 response back from the institution |
| **Common Prerequisite Request Block (CPR)** | Contains the parameters of the selected programs at the student’s home and remote institutions |
| **Common Prerequisite Response Block (CPA)** | Contains the response from the Advising system containing the common prerequisite data |

There are ten core message types processed by the Message Director, and each of them are made up of the above blocks:

|  |  |  |
| --- | --- | --- |
|  | Expected inputs | Expected Outputs |
| **VERIFY**  Authenticates a student’s user ID and password at her Home Institution | C + SD | C + SD |
| **TRANSCRIPT**  Get a student’s transcript (HTML) from her Home Institution | C + SD | C + SD + AA |
| **COURSELIST**  Get a student’s demographic and academic history data from her Home Institution | C + SD | C + SD + CL |
| **GRADAUDIT**  Get a student’s graduation audit (HTML) from her Home Institution for her current major | C + SD | C + SD + AA |
| **LOCALSHOP**  Get a student’s “what-if” scenario (HTML) from her Home Institution if she transfers into another major | C + SD + AR | C + SD + AR + AA |
| **REMOTESHOP**  Get a student’s “what-if” scenario (HTML) from a secondary institution if she was to transfer her coursework into a program at that institution | C + SD + AR + CL | C + SD + AR + AA |
| **ADVISE22**  FXML Only  Get a student’s “what-if” scenario in a structured format (XML) | C + SD + AR | C + SD + 22A |
| **ADVISE22 (Transfer Institution – FEDI during request only)**  Get a student’s “what-if” scenario from a secondary institution if she was to transfer her coursework into a program at that institution in a structured format (XML) | C + SD + AR + CL | C + SD + 22A (in XML) |
| **ADMISSIONS** FXML Only  Transmits a student’s transient applications request to a remote institution | C + SD + DR | C + SD + DA |
| **STATEKEYCK**  A backchannel validation step that determines whether the current user’s session is still valid, and returns to the message director the student ID for that user. | C + SD | C + SD |
| **COMMPREREQ**  FXML Only  A backchannel step that requests the current common prerequisites necessary for a full ADVISE22 response. | C + SD + CPR | C + SD + CPA |

## Control Block

The Control Block is structured in the following format:

002790TCP FEDI00000675000000006750000002090 0DD6

Each group of characters represents a single field representing important aspects of the messages. The fields in the control block are:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Name** | **Data Type** | **Size** | **Start Position** | **End Position** | **Description** |
| **Total Record Size** | Number (left-padded with 0s) | 6 | 1 | 6 | States the entire length of the messages (including control block) |
| **Transaction Type** | Text | 4 | 7 | 10 | Always the value “TCP “. |
| **Message Type Identifier** | Text | 4 | 11 | 14 | One of:  “FEDI” – a plaintext EDI message  “FXML” – a structured XML message |
| **Compression Method**  (obsolete) | Text | 1 | 15 | 15 | Formerly used to denote the message’s compression method. Compression is not a feature at this time of the new Message Director. Will always be “0” |
| **Encrypt Key Pass Method**  (obsolete) | Text | 1 | 16 | 16 | Formerly used to denote how a message was to be encrypted. The current version of the Message Director no longer supports this. Will always be “0” |
| **FICE Code of recipient** | Text | 10 | 17 | 27 | The institutions FICE code, + 4 (Campus) |
| **FICE** **Code of student’s home institution**  (obsolete, always FICE Code of recipient) | Text | 10 | 28 | 38 | The institutions FICE code, + 4 (Campus) |
| **Ultimate Request Type**  (obsolete) | Text | 2 | 39 | 40 | An identifier indicating the request type of this message. No longer used, as the field in the Standard Data Block’s PROCESS field denotes this information, and messages are no longer “forwarded” to other Message Directors. |
| **Message State**  (obsolete) | Text | 2 | 41 | 42 | An identifier indicating the state of this message. No longer used, as the message state is now defined by the Message Director Server examining which messages it has received in response to its requests.` |
| **Encrypt Cipher Method**  (obsolete) | Text | 1 | 43 | 43 | Formerly used to denote how a message was to be encrypted. The current version of the Message Director no longer supports this. Will always be “0”. |
| **QueueID**  (obsolete) | Text | 7 | 44 | 50 | Formerly used to collate multiple messages as part of a transaction (e.g. ADVISE22). No longer used, will always be empty spaces. |
| **Digest** | Text | 4 | 51 | 54 | A digest of critical Control Block and Standard Data Block fields, used to detect improper modification by Site Hosts |
| **Message ID**  (obsolete) | Text | 6 | 55 | 60 | Formerly used as a uniquely generated number used to match a response message with a request message. This processing has been moved to the RETNDATA field in the SDB. |

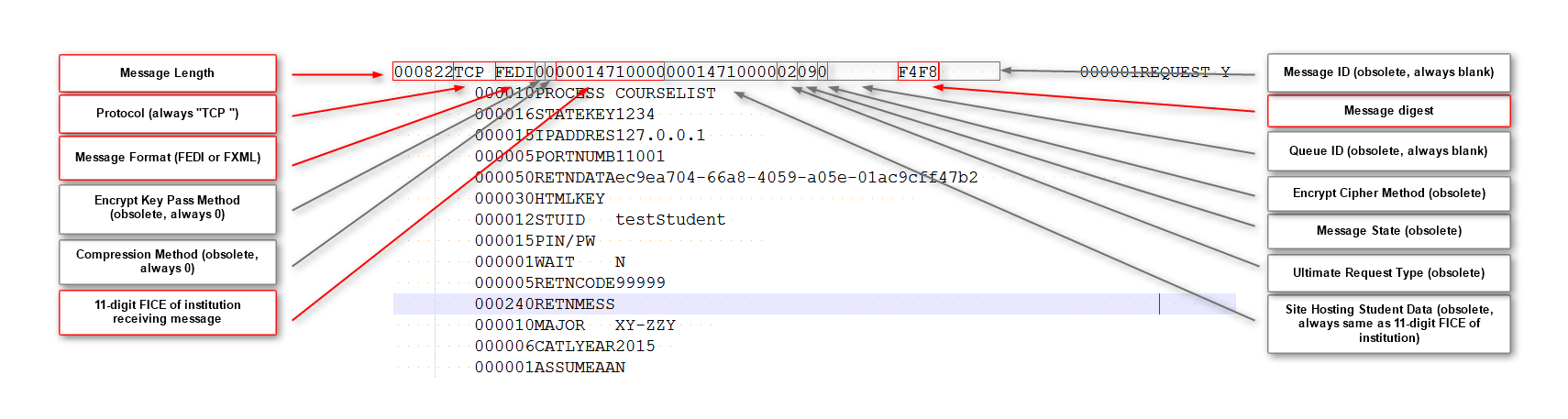


Figure - Each field in the Control Block

For a request message, the Site Host may depend on the fact that the length of the total message is contained in the first 6 characters of the Control Block. Similarly, when a Site Host formulates a response message, it is responsible to place the (new) total record length in characters 1 through 6. A Site Host must not change any other characters in the Control Block.

## Standard Data Block

In an FEDI message, The Standard Data Block is structured in the following format:

000001REQUEST Y

000010PROCESS COURSELIST

000016STATEKEYT0030582G0030582

000015IPADDRES123.456.789.012

000005PORTNUMB11001

000050RETNDATA91097172-870c-45ef-9a11-5b1267bb7ae2

000030HTMLKEY Z8Vwur0l9VZIfuV1dV5PAQYWmCI=

000012STUID testStudent

000015PIN/PW

000001WAIT N

000005RETNCODE99999

000240RETNMESS

Each line represents a single field, and is made up of five components:

1. Padding space of 8 characters
2. A 6-digit number, left-padded with 0s, stating the length of the field
3. A 10-character field name, right-padded with empty spaces, stating the name of the field
4. An N-character field value, where N is defined by the 6-digit field length, right padded to N characters with empty spaces (i.e. ASCII code 32).
5. A single line feed (LF) character

In a FXML message, the Standard Data Block is structured in the following format:

<FACTS\_MESSAGE Process="COMMPREREQ" Request="Y" Wait="N">

<STANDARD\_BLK>

<STATEKEY>T0030582G0030582</STATEKEY>

<IPADDRESS>123.456.789.012</IPADDRESS>

<PORT>11001</PORT>

<RETNDATA>91097172-870c-45ef-9a11-5b1267bb7ae2</RETNDATA>

<HTMLKEY>Z8Vwur0l9VZIfuV1dV5PAQYWmCI=</HTMLKEY>

<STUID>testStudent</STUID>

<PIN\_PW></PIN\_PW>

<RETNCODE>99999</RETNCODE>

<RETNMESS></RETNMESS>

</STANDARD\_BLK>

</FACTS\_MESSAGE>

The fields found within the standard data block are:

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | **Data Type** | **Length** | **Description** |
| **REQUEST**  (For FXML, the attribute “Request” in the FACTS\_MESSAGE XML element) | Text | 1 | “Y” when the transmitted message is a request. “N” when the transmitted message is a response. |
| **PROCESS** (For FXML, the attribute “Process” in the FACTS\_MESSAGE XML element) | Text | 10 | One of the following values that define the type of the message being transmitted and received:  **VERIFY**  **COURSELIST**  **TRANSCRIPT**  **LOCALSHOP**  **REMOTESHOP**  **GRADAUDIT**  **ADVISE22**  **STATEKEYCK**  **ADMISSION**  **COMMPREREQ** |
| **STATEKEY** | Text | 16 | Represents the unique identifier assigned to the current user by an external system.  Any requests that originate as an EDI message (via a Socket Adapter Listener), or contains callback data (via the JSON API) will receive this value in response to their request. Otherwise, when the Socket Adapter is communicating with institutions, this field is blank, or a placeholder value. |
| **IPADDRES** | Text | 15 | Represents the IP address that the recipient of this message should return the response to.  In the case of the Socket Adapter communicating with an Institution, this value will be the IP Address of the Socket Adapter the institution should return its response to.  In the case of a request via the EDI interface (via a Socket Adapter Listener), this value should be the IP Address of system where the message director should return its response. |
| **PORTNUMB**  (For FXML, the element is titled “Port”) | Integer | 5 | Used in conjunction with **IPADDRES** to define how the recipient of this message should return the response. |
| **RETNDATA** | Text | 50 | Represents a value that should be returned in the response to this message.  When the Message Director is communicating with an institution via a Socket Adapter, this value is the **Conversation ID** of the overarching message that is being processed.  In the case of a request via the EDI interface (via a Socket Adapter Listener), a value can be provided in this field, and will be returned in the response to the message. |
| **HTMLKEY** | Text | 30 | Represents a value that should be returned in the response to this message.  The Message Director Service designates this value when communicating with a Socket Adapter when caching is enabled. The value represents a hashed form of the request parameters of this message.  When the Message Director Service receives a response with this value in it, it places it inside its cache, so that future requests (for that institution, and message type, and for the period defined in the InstitutionSiteHost.HtmlValidMinutes column) will return inexpensively from a local cache, instead of from an expensive additional request to an institution.  When a Socket Adapter is performing a **CommPrereq** request, additional pieces of information are placed within this message: the year of the program being requested, and two padding characters (“XX”). This is to backwards compatibility with the old system, which relied on the value in the **HTMLKEY** field to retrieve the Common Prerequisites for the given year.  (Note that this implementation in the advising system should be changed to use the standard “**ProgramYear**” element in the new Message Director’s **CommonPrereq** request) |
| **STUID** | Text | 12/40 | The ID of the student on behalf of whom this message is being transmitted.  For institutions that support the extended ID format (via the SiteHosts.SiteHostExtendedMessage column in the database), this will be defined as 40 characters in length. Otherwise, by default, the field is defined as 12 characters in length. |
| **PIN/PW**  (For FXML, the element is titled “PIN\_PW”) | Text | 15/128 | The password of the student on behalf of whom this message is being transmitted.  Used only in the **VERIFY** process; for other messages, the receiving system should assume that the Socket Adapter is a trusted party, and the value in **STUID** should serve as the sole authentication mechanism.  For institutions that support the extended ID format (via the SiteHosts.SiteHostExtendedMessage column in the database), this will be defined as 128 characters in length. Otherwise, by default, the field is defined as 15 characters in length. |
| **WAIT**  (For FXML, the attribute “Wait” in the FACTS\_MESSAGE XML element) | Text | 1 | If “Y”, the receiving system should return the message via the same socket connection as the message that was transmitted. If “N”, the receiving system should open a socket connection to the **IPADDRES** and **PORTNUMB** specified in the request to return its response.  An institution’s preference for this protocol is defined in the SiteHosts.SiteHostResponseTimeout column in the Message Director database. If that value is 0, messages transmitted to an institution will contain the value “N”. Otherwise, messages transmitted to an institution will contain the value “Y”. The value in the field will then denote for how long the Socket Adapter should hold the connection open while waiting for a response. |
| **RETNCODE** | Text | 5 | A code representing the success state of the message. In nearly all cases, a value of 99999\* denotes a request, while any other value denotes a response. A value of 00000 indicates success, while any other value indicates an error or issue, with a value in the **RETNMSG** describing why the operation was not successful.  \* In the case of an ADVISE22 request to a TRANSFER institution, this value is “00000”, in order to preserve compatibility with some institutions implementations of the ADVISE22 message, as due to the forwarding nature of the prior version of the Message Director, all Transfer institution ADVISE22 requests had the value “00000” in this field. |
| **RETNMSG** | Text | 240 | A value representing any additional data that corresponds to a non-00000, non-99999 **RETNCODE**. |

## Process-Specific Data Blocks

### Audit Request Block

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | **Data Type** | **Length** | **Description** |
| **MAJOR** | Text | 10 | The student’s selected major code |
| **CATLYEAR** | Text | 16 | The calendar year associated with the student’s selected program |

### Course List Block

A Course List block is received from institutions, and can either be returned to the original caller (in the case of a COURSELIST request), or relayed to another institution, as in the REMOTESHOP and ADVISE22 processes. Note that there is no XML representation of the Course List Block; any requests that possess or return COURSELIST data (COURSELIST, REMOTESHOP, and ADVISE22) are transmitted via EDI.

The Course List Block is made up of three fields:

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | **Data Type** | **Length** | **Description** |
| **COURSLST** | Text | 116 | Details of a course on the student’s transcript. This field is further defined in the Course List Entry section below. |
| **DEMOGRAF** | Text | 100 | Demographic information about the selected student. This field is further defined in the Demographics Entry section below. |
| **TESTRECS** | Text | 217 | Details of a test on the student’s transcript. This field is further defined in the Test Record Entry section below. |

For a single request/response possessing a Course List Block, zero to one DEMOGRAF section is expected, while zero to many COURSLST and TESTRECS records may be expected.

#### Course List Entry

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Name** | **Data Type** | **Size** | **Start Position** | **End Position** | **Description** |
| **Term** | Text | 6 | 1 | 6 | Always YYYYMM |
| **Term Indicator** | Text | 1 | 7 | 7 |  |
| **FICE Code of Institution where Course was Taken** | FICE Code (11 digits, 7 + 4 digit campus code) | 11 | 8 | 18 |  |
| **Original Course College Code** | Text | 2 | 19 | 20 |  |
| **Original Course Prefix** | Text | 4 | 21 | 24 |  |
| **Original Course Number** | Text | 5 | 25 | 29 |  |
| **Original Course Suffix** | Text | 1 | 30 | 30 |  |
| **Original Course Section** | Text | 6 | 31 | 36 |  |
| **Course Title** | Text | 23 | 37 | 59 |  |
| **Updated Course College Code** | Text | 2 | 60 | 61 |  |
| **Updated Course Prefix** | Text | 4 | 62 | 65 |  |
| **Update Course Number** | Text | 5 | 66 | 70 |  |
| **Updated Course Suffix** | Text | 1 | 71 | 71 |  |
| **Updated Course Section** | Text | 6 | 72 | 77 |  |
| **Course Type** | Text | 1 | 78 | 78 | Z = CLEP  Y = Advanced Placement  A = American College Testing Program  V = Vocational Non-Credit  I = International Baccalaureate  H = Honors  O = Other External Credit  B = International Baccalaureate & Honors  <Blank> - Normal institutional Credit |
| **Repeat** | Text | 1 | 79 | 79 | T = Repeated Later, not in GPA  R = Repeated, in GPA  M = Allowed Repeat, all in GPA  <Blank> = None of the Above |
| **Grade** | Text | 3 | 80 | 82 |  |
| **Credit** | Number | 6 | 83 | 88 | Stored as \d{6}, where {1-3} are the integer portion, and {4-6} are the decimal portion. Any non-significant digits are always zero, e.g.: 3.25 = 003250 |
| **Grade Points** | Number | 8 | 89 | 96 | Stored as \d{9}, where {1-5} are the integer portion, and {5-8} are the decimal portion. Any non-significant digits are always zero, e.g. 525.75 = 00525750 |
| **Level** | Text | 2 | 97 | 98 | D = Upper division & Graduate  G = Graduate  H = Higher or upper division  I = institution credit  L = lower division  P = Professional  R = Remedial  U = Undergraduate |
| **Credit Type** | Text | 1 | 99 | 99 | A = Audit  C = Continuing Education Unit (CEU)  G = Carnegie Unit  N = No Credit  Q = Quarter Hour Credit  S = Semester Hour Credit  U = Units  V = Vocational Credit  X = Other Credit |
| **<Unused, Reserved>** | Text | 20 | 100 | 119 | Not used, no value expected |

#### Demographics Entry

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Name** | **Data Type** | **Size** | **Start Position** | **End Position** | **Description** |
| **FICE (7 digits + 4 digit Campus Code)** | Text | 11 | 1 | 11 |  |
| **StudentID** | Text | 12 | 12 | 23 | Redefinition of StudentID of the Standard Data Block. Expected to be truncated to 12 characters if over 12 characters. |
| **Full Student Name** | Text | 60 | 24 | 83 |  |
| **Birth Date** | Date | 8 | 84 | 91 | YYYYMMDD |
| **Foreign Lang** | Text | 1 | 92 | 92 | Y = Demonstrated Competency  N = Not Demonstrated Competency  X = Exempt from Competency  Z = Info not Recorded |
| **Gordon Rule** | Text | 1 | 93 | 93 | Y = Requirement Met  N = Requirement Not Met  X = Exempt from requirement  Z = Info Not recorded |
| **General Ed** | Text | 1 | 94 | 94 | A = All met except CLAST  Y = Requirement Met  N = Requirement Not Met  X = Info not available |
| **<Unused, Reserved>** | Text | 6 | 95 | 100 |  |

#### Test Record Entries

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **ACT Format** | |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | **Name** | **Data Type** | **Length** | **Start** | **End** | **Description** | | Testcode | Text | 12 | 1 | 12 | "ACT         " | | Testdate | Number | 6 | 13 | 18 | MMYYYY | | Indicator | Text | 1 | 19 | 19 | C = Composite score from multi tests Blank = Not composite | | English | Number | 4 | 20 | 23 | English scaled sub-score | | Math | Number | 4 | 24 | 27 | Math scaled sub-score | | SocialStd | Number | 4 | 28 | 31 | Social Studies scaled sub-score | | NaturalSci | Number | 4 | 32 | 35 | Natural Science scaled sub-score | | Composite | Number | 4 | 36 | 39 | Composite scaled score | | Filler | Text | 178 | 40 | 217 |  | |
| **PAC Format (ACT after 6/89)** | |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | **Name** | **Data Type** | **Length** | **Start** | **End** | **Description** | | Testcode | Text | 12 | 2 | 13 | "PAC         " | | Testdate | Number | 6 | 14 | 19 | MMYYYY | | Indicator | Text | 1 | 20 | 20 | C = Composite score from multi tests Blank = Not composite | | English | Number | 4 | 21 | 24 | English scaled sub-score | | Math | Number | 4 | 25 | 28 | Math scaled sub-score | | Reading | Number | 4 | 29 | 32 | Reading scaled sub-score | | Science | Number | 4 | 33 | 36 | Science Reasoning scaled sub-score | | Composite | Number | 4 | 37 | 40 | Composite scaled score | | Filler | Text | 178 | 41 | 218 |  | |
| **Scholastic Aptitude Test Format (Prior to 04/95)** | |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | **Name** | **Data Type** | **Length** | **Start** | **End** | **Description** | | Testcode | Text | 12 | 1 | 12 | "SAT         " | | Testdate | Number | 6 | 13 | 18 | MMYYYY | | Indicator | Text | 1 | 19 | 19 | C = Composite score from multi tests Blank = Not composite | | Verbal | Number | 4 | 20 | 23 | Verbal sub-score | | Math | Number | 4 | 24 | 27 | Math scaled sub-score | | Reading | Number | 4 | 28 | 31 | Reading Comprehension sub-score | | Vocabulary | Number | 4 | 32 | 35 | Vocabulary sub-score | | Writing | Number | 4 | 36 | 39 | Standard written English sub-score | | Science | Number | 4 | 40 | 43 | Science sub-score | | Filler | Text | 174 | 44 | 217 |  | |
| **Scholastic Assessment Test I: Reasoning Tests Format (04/95)** | |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | **Name** | **Data Type** | **Length** | **Start** | **End** | **Description** | | Testcode | Text | 12 | 1 | 12 | "SATI        " | | Testdate | Number | 6 | 13 | 18 | MMYYYY | | Indicator | Text | 1 | 19 | 19 | C =  Composite score from multi tests Blank = Not composite | | Verbal | Number | 4 | 20 | 23 | Verbal sub-score | | Reading | Number | 4 | 24 | 27 | Critical Reading sub-score | | Analogies | Number | 4 | 28 | 31 | Analogies sub-score | | Sentence | Number | 4 | 32 | 35 | Sentence Completion sub-score | | Math | Number | 4 | 36 | 39 | Math sub-score | | Arithmetic | Number | 4 | 40 | 43 | Arithmetic & algebraic sub-score | | Geometric | Number | 4 | 44 | 47 | Geometric reasoning sub-score | | Filler | Text | 170 | 48 | 217 |  | |
| **Scholastic Assessment Test II: Subject Tests Format (after 04/95)** | |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | **Name** | **Data Type** | **Length** | **Start** | **End** | **Description** | | Testcode | Text | 12 | 1 | 12 | "SATII       " | | Testdate | Number | 6 | 13 | 18 | MMYYYY | | Indicator | Text | 1 | 19 | 19 | C =  Composite score from multi tests Blank = Not composite | | Sub-score1 | Number | 4 | 20 | 23 | American History/Social Studies | | Sub-score2 | Number | 4 | 24 | 27 | Biology Reading | | Sub-score3 | Number | 4 | 28 | 31 | Chemistry | | Sub-score4 | Number | 4 | 32 | 35 | Chinese Listening | | Sub-score5 | Number | 4 | 36 | 39 | Chinese Listening: Reading | | Sub-score6 | Number | 4 | 40 | 43 | Chinese Listening: Listening | | Sub-score7 | Number | 4 | 44 | 47 | Chinese Listening: Usage | | Sub-score8 | Number | 4 | 48 | 51 | European History/World Cultures | | Sub-score 9 | Number | 4 | 52 | 55 | English composition | | Sub-score10 | Number | 4 | 56 | 59 | English comp with essay | | Sub-score11 | Number | 4 | 60 | 63 | French | | Sub-score12 | Number | 4 | 64 | 67 | French Listening | | Sub-score13 | Number | 4 | 68 | 71 | French Listening: Reading | | Sub-score14 | Number | 4 | 72 | 75 | French Listening: Listening | | Sub-score15 | Number | 4 | 76 | 79 | German | | Sub-score16 | Number | 4 | 80 | 83 | German Listening | | Sub-score17 | Number | 4 | 84 | 87 | German Listening: Reading | | Sub-score18 | Number | 4 | 88 | 91 | German Listening: Listening | | Sub-score19 | Number | 4 | 92 | 95 | Hebrew | | Sub-score20 | Number | 4 | 96 | 99 | Hebrew | | Sub-score21 | Number | 4 | 100 | 103 | Italian | | Sub-score22 | Number | 4 | 104 | 107 | Japanese Listening | | Sub-score23 | Number | 4 | 108 | 111 | Japanese Listening: Reading | | Sub-score24 | Number | 4 | 112 | 115 | Japanese Listening: Listening | | Sub-score25 | Number | 4 | 116 | 119 | Japanese Listening: Usage | | Sub-score26 | Number | 4 | 120 | 123 | Literature | | Sub-score27 | Number | 4 | 124 | 127 | Latin | | Sub-score28 | Number | 4 | 128 | 131 | Math Level I | | Sub-score29 | Number | 4 | 132 | 135 | Math Level II | | Sub-score30 | Number | 4 | 136 | 139 | Math Level IIC (calculator) | | Sub-score31 | Number | 4 | 140 | 143 | Physics | | Sub-score32 | Number | 4 | 144 | 147 | Spanish | | Sub-score33 | Number | 4 | 148 | 151 | Spanish Listening | | Sub-score34 | Number | 4 | 152 | 155 | Spanish Listening: reading | | Sub-score35 | Number | 4 | 156 | 159 | Spanish Listening: listening | | Sub-score36 | Number | 4 | 160 | 163 | Writing | | Sub-score37 | Number | 4 | 164 | 167 | Writing: Multiple choice | | Sub-score38 | Number | 4 | 168 | 171 | Writing: Identifying Sentence Errors | | Sub-score39 | Number | 4 | 172 | 175 | Writing: Improving Sentences | | Sub-score40 | Number | 4 | 176 | 179 | Writing: Improving Paragraphs | | Sub-score41 | Number | 4 | 180 | 183 | Writing: Writing Sample | | Sub-score42 | Number | 4 | 184 | 187 | Math Level 1C (Calculator) | | Filler | Text | 30 | 188 | 217 |  | |
| **TOEFL Format** | |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | **Name** | **Data Type** | **Length** | **Start** | **End** | **Description** | | Testcode | Text | 12 | 1 | 12 | "TOEFL       " | | Testdate | Number | 6 | 13 | 18 | MMYYYY | | Form | Text | 1 | 19 | 19 | Form designator of this test | | Listening | Number | 4 | 20 | 23 | Listening sub-score | | Writing | Number | 4 | 24 | 27 | Writing sub-score | | Reading | Number | 4 | 28 | 31 | Reading sub-score | | Total | Number | 4 | 32 | 35 | Total score | | Filler | Text | 182 | 36 | 217 |  | |
| **MAPS Format** | |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | **Name** | **Data Type** | **Length** | **Start** | **End** | **Description** | | Testcode | Text | 12 | 1 | 12 | "FLA MAPS    " | | Testdate | Number | 6 | 13 | 18 | MMYYYY | | Indicator | Text | 1 | 1 | 1 | C =  Composite score from multi tests Blank = Not composite | | Reading | Number | 4 | 2 | 5 | Reading scaled sub-score | | Writing | Number | 4 | 6 | 9 | Written English scaled sub-score | | Arithmetic | Number | 4 | 10 | 13 | Arithmetic scaled sub-score | | Algebra | Number | 4 | 14 | 17 | Elementary Algebra scaled sub-score | | Filler | Text | 182 | 18 | 199 |  | |
| **FLC MAPS Format** | |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | **Name** | **Data Type** | **Length** | **Start** | **End** | **Description** | | Testcode | Text | 12 | 1 | 12 | "FLC MAPS    " | | Testdate | Number | 6 | 13 | 18 | MMYYYY | | Indicator | Text | 1 | 19 | 19 | Language indicator: F = French G = German H = Hebrew I = Italian L = Latin R = Russian S = Spanish | | Score | Number | 4 | 20 | 23 | Scales score | | Filler | Text | 194 | 24 | 217 |  | |
| **NEW MAPS Format** | |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | **Name** | **Data Type** | **Length** | **Start** | **End** | **Description** | | Testcode | Text | 12 | 1 | 12 | "NEW MAPS    " | | Testdate | Number | 6 | 13 | 18 | MMYYYY | | Indicator | Text | 1 | 19 | 19 | C =  Composite score from multi tests Blank = Not composite | | Reading | Number | 4 | 20 | 23 | Reading comp scaled sub-score | | Writing | Number | 4 | 24 | 27 | Written English scaled sub-score | | Arithmetic | Number | 4 | 28 | 31 | Arithmetic skills scaled sub-score | | Algebra | Number | 4 | 32 | 35 | Elementary Algebra scaled sub-score | | Filler | Text | 182 | 36 | 217 |  | |
| **CLAST Format** | |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | **Name** | **Data Type** | **Length** | **Start** | **End** | **Description** | | Testcode | Text | 12 | 1 | 12 | "CLAST       " | | Testdate | Number | 6 | 13 | 18 | MMYYYY | | Filler | Text | 1 | 19 | 19 |  | | Computation | Number | 4 | 20 | 23 | Computation score or exemption code: 0999 = waived 0998 = 9C exemption 0997 = 9A/SAT exemption 0996 = 9A/ACT exemption 0995 = 9B exemption | | Date | Number | 6 | 24 | 29 | Date of Comp score MMYYYY | | Reading | Number | 4 | 30 | 33 | Reading score or exemption code: 0999 = waived 0998 = 9C exemption 0997 = 9A/SAT exemption 0996 = 9A/ACT exemption 0995 = 9B exemption | | Date | Number | 6 | 34 | 39 | Date of Reading score MMYYYY | | Writing | Number | 4 | 1 | 4 | Writing score or exemption code: 0999 = waived 0998 = 9C exemption 0997 = 9A/SAT exemption 0996 = 9A/ACT exemption 0995 = 9B exemption | | Date | Number | 6 | 5 | 10 | Date of Writing score MMYYYY | | Essay | Number | 4 | 11 | 14 | Essay score or exemption code: 0999 = waived 0998 = 9C exemption 0997 = 9A/SAT exemption 0996 = 9A/ACT exemption 0995 = 9B exemption | | Date | Number | 6 | 15 | 20 | Date of Essay score MMYYYY | | Filler | Text | 158 | 21 | 178 |  | |  |  |  |  |  |  | |
| **ASSET Format** | |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | **Name** | **Data Type** | **Length** | **Start** | **End** | **Description** | | Testcode | Text | 12 | 1 | 12 | "ASSET       " | | Testdate | Number | 6 | 13 | 18 | MMYYYY | | Indicator | Text | 1 | 19 | 19 | Test indicator | | Language | Number | 4 | 20 | 23 | Language usage score | | Reading | Number | 4 | 24 | 27 | Reading skills score | | Numeric | Number | 4 | 28 | 31 | Numeric skills score | | EleAlgebra | Number | 4 | 32 | 35 | Elementary Algebra score | | IntAlgebra | Number | 4 | 36 | 39 | Intermediate Algebra score | | ColAlgebra | Number | 4 | 40 | 43 | College Algebra score | | AdvLang | Number | 4 | 44 | 47 | Advanced Language Usage score | | Filler | Text | 170 | 48 | 217 |  | |
| **NEW ASSET Format** | |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | **Name** | **Data Type** | **Length** | **Start** | **End** | **Description** | | Testcode | Text | 12 | 1 | 12 | "NEW ASSET   " | | Testdate | Number | 6 | 13 | 18 | MMYYYY | | Filler | Text | 1 | 19 | 19 |  | | Writing | Number | 4 | 20 | 23 | Writing skills scales sub-score | | Reading | Number | 4 | 24 | 27 | Reading skills scaled sub-score | | Numeric | Number | 4 | 28 | 31 | Numeric skills scaled sub-score | | EleAlgebra | Number | 4 | 32 | 35 | Elementary Algebra scaled sub-score | | IntAlgebra | Number | 4 | 36 | 39 | Intermed Algebra scaled sub-score | | ColAlgebra | Number | 4 | 40 | 43 | College Algebra scaled sub-score | | Geometry | Number | 4 | 44 | 47 | Geometry scaled sub-score | | Filler | Text | 170 | 48 | 217 |  | |
| **CPT Format** | |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | **Name** | **Data Type** | **Length** | **Start** | **End** | **Description** | | Testcode | Text | 12 | 1 | 12 | "CPT         " | | Testdate | Number | 6 | 13 | 18 | MMYYYY | | Filler | Text | 1 | 19 | 19 |  | | Reading | Number | 4 | 20 | 23 | Reading comp scaled sub-score | | Sentence | Number | 4 | 24 | 27 | Sentence skills scaled sub-score | | Arithmetic | Number | 4 | 28 | 31 | Arithmetic skills scaled sub-score | | EleAlgebra | Number | 4 | 32 | 35 | Elementary Algebra scaled sub-score | | Filler | Text | 182 | 36 | 217 |  | |
| **The College Board's Advanced Placement Test Format** | |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | **Name** | **Data Type** | **Length** | **Start** | **End** | **Description** | | Testcode | Text | 12 | 1 | 12 | "APT         " | | Testdate | Number | 6 | 13 | 18 | MMYYYY | | Indicator | Text | 1 | 19 | 19 | C =  Composite score from multi tests Blank = Not composite | | Sub-score1 | Number | 4 | 20 | 23 | Art History | | Sub-score2 | Number | 4 | 24 | 27 | Art Studio Drawing | | Sub-score3 | Number | 4 | 28 | 31 | Art Studio General | | Sub-score4 | Number | 4 | 32 | 35 | Biology | | Sub-score5 | Number | 4 | 36 | 39 | Calculus AB | | Sub-score6 | Number | 4 | 40 | 43 | Calculus BC | | Sub-score7 | Number | 4 | 44 | 47 | Chemistry | | Sub-score8 | Number | 4 | 48 | 51 | Computer Science A | | Sub-score9 | Number | 4 | 52 | 55 | Computer Science B | | Sub-score10 | Number | 4 | 56 | 59 | Economics Macro | | Sub-score11 | Number | 4 | 60 | 63 | Economics Micro | | Sub-score12 | Number | 4 | 64 | 67 | English Language & Composition | | Sub-score13 | Number | 4 | 68 | 71 | English Literature & Composition | | Sub-score14 | Number | 4 | 72 | 75 | European History | | Sub-score15 | Number | 4 | 76 | 79 | French Language | | Sub-score16 | Number | 4 | 80 | 83 | French Literature | | Sub-score17 | Number | 4 | 84 | 87 | German Language | | Sub-score18 | Number | 4 | 88 | 91 | German Literature | | Sub-score19 | Number | 4 | 92 | 95 | Government/Politics | | Sub-score20 | Number | 4 | 96 | 99 | Government & Politic Comparative | | Sub-score21 | Number | 4 | 100 | 103 | Latin: Catullus-Horace | | Sub-score22 | Number | 4 | 104 | 107 | Latin: Vergil | | Sub-score23 | Number | 4 | 108 | 111 | Music Listening & Literature | | Sub-score24 | Number | 4 | 112 | 115 | Music Theory | | Sub-score25 | Number | 4 | 116 | 119 | Physics | | Sub-score26 | Number | 4 | 120 | 123 | Physics C Electricity & Magnetism | | Sub-score27 | Number | 4 | 124 | 127 | Physics C Mechanical | | Sub-score28 | Number | 4 | 128 | 131 | Psychology | | Sub-score29 | Number | 4 | 132 | 135 | Spanish Language | | Sub-score30 | Number | 4 | 136 | 139 | Spanish Literature | | Sub-score31 | Number | 4 | 140 | 143 | United States History | | Filler | Text | 74 | 144 | 217 |  | |
| **Allied Health Profession Admission Test Format** | |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | **Name** | **Data Type** | **Length** | **Start** | **End** | **Description** | | Testcode | Text | 12 | 1 | 12 | "AHPAT       " | | Testdate | Number | 6 | 13 | 18 | MMYYYY | | Indicator | Text | 1 | 19 | 19 | C =  Composite score from  Blank = Not composite | | Sub-score1 | Number | 4 | 20 | 23 | Verbal ability | | Sub-score2 | Number | 4 | 24 | 27 | Quantitative ability | | Sub-score3 | Number | 4 | 28 | 31 | Biology | | Sub-score4 | Number | 4 | 32 | 35 | Chemistry | | Sub-score5 | Number | 4 | 36 | 39 | Reading Comprehension | | Filler | Text | 178 | 40 | 217 |  | |
| **College Level Examination Program Subject Examination Format** | |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | **Name** | **Data Type** | **Length** | **Start** | **End** | **Description** | | Testcode | Text | 12 | 1 | 12 | "CLEP        " | | Testdate | Number | 6 | 13 | 18 | MMYYYY | | Indicator | Text | 1 | 19 | 19 | C =  Composite score from multi tests Blank = Not composite | | Sub-score1 | Number | 4 | 20 | 23 | American Government | | Sub-score2 | Number | 4 | 24 | 27 | American History I: Early Colonization to 1877 | | Sub-score3 | Number | 4 | 28 | 31 | American History II: 1865-Present | | Sub-score4 | Number | 4 | 32 | 35 | General Psychology | | Sub-score5 | Number | 4 | 36 | 39 | Human Growth & Development | | Sub-score6 | Number | 4 | 40 | 43 | Intro to Educational Psychology | | Sub-score7 | Number | 4 | 44 | 47 | Introductory Macro Economics | | Sub-score8 | Number | 4 | 48 | 51 | Introductory Micro Economics | | Sub-score9 | Number | 4 | 52 | 55 | Introductory Sociology | | Sub-score10 | Number | 4 | 56 | 59 | Western Civilization I: Ancient Near East to 1648 | | Sub-score11 | Number | 4 | 60 | 63 | Western Civilization II: 1648 to Present | | Sub-score12 | Number | 4 | 64 | 67 | College French: Level 1 & 2 | | Sub-score13 | Number | 4 | 68 | 71 | College German: Level 1 & 2 | | Sub-score14 | Number | 4 | 72 | 75 | College Spanish: Level 1 & 2 | | Sub-score15 | Number | 4 | 76 | 79 | American Literature | | Sub-score16 | Number | 4 | 80 | 83 | Analysis & Interpretation of Literature | | Sub-score17 | Number | 4 | 84 | 87 | College Composition | | Sub-score18 | Number | 4 | 88 | 91 | English Literature | | Sub-score19 | Number | 4 | 92 | 95 | Freshman English | | Sub-score20 | Number | 4 | 96 | 99 | Calculus with Elementary Function | | Sub-score21 | Number | 4 | 100 | 103 | College Algebra | | Sub-score22 | Number | 4 | 104 | 107 | Trigonometry | | Sub-score23 | Number | 4 | 108 | 111 | College Algebra with Trigonometry | | Sub-score24 | Number | 4 | 112 | 115 | General Biology | | Sub-score25 | Number | 4 | 116 | 119 | General Chemistry | | Sub-score26 | Number | 4 | 120 | 123 | Info Systems & Computer Apps | | Sub-score27 | Number | 4 | 124 | 127 | Intro to Management | | Sub-score28 | Number | 4 | 128 | 131 | Introductory Accounting | | Sub-score29 | Number | 4 | 132 | 135 | Introductory Business Law | | Sub-score30 | Number | 4 | 136 | 139 | Introductory Marketing | | Filler | Text | 78 | 140 | 217 |  | |
| **Dental Admissions Test Format** | |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | **Name** | **Data Type** | **Length** | **Start** | **End** | **Description** | | Testcode | Text | 12 | 1 | 12 | "DAT         " | | Testdate | Number | 6 | 13 | 18 | MMYYYY | | Indicator | Text | 1 | 19 | 19 | C =  Composite score from multi tests Blank = Not composite | | Sub-score1 | Number | 4 | 20 | 23 | Quantitative Reasoning | | Sub-score2 | Number | 4 | 24 | 27 | Reading | | Sub-score3 | Number | 4 | 28 | 31 | Biology | | Sub-score4 | Number | 4 | 32 | 35 | General Chemistry | | Sub-score5 | Number | 4 | 36 | 39 | Organic Chemistry | | Sub-score6 | Number | 4 | 40 | 43 | Perceptual Ability | | Sub-score7 | Number | 4 | 44 | 47 | Survey of Natural Science | | Sub-score8 | Number | 4 | 48 | 51 | Academic Average | | Filler | Text | 166 | 52 | 217 |  | |
| **General Education Development Format** | |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | **Name** | **Data Type** | **Length** | **Start** | **End** | **Description** | | Testcode | Text | 12 | 1 | 12 | "GED         " | | Testdate | Number | 6 | 13 | 18 | MMYYYY | | Indicator | Text | 1 | 19 | 19 | C =  Composite score from multi tests Blank = Not composite | | Sub-score1 | Number | 4 | 20 | 23 | Mathematics | | Sub-score2 | Number | 4 | 24 | 27 | Interpreting Literature & the Arts | | Sub-score3 | Number | 4 | 28 | 31 | Science | | Sub-score4 | Number | 4 | 32 | 35 | Social Studies | | Sub-score5 | Number | 4 | 36 | 39 | Writing Skills | | Filler | Text | 178 | 40 | 217 |  | |
| **Graduate Management Admissions Test Format** | |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | **Name** | **Data Type** | **Length** | **Start** | **End** | **Description** | | Testcode | Text | 12 | 1 | 12 | "GMAT        " | | Testdate | Number | 6 | 13 | 18 | MMYYYY | | Indicator | Text | 1 | 19 | 19 | C =  Composite score from multi tests Blank = Not composite | | Sub-score1 | Number | 4 | 20 | 23 | Verbal | | Sub-score2 | Number | 4 | 24 | 27 | Quantitative | | Sub-score3 | Number | 4 | 28 | 31 | Writing | | Sub-score4 | Number | 4 | 32 | 35 | Total | | Filler | Text | 182 | 36 | 217 |  | |
| **Graduate Record Examination General Test Format** | |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | **Name** | **Data Type** | **Length** | **Start** | **End** | **Description** | | Testcode | Text | 12 | 1 | 12 | "GRE         " | | Testdate | Number | 6 | 13 | 18 | MMYYYY | | Indicator | Text | 1 | 19 | 19 | C =  Composite score from multi tests Blank = Not composite | | Sub-score1 | Number | 4 | 20 | 23 | Verbal | | Sub-score2 | Number | 4 | 24 | 27 | Quantitative | | Sub-score3 | Number | 4 | 28 | 31 | Analytical | | Filler | Text | 186 | 32 | 217 |  | |
| **International Baccalaureate Format** | |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | **Name** | **Data Type** | **Length** | **Start** | **End** | **Description** | | Testcode | Text | 12 | 1 | 12 | "IB          " | | Testdate | Number | 6 | 13 | 18 | MMYYYY | | ExamLevel | Text | 1 | 19 | 19 | S = Subsidiary (1 year)  H = Higher (2 year) O = Out-of-state | | Sub-score1 | Number | 4 | 20 | 23 | English A | | Sub-score2 | Number | 4 | 24 | 27 | French A | | Sub-score3 | Number | 4 | 28 | 31 | German A | | Sub-score4 | Number | 4 | 32 | 35 | Spanish A | | Sub-score5 | Number | 4 | 36 | 39 | English B | | Sub-score6 | Number | 4 | 40 | 43 | French B | | Sub-score7 | Number | 4 | 44 | 47 | German B | | Sub-score8 | Number | 4 | 48 | 51 | Spanish B | | Sub-score9 | Number | 4 | 52 | 55 | History | | Sub-score10 | Number | 4 | 56 | 59 | Geography | | Sub-score11 | Number | 4 | 60 | 63 | Economics | | Sub-score12 | Number | 4 | 64 | 67 | Philosophy | | Sub-score13 | Number | 4 | 68 | 71 | Psychology | | Sub-score14 | Number | 4 | 72 | 75 | Social Anthropology | | Sub-score15 | Number | 4 | 76 | 79 | Organization & Mgmt Studies | | Sub-score16 | Number | 4 | 80 | 83 | Biology | | Sub-score17 | Number | 4 | 84 | 87 | Chemistry | | Sub-score18 | Number | 4 | 88 | 91 | Chemistry (General) | | Sub-score19 | Number | 4 | 92 | 95 | Chemistry (Applied) | | Sub-score20 | Number | 4 | 96 | 99 | Physics | | Sub-score21 | Number | 4 | 100 | 103 | Environmental Systems | | Sub-score22 | Number | 4 | 104 | 107 | Design Technology | | Sub-score23 | Number | 4 | 108 | 111 | Physical & Chemical Systems | | Sub-score24 | Number | 4 | 112 | 115 | Mathematics | | Sub-score25 | Number | 4 | 116 | 119 | Math with Further Math | | Sub-score26 | Number | 4 | 120 | 123 | Math with Computing | | Sub-score27 | Number | 4 | 124 | 127 | Mathematical Studies | | Sub-score28 | Number | 4 | 128 | 131 | Music | | Sub-score29 | Number | 4 | 132 | 135 | Classical Greek | | Sub-score30 | Number | 4 | 136 | 139 | Latin | | Sub-score31 | Number | 4 | 140 | 143 | Computing Studies | | Sub-score32 | Number | 4 | 144 | 147 | History/Culture of Islamic World | | Total | Number | 4 | 148 | 151 | Total Score | | Filler | Text | 66 | 152 | 217 |  | |
| **Law School Admissions Test Format** | |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | **Name** | **Data Type** | **Length** | **Start** | **End** | **Description** | | Testcode | Text | 12 | 1 | 12 | "LSAT        " | | Testdate | Number | 6 | 13 | 18 | MMYYYY | | Indicator | Text | 1 | 19 | 19 | C =  Composite score from multi tests Blank = Not composite | | Sub-score1 | Number | 4 | 20 | 23 | Reading Comprehension | | Sub-score2 | Number | 4 | 24 | 27 | Analytical Reasoning | | Sub-score3 | Number | 4 | 28 | 31 | Logical Reasoning | | Sub-score4 | Number | 4 | 32 | 35 | Variable | | Filler | Text | 182 | 36 | 217 |  | |
| **Medical Colleges Aptitude Test  Format** | |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | **Name** | **Data Type** | **Length** | **Start** | **End** | **Description** | | Testcode | Text | 12 | 1 | 12 | "MCAT        " | | Testdate | Number | 6 | 13 | 18 | MMYYYY | | Indicator | Text | 1 | 19 | 19 | C =  Composite score from multi tests Blank = Not composite | | Sub-score1 | Number | 4 | 20 | 23 | Biology | | Sub-score2 | Number | 4 | 24 | 27 | Chemistry | | Sub-score3 | Number | 4 | 28 | 31 | Physics | | Sub-score4 | Number | 4 | 32 | 35 | Reading | | Sub-score5 | Number | 4 | 36 | 39 | Science | | Sub-score6 | Number | 4 | 40 | 43 | Reasoning | | Sub-score7 | Number | 4 | 44 | 47 | Quantitative | | Filler | Text | 170 | 48 | 217 |  | |
| **Miller Analogies Test Format** | |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | **Name** | **Data Type** | **Length** | **Start** | **End** | **Description** | | Testcode | Text | 12 | 1 | 12 | "MAT         " | | Testdate | Number | 6 | 13 | 18 | MMYYYY | | Indicator | Text | 1 | 19 | 19 | C =  Composite score from multi tests Blank = Not composite | | Score | Number | 4 | 20 | 23 |  | | Filler | Text | 194 | 24 | 217 |  | |
| **Test of Adult Basic Education Format** | |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | **Name** | **Data Type** | **Length** | **Start** | **End** | **Description** | | Testcode | Text | 12 | 1 | 12 | "TABE        " | | Testdate | Number | 6 | 13 | 18 | MMYYYY | | Indicator | Text | 1 | 19 | 19 | C =  Composite score from multi tests Blank = Not composite | | Sub-score1 | Number | 4 | 20 | 23 | Language Arts scaled | | Sub-score2 | Number | 4 | 24 | 27 | Mechanics scaled | | Sub-score3 | Number | 4 | 28 | 31 | Expression scaled | | Sub-score4 | Number | 4 | 32 | 35 | Reading scales | | Sub-score5 | Number | 4 | 36 | 39 | Vocabulary scaled | | Sub-score6 | Number | 4 | 40 | 43 | Comprehension scaled | | Sub-score7 | Number | 4 | 44 | 47 | Mathematics scaled | | Sub-score8 | Number | 4 | 48 | 51 | Computation scaled | | Sub-score9 | Number | 4 | 52 | 55 | Concepts/Applications scaled | | Sub-score10 | Number | 4 | 56 | 59 | Spelling scaled | | Filler | Text | 158 | 60 | 217 |  | |
| **Test of Spoken English Format** | |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | **Name** | **Data Type** | **Length** | **Start** | **End** | **Description** | | Testcode | Text | 12 | 1 | 12 | "TSE         " | | Testdate | Number | 6 | 13 | 18 | MMYYYY | | Indicator | Text | 1 | 19 | 19 | C =  Composite score from multi tests Blank = Not composite | | Sub-score1 | Number | 4 | 20 | 23 | Pronunciation | | Sub-score2 | Number | 4 | 24 | 27 | Grammar | | Sub-score3 | Number | 4 | 28 | 31 | Fluency | | Sub-score4 | Number | 4 | 32 | 35 | Overall Comprehension | | Filler | Text | 182 | 36 | 217 |  | |
| **Test of Written English Format** | |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | **Name** | **Data Type** | **Length** | **Start** | **End** | **Description** | | Testcode | Text | 12 | 1 | 12 | "TWE         " | | Testdate | Number | 6 | 13 | 18 | MMYYYY | | Indicator | Text | 1 | 19 | 19 | C =  Composite score from multi tests Blank = Not composite | | Score | Number | 4 | 20 | 23 |  | | Filler | Text | 194 | 24 | 217 |  | |
| **Veterinary College Admission Test Format** | |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | **Name** | **Data Type** | **Length** | **Start** | **End** | **Description** | | Testcode | Text | 12 | 1 | 12 | "VCAT        " | | Testdate | Number | 6 | 13 | 18 | MMYYYY | | Indicator | Text | 1 | 19 | 19 | C =  Composite score from multi tests Blank = Not composite | | Sub-score1 | Number | 4 | 20 | 23 | Verbal Ability | | Sub-score2 | Number | 4 | 24 | 27 | Biology | | Sub-score3 | Number | 4 | 28 | 31 | Chemistry | | Sub-score4 | Number | 4 | 32 | 35 | Quantitative Ability | | Sub-score5 | Number | 4 | 36 | 39 | Reading Comprehension | | Filler | Text | 178 | 40 | 217 |  | |
| **FCELPT Format** | |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | **Name** | **Data Type** | **Length** | **Start** | **End** | **Description** | | Testcode | Text | 12 | 1 | 12 | "FCELPT      " | | Testdate | Number | 6 | 13 | 18 | MMYYYY | | Indicator | Text | 1 | 19 | 19 |  | | Sub-score1 | Number | 4 | 20 | 23 | Reading Comprehension | | Sub-score2 | Number | 4 | 24 | 27 | Sentence Skills | | Sub-score3 | Number | 4 | 28 | 31 | Elementary Algebra | | Sub-score4 | Number | 4 | 32 | 35 | Arithmetic | | Sub-score5 | Number | 4 | 36 | 39 | College Level Math | | Filler | Text | 178 | 40 | 217 |  | |

# EDI Messages Overview

## STATEKEYCK

A STATEKEYCK message is sent from the Message Director to the Advising system to validate that the passed credentials (“State Key”) are valid. The response of this message informs the Message Director of the student name, which is then used in subsequent operations.

|  |  |
| --- | --- |
| **Example request:** | 000877TCP FEDI00ADVISING ADVISING 04200 A77E 000001REQUEST Y  000010PROCESS STATEKEYCK  000016STATEKEYT0026853G0026853  000015IPADDRES127.0.0.1   000005PORTNUMB03006  000050RETNDATA68074277-89fb-4a47-bf31-54e1e9368790   000030HTMLKEY   000040STUID   000128PIN/PW   000001WAIT N  000005RETNCODE99999  000240RETNMESS |
| **Example response:** | 000877TCP FEDI00ADVISING ADVISING 04200 A77E 000001REQUEST Y  000010PROCESS STATEKEYCK  000016STATEKEYT0026853G0026853  000015IPADDRES127.0.0.1   000005PORTNUMB03006  000050RETNDATA68074277-89fb-4a47-bf31-54e1e9368790   000030HTMLKEY   000040STUID GST   000128PIN/PW   000001WAIT N  000005RETNCODE00000  000240RETNMESS |
| **Message Flow:** |  |

## VERIFY

A VERIFY message is sent to and from the Message Director to validate a student’s credentials at a given institution. The response is then delivered back to the originating system, who inspects the RETNCODE and RETNMESS fields to determine the response given by the institution as to whether the student credentials were valid.

|  |  |
| --- | --- |
| **Example request:** | 000736TCP FEDI00ADVISING 0001472000001010 000001REQUEST Y  000010PROCESS VERIFY   000016STATEKEYT0026854M0026854  000015IPADDRES192.168.22.88   000005PORTNUMB3008   000050RETNDATA   000030HTMLKEY   000012STUID 111111111   000015PIN/PW 0180   000001WAIT N  000005RETNCODE99999  000240RETNMESS |
| **Example response:** | 000736TCP FEDI00ADVISING 01100 22C1 000001REQUEST N  000010PROCESS VERIFY   000016STATEKEYT0026854M0026854  000015IPADDRES192.168.22.88   000005PORTNUMB03008  000050RETNDATA   000030HTMLKEY   000012STUID 111111111   000015PIN/PW 0180   000001WAIT N  000005RETNCODE00000  000240RETNMESS |
| **Message Flow:** |  |

## COURSELIST

A COURSELIST call is performed on behalf of a student if a calling system requires a structured list of the student’s courses at his home institution. It is also used in the REMOTESHOP and ADVISE22 processes to re-transmit to a transfer institution.

|  |  |
| --- | --- |
| **Example request:** | 000822TCP FEDI00000147200000001472000002090 66AC 000001REQUEST Y  000010PROCESS COURSELIST  000016STATEKEY1234   000015IPADDRES146.201.218.132  000005PORTNUMB03006  000050RETNDATAdc5f4ba2-ab8e-4eae-a41b-94723d352a55   000030HTMLKEY   000012STUID 111111111   000015PIN/PW   000001WAIT Y  000005RETNCODE99999  000240RETNMESS   000010MAJOR AC-ATG   000006CATLYEAR2014   000001ASSUMEAAN |
| **Example response:** | 011561TCP FEDI00000147200000001472000002090 66AC 000001REQUEST Y  000010PROCESS COURSELIST  000016STATEKEY1234   000015IPADDRES146.201.218.132  000005PORTNUMB03006  000050RETNDATAdc5f4ba2-ab8e-4eae-a41b-94723d352a55   000030HTMLKEY   000012STUID 111111111   000015PIN/PW   000001WAIT Y  000005RETNCODE00000  000240RETNMESS   000010MAJOR AC-ATG   000006CATLYEAR2014   000001ASSUMEAAN  000100DEMOGRAF001500 1 F08007171 FACTS FACTS 19801025NNN   000119COURSLST200408 00015001 AMH 2010 U S HISTORY AMH 2010 008 0 A 00300000012000U S   000119COURSLST200408 00015001 BSC 1005 GEN BIOLOGY BSC 1005 008 0 B 00300000009000U S   000119COURSLST200408 00015001 BSC 1005 L GEN BIO LAB BSC 1005 L006 0 B 00100000003000U S   000119COURSLST200408 00015001 ENC 1101 COMPOSITION I ENC 1101 006 0 B 00300000009000U S   000119COURSLST200408 00015001 SYG 2000 GENERAL SOC SYG 2000 007 0 C 00300000006000U S |
| **Message Flow:** |  |

## TRANSCRIPT

A TRANSCRIPT message is sent to an institution on behalf of a student to retrieve preformatted HTML containing the student’s transcript. Note that TRANSCRIPT, and subsequent operations that operate on behalf of the student, do not need the PIN/PW field to be provided. The response is returned in a field called “TRANDATA”.

|  |  |
| --- | --- |
| **Example request:** | 000736TCP FEDI00000147200000001472000005110 C1D7 000001REQUEST Y  000010PROCESS TRANSCRIPT  000016STATEKEY1234   000015IPADDRES146.201.218.132  000005PORTNUMB03006  000050RETNDATA685a387d-c5bb-4dc5-b6e0-504962747941   000030HTMLKEY   000012STUID 111111111   000015PIN/PW   000001WAIT Y  000005RETNCODE99999  000240RETNMESS |
| **Example response:** | 023047TCP FEDI00000147200000001472000005110 C1D7 000001REQUEST Y  000010PROCESS TRANSCRIPT  000016STATEKEY1234   000015IPADDRES146.201.218.132  000005PORTNUMB03006  000050RETNDATA685a387d-c5bb-4dc5-b6e0-504962747941   000030HTMLKEY   000012STUID 111111111   000015PIN/PW   000001WAIT Y  000005RETNCODE00000  000240RETNMESS   022288TRANDATA<HTML><HEAD><TITLE>FACTS - UNOFFICIAL TRANSCRIPT </TITLE></HEAD><BODY BGCOLOR="#FFFFCC" TEXT="#000066" LINK="#0000EE" VLINK="#3333FF" ALINK=" |
| **Message Flow:** |  |

## GRADAUDIT

A GRADAUDIT call is performed on behalf of a student to his home institution if he wants to see his progress towards his current degree.

|  |  |
| --- | --- |
| **Example request:** | 000736TCP FEDI00000147200000001472000006140 32E2 000001REQUEST Y  000010PROCESS GRADAUDIT   000016STATEKEY1234   000015IPADDRES146.201.218.132  000005PORTNUMB03006  000050RETNDATAf8b64586-c654-4179-921a-4d066fc5d6fb   000030HTMLKEY   000012STUID 111111111   000015PIN/PW   000001WAIT Y  000005RETNCODE99999  000240RETNMESS |
| **Example response:** | 015859TCP FEDI00000147200000001472000006140 32E2 000001REQUEST Y  000010PROCESS GRADAUDIT   000016STATEKEY1234   000015IPADDRES146.201.218.132  000005PORTNUMB03006  000050RETNDATAf8b64586-c654-4179-921a-4d066fc5d6fb   000030HTMLKEY   000012STUID 111111111   000015PIN/PW   000001WAIT Y  000005RETNCODE00000  000240RETNMESS   015100AUDITDAT<HTML><HEAD><TITLE>FACTS - UNOFFICIAL DEGREE AUDIT.</TITLE></HEAD><BODY BGCOLOR="#FFFFCC" TEXT="#000066" LINK="#0000EE" VLINK="#3333FF" ALINK= |
| **Message Flow:** |  |

## LOCALSHOP

A LOCALSHOP message is transmitted to an institution on behalf of a student to perform a “what-if” scenario that would inform the student of their progress towards a new degree if they were to change majors. As part of the request, two additional fields, MAJOR, and CATLYEAR are transmitted.

|  |  |
| --- | --- |
| **Example request:** | 000798TCP FEDI00000147200000001472000007150 A272 000001REQUEST Y  000010PROCESS LOCALSHOP   000016STATEKEY1234   000015IPADDRES146.201.218.132  000005PORTNUMB03006  000050RETNDATAafe30a19-4b8c-4683-889b-ebf69e401068   000030HTMLKEY   000012STUID 111111111   000015PIN/PW   000001WAIT Y  000005RETNCODE99999  000240RETNMESS   000010MAJOR 10   000006CATLYEAR2014 |
| **Example response:** | 029329TCP FEDI00000147200000001472000007150 A272 000001REQUEST Y  000010PROCESS LOCALSHOP   000016STATEKEY1234   000015IPADDRES146.201.218.132  000005PORTNUMB03006  000050RETNDATAafe30a19-4b8c-4683-889b-ebf69e401068   000030HTMLKEY   000012STUID 111111111   000015PIN/PW   000001WAIT Y  000005RETNCODE00000  000240RETNMESS   028570AUDITDAT<HTML><HEAD><TITLE>FACTS - UNOFFICIAL DEGREE AUDIT.</TITLE></HEAD><BODY BGCOLOR="#FFFFCC" TEXT="#000066" LINK="#0000EE" VLINK="#3333FF" ALINK= |
| **Message Flow:** |  |

## REMOTESHOP

A REMOTESHOP message is transmitted to a potential transfer institution on behalf of a student to perform a “what-if” scenario that would inform the student of their progress if they were to transfer into a major at that university. As part of the request, two additional fields, MAJOR, and CATLYEAR are transmitted. In addition, all fields as returned by the home institution COURESLIST request are transmitted to the remote institution.

|  |  |
| --- | --- |
| **Example request:** | 011702TCP FEDI00000153500000001472000008160 4E71 000001REQUEST Y  000010PROCESS REMOTESHOP  000016STATEKEY1234   000015IPADDRES146.201.218.132  000005PORTNUMB03006  000050RETNDATAdc5f4ba2-ab8e-4eae-a41b-94723d352a55   000030HTMLKEY   000040STUID 111111111   000128PIN/PW   000001WAIT N  000005RETNCODE99999  000240RETNMESS   000010MAJOR AC-ATG   000006CATLYEAR2014   000001ASSUMEAAY  000100DEMOGRAF001500 1 F08007171 FACTS FACTS 19801025NNN   000119COURSLST200408 00015001 AMH 2010 U S HISTORY AMH 2010 008 0 A 00300000012000U S   000119COURSLST200408 00015001 BSC 1005 GEN BIOLOGY BSC 1005 008 0 B 00300000009000U S   000119COURSLST200408 00015001 BSC 1005 L GEN BIO LAB BSC 1005 L006 0 B 00100000003000U S   000119COURSLST200408 00015001 ENC 1101 COMPOSITION I ENC 1101 006 0 B 00300000009000U S   000119COURSLST200408 00015001 SYG 2000 GENERAL SOC SYG 2000 007 0 C 00300000006000U S |
| **Example response:** | 035284TCP FEDI00000153500000001472000008160 4E71 000001REQUEST N  000010PROCESS REMOTESHOP  000016STATEKEY1234   000015IPADDRES146.201.218.132  000005PORTNUMB03006  000050RETNDATAdc5f4ba2-ab8e-4eae-a41b-94723d352a55   000030HTMLKEY   000040STUID 111111111   000128PIN/PW   000001WAIT N  000005RETNCODE00000  000240RETNMESS   034384AUDITDAT<HTML><HEAD><TITLE>FACTS - UNOFFICIAL DEGREE AUDIT.</TITLE></HEAD><BODY BGCOLOR="#FFFFCC" TEXT="#000066" LINK="#0000EE" VLINK="#3333FF" ALINK= |
| **Message Flow:** |  |

## ADVISE22

An ADVISE22 operation is performed on behalf of a student presently enrolled at a stage college in an associates of arts degree, in order to determine the completion progress towards a bachelor’s degree at four-year university. The ADVISE22 process makes use of both the COMMPREREQ as well as the COURSELIST functions, as well as making two separate ADVISE22 requests to both the home and transfer institution.

Due to inconsistent quality in the FXML responses provided by the institutions, the Message Director has some corrective capabilities if it detects a problem with the XML structure:

* Any non-entity reference ampersands in text content are replaced with “&amp;”
* Any malformed DTD is ignored
* Any ASCII NUL characters are replaced with whitespace
* Any otherwise malformed XML document is parsed with a secondary SAX parser to ensure that that the message makes it back to the Message Director from a Socket Adapter, and regular expressions are then used to pull the process-specific <Program> and <Data> elements from the returned <ADVISE22\_RESP> element.

|  |  |
| --- | --- |
| **Example request (2-year, FXML only):** | 000608TCP FXML00000147200000001472000012410 5FF7 <?xml version="1.0" encoding="UTF-8"?> <FACTS\_MESSAGE Process="22ADVISE" Request="Y" Wait="Y">  <STANDARD\_BLK>  <STATEKEY>1234</STATEKEY>  <IPADDRESS>146.201.218.132</IPADDRESS>  <PORT>3006</PORT>  <RETNDATA>002ed05e-40dc-4aed-8b1e-c22648034294</RETNDATA>  <HTMLKEY/>  <STUID>111111111</STUID>  <PIN\_PW/>  <RETNCODE>99999</RETNCODE>  <RETNMESS/>  </STANDARD\_BLK>  <ADVISE22\_REQ>  <MAJOR>11</MAJOR>  <CATLYEAR>2014</CATLYEAR>  </ADVISE22\_REQ> </FACTS\_MESSAGE> |
| **Example request (4-year, FEDI only)** | 011561TCP FEDI00000395400000003954000012410 9C1C 000001REQUEST Y  000010PROCESS 22ADVISE   000016STATEKEY1234   000015IPADDRES146.201.218.132  000005PORTNUMB03006  000050RETNDATA002ed05e-40dc-4aed-8b1e-c22648034294   000030HTMLKEY   000012STUID 111111111   000015PIN/PW   000001WAIT Y  000005RETNCODE00000  000240RETNMESS   000010MAJOR 0690   000006CATLYEAR2014   000001ASSUMEAAY  000100DEMOGRAF001500 1 F08007171 FACTS FACTS 19801025NNN   000119COURSLST200408 00015001 AMH 2010 U S HISTORY AMH 2010 008 0 A 00300000012000U S   000119COURSLST200408 00015001 BSC 1005 GEN BIOLOGY BSC 1005 008 0 B 00300000009000U S   000119COURSLST200408 00015001 BSC 1005 L GEN BIO LAB BSC 1005 L006 0 B 00100000003000U S   000119COURSLST200408 00015001 ENC 1101 COMPOSITION I ENC 1101 006 0 B 00300000009000U S   000119COURSLST200408 00015001 SYG 2000 GENERAL SOC SYG 2000 007 0 C 00300000006000U S |
| **Example response (2-year):** | 023622TCP FXML00000147200000001472000012410 5FF7 <?xml version="1.0" e<FACTS\_MESSAGE Process="22ADVISE " Request="Y" Wait="Y" ><STANDARD\_BLK><STATEKEY>1234 </STATEKEY><IPADDRESS>146.201.218.132</IPADDRESS><PORT>3006 </PORT><RETNDATA>002ed05e-40dc-4aed-8b1e-c22648034294 </RETNDATA><HTMLKEY></HTMLKEY><STUID>111111111 </STUID><RETNCODE>00000</RETNCODE><RETNMESS> </RETNMESS></STANDARD\_BLK><ADVISE22\_RESP><Student><StuID>111111111 </StuID><Name><FirstName>STUDENT </FirstName><MiddleName>TEST </MiddleName><LastName>DUMMY </LastName><Suffix/></Name> |
| **Message Flow:** |  |

## ADMISSIONS

An ADMISSION operation is performed on behalf of a student who submitted a transient admissions application from the TSAA application. The ADMISSION operation only transmits using FXML, relaying the request by the TSAA to the selected transfer institution. The Message Director does not do anything with the response of the ADMISSION request, it simply relays it back to the TSAA system.

|  |  |
| --- | --- |
| **Example request:** | 005077TCP FXML00ADMISSIONS ADMISSIONS010270 E80F000014<?xml version="1.0" encoding="UTF-8"?> <FACTS\_MESSAGE Process="ADMISSION" Request="Y" Wait="N">  <STANDARD\_BLK>  <STATEKEY>1234</STATEKEY>  <IPADDRESS>146.201.218.132</IPADDRESS>  <PORT>3006</PORT>  <RETNDATA>002ed05e-40dc-4aed-8b1e-c22648034294</RETNDATA>  <HTMLKEY/>  <STUID>111111111</STUID>  <PIN\_PW/>  <RETNCODE>99999</RETNCODE>  <RETNMESS/>  </STANDARD\_BLK>  <ADMISSION\_REQ FACTS\_ID="261616133" Track="000023126">  <APPLICANT\_MASTER AppCat="T" AppType="01" MON="Fall" YR="2015">  <SSN>261616133</SSN>  <NAME Relationship="18">  <LAST\_NAME>TEST TWO</LAST\_NAME>  <FIRST\_NAME>FLVC</FIRST\_NAME>  <MIDDLE\_NAME/>  </NAME>  <ADDRESS AddrType="P">  <ADDRESS1>123 Fake Street</ADDRESS1>  <ADDRESS2/>  <CITY>Tampa</CITY>  <STATE>FL</STATE>  <ZIP>33605</ZIP>  <DAY\_PHONE>8134962270</DAY\_PHONE>  <EMAIL\_ADDRESS>spolansky@flvc.org</EMAIL\_ADDRESS>  </ADDRESS>  <ADDRESS AddrType="F">  <ADDRESS1>123 Fake Street</ADDRESS1>  <ADDRESS2/>  <CITY>Tampa</CITY>  <STATE>FL</STATE>  <ZIP>33605</ZIP>  <DAY\_PHONE>8134962270</DAY\_PHONE>  <EMAIL\_ADDRESS/>  </ADDRESS>  <CITIZENSHIP Code="US"/>  <IMMIGRANT\_STATUS Code="C"/>  <GENDER Code="F"/>  <BIRTHDATE DAY="01" MON="01" YR="1997"/>  <RACE\_ETHNICITY>[WBAIPH]</RACE\_ETHNICITY>  <PARENT\_SCHOOL\_FICE\_CODE>0001485</PARENT\_SCHOOL\_FICE\_CODE>  <HOST\_ADMISSION\_QUESTION1>Have you ever been designated a sexual predator by any court?</HOST\_ADMISSION\_QUESTION1>  <HOST\_ADMISSION\_ANSWER1>N</HOST\_ADMISSION\_ANSWER1>  <HOST\_ADMISSION\_QUESTION2>Have you ever been designated a sexual offender, or convicted of any sexual felony offense, by any court?</HOST\_ADMISSION\_QUESTION2>  <HOST\_ADMISSION\_ANSWER2>N</HOST\_ADMISSION\_ANSWER2>  <COMMENT>FLVC TEST PLEASE IGNORE</COMMENT>  <SUBMITTED\_TIMESTAMP>03/17/2015 11:53 AM</SUBMITTED\_TIMESTAMP>  </APPLICANT\_MASTER>  <COURSE Approved="Y" CredHrs="3" CrsNbr="ENC1201">  <COURSE\_TITLE>composition</COURSE\_TITLE>  <COURSE\_USE>G</COURSE\_USE>  <COURSE\_EQUIVALENT/>  <COURSE\_DISTANCE\_LEARNING>N</COURSE\_DISTANCE\_LEARNING>  <FINANCIAL\_AID\_ELIGIBLE>Y</FINANCIAL\_AID\_ELIGIBLE>  </COURSE>  <REGISTRAR\_CERTIFICATION>  <IS\_ENROLLED\_IN\_DEGREE\_PROGRAM YN="Y"/>  <IS\_ELIGIBLE\_TO\_REENROLL YN="Y"/>  <HAS\_REQUIRED\_VACCINATIONS YN="Y"/>  <LEGAL\_CLASSIFICATION Code="R"/>  </REGISTRAR\_CERTIFICATION>  <TF\_SECTION Institution="H">  <SECTION\_TITLE>Academic Advisor</SECTION\_TITLE>  <SECTION\_ROLE>Academic Advisor</SECTION\_ROLE>  <CONTEXT\_REAL>Florida Keys Community College</CONTEXT\_REAL>  <COMMENT>FLVC TEST PLEASE IGNORE</COMMENT>  <USER\_NAME>flvcfkcc</USER\_NAME>  <FULLNAME>FLVC TEST</FULLNAME>  <SIGNED\_TIMESTAMP>03/17/2015 11:58 AM</SIGNED\_TIMESTAMP>  <SIGNED\_STATE>Approved</SIGNED\_STATE>  </TF\_SECTION>  <TF\_SECTION Institution="H">  <SECTION\_TITLE>Admissions Officer Certification</SECTION\_TITLE>  <SECTION\_ROLE>Admissions Officer</SECTION\_ROLE>  <CONTEXT\_REAL>Florida Keys Community College</CONTEXT\_REAL>  <COMMENT>FLVC TEST PLEASE IGNORE</COMMENT>  <USER\_NAME>flvcfkcc</USER\_NAME>  <FULLNAME>FLVC TEST</FULLNAME>  <SIGNED\_TIMESTAMP>03/17/2015 11:59 AM</SIGNED\_TIMESTAMP>  <SIGNED\_STATE>Approved</SIGNED\_STATE>  </TF\_SECTION>  <TF\_SECTION Institution="H">  <SECTION\_TITLE>Financial Aid Officer</SECTION\_TITLE>  <SECTION\_ROLE>Financial Aid Officer</SECTION\_ROLE>  <CONTEXT\_REAL>Florida Keys Community College</CONTEXT\_REAL>  <COMMENT>FLVC TEST PLEASE IGNORE</COMMENT>  <USER\_NAME>flvcfkcc</USER\_NAME>  <FULLNAME>FLVC TEST</FULLNAME>  <SIGNED\_TIMESTAMP>03/17/2015 11:59 AM</SIGNED\_TIMESTAMP>  <SIGNED\_STATE>Approved</SIGNED\_STATE>  </TF\_SECTION>  <TF\_SECTION Institution="T">  <SECTION\_TITLE>Registrar-Main Admissions</SECTION\_TITLE>  <SECTION\_ROLE>Registrar-Main</SECTION\_ROLE>  <CONTEXT\_REAL>Florida State College at Jacksonville</CONTEXT\_REAL>  <COMMENT>FLVC TEST PLEASE IGNORE</COMMENT>  <USER\_NAME>flvcfkcc</USER\_NAME>  <FULLNAME>FLVC TEST</FULLNAME>  <SIGNED\_TIMESTAMP>03/17/2015 11:59 AM</SIGNED\_TIMESTAMP>  <SIGNED\_STATE>Approved</SIGNED\_STATE>  </TF\_SECTION>  </ADMISSION\_REQ> </FACTS\_MESSAGE> |
| **Example response:** | 000477TCP FXML00ADMISSIONS ADMISSIONS010270 CE15000065<?xml version='1.0'?> <FACTS\_MESSAGE Process='ADMISSION' Request='Y' Wait='N'>  <STANDARD\_BLK>  <STATEKEY>T0023126F0023126</STATEKEY>  <IPADDRESS>146.201.218.131</IPADDRESS>  <PORT>03006</PORT>  <RETNDATA>23126</RETNDATA>  <HTMLKEY></HTMLKEY>  <STUID>261616133</STUID>  <PIN\_PW></PIN\_PW>  <RETNCODE>00000</RETNCODE>  <RETNMESS></RETNMESS>  </STANDARD\_BLK>  <ADMISSION\_RESP Type='C'> 1426607989448</ADMISSION\_RESP> </FACTS\_MESSAGE> |
| **Message Flow:** |  |

## COMMONPREREQ

A COMMPREREQ message is sent during each ADVISE22 conversation. The request is delivered to the FLVC Advising System, who then returns a response with the Common Prerequisite data for the selected program.

|  |  |
| --- | --- |
| **Example request:** | 000869TCP FXML00ADVISING ADVISING 15400 69FD <?xml version="1.0" encoding="UTF-8"?> <FACTS\_MESSAGE Process="COMMPREREQ" Request="Y" Wait="N">  <STANDARD\_BLK>  <STATEKEY>1234</STATEKEY>  <IPADDRESS>127.0.0.1</IPADDRESS>  <PORT>11001</PORT>  <RETNDATA>ab478a32-fdcc-4e67-aa1a-1fcf25c8cbae</RETNDATA>  <HTMLKEY>HBcooyQVLY1zqH1zdbfAWZ324Y4=2015XX</HTMLKEY>  <STUID/>  <PIN\_PW/>  <RETNCODE>99999</RETNCODE>  <RETNMESS/>  </STANDARD\_BLK>  <ADVISE22\_REQ>  <CIPCode>123456</CIPCode>  <ProgramYear>2015</ProgramYear>  <TrackNum>1/2</TrackNum>  <SourceFICE>00014710000</SourceFICE>  <SourcePgmCode>XY-ZZY</SourcePgmCode>  <TransferFICE>00014810000</TransferFICE>  <TransferPgmCode>AB-CDE</TransferPgmCode>  </ADVISE22\_REQ> </FACTS\_MESSAGE> |
| **Example response:** | <FACTS\_MESSAGE Process="COMMPREREQ" Request="Y" Wait="N">  <STANDARD\_BLK>  <STATEKEY>1234</STATEKEY>  <IPADDRESS>127.0.0.1</IPADDRESS>  <PORT>0</PORT>  <RETNDATA>ab478a32-fdcc-4e67-aa1a-1fcf25c8cbae</RETNDATA>  <HTMLKEY>HBcooyQVLY1zqH1zdbfAWZ324Y4=2015XX</HTMLKEY>  <STUID></STUID>  <PIN\_PW></PIN\_PW>  <RETNCODE>00000</RETNCODE>  <RETNMESS></RETNMESS>  </STANDARD\_BLK>  <ADVISE22\_RESP>  <SourceContact />  <TransferContact />  <Program LimitedAccess="Y">  <Title\_Description>Special Education, General</Title\_Description>  <Track>  <Code>1</Code>  <Area>  <Title\_Description>Special Education, General</Title\_Description>  <CourseGroup GroupType="And">  <Course CrsHrs="3" GenEd="Y"> |
| **Message Flow:** |  |

# API

## Redirect Handler Interface

|  |  |  |
| --- | --- | --- |
| **Process:** **Transcript** | | |
| **URL:** /<context root>/transcript?P0=<StateKey>&P3=<Student’s Home Institution> | | |
| **Parameter name** | **Translated Name** | **Usage** |
| P0 | State Key | Enables the Message Director to perform a State Key Check operation on behalf of this student to validate that their current session is active; as well as obtain the student’s StudentId |
| P3 | Student’s Home Institution | Used to determine which institution to make the TRANSCRIPT call to on behalf of this student |

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| **Process:** Grad Audit | | |
| **URL:** /<context root>/transcript?P0=<StateKey>&P3=<Student’s Home Institution> | | |
| **Parameter name** | **Translated Name** | **Usage** |
| P0 | State Key | Enables the Message Director to perform a State Key Check operation on behalf of this student to validate that their current session is active; as well as obtain the student’s StudentId |
| P3 | Student’s Home Institution | Used to determine which institution to make the GRADAUDIT call to on behalf of this student |

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| --- | --- | --- |
| **Process:** Local Shop | | |
| **URL:** /<context root>/localShop? P0=<StateKey>&P3=<Student’s Home Institution>&P5=<Program Code at Home Institution>&P6=<Program Year> | | |
| **Parameter name** | **Translated Name** | **Usage** |
| P0 | State Key | Enables the Message Director to perform a State Key Check operation on behalf of this student to validate that their current session is active; as well as obtain the student’s StudentId |
| P3 | Student’s Home Institution | Used to determine which institution to make the LOCALSHOP call to on behalf of this student |
| P5 | Program Code at Home Institution | A code stored within the advising system that corresponds to a major at the student’s home institution that the student may be interested in changing to |
| P6 | Program Year | The year in which the major change would be active; used to select the correct program at the home institution |

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| **Process:** Remote Shop | | |
| **URL:** /<context root>/remoteShop? P0=<StateKey>&P3=<Desired Transfer Institution>&P4=<Student’s Home Institution>&P5=<Program Code at Transfer Institution>&P6=<Program Year> | | |
| **Parameter name** | **Translated Name** | **Usage** |
| P0 | State Key | Enables the Message Director to perform a State Key Check operation on behalf of this student to validate that their current session is active; as well as obtain the student’s StudentId |
| P3 | Desired Transfer Institution | Used to determine which institution to make the REMOTESHOP call to on behalf of this student |
| P4 | Student’s Home Institution | Used to determine which institution to make the COURSELIST call to on behalf of this student |
| P5 | Program Code at Transfer Institution | Transmitted as part of the REMOTESHOP request to the transfer institution, so that it can choose the correct program for the student |
| P6 | Program Year | Transmitted as part of the REMOTESHOP request to the transfer institution, so that it can choose the correct program for the student |

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| --- | --- | --- |
| **Process:** Advise 22 | | |
| **URL:** /<context root>/advise22?P0=<StateKey>&P3=<Student’s Home Institution>&P4=<Desired Transfer Institution>&P5=<Program Code at Transfer Institution>&P6=<Program Year>&P7=<Assume AA>&P8=<Program Code at Home Institution>&P9=<CIP Code of chosen Program>&P10=<Program Track>&P11=<Is Program Limited Access>&P12=<Selected Transfer Year>&P13=<Selected Transfer Term>&P14=<Selected Program Title> | | |
| **Parameter name** | **Translated Name** | **Usage** |
| P0 | State Key | Enables the Message Director to perform a State Key Check operation on behalf of this student to validate that their current session is active; as well as obtain the student’s StudentId |
| P3 | Student’s Home Institution | Used to determine which institution to make the COURSELIST and initial ADVISE22 call to on behalf of this student |
| P4 | Desired Transfer Institution | Used to determine which institution to make the second ADVISE22 call, with the first COURSELIST response |
| P5 | Program Code at Transfer Institution | Transmitted to the Advising system in the COMMPREREQ request to look up the correct common prerequisites. Transmitted as part of the ADVISE22 request to the transfer institutions so that it can choose the correct program for the student. |
| P6 | Program Year | Transmitted as part of the ADVISE22 request to the both the home and transfer institutions so that they can choose the correct program for the student. |
| P7 | Assume AA | A flag value used used in the processing of the merged Advise22 response |
| P8 | Program Code at Home Institution | Transmitted to the Advising system in the COMMPREREQ request to look up the correct common prerequisites. Transmitted as part of the ADVISE22 request to the home institution so that it can choose the correct program for the student. |
| P9 | CIP Code of Chosen Program | Transmitted to the Advising system in the COMMPREREQ request to look up the correct common prerequisites. |
| P10 | Program Track | Transmitted to the Advising system in the COMMPREREQ request to look up the correct common prerequisites. |
| P11 | Is Program Limited Access | A flag value used used in the processing of the merged Advise22 response |
| P12 | Selected Transfer Year | The year that the student is interested in transferring. Transmitted as part of the ADVISE22 request to the both the home and transfer institutions so that they can choose the correct program for the student. |
| P13 | Transfer Term | The term that the student is interested in transferring. |
| P14 | Title | The title of the program that the student is interested in transferring into. |

# Appendix

## Advise22 DTD and XSD

Responses from institutions are expected, but not validated to be returned in this format. The processing of Advise22 responses will attempt to extract as much information as possible out of the institution responses; severe conformance errors to the following XSD will cause the processing to fail and an error message to be displayed to the student.

|  |
| --- |
| <?xml version="1.0" encoding="utf-8"?>  <xs:schema attributeFormDefault="unqualified" elementFormDefault="qualified" xmlns:xs="http://www.w3.org/2001/XMLSchema">  <xs:element name="FACTS\_MESSAGE">  <xs:complexType>  <xs:sequence>  <xs:element name="STANDARD\_BLK">  <xs:complexType>  <xs:sequence>  <xs:element name="STATEKEY" type="xs:string" />  <xs:element name="IPADDRESS" type="xs:string" />  <xs:element name="PORT" type="xs:unsignedShort" />  <xs:element name="RETNDATA" type="xs:string" />  <xs:element name="HTMLKEY" type="xs:string" />  <xs:element name="STUID" type="xs:string" />  <xs:element name="PIN\_PW" minOccurs="0" type="xs:string" />  <xs:element name="RETNCODE" type="xs:string" />  <xs:element name="RETNMESS" type="xs:string" />  </xs:sequence>  </xs:complexType>  </xs:element>  <xs:element name="ADVISE22\_RESP">  <xs:complexType>  <xs:sequence>  <xs:element ref="Student" />  <xs:element ref="Program" />  </xs:sequence>  </xs:complexType>  </xs:element>  </xs:sequence>  <xs:attribute name="Process" type="xs:string" use="required" />  <xs:attribute name="Request" type="xs:string" use="required" />  <xs:attribute name="Wait" type="xs:string" use="required" />  </xs:complexType>  </xs:element>  <xs:element name="Address1" type="xs:string" />  <xs:element name="Address2" type="xs:string" />  <xs:element name="BirthDate" type="xs:string" />  <xs:element name="City" type="xs:string" />  <xs:element name="Code" type="xs:string" />  <xs:element name="Country" type="xs:string" />  <xs:element name="County" type="xs:string" />  <xs:element name="EmailAddress" type="xs:string" />  <xs:element name="Fax" type="xs:string" />  <xs:element name="FirstName" type="xs:string" />  <xs:element name="LastName" type="xs:string" />  <xs:element name="MiddleName" type="xs:string" />  <xs:element name="Name">  <xs:complexType>  <xs:sequence>  <xs:element ref="FirstName" />  <xs:element minOccurs="0" maxOccurs="1" ref="MiddleName" />  <xs:element ref="LastName" />  <xs:element minOccurs="0" maxOccurs="1" ref="Suffix" />  </xs:sequence>  </xs:complexType>  </xs:element>  <xs:element name="Phone" type="xs:string" />  <xs:element name="State" type="xs:string" />  <xs:element name="Term" type="xs:string" />  <xs:element name="Zip" type="xs:string" />  <xs:element name="Address">  <xs:complexType>  <xs:sequence>  <xs:element minOccurs="0" maxOccurs="1" ref="Address1" />  <xs:element minOccurs="0" maxOccurs="1" ref="Address2" />  <xs:element minOccurs="0" maxOccurs="1" ref="City" />  <xs:element minOccurs="0" maxOccurs="1" ref="County" />  <xs:element minOccurs="0" maxOccurs="1" ref="State" />  <xs:element minOccurs="0" maxOccurs="1" ref="Zip" />  <xs:element minOccurs="0" maxOccurs="1" ref="Country" />  <xs:element minOccurs="0" maxOccurs="1" ref="Phone" />  <xs:element minOccurs="0" maxOccurs="1" ref="Fax" />  <xs:element minOccurs="0" maxOccurs="1" ref="EmailAddress" />  </xs:sequence>  </xs:complexType>  </xs:element>  <xs:element name="Program">  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ref="AwardType" />  </xs:choice>  </xs:complexType>  </xs:element>  <xs:element name="Area">  <xs:complexType>  <xs:choice maxOccurs="unbounded">  <xs:element minOccurs="0" maxOccurs="1" ref="Code" />  <xs:element minOccurs="0" maxOccurs="1" ref="Title\_Description" />  <xs:element minOccurs="0" maxOccurs="1" ref="RequirementGroup" />  <xs:element minOccurs="0" maxOccurs="unbounded" ref="CourseGroup" />  <xs:element minOccurs="0" maxOccurs="unbounded" ref="Review" />  <xs:element minOccurs="0" maxOccurs="1" ref="Summary" />  </xs:choice>  <xs:attribute name="AreaType" type="xs:string" />  <xs:attribute name="AreaNum" type="xs:string" />  <xs:attribute default="N" name="Disqualify">  <xs:simpleType>  <xs:restriction base="xs:NMTOKEN">  <xs:enumeration value="Y" />  <xs:enumeration value="N" />  </xs:restriction>  </xs:simpleType>  </xs:attribute>  <xs:attribute default="Old" name="Format">  <xs:simpleType>  <xs:restriction base="xs:NMTOKEN">  <xs:enumeration value="Old" />  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value="[Oo][Rr]" />  <xs:pattern value="[Nn][Oo][Tt]" />  </xs:restriction>  </xs:simpleType>  </xs:union>  </xs:simpleType>  </xs:attribute>  </xs:complexType>  </xs:element>  <xs:element name="Course">  <xs:complexType>  <xs:sequence>  <xs:element ref="CourseId" />  <xs:element minOccurs="0" maxOccurs="1" ref="Title\_Description" />  <xs:element minOccurs="0" maxOccurs="1" ref="RequirementGroup" />  <xs:element minOccurs="0" maxOccurs="unbounded" ref="Review" />  <xs:element minOccurs="0" maxOccurs="1" ref="TermTaken" />  <xs:element minOccurs="0" maxOccurs="1" ref="GradeEarned" />  <xs:element minOccurs="0" maxOccurs="1" ref="HoursEarned" />  <xs:element minOccurs="0" maxOccurs="1" ref="TransferFrom" />  </xs:sequence>  <xs:attribute default="Choice" name="CrsStatus">  <xs:simpleType>  <xs:restriction base="xs:NMTOKEN">  <xs:enumeration value="Completed" />  <xs:enumeration value="Enrolled" />  <xs:enumeration value="Choice" />  </xs:restriction>  </xs:simpleType>  </xs:attribute>  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