

Schools Interoperability Framework Implementation Specification

Version 1.0

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This document is the result of collaborative efforts from the following participants of the School Interoperability Framework initiative.

SIF PARTICIPANTS

- The Administrative Assistants Ltd.
- Advantage Learning Systems, Inc.
- Anoka-Hennepin School District, MN
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PREAMBLE

Schools Implementation Framework (SIF) is the place where companies and educators can participate in the development of specifications that will ensure interoperability in the K-12 instructional and administrative environment. The SIF is not a product, but an industry initiative to develop a technical blueprint for K-12 software that will enable diverse applications to interact and share data now and in the future.

By using the *SIF Implementation Specification v.1.0* in administrative and instructional K-12 products, SIF will:

- Enhance product functionality efficiently
- Facilitate data sharing without incurring expensive customer development costs
- Leverage co-marketing opportunities with partners and distributors
- Provide best of breed solutions to customers easily and seamlessly
- Join industry leaders in creating the next generation framework for education technology

This specification is released with the following provisos to developer and educators.

COMPLIANCE CLAIMS

No organization may claim to be SIF compliant until compliance criteria has been created and their product has been tested for compliance. As marketing, PR and technical materials are being created, companies may use the following designation to describe their company's involvement.

- **SIF Participant.** This means that the organization has paid their SIF dues and has designated people to be technical and marketing resources to the project. SIF participants are involved in the working groups that are writing the specifications and may vote on future versions of the specifications.
- **SIF Endorser.** This is an organization that is building product to the SIF specifications but has not paid SIF dues. SIF endorsers are encouraged to comment on the specifications, but may not vote or help to write future versions of the specifications.
- **SIF Compliant.** Ultimately, this designation will be placed on specific products that have met SIF criteria and passed compliance testing. This designation may not be used until compliance criteria has been written and agreed to by the SIF participants.

COMMENT PERIOD AND PROCESS

SIF wishes to receive comments on any portion of this document. Feedback from developers who have used or implemented any objects at a test site is essential to the continued

development and improvement of the specifications. Comments, testing feedback and organizations willing to share case studies on the results of their testing may post the information at www.sifinfo.org.

DISCLAIMER

The information, software, products, and services included in the *SIF Implementation Specification v.1.0* may include inaccuracies or typographical errors. Changes are periodically added to the information herein. SIF may make improvements and/or changes in this document at any time without notification. Information contained in this document should not be relied upon for personal, medical, legal or financial decisions. You should consult an appropriate professional for specific advice tailored to your situation.

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INTRODUCTION

One of the most pressing challenges for the K-12 education industry today is software interoperability: how to enable different software applications to share information in order to improve efficiency and reduce cost. To meet this challenge, many software companies in the education industry and educational institutions have spearheaded the Schools Interoperability Framework (SIF) initiative. SIF is an effort to promote interoperability between software applications from different vendors without requiring each vendor to learn and support the intricacies of other vendor's applications.

SIF has two deliverables: the *SIF Implementation Specification v.1.0* and the notice of availability of one or more SIF compliant Zone Integration Servers. The Implementation Specification defines the software implementation guidelines for SIF. The Implementation Specification does not make any assumption of what hardware and software products need to be used to develop SIF compliant applications. Instead, it only defines the requirements of architecture, communication, software components, and interfaces between them. The goal of SIF is to ensure that all the SIF compliant applications can achieve interoperability, regardless of how they are implemented. SIF is truly an open industrial initiative. SIF Zone Integration Servers will be created by organizations for use on one or more hardware and operating system platforms. They are required to meet the requirements of the Implementation Specification and will be tested as being compliant with that specification but the specifics of the implementation and any additional features will be left to each developing organization to determine.

The target users of this document include software developers who develop SIF compliant products, technology specialists who deploy SIF solutions for K-12 institutions, and executive managers who need to evaluate the feasibility of SIF.

OBJECTIVES

A SIF implementation must enable different applications to exchange data efficiently, reliably, and securely regardless of what platforms are hosting the applications. Nothing should be designed to preclude the specification implementation with any architecture. To this end HTTPS has been chosen as the default transport protocol for sending SIF's XML messages. HTTPS must always be supported in all SIF implementations.

When HTTP and XML are used together in this way, a truly platform-neutral wire is created, over which any two SIF compliant applications can intercommunicate, independently of the language they are written in, and the operating system and hardware they are deployed on.

The requirement of efficiency implies that the SIF implementation must support both real-time and batch data exchange between different applications. To achieve this goal, the communication mechanism for SIF must be efficient and lightweight. A SIF implementation should also scale well in order to support large numbers of applications.

Reliability implies that when an application sends out a message destined for a receiver, the delivery of the message is guaranteed. This requirement also implies that messages sent by an application will arrive at the receiver in the same order as they were sent and that each message is delivered once and only once.

The SIF security requirement has three aspects, all of which may be optionally invoked by applications, and none of which may preclude compliant application interoperability.

- SIF must enable each message that is sent to SIF to be encrypted in a defined manner so that only the authorized receiver can decrypt and process the message.
- SIF must enable an application to optionally authenticate its partner before messages are exchanged and the data is processed. This is necessary to prevent unauthorized programs from accessing other applications to perform potentially damaging operations.
- SIF must enable access control that can be configured to restrict access to information to designated applications. For example, an application designed for students may not be allowed to request teachers' personal information, nor should it permit students to falsify messages to other students or teachers.

SPECIFICATION ORGANIZATION

1. Preamble
2. Introduction
3. Working Group Overviews
4. Data Model Elements
5. Data Model Objects
6. Data Model Objects – Draft
7. Appendices
8. References

The Preamble includes the compliance claims, comment period information and the disclaimer. The Introduction includes the specification objectives, assumptions and compliance information and details the concepts, architecture, message processing, and HTTP/HTTPS transport layer. The Working Group Overviews contain the objective of the working group and a list of all elements and objects that each working group has created. The Elements section starts by detailing the Infrastructure common elements and is followed by the common elements from the other working groups in alphabetical order. The Data Model section contains the 17 Approved data objects including the SIF_ZoneStatus data object. This section is followed by the Data Models – Draft section that provides details in alphabetical order all of the 37 Draft objects. The Appendices provide a variety of information about open issues; infrastructure status and codes; XML conventions; use of SIF_EncryptionLevel and SIF_AuthenticationLevel; state, country and language codes; relationship codes; status reason and grade level codes; student discipline codes; educational test and subtest codes; and medical codes. The document ends with References.

OBJECTS: FROM CREATION TO IMPLEMENTATION

In order for an object to be included in the specifications it must go through a series of steps. These include the following:

1. The concept is presented to a working group or board member.
2. A draft object is written and reviewed by the working group.
3. Use case scenarios are written for the object.
4. The Common Objects Police (COP) committee reviews the use case scenarios and object for consistency and detail.
5. The object is voted on by the membership.
6. The object is included in the next specification.
7. The object is included in applications.
8. Applications go through compliance testing. Part of the testing application is a list of all objects included in the application and the specification version.
9. Pilot Site and Implementation Showcase Site testing occurs.
10. Applications are implemented in learning environment.
11. Modifications are suggested for an object and the steps start all over again.

WORKING GROUPS

The following working groups are developing specifications. Others may be added.

- Data Analysis & Reporting
- Exceptionalities
- Food Services
- Grade Book
- Human Resources & Financial Management
- Instructional Management
- Infrastructure
- Library Automation
- Student Information Services
- Transportation and Geographic Information

Additional working groups are supporting the project.

- Compliance
- Customer Requirements & Information
- Marketing

ASSUMPTIONS

The authors of this document have made the following assumptions.

- Readers have good understanding of communication protocols such as HTTPS and TCP/IP.
- Readers have an understanding of data encryption and digital signatures based on certificates.
- Readers are familiar with relational databases and data queue service concepts.
- Adequate XML development tools and software libraries (such as an XML Parser) are available to developers when they develop SIF compliant software.

APPLICATION & ZIS COMPLIANCE

An application is compliant when it is compliant with all SIF objects that are in the application. All applications and ZISs wishing to be SIF compliant will be tested at a third party testing facility.

CONCEPTS

This chapter presents the ideas behind the implementation of SIF, including the application and data models that it is based on. It serves as a precursor to further descriptions in following chapters.

ZONE ARCHITECTURE

Although there are many variations of SIF topographies, the common feature is that a number of applications wish to share data. All SIF implementations regardless of their complexity consist of one or more applications with their associated interface agents all being managed by a Zone Integration Server (ZIS).

One typical use of SIF is to connect products from various vendors together within a single school. These applications could include a student information application, a food service program, and a library automation application. Each of these applications will have a vendor provided interface program called an “Agent.”

Since the same school shares these applications, it makes sense to group them together into a logical entity. This entity is referred to as a “Zone” and is managed by a Zone Integration Server (ZIS). A ZIS is required for each zone that is part of the system topography.

There are no predefined sizes for zones so a zone can be as large or small as required in order to meet the needs of the customer. There are also no limits to the number of zones in an installation.

In more complex architectures, there can be multiple zones where each zone can communicate with each other.

Applications rely on their agent to exchange data using a predefined data model. Agents then communicate with other agents using the ZIS as a routing resource. The ZIS also provides access control so the customer can control what applications have access to what SIF data.

DATA MODEL

The data that can be exchanged in SIF is defined using a series of data objects. These objects are expressed using XML and comprise the schemas that define the semantics of information that can be managed by the applications. “StudentSchoolEnrollment,” “StudentPersonal,” and “StaffPersonal” are three of the many predefined data objects.

When an application makes a change in one of the SIF objects, its agent will generate an Event message containing the changes that were made. The Zone Integration Server will receive this event and propagate it to all the other agents that are interested in updates to that particular object.

The Data and Event objects are carried within a SIF Infrastructure message when they are being transferred between agents. Besides the data, each Infrastructure message contains a SIF_Header element that specifies the source of the message and optional authentication information.

Several companies and school districts are creating ZIS for school district use. SIF interoperability does not exist without a compliant ZIS.

APPROVED AND DRAFT OBJECTS

All objects included in the *SIF Implementation Specification v.1.0* are labeled as Approved or Draft. Approved objects are approved for use in development of product; and compliance criteria will be written for them. Draft objects are not approved for pilot or beta testing nor will they be tested for compliance. The working groups have included draft objects in v.1.0 so that developers and system managers know of their potential existence and can use the draft objects in future testing.

The working groups have created objects for efficient data exchange regardless of the platform or application. The objects included in the *Schools Interoperability Framework Implementation Specifications v.1.0* are listed below. The matrix below includes the responsible working groups’ approved objects (bold) that must pass compliance testing, and the draft objects (italic) that will be included in later versions of the specifications. Data Analysis and Reporting will include objects in future versions.

Matrix of SIF Data Objects by Working Group Creator									
June 27, 2000	Legend: * Bold = will have compliance criteria for v.1.0; <i>Italic</i> = Draft								
	Product Category								
Objects*	Except.	Food	Grade Book	HR/Fin	Instr. Mgt	Infra.	Library	SIS	Transport
SIF_ZoneStatus						Yes			
<i>AssessmentInfo</i>					<i>Yes</i>				
<i>AssessmentResult</i>					<i>Yes</i>				
<i>Assignment</i>			<i>Yes</i>						
<i>AssignmentCategory</i>			<i>Yes</i>						
<i>AttendDefinition</i>			<i>Yes</i>						
<i>Billing</i>				<i>Yes</i>					
BusEquipment									Yes
BusInfo									Yes
BusRouteDetail									Yes
BusRouteInfo									Yes
BusStopInfo									Yes
<i>CommentDefinition</i>			<i>Yes</i>						
<i>CourseInfo</i>								<i>Yes</i>	
<i>EmployeeInfo</i>				<i>Yes</i>					
<i>LearningResourceInfo</i>					<i>Yes</i>				
<i>LessonInfo</i>					<i>Yes</i>				
<i>LessonObjectInfo</i>					<i>Yes</i>				
LibraryPatronStatus							Yes		
<i>Payment</i>				<i>Yes</i>					
<i>Purchasing</i>				<i>Yes</i>					
<i>ResourceResult</i>					<i>Yes</i>				
<i>ResourceSourceInfo</i>					<i>Yes</i>				
RoomInfo								Yes	
RoomType								Yes	
<i>SchoolDefinedComment</i>			<i>Yes</i>						
SchoolInfo		Yes					Yes	Yes	
<i>SectionInfo</i>								<i>Yes</i>	
StaffPersonal							Yes	Yes	
<i>StudentAssessment</i>								<i>Yes</i>	
<i>StudentComment</i>			<i>Yes</i>						
StudentContact		Yes						Yes	
<i>StudentCourse Enrollment</i>								<i>Yes</i>	
<i>StudentDailyAttendance</i>		<i>Yes</i>						<i>Yes</i>	
<i>StudentDailyAttendance Total</i>								<i>Yes</i>	
<i>StudentDiscipline</i>								<i>Yes</i>	
<i>StudentGrade</i>			<i>Yes</i>						
StudentMeal		Yes							
<i>StudentMedical</i>		<i>Yes</i>						<i>Yes</i>	
<i>StudentParticipation</i>	<i>Yes</i>								
StudentPersonal		Yes					Yes	Yes	
StudentPicture		Yes					Yes	Yes	
<i>StudentPlacement</i>	<i>Yes</i>								

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StudentSchool Enrollment		Yes					Yes	Yes	
<i>StudentScore</i>			<i>Yes</i>						
<i>StudentSection Attendance</i>			<i>Yes</i>						
<i>StudentSection AttendanceTotal</i>			<i>Yes</i>						
<i>StudentSibling</i>								<i>Yes</i>	
StudentTransportInfo									Yes
<i>TeacherDefined Comment</i>			<i>Yes</i>						
<i>TermInfo</i>			<i>Yes</i>						
<i>TimeWorked</i>				<i>Yes</i>					
<i>VendorInfo</i>				<i>Yes</i>					
<i>W4</i>				<i>Yes</i>					

ELEMENTS

The elements included in this set of specifications are

1. Address
2. Demographics
3. GridLocation
4. HealthContact
5. Immunization
6. Message
7. Name
8. OtherId
9. PhoneNumber
10. Screening
11. SIF_Authentication
12. SIF_Header

The message elements included in this set of specifications are

1. SIF_Ack
2. SIF_Event
3. SIF_Provide
4. SIF_Register
5. SIF_Request
6. SIF_Response
7. SIF_Subscribe
8. SIF_SystemControl
9. SIF_Unprovide
10. SIF_Unregister
11. SIF_Unsubscribe

EVENT REPORTING: A PUBLISH AND SUBSCRIBE MODEL

Event propagation is handled in SIF using a publishing and subscription model: events are published/reported by each application and are received by other applications that have subscribed to them. Once an application's agent publishes an event, the delivery of the event to the subscriber agents is guaranteed.

Each application's agent needs to subscribe to the events that are of interest to the application; otherwise they will not receive those events.

All agents are free to publish events for SIF objects and, in fact, are required to publish events for objects that contain data elements that the associated application modifies. There is no requirement for an agent to explicitly register as a publisher. In order to provide control over who may or may not publish events that get distributed to subscribers, the ZIS provides an access control mechanism. If a given agent does not have the authority to publish a certain event, that event will never be propagated to the other agents.

Each event may have zero or more subscribers. If there are no registered subscribers when an event is posted, it will be discarded.

DATA PROVISION: A REQUEST AND RESPONSE MODEL

SIF also provides a request and response model for use in data queries.

An application agent may register itself to the ZIS as a provider of certain data objects. This allows the ZIS to satisfy a request from an agent to locate the provider of a given data object. There can be only one active provider of a data object within a zone.

When an agent is interested in querying for data (StudentPersonal data, for example), it will issue a request to the ZIS. The ZIS will then consult its list of providers and forward the request to the agent that is providing the object. The provider of the data will then produce a response and send it to its ZIS to be forwarded back to the original requester.

It should be noted that, although an extensive query condition mechanism is envisioned in the future, Version 1 agents are not required to support these complex query conditions. They must, however, support simple query conditions based on the key attributes of each data object. For example, a query for a StudentPersonal object should support a condition involving StudentPersonal/RefId.

COMMUNICATION: AN ASYNCHRONOUS MODEL

In order to ensure scalability and reliability, SIF requires that all communications between agents and Zone Integration Servers be asynchronous in nature. A ZIS or agent cannot be assured that it will get an immediate response to a message it submitted.

The asynchronous communication model can be likened to communicating with someone via e-mail or through the postal office: you send the message, but you don't know when it will be received, let alone when the receiver will respond to you.

By requiring asynchronous communications, a SIF implementation can exploit software designs that achieve high scalability and reliability. For example, even if an agent is not currently connected to SIF, an application can still send messages to the agent knowing that the ZIS will deliver those messages as soon as the agent is available.

SECURITY MODEL

The security model of SIF centers around three areas: Encryption, Authentication, and Access Control. With the exception of encryption, which is a part of the HTTPS transport protocol, a SIF implementation may choose to use any, all, or none of the security options depending upon the needs of a particular installation.

SIF must enable administrators to set the levels of security, no matter what protocols are being used. HTTPS is the required protocol. The levels can span from 0 (minimum level) to the maximum level as applicable to the secured protocol being used.

Encryption

Encryption provides the mechanism to ensure that only the sender and receiver of a message can view the message contents. In a totally secure model, all communications between the agent and ZIS and the ZIS to other zones will be encrypted. The HTTPS protocol, which must be supported by all agents and ZIS, is a secure transport and provides encryption of the data being exchanged.

If additional transports are used for communications, it is important to know if these transports are secure to avoid exposing sensitive data. The SIF provides a method for an agent or ZIS to ensure that a secure path is used in communications. As the message is transferred from one point to another, the ZIS ensures that the transport being used is secure. If a secure channel is specified and the message will pass through an unsecure transport, the ZIS must return an error to the message originator and not transport the message across an unsecure channel.

In order to eliminate duplication of effort, the establishment of a secure channel and encryption is delegated to the transport layer.

Authentication and Validation

The role authentication is to provide a means to ensure that the author of the message is the actual author. Authentication guards against a situation where a foreign agent claims to be a legitimate zone participant and fakes a message to gain access or alter the SIF data.

Another important requirement is to ensure that the message passes through the SIF and arrives at its destination exactly the same as the original message. Authentication can be combined with a message digest and signature to ensure that not only the author is whom it claims to be but also that the message has arrived intact, without modifications.

Authentication support is optional but highly recommended. SIF has chosen the X.509 digital certificate standard to provide both authentication and digital signatures.

Access Control

The SIF must be customizable for specific deployments. This particularly applies to customization for the security policies. For example, a SIF administrator can specify which applications can participate in the SIF deployment, what data objects each application can provide or request, and what events each application can produce and subscribe to.

The access control requirements are discussed more fully under ZIS Requirements.

SIF ARCHITECTURE

This section describes the architecture and components that make up the SIF. It presents the functional requirements for each component. It also defines the interfaces between these components.

ARCHITECTURAL COMPONENTS

SIF implementation is a distributed networking system that consists of a Zone Integration Server (ZIS) and one or more integration agents organized into a zone. The size of the zone is flexible and could consist of a single building, school, a small group of schools, a district, etc. SIF is a scalable solution to data exchange and supports multiple SIF implementations or zones.

A Zone Integration Server is a program that provides integration services to all the agents registered with it so that they can provide data, subscribe to events, publish events, request for data, and respond to requests. It is responsible for all access control and routing within the system.

Each application server requires an agent, which typically is provided by the application vendor, to communicate with other application servers via their respective agents. For example, a school may use a student information application, a food service application, and a library automation application. Each of these applications must have an agent for their application that will act as a go-between between the application and the Zone Integration Server.

In SIF, an agent never talks to another agent directly. Instead, an agent communicates with its ZIS who will manage the connection to the other agent. By having the ZIS manage the routing responsibilities, it allows complex, multi-zone communications to occur between agents that have no direct information about the other. The ZIS acts as the trusted intermediary that brokers the data exchange.

The below diagram illustrates a typical single zone SIF implementation that reflects a single school zone.

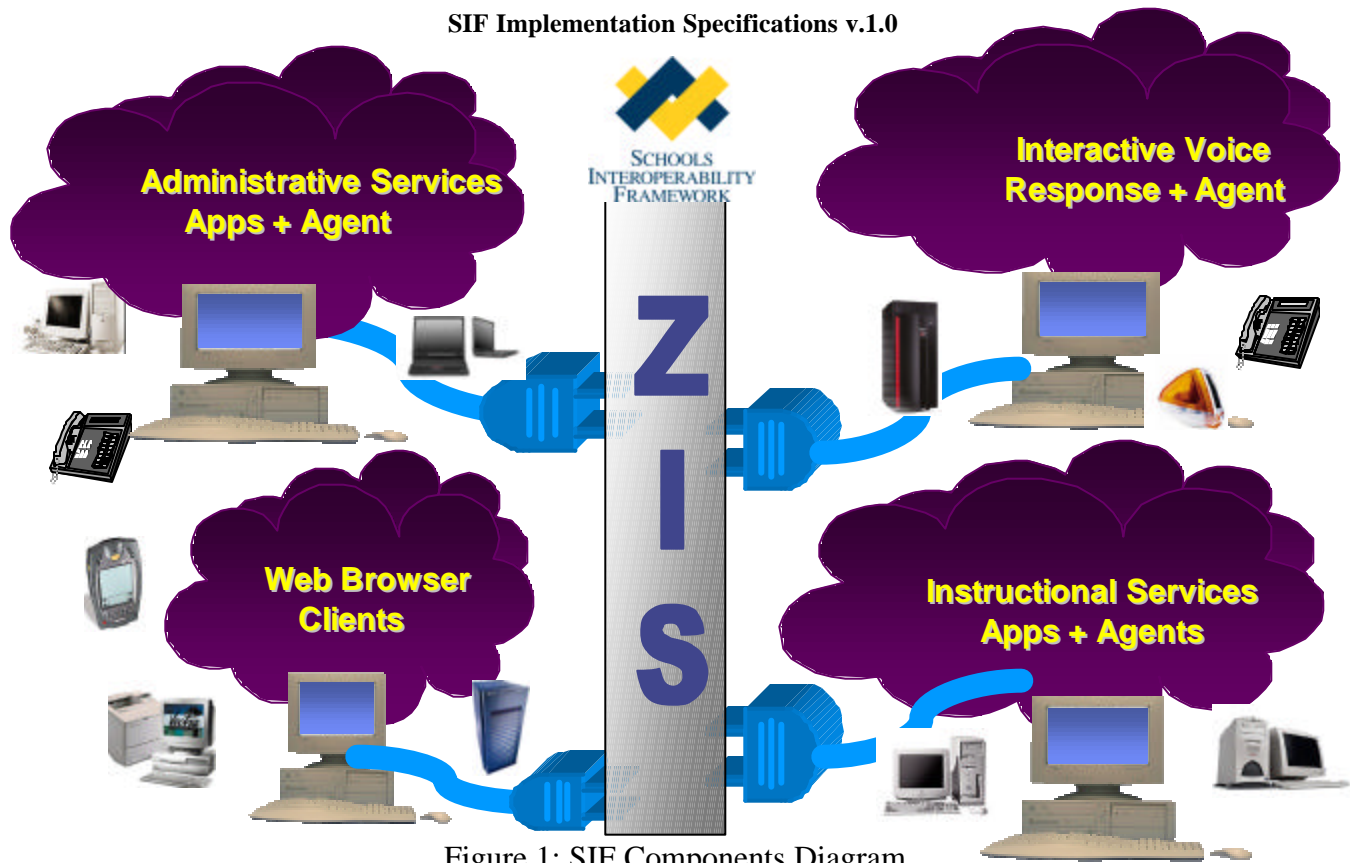


Figure 1: SIF Components Diagram

In some SIF implementations, it may be necessary for SIF compliant applications to be organized into different zones based on the requirements of ownership, organizational structure, geographical proximity, security, or management. A zone is typically defined according to physical boundaries; for example, a zone can consist of all the applications that are connected over a private network and managed by one organization, such as a school. A Zone Integration Server is required in each zone and each application server requires an agent to connect to the ZIS. The ZIS cooperates with the agents to support data exchange between the application servers within the zone. Zone Integration Servers also cooperate with each other to let applications in different zones exchange messages either over a private network or a public network such as the Internet.

Security, scalability, and manageability requirements can also influence the decision of how zones should be defined. For example, for a school district that has a large number of applications, it may be wise to organize the applications into multiple zones in order to achieve better overall performance and scalability in each zone. Conversely, it may be a good idea to put the small number of applications from different school districts into one SIF zone to reduce the administration and infrastructure cost.

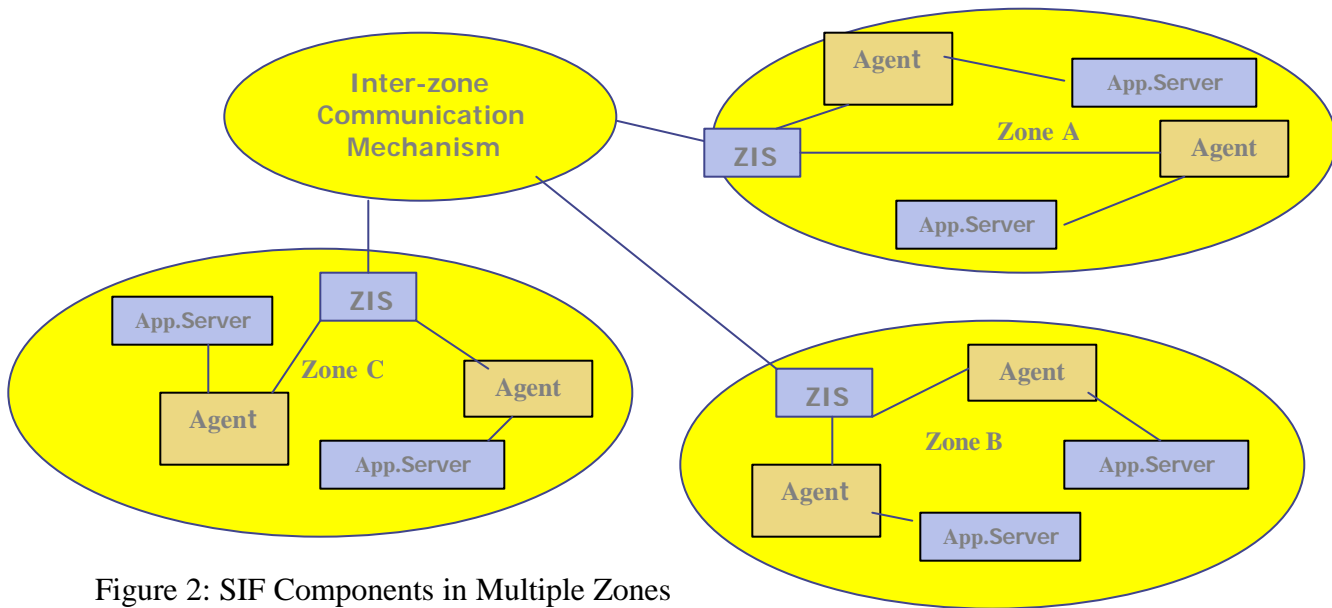


Figure 2: SIF Components in Multiple Zones

NAMING CONVENTIONS FOR AGENTS AND ZONE INTEGRATION SERVERS

SIF requires that each agent and ZIS be identified with a distinct identifier that is unique within the zone where the agent/ZIS belongs. This identifier is carried inside the SIF_Header for each message that the agent/ZIS originates in the SIF_SourceId element and is used by the ZIS to route the response to the message.

The identifier should be chosen such that it is descriptive as to what area of the SIF it serves. For example, the library automation agent for Ramsey Elementary may carry the identifier *RamseyLIB* instead of the less descriptive *CC41Agent*. The Zone Integration Server for Ramsey could be known as *RamseyZIS*.

If certificates are used then the SIF_SourceId for each agent and ZIS must be that same as the Subject Id of their own certificate.

OBJECT IDENTIFIERS

Other agents can reference many of the data objects that comprise a SIF implementation. For example, the StudentPersonal object carries detailed information about a student and every agent that manages student information would want to use this object.

All of these objects carry an attribute that identifies this particular object. The attribute is labeled RefId or some variation (StaffRefId, StudentRefId, ContactRefId, etc.) It is imperative that reference identifiers not clash with another reference identifier. This is especially relevant when an agent manages a database comprised of a mix of these objects. For example, a library database contains Patrons, which are a mix of both Students and Staff.

In order to eliminate the possibility of duplicated reference identifiers and to provide a consistent way of generating these identifiers, SIF requires the use of a globally unique identifier (GUID) whenever a RefId is used.

This identifier is for the use of SIF to identify this object. It does not have to appear on any customer screens and it does not replace any identifiers currently in use by the applications. Application users will still reference the objects in the same way as before. The GUID provides an additional key, which becomes the SIF primary key that agents use to reference this object within SIF.

For further information concerning the generation of GUIDs, refer to the Internet draft concerning GUIDs: <http://www.kashpureff.org/nic/drafts/draft-leach-uuids-guids-00.txt.html>.

AGENT/APPLICATION REQUIREMENTS

Each application that wants to be a SIF application must have an integration agent written for it. An agent is an extension to the application and its job is to communicate with the ZIS. In most cases, the agents are treated as another, specialized client to the application server and the agent runs as a daemon in the background to service SIF requests.

Regardless of type of application, all applications and agents need to perform the following duties.

Establish Connection to ZIS

The agent must establish a connection to the ZIS initially using a register message. This message provides the ZIS information that allows the ZIS to contact the agent in the future if it requires the services of the agent. Since HTTPS is the official standard protocol to use when contacting the ZIS, all agents must be able to support the HTTPS protocol described later in this document.

As part of this connection, the agent can then specify which objects that it can provide and which objects are of interest to the agent (i.e., which objects it subscribes to).

Transmit Application Changes to the ZIS

When the application makes changes to objects that are shared by the SIF, the application generally stores these changes into a temporary repository. The agent is responsible for periodically checking that repository and transferring those changes to the SIF via Events so that they may be propagated to subscribing agents.

After a message has been successfully transferred to the ZIS and the ZIS has indicated that the message has been fully processed, the agent should remove the message from the table or mark it in some manner so that it doesn't get sent to the ZIS again.

If an application does not support an optional field of an object or that element was not changed during the last edit, it must not send an empty element (i.e., <Name/> or <Name></Name>); it should omit the element from the XML stream instead.

Respond to Requests

If an application agent provides any object, the agent must be prepared to handle request messages for that object. This involves the ability of the agent to traverse the application database and construct an XML response stream based upon the parameters of the query request.

When an agent is returning a response, it must ensure that the response packets are no larger than the SIF_MaxBufferSize specified by the request or the agent must return an error.

The request message also contains a SIF_SifVersion that specifies which SIF version the responding agent should use when preparing the response packets. If a responding agent can support the requested SIF version, it should return a response packet using that version. If the agent cannot support the requested SIF version, the agent must return an error.

All agents supporting requests must be able to support returning all of the object fields or a subset of the fields as specified by the query request. For example, the ZIS may request that only a student's graduation year be returned and not the entire StudentPersonal object.

If an application does not support an optional element of an object, it must not return an empty element. Omit the element from the XML stream instead.

The agent must also support object qualification based upon the parameters of the query request, which includes nested conditions.

It should be noted that, although an extensive query condition mechanism is envisioned in the future, Version 1 agents are not required to support these complex query conditions. They must, however, support simple query conditions based on the key attributes of each data object. For example, a query for a StudentPersonal object should support a condition involving StudentPersonal/RefId.

Changes Required to the Vendor's Application

Depending upon the type of architecture, the core application may need to be altered to ensure that the agent is able to forward changes to objects of interest to SIF. For example, an application that edits student data may need to be modified to capture the adds, changes, and deletes made to students and store them into a temporary repository until the agent can forward them to the ZIS. Other architectures provide the ability to trap these changes at a server level eliminating the need for any changes to the application itself.

To meet the SIF requirement of data robustness, it is highly recommended that all changes to objects of interest to SIF be persisted using a database table, local message queue, or other highly reliable storage system. The SIF specification allows for the ZIS and any or all agents to be offline at any given time. Without storing agent changes locally, these changes could be lost if the ZIS was unavailable.

When a new object is created that will be shared with SIF, it is the responsibility of the application adding the record to assign a RefId in the form of a GUID before releasing that object to the framework. The application also needs to maintain the RefId to local identifier index file that is used to map a RefId GUID to an identifier that the application uses locally.

If an application is editing an existing record, it is recommended that only the changed fields be sent to SIF. This will result in smaller message sizes and improved performance.

To avoid unintentional overwriting of data, unsupported fields or fields that have not been changed must not be sent to SIF using empty XML elements (i.e. <Name/> or <Name></Name>); omit the fields from the XML stream instead.

Support Authentication and Digital Signatures

Supporting authentication is not a requirement but it is highly recommended to ensure that your agent will be able to communicate with any ZIS. SIF does not mandate the use of authentication and digital signatures, but it is feasible that many SIF implementations will require the functionality. This is especially true for installations that span multiple zones and may use the Internet to partially transport data.

Another strategy is to leverage the authentication and verification mechanisms that are built into the network operating system or transport protocol. If these services are available, the authentication and verification takes place completely within the underlying security package without requiring an agent to use the authentication elements available in SIF. In most cases, the authentication is very efficient and can be performed more quickly than if the agent and ZIS had to perform the same functions. This option is particularly attractive if communications occur over multiple zones.

The HTTPS (SSL/TLS) layer supports authentication between an agent and a ZIS, or between two ZIS's. If authentication is enabled, a message receiver (agent or ZIS) can trust the SSL/TLS layer to verify that the message in its entirety comes from the claimed sender. If a message has the SIF_Authentication element (a child element to the Message element), the message receiver can choose to further authenticate the message using TLS/SSL compliant mechanism, or simply ignores it by fully trusting the authentication result from the SSL/TLS layer.

ZONE INTEGRATION SERVER REQUIREMENTS

The Zone Integration Server is the central integration point for all the agents in a zone. Depending on the message type, ZIS either saves information in the messages that it receives or forwards the messages to an appropriate agent or zone.

The ZIS implementer is free to internally manage registration and access permissions information in any form that the implementer supports. In order to provide an example of how an administration system may be structured, this document describes a database consisting of Providers, Subscribers, Agents, and Access Control.

Agent/ZIS Registration

The ZIS is responsible for maintaining information about the agents that register with it. This document will not make any distinctions between agents connected directly to a ZIS and those agents connecting through a series of ZIS connections.

The focus of the registration phase is to note how the ZIS may contact the agent in the future. This is essential to allow the ZIS to deliver events and request messages to the agent.

Information about security preferences, the SIF specification version supported by the agent and the maximum size of an incoming packet from the ZIS is also communicated to the ZIS during agent registration and must be stored and honored.

Maintain the Access Control Database

After a ZIS receives a message from an agent and optionally authenticates it, the ZIS needs to check whether this agent is authorized to perform the functions as described in the messages that the agent sends. When an agent tries to inquire about a student's personal information, for example, the ZIS needs to check if the agent has the proper permission to request such information. Access control, or authorization, is needed to ensure that the information available in SIF is accessible only to authorized agents.

The Access Control List (ACL) is the foundation for implementing access control for the SIF. Each ZIS relies on an Authorization Database Table (ADB), which contains the Access Control List (ACL), for each data object. Each entry in the ACL is an ACE (Access Control Entry), which contains an object name, the unique ID for an agent, and the permissions granted to the agent for the object.

Provision and Request for Objects

Each ACE in the ACL for each data object contains the permissions, which include "Provide" and "Request." An agent that is granted the "Provide" permission to an object can become a provider of the object. An agent that is granted the "Request" permission to an object can request the object.

The following are the Access Control Lists for two data objects in the ADB.

Object	Type	ACL	Permission
StudentPersonal	Data	RamseySIS	Provide
StudentPersonal	Data	RamseyFOOD, RamseyLIB	Request

The above table shows that RamseySIS can provide StudentPersonal objects and that RamseyFOOD and RamseyLIB can request StudentPersonal objects.

Reporting and Subscription for Objects

The Authorization Database Table (ADB) also contains an ACL for each data object for reporting and subscription of events containing that object. Each ACE contains the unique ID for an agent and its permissions with regard to the events for that object. The supported permissions for events are "Report" and "Subscribe." An agent that is granted the "Subscribe" permission to an object can subscribe to events for that object; otherwise the subscription request from the agent will be rejected. By the same token, an agent can report events containing an object only if it has been granted the "Report" permission; otherwise the reporting of that event from this agent will be ignored.

Reporting and subscription levels are not granular enough to specify Add, Update, or Delete. If an agent is authorized to report or subscribe to an object, the agent will send or receive all changes, respectively.

The following are the Access Control Lists in the ADB.

Object	Type	ACL	Permission
StudentPersonal	Event	RamseyFOOD, RamseyLIB	Subscribe
StudentPersonal	Event	RamseySIS	Report

The above table shows that RamseySIS can post update events for the StudentPersonal object while RamseyFOOD and RamseyLIB will receive the events posted.

Inter-zone Authorization

Inter-zone authorization is handled in exactly the same way as a local access entry. The difference is that the entire path to the agent must be specified (i.e. SIF_SourceId=DistrictZIS|DistrictSIS).

Maintain Provider Database

The ZIS must accept provision messages from the agents registered with the ZIS if the agents carry the proper access level and permissions. The SIF specification states that there can be only one provider of an object in a zone. If an object already has a provider, the ZIS must reject any additional attempts for provision.

For providers that are located outside of the current zone, the SIF_SourceId of the provider is the full path to that agent. For example, if a provider of StudentPersonal objects is known as DistrictSIS and is registered with a ZIS known as DistrictZIS, the provider of the StudentPersonal object would be stored as DistrictZIS|DistrictSIS.

Maintain Subscriber Database

The ZIS must also accept subscription requests from the agents registered with the ZIS provided that the agents have the proper permissions to subscribe to a given object. The SIF_SourceId of the subscriber is the identifier that the agent used during the registration process. Subscribers outside of the current zone are supported in the exact same manner that providers were supported in provision. Use the full path to the agent (i.e. DistrictZIS|DistrictSIS).

Update SIF_Header SIF_SourceId and SIF_DestinationId

If a message is being forwarded to another agent or zone, the ZIS must update the SIF_SourceId element of the SIF_Header element and append the next destination to it. This is to ensure that the message response will follow the same path as the original message. If the route was RamseyLIB to RamseyZIS to DistrictZIS to DistrictSIS, the SIF_SourceId would contain RamseyLIB|RamseyZIS|DistrictZIS|DistrictSIS by the time the message was received by DistrictSIS.

Upon reaching the final destination agent, the ZIS should copy the SIF_SourceId element into the SIF_DestinationId element prior to sending the message to the agent.

Refresh the SIF_Header SIF_Security Element

When an agent or ZIS uses authentication, the message may contain a SIF_Authentication element. If such an element is present and carries a signature, the ZIS must authenticate the message using the existing signature and then resign the message using the ZIS's certificate before forwarding the message on to the next agent or ZIS.

This is absolutely essential because SIF employs limited trusts, which cut down on the complexity and the need for all parties to have access to all security certificates. In a system where Agent1 is communicating with ZIS1 and ZIS1 is going to forward the message to Agent2, the authentication will fail if the ZIS does not resign the message after validating it from Agent1. This is so because Agent1 has access to the certificate of ZIS1 and Agent2 has access to the certificate of ZIS1. Agent1 and Agent2 do not know about each other and are unable to authenticate successfully.

When multiple zones are used, the trusts move back and forth with only the immediate pair of senders and receivers knowing how to authenticate themselves.

Another important function that the ZIS is required to perform is to reject a request to transfer data over an unsecure channel. If the SIF_Header contains a SIF_Security / SIF_SecureChannel element, the ZIS is required to verify that any transport that the ZIS uses to send and receive data for this message provides at least as much security as is defined by the SIF_AuthenticationLevel and SIF_EncryptionLevel elements. The ZIS is not permitted to drop to a lower level of security in order to handle the message. For example, if the SIF_AuthenticationLevel is set to "1" and the SIF_EncryptionLevel to "2," the ZIS may not use a transport that is less secure (i.e. SIF_AuthenticationLevel of "0" or an SIF_EncryptionLevel of "0" or "1").

Using and honoring the SIF_Authentication and SIF_EncryptionLevel elements ensures that the agent has a reasonable expectation that sensitive data will not be transferred over unsecure transports.

Message Queuing Services

To satisfy the requirements of message robustness and non-stop message delivery, a message queue solution is highly recommended. A good message queue solution should provide the following features.

- Messages in a queue can be saved in permanent storage and will not be lost until an authorized program such as the message sender or receiver requests their removal.
- A message queue server manages all message queues and typically is hosted on a highly reliable and available machine. This usually means that even if the message receiver is unavailable, a sender can still deliver messages to the receiver's queue. The queue server will save the messages permanently until the receiver is ready to retrieve them.
- Security mechanisms to provide authentication and data encryption services.
- Administration tools and message tracking capabilities.
- Available on multiple platforms.

Because of transport requirements including the requirement to return or respond to a SIF_Ack message, a ZIS or other intermediary must manage access to the queues. An agent must not directly post SIF messages or read SIF messages from the queue directly.

Use of Selective Message Blocking (SMB) to Resolve Deadlocks

Description

Selective Message Blocking is a feature that must be implemented by a compliant Zone Integration Server, to enable an agent to request information from other Agents while it is processing a SIF_Event message, without causing communication “deadlock” between an agent and a ZIS.

This feature allows an agent to inform the ZIS with an “Intermediate” SIF_Ack message so that the ZIS will not deliver more SIF_Event messages to the agent. The ZIS, however, can deliver other types of messages such as SIF_Request and SIF_Response messages, to this agent. After it finishes processing the SIF_Event message this agent can send the “Final” SIF_Ack message to the ZIS, which will discard the SIF_Event message and resume sending other pending SIF_Event messages to this agent.

Requirements

- After delivering a SIF_Event message to an agent, the ZIS must not deliver another SIF_Event message until a SIF_Ack has been received, giving the ZIS permission to discard that message.
- If no SIF_Ack is received, this event and all other SIF_Event messages destined for the agent, whether existing or upcoming, are considered frozen. The ZIS will not deliver any messages that are frozen.
- If an error occurred, this SIF_Event must be considered an undelivered message. The next message to be delivered to the agent will be this message.
- The next message to be delivered is the oldest message that isn’t frozen. Once a message type is unfrozen, all messages of the same type are delivered according to the order in which they are received by the ZIS.
- If the ZIS receives a SIF_SystemControl- SIF_Wakeup or SIF_Register message then the block on any frozen messages will be removed and the originally blocked message will be then next message delivered to the Agent.

Examples

Here is an example that illustrates how the behavior works. The table below represents the agent’s message queue being maintained by the ZIS. The message at the top represents the oldest message in the queue and is the message that is currently being processed as the example begins.

Agent Message Queue
SIF_Event message containing a StudentSchoolEnrollment object with an Action of “Add.”
SIF_Event message containing a StudentPersonal object with an Action of “Add.”
SIF_Request message for a StudentPersonal object from another agent – This agent is the provider.
SIF_Event message containing a StudentSchoolEnrollment object with an Action of “Add.”

The agent requires data from a SchoolInfo object that it doesn't have locally. Thus, it will open a channel to the ZIS and submit a SIF_Request for a SchoolInfo object. After submitting the SIF_Request, the agent will return an "Intermediate" SIF_Ack indicating that the ZIS will be contacted later to release the SIF_Event message.

The ZIS will now freeze the delivery of any more SIF_Event messages to this agent until the agent has sent the SIF_Ack releasing the original message:

Agent Message Queue
<i>SIF_Event message containing a StudentSchoolEnrollment object with an Action of "Add." (holding)</i>
<i>SIF_Event message containing a StudentPersonal object with an Action of "Add." (frozen)</i>
<i>SIF_Request message for a StudentPersonal object from another agent – This agent is the provider.</i>
<i>SIF_Event message containing a StudentSchoolEnrollment object with an Action of "Add." (frozen)</i>

The next message to be sent to the agent is the SIF_Request for a StudentPersonal object. For our example, the agent will accept the SIF_Request by returning an "Immediate" SIF_Ack indicating that processing is complete and the agent will hand the SIF_Request off to another part of the agent for handling.

Meanwhile, the ZIS has deposited the SIF_Response from the SchoolInfo provider's agent into the queue. The queue now looks like this:

Agent Message Queue
<i>SIF_Event message containing a StudentSchoolEnrollment object with an Action of "Add." (holding)</i>
<i>SIF_Event message containing a StudentPersonal object with an Action of "Add." (frozen)</i>
<i>SIF_Event message containing a StudentSchoolEnrollment object with an Action of "Add." (frozen)</i>
<i>SIF_Response message containing the SchoolInfo object previously requested.</i>

The next message the agent receives is the SIF_Response. The agent takes the SIF_Response and uses the information from it along with the data in the original StudentSchoolEnrollment object to update its database.

The agent is now completed processing of the original message and opens a channel to the ZIS and sends a "Final" SIF_Ack and the original message identifier. The SIF_Ack says that the agent has completed processing and the ZIS may discard the message.

The agent returns an "Immediate" SIF_Ack telling the ZIS to discard the SIF_Response completing the last message cycle. The ZIS having received this SIF_Ack will discard the message.

Because the agent also sent an SIF_Ack telling the ZIS to discard the original message, the freeze on SIF_Event messages has been lifted and the next message to be sent to the agent is the SIF_Event for a StudentPersonal add:

Agent Message Queue
<i>SIF_Event message containing a StudentPersonal object with an Action of "Add."</i>
<i>SIF_Event message containing a StudentSchoolEnrollment object with an Action of "Add."</i>

“Immediate” SIF_Ack

The “Immediate” SIF_Ack is a SIF_Ack message with status code of “1.” This type of SIF_Ack is returned as a response to a message received by the ZIS and indicates that the agent has persisted or has processed the message and the ZIS MUST remove the message from its queue.

```
<Message xmlns="http://www.sifinfo.org/v1.0/messages">
  <SIF_Ack>
    <SIF_Header>
      <SIF_MsgId>ABCD10580EF250789012AC05</SIF_MsgId>
      <SIF_Date>19990218</SIF_Date>
      <SIF_Time Zone="GMT-08:00">08:39:40</SIF_Time>
      <SIF_SourceId>RamseyLIB</SIF_SourceId>
      <SIF_DestinationId>RamseySIS</SIF_DestinationId>
    </SIF_Header>
    <SIF_OriginalSourceId>RamseySIS</SIF_OriginalSourceId>
    <SIF_OriginalMsgId>10580EF2ABCD50789012AC05</SIF_OriginalMsgId>
    <SIF_Status>
      <SIF_Code>1</SIF_Code>
    </SIF_Status>
  </SIF_Ack>
</Message>
```

“Intermediate” SIF_Ack

The “Intermediate” SIF_Ack is a SIF_Ack message with status code of “2.” This type of SIF_Ack is returned as a response to a message received by the ZIS and indicates that the agent has not completed processing of the message and the ZIS MUST NOT remove the message from its queue. The agent will send a “Final” SIF_Ack to the ZIS in the future to signal that the ZIS can discard the message.

```
<Message xmlns="http://www.sifinfo.org/v1.0/messages">
  <SIF_Ack>
    <SIF_Header>
      <SIF_MsgId>ABCD10580EF250789012AC05</SIF_MsgId>
      <SIF_Date>19990218</SIF_Date>
      <SIF_Time Zone="GMT-08:00">08:39:40</SIF_Time>
      <SIF_SourceId>RamseyLIB</SIF_SourceId>
      <SIF_DestinationId>RamseySIS</SIF_DestinationId>
    </SIF_Header>
    <SIF_OriginalSourceId>RamseySIS</SIF_OriginalSourceId>
    <SIF_OriginalMsgId>10580EF2ABCD50789012AC05</SIF_OriginalMsgId>
    <SIF_Status>
      <SIF_Code>2</SIF_Code>
    </SIF_Status>
  </SIF_Ack>
</Message>
```

“Final” SIF_Ack

A “Final” SIF_Ack is a message with status code of “3.” The agent SENDS this type of SIF_Ack to the ZIS after the agent has completely processed a message where it previously sent an “Intermediate” SIF_Ack. When the ZIS receives this message, it MUST discard the message referenced in the SIF_Ack.

```
<Message xmlns="http://www.sifinfo.org/v1.0/messages">
  <SIF_Ack>
    <SIF_Header>
      <SIF_MsgId>ABCD10580EF250789012AC05</SIF_MsgId>
      <SIF_Date>19990218</SIF_Date>
      <SIF_Time Zone="GMT-08:00">08:39:40</SIF_Time>
      <SIF_SourceId>RamseyLIB</SIF_SourceId>
      <SIF_DestinationId>RamseySIS</SIF_DestinationId>
    </SIF_Header>
    <SIF_OriginalSourceId>RamseySIS</SIF_OriginalSourceId>
    <SIF_OriginalMsgId>10580EF2ABCD50789012AC05</SIF_OriginalMsgId>
    <SIF_Status>
      <SIF_Code>3</SIF_Code>
    </SIF_Status>
  </SIF_Ack>
</Message>
```

Agent Local Queue

An agent can be developed with local queuing mechanism so that it can automatically “cache” incoming messages in a local queue and notify the ZIS that it has already received all the messages with Immediate SIF_Ack messages (which will cause the ZIS to discard the messages that have already been received). The Agent Local Queue (or Agent Queuing Model) can complement the Selective Message Blocking mechanism on the ZIS in the following ways.

- An agent with Agent Local Queue does not need to send any “Intermediate” SIF_Ack to the ZIS. The agent will send the “immediate” SIF_Ack to the ZIS, after the agent receives each incoming message. After receiving the SIF_Ack for a previously sent message, the ZIS can discard that message.
- The Agent Local Queue mechanism must come with an API that allows an agent to select a message of a given type. This essentially calls for the implementation of the SMB mechanism on the agent instead of on the ZIS.

Agent Local Queue (or Agent Queue Model, or AQM) is NOT a required feature of any ZIS or agent product for SIF Specification v.1.0. Agent or ZIS developers can choose not to develop the Agent Local Queue mechanism since this is not part of the compliance requirement for the specification v.1.0 release.

“Pull” and “Push”

Pull and Push delivery modes are both supported with the Selective Message Blocking (SMB) mechanism. When an agent is communicating with the ZIS in “Pull” mode, the ZIS simply returns the first “unfrozen” message to the agent.

Administration

Administration of SIF applies to the configuration and customization mechanisms and components. It is the intent of the Infrastructure Working Group to provide a standardized group of messages to perform this administration.

As Zone Integration Servers are being built using the SIF specification, it is highly recommended that the implementers work closely with the Infrastructure Working Group and participate in the specification of these messages.

It is recommended but not required that an administration program have a web-based front end so that the Zone Integration Server may be easily administered remotely.

Some of the areas that require administration are:

- Communication Services
This includes defining what protocol will be used for agent to communicate with ZIS.
- Security Policies
This includes defining which agent is authorized to connect to a ZIS. It also includes the customization of access control policies for each data object and event object. It may also include installing certificates of Agents and ZIS in each ZIS.
- Inter-zone Communication
This includes defining which ZIS is allowed to participate in Inter-zone Communication, and security policies that apply to ZIS (the same as those that apply to communication between ZIS and Agents)
- Start and stop ZIS
- Add and remove an agent
- Capture error and message logs from ZIS for analysis
It can also track messages to help determine if a message has been delivered to its destination, or the message is still being buffered somewhere waiting to be delivered.
- Report information about ZIS statistics including the agents that are currently registered
- Provide a mechanism to test to see if the agents registered are currently running and able to respond to the ZIS

MESSAGE PROCESSING

To ensure interoperability, SIF defines a set of messages that are exchanged between agents and Zone Integration Servers. The SIF messages are used to perform various operations such as provision, subscription, event report, request and response, and ZIS administration.

MESSAGE VALIDATION

SIF recommends that each message receiver validate any incoming message to ensure that it is a valid SIF message. A message receiver should discard any messages that do not conform to the SIF Message Specification and return an error to the originator of the message.

The SIF Message Specification will evolve over time to include new messages and modifications to messages that have been defined. Each agent and ZIS should explicitly define what version of the SIF Message Specification they support and validate each incoming message to ensure that they can support it.

Message validation for v.1.0 will be done with the XML Data Type Dictionary (DTD) for the corresponding version of the SIF Message Specification. As XML Schema becomes an accepted standard (i.e. a Proposed Recommendation in W3C), future versions of SIF will also support it as a validation mechanism.

MESSAGE IDENTIFICATION

Each message originating from an agent or ZIS needs to have a message identifier, SIF_MsgId that will be used to identify the message. In order to eliminate the possibility of duplicated message identifiers, and to provide a consistent way of generating these identifiers, SIF requires the use of a globally unique identifier (GUID) as message identifiers.

This identifier is for the use of SIF to identify this object. It does not have to appear on any customer screens and it does not replace any identifiers currently in use by the applications. Application users will still reference the objects in the same way as before. The GUID provides an additional key, which becomes the SIF primary key that agents use to reference this object within SIF.

For further information concerning the generation of GUIDs, refer to the Internet draft concerning GUIDs and uuids: .

The reason that a unique identifier is required is that messages are handled asynchronously by SIF. This means that responses for a given request message may not arrive until some time in the future. When the response arrives, it will contain the original SIF_MsgId but no other information about the original message is guaranteed to be provided. The message originator must ensure that it will be able to match up the response with the original message based solely on the message identifier.

MESSAGE ROBUSTNESS

It is important for SIF to guarantee message delivery no matter what happens during a message delivery, including an unexpected network breakdown or system crash. This requires that each agent and ZIS save each message in permanent storage, and only deletes the message after the receiver has returned an Immediate or Final SIF_Ack.

MESSAGE DELIVERY

There are two models for delivering messages to an agent, “Push” and “Pull.” An agent specifies which mode it wants to use when it registers with the ZIS.

“Push” refers to the action by a ZIS to actively deliver messages to an agent without the agent having to initiate contact with the ZIS. When the ZIS receives a message for an agent and the agent is not in “Sleep” mode; the ZIS will initiate contact with the agent and send the message to the agent.

“Pull” refers to the action by an agent to explicitly request a single message from the ZIS. When an agent is ready to receive a message, it sends a “Pull” request to the ZIS, to obtain a message that the ZIS has saved in the queue for the agent. After receiving the pull request, the ZIS will

examine the agent's queue and either returns a message or a status code indicating that no messages are available for the agent.

Both modes serve useful purposes. The key requirement is that both an agent and its ZIS must communicate using the SAME mode to avoid potential conflicts.

The “Push” Model

When an agent has registered using the “Push” mode, the agent assumes that the ZIS will open a transport connection and send the next available message to the agent. An agent can reply to the sent message with an Immediate or Intermediate SIF_Ack.

The “Pull” Model

When an agent has registered using the “Pull” mode, the agent requests a message from the ZIS by sending a SIF_SystemControl – SIF_GetMessage message to the ZIS.

An agent can only issue a SIF_SystemControl – SIF_GetMessage to request a message if the agent has previously sent a successful SIF_Register message specifying Pull mode. If the ZIS receives a SIF_GetMessage request and the agent hasn't registered using the Pull mode, the ZIS must return a SIF_Ack containing an Error Category of “5” and a Error Code of “9” to indicate that agent has registered using Push mode.

After receiving a SIF_GetMessage request from an agent, the ZIS will return the next message to be delivered to the agent. The criteria used to select the message are identical to that used if the ZIS were to Push a message to an agent.

If a message is available for the agent, the ZIS will return a SIF_Ack message with a SIF_Status/SIF_Code of 0 and SIF_Status/SIF_Data containing the message from the queue:

```
<Message xmlns="http://www.sifinfo.org/v1.0/messages">
  <SIF_Ack>
    <SIF_Header>
      <SIF_MsgId>ABCD1058E028D076F083</SIF_MsgId>
      <SIF_Date>19990218</ SIF_Date>
      <SIF_Time Zone="GMT-08:00">08:39:40</SIF_Time>
      <SIF_SourceId>RamseyLIB</SIF_SourceId>
      <SIF_DestinationId>RamseySIS</ SIF_DestinationId>
    </SIF_Header>
    <SIF_OriginalSourceId>RamseySIS</ SIF_OriginalSourceId>
    <SIF_OriginalMsgId>1058ABCDE028D076F083</SIF_OriginalMsgId>
    <SIF_Status>
      <SIF_Code>0</SIF_Code>
      <SIF_Data>...the message from the queue...</SIF_Data>
    </SIF_Status>
  </SIF_Ack>
</Message>
```

An agent can choose to remove the message from the agent's queue on the ZIS by sending an “Immediate” SIF_Ack or it can notify the ZIS that it is processing the message by sending an

“Intermediate” SIF_Ack and later send a “Final” SIF_Ack when the message processing is complete.

If there are no messages in the agent’s queue that can be delivered, the ZIS will return a SIF_Ack message with a SIF_Status/ SIF_Code of 9 to indicate that there are no messages available for the agent:

```
<Message xmlns="http://www.sifinfo.org/v1.0/messages">
  <SIF_Ack>
    <SIF_Header>
      <SIF_MsgId>ABCD1058E028D076F083</SIF_MsgId>
      <SIF_Date>19990218</SIF_Date>
      <SIF_Time Zone="GMT-08:00">08:39:40</SIF_Time>
      <SIF_SourceId>RamseyLIB</SIF_SourceId>
      <SIF_DestinationId>RamseySIS</SIF_DestinationId>
    </SIF_Header>
    <SIF_OriginalSourceId>RamseySIS</SIF_OriginalSourceId>
    <SIF_OriginalMsgId>1058ABCDE028D076F083</SIF_OriginalMsgId>
    <SIF_Status>
      <SIF_Code>9</SIF_Code>
    </SIF_Status>
  </SIF_Ack>
</Message>
```

MESSAGE HANDLING PROTOCOLS

Initial Message Processing

When a message is received, the ZIS should first validate the XML message and then determine if the sender has the proper access and permissions required based on the message contents. If validation or access errors are found, a SIF_Ack with a SIF_Error element should be returned to the caller and no further processing should occur.

Step	Process	Flow Control
1	Validate incoming XML message	Go to Step 3 if XML validates.
2	Prepare a SIF_Ack containing a SIF_Error element. Set SIF_Error/ SIF_Category to indicate XML Validation and place the appropriate error code and description in SIF_Error/ SIF_Code and SIF_Error/ SIF_Desc. Place any additional parser information into SIF_Error/ SIF_ExtendedDesc. Return the SIF_Ack to caller.	Stop processing this message.
3	Examine message SIF_Header to retrieve the SIF_SourceId and the message to get the message type	
4	Using the SIF_SourceId consult the ACL to determine if sender has the proper access and permissions based on the message type and the type of object being manipulated.	Go to Step 6 if the Sender has the proper permissions.
5	Prepare a SIF_Ack containing a SIF_Error element. Set SIF_Error/ SIF_Category to indicate Access and Permissions. Set SIF_Error/ SIF_Code and SIF_Error/ SIF_Desc to appropriate values. Return the SIF_Ack to caller.	Stop processing this message.
6	Forward message to the proper handler based on the message type.	

Registration

Before an agent can begin using SIF, it must register itself in order to provide the data that the ZIS needs to interact with the agent. This process is handled using a SIF_Register message.

SIF_Register processing (Non protocol change)

Step	Process	Flow Control
1	Examine SIF_SifVersion and determine if the ZIS can handle the version.	Go to Step 3 if the ZIS can handle the SIF version specified by agent.
2	Prepare a SIF_Ack containing a SIF_Error element. Set SIF_Error/ SIF_Category to indicate Registration and SIF_Error/ SIF_Code and SIF_Error/ SIF_Desc to indicate that the ZIS cannot handle SIF messages in the version requested. Return the SIF_Ack to the caller.	Stop processing this message.
3	Examine SIF_MaxBufferSize and verify that it is greater than or equal to the minimum value for the ZIS	Go to Step 5 if SIF_MaxBufferSize is large enough.
4	Prepare a SIF_Ack containing a SIF_Error element. Set SIF_Error/ SIF_Category to indicate Registration and SIF_Error/ SIF_Code and SIF_Error/ SIF_Desc to indicate that the SIF_MaxBufferSize is too small to be supported by the ZIS. Return the SIF_Ack to the caller	Stop processing this message.
5	Perform some validation of the SIF_Protocol element to be sure that the agent callback information is supplied.	Go to Step 7 if SIF_Protocol information appears valid.
6	Prepare a SIF_Ack containing a SIF_Error element. Set SIF_Error/ SIF_Category to indicate Registration and SIF_Error/ SIF_Code and SIF_Error/ SIF_Desc to indicate that the protocol is not supported or authorized. Return the SIF_Ack to the caller	Stop processing this message.
7	Examine the SIF_EncryptionLevel and verify that it is supported and meets the minimum requirements for the ZIS.	Go to Step 9 if the SIF_EncryptionLevel is supported.
8	Prepare a SIF_Ack containing a SIF_Error element. Set SIF_Error/ SIF_Category to indicate Registration and SIF_Error/ SIF_Code and SIF_Error/ SIF_Desc to indicate that the encryption level isn't supported. Return the SIF_Ack to the caller	Stop processing this message.
9	Examine the SIF_AuthenticationLevel and verify that it is supported and meets the minimum requirements for the ZIS.	Go to Step 11 if the SIF_AuthenticationLevel is supported.
10	Prepare a SIF_Ack containing a SIF_Error element. Set SIF_Error/ SIF_Category to indicate Registration and SIF_Error/ SIF_Code and SIF_Error/ SIF_Desc to indicate that the authentication level isn't supported. Return the SIF_Ack to the caller	Stop processing this message.
11	Store data from the SIF_Register message into the agent's database profile.	
12	If the agent was previously registered and is requesting a new protocol, transfer control to the "agent requesting protocol change" processing.	Transfer to protocol change processing if previously registered and a protocol change is requested.
13	Prepare a SIF_Ack. Return the SIF_Ack to the caller.	Stop processing this message.

Another use of the SIF_Register message is to request the use of another protocol besides the default HTTPS. If the ZIS receives a SIF_Register message containing protocol information different than the current settings, it should process the message as normal but then continue on to the protocol change processing.

When an agent wishes to use a different protocol, it sends a SIF_Register message with the SIF_Protocol elements indicating the new protocol information including the details of how the ZIS can contact the agent using the new protocol. If the protocol is supported and authorized by the ZIS, it will return a SIF_Register of its own describing how the agent may contact the ZIS using the new protocol. To complete the transaction, the agent switches to the new protocol and contacts the ZIS using the information from the SIF_Register message returned by the ZIS. If connect was made with the ZIS, the ZIS will route any communications to the agent over the new transport.

SIF_Register processing (Agent protocol request processing)

Step	Process	Flow Control
1	Examine message and retrieve the SIF_Protocol element information from the message.	
2	Confirm that ZIS can use this protocol and that the protocol meets the security policies that the ZIS has set.	Go to Step 4 if protocol is supported and authorized.
3	Prepare a SIF_Ack containing a SIF_Error element. Set SIF_Error/ SIF_Category to indicate Registration and SIF_Error/ SIF_Code and SIF_Error/ SIF_Desc to indicate that the protocol is not supported or authorized. Return the SIF_Ack to the caller and do not make any changes to the communication protocol settings.	Stop processing the message.
4	Prepare a SIF_Ack containing a SIF_Status element. Set SIF_Status/ SIF_Code to indicate success and add a SIF_Register message to SIF_Status/ SIF_Data element containing information as to how the agent can contact the ZIS under the new protocol.	
5	Return the SIF_Ack to caller. Do not update the protocol information in the agent's profile until later.	Stop message processing (Wait for the SIF_Register on the new protocol).
6	Agent contacts the ZIS again using the new protocol.	
7	Prepare a SIF_Ack response object filling in the SIF_Header, SIF_OriginalSourceId and SIF_OriginalMsgId elements.	
8	Prepare a SIF_Ack. Return the SIF_Ack to the caller and save the protocol information to agent's profile. All communications between the ZIS and agent will use this protocol.	Stop processing this message.

When an agent is going to be uninstalled and removed from the SIF, the agent should send a SIF_Unregister message. When a ZIS receives this message from an agent, it performs the steps outlined in the SIF_Unprovide message and SIF_Unsubscribe message. The ZIS will also remove any registration information and remove the agent from its list of registered agents.

It is recommended that the ZIS not remove access control data from its database as a replacement agent may be installed. Keeping the access permissions is optional, however.

SIF Unregister processing

Step	Process	Flow Control
1	Examine message and retrieve the SIF_SourceId of the message.	Go to Step 3 if SIF_SourceId is currently registered with the ZIS.
2	Prepare a SIF_Ack containing a SIF_Error element. Set SIF_Error/ SIF_Category to indicate Registration and SIF_Error/ SIF_Code and SIF_Error/ SIF_Desc to indicate that the agent is not currently registered with the ZIS. Return the SIF_Ack to the Caller.	Stop processing the message.
3	Perform SIF_Unprovide and SIF_Unsubscribe functionality. ZIS must remove agent from its list of registered agents.	
4	Prepare a SIF_Ack. Return the SIF_Ack to caller.	Stop processing the message.

Provision

An agent makes an object available to be requested by a process called Provision that is represented by the SIF_Provide message. If an agent wishes to withdraw an object previously provided, the SIF_Unprovide message is used.

The SIF_Provide/SIF_Unprovide messages can contain provision requests for multiple objects. The ZIS must treat all of the objects as a set; if there is an error with one of the objects then there should be no change to the Providers database.

SIF Provide processing

Step	Process	Flow Control
1	Prepare a SIF_Ack.	
2	Examine the message and retrieve the name of an object to be provided.	Go to Step 8 if there are no further object provisions to process in the message.
3	Check the Providers database to see if this object has already been provided.	Go to Step 7 if the object does not have a provider.
4	Is the current provider the same as the SIF_SourceId of this message?	Go to Step 6 if the current provider is different from the SIF_SourceId.
5	Add a SIF_Error element to the SIF_Ack. Set SIF_Error/ SIF_Category to indicate Provision and set SIF_Error/ SIF_Code and SIF_Error/ SIF_Desc to indicate that the object already has a provider. Place the name of the provider in SIF_Error/ SIF_ExtendedDesc.	Go to Step 9.
6	Add a SIF_Status element to the SIF_Ack. Set SIF_Status/ SIF_Code to indicate that the caller is already the provider of this object. Place the object name in SIF_Status/ SIF_Data.	Go to Step 2.
7	Permission for the sender to perform this operation on this object should be granted under Step 6 of the Initial Message Process handler. Add a record in the Providers database to indicate that SIF_SourceId is the provider of this object. If an error occurs, add a SIF_Error element to the SIF_Ack.	If an error occurs go to Step 9 otherwise go to Step 2.
8	Return the SIF_Ack to the caller	Stop processing the message.
9	Undo all changes to the Providers database. Return the SIF_Ack to the caller.	Stop processing the message.

SIF Unprovide processing

Step	Process	Flow Control
1	Prepare a SIF_Ack.	
2	Examine the message and retrieve the name of an object to be unprovided.	Go to Step 7 if there are no further objects to process in the message.
3	Check the Providers database to see if the SIF_SourceId is providing this object.	Go to Step 5 if the SIF_SourceId is the current provider.
4	Add a SIF_Error element to the SIF_Ack. Set SIF_Error/ SIF_Category to indicate Provision and set SIF_Error/ SIF_Code and SIF_Error/ SIF_Desc to indicate that SIF_SourceId is not the provider of the object.	Go to Step 8.
5	Remove the record in the Providers database that marks SIF_SourceId as the provider of this object. If an error occurs, add a SIF_Error element to the SIF_Ack.	If an error occurs go to Step 8 otherwise go to Step 6.
6	Cancel any SIF_Requests or SIF_Responses that are in process. When a SIF_Response is received return a SIF_Ack containing a SIF_Error element. Set SIF_Error/ SIF_Category to indicate Request and Response and SIF_Error/ SIF_Code and SIF_Error/ SIF_Desc to indicate that the Request is canceled. If an error occurs, add a SIF_Error element to the SIF_Ack.	If an error occurs go to Step 8 otherwise go to Step 2.
7	Return the SIF_Ack to the caller	Stop processing the message.
8	Undo all changes to the Providers database. Return the SIF_Ack to the caller.	Stop processing the message.

Subscription

An agent requests to receive events for an object by a process called Subscription that is represented by the SIF_Subscribe message. If an agent wishes to stop receiving Events for a previously subscribed object, the SIF_Unsubscribe message is used.

The SIF_Subscribe/SIF_Unsubscribe messages can contain subscription requests for multiple objects. The ZIS must treat all of the objects as a set, if there is an error with one of the objects then no should be no change to the Subscribers database.

SIF Subscribe processing

Step	Process	Flow Control
1	Prepare a SIF_Ack.	
2	Examine the message and retrieve the name of an object to be subscribed to.	Go to Step 6 if there are no further object subscriptions to process in the message.
3	Check the Subscriber database to see if this SIF_SourceId has already subscribed to this event.	Go to Step 5 if the SIF_SourceId does not have a subscription to this event.
4	Add a SIF_Status element to the SIF_Ack. Set SIF_Status/ SIF_Code to indicate that the caller is already a subscriber for this object's events. Place the object name in SIF_Status/ SIF_Data.	Go to Step 2.
5	Permission for the sender to perform this operation on this object should be been granted under Step 6 of the Initial Message Process handler. Add a record in the Subscriber database to indicate that SIF_SourceId is a subscriber of this object's events. If an error occurs, add a SIF_Error element to the SIF_Ack.	If an error occurs go to Step 7 otherwise go to Step 2.

Step	Process	Flow Control
6	Return the SIF_Ack to the caller.	Stop processing the message.
7	Undo all changes to the Subscribes database. Return the SIF_Ack to the caller.	Stop processing the message

SIF Unsubscribe processing

Step	Process	Flow Control
1	Prepare a SIF_Ack.	
2	Examine message and retrieve the name of the object to be unsubscribed.	Go to Step 7 if there are no further objects to process in the message.
3	Check the Subscribers database to see if the SIF_SourceId is subscribed this object event.	Go to Step 5 if the SIF_SourceId is a current subscriber.
4	Add a SIF_Error element to the SIF_Ack. Set SIF_Error/ SIF_Category to indicate Subscription and set SIF_Error/ SIF_Code and SIF_Error/ SIF_Desc to indicate that SIF_SourceId is not a current subscriber of the object's events.	Go to Step 8.
5	Remove the record in the Subscribers database that marks SIF_SourceId as a subscriber of this object's events. If an error occurs, add a SIF_Error element to the SIF_Ack.	If an error occurs go to Step 8 otherwise go to Step 2.
6	Remove any events in SIF_SourceId's queue that refer to the unsubscribed object. If an error occurs, add a SIF_Error element to the SIF_Ack.	If an error occurs go to Step 8 otherwise go to Step 2.
7	Return the SIF_Ack to the caller.	Stop processing the message.
8	Undo all changes to the Subscribes database. Return the SIF_Ack to the caller.	Stop processing the message.

Event Reporting

When an application has made a change in an object that is part of the SIF, the agent will send a SIF_Event message to its Zone Integration Server so the framework may distribute it.

SIF Event processing

Step	Process	Flow Control
1	Examine message and retrieve the name of the object.	
2	Permission for the sender to perform this operation on this object should be granted under Step 6 of the Initial Message Process handler. Check the Subscriber database to see if there are any subscribers for the event.	Go to Step 4 if there are no subscribers for this object.
3	Create a new message for this event and place a copy into each subscribing agent's queue.	
4	Return a SIF_Ack to the caller.	Stop processing the message.

Request Protocol

When an agent needs to submit a request for an object, it uses the SIF_Request message. The ZIS will attempt to locate a provider for the object and then forward the request to that provider.

The requesting agent can then expect to receive a SIF_Response message containing the response data or a SIF_Ack to indicate a failure in fulfilling the request.

Request processing

Step	Process	Flow Control
1	Prepare a SIF_Ack.	
2	Permission for the caller to perform this operation on this object was confirmed during the initial message process.	
3	Examine the Providers database to locate the provider of the requested object.	Go to Step 6 if a provider was located.
4	Add a SIF_Error element with the SIF_Error/ SIF_Category set to indicate Request and Response and SIF_Error/ SIF_Code and SIF_Error/ SIF_Desc to indicate that no provider was found. Return the SIF_Ack to the caller.	Stop processing the message.
5	Deposit the request in the provider's queue or forward the request to another zone if the provider is located outside of the current zone.	
6	Return an "Immediate" SIF_Ack to the caller to indicate that request has been sent.	Stop processing the message.

Response Protocol

Once a request has been delivered to the agent that can handle it, the agent must examine the request paying particular attention to the SIF_SifVersion and SIF_MaxBufferSize elements.

If an agent is unable to return the object represented in the SIF_SifVersion specified in the SIF_Request, it should immediately return a SIF_Ack containing a SIF_Error element. After successfully transferring the SIF_Ack to its ZIS, the agent has no further need to process the request.

The other issue that must be considered is the SIF_MaxBufferSize. This specifies that maximum size of any SIF_Response message that the originating agent can handle. It is the agent's responsibility to group the response data such that the maximum packet size never is exceeded. If, for some reason, the agent cannot honor the SIF_MaxBufferSize, it must return a SIF_Ack containing a SIF_Error element. After successfully transferring the SIF_Ack to its ZIS, the agent has no further need to process the request.

HTTP/HTTPS TRANSPORT LAYER

In order to ensure that all agents and Zone Integration Servers can communicate with each other regardless of the vendor of the agents and ZIS, all agents and ZIS implementations must support the SIF HTTPS transport layer protocol. This protocol provides for secure communications and can support limited authentication functions.

This section describes the transport layer protocol that must be used when communicating between agent and ZIS.

If a vendor decides to offer an HTTP transport in addition to the required HTTPS transport, the protocol for HTTP must be the same as described for the HTTPS implementation.

CONCEPTS

The architecture for implementing SIF transactions over HTTP/HTTPS is built around the following key concepts:

Message

A Message must be one of the XML types defined in Infrastructure Message specification. These include SIF_Register, SIF_Event, SIF_Subscribe, etc.

Receiver

A Receiver is any entity, which is capable of processing Messages. Note that a Receiver is conceptually distinct from a SIF Destination, though they do refer to the same entities and in many cases will have the same identity. The difference is that a Receiver is the immediate processor of a Message, while a Destination is the ultimate consumer of a Message.

Server

A Server is an entity capable of receiving HTTP Methods. It is associated with one or more Receivers, which must all belong to the same Zone.

Client

A Client is an entity capable of invoking HTTP Methods on a Server, and receiving its reply.

Method

A Method is any of the requests defined in Section 9 of the HTTP specification (HyperText Transport Protocol 1.1 Specifications, rfc2616, URL: <http://www.ietf.org/rfc>). The SIF HTTP/HTTPS transport uses HTTP Methods to send and retrieve SIF Messages.

Reply

A Reply is the synchronous HTTP Response by which the Server replies to the Client. It must conform to the HTTP specification; particularly the Status Codes defined in Section 10 (HyperText Transport Protocol 1.1 Specifications, rfc2616, URL: <http://www.ietf.org/rfc>). The Server must generate an appropriate Reply for all Methods that must include a SIF_Ack message in the reply body.

Notice

A Notice is the primary type of SIF transaction. It is implemented as an HTTP Method that contains a Message and is sent to a Receiver. All Notices must be sent using the HTTP POST Method.

CONFIGURATION

The following section defines configuration guidelines that must be followed by SIF implementers.

Asynchronous Communications

In order to support asynchronous communications between the ZIS and agent, both the agent and ZIS must act as a Client and a Server. When the agent contacts the ZIS, it is operating as a Client and the ZIS is the Server. When the ZIS contacts the agent to deliver a SIF_Event or SIF_Request, the agent acts as a Server with the ZIS as the Client.

Security

Any security mechanisms implemented must negotiate protocols using eXtensible Style Language (XSL), the primary negotiation protocol used by HTTPS. Vendors may use any encryption and authentication protocols with the proviso that there must be an Internet Draft or RFC describing how to use it with XSL.

Ports

The exact port(s) used for communication must be configurable on a per-installation basis. In general, port 443 is recommended as the port for HTTPS and port 80 is recommended as the port for HTTP. The port numbers are configurable by each school and the actual port number being used by the ZIS or Agent will be communicated to other programs as an URL address during the registration phase.

Response Headers

All Notices and Replies must specify the XML media type as:

Content-Type:application/xml;charset="utf-8"

If the protocol being used is HTTPS, the Client must include the following headers in its Notice to ensure that the Server will attempt an upgrade of an existing connection to a higher level of security using TLS.

Upgrade: TLS/1.0
Connection: Upgrade

It is not recommended that a Client/Server connection be made using HTTP. However, if the Server grants a protocol change to HTTP, the inclusion of the Upgrade and Connection headers is not required.

METHODS

This section uses the above definitions to summarize the syntax and status codes of the various HTTP Methods in a SIF context.

A vendor may support additional HTTP based uses (WebDAV, etc.) over the same transport channel. However, these extended uses must be clearly documented in the Zone Integration Server or agent documentation that is provided by the vendor. All vendors must support the following methods as documented and any vendor extended uses must not interfere with the processing of these methods.

Notice

A Notice Method must be used to submit an Infrastructure message to SIF. The Infrastructure message is contained in the POST data. The Receiver will return a SIF_Ack that will indicate whether or not the Sender may discard the message immediately or whether it must persist with the message until it receives another SIF_Ack in the future.

200 OK

This indicates that the Notice was submitted to the Server and the Server has responded with a SIF_Ack message. The consumer should examine the SIF_Ack to determine what steps the consumer needs to take next.

3XX, 4XX, 5XX Transport error

This indicates that a transport error has occurred between the originating client and the Server. Refer to Section 10 of the HTTP 1.1 Specification for the meaning of the response code.

WORKING GROUP OVERVIEWS

INFRASTRUCTURE WORKING GROUP

INTRODUCTION

Contact for Questions:

- **Allan Kong, Microsoft** **allank@microsoft.com**
- **Ron Kleinman, Sun Microsystems** **ron.kleinman@eng.sun.com**

The SIF Infrastructure Working Group is responsible for designing the SIF messages and protocols that are used to transmit data objects and events.

In order to enable applications to exchange their defined data objects and events, some mechanism must be defined to provide the transport functionality. The SIF messages defined by the Infrastructure Working Group provide this functionality.

These SIF messages are used by applications to register themselves, provide for data objects, subscribe to events, request data objects, respond to requests, and to provide ZIS administration functions.

All objects detailed in the Infrastructure Working Group data models have Approved status. In order to support universally available administration functions, the Infrastructure Working Group will be adding additional objects.

ELEMENTS

The following elements are found in this section.

1. **Message**
2. **SIF_Authentication**
3. **SIF_Header**

MESSAGE ELEMENTS

1. **SIF_Ack**
2. **SIF_Event**
3. **SIF_Provide**
4. **SIF_Register**
5. **SIF_Request**
6. **SIF_Response**
7. **SIF_Subscribe**
8. **SIF_SystemControl**

- 9. SIF_Unprovide
- 10. SIF_Unregister
- 11. SIF_Unsubscribe

OBJECT

Approved, Mandatory

- 1. SIF_ZoneStatus

EXCEPTIONALITIES WORKING GROUP

INTRODUCTION

Contact for Questions:

- **Mary Beth Janes**
- **Rich Sanders**

mjanes@apple.com
richs@ltools.com

The Exceptionalities Working Group defines the data model for exceptionality and special needs applications. This would include such programs that provide information about the placement and education of students with disabilities, students in federally funded programs, and students who are in special school programs. These programs will be referred to as exceptionality program(s).

Because there is a separate data collection system for the monitoring of students who receive specialized services that are not available to the typical students, this model is important to maintain basic information that can be shared between programs. Thus the data model for this group will enable schools to use data that will identify students with special needs and their special requirements.

All objects detailed in the Exceptionalities Working Group Data Model have required status and therefore are provided so that developers creating SIF compliant products may know what objects are required for version one.

OBJECTS

Draft

- 1. StudentParticipation**
- 2. StudentPlacement**

FOOD SERVICES WORKING GROUP

INTRODUCTION

Contact for Questions:

- **David Guidos, SNAP Systems** **daveg@snapsystems.com**

The SIF Food Services Working Group has identified and defines the objects and events required to support data exchange using SIF. The working group has identified the need for a single new approved object called StudentMeal whose purpose is to communicate the current meal status of a given student.

This object will return information such as the amount of remaining breakfast/lunch credits, cash balance, meal status (free/reduced) etc. It is important to note that this object will return current status information only. It is not intended to provide historical transaction reporting.

This object is designed to be a “read only” object that is returned as a result of a query. As such, there are no events defined to create, update, or delete an object of this type.

OBJECTS

Approved, Mandatory

1. StudentMeal

GRADEBOOK WORKING GROUP

INTRODUCTION

Contact for Questions:

- Marge Abrams, Jackson Software mla@jacksoncorp.com
- Russ Cruickshanks, Misty City Software russ@mistycity.com

The Gradebook Workgroup as identified and defined the objects and events required to support data exchange for student grades, comments, attendance, and scores. All objects detailed in the Gradebook Working Group have draft status and therefore are provide so that developers creating SIF compliant products may know what objects will be coming soon.

OBJECTS

Draft

1. Assignment
2. AssignmentCategory
3. AttendanceDefinition
4. CommentDefinition
5. SchoolDefinedComment
6. StudentComment
7. StudentGrade
8. StudentScore
9. StudentSectionAttendance
10. StudentSectionAttendanceTotal
11. TeacherDefinedComment
12. TermInfo

HR/FINANCIALS WORKING GROUP

INTRODUCTION

Contact for Questions:

- **Curtis Crawford, DataTeam** **ccrawford@datateam.com**

The SIF HR/Finance Working Group as identified and defined the objects and events required to support data exchange using SIF.

The HR/Finance Working Group has defined several data objects to facilitate the transfer of information between systems that process human resource and financial administration data. The group has focused on the most valuable information for interoperability between systems, but has not focused on information that is primarily used within a typical HR or financial system.

OBJECTS

Draft

- 1. Billing**
- 2. EmployeeInfo**
- 3. Payment**
- 4. Purchasing**
- 5. TimeWorked**
- 6. VendorInfo**
- 7. W4**

INSTRUCTIONAL MANAGEMENT WORKING GROUP

INTRODUCTION

Contact for Questions:

- **Dick Robinson, AAL**

dickrobinson2@msn.com

This section describes the objects in the data model for the SIF Instructional Management Working Group. The scope for the instructional management data model includes lessons, learning resources and assessments. Basic information about the lessons and lesson objectives help map them to learning resources and supports locating an appropriate assessment. Learning resources do not have to be software, but can be computer instruction products (courseware) that would use SIF objects to expose information about the courseware (ResourceSourceInfo, LearningResourceInfo, and AssessmentInfo) and return information after use by a learner (ResourceResult, and AssessmentResult) to any SIF compliant management system or other application.

All objects detailed in the Instructional Management Working Group have draft status.

OBJECTS

Draft

1. **AssessmentInfo**
2. **AssessmentResult**
3. **LearningResourceInfo**
4. **LessonInfo**
5. **LessonObjectiveInfo**
6. **ResourceResult**
7. **ResourceSourceInfo**

LIBRARY AUTOMATION WORKING GROUP

INTRODUCTION

Contact for Questions:

- **Ralph Iden, Follett Software** [**riden@fsc.follett.com**](mailto:riden@fsc.follett.com)

This section defines the objects, events, and exceptions that the members of the SIF Library Automation Working Group have identified as being required to support data exchange using SIF. The working group has identified the need for an approved object called LibraryPatronStatus whose purpose is to communicate the current library status of a given Student or Teacher.

The LibraryPatronStatus object will return information such as the number of titles currently checked out, the number and amount of any fines or refunds assessed. It is also able to return an enumerated list of the books currently checked out, fines assessed, and holds for titles that are ready for the student or teacher to pick up.

OBJECTS

Approved, Mandatory

- 1. LibraryPatronStatus**

STUDENT INFORMATION SERVICES

INTRODUCTION

Contact for Questions:

- **Bill Duncan, Chancery Software** **billd@chancery.com**
- **Xavier Wiechers, Chancery Software** **xavierw@chancery.com**

This section defines the objects, events, and exceptions that the members of the SIF Student Information Services Working Group have identified as being required to support data exchange using SIF.

Objects and elements detailed in the Student Information Services Working Group are listed below. Compliance criteria will be written for the Approved objects.

ELEMENTS

1. **Address**
2. **Demographics**
3. **GridLocation**
4. **Name**
5. **OtherID**
6. **PhoneNumber**

OBJECTS

Approved, Mandatory

1. **SchoolInfo**
2. **StaffPersonal**
3. **StudentContact**
4. **StudentPersonal**
5. **StudentSchoolEnrollment**

Approved, Optional

1. **RoomInfo**
2. **RoomType**
3. **StudentPicture**

Draft

1. **CourseInfo**
2. **SectionInfo**
3. **StudentAssessment**
4. **StudentCourseEnrollment**
5. **StudentDailyAttendance**

- 6. StudentDailyAttendanceTotal**
- 7. StudentDiscipline**
- 8. StudentMedical**
- 9. StudentSibling**

TRANSPORTATION AND GEOGRAPHIC INFORMATION WORKING GROUP

INTRODUCTION

Contact for Questions:

- Doug Hamlin, Versatrans/Creighton Manning [**doug.hamlin@versatrans.com**](mailto:doug.hamlin@versatrans.com)

This section defines the objects, events, and exceptions that the members of the SIF Transportation and Geographic Information Working Group have identified as being required to support data exchange using SIF. All elements and objects will have compliance criteria created for them.

ELEMENTS

1. GridLocation

OBJECTS

Approved, Mandatory

1. BusInfo
2. BusRouteDetail
3. BusRouteInfo
4. BusStopInfo
5. StudentTransportInfo

Approved, Optional

1. BusEquipment

DATA MODEL ELEMENTS

INFRASTRUCTURE

ELEMENTS

The characteristics for all of the tables in this section use the following codes.

Characteristics Codes	
R	Required Attribute
M	Mandatory Element
O	Optional Element
C	Conditional Element
MR	Mandatory & Repeatable Element
OR	Optional & Repeatable Element
CR	Conditional & Repeatable Element

Name	Message
Description	The Message element is the outer most tag in all SIF messages.
Type	Element
Status	Not Applicable
Updateable	Not Applicable

Element	Attrib	Char	Description
Message		M	
	xmlns	R	The xmlns attribute specifies the XML name space for SIF messages. The valid value for this attribute is "http://www.sifinfo.org/v1.0/messages."

Message Example

```
<Message xmlns="http://www.sifinfo.org/v1.0/messages">
</Message>
```

Name	SIF_Authentication
Description	The SIF_Authentication element exists in messages that are digitally signed.
Type	Element
Status	Not Applicable
Updateable	Not Applicable

Element	Attrib	Char	Description
SIF_Authentication		O	
	Type	R	The Type attribute specifies which algorithm was used to prepare the digest. The valid value for this attribute is "X.509."
SIF_Authentication/ SIF_Signature		M	This element contains a digitally signed digest of the message contents including the header minus the SIF_Authentication element. The data is stored in base64 format.

SIF_Authentication Example

```

<SIF_Authentication Type="X.509">
  <SIF_Signature>EB0A738FC....</SIF_Signature>
</SIF_Authentication>

```

Name	SIF_Header
Description	SIF_Header is a common message header for all SIF messages.
Type	Element
Status	Not Applicable
Updateable	Not Applicable

Element	Attrib	Char	Description
SIF_Header		M	Header information contained in the message.
SIF_MsgId		M	SIF_MsgId is a globally unique message identifier from the Agent or ZIS that sends out the message.
SIF_Date		M	The date on which the message is sent. It is a string value in the format of "CCYYMMDD." For example, < SIF_Date>19990218</ SIF_Date> represents February 18, 1999.
SIF_Time		M	The time at which the message is sent
	Zone	R	The Zone attribute describes the time zone in the ISO code. Its value is the time for the time zone, in the format of "HH:MM:SS," with HH in the range of 0 to 23. For example, the element < SIF_Time Zone = "GMT-08:00" >20:39:12</ SIF_Time> represents 20 hours 39 minutes and 12 seconds (or 8 o'clock 39 minutes and 12 seconds PM) for the Pacific Standard Time. SIF_Date and SIF_Time together represent the time stamp of a message.
SIF_Security		O	This element contains the security policies to use for this message.

SIF Implementation Specifications v.1.0

Element	Attrib	Char	Description
SIF_Security/ SIF_SecureChannel		O	If this element is present then a secure channel is required between the source and destination that supports an authentication and encryption level of at least the levels specified. If the message passes through multiple zones, all intermediate receivers and forwarders must use a channel that is no less secure to transmit the message and response.
SIF_Security/ SIF_SecureChannel/ SIF_Authentication Level		M	The minimum level of authentication required by the message originator to be considered a secure channel. Acceptable values are: “0” – No authentication is required; “1” – Authentication against the SIF_Authentication element is required; “2” – Authentication using anonymous certificates (web browser mode) is required; and “3” – Authentication using certificates issued by a specified certificate authority (i.e. school district, etc.) is required.
SIF_Security/ SIF_SecureChannel/ SIF_EncryptionLevel		M	The minimum level of encryption required by the message originator to be considered a secure channel. The levels are based on key lengths (expressed in bits) of a symmetric cipher algorithm. See explanatory text after the table. Acceptable values are: “0” – No encryption is required, “1” – System must use at least a 40 bit key (very weak), “2” – System must use at least a 64 bit key, “3” – System must use at least an 80 bit key (strong), and “4” – System must use at least a 128 bit key (very strong).
SIF_SourceId		M	The SIF_SourceId is the ID of the originator of the message. Each source needs to have a unique identifier following the naming convention as described in the implementation specification.
SIF_DestinationId		O	This element represents the ID of the destination where the message should be forwarded. This is an optional element for an agent, as the ZIS will insert a SIF_DestinationId in the header as it routes the message. When an originating agent inserts this element in the message header, it requires that the message be delivered using the routing as represented by this element.

Notes on SIF_AuthenticationLevel

If authentication based on certificates is being used, care needs to be given to determine if Level 2 (anonymous certificates) will provide the necessary level of protection. With Level 2 authentication, it is possible to use a web browser to make secure connections to the ZIS using the certificates that are built into the browser. This level of authentication is what is used by almost all Internet transactions (stock trading, shopping, financial, etc.). Level 2 does expose the user to a risk of a “man-in-the-middle” attack that can’t occur using Level 3 authentication.

Level 3 mandates that a certificate issued by a trusted authority (i.e. school district) be installed in the web browser before the browser will be able to connect to the ZIS. This may place unnecessary burdens on the client especially if it is likely that authorized users may wish to connect to the ZIS using a variety of browsers. See Appendix D for more information.

Notes on SIF_EncryptionLevel

Weaknesses in a cipher algorithm aside, the major governing factor as to the strength of data encryption are the length of the cipher key. Thus a 128-bit implementation typically provides stronger encryption than an 80-bit implementation.

There are also two main types of cipher algorithms. The first is called a symmetric cipher, which uses the same key to encrypt and decrypt the data. The second type is called public-key cipher, which depends, upon using a private key of the sender along with the public key of the receiver. Because of the nature of public-key ciphers, a larger number of bits must be used to achieve a comparable level of encryption strength.

The SIF_EncryptionLevel bit sizes are based on symmetric ciphers. A table that lists the equivalent key length for a public-key cipher is listed below. See Appendix D for more information.

Symmetric Key Length	Public Key Length	Strength
40 bits	256 bits	Very weak, not recommended except for very minimal protection (i.e. prevents casual snooping but can be broken in minutes by knowledgeable attackers).
64 bits	512 bits	Weak. The current U.S. "standard" has been bumped up to 64 bits from 56 bits but the key length is still weak for sensitive data.
80 bits	768 bits	Moderate
128 bits	2048 bits	Strong, recommended for Internet exposure (limited by Export laws to Canada and the United States)

For more information regarding this topic, please refer to Chapter 7 of "Applied Cryptography, 2nd Edition," by Bruce Schneier.

SIF Header Examples

```
<SIF_Header>
  <SIF_MsgId>abc90785efda330d</SIF_MsgId>
  <SIF_Date>19990218</SIF_Date>
  <SIF_Time Zone = "GMT-08:00">20:39:12</SIF_Time>
  <SIF_SourceId>RamseySIS</SIF_SourceId>
</SIF_Header>
```

```
<SIF_Header>
  <SIF_MsgId>abc90785efda330f</SIF_MsgId>
  <SIF_Date>19990311</SIF_Date>
  <SIF_Time Zone = "GMT-08:00">08:39:49</SIF_Time>
  <SIF_Security>
    <SIF_SecureChannel>Yes</SIF_SecureChannel>
  </SIF_Security>
  <SIF_SourceId>RamseyLIB</SIF_SourceId>
  <SIF_DestinationId>RamseySIS</SIF_DestinationId>
</SIF_Header>
```

MESSAGES

SIF_Ack

This message is used as an acknowledgement for infrastructure messages. All infrastructure messages will return a SIF_Ack as a result to indicate if the request was successful or not.

The infrastructure uses SIF_Ack in three main ways. The first is a simple acknowledgment of a successful result. No additional information needs to be conveyed to the caller so a basic SIF_Ack containing a SIF_Header, SIF_OriginalSourceId and a SIF_OriginalMsgId element is returned.

In situations where additional information needs to be sent to the caller, a SIF_Status element will be added to the basic SIF_Ack. This provides the capability to tell the caller that the infrastructure call was successful but the caller needs to know some additional information. This variation is used to implement the “Pull” message delivery mode via the SIF_SystemControl – SIF_GetMessage message. The ZIS returns a SIF_Ack with the SIF_Status/SIF_Code element set to 0 and the SIF_Status/SIF_Data element containing a message. Another frequent use by the infrastructure is to signal the caller that the message was received but will take some time to process. The SIF_Ack can tell the caller to expect another SIF_Ack in the future after their request has been processed.

Finally, if an error needs to be reported, one or more SIF_Error elements may be added to the basic SIF_Ack. The SIF_Error element contains a standardized error number as well as a description of the error.

Element	Attrib	Char	Description
SIF_Ack		M	This message is used as an acknowledgement to an infrastructure message.
SIF_Authentication		O	Authentication information for the message.
SIF_Header		M	Header information contained in the message.
SIF_OriginalSourceId		M	The SIF_SourceId of the infrastructure message for which the SIF_Ack serves as a response.
SIF_OriginalMsgId		M	The SIF_MsgId of the infrastructure message for which the SIF_Ack message serves as a response.
SIF_Status		O	This element is used to convey additional status information about a successful response.
SIF_Status/SIF_Code		M	See Appendix B.
SIF_Status/SIF_Data		O	Optional element to hold additional information being returned to the caller.
SIF_Error		O	This element is used to signal an unsuccessful response.
SIF_Error/ SIF_Category		M	See Appendix B.
SIF_Error/SIF_Code		M	See Appendix B.
SIF_Error/SIF_Desc		M	A simple, easy to understand, description of the error. The primary consumer of this message is the application user. Example: “Unable to open database.”

Element	Attrib	Char	Description
SIF_Error/ SIF_ExtendedDesc		O	An optional error description that is more complete and technical in nature. It is to be used as a diagnostic message in trouble-shooting procedures. Example: "The 'Students' table is opened in exclusive mode by user 'ADM1' (dbm.cpp, line 300)."

SIF Ack Status Message Example

```

<Message xmlns="http://www.sifinfo.org/v1.0/messages">
  <SIF_Ack>
    <SIF_Authentication Type="X.509">
      <SIF_Signature>09AAF309C...</SIF_Signature>
    </SIF_Authentication>
    <SIF_Header>
      <SIF_MsgId>AB1058CD...</SIF_MsgId>
      <SIF_Date>19990218</SIF_Date>
      <SIF_Time Zone="GMT-08:00">08:39:40</SIF_Time>
      <SIF_Security>
        <SIF_SecureChannel>
          <SIF_AuthenticationLevel>2</SIF_AuthenticationLevel>
          <SIF_EncryptionLevel>3</SIF_EncryptionLevel>
        </SIF_SecureChannel>
      </SIF_Security>
      <SIF_SourceId>RamseyLIB</SIF_SourceId>
      <SIF_DestinationId>RamseySIS</SIF_DestinationId>
    </SIF_Header>
    <SIF_OriginalSourceId>RamseySIS</SIF_OriginalSourceId>
    <SIF_OriginalMsgId>1298ACEF...</SIF_OriginalMsgId>
    <SIF_Status>
      <SIF_Code>0</SIF_Code>
      <SIF_Data>
        <SIF_Request>....</SIF_Request>
      </SIF_Data>
    </SIF_Status>
  </SIF_Ack>
</Message>

```

SIF Ack Error Message Example

```

<Message xmlns="http://www.sifinfo.org/v1.0/messages">
  <SIF_Ack>
    <SIF_Authentication Type="X.509">
      <SIF_Signature>0B0AF38FC...</SIF_Signature>
    </SIF_Authentication>
    <SIF_Header>
      <SIF_MsgId>CD5087FE...</SIF_MsgId>
      <SIF_Date>19990218</SIF_Date>
      <SIF_Time Zone="GMT-08:00">08:39:40</SIF_Time>
      <SIF_Security>
        <SIF_SecureChannel>
          <SIF_AuthenticationLevel>2</SIF_AuthenticationLevel>
          <SIF_EncryptionLevel>3</SIF_EncryptionLevel>
        </SIF_SecureChannel>
      </SIF_Security>
      <SIF_SourceId>RamseyLIB</SIF_SourceId>
      <SIF_DestinationId>RamseySIS</SIF_DestinationId>
    </SIF_Header>
  </SIF_Ack>
</Message>

```



```

</SIF_Header>
<SIF_OriginalSourceId>RamseySIS</SIF_OriginalSourceId>
<SIF_OriginalMsgId>1945CD78...</SIF_OriginalMsgId>
<SIF_Error>
  <SIF_Category>3</SIF_Category>
  <SIF_Code>5</SIF_Code>
  <SIF_Desc>Sender's certificate is not trusted</SIF_Desc>
  <SIF_ExtendedDesc>Agent requires certificate issued by ISD11 CA</SIF_ExtendedDesc>
</SIF_Error>
</SIF_Ack>
</Message>

```

SIF_Event

SIF_Event is used to deliver event objects as defined in SIF. Events represent changes to data objects. The message contains the following elements.

Element	Attrib	Char	Description
SIF_Event		M	Event is used to deliver event objects as defined in SIF.
SIF_Authentication		O	Authentication information for the message.
SIF_Header		M	Header information contained in the message.
SIF_ObjectData		M	This is the element that encapsulates potentially different types of events.
SIF_ObjectData/ SIF_EventObject		MR	This element encapsulates the objects that are associated with one type of event. For example Student Personal Information Change.
	ObjectName	R	This is the name of the object for which the event is being sent. This can be any one of the objects for which an event has been specified.
	Action	R	This is the action associated with the object that is being conveyed by this event. Allowable values = - "Add" - "Delete" - "Change"
SIF_ObjectData/ SIF_EventObject/ ObjectName1...N		MR	These are the actual objects (partial or whole) that are sent along with the event. Any valid SIF object for which events are defined can occur here.

SIF Event Message Example

(Includes StudentPersonal changes)

```

<Message xmlns="http://www.sifinfo.org/v1.0/messages">
  <SIF_Event>
    <SIF_Header>
      <SIF_MsgId>AB34DC09...</SIF_MsgId>
      <SIF_Date>19990218</SIF_Date>
      <SIF_Time Zone = "GMT-08:00">20:39:12</SIF_Time>
      <SIF_SourceId>RamseySIS</SIF_SourceId>
    </SIF_Header>
    <SIF_ObjectData>
      <SIF_EventObject ObjectName="StudentPersonal" Action="Change">
        <StudentPersonal RefId = "D3E34B359D75101A8C3D00AA001A1652">
          <PhoneNumber>
            <AreaCode>510</AreaCode>
            <Number>333-2299</Number>

```

```

        </PhoneNumber>
      </StudentPersonal>
    </SIF_EventObject>
  </SIF_ObjectData>
</SIF_Event>
</Message>

```

SIF_Provide

The SIF_Provide message is used for advertising the provision of data objects. It contains the following elements.

Element	Attrib	Char	Description
SIF_Provide		M	The SIF_Provide message is used for advertising the provision of data objects.
SIF_Authentication		O	Authentication information for the message.
SIF_Header		M	Header information contained in the message.
SIF_Object		MR	This is the object that is being provided.
	ObjectName	R	The actual name of the object that is being provided. Allowed values = The name of any valid SIF object.

SIF_Provide Message Example

```

<Message xmlns="http://www.sifinfo.org/v1.0/messages">
  <SIF_Provide>
    <SIF_Header>
      <SIF_MsgId>34DC87FE...</SIF_MsgId>
      <SIF_Date>19990218</SIF_Date>
      <SIF_Time Zone = "GMT-08:00">20:39:12</SIF_Time>
      <SIF_SourceId>RamseySIS</SIF_SourceId>
    </SIF_Header>
    <SIF_Object ObjectName = "StudentPersonal"/>
    <SIF_Object ObjectName = "StudentDiscipline"/>
  </SIF_Provide>
</Message>

```

SIF_Register

SIF_Register is the message for registering a SIFNode with a ZIS. It should be the first message from a sender before it sends out other SIF messages. This message serves to provide ZIS with the sender's identification information as well as to provide the information that the ZIS will need to contact this agent/ZIS. The ZIS will check to ensure that each sender provides a ZIS locally unique identifier (the SIF_SourceId) in its SIF_Register message.

Once a sender registers in the ZIS with the SIF_Register message, the sender can use the SIF_SourceId value in the header of all other outgoing messages as its identification. It is not necessary to send a SIF_Register message each time your agent starts up but it is not an error to do so. If there are any blocked messages in the Agent's queue when a ZIS receives the SIF_Register message the blocks will be removed.

Element	Attrib	Char	Description
SIF_Register		M	SIF_Register is the message for registering a SIFNode with a ZIS.
SIF_Authentication		O	Authentication information for the message.
SIF_Header		M	Header information as described before.

SIF Implementation Specifications v.1.0

Element	Attrib	Char	Description
SIF_Name		M	This is the descriptive name of the agent or ZIS that is registering (i.e. Ramsey Media Center).
SIF_SifVersion		M	Specifies which SIF Specification version should be used when the ZIS communicates with the agent/ZIS. If the ZIS cannot communicate in this format, it should reject the request.
SIF_MaxBufferSize		M	Specifies the maximum size of a response packet to be returned by the ZIS. This applies to SIF_Event messages as well as ZIS provided data objects. The ZIS may return packets smaller than the maximum value. If the maximum size is too small to contain a single whole response object, the ZIS should reject the registration request.
SIF_Mode		M	Specifies the communication mode (Pull or Push) as chosen by the message sender. Its valid values are "Push" and "Pull."
SIF_Protocol		O	
	Type	R	Describes the type of protocol to use when contacting the registering agent/ZIS.
	Secure	R	Tells if this protocol provides a secure channel. Values are "Yes" or "No."
SIF_Protocol/ SIF_URL		C	This element is required if the protocol is HTTPS or HTTP. It contains an URL that identifies the SIFNode.
SIF_Protocol/ SIF_Property		C	If the protocol isn't HTTPS or HTTP then the SIF_Protocol element may contain zero or more Property elements. Each property element contains a "SIF_Name"/"SIF_Value" pair that describes data that the ZIS needs in order to communicate with the SIFNode.

SIF Register Message Example

```

<Message xmlns="http://www.sifinfo.org/v1.0/messages">
  <SIF_Register>
    <SIF_Header>
      <SIF_MsgId>14BA0965...</SIF_MsgId>
      <SIF_Date>19990218</SIF_Date>
      <SIF_Time Zone = "GMT-08:00">20:39:12</SIF_Time>
      <SIF_SourceId>RamseySIS</SIF_SourceId>
    </SIF_Header>
    <SIF_Name>Ramsey Administration Office</SIF_Name>
    <SIF_SifVersion>1.00</SIF_SifVersion>
    <SIF_MaxBufferSize>1024000</SIF_MaxBufferSize>
    <SIF_Mode>Push</SIF_Mode>
    <SIF_Protocol Type="HTTPS" Secure="Yes">
      <SIF_URL>https://RamseyNT:8030/StudentAdmin</SIF_URL>
    </SIF_Protocol>
  </SIF_Register>
</Message>

```

SIF_Request

This message is used to request information in SIF data objects from other agents. It specifies fields in the object to request and the query or search criteria.

Element	Attrib	Char	Description
SIF_Request		M	SIF_Request is used to request information in SIF data objects from other agents.
SIF_Authentication		O	Authentication information for the message.
SIF_Header		M	Header information associated with the message.

SIF Implementation Specifications v.1.0

Element	Attrib	Char	Description
SIF_SifVersion		M	Specifies which SIF Specification version should be used when returning the response data. If a responder cannot return response data in this format, it should reject the request.
SIF_MaxBufferSize		M	Specifies the maximum size of a response packet to be returned to the requester. The responder may return packets smaller than the maximum value. If the maximum size is too small to contain a single whole response object, the responder should reject the request.
SIF_Query		M	The element contains the following child elements.
SIF_Query/ SIF_QueryObject		M	This is the object that is being queried for.
	Object Name	R	The actual name of the object that is being queried for. Allowed values are the name of any valid SIF object
SIF_Query/ SIF_QueryObject/ SIF_Element		OR	These are the individual elements of the object that have been requested.
SIF_Query/ SIF_ConditionGroup		O	This element represents the conditions that the queried objects(s) must meet.
	Type	R	The Boolean operator for joining conditions. Allowed values = - “And” - “Or” - “None”, this value should be used if there is only one SIF_Conditions element.
SIF_Query/ SIF_ConditionGroup/ SIF_Conditions		OR	This construct allows for nested conditions and is provided for future extensions.
	Type	R	The Boolean operator for joining conditions. Allowed values = - “And” - “Or” - “None”, this value should be used if there is only one SIF_Condition element.
SIF_Query/ SIF_ConditionGroup/ SIF_Conditions/ SIF_Condition		OR	This element represents an individual condition.
SIF_Query/ SIF_ConditionGroup/ SIF_Conditions/ SIF_Condition/ SIF_Element		M	This is the name of the element that appears in the condition. In version 1 this is restricted to be the data object name and one or more of its key attributes.
SIF_Query/ SIF_ConditionGroup/ SIF_Conditions/ SIF_Condition/ SIF_Operator		M	The operator for the condition. The values of this are tabulated below.
SIF_Query/ SIF_ConditionGroup/ SIF_Conditions/ SIF_Condition/ SIF_Value		M	SIF_Value is the data that is used to compare with the value of the Element or Attribute.

The following SIF_Query element indicates that the elements Name and Address are requested from the StudentPersonal object.

```
<SIF_Query>
  <SIF_QueryObject ObjectName = "StudentPersonal"/>
    <SIF_Element>Name</SIF_Element>
    <SIF_Element>Address</SIF_Element>
  </SIF_QueryObject>
</SIF_Query>
```

The element and element attributes are expressed in XSL syntax, representing the path of the element within the specified object.

For example, StudentPersonal/Name/FirstName represents the FirstName element within Name element and within the StudentPersonal object.

For example, StudentPersonal/Name/@Type represents the Type attribute of the Name element within the StudentPersonal object.

SIF_ConditionGroup

The SIF_Query element may have a SIF_ConditionGroup element that may have one or more SIF_Conditions elements. A SIF_Conditions element may contain one or more SIF_Condition elements.

Each SIF_Condition element defines a search criterion, which contains the following sub-elements.

SIF_Element

An Element is the name of the element defined in an SIF defined object. An Attribute is the name of an attribute defined for an element in an SIF defined object.

The Element or Attribute can be represented with the extensible Style Language (XSL) pattern-matching syntax. For example, the FirstName element within Name in StudentPersonal object can be represented as:

StudentPersonal/Name/FirstName

For example, the Name Type attribute of a StudentPersonal object can be expressed as: StudentPersonal/Name/@Type. In Version 1, SIF_Element is restricted to attributes for the root element of each object, for example, StudentPersonal/@RefId.

SIF_Operator (limited support in Version 1.0)

The SIF_Operator can be one of the following values.

Operator	Meaning
EQ*	Equal to
GT	Greater than
LT	Less than
GE	Greater than or equal to
LE	Less than or equal to
NE	Not equal to

**Indicates supported in Version 1*

SIF_Value

```

<SIF_Condition>
  <SIF_Element>StudentPersonal/Name/FirstName</SIF_Element>
  <SIF_Operator>EQ</SIF_Operator>
  <SIF_Value>Alicia</SIF_Value>
</SIF_Condition>

```

* This condition can be translated into the XSL syntax:
StudentPersonal/Name/FirstName = Alicia.

```

<SIF_Condition>
  <SIF_Element>StudentPersonal/@RefId</SIF_Element>
  <SIF_Operator>EQ</SIF_Operator>
  <SIF_Value>D3E34B359D75101A8C3D00AA001A1652</SIF_Value>
</SIF_Condition>

```

* This condition can be translated into the XSL syntax: StudentPersonal/@RefId = "D3E34B359D75101A8C3D00AA001A1652."

The SIF_Conditions element has one attribute "Type" which can be one of the following values.

Type	Meaning
And	All conditions within the SIF_Conditions element are AND-together.
Or	All conditions within the SIF_Conditions element are OR-together.
None	There is only one SIF_Condition within the SIF_Conditions element.

SIF_Conditions Example

(Includes conditions block which AND-together two conditions)

```

<SIF_Conditions Type = "And">
  <SIF_Condition>
    <SIF_Element>StudentPersonal/@RefId</SIF_Element>
    <SIF_Operator>NE</SIF_Operator>
    <SIF_Value>D3E34B359D75101A8C3D00AA001A1652</SIF_Value>
  </SIF_Condition>
  <SIF_Condition>
    <SIF_Element>StudentPersonal/Name/FirstName</SIF_Element>
    <SIF_Operator>EQ</SIF_Operator>
    <SIF_Value>Alicia</SIF_Value>
  </SIF_Condition>
</SIF_Conditions>

```

The above request criteria can be translated into this statement: all StudentPersonal objects whose RefId is **NOT** D3E34B359D75101A8C3D00AA001A1652, and whose first name is Alicia.

SIF_Response

SIF_Response is used to respond to a SIF_Request message. A response consists of one or many data objects, which are either complete or partial. A partial data object is one that contains a subset of the elements for the data object.

SIF Implementation Specifications v.1.0

Element	Attrib	Char	Description
SIF_Response		M	SIF_Response is used to respond to a SIF_Request message.
SIF_Authentication		O	Authentication information for this message.
SIF_Header		M	Header information contained in the message. The SIF_DestinationId needs to be the SIF_SourceId of the original SIF_Request message, which the SIF_Response is for.
SIF_RequestMsgId		M	This is the message ID of the SIF_Request message. It tells for which previous request a response is, and provides a unique match between a response and a previous request. Since the ID of each message from an Agent is unique, the receiver of a SIF_Response message will be able to relate the response to a SIF_Request that it sent out previously.
SIF_PacketNumber		O	<p>This element represents the index of the SIF_Response message in the sequence of packets that make up a complete response. Its value must be in the range of 1 through n, with n equal to the total number of packets that make up a response.</p> <p>This element is optional. It is only needed when a response needs to be broken into a sequence of SIF_Response messages.</p> <p>The SIF_PacketNumber and the SIF_MorePackets elements must exist in pair.</p> <p>The receiver of a SIF_Response message, with the help of the SIF_MorePackets and SIF_PacketNumber element in each incoming SIF_Response message, will be able to interpret and process each SIF_Response as part of a complete response to a previous request.</p> <p>This element is optional. It is only needed when a response needs to be broken into a sequence of SIF_Response messages.</p>
SIF_MorePackets		O	<p>This element provides an indication as to where there are more packets besides this one to make up a complete response. The value of this element can only be YES or NO.</p> <p>The necessity of this element stems from the requirement from an Agent to send a long response in a sequence of SIF_Response messages, either for the benefit of improving performance or for circumventing the limitation of the underlying network infrastructure.</p> <p>This element is optional. It is needed only when a response needs to be broken into a sequence of SIF_Response messages.</p> <p>When this element's value is equal to NO, it is an indication from the sender to the receiver that it has already sent out all the packets that make up a complete response for a request as indicated by the SIF_RequestMsgId element.</p>
SIF_ObjectData		M	The SIF_ObjectData element contains the data objects (or elements within the data objects) that are requested in the original SIF_Request message.
SIF_ObjectData/ ObjectName1..N		MR	These are the actual objects that represent the whole or partial result set. Any valid SIF object can occur here.

SIF Response Message Example

(Serves as a hypothetical response to the sample request in the Request section)

```

<Message xmlns="http://www.sifinfo.org/v1.0/messages">
  <SIF_Response>
    <SIF_Header>...</SIF_Header>
    <SIF_RequestMsgId>FE1078BA...</SIF_RequestMsgId>
    <SIF_ObjectData>
      <StudentPersonal RefId="E3E34B359D75101A8C3D00AA0018475"
        <Name>
          <FirstName>Alicia</FirstName>
          <LastName>Johnson</LastName>
        </Name>
      </StudentPersonal>
    </SIF_ObjectData>
  </SIF_Response>
</Message>

```

Two SIF Response Messages Example

(Makes up a complete response)

```

<Message SIF="http://www.sifinfo.org/v1.0/messages">
  <SIF_Response>
    <SIF_Header>...</SIF_Header>
    <SIF_RequestMsgId>FE1078BA...</SIF_RequestMsgId>
    <SIF_MorePackets>YES</SIF_MorePackets>
    <SIF_PacketNumber>1</SIF_PacketNumber>
    <SIF_ObjectData>
      <StudentPersonal RefId="E3E34B359D75101A8C3D00AA0018475"
        <Name>
          <FirstName>Alicia</FirstName>
          <LastName>Johnson</LastName>
        </Name>
      </StudentPersonal>
    </SIF_ObjectData>
  </SIF_Response>
</Message>

<Message SIF="http://www.sifinfo.org/v1.0/messages">
  < SIF_Response>
    < SIF_Header>...</ SIF_Header>
    < SIF_RequestMsgId>FE1078BA...</ SIF_RequestMsgId>
    < SIF_MorePackets>NO</ SIF_MorePackets>
    < SIF_PacketNumber>2</ SIF_PacketNumber>
    < SIF_ObjectData>
      <StudentPersonal RefId="F14B5B359D75101A8C3D00AA0018475"
        <Name>
          <FirstName>Alicia</FirstName>
          <LastName>Smith</LastName>
        </Name>
      </StudentPersonal>
    </ SIF_ObjectData>
  </ SIF_Response>
</Message>

```


A response should be divided into multiple SIF_Response messages only if the response is so long that sending the whole response in one single SIF_Response message may cause performance problems (such as longer latency in both the sender and the receiver).

SIF_Subscribe

Element	Attrib	Char	Description
SIF_Subscribe		M	This message is used to subscribe to event objects that are contained in this message.
SIF_Authentication		O	Authentication information for this message.
SIF_Header		M	Header information contained in the message.
SIF_Object		MR	
	Object Name	R	The actual name of the object that is being subscribed to. All valid events for this object will be routed to the subscriber. Allowed values are the names of any valid SIF object.

SIF_Subscribe Message Example

```
<Message xmlns="http://www.sifinfo.org/v1.0/messages">
  <SIF_Subscribe>
    <SIF_Header>
      <SIF_MsgId>AB2065FD...</SIF_MsgId>
      <SIF_Date>19990218</SIF_Date>
      <SIF_Time Zone = "GMT-08:00">20:39:12</SIF_Time>
      <SIF_SourceId>RamseyLIB</SIF_SourceId>
    </SIF_Header>
    <SIF_Object ObjectName = "StudentPersonal"/>
    <SIF_Object ObjectName = "StaffPersonal"/>
  </SIF_Subscribe>
</Message>
```

SIF_SystemControl

A SIF_SystemControl message is designed to control the flow of data between one SIF node and another. The SIF_SystemControl message is a container for a number of specialized control sub-messages. SIF_SystemControl messages are not persisted in a message queue for later delivery but are immediately sent to the intended receivers. If a message contained within a SIF_SystemControl message is unable to be delivered to an agent or ZIS, the message will be discarded.

Element	Attrib	Char	Description
SIF_SystemControl		M	This message is designed to control the flow of data between two directly connected SIF nodes.
SIF_Authentication		O	Authentication information for this message.
SIF_Header		M	Header information contained in the message.
SIF_SystemControl Data		M	This element holds the sub-message being sent.

SIF_SystemControl Message Example

```

<Message xmlns="http://www.sifinfo.org/v1.0/messages">
  <SIF_SystemControl>
    <SIF_Header>
      ...
    </SIF_Header>
    <SIF_SystemControlData>
      ...
    </SIF_SystemControlData>
  </SIF_SystemControl>
</Message>

```

SIF_SystemControl – SIF_Ping

SIF_SystemControl-SIF_Ping is sent to detect if an agent or ZIS is ready to receive and process messages. The SIF_SystemControl-SIF_Ping message contains no elements.

Element	Attrib	Char	Description
SIF_Ping		M	This sub-message detects if a agent or ZIS is ready to receive and process messages.

SIF_SystemControl – SIF_Ping Message Example

```

<Message xmlns="http://www.sifinfo.org/v1.0/messages">
  <SIF_SystemControl>
    <SIF_Header>
      ...
    </SIF_Header>
    <SIF_SystemControlData>
      <SIF_Ping/>
    </SIF_SystemControlData>
  </SIF_SystemControl>
</Message>

```

When a sender sends a SIF_Ping message to a receiver and the message is received, the receiver will return a SIF_Ack containing one of two responses. If the receiver is able to process messages, it will return an “Okay” status:

```

<Message xmlns="http://www.sifinfo.org/v1.0/messages">
  <SIF_Ack>
    <SIF_Header>
      ...
    </SIF_Header>
    <SIF_OriginalSourceId>RamseySIS</SIF_OriginalSourceId>
    <SIF_OriginalMsgId>9812ABFD...</SIF_OriginalMsgId>
    <SIF_Status>
      <SIF_Code>0</SIF_Code>
      <SIF_Data>Success</SIF_Data>
    </SIF_Status>
  </SIF_Ack>
</Message>

```

If the receiver is not able to process messages because it is “sleeping,” it will return a “Receiver is sleeping” status.

```
<Message xmlns="http://www.sifinfo.org/v1.0/messages">
  <SIF_Ack>
    <SIF_Header>
      ...
    </SIF_Header>
    <SIF_OriginalSourceId>RamseySIS</SIF_OriginalSourceId>
    <SIF_OriginalMsgId>9812ABFD...</SIF_OriginalMsgId>
    <SIF_Status>
      <SIF_Code>8</SIF_Code>
      <SIF_Data>Receiver is sleeping</SIF_Data>
    </SIF_Status>
  </SIF_Ack>
</Message>
```

If a connection cannot be made between the sender and the receiver, a Transport error will be returned.

```
<Message xmlns="http://www.sifinfo.org/v1.0/messages">
  <SIF_Ack>
    <SIF_Header>
      ...
    </SIF_Header>
    <SIF_OriginalSourceId>RamseySIS</SIF_OriginalSourceId>
    <SIF_OriginalMsgId>9812ABFD...</SIF_OriginalMsgId>
    <SIF_Error>
      <SIF_Category>10</SIF_Category>
      <SIF_Code>4</SIF_Code>
      <SIF_Desc>Unable to establish connection</SIF_Desc>
      <SIF_ExtendedDesc>Error 10061: Connection refused</SIF_ExtendedDesc>
    </SIF_Error>
  </SIF_Ack>
</Message>
```

SIF_SystemControl – SIF_Sleep

The SIF_SystemControl-SIF_Sleep message allows the sender to signal the receiver that it must not send any more messages to the sender. After the sender receives a SIF_Ack indicating that the message was received, the receiver must not send any further messages to the sender.

This message provides the ability to signal an agent or ZIS that the sender will be unable to process further messages until some time in the future. Reasons for sending a SIF_Sleep message include the sender is unable to process more data because of limited resources (i.e. disk storage, network bandwidth, etc.), the sender is being temporarily shutdown and will be unable to receive messages, or the sender is about to issue a protocol change via a SIF_Register message and desires an orderly transition between protocols.

Since the sender may send a SIF_Sleep message for a variety of reasons, if the receiver sends messages after a SIF_Sleep message but prior to receiving a SIF_Wakeup or SIF_Register message from the sender, an error must be returned. A transport error will be returned if a connection cannot be established with the sender or the sender may choose to receive the connection but return an error.

If the sender is an agent, the ZIS will continue to hold any messages for the agent in the queue but the ZIS will not send those messages until a SIF_Wakeup (or SIF_Register) message is received.

If an agent is processing a message requiring additional requests to be sent to the ZIS and a SIF_Sleep message is received from the ZIS, the agent will not be able to retrieve the additional data. The agent must abort the processing of the message and attempt only attempt to process the message after receiving a SIF_Wakeup message from the ZIS.

The SIF_SystemControl-SIF_Sleep message contains no elements.

Element	Attrib	Char	Description
SIF_Sleep		M	This sub-message tells a receiver not to send any more messages to the sender.

SIF_SystemControl – SIF_Sleep Message Example

```
<Message xmlns="http://www.sifinfo.org/v1.0/messages">
  <SIF_SystemControl>
    <SIF_Header>
      ...
    </SIF_Header>
    <SIF_SystemControlData>
      <SIF_Sleep/>
    </SIF_SystemControlData>
  </SIF_SystemControl>
</Message>
```

The receiver responds by returning a SIF_Ack with an “Okay” status.

```
<Message xmlns="http://www.sifinfo.org/v1.0/messages">
  <SIF_Ack>
    <SIF_Header>
      ...
    </SIF_Header>
    <SIF_OriginalSourceId>RamseySIS</SIF_OriginalSourceId>
    <SIF_OriginalMsgId>34BA87EF...</SIF_OriginalMsgId>
    <SIF_Status>
      <SIF_Code>0</SIF_Code>
      <SIF_Data>Success</SIF_Data>
    </SIF_Status>
  </SIF_Ack>
</Message>
```

SIF_SystemControl – SIF_Wakeup

When the “sleeping” agent or ZIS is ready to resume message processing, it will send a SIF_SystemControl - SIF_Wakeup message. This will signal the receiver that the sender is now able to process messages. Sending a SIF_Wakeup message without a previous SIF_Sleep message is permissible and is not considered an error.

If there are any blocked messages in the Agent’s queue when a ZIS receives the SIF_Wakeup message the blocks will be removed.

Since a ZIS may choose to stop sending messages to an agent or ZIS if a connection can not be made with that agent or ZIS, it is recommended, that an agent send a SIF_Wakeup message to the ZIS upon agent startup. It is also advisable that a ZIS send a SIF_Wakeup message to all Zone Integration Servers where it has registered itself. The SIF_SystemControl- SIF_Wakeup message contains no elements.

Element	Attrib	Char	Description
SIF_Wakeup		M	This message tells a receiver that the sender is able to process messages.

SIF_SystemControl - Wakeup Message Example

```
<Message xmlns="http://www.sifinfo.org/v1.0/messages">
  <SIF_SystemControl>
    <SIF_Header>
      ...
    </SIF_Header>
    <SIF_SystemControlData>
      <SIF_Wakeup/>
    </SIF_SystemControlData>
  </SIF_SystemControl>
</Message>
```

The receiver responds by returning a SIF_Ack with an “Okay” status.

```
<Message xmlns="http://www.sifinfo.org/v1.0/messages">
  <SIF_Ack>
    <SIF_Header>
      ...
    </SIF_Header>
    <SIF_OriginalSourceId>RamseySIS</SIF_OriginalSourceId>
    <SIF_OriginalMsgId>56DFAC98...</SIF_OriginalMsgId>
    <SIF_Status>
      <SIF_Code>0</SIF_Code>
      <SIF_Data>Success</SIF_Data>
    </SIF_Status>
  </SIF_Ack>
</Message>
```

SIF_Sleep/SIF_Wakeup versus SIF_Register/SIF_Unregister

Using the SIF_Wakeup message is the preferred method of communicating that an agent or ZIS is ready to process messages. This is preferable over the use of a SIF_Register message because a SIF_Register message specifies protocol information while the SIF_Sleep/SIF_Wakeup pair communicates flow control information.

However, when a SIF_Register message is processed, the receiver must behave like a SIF_Wakeup message was also received. This simplifies the use of the Infrastructure as shown in the following example:

- Agent starts up using previously registered Protocol “X”
- Agent sends a SIF_Wakeup as a courtesy to the ZIS

- Agent later sends a SIF_Sleep message prior to switching protocol settings
- Agent sends a SIF_Register to the ZIS for Protocol “Y”
- Agent is receiving messages using the new protocol settings

It is important to note that while SIF_Sleep and SIF_Wakeup are opposites of one another, this is not the case with SIF_Register and SIF_Unregister. This is because an SIF_Unregister command removes essential agent configuration information such as the Provision and Subscription lists, which will not be specified by a subsequent SIF_Register command. In other words, a SIF_Register alone will not reverse the effects of a SIF_Unregister.

SIF_SystemControl – SIF_GetMessage

The SIF_SystemControl - SIF_GetMessage message provides the mechanism for an agent to pull message from a ZIS. An agent sends a SIF_SystemControl - SIF_GetMessage and the ZIS returns the next available message, according to the Selective Message Blocking scheme, wrapped in a SIF_Ack with a SIF_Status/ SIF_Code of 0 and the message in the SIF_Status/ SIF_Data element. If there are no messages to be returned, the ZIS returns a value of 9 in SIF_Status/ SIF_Code.

If an agent is not registered with a mode of “Pull” the ZIS will return a SIF_Ack with an error category of 5 and an error code of 9. The SIF_SystemControl-SIF_GetMessage message contains no elements.

Element	Attrib	Char	Description
SIF_GetMessage		M	This message tells the receiver to return the first available message, according to the Selective Message Blocking scheme, to the sender in that the sender is able to process messages.

SIF_SystemControl – SIF_GetMessage Message Example

```
<Message xmlns="http://www.sifinfo.org/v1.0/messages">
  <SIF_SystemControl>
    <SIF_Header>
      ...
    </SIF_Header>
    <SIF_SystemControlData>
      <SIF_GetMessage/>
    </SIF_SystemControlData>
  </SIF_SystemControl>
</Message>
```

The receiver responds by returning a SIF_Ack with the next message to be sent in the SIF_Status/SIF_Data element.

```
<<Message xmlns="http://www.sifinfo.org/v1.0/messages">
  <SIF_Ack>
    <SIF_Header>
      ...
    </SIF_Header>
    <SIF_OriginalSourceId>RamseySIS</SIF_OriginalSourceId>
    <SIF_OriginalMsgId>87561203...</SIF_OriginalMsgId>
```

```

    <SIF_Status>
      <SIF_Code>0</SIF_Code>
      <SIF_Data>
        <SIF_Event> ... </SIF_Event>
      </SIF_Data>
    </SIF_Status>
  </SIF_Ack>
</Message>

```

If there are no messages to be sent then the receiver returns the following status SIF_Ack:

```

<Message xmlns="http://www.sifinfo.org/v1.0/messages">
  <SIF_Ack>
    <SIF_Header>
      ...
    </SIF_Header>
    <SIF_OriginalSourceId>RamseySIS</SIF_OriginalSourceId>
    <SIF_OriginalMsgId>87561203...</SIF_OriginalMsgId>
    <SIF_Status>
      <SIF_Code>9</SIF_Code>
    </SIF_Status>
  </SIF_Ack>
</Message>

```

SIF_Unprovide

This message performs the opposite function of SIF_Provide. It removes the message sender as a provider of the data objects contained in this message.

Element	Attrib	Char	Description
SIF_Unprovide		M	This message performs the opposite function of SIF_Provide.
SIF_Authentication		O	Authentication information for this message.
SIF_Header		M	Header information contained in the message.
SIF_Object		MR	This is the object that is being removed from the provider list.
	Object Name	R	The actual name of the object that is being removed. Allowed values are the names of any valid SIF object.

SIF_Unprovide Message Example

```

<Message xmlns="http://www.sifinfo.org/v1.0/messages">
  <SIF_Unprovide>
    <SIF_Header>
      <SIF_MsgId>76EFAB54...</SIF_MsgId>
      <SIF_Date>19990218</SIF_Date>
      <SIF_Time Zone = "GMT-08:00">20:39:12</SIF_Time>
      <SIF_SourceId>RamseySIS</SIF_SourceId>
    </SIF_Header>
    <SIF_Object ObjectName = "StudentPersonal"/>
    <SIF_Object ObjectName = "StaffPersonal"/>
  </SIF_Unprovide>
</Message>

```

SIF_Unregister

This message allows an agent to remove any association it has with the ZIS. By sending this message, the ZIS will remove all provisions and subscriptions it maintains for the sender.

Element	Attrib	Char	Description
SIF_Unregister		M	This message is used to unregister an agent or ZIS from a ZIS.
SIF_Authentication		O	Authentication information for this message.
SIF_Header		M	Header information contained in the message.

The following message will remove the agent known as “RamseyFOOD” from the ZIS. All provisions and subscriptions will be canceled and any unprocessed events in the queue for this agent will be discarded.

SIF_Unregister Message Example

```
<Message xmlns="http://www.sifinfo.org/v1.0/messages">
  <SIF_Unregister>
    <SIF_Header>
      <SIF_MsgId>1057FABD...</SIF_MsgId>
      <SIF_Date>19990218</SIF_Date>
      <SIF_Time Zone = "GMT-08:00">20:39:12</SIF_Time>
      <SIF_SourceId>RamseyFOOD</SIF_SourceId>
    </SIF_Header>
  </SIF_Unregister>
</Message>
```

SIF_Unsubscribe

This message performs the opposite function of SIF_Subscribe. It removes the message sender as a subscriber to the events contained in this message.

Element	Attrib	Char	Description
SIF_Unsubscribe		M	This message is used to unsubscribe to events.
SIF_Authentication		O	Authentication information for this message.
SIF_Header		M	Header information contained in the message.
SIF_Object		MR	
	Object Name	R	The actual name of the object that is being unsubscribed. Events for this object will no longer be routed to the subscriber. Allowed values are the names of any valid SIF object.

SIF_Unsubscribe Message Example

```
<Message xmlns="http://www.sifinfo.org/v1.0/messages">
  <SIF_Unsubscribe>
    <SIF_Header>
      <SIF_MsgId>101</SIF_MsgId>
      <SIF_Date>19990218</SIF_Date>
      <SIF_Time Zone = "GMT-08:00">20:39:12</SIF_Time>
      <SIF_SourceId>RamseyFOOD</SIF_SourceId>
    </SIF_Header>
    <SIF_Object ObjectName = "StudentPersonal"/>
    <SIF_Object ObjectName = "StaffPersonal"/>
  </SIF_Unsubscribe>
</Message>
```


TECHNICAL WORKING GROUPS

ELEMENTS

Name	Address
Description	This element contains information about the address. The Address element always occurs within another object such as StudentPersonal/StudentAddress.
Type	Element
Status	Not Applicable
Updateable	Not Applicable

Element	Attrib	Char	SP/Ex ID	SP/Ex Codes	Description
Address		O			This element contains information about the address. The address element could be included in a student address, school address, or contact address.
	Type	R		<u>Code & Description</u> AC-City and State CC-Country CI-City CY-County/Parish DR-District of Residence F-Current Address L-Local Address M-Mailing Address O-Office Address P-Permanent Address PT-3 digit Canadian Postal Code PU-6 digit Canadian Postal Code RE-Regional Education Service Agency SB-Suburban SD-School District SH-School Campus Code SP-State/Province SS-School TN-Township UR-Urban ZZ-Mutually Defined	SPEEDE-ExPRESS code that defines the location of the address.
Street		M			The street element is a complex element and breaks the street down into several parts.
Street/Line1		M			Address line 1.
Street/Line2		O			Address line 2.
Street/Line3		O			Address line 3.

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Element	Attrib	Char	SP/Ex ID	SP/Ex Codes	Description
Street/Complex		O			Name of the complex.
Street/Street Number		O			The number of the street.
Street/Street Prefix		O			Street prefix like NE
Street/Street Name		O			The name of the street.
Street/StreetType		O			The type of street. For example, Lane, Blvd., Ave etc.
Street/Street Suffix		O			Street suffix like SW.
Street/AptType		O			Type of apartment, for example, Suite.
Street/AptNum Prefix		O			Apartment number prefix.
Street/Apt Number		O			The number of the apartment.
Street/AptNum Suffix		O			Apartment number suffix.
City		M			The city part of the address.
County		O			The county part of the address.
StatePr		M			The state or province.
	Code	R	N402-156	See Appendix E.	The state code.
Country		M			
	Code	R	N404-26	See Appendix E.	The country code.
PostalCode		M			The ZIP/Postal code.
GridLocation		O			The location of the address. For a description of this element, see the GridLocation specification.

Address Example

<Address Type="M">

```

<Street>
  <Line1>1 IBM Plaza</Line1>
  <Line2>Suite 2000</Line2>
  <Line3>Chicago, IL 60611</Line3>
  <StreetNumber>1</StreetNumber>
  <StreetName>IBM</StreetName>
  <StreetType>Plaza</StreetType>
  <AptType>Suite</AptType>
  <AptNumber>2000</AptNumber>
</Street>
<City>Chicago</City>
<County>Cook</County>
<StatePr Code="IL"/>
<Country Code="US"/>
<PostalCode>60611</PostalCode>
<GridLocation>
  <Latitude>41.7699657</Latitude>

```

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```
<Longitude>79.548445</Longitude >
</GridLocation >
</Address>
```

Name	Demographics
Description	Demographics information about the student, contact, staff member, etc. This element always occurs within an object such as StudentPersonal, StudentContact etc.
Type	Element
Status	Not Applicable
Updateable	Not Applicable

Element	Attrib	Char	SP/Ex ID	SP/Ex Codes	Description
Demographics		O			Demographics information about the student, contact, or staff member.
Ethnicity		OR			
	Type	R			A code that specifies the coding structure used. The default is "NA."
	Code	R	DMG05-1109	Race or Ethnicity Code Description: Code indicating the racial or ethnic background of a person; it is normally self-reported; Under certain circumstances this information is collected for United States Government statistical purposes. <u>Code & Description</u> 7-Not Provided A-Asian or Pacific Islander B-Black C-Caucasian D-Subcontinent Asian American E-Other Race or Ethnicity F-Asian Pacific American G-Native American H-Hispanic I-American Indian or Alaskan Native J-Native Hawaiian N-Black (Non Hispanic) O-White (Non Hispanic) P-Pacific Islander Z-Mutually Defined	This code is a SPEEDE/ExPRESS code that identifies the student's race. Allowable values = 7, A, B, C, D, E, F, G, H, I, J, N, O, P, Z
Ethnicity/Number		O			A percentage associated with the ethnicity.

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Element	Attrib	Char	SP/Ex ID	SP/Ex Codes	Description
Gender		O	DMG03-1068	Gender Code Description: Code indicating the sex of the individual Code & Description F-Female M-Male U-Unknown	This is a SPEEDE/ExPRESS code that identifies the person's gender. Allowable values = "F", "M", and "U".
BirthDate		O			The person's date of birth.
PlaceOfBirth		O			The person's place of birth –like village, town, city etc.
StateOfBirth		O			The person's state of birth.
	Code	R	N402-156	See Appendix E.	The code for identifying the state.
CountryOf Birth		O			The person's country of birth.
	Code	R	DMG07-26	See Appendix E.	
CountryOf Citizenship		OR			The person's country of citizenship.
	Code	R	DMG07-26	See Appendix E.	
CountryOf Residency		OR			The person's country of residence.
	Code	R	DMG07-26	See Appendix E.	
Immigration Status		O			The person's immigration status.
English Proficiency		O		Language Proficiency Indicator (English Proficiency of the Student)	
	Code	R	IND106-1476	Description: Code indicating language proficiency Note to User: This code indicates the student's English proficiency. Code & Description 1-English Only 2-Fluent English Proficient 3-Limited English Proficient 4-Non-English Speaking 5-Status Unknown 6-Redesignated Fluent English Proficient A-Excellent or Fluent B-Good C-Fair D-Poor E-Unacceptable	This SPEEDE/ExPRESS code specifies the person's proficiency in English.

Element	Attrib	Char	SP/Ex ID	SP/Ex Codes	Description
Language		OR		NISO Z39.53 Language Codes are transmitted in data element 67 when data element 66 was coded as LD. This code set is available from either ANSI or from: National Information Standards Organization Press P.O. 338 Oxon Hill, MD 20750-0338 (301) 567-9522 or (800) 282-6476	
	Type	R	LUI10 2-67	See Appendix E.	This is the language code that specifies the person's language.

Demographics Example

```

<Demographics>
  <Ethnicity Type="NA" Code="C">
    <Number>100%</Number>
  </Ethnicity>
  <Gender>M</Gender>
  <BirthDate>19600926</BirthDate>
  <PlaceOfBirth>Chicago</PlaceOfBirth>
  <StateOfBirth Code="IL"/>
  <CountryOfBirth Code="US"/>
  <CountryOfCitizenship Code="US"/>
  <CountryOfResidency Code="US"/>
  <EnglishProficiency Code="1"/>
  <Language Type="ENG"/>
</Demographics>

```

Name	GridLocation
Description	This element contains a map location. The GridLocation element is utilized within another object or element, such as Address or BusStopInfo.
Type	Element
Status	Not Applicable
Updateable	Not Applicable

Element	Attrib	Char	SP/Ex ID	SP/Ex Codes	Description
GridLocation		O			This element contains information about a map location. This element is included in other elements or objects.
Latitude		M			The latitude coordinate of this location expressed in decimal format.
Longitude		M			The longitude coordinate of this location expressed in decimal format.

GridLocation Example

```

<GridLocation>
  <Latitude>41.7699657</Latitude>
  <Longitude>79.548445</Longitude>
</GridLocation>

```

Name	HealthContact
Description	This element always occurs within an object such as StudentMedical.
Type	Element
Status	Not Applicable
Updateable	Not Applicable

Element	Attrib	Char	SP/Ex ID	SP/Ex Codes	Description
HealthContact		OR			Information about the health related contacts with the student.
InitiatedByName		O			Name of person initiating or referring the contact.
InitiatedBy Position		O			Position of person initiating or referring the contact. See Appendix K.
ReferredToName		O			Name of person this contact is referred to
ReferredTo Position		O			Position of person this contact is referred to
HandledByName		O			Name of person actually handling this contact
HandledBy Position		O			Position of person actually handling this contact
DateOfInitiation		O			Date that the contact was initiated or referred
DateOfHandling		O			Date that the contact was handled
FacilityName		O			Name of facility at which contact was handled
Name Responsible		O			Name of doctor, nurse, staff, or clinician responsible for the accountability of this contact.
PlaceOfContact		O			The place of contact –like village, town, city etc.
StateOfContact		O			The state the contact occurred in.
	Code	R	N402-156	See Appendix E.	The code for identifying the state.
CountryOf Contact		O			The country the contact occurred in.
ResultCode		O			Code to indicate what occurred after or during contact. See Appendix K.
ResultText		O			Textual result of contact – like a school psychologist making notes on the session
ViewSecurity Level		O			Security level required for viewing this record, as per release authorization. See Appendix K.
EditSecurity Level		O			Security level required for editing this record. See Appendix K.
DeleteSecurity Level		O			Security level required for deleting this record. See Appendix K.
PublicKey		O			Public key for allowing access to this record

HealthContact Example

```

<HealthContact>
  <InitiatedByName> Jim Smith </InitiatedByName>
  <InitiatedByPosition> PSYO </InitiatedByPosition>
  <ReferredToName> Jim Smith </ReferredToName>
  <ReferredToPosition> CBO </ReferredToPosition>
  <HandledByName> Jane Smith </HandledByName>
  <HandledByPosition> MFCC </HandledByPosition>
  <DateOfInitiation>19991114</DateOfInitiation>
  <DateOfHandling>20000103</DateOfHandling>
  <FacilityName> Red Pine Community Support Center </FacilityName>
  <NameResponsible> Jane Smith </NameResponsible>
  <PlaceOfContact>Chicago</PlaceOfContact>
  <StateOfContact Code="IL"/>
  <CountryOfContact Code="US"/>
  <ResultCode> FOL </ResultCode>
  <ResultText> Need to continue to establish family dynamics via session with mother and student.
  </ResultText>
  <ViewSecurityLevel> FDS </ViewSecurityLevel>
  <EditSecurityLevel> FDC </EditSecurityLevel>
  <DeleteSecurityLevel> FDC </DeleteSecurityLevel>
  <PublicKey> WER9899E8E99G9898F9G9SD9GS89F8DG98SD9FG8 </PublicKey>
</HealthContact>

```

Name	Immunization
Description	This element always occurs within an object such as StudentMedical.
Type	Element
Status	Not Applicable
Updateable	Not Applicable

Element	Attrib	Char	SP/Ex ID	SP/Ex Codes	Description
Immunization		OR			Immunization information about the student.
Disease		M			The disease(s) the immunization targets. See Appendix K.
Sequence		M			The sequence number of the immunization. For example, some immunizations require three repetitions or sub-immunizations.
DateOfImmunization		M			Date that the immunization occurred
FacilityName		O			Name of clinic or organization administering the immunization
NameResponsible		O			Name of doctor, nurse, or clinician overseeing immunization
PlaceOf Immunization		O			The place of immunization –like village, town, city etc.
StateOfImmunization		O			The state the immunization occurred in.
	Code	R	N402-156		The code for identifying the state. See Appendix E.

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Element	Attrib	Char	SP/Ex ID	SP/Ex Codes	Description
CountryOfImmunization		O			The country the immunization occurred in.
ViewSecurityLevel		O			Security level required for viewing this record, as per release authorization. See Appendix K.
EditSecurityLevel		O			Security level required for editing this record.
DeleteSecurityLevel		O			Security level required for deleting this record
PublicKey		O			Public key for accessing this record

Immunization Example

```

<Immunization>
  <Disease> MMR </Disease>
  <Sequence> 1 </Sequence>
  <DateOfImmunization>19600926</DateOfImmunization>
  <FacilityName> Kaiser </FacilityName>
  <NameResponsible> Spock </NameResponsible>
  <PlaceOfImmunization>Chicago</PlaceOfImmunization>
  <StateOfImmunization Code="IL"/>
  <CountryOfImmunization Code="US"/>
  <ViewSecurityLevel> FDS </ViewSecurityLevel>
  <EditSecurityLevel> FDC </EditSecurityLevel>
  <DeleteSecurityLevel> FDC </DeleteSecurityLevel>
  <PublicKey> WER9899E8E99G9898F9G9SD9GS89F8DG98SD9FG8 </PublicKey>
</Immunization>

```

Name	Name
Description	The Name element, which could belong to a student, staff member, contact etc. This element always occurs within an object such as StudentPersonal, StudentContact, StaffPersonal, etc.
Type	Element
Status	Not Applicable
Updateable	Not Applicable

Element	Attrib	Char	SP/Ex ID	SP/Ex Codes	Description
Name		O			
	Type	R	IN102-1107	Code & Description 01-Given Name (Name at Birth) 02-Current Legal 03-Alias 04-Name of Record 05-Previous Name 07-Married Name 08-Professional Name	This attribute is a SPEEDE/ExPRESS code that specifies what type of name this is.

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Element	Attrib	Char	SP/Ex ID	SP/Ex Codes	Description
Name/Prefix		O			A prefix associated with the name like Mr., Ms. Etc.
Name/LastName		M			The last name.
Name/FirstName		M			The first name.
Name/Middle Name		O			The middle name or initial.
Name/Suffix		O			Generation of suffix like II, Jr. etc.
Name/Preferred Name		O			This is a name that the person prefers to be called by.
Name/SortName		O			This is the name to be used for sorting purposes.
Name/FullName		O			A free text field for the complete name.

Name Example

```

<Name Type="01">
  <Prefix>Mr.</Prefix>
  <LastName>Woodall</LastName>
  <FirstName>Charles</FirstName>
  <MiddleName>William</MiddleName>
  <PreferredName>Chuck</PreferredName>
</Name>

```

Name	OtherId
Description	Lists all “other” Id’s associated with objects. This element always occurs within an object.
Type	Element
Status	Not Applicable
Updateable	Not Applicable

Element	Attrib	Char	SP/Ex ID	SP/Ex Codes	Description
OtherId		O		Reference Identification Qualifier Description: Code qualifying the Reference Identification	
	Type	R	REF01-128	Code & Description 06-System Number 23-Client Number 28-Employee Identification Number 29-United States Government Visa Number 3H-Case Number 48-Agency’s Student Number. This is the number assigned by an agency other than the institution sending the record. 49-Family Unit Number	This is the SPEEDE/ExPRESS code that defines the type of this other Id.

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Element	Attrib	Char	SP/Ex ID	SP/Ex Codes	Description
				Code & Description (cont.) 50-State Student Identification Number 56-Corrected Social Security Number 57-Prior Incorrect Social Security Number C0-Canadian Social Insurance Number LR-Local Student Identification Number MV-Migrant Number SY-Social Security Number V2-Visa Type V4-State Department I-20-Form Number V5-State Department IAP 66-Form Number ZZ-Mutually Defined	

OtherId Example

<OtherId Type="SY">33333333</OtherId>

Name	PhoneNumber
Description	This element always occurs within an object such as StudentPersonal, StaffPersonal, etc.
Type	Element
Status	Not Applicable
Updateable	Not Applicable

Element	Attrib	Char	SP/Ex ID	SP/Ex Codes	Description
PhoneNumber		O			
	Format	R			This is a code that specifies the format of this phone number. Allowable values: "NA" (North America), "EU" (Europe), or "FF" (Free-form).
	Type	R	PER03-365	Communication Number Qualifier Description: Code identifying the type of communication number. Code & Description AP-Alternate Telephone AS-Answering Service BN-Beeper Number CP-Cellular Phone EM-Electronic Mail EX-Telephone Extension FX-Facsimile HF-Home Facsimile Number	A SPEEDE/ExPRESS code that specifies what type of phone number this is.

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Element	Attrib	Char	SP/Ex ID	SP/Ex Codes	Description
				Code & Description (cont.) HP-Home Phone Number NP-Night Telephone OF-Other Residential Facsimile Number OT-Other Residential Telephone Number PA-Appointment Phone PC-Personal Cellular PP-Personal Phone TE-Telephone TL-Telex TM-Telemail TN-Teletex Number VM-Voice Mail WC-Work Cellular WF-Work Facsimile Number WP-Work Phone Number	

PhoneNumber Example

<PhoneNumber Format="NA" Type="HP">(312) 555-1234</PhoneNumber>

Name	Screening
Description	This element always occurs within an object such as StudentMedical.
Type	Element
Status	Not Applicable
Updateable	Not Applicable

Element	Attrib	Char	SP/Ex ID	SP/Ex Codes	Description
Screening		OR			Information about the medical screening done.
Target		M			Target of the screen. See Appendix K.
Sequence		M			The sequence number of the screen. For example, some screenings require multiple repetitions.
DateOfScreening		M			Date that the screening occurred.
FacilityName		O			Name of clinic or organization administering the immunization.
NameResponsible		O			Name of doctor, nurse, staff, or clinician overseeing screening.
PlaceOfScreening		O			The place of screening – like village, town, city etc.
StateOfScreening		O			The state the screening occurred in.
	Code	R	N402-156	See Appendix E.	The code for identifying the state.
CountryOfScreening		O			The country the screening occurred in.

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Element	Attrib	Char	SP/Ex ID	SP/Ex Codes	Description
ResultPassFail		O			A pass or fail for the result of the screen – like Tuberculosis.
ResultNumeric		O			Numeric result of screen – like a vision of 20/100.
ResultText		O			Textual result of screen – like an assessment of language difficulties by a speech pathologist.
ViewSecurityLevel		O			Security level required for viewing this record, as per release authorization. See See Appendix K.
EditSecurityLevel		O			Security level required for editing this record.
DeleteSecurityLevel		O			Security level required for deleting this record.
PublicKey		O			Public key for accessing this record.

Screening Example

```

<Screening>
  <Target> Vision </Target>
  <Sequence> 1 </Sequence>
  <DateOfScreening >19600926</ DateOfScreening >
  <FacilityName> Kaiser </FacilityName>
  <NameResponsible> Ben Spock </ NameResponsible >
  <PlaceOfScreening>Chicago</PlaceOfScreening>
  <StateOfScreening Code="IL"/>
  <CountryOfScreening Code="US"/>
  <ResultText> 20/100 with astigmatism </ResultText>
  <ViewSecurityLevel> FDS </ViewSecurityLevel>
  <EditSecurityLevel> FDC </EditSecurityLevel>
  <DeleteSecurityLevel> FDC </DeleteSecurityLevel>
  <PublicKey> WER9899E8E99G9898F9G9SD9GS89F8DG98SD9FG8 </PublicKey>
</Screening>

```

APPROVED DATA MODEL OBJECTS

INFRASTRUCTURE

The characteristics for all of the tables in this section use the following codes.

Characteristics Codes	
R	Required Attribute
M	Mandatory Element
O	Optional Element
C	Conditional Element
MR	Mandatory & Repeatable Element
OR	Optional & Repeatable Element
CR	Conditional & Repeatable Element

Name	SIF_ZoneStatus
Description	The SIF_ZoneStatus object is an object that is implicitly provided by all Zone Integration Servers to provide information about the ZIS. The SIF_ZoneStatus record is the mechanism that is used to walk the zones in order to build specialized query routing requests.
Type	Object
Status	Approved
Updateable	No

Element	Attrib	Char	Description
SIF_ZoneStatus		M	
	ZoneId	R	The identifier for this Zone Integration Server. It is the same as the SIF_SourceId that the ZIS would place in any SIF_Header that it creates.
SIF_Name		O	The descriptive name for the zone managed by this ZIS.
SIF_Vendor		O	Contains information about the vendor who wrote this ZIS.
SIF_Vendor/SIF_Name		M	The name of the company who wrote the ZIS.
SIF_Vendor/SIF_Product		M	The product name assigned by the vendor to identify this ZIS.
SIF_Vendor/SIF_Version		M	The version of the vendor's product – not necessarily the SIF version.
SIF_Providers		C	Encompasses all the providers registered with this ZIS. This element is mandatory if there are providers registered with the ZIS.
SIF_Providers/ SIF_Provider		MR	
	SourceId	R	The identifier of the SIFNode that is providing objects. This is the AgentId or ZISId that would appear in the SIF_SourceId field of any SIF_Header created by the SIFNode.
SIF_Providers/ SIF_Provider/SIF_Object		MR	

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Element	Attrib	Char	Description
	Object Name	R	The name of the object being provided by this SIFNode.
SIF_Subscribers		C	Encompasses all the subscribers registered with this ZIS. This element is mandatory if there are subscribers registered with the ZIS.
SIF_Subscribers/ SIF_Subscriber		MR	
	SourceId	R	The identifier of the SIFNode that is subscribing to the object events. This is the AgentId or ZISId that would appear in the SIF_SourceId field of any SIF_Header created by the SIFNode.
SIF_Subscribers/ SIF_Subscriber/ SIF_Object		MR	
	Object Name	R	The name of the object being subscribed to by this SIFNode.
SIF_SIFNodes		C	Encompasses all of the nodes attached to this ZIS. This element is mandatory if there are SIFNodes registered with the ZIS.
SIF_SIFNodes/ SIF_SIFNode		MR	
	Type	R	Allowable values are “Agent” and “ZIS.”
SIF_SIFNodes/ SIF_SIFNode/SIF_Name		M	The descriptive name of the SIFNode (i.e. Ramsey Food Services).
SIF_SIFNodes/ SIF_SIFNode/ SIF_SourceId		M	The agent or ZIS identifier. This is the same value that the SIFNode would place in any SIF_Header that it would create.
SIF_SIFNodes/ SIF_SIFNode/SIF_Mode		M	Specifies the communication mode (Pull or Push) as chosen by the message sender. Its valid values are “Push” and “Pull.”
SIF_SIFNodes/ SIF_SIFNode/ SIF_Protocol		O	Describes the currently active protocol that the SIFNode is using to communicate with the ZIS. The protocol information describes how the ZIS may contact the node.
	Type	R	Identifies the protocol being used. Values could include “HTTPS,” “HTTP,” and “MSMQ.”
	Secure	R	Indicates if the protocol provides a secure channel. Values are “Yes” or “No.”
SIF_SIFNodes/ SIF_SIFNode/ SIF_Protocol/SIF_URL		C	This element is required if the protocol is HTTPS or HTTP. It contains an URL that identifies the SIFNode.
SIF_SIFNodes/ SIF_SIFNode/ SIF_Protocol/ SIF_Property		C	If the protocol isn’t HTTPS or HTTP then the SIF_Protocol element may contain zero or more SIF_Property elements. Each property element contains a “SIF_Name”/“SIF_Value” pair that describes data that the ZIS needs in order to communicate with the SIFNode.
SIF_SIFNodes/ SIF_SIFNode/ SIF_Version		M	This is the version of the SIF Specification that the SIFNode uses. This information was communicated when the SIFNode registered with the ZIS.
SIF_SIFNodes/ SIF_SIFNode/ SIF_AuthenticationLevel		O	This is the level of authentication that the SIFNode supports when it wants to communicate via a secure channel. This information was communicated when the SIFNode registered with the ZIS. See the SIF_Security/ SIF_SecureChannel/ SIF_AuthenticationLevel definition for a list of valid values.

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Element	Attrib	Char	Description
SIF_SIFNodes/ SIF_SIFNode/ SIF_EncryptionLevel		O	This is the level of encryption that the SIFNode supports when it wants to communicate via a secure channel. This information was communicated when the SIFNode registered with the ZIS. See the SIF_Security/ SIF_SecureChannel/ SIF_EncryptionLevel definition for a list of valid values.
SIF_SIFNodes/ SIF_SIFNode/ SIF_MaxBufferSize		M	Specifies that the ZIS should never send SIF_Event or ZIS supplied query responses packets larger than this value. Query responses from other providers are controlled by the SIF_MaxBufferSize attribute in the SIF_Request message.
SIF_SIFNodes/ SIF_SIFNode/ SIF_Sleeping		M	This element shows whether the SIFNode is ready to process messages. Acceptable values are: “No” – the SIFNode is ready to process messages, “Yes” – the SIFNode is sleeping and cannot process messages.
SIF_SIFNodes/ SIF_SIFNode/ SIF_DynamicConnection Data		O	This element encompasses the statistics that the ZIS maintains for each SIFNode. No child elements have been defined in Version 1.0 of the specification.
SIF_Supported Authentication		C	Enumerates the various authentication protocols that the ZIS supports. If the ZIS supports an authentication protocol this element is mandatory.
SIF_Supported Authentication/ SIF_ProtocolName		MR	Describes a particular authentication protocol supported. Currently, only “X.509” is supported.
SIF_SupportedProtocols		M	Enumerates the various communication transport protocols that are supported by the ZIS.
SIF_SupportedProtocols/ SIF_Protocol		MR	
	Type	R	Identifies the protocol type.
	Secure	R	Indicates if the protocol provides a secure channel. Values are “Yes” and “No.”
SIF_SupportedProtocols/ SIF_Protocol/SIF_URL		C	This element is required if the protocol is HTTPS or HTTP. It contains an URL that identifies the SIFNode.
SIF_SupportedProtocols/ SIF_Protocol/ SIF_Property		C	If the protocol isn’t HTTPS or HTTP then the SIF_Protocol element may contain zero or more SIF_Property elements. Each property element contains a “SIF_Name”/“SIF_Value” pair that describes data that the ZIS needs in order to communicate with the SIFNode.
SIF_SupportedVersions		M	Enumerates the versions of the SIF Specification that this ZIS can use when communicating with the SIFNode.
SIF_SupportedVersions/ SIF_Versions		MR	Lists a specific SIF Specification version.

SIF ZoneStatus Example

```

<SIF_ZoneStatus ZoneId="RamseyZIS">
  <SIF_Name>Ramsey Elementary</SIF_Name>
  <SIF_Vendor>
    <SIF_Name>ZoneMaster, Inc.</SIF_Name>
    <SIF_Product>ZonePlus Zone Integration Server</SIF_Product>
    <SIF_Version>1.00</SIF_Version>
  </SIF_Vendor>
  <SIF_Providers>

```

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```
<SIF_Provider SourceId="RamseyFOOD">
  <SIF_Object ObjectName="StudentMeal"/>
</SIF_Provider>
<SIF_Provider SourceId="RamseyLIB">
  <SIF_Object ObjectName="LibraryPatronStatus"/>
</SIF_Provider>
<SIF_Provider SourceId="RamseySIS">
  <SIF_Object ObjectName="StudentPersonal"/>
  <SIF_Object ObjectName="StudentSchoolEnrollment"/>
</SIF_Provider>
</SIF_Providers>
<SIF_Subscribers>
  <SIF_Subscriber SourceId="RamseyFOOD">
    <SIF_Object ObjectName="StudentPersonal"/>
    <SIF_Object ObjectName="StudentSchoolEnrollment"/>
  </SIF_Subscriber>
  <SIF_Subscriber SourceId="RamseyLIB">
    <SIF_Object ObjectName="StudentPersonal"/>
    <SIF_Object ObjectName="StudentSchoolEnrollment"/>
  </SIF_Subscriber>
  <SIF_Subscriber SourceId="RamseySIS">
    <SIF_Object ObjectName="StudentMeal"/>
  </SIF_Subscriber>
</SIF_Subscribers>
<SIF_SIFNodes>
  <SIF_SIFNode Type="Agent">
    <SIF_Name>Ramsey Food Services</SIF_Name>
    <SIF_SourceId>RamseyFOOD</SIF_SourceId>
    <SIF_Mode>Push</SIF_Mode>
    <SIF_Protocol Type="HTTPS" Secure="Yes">
      <SIF_URL>https://RamseyNT:8010/FoodService</SIF_URL>
    </SIF_Protocol>
    <SIF_Version>1.00</SIF_Version>
    <SIF_AuthenticationLevel>1</SIF_AuthenticationLevel>
    <SIF_EncryptionLevel>2</SIF_EncryptionLevel>
    <SIF_MaxBufferSize>16384</SIF_MaxBufferSize>
    <SIF_DynamicConnectionData/>
    <SIF_Sleeping>No</SIF_Sleeping>
  </SIF_SIFNode>
  <SIF_SIFNode Type="Agent">
    <SIF_Name>Ramsey Media Resource Center</SIF_Name>
    <SIF_SourceId>RamseyLIB</SIF_SourceId>
    <SIF_Mode>Pull</SIF_Mode>
    <SIF_Protocol Type="HTTPS" Secure="Yes">
      <SIF_URL>https://RamseyNT:8020/Library</SIF_URL>
    </SIF_Protocol>
    <SIF_Version>1.00</SIF_Version>
    <SIF_AuthenticationLevel>0</SIF_AuthenticationLevel>
    <SIF_EncryptionLevel>1</SIF_EncryptionLevel>
    <SIF_MaxBufferSize>16384</SIF_MaxBufferSize>
    <SIF_DynamicConnectionData/>
    <SIF_Sleeping>No</SIF_Sleeping>
  </SIF_SIFNode>
  <SIF_SIFNode Type="Agent">
    <SIF_Name>Ramsey Administration</SIF_Name>
    <SIF_SourceId>RamseySIS</SIF_SourceId>
```



```

    <SIF_Mode>Push</SIF_Mode>
    <SIF_Protocol Type="HTTPS" Secure="Yes">
      <SIF_URL>https://RamseyNT:8030/StudentAdmin</SIF_URL>
    </SIF_Protocol>
    <SIF_Version>1.00</SIF_Version>
    <SIF_AuthenticationLevel>0</SIF_AuthenticationLevel>
    <SIF_EncryptionLevel>0</SIF_EncryptionLevel>
    <SIF_MaxBufferSize>16384</SIF_MaxBufferSize>
    <SIF_DynamicConnectionData/>
    <SIF_Sleeping>No</SIF_Sleeping>
  </SIF_SIFNode>
</SIF_SIFNodes>
<SIF_SupportedAuthentication>
  <SIF_ProtocolName>X.509</SIF_ProtocolName>
</SIF_SupportedAuthentication>
<SIF_SupportedProtocols>
  <SIF_Protocol Type="HTTPS" Secure="Yes">
    <SIF_URL>https://RamseyNT:8000/ZIS</SIF_URL>
  </SIF_Protocol>
  <SIF_Protocol Type="HTTP" Secure="No">
    <SIF_URL>http://RamseyNT:8000/ZIS</SIF_URL>
  </SIF_Protocol>
  <SIF_Protocol Type="MSMQ" Secure="Yes">
    <SIF_Property>
      <SIF_Name>Machine</SIF_Name>
      <SIF_Value>//RamseyNT</SIF_Value>
    </SIF_Property>
    <SIF_Property>
      <SIF_Name>UseAuthentication</SIF_Name>
      <SIF_Value>Yes</SIF_Value>
    </SIF_Property>
    <SIF_Property>
      <SIF_Name>UseEncryption</SIF_Name>
      <SIF_Value>Yes</SIF_Value>
    </SIF_Property>
  </SIF_Protocol>
</SIF_SupportedProtocols>
<SIF_SupportedVersions>
  <SIF_Version>1.00</SIF_Version>
</SIF_SupportedVersions>
</SIF_ZoneStatus>

```

OTHER APPROVED DATA MODEL OBJECTS

The characteristics for all of the tables in this section use the following codes.

Characteristics Codes	
R	Required Attribute
M	Mandatory Element
O	Optional Element
C	Conditional Element
MR	Mandatory & Repeatable Element
OR	Optional & Repeatable Element
CR	Conditional & Repeatable Element

Name	BusEquipment
Description	This object contains information about a type of equipment that may be on a bus. Examples include wheelchair, car seat, etc.
Type	Object
Status	Approved
Updateable	Yes



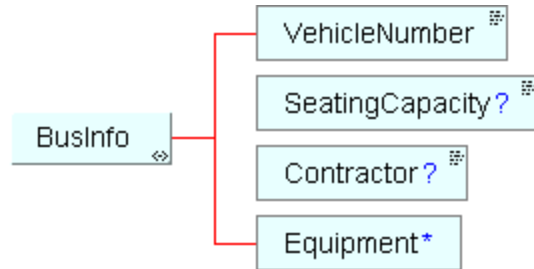
Element	Attrib	Char	Description
BusEquipment		O	
	RefId	R	GUID that identifies this type of equipment.
Description		M	Explanation about the type of equipment.

BusEquipment Example

```

<BusEquipment RefId ="D3E34B359D75101A8C3D00AA001A1652">
  <Description>Wheelchair</Description>
</BusEquipment>
  
```

Name	BusInfo
Description	This object contains all of the information about a bus.
Type	Object
Status	Approved
Updateable	Yes



Element	Attrib	Char	Description
BusInfo		M	
	RefId	R	GUID that identifies this bus.
VehicleNumber		M	Vehicle number of the bus.
SeatingCapacity		O	The number of people who can ride on the bus at the same time.
Contractor		O	The name of the contractor for this bus.
Equipment		OR	Describes any special equipment that is on this bus.
	RefId	R	GUID that identifies the type of equipment. See the BusEquipment specification for more information.
	Count	R	The number of pieces of this type of equipment that are on this bus.

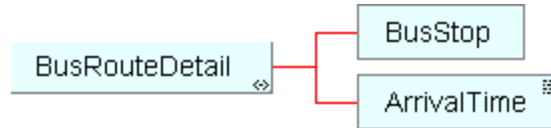
BusInfo Example

```

<BusInfo RefId="D3E34B359D75101A8C3D00AA001A1652">
  <VehicleNumber>63</VehicleNumber>
  <SeatingCapacity>71</SeatingCapacity>
  <Contractor>RYDER</Contractor>
  <Equipment RefId="E2F23A5323E87343B9A34BE457321" Count="3" />
  <Equipment RefId="34BE45E87343B9A5323A73212F23E" Count="4" />
</BusInfo>

```

Name	BusRouteDetail
Description	This object contains the schedule for the bus route.
Type	Object
Status	Approved
Updateable	Yes



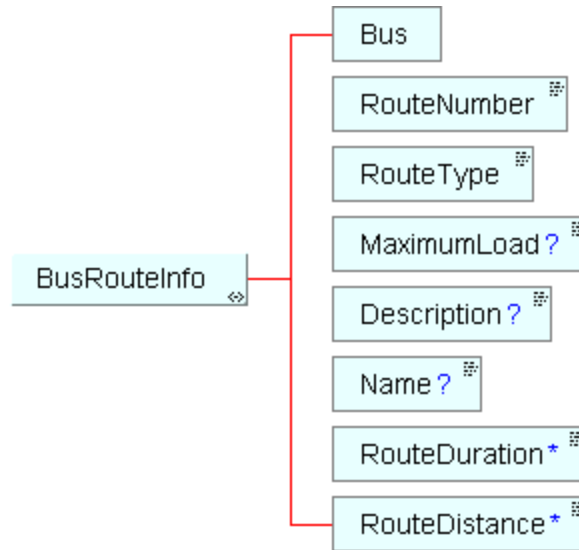
Element	Attrib	Char	Description
BusRouteDetail		M	
	RefId	R	GUID that identifies this object.
	BusRouteRefId	R	GUID that identifies the bus route. See the BusRoute specification for more details.
BusStop		M	
	RefId	R	GUID that identifies a bus stop on the route. See the BusStop specification for more details.
ArrivalTime		M	The time that the bus associated with this route will stop at this bus stop.
	Zone	R	The Zone attribute describes the time zone in the ISO code. Its value is the time for the time zone, in the format of “HH:MM:SS,” with HH in the range of 0 to 23. For example, the element <Time Zone = “GMT-08:00” >15:39:00</Time> represents 15 hours 39 minutes and 0 seconds (or 3:39 PM) for the Pacific Standard Time.

BusRouteDetail Example

```

<BusRouteDetail RefId ="D3E34B359D75101A8C3D00AA001A1652"
  BusRouteRefId = "C2F23F450B86234B9B3D00AA001A1652">
  <BusStop RefId="B7A34E561C97345C0A4E11BB112B2753" />
  <ArrivalTime Zone="GMT-08:00">15:39:00</Time>
</BusRouteDetail>
  
```

Name	BusRouteInfo
Description	This object contains all of the information about a bus route.
Type	Object
Status	Approved
Updateable	Yes



Element	Attrib	Char	Description
BusRouteInfo		M	
	RefId	R	GUID that identifies this bus route.
Bus		M	
	RefId	R	GUID that identifies the bus that is associated with this route. See the BusInfo specification for more information.
RouteNumber		M	A unique identifier for the route. It may contain any printable ASCII character. For instance, you may have route 16AM in the morning and a 16PM in the afternoon.
RouteType		M	The type of route. Allowable values are: "Inbound" and "Outbound."
MaximumLoad		O	The maximum number of students who are on the bus at any point along this route.
Description		O	Short explanation of the route. It may be used to designate an area, or used to color-code bus routes (the "orange" route).
Name		O	Name of the driver who drives this route. For a description of this element, see the Name specification.
RouteDuration		OR	The value is in the format of "HH:MM:SS."
	Type	R	Allowable values are "Loaded" and "Total." "Loaded" refers to the amount of time that at least one student is riding the bus. "Total" includes time when no student is on the bus, including time driving to and from the garage, etc.
RouteDistance		OR	Distance in miles.
	Type	R	Allowable values are "Loaded" and "Total." "Loaded" refers to the distance the bus drives when at least one student is riding the bus. "Total" includes the total distance driven for this route, including distance to and from the garage, etc.

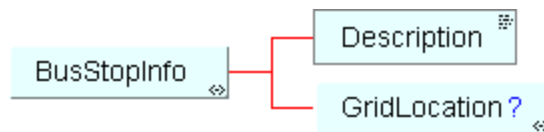
BusRouteInfo Example

```

<BusRouteInfo RefId ="D3E34B359D75101A8C3D00AA001A1652">
  <Bus RefId = "A2E35B359D75101A8C3D00AA001A0000"></Bus>
  <RouteNumber>16AM</RouteNumber>
  <RouteType>Inbound</RouteType>
  <MaximumLoad>40</MaximumLoad>
  <Description>1st Transfer Bus</Description>
  <Name Type="02">
    <LastName>Smith</LastName>
    <FirstName>Jon</FirstName>
  </Name>
  <RouteDuration Type="Loaded">00:16:45</RouteDuration>
  <RouteDuration Type="Total">00:28:00</RouteDuration>
  <RouteDistance Type="Loaded">5.23</RouteDistance>
  <RouteDistance Type="Total">9.9</RouteDistance>
</BusRouteInfo>

```

Name	BusStopInfo
Description	This object contains information about a bus stop.
Type	Object
Status	Approved
Updateable	Yes



Element	Attrib	Char	Description
BusStopInfo		M	
	RefId	R	GUID that identifies this location.
Description		M	An explanation of this location.
GridLocation		O	The location of the bus stop.

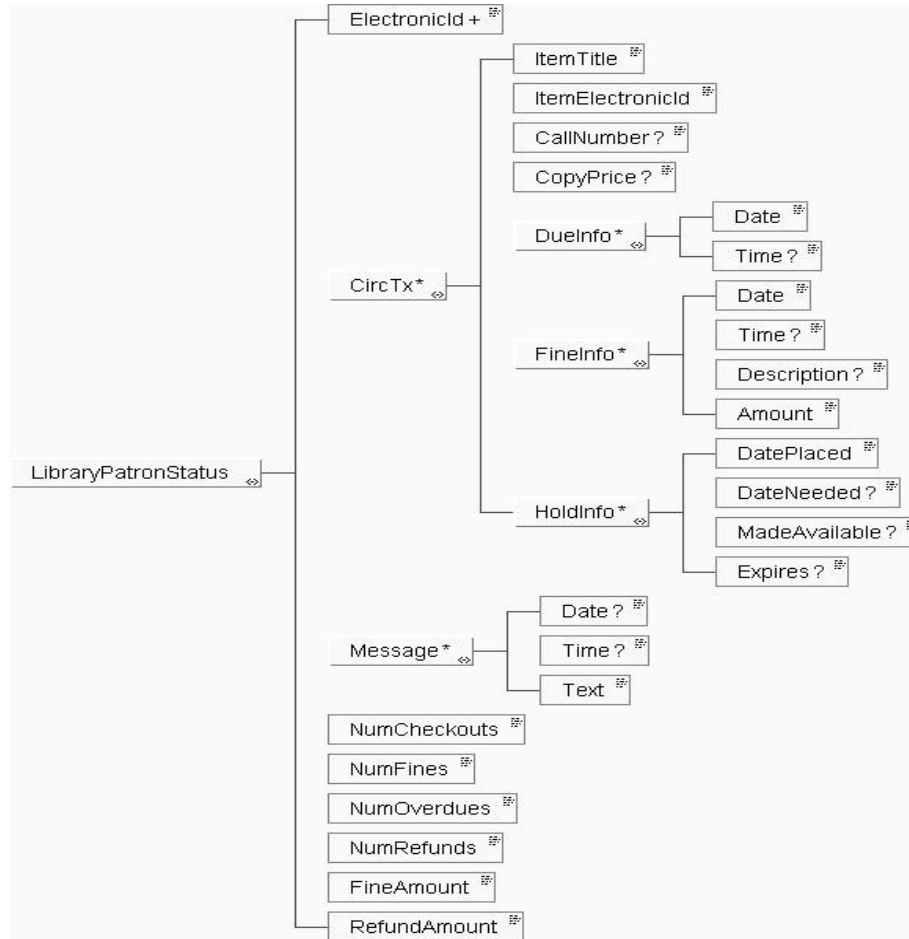
BusStopInfo Example

```

<BusStopInfo RefId ="D3E34B359D75101A8C3D00AA001A1652">
  <Description>Elm St @ Pine Ave</Description>
  <GridLocation>
    <Latitude>41.7699657</Latitude>
    <Longitude>79.548445</Longitude>
  </GridLocation>
</BusStopInfo>

```

Name	LibraryPatronStatus
Description	This object reports the current library status for the requested student or staff member.
Type	Object
Status	Approved
Updateable	No



Element	Attrib	Char	Description
LibraryPatronStatus		M	
	Library Type	R	A library defined language independent value that refers to a specific patron type.
	SifRefId	R	The SIF wide unique identifier of a student or teacher. Note that many library automation products work with patrons and not students and teachers.
	SifType	R	The type of patron mapped to a SIF supported object. Allowed Values: - "Student" - "Teacher"
ElectronicId		MR	Lists any barcode, magstripe, or PIN associated with this patron.

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	Type	R	Allowable Values: - “Barcode” - “Magstripe” - “PIN”
CircTx		OR	Contains information about library items that are checked out or have fines or holds placed on them.
CircTx/ItemResourceTitle		M	The title of the item being referenced by this CircTx.
CircTx/ElectronicBookId		M	The electronic identifier for the title referenced by this CircTx
	Type	R	Allowable Values: - “Barcode” - “Magstripe”
CircTx/CallNumber		O	The library call number, if any, assigned to this item.
CircTx/CopyPrice		O	The cost of this copy.
CircTx/DueInfo		O	If the title is currently checked out to this person, this element contains the date and time that the title is due back to the library.
CircTx/DueInfo/Date		M	The date that this item is due back at the library if the item is currently checked out to the patron.
CircTx/DueInfo/Time		O	The time that this item is due back at the library if the item is currently checked out to the patron.
CircTx/FineInfo		OR	If the title has a fine assessed to this person, this element will contain the information about the fine.
	Type	R	Type of fine assessed to this patron and item. Allowed values: - “Damaged” - “Lost” - “Overdue” - “Refund”
CircTx/FineInfo/Date		M	The date that this fine was assessed to the patron.
CircTx/FineInfo/Time		O	The time that this fine was assessed to the patron.
CircTx/FineInfo/Description		O	More detailed information concerning the assessed fine or refund.
CircTx/FineInfo/Amount		M	The current balance owed on the fine.
CircTx/HoldInfo		OR	If the title has a hold placed on it by the person, this element will contain the information about the hold.
	Type	R	The type of hold being referenced. Allowed values: - “Ready” (which means that a previously placed hold is ready for the patron to pick up at the library desk.) - “NotReady.”
CircTx/HoldInfo/Date Placed		M	The date that the hold was first placed. The date follows the same format as the SIF Date element.
CircTx/HoldInfo/Date Needed		O	The date that the patron needs this title by. The date follows the same format as the SIF Date element.
CircTx/HoldInfo/Made Available		O	The date that this item became available for the patron to pick up. The date follows the same format as the SIF Date element.
CircTx/HoldInfo/Expires		O	The date when this ready hold will expire freeing the item to be assigned to another patron. The date follows the same format as the SIF Date element.
Message		OR	
	Priority	R	The level of urgency associated with this message. Allowed Values: - “Low” - “Normal” - “Urgent”

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Message/Date		O	The date that this message was originally sent.
Message/Time		O	The time that this message was originally sent.
Message/Text		M	The contents of the message.
NumCheckouts		M	The total number of items that this patron currently has checked out.
NumFines		M	The total number of fines currently assessed to this patron.
NumOverdues		M	The total number of checkouts that are currently overdue.
FineAmount		M	The total monetary amount of the fines that this patron currently owes the library.
NumRefunds		M	The total number of refunds currently credited to this patron.
RefundAmount		M	The total monetary amount of the refunds that the library currently owes the patron.

LibraryPatronStatus Example

<LibraryPatronStatus SifRefId="AB7897FD342689DA43978GF34976DA32" SifType="Student"

LibraryType="AP">

 <ElectronicId Type="Barcode">P12345</ElectronicId>

 <CircTx>

 <ItemTitle>How I Did It</ItemTitle>

 <ItemElectronicBookId Type="Barcode">T876</ItemElectronicBookId>

 <CallNumber>FIC</CallNumber>

 <CopyPrice>23.95</CopyPrice>

 <DueInfo>

 <Date>19990130</Date>

 <Time Zone = "GMT-08:00">20:39:12</Time>

 </DueInfo>

 <FineInfo Type="Damaged">

 <Date>19990122</Date>

 <Time Zone = "GMT-08:00">20:39:12</Time>

 <Description>Broken spine</Description>

 <Amount>4.00</Amount>

 </FineInfo>

 <HoldInfo Type="Ready">

 <DatePlaced>19981217</DatePlaced>

 <DateNeeded>19990120</DateNeeded>

 <MadeAvailable>19990116</MadeAvailable>

 <Expires>19990201</Expires>

 </HoldInfo>

 </CircTx>

 <Message Priority="Urgent">

 <Date>19990129</Date>

 <Time Zone = "GMT-08:00">20:39:12</Time>

 <Text>Please contact Ms. Burke immediately.</Text>

 </Message>

 <Message Priority="Low">

 <Text>January is a great month to read about snow!</Text>

 </Message>

 <NumCheckouts>1</NumCheckouts>

 <NumFines>1</NumFines>

 <NumOverdues>0</NumOverdues>

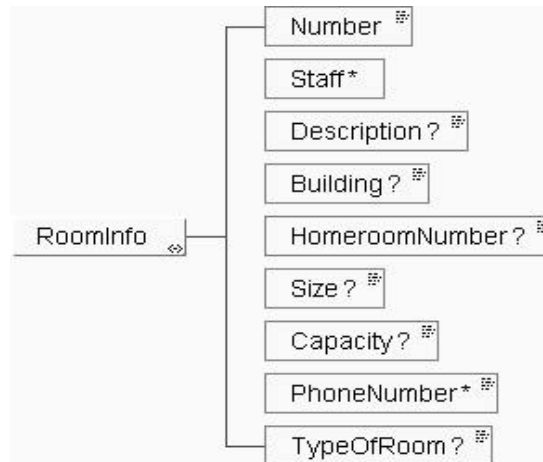
 <FineAmount>4.00</FineAmount>

 <NumRefunds>0</NumRefunds>

 <RefundAmount>0.00</RefundAmount>

</LibraryPatronStatus>

Name	RoomInfo
Description	This object contains all of the information about a school's room. This object contains a reference to a room type so that it may represent anything from a gym, cafeteria, to a standard classroom.
Type	Object
Status	Approved
Updateable	Yes



Element	Attrib	Char	SP/Ex ID	SP/Ex Code	Description
RoomInfo		O			This object contains all of the information about a school's room. This object contains a reference to a room type so that it may represent anything from a gym, cafeteria, to a standard classroom. See RoomType for more information on this. The Staff element usually represents the Homeroom Teacher.
	RefId	R			GUID that identifies this room.
	School RefId	R			GUID that identifies the school that this room belongs to.
Number		M			Room Number as presented to the user/application.
Staff		OR			Staff assigned to this room. For example the Homeroom Teacher.
	RefId	R			GUID that identifies the staff assigned to this room.
Description		O			Friendly name that can be assigned to the room. For example Staff Cafeteria.
Building		O			Extra building information. In the future Building could become its own object in which case this element will need to be changed to a RefId. Currently it is only required as a free text field.
HomeroomNumber		O			When a room is designated as a homeroom it may have a different number. Usually blank when room is not a homeroom.
Size		O			Size in square feet.

Element	Attrib	Char	SP/Ex ID	SP/Ex Code	Description
Capacity		O			Number of persons (usually students) that this room can hold.
PhoneNumber		OR			These are the room's phone numbers. For a description of this element, refer to the PhoneNumber specification.
TypeOfRoom		O			Type of room.
	RefId	R			GUID that identifies the room type assigned to this room.

RoomInfo Example

```

<RoomInfo RefId ="D3E34B359D75101A8C3D00AA001A1652"
  SchoolRefId ="A2E35B359D75101A8C3D00AA001A0000">
  <Description>Room 101</Description>
  <Building>Main A</Building>
  <Number>101</Number>
  <Staff RefId ="A8C3A2E35B359D75101D00AA001A0000">
  <HomeroomNumber>10-HR-A</HomeroomNumber>
  <Size>400</Size>
  <Capacity>35</Capacity>
  <PhoneNumber Format="NA" Type="TE">(312) 555-1234</PhoneNumber>
  <PhoneNumber Format="NA" Type="AP">(312) 555-4321</PhoneNumber>
  <TypeOfRoom RefId = "9D75101A8C3D00AA001A0000A2E35B35">
</RoomInfo>

```

Name	RoomType
Description	This object identifies the type of room. For example Gym, Cafeteria, Standard Classroom, etc.
Type	Object
Status	Approved
Updateable	Yes



Element	Attrib	Char	SP/Ex ID	SP/Ex Code	Description
RoomType		O			Identifies the type of room. For example Gym, Cafeteria, Standard Classroom, etc.
	RefId	R			GUID that identifies this room type.
	SchoolRefId	R			GUID that identifies the school that this room type belongs to.
Description		M			Description of the room type.

RoomType Example

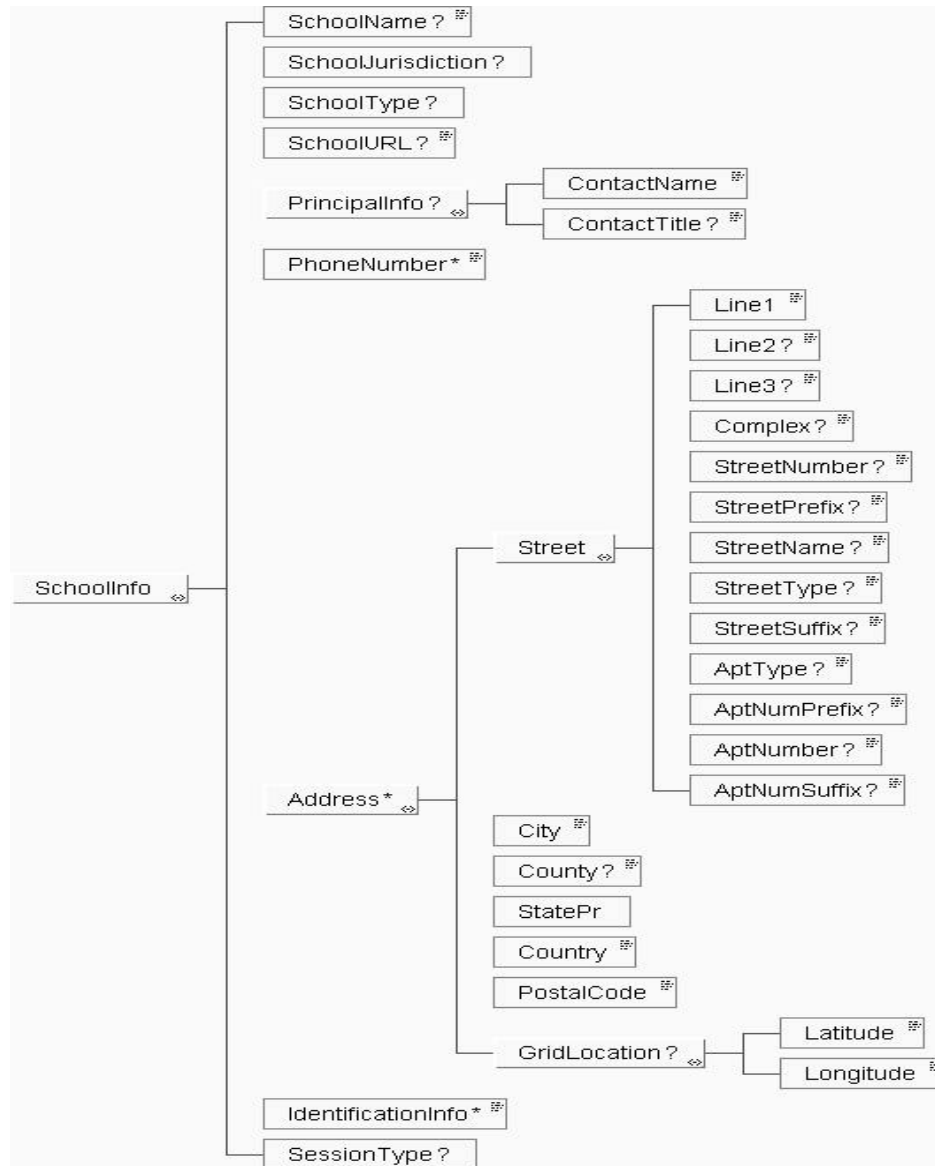
```

<RoomType RefId ="D3E34B359D75101A8C3D00AA001A1652"
  SchoolRefId ="A2E35B359D75101A8C3D00AA001A0000">
  <Description>Gymnasium</Description>
</RoomType>

```

SIF Implementation Specifications v.1.0

Name	SchoolInfo
Description	This object contains information about the school.
Type	Object
Status	Approved
Updateable	Yes



Element	Attrib	Char	SP/Ex ID	SP/Ex Codes	Description
SchoolInfo		M			
	RefId	R			The GUID of the school whose information this is.
SchoolName		O			Name of school.
School Jurisdiction		O			The jurisdiction for this school.

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Element	Attrib	Char	SP/Ex ID	SP/Ex Codes	Description
	Code	R	N405-309	<u>Code & Description</u> RE-Regional Education Service Agency SB-Suburban SD-School District SH-School Campus Code SP-State/Province SS-School TN-Township UR-Urban ZZ-Mutually Defined	A SPEEDE/ExPRESS code that identifies the jurisdiction for the school.
SchoolType		O		Entity Identifier Code (subset): Code identifying an organizational entity, a physical location, property	The type of school this is.
	Code	R	98	<u>Code & Description</u> HS-High School M8-Educational Institution VO-Elementary School VQ-Middle School VR-Junior High School ZZ-Mutually Defined	
SchoolURL		O			URL for the school.
PrincipalInfo		O			Information about the school's principal.
PrincipalInfo/ ContactName		M			The name of the principal.
PrincipalInfo/ ContactTitle		O			The principal's title.
PhoneNumber		OR			The school's phone numbers.
Address		OR			The school's addresses.
Identification Info		OR			The school's identification information. The actual sub-elements that make up this identification will be based on the identification code. This is the School ID that is used in other objects.
	Code	R	N103-66	Identification Code Qualifier (Institution Code Qualifier) Description: Code designating the system/method of code structure used for Identification Code (67) <u>Code & Description</u> 75 State or Province Assigned Number 76 Local School District or Jurisdiction Number	A SPEEDE/ExPRESS code that says which identification system is used.

SIF Implementation Specifications v.1.0

Element	Attrib	Char	SP/Ex ID	SP/Ex Codes	Description
				<u>Code & Description (cont.)</u> 77 National Center for Education Statistics (NCES) Common Core of Data (CCD) number for PreK - 12 institutions 78 The College Board and ACT 6 digit code list of secondary educational institutions	
SessionType		O			
	Code	R	SES04-1139	Session Code (Type of Session) Description: Code identifying the type of academic session at an educational institution. <u>Code & Description</u> 1-Full year 2-Semester 3-Trimester 4-Quarter 5-Quinmester 6-Mini-term 7-Summer Session 8-Interession (Year Round Schools) 9-Long session which is longer than a semester or quarter or trimester but shorter than a full year	A SPEEDE/ExPRESS code that specifies the session type.

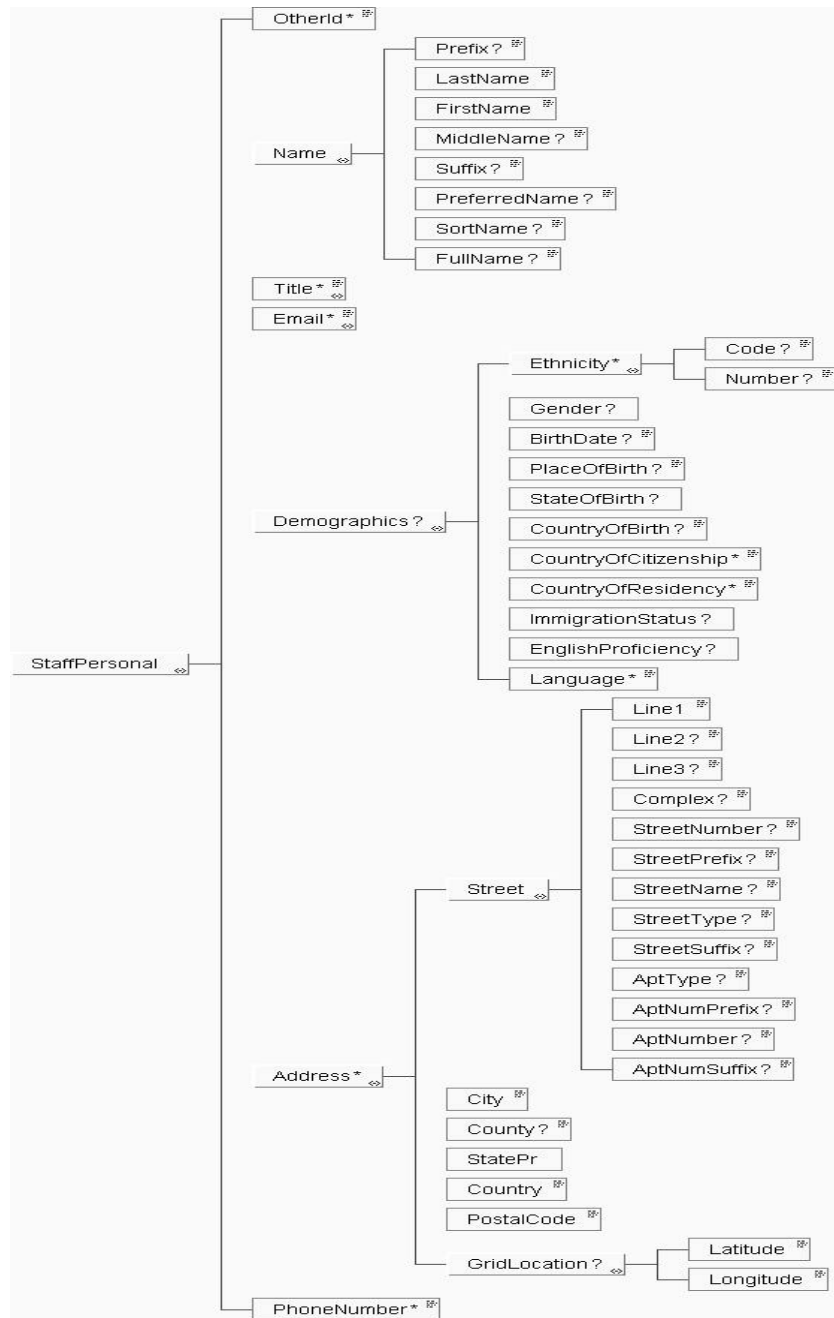
SchoolInfo Example

```

<SchoolInfo RefId="D3E34B359D75101A8C3D00AA001A1652">
  <SchoolName>Lincoln High School</SchoolName>
  <SchoolJurisdiction Code="SD"/>
  <SchoolType Code="HS"/>
  <SchoolURL>www.lincolnhs.edu</SchoolURL>
  <PrincipalInfo>
    <Name>Richard Knudson</Name>
    <ResourceTitle>Dr.</ ResourceTitle>
  </PrincipalInfo>
  <PhoneNumber Format="NA" Type="TE">(312) 555-1234</PhoneNumber>
  <IdentificationInfo Code="76">00123</IdentificationInfo>
  <SessionType Code="1"/>
</SchoolInfo>

```

Name	StaffPersonal
Description	This object contains all the personal information relating to a staff member, who might be a teacher or other employee of the school or district.
Type	Object
Status	Approved
Updateable	Yes



SIF Implementation Specifications v.1.0

Element	Attrib	Char	SP/Ex ID	SP/Ex Codes	Description
StaffPersonal		M			
	RefId	R			The GUID of the staff member that this object is linked to.
OtherId		OR			Lists all “other” ID’s associated with the staff member. For a description of this element, see the OtherId specification.
Name		M			Name of the staff member. For a description of this element, see the Name specification.
Title		OR			The staff member’s title.
Email		OR			The staff member’s e-mail
Demographics		O			This element contains information related to staff member demographics. For a description of this element, see the Demographics specification.
Address		OR			This element has the staff member’s address information. For a description of this element, see the Address element specification.
PhoneNumber		OR			This is the staff member’s phone number. For a description of this element, refer to the PhoneNumber specification.

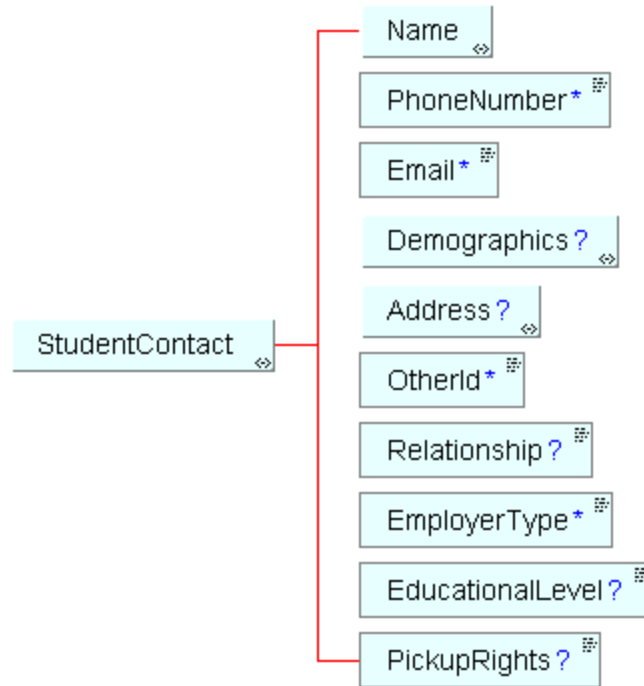
StaffPersonal Example

```

<StaffPersonal RefId="D3E34F419D75101A8C3D00AA001A1652">
  <OtherId Type="SY">333-33-3333</OtherId>
  <Name Type="01">
    <Prefix>Mr.</Prefix>
    <LastName>Woodall</LastName>
    <FirstName>Charles</FirstName>
    <MiddleName>William</MiddleName>
    <PreferredName>Chuck</PreferredName>
  </Name>
  <ResourceTitle>Principal</ResourceTitle>
  <Email>chuckw@imginc.com</Email>
  <Demographics>
    See the Demographics specification for details
  </Demographics>
  <Address>
    See the Address specification for details
  </Address>
  <PhoneNumber Format="NA" Type="HP">(312) 555-1234</PhoneNumber>
</StaffPersonal>

```


Name	StudentContact
Description	This object contains the student's contact information.
Type	Object
Status	Approved
Updateable	Yes



Element	Attrib	Char	SP/Ex ID	SP/Ex Codes	Description
Student Contact		M			
	Student RefId	R			The GUID of the student whose contact this is.
	Type	R	INI03-98	Entity Identifier Code Description: Code identifying an organizational entity, a physical location, property or an individual Note to User: This code describes the relationship this entity has with the student. If this occurrence of the IN1 refers to the student, use "S2." Code& Description 6X-Disciplinary Contact E1-Person or Other Entity Legally Responsible for a Child E2-Person or Other Entity With Whom a Child Resides	

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Element	Attrib	Char	SP/Ex ID	SP/Ex Codes	Description
				Code& Description (cont.) E3-Person or Other Entity Legally Responsible for and With Whom a Child Resides E4-Other Person or Entity Associated with Student EMC-Emergency Contact (SIF additions) P3-Primary Care Provider S1-Parent S2-Student S3-Custodial Parent	
Name		M			The name of the contact. For a description of this element, see the Name specification.
Phone Number		OR			The contacts phone number(s). For a description of this element, see the PhoneNumber specification.
Email		OR			The contact's e-mail address (es).
Demo-graphics		O			Demographic information about the contact. For a description of this element, see the Demographics specification.
Address		O			The contact's address (es). For a description of this element, see the Address specification.
OtherId		OR			Lists all "other" Id's associated with the contact. For a description of this element, see the OtherId specification.
Relationship		O			
	Code	R	IN106-1069	Individual Relationship Code Description: Code indicating the relationship between two individuals or entities. See Appendix F.	A SPEEDE/ExPRESS code that defines the relationship to the contact to the student.
Employer Type		OR			
Educational Level		O			

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Element	Attrib	Char	SP/Ex ID	SP/Ex Codes	Description
	Code	R		<p>Source: NCES Student Data Handbook Code & Description 01-Government--A federal, regional, state or local government agency. 02-Military--A branch of the armed forces. 03-Private organization--A non-governmental organization. 04-Self-employed--Earning income directly from one's own business, trade, or profession rather than as an employee of another individual or organization. 99-Other</p> <p>0K-Kindergarten 01-First grade 02-Second grade 03-Third grade 04-Fourth grade 05-Fifth grade 06-Sixth grade 07-Seventh grade 08-Eighth grade 09-Ninth grade 10-Tenth grade 11-Eleventh grade 12-Twelfth grade AD-Adult EL-Elementary School HG-High School Graduate or Equivalent HS-Attended high school, but did not graduate IF-Infant (0 to age 2) MS-Middle or Junior High School P0 Pre-Kindergarten Level 0 P1 Pre-Kindergarten Level 1 P2 Pre-Kindergarten Level 2 P3 Pre-Kindergarten Level 3 P4 -Pre-Kindergarten Level 4 P5-Pre-Kindergarten Level 5 PK-Pre-Kindergarten PS-Some Postsecondary (e.g. college) SS-Secondary School UN-Ungraded VS-Vocational School</p>	<p>An NCES code that defines the employer type. Allowable values = 01, 02, 03, 04, 99</p> <p>A code for the contact's educational level.</p>

Element	Attrib	Char	SP/Ex ID	SP/Ex Codes	Description
Pickup Rights		O			<p>This element tells whether or not the contact has pickup rights.</p> <p>Allowable values are “Yes” and “No”</p>

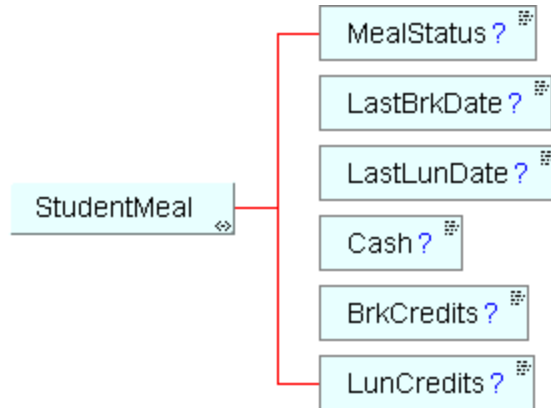
StudentContact Example

```

<StudentContact RefId="D3E34B379D75101A8C3D00AA001A1652"
  StudentRefId="D3E34B359D75101A8C3D00AA001A1652"
  Type="S1">
  <Name>See Name element described in StudentPersonal</Name>
  <PhoneNumber Format="NA" Type="HP">(604) 555-1212</PhoneNumber>
  <Email/>
  <Demographics>See Demographics element for description</Demographics>
  <Address>See Address element for description</Address>
  <OtherId/>
  <Relationship Code="03"/>
  <EmployerType/>
  <EducationalLevel Code="03">PS</EducationalLevel>
  <PickupRights>No</PickupRights>
</StudentContact>

```

Name	StudentMeal
Description	This object includes information about a student meal options.
Type	Object
Status	Approved
Updateable	Yes



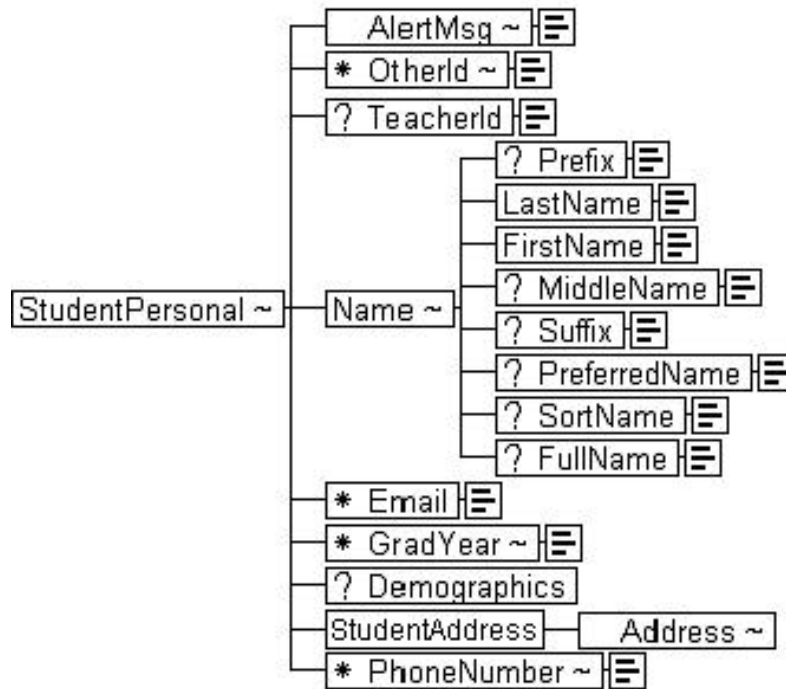
Element	Attrib	Char	Description
StudentMeal		M	
	Student RefId	R	The GUID of the student to whom this object is linked.
MealStatus		O	This gives information about a student's meal status.
	Type	R	Allowable Values: - "Free" - "Reduced" - "None"
LastBrkDate		O	Date that the student last had breakfast.
LastLunDate		O	Date that the student last had lunch.
Cash		O	The student's cash balance.
BrkCredits		O	Number of breakfast credits remaining.
LunCredits		O	Number of lunch credits remaining.

StudentMeal Example

```

<StudentMeal StudentRefId="D3E34B359D75101A8C3D00AA001A1652">
  <MealStatus Type="Free"/>
  <LastBrkDate>19990129</LastBrkDate>
  <LastLunDate>19990129</LastLunDate>
  <Cash>3.50</Cash>
  <BrkCredits>5</BrkCredits>
  <LunCredits>5</LunCredits>
</StudentMeal>
  
```

Name	StudentPersonal
Description	This object contains all the personal information related to the student.
Type	Object
Status	Approved
Updateable	Yes



Element	Attrib	Char	SP/Ex ID	SP/Ex Codes	Description
StudentPersonal		M			
	RefId	R			The GUID of the student that this object is linked to.
AlertMsg		OR			This is an alert message that is associated with the student.
	Type	R			This attribute specifies what type of alert message this is.
OtherId		OR			Lists all “other” Id’s associated with the student. For a description of this element, see the OtherId specification.
Name		M			Name of the Student. For a description of this element, see the Name specification.
Email		OR			The student’s e-mail
	Type	R			This attribute specifies what type of email.
GradYear		OR			The year that the student is expected to graduate.

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Element	Attrib	Char	SP/Ex ID	SP/Ex Codes	Description
	Type	R			This attribute specifies whether this is the original or projected year of graduation. Allowable values = - "Original" - "Projected"
Demographics		O			This element contains information related to student demographics. For a description of this element, see the Demographics specification.
StudentAddress		OR			This element has the student's address information.
	PickupOr Dropoff	R			Specifies if this is a pickup or dropoff address. This property may be needed by a transportation application. Allowable values are: "NA," "Pickup," "Dropoff," "Both."
	DayOfWeek	R			This attribute indicates the days of the week for which the pickup or dropoff address is valid. The attribute is relevant only if the value of the PickupOrDropoff attribute is "Pickup," "Dropoff" or "Both." Valid values of the attribute are: "NA" if not relevant, the string "MoTuWeThFrSaSu" representing Monday thru Friday, or a subset of the string.
StudentAddress/ Address		R			This is the actual address. For details of this element, refer to the Address specification.
PhoneNumber		OR			This is the student's phone number. For a description of this element, see the PhoneNumber specification.

StudentPersonal Example

```

<StudentPersonal StudentRefId="D3E34B359D75101A8C3D00AA001A1652">
  <AlertMsg Type="Legal">This is the Legal Alert for Joe Student</AlertMsg>
  <OtherId Type="06">P00001</OtherId>
  <OtherId Type="28">WB0025</OtherId>
  <Name Type="01">
    <LastName>Student</LastName>
    <FirstName>Joe</FirstName>
    <MiddleName></MiddleName>
    <PreferredName>Joe</PreferredName>
  </Name>
  <Email>Joe.Student@anyschool.com</Email>
  <GradYear Type="Original">1982</GradYear>
  <Demographics>
    See the Demographics specification for details
  </Demographics>
  <StudentAddress PickupOrDropoff="NA" DayOfWeek="MoTuWeThFrSaSu" >
    <Address>
      See the Address specification for details
    </Address>
  </StudentAddress>
  <PhoneNumber Format="NA" Type="HP">(312) 555-1234</PhoneNumber>
</StudentPersonal>

```

Name	StudentPicture
Description	This object contains information about the student's picture.
Type	Object
Status	Approved
Updateable	Yes



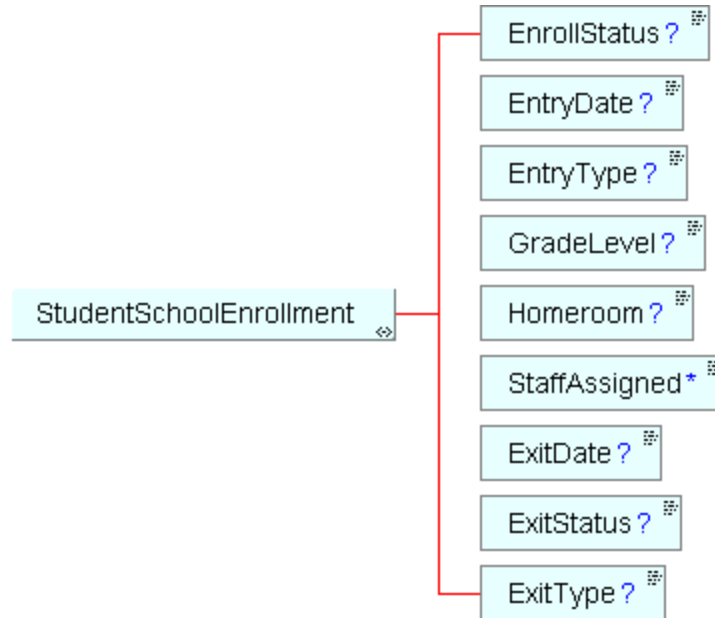
Element	Attrib	Char	SP/Ex ID	SP/Ex Codes	Description
StudentPicture		O			The encoding used for the picture is Base 64.
	Student RefId	R			This is the GUID of the student whose picture this is.
PictureSource		M			This element defines the picture. If Type is URL, this is the location of the picture; otherwise, this is the picture image content in the specified format.
	Type	R			The way the picture is specified. Allowable values: "URL," "BMP," "JPEG," "GIF," etc.

StudentPicture Example

```

<StudentPicture StudentRefId="D3E34B359D75101A8C3D00AA001A1652">
  <PictureSource Type="URL">http://www.schoolsite.com/pictures/1999/1234.jpg</PictureSource>
</StudentPicture>
  
```


Name	StudentSchoolEnrollment
Description	This object defines information related to a student's enrollment.
Type	Object
Compliance Status	Mandatory
Updateable	Yes



Element	Attrib	Char	SP/Ex ID	SP/Ex Code	Description
StudentSchool Enrollment					
	RefId	R			The id that uniquely identifies a particular enrollment.
	Student RefId	R			The id of the student to whom this information is linked.
	Membership RefId	R			The GUID of the school to which this enrollment applies.
	Membership Type	R			The type of school this is. Allowable values: "Home" "Concurrent"

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Element	Attrib	Char	SP/Ex ID	SP/Ex Code	Description
	Time Frame	R			The timeframe of the enrollment. Allowed values: Current - today's date falls between EntryDate and ExitDate (inclusive) Historical - today's date falls after ExitDate Future - today's date falls before EntryDate NA - None of the above
EnrollStatus		O			This is the enrollment status for this enrollment. This field tells if this is a current enrollment or not.
	Code	R	SST07-641	Status Reason Code (Current Enrollment Status Code) Description: Code indicating the status reason Note to User: This element indicates if the student is currently enrolled at the institution and how the courses for which the student is enrolled are contained in the transaction set. <u>Code & Description</u> B30 Currently enrolled but courses in progress not included B31 Not currently enrolled B33 Unreported Information is not available in record B34 Currently enrolled and courses in progress are included	
EntryDate		O			This is the date from when this enrollment is valid.
EntryType		O		Status Reason Code (Reason for Entry or Exit) Description: Code indicating the status reason.	

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Element	Attrib	Char	SP/Ex ID	SP/Ex Code	Description
	Code	R	SSE03-641	Status Reason codes are listed in Appendix F.	
GradeLevel		O			
	Code	R	SES10-1131	Level of Individual, Test, or Course Code (Grade or Academic Level of Student) Description: Code identifying level of course, test, or student. Note to User: This is the code identifying the grade level or academic level of the student for this session. This does not refer to the level of courses taken. Grade Level codes are listed in Appendix F.	
Homeroom		O			Homeroom for this enrollment.
	RefId	R			Reference to the RoomInfo object.
StaffAssigned		OR			Staff assigned to the student for this enrollment.
	Type	R			The type of assignment: Allowed values are "Advisor", "Counselor"
	RefId	R			Reference to the StaffPersonal object.
ExitDate		O			The date the student left the school.
ExitStatus		O			
	Code	R			Allowable values = 01,02
ExitType		O			
	Code	R		Status Reason codes are listed in Appendix F.	

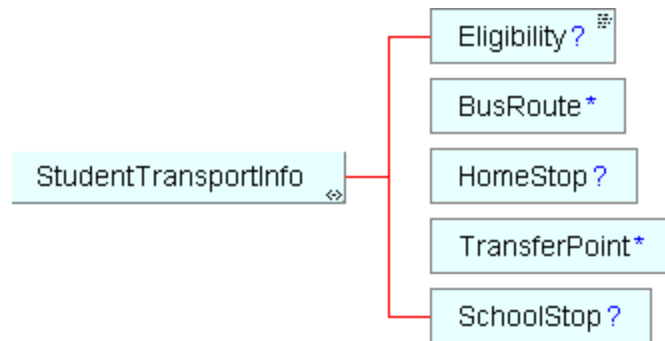
StudentSchoolEnrollment Example

```

<StudentSchoolEnrollment StudentRefId="D3E34B359D75101A8C3D00AA001A1652"
  RefId="A8C3D3E34B359D75101D00AA001A1652">
  MembershipRefId="D3E34B359D75101A8C3D00AA001A1651"
  MembershipType="Home"
  TimeFrame="Current">
  <EnrollStatus Code="B34"/>
  <EntryDate>20000129</EntryDate>
  <EntryType Code="B27"/>
  <GradeLevel Code="24"/>
  <Homeroom RefId="D7510D3E34B3591A8C3D00AA001A1651"/>
  <StaffAssigned Type="Advisor" RefId="B359D3E34D75101A8C3D00AA001A1652"/>
</StudentSchoolEnrollment>

```

Name	StudentTransportInfo
Description	This object contains transportation information about a student. Students should have at least two StudentTransportInfo objects associated with them - one for inbound information (getting to school) and one for outbound information (leaving school). If their transportation changes based on the day of the week, then a student will have more than two StudentTransportInfo objects.
Type	Object
Status	Approved
Updateable	Yes



Element	Attrib	Char	Description
StudentTransportInfo		M	
	RefId	R	GUID that identifies this object.
	StudentRefId	R	GUID that identifies the student that this object refers to.
	Type	R	The direction of transportation that this object refers to. Allowable values are: "Inbound" and "Outbound."
	DayOfWeek	R	This attribute indicates the day(s) of the week to which this object refers. Valid values are: the string "MoTuWeThFrSaSu" representing Monday thru Friday, or a subset of the string.
	SchoolRefId	R	The school that the student attends on these day(s) of the week.
Eligibility		O	Eligibility status of student for district transportation for this trip. Allowable values are: "Bus," "Walk," "BusHazard," "BusOutOfAttendance," "ParentPay," and "Unknown."
BusRoute		OR	If BusRoute does not exist, then the student does not ride a bus to/from school, depending on Type.
	RefId	R	
HomeStop		O	If the HomeStop does not exist, then the student does not ride a bus to school.
	RefId	R	GUID that identifies the origin bus stop for an inbound route or the destination bus stop for an outbound route.

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Element	Attrib	Char	Description
TransferPoint		OR	There should be one TransferPoint element for each intermediate point on a trip. The “embark” and “disembark” bus stops for a single transfer point must be at the same location. To order multiple TransferPoint elements, use the Time element of the BusStop objects referenced by the attributes.
	EmbarkBusStop RefId	R	GUID that identifies the bus stop where the student gets on the bus. See the BusStop specification for more information.
	Disembark BusStop RefId	R	GUID that identifies the bus stop where the student gets off the bus. See the BusStop specification for more information.
SchoolStop		O	If the SchoolStop does not exist, then the student does not ride a bus to school.
	RefId	R	GUID that identifies the origin bus stop for an outbound route or the destination bus stop for an inbound route.

StudentTransportInfo Example

```

<StudentTransportInfo RefId = "D3E34B359D75101A8C3D00AA001A1652"
  StudentRefId = "C2F23F450B86234B9B3D00AA001A1652"
    Type = "Inbound"
    DayOfWeek = "MoWeFr">
  <SchoolRefId = "B7A34E561C97345C0A4E11BB112B2753">
    <Eligibility>Bus</Eligibility>
    <BusRoute RefId = "564E971C5C344E0ABB11EE272B53A3B7"></BusRouteRefId>
    <HomeStop RefId = "A3B7564E971C5C344E0ABB11EE272B53"></HomeStopRefId>
    <SchoolStop RefId = "7B3AE465C17943C5A0E411BB11B272351"></SchoolStopRefId>
  </StudentTransportInfo>

```

DRAFT DATA MODEL OBJECTS

The characteristics for all of the tables in this section use the following codes.

Characteristics Codes	
R	Required Attribute
M	Mandatory Element
O	Optional Element
C	Conditional Element
MR	Mandatory & Repeatable Element
OR	Optional & Repeatable Element
CR	Conditional & Repeatable Element

Name	AssessmentInfo
Description	This object includes information about assessments - questions used to indicate the level of mastery in a particular subject.
Type	Object
Status	Draft
Updateable	Not Yet Determined

Element	Attrib	Char	Description
AssessmentInfo		M	Information includes standard question types and their properties (like answer choices, correct answer, question stem)
	AssessmentRefId	R	The GUID of the AssessmentInfo.
AssessmentInfoTitle		O	The title of the AssessmentInfo.
MultipleChoice		OR	Question type, 0 or more instances.
MultipleChoice/Question		M	Must have a question stem.
MultipleChoice/ResponseOption		OR	Should have at least two.
MultipleChoice/LearningStyle		O	Optional unstructured information.
MultipleChoice/Answer		M	The correct answer (s).
Completion		O	Question type, 0 or more instances.
Completion/Question		M	Must have a question stem.
Completion/ExpectedResponse		M	Correct answer.
Completion/LearningStyle		O	Optional unstructured information.
Completion/Credit		M	Credit for question.
Narrative		OR	Question type, 0 or more instances.
Narrative/Question		M	Must have a question stem.
Narrative/ExpectedResponse		MR	One or more Correct Answers.
Narrative/LearningStyle		O	Optional unstructured information.
Narrative/CreditAlgorithm		MR	Credit algorithms for question.

AssessmentInfo Example

```

<AssessmentInfo AssessmentRefId="FA134AB05A0406AC1100123442132F21">
  <MultipleChoice>
    <Question>2x - 7 = 5</Question>
    <ResponseOption>4</ResponseOption>
    <ResponseOption>6</ResponseOption>
    <ResponseOption>5</ResponseOption>
    <ResponseOption>10</ResponseOption>
    <ResponseOption>8</ResponseOption>
    <Answer>6</Answer>
  </MultipleChoice>
</AssessmentInfo >

```

Name	AssessmentResult
Description	This object includes information about the result of one learner completing one assessment.
Type	Object
Status	Draft
Updateable	Not Yet Determined

Element	Attrib	Char	Description
AssessmentResult		M	
	AssessmentInfo RefId	R	The GUID of the AssessmentResult.
	StudentRefId	R	The GUID of the Student.
Date		O	Date completed.
AssessmentScore		M	Overall score for assessment.
Mastery		O	Mastery status, one of True, False, Partial
Mastery/True		O	User mastered Assessment.
Mastery/ False		O	User didn't master Assessment.
Mastery/Partial		O	User mastered partial Assessment.
CompletionState		O	Completion status, one of Start, NotStart, Completed.
CompletionState/ Started		O	User started Assessment.
CompletionState/ NotStarted		O	User hasn't started Assessment.
CompletionState/Competed		O	User completed Assessment.
CompletionState/ Pending		O	User status pending
CompletionState/No CompletionPossible		O	Completion won't happen

AssessmentResult Example

```

<AssessmentResult AssessmentRefId="7897D3E34B359D701A8C3D00AA1A1652"
  StudentRefId = "D3E34B359D75101A8C3D00AA001A1652">
  <Date>20001102</Date>
  <AssessmentScore>90%</AssessmentScore>
  <Mastery>True</Mastery>
  <CompletionState>Completed</CompletionState>
</AssessmentResult>

```

Name	AssignmentCategory
Description	This object is to provide information about a particular category to allow applications to synchronize their category tables, etc.
Type	Object
Status	Draft
Updateable	Not Yet Determined

Element	Attrib	Char	Description
AssignmentCategory	RefId	R	GUID that identifies an assignment group.
Description		M	The name/short description of the category.
Weight		O	The weight of the category.

AssignmentCategory Example

```
<AssignmentCategory RefId="98H57J1L13BA8C3D00AA012B359D751Z">
  <Description>Tests</Description>
  <Weight>35.0</Weight>
</AssignmentCategory>
```

Name	AssignmentInfo
Description	This object provides information about a particular assignment, allow applications to synchronize each other's assignment tables, gather the definition for a StudentScore object, etc.
Type	Object
Status	Draft
Updateable	Not Yet Determined

Element	Attrib	Char	Description
AssignmentInfo	Assignment RefId	R	A GUID that identifies AssignmentInfo.
	SectionRefId	R	
	TermRefId	R	
AssignmentCategory	RefId	R	
PointsPossible		M	The points possible on the assignment.
CreateDate		O	Creation date of the assignment (CCYYMMDD).
DueDate		O	Date the assignment is due (CCYYMMDD).
Description		O	The text-based description of the assignment.
Weight		O	The weight of the assignment.

AssignmentInfo Example

```
<AssignmentInfo RefId="359D75101AD0A9D7A8C3DAD0A8510VD2"
  SectionRefId="D0A0A27AD0A8510AD9D75101A8C3DA39"
  TermRefId="A8C3A2E35B359D75101D00AA001A0000">
  <AssignmentCategory RefId="98H57J1L13BA8C3D00AA012B359D751Z">
    <PointsPossible>100</PointsPossible>
    <CreateDate>20001121</CreateDate>
    <DueDate>20001125</DueDate>
    <Description>Pop Quiz 1</Description>
    <Weight>1.0</Weight>
  </AssignmentCategory>
</AssignmentInfo>
```


Name	AttendanceCodeInfo
Description	This object provides information about a particular attendance code, allows applications to synchronize each other's attendance code tables, etc.
Type	Object
Status	Draft
Updateable	Not Yet Determined

Element	Attrib	Char	Description
AttendanceCodeInfo	RefId	R	GUID that identifies this comment.
	StaffPersonalRefId	R	
Description		O	The text description of the attendance code.
AttendCode		M	The attendance code given.

AttendanceCodeInfo Example

```

<AttendanceCodeInfo RefId="64A309DA063A2E35B359D75101A8C3D0"
  StaffPersonalRefId="69AD00AA001A32E35B359D75101A8C33">
  <Description >Absent</Description>
  <AttendCode>Ab</AttendCode>
</AttendanceCodeInfo>

```

Name	Billing
Description	This object contains an amount to be billed to an outside entity.
Type	Object
Status	Draft
Updateable	Not Yet Determined

Element	Attrib	Char	Description
Billing		M	
	TransRefId	R	GUID for this transaction. The application that owns this object is responsible for generating this unique Id. This ID can be generated using a combination of existing attributes of the object.
EntityId		M	ID of the entity being billed for this billing activity (e.g., student ID, employee ID, organization).
BillingDate		M	Date of the transaction.
TransactionDescription		M	Description of the transaction.
BilledAmount		M	Amount to be billed.

Billing Example

```

<Billing TransRefId="CA12345847DEA97463FEB238759FD123">
  <EntityId>BA497254965FDA48965ABCE4589EA421</EntityId>
  <BillingDate>19991012</BillingDate>
  <TransactionDescription>Activity Fees</TransactionDescription>
  <BilledAmount>50.00</BilledAmount/>
</Billing>

```

Name	CommentDefinition
Description	This object allows applications to synchronize each other's comment tables.
Type	Object
Status	Draft
Updateable	Not Yet Determined

Element	Attrib	Char	
CommentDefinition		O	
	RefId	R	GUID that identifies this comment.
	StaffRefId	R	
CommentString		M	Text of the comment.
CommentCode		O	The comment code.

CommentDefinition Example

```

<CommentDefinition RefId="A3E34B359D75101A8C3D00AA001A1652"
  StaffRefId="B3E34B359D97401A8C3D00AA001A1652">
  <CommentString>Participates in class</CommentString>
  <CommentCode>B231</CommentCode>
</CommentDefinition>

```

Name	CourseInfo
Description	This object is for course information.
Type	Object
Status	Draft
Updateable	Not Yet Determined

Element	Attrib	Char	SP/Ex ID	SP/Ex Codes	Description
CourseInfo		M			Course Information.
	RefId	R			The Guid associated with the course.
Subject		O			Subject matter area or department.
	Code	R		Source: National Center for Education Statistics: "A Pilot Standard National Course Classification System for Secondary Education" Code & Description 01-Agriculture and Renewable Natural Resources 02-Business 03-Computer and Information Sciences	The NCES subject code. Allowable values = 01, 02, 03, 04, 05, 06, 07, 08, 09, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 99

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Element	Attrib	Char	SP/Ex ID	SP/Ex Codes	Description
				<u>Code & Description (cont.)</u> 04-Construction Trades 05-Consumer and Homemaking Education 06-Cosmetology 07-Drafting 08-Elective Activities 09-Energy, Power, and Transportation Technologies 10-English Language and Literature 11: Fine and Performing Arts 12-Foreign Language and Literature 13-Graphic and Printing Communication 14- Health and Safety Education 15-Health Care Sciences 16-Industrial/Technology Education 17-Life and Physical Sciences 18-Marketing 19-Mass Communication 20-Mathematics 21-Military Science 22-Multi/Interdisciplinary Studies 23-Physical Education 24-Precision Metalwork 25-Public, Protective, and Social Services 26-Religious Education and Theology 27-Social Sciences and History 28-Special/Exceptional Education 29-Vocational Home Economics	
Descriptive Resource Title		O			
	Text	R			This represents a descriptive term by which a course is identified.
Instructional Level		O			An indication of the general nature & difficulty of instruction provided.
	Code	R	SUM40 2-1142	Academic Grade or Course Level Code Description: Code indicating the level or type or both, of work reflected in the grade average and the credit hours. <u>Code & Description</u> 1-Remedial 2-Basic 3-Teacher's Aide	

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Element	Attrib	Char	SP/Ex ID	SP/Ex Codes	Description
				4-General 5-Applied 6-Survey 7-Regular 8-Specialized Topics 9-Advanced 10-Honors 11-Gifted and Talented 12-Advanced Placement 13-Special Education 14-Vocational Education 15-Independent Study 16-Work Experience 17-Adult Basic 18-Adult Secondary 19-International Baccalaureate A-Summary of all courses taken at all institutions AR-Academic Renewal B-Summary of all courses taken at sending institution D-Dual Level (Upper Division and Graduate) DL-Dual Level (Graduate and Professional) E-Summary of All Courses Taken at All Institutions, Excluding Repeated and/or Forgiven Courses F-Summary of All Courses Taken at the Sending Institution, Excluding Repeated and/or Forgiven Courses G-Graduate (postsecondary) H-Higher or Upper division (postsecondary) I-Institutional Credit L-Lower division (postsecondary) M-Work in the Major or Program P-Professional R-Remedial (postsecondary) T-Summary of Transfer Work Only U-Undergraduate (postsecondary) V- Summary of Transfer Work Only, Excluding Repeated and/or Forgiven Courses	
CreditsSIS		O			
				Academic Credit Type Code Description: Code indicating the type of credit used (awarded) by the sending institution <u>Code & Description</u> A-Adult Credits C-Continuing Education Unit	

Element	Attrib	Char	SP/Ex ID	SP/Ex Codes	Description
	Code	R	SUM01-1141	<u>Code & Description (cont.)</u> G-Carnegie Units N-No Credit Q-Quarter Hour Credit S-Semester Hour Credit U-Units V-Vocational Credits X-Other Type of Credit	The number of credits associated with the course.

CourseInfo Example

```

<CourseInfo RefId="9D75101A8C3D00AA001A0000A2E35B35">
  <Subject Code="13"/>
  <DescriptiveTitle>Gif, JPeg, or Png: What's the Difference?
</DescriptiveTitle>
  <InstructionalLevel Code="9"/>
  <CreditsSIS Code="A">2</CreditsSIS>
</CourseInfo>

```

Name	EmployeeInfo
Description	This object contains basic HR information for employees.
Type	Object
Status	Draft
Updateable	Not Yet Determined

Element	Attrib	Char	Description
EmployeeInfo		M	
	EmployeeRefId	R	Employee Id.
Name		O	As defined by the StudentPersonal objects.
Address		O	As defined by the StudentPersonal object.
Ssn		O	Social security number.
BirthDate		O	As defined by the StudentPersonal object.
HireDate		O	Date of hire.
StatePrOfHire		O	State of hire.
	Code	R	ANSI X12 codes as defined in the Address/StatePr field of the StudentPersonal Object.

EmployeeInfo Example

```

<EmployeeInfoEmployeeRefId="CD590651225DAC3859DEA3458BC39583">
  <Name>John Doe</Name>
  <Address>...</Address>
  <Ssn>590651225</Ssn>
  <BirthDate>19571210</BirthDate>
  <HireDate>19850801</HireDate>
  <StatePROfHire Code="NY"/>
</EmployeeInfo>

```

Name	LearningResourceInfo
Description	This object includes information about learning resources - self-contained instruction (software and other media) that can be used to support a lesson.
Type	Object
Status	Draft
Updateable	Not Yet Determined

Element	Attrib	Char	Description
LearningResourceInfo		M	
	Learning Resource RefId	R	The GUID of the LearningResourceInfo.
ResourceTitle		M	Title of the LearningResourceInfo.
Description		O	Unstructured text description.
ResourceAuthor		OR	Author information, 0 or more of:
ResourceAuthor/Organization		OR	Organization names.
ResourceAuthor/ContactInfo		OR	Contact information.
ResourceAuthor/Email		OR	Email addresses.
AgreementInfo		OR	Agreement for resource use...
AgreementInfo/AgreementDate		O	
AgreementInfo/UseAgreement		O	
CostInfo		OR	Cost information for resource ...
CostInfo/CostBasis		O	
CostInfo/Cost		O	
CostInfo/PaymentTerms		O	
ApprovedBy		OR	Resource approvals ...
ApprovedBy/Name		O	
ApprovedBy/Job ResourceTitle		O	
ApprovedBy/Date		O	
ContentInfo		OR	Content information ...
ContentInfo/GradeLevel		O	
ContentInfo/ResourceType		O	
ContentInfo/PrimarySubject		O	
ContentInfo/SecondarySubject		O	

LearningResourceInfo Example

```
<LearningResourceInfo LearningResourceRefId="MC35421LMA12345SC2453DS6453CW342" >
  <ResourceTitle>Beginning Algebra Practice</ResourceTitle>
</LearningResourceInfo>
```

Name	LessonInfo
Description	This object includes information about lessons - short (hours or days) periods of classroom instruction that cover a particular requirement in the curriculum.
Type	Object
Status	Draft
Updateable	Not Yet Determined

Element	Attrib	Char	Description
LessonInfo		M	
	LessonRefId	R	The GUID that identifies the LessonInfo.
ResourceTitle		M	The title of the lesson.
Description		O	An unstructured text description.
ResourceAuthor		OR	Author information, 0 or more of:
ResourceAuthor/ Organization		OR	Organization names.
ResourceAuthor/ ContactInfo		OR	Contact information.
ResourceAuthor/Email		OR	Email addresses.
LessonObjectiveLink		OR	0 or more links to Objective entities.
	Objective RefId	R	The GUID of the LessonObjectiveLink.
ResourceLink		OR	0 or more links to Resource entities.
	Resource RefId	R	The GUID of the ResourceLink.
AssessmentLink		OR	0 or more links to Assessment entities.
	Assessment RefId	R	The GUID of the AssessmentLink.

LessonInfo Example

```

<LessonInfo LessonRefId="DA134EA1325DE53421AB05A0406FC110">
  <ResourceTitle>Beginning Algebra</ResourceTitle>
  <Description>Algebra 5th Grade ...</Description>
  <ResourceAuthor>
    <Organization>Bob's Company</Organization>
    <ContactInfo>Call Bob ...</ContactInfo>
    <ContactInfo>Call Bob's friend, Bill ...</ContactInfo>
    <Email>Bob@bobsCo.com</Email>
  </ResourceAuthor>
  <LessonObjectiveLink ObjectiveRefId = "D34B359D75101A8C3D00AA001A1652457"/>
  <ResourceLink ResourceRefId = " A3E34B359D75101A3C3D00AA001A1652"/>
  <AssessmentLink AssessmentRefId = " D4B359D75101AC3D00AA001A16522345"/>
</LessonInfo>

```

Name	LessonObjectiveInfo
Description	This object includes information about objectives for a given lesson.
Type	Object
Status	Draft
Updateable	Not Yet Determined

Element	Attrib	Char	Description
LessonObjectiveInfo			
	Objective RefId	R	The GUID of the LessonObjectiveInfo.
ResourceTitle		M	Title of the objective.
Description		O	Unstructured text description.
Activities		O	Unstructured text information.
ResourceAuthor		OR	ResourceAuthor information, 0 or more of:
ResourceAuthor/Organization		OR	Organization names
ResourceAuthor/ContactInfo		OR	Contact information
ResourceAuthor/Email		OR	Email addresses
Content		O	
Concept		O	
Goal		O	
Performances		O	

LessonObjectiveInfo Example

```

<LessonObjectiveInfo ObjectiveRefId="FA134SC3425BD4564E7897AB4385CD34">
  <ResourceTitle>Algebra Basic Equations</ResourceTitle>
  <Description>This establishes ... </Description>
  <Activities>An initial tutorial... A short video on equalities...</Activities>
  <ResourceAuthor>
    <Organization>Boomer Middle School</Organization>
    <ContactInfo>I. M. Smart</ContactInfo>
    <Email>imsmart@boomer.edu</Email>
  </ResourceAuthor>
  <Content>Studying ...</Content>
  <Concept>In terms of ...</Concept>
  <Goal>Will help Students understand ...</Goal>
  <Performances>As demonstrated by ...</Performances>
</LessonObjectiveInfo>

```


Name	Payment
Description	This object complements the billing object, and contains information about the payment of a billing object.
Type	Object
Status	Draft
Updateable	Not Yet Determined

Element	Attrib	Char	Description
Payment		M	
	TransRefId	R	GUID for this transaction. The application that owns this object is responsible for generating this unique Id. This ID can be generated using a combination of existing attributes of the object.
EntityId		M	ID of the entity related to this billing activity (e.g., student ID, employee ID).
ReceivedDate		M	Date payment was received.
TransactionDescription		M	Transaction description.
ReceivedAmount		M	Amount received.
ReceivedTransactionId		M	Memo transaction ID from other vendor software.

Payment Example

```

<Payment TransRefId="EDF4985ABC3458FEDA75493AB3812345">
  <EntityId>AA497254965BBEE43576FF3344AA2323</EntityId>
  <ReceivedDate>19991020</ReceivedDate>
  <TransactionDescription>Activity Fees</TransactionDescription>
  <ReceivedAmount>50.00</ReceivedAmount>
  <ReceivedTransactionID>010523</ReceivedTransactionID>
</Payment>

```

Name	Purchasing
Description	This object provides information down to the line item level for requisitions and purchase orders.
Type	Object
Status	Draft
Updateable	Not Yet Determined

Element	Attrib	Char	Description
Purchasing		M	
	PurchRefId	R	Transaction Guidfor this purchasing activity. The application that owns this object is responsible for generating this unique Id. This ID can be generated using a combination of existing attributes of the object.
FormType		M	
	Code	R	Type of purchasing document. Allowable Values: "PO" – Purchase order "Req" – Requisition

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FormNumber		M	Requisition or PO number.
FiscalYear		O	Fiscal year for the transaction.
SiteId		O	The building ID for this purchasing activity.
OriginatorId		O	The employee ID for the originator of this purchasing activity.
PurchasingItem		M	Contains information about the item being purchased.
PurchasingItem/VendorId		O	The GUID of the vendor the item is being ordered from.
PurchasingItem/ItemNumber		O	Vendor item number.
PurchasingItem/ItemDescription		O	Description of the item.
PurchasingItem/Quantity		O	Quantity ordered.
PurchasingItem/UnitCost		O	Unit cost of the item.
PurchasingItem/ExpenseAccount		O	Account that is to be charged for the item.

Purchasing Example

```

<Purchasing PurchRefId="ED12345FDA8497275BC28AA349DD3721">
  <FormType Code = "Req">
    <FormNumber>00342</FormNumber>
    <FiscalYear>1999</FiscalYear>
    <SiteId>Walnut Grove</SiteId>
    <OriginatorId >497256195</OriginatorId>
    <PurchasingItem>
      <VendorId>ABCSCHL</VendorId>
      <ItemNumber>154486</ItemNumber>
      <ItemDescription>Floor Wax</ItemDescription>
      <Quantity>10</Quantity>
      <UnitCost>7.00</UnitCost>
      <ExpenseAccount>10045</ExpenseAccount>
    </PurchasingItem>
  </Purchasing>

```

Name	ResourceResult
Description	This object includes information about the result of one learner completing one learning resource. This includes a reference to student and learning resource entities.
Type	Object
Status	Draft
Updateable	Not Yet Determined

Element	Attrib	Char	Description
ResourceResult		M	
	ResourceRefId	R	The GUID of the ResourceResult.
	StudentRefId	M	The GUID of the Student.
Date		O	Date completed.
ResourceScore		O	User's score.
CompletionState		O	Completion status, one of:
CompletionState/Started		O	User started Assessment.
CompletionState/ NotStarted		O	User hasn't started Assessment.

CompletionState/ Completed		O	User completed Assessment.
CompletionState/ Pending		O	User status pending.
CompletionState/ NoCompletionPossible		O	Completion won't happen.

ResourceResult Example

```

<ResourceResult ResourceRefId="7897 D3E34B359D75101A8C3D00AA1652"
  StudentRefId="D3E34B359D75101A8C3D00AA001A1652">
  <Date>yyyymmdd</Date>
  <ResourceScore>90%</ResourceScore>
  <CompletionState>Completed</CompletionState>
</ResourceResult>

```

Name	ResourceSourceInfo
Description	This object includes contact and ordering information about the source of a learning resource or assessment.
Type	Object
Status	Draft
Updateable	Not Yet Determined

Element	Attrib	Char	Description
ResourceSourceInfo		M	
	SourceRefId	R	The GUID of the ResourceSourceInfo.
SourceEntity		O	Name of source entity.
Address		O	Full address info - defined elsewhere.
Ordering		O	Unstructured ordering information.

ResourceSourceInfo Example

```

<ResourceSourceInfo SourceRefId ="MA345NS7897LK4597394JD3456PY5476">
  <SourceEntity>Resource Makers</SourceEntity>
  <Ordering>Call Bob</Ordering>
</ResourceSourceInfo>

```

Name	SchoolDefinedComment
Description	This object allows applications to synchronize each other's comment tables when comments are provided by an application other than the gradebook.
Type	Object
Status	Draft
Updateable	Not Yet Determined

Element	Attribute	Char	Description
SchoolDefinedComment			
	RefId	R	
	SchoolRefId	R	
CommentCode		M	A previously defined code for this comment.
CommentText		O	The text associated with this comment

SchoolDefinedComment Example

```

<SchoolDefinedComment RefId=" BBDD45682EFA3578932EED4563BCCD32"
    SchoolRefId=" B2DD45682EFA3578932EED4563BCCD32">
    <CommentCode>B231</CommentCode>
    <CommentText>Participates in class</CommentText>
</SchoolDefinedComment>

```

Name	SectionInfo
Description	This object provides information about the section -- the specific time period a session of the course meets.
Type	Object
Status	Draft
Updateable	Not Yet Determined

Element	Attrib	Char	Description
SectionInfo			
	RefId	R	The GUID of the associated section entity.
	CourseRefId	R	The GUID of the teacher that this course links to.
Teacher		OR	
	RefId		The GUID of the teacher that teach this section.
SchedulingTerm		O	
SchedulingTerm/StartDate		O	Start of the scheduling term.
SchedulingTerm/EndDate		O	End of the scheduling term.
SchedulingTerm/Description		O	Description of the term.
ReportingTerm		O	
ReportingTerm/StartDate		O	Start of the reporting term.
ReportingTerm/EndDate		O	End of the reporting term.
ReportingTerm/Description		O	Description of the term.

SectionInfo Example

```

<SectionInfo RefId="D3E34B359D75101A8C3D00AA001A1652"
    CourseRefId=" A2E35B359D75101A8C3D00AA001A0000">
    <Teacher RefId=" A8C3A2E35B359D75101D00AA001A0000"/>
    <SchedulingTerm>
    <StartDate>19990907</StartDate>
    <EndDate>20000623</EndDate>
    <Description>1999/2000 All year</Description>
    </SchedulingTerm>
    <ReportingTerm>
    <StartDate>19990907</StartDate>
    <EndDate>20000623</EndDate>
    <Description>1999/2000 All year</Description>
    </ReportingTerm>
</SectionInfo>

```

Name	StudentAssessment
Description	This object provides information about the student's assessment record.
Type	Object
Status	Draft
Updateable	Not Yet Determined

Element	Attrib	Char	SP/Ex ID	SP/Ex Codes	Description
Student Assessment					
	RefId	R			The GUID of the StudentAssessment.
	Student RefId	R			The GUID of the student that this record is linked to.
Assessment Type		M			
	Code	R	TST01-1155	Educational Test or Requirement Code (Test Code) Description: Indicates a particular national, regional, state, or local test or requirement. The source of this code set is the "List of National and State Student Tests and Subtests Used in Electronic Transfer of Educational Records." It is available from AACRAO. See Appendix J.	This is the SPEEDE/ExPRESS code that says what type of assessment this is.
Assessment ResourceTitle		O			The title (description) of this assessment.
SubTest		M			Information about the Subtest
SubTest/Sub TestType		M			
	Code	R		1158 Subtest Code Code indicating a particular subtest of a test Type: ID Segments: SBT Min/Max: 5/5 Transaction Sets: 130 This source of this code set is the "List of National and State Student Test and Subtests Used in Electronic Transfer of Educational Records." It is available from AACRAO. See Appendix J.	

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Element	Attrib	Char	SP/Ex ID	SP/Ex Codes	Description
SubTest/ SubTest ResourceTitle		O			A description of the sub test.
TestLevel		M		Description: Code identifying level of course, test, or student See Appendix J.	
	Code	R			This is an NCES code that specifies what level this test is for.
Reporting Method		M			
	Code	R	SRE01-1160	Test Score Qualifier Code (Type of Test Score) Description: Code indicating the manner in which the actual academic test score result is reported. <u>Code & Description</u> 1-Scaled Score 2-Grade Equivalent or Grade Level Indicator 3-Standard Score 4-Raw Score 5-Percent of Items Correct 6-Mastery Score 7-Adjective Classification or Locally Defined Score 8-Stanine 9-Percentile A-Normal Curve Equivalent B-Equated Score (pre-test and post-test were different) Z-Locally Defined	The NCES code that specifies which reporting method was used.
Score		M			The result of this assessment.
TestDate		M			The date test was given.
Student GradeLevel		O			The student's grade level.
	Code	R		Description: Code identifying level of course, test, or student See Appendix J.	

StudentAssessment Example

```

<StudentAssessment RefId="A3E34B359D75101A8C3D00AA001A1652"
  StudentRefId="D3E34B359D75101A8C3D00AA001A1652">
  <AssessmentType Code="3"/>
  <AssessmentResourceTitle>California Achievement Tests, 1986</ResourceAssessmentTitle>
  <SubTest>
    <SubTestType Code="1"/>
    <SubTestResourceTitle>Vocabulary</SubTestResourceTitle>
  </SubTest>

```

```

<TestLevel Code="23"/>
<ReportingMethod Code="1"/>
<Score>0</Score>
<TestDate>19990101</TestDate>
<StudentGradeLevel Code="24"/>
</StudentAssessment>

```

Name	StudentComment
Description	This object allows a teacher to assign a comment to a student.
Type	Object
Status	Draft
Updateable	Not Yet Determined

Element	Attrib	Char	Description
StudentComment			
	StudentRefId	R	
	SectionRefId	R	
	TermRefId	R	
SchoolCommentCode		M	
	SchoolRefId	R	A previously defined code for this comment.
	CommentCodeRefId	R	

StudentComment Example

```

<StudentComment StudentRefId="A2E35B359D75101A8C3D00AA001A0000"
  SectionRefId="D0A0A27AD0A8510AD9D75101A8C3DA39"
  TermRefId="7E59D75101A80A70016S75RM097A0726">
<SchoolCommentCode CommentCodeRefId="C3D0A9D7A01D0A0A28510AD75101C351">
</StudentComment>

```

Name	StudentCourseEnrollment
Description	This object contains information about a student's enrollment in a course.
Type	Object
Status	Draft
Updateable	Not Yet Determined

Element	Attrib	Char	SP/Ex ID	SP/Ex Codes	Description
StudentCourse Enrollment					This object defines information related to a student's enrollment.
	StudentRefId	R			GUID of the student to whom the enrollment information applies.
	SectionRefId	R			GUID of the section that this student is enrolled in.
	SchoolRefId	R			GUID of the school in which the student is enrolled in this course.

Element	Attrib	Char	SP/Ex ID	SP/Ex Codes	Description
EntryDate		O			Date from when this course enrollment is valid.
ExitDate		O			Date on which the student left the course.
ExitType		O			
	Code	R		See Appendix H.	

StudentCourseEnrollment Example

```

<StudentCourseEnrollment StudentRefId="CAE293165987101A8C3D00AA00456789"
  SectionRefId="9076AB23E386112B7EA2256100BB3312"
  SchoolRefId="AA21C3342378B1238976775436907821">
  <EntryDate>19990129</EntryDate>
  <ExitDate>19991108</ExitDate>
  <ExitType Code="B38"/>
</StudentCourseEnrollment>

```

Name	StudentDailyAttendance
Description	This object provides daily attendance information.
Type	Object
Status	Draft
Updateable	Not Yet Determined

Element	Attrib	Char	SP/Ex ID	SP/Ex Codes	Description
Student Daily Attendance					
	Student RefId	R			The GUID of the student.
	Date	R			The calendar date for when this attendance was recorded (CCYYMMDD).
	Code	R		Class Attendance Status Source: National Center for Education Statistics: "Student Data Handbook: Elementary, Secondary and Early Childhood Education" 01 In attendance/present --A student is present at a class or is attending a class activity off campus, which is sponsored by the school, is a part of the program of the School, and is personally supervised by one or more members of the school staff. This may include authorized independent study, work-study programs, field trips, athletic	Early Childhood Education" 01 In attendance/present --A student is present at a class or is attending a class activity off campus that is sponsored by the school, is a part of the program of the school, and is personally supervised by one or more members of the school staff. Student's attendance code. NCES Allowable

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Element	Attrib	Char	SP/Ex ID	SP/Ex Codes	Description
				<p>contests, music festivals, student conventions, instruction for homebound students, and similar activities officially authorized under policies of the local school board. It does not include “making up” schoolwork at home or activities supervised or sponsored by private individuals or groups.</p> <p>02 Excused absence--A student is not present at a class or at a school-endorsed or sponsored class activity, but is temporarily excused from attendance because he or she: 1) is ill and attendance in school would endanger his or her health or the health of others and; 2) has an immediate family member who is seriously ill or has died; 3) is observing a recognized religious holiday of his or her faith; or 4) is otherwise excused from school in accordance with board policies.</p> <p>03 Unexcused absences--A student is not present at a class or at a school-endorsed or sponsored class activity without acceptable cause, parental knowledge, or authorization from the school administrator or his or her agent.</p> <p>04 Tardy--A student is absent at the time a given class and/or half day of attendance begins but is present before the close of that class or half day. If a student is counted as absent but attends class later in the period, the absence may be changed to tardy.</p> <p>05 Early departure--A student leaves class before the official close of the session. Reasons may include a special activity for curricular enrichment, doctor’s appointment, and family emergency. State, local, and school regulations may distinguish excused and unexcused early departures. When officially approved on a regular basis, early departures immediately prior to the close of the session are considered to be released time.</p>	Values = 01,02,03,04,05, 99

StudentDailyAttendance Example

```

<StudentDailyAttendance StudentRefId="D3E34B359D75101A8C3D00AA001A1652"
  Date="20001101">
  <Code>01</Code>
</StudentDailyAttendance>

```

Name	StudentDailyAttendanceTotal
Description	This object provides total daily attendance information.
Type	Object
Status	Draft
Updateable	Not Yet Determined

Element	Attrib	Char	SP/E x ID	SP/Ex Codes	Description
StudentDaily AttendanceTotal					The purpose of this object is to provide a running total for attendance for a given period of time
	StudentRefId	R			The GUID of the student.
	StartDate	R			Starting date of the attendance reporting period (CCYYMMDD).
	EndDate	R			Ending date of the attendance reporting period (CCYYMMDD).
	Code	R			The attendance code for which this total has been calculated.
Total		M			The attendance total.

StudentAttendanceTotal Example

```

<StudentDailyAttendanceTotal StudentRefId="D3476FAE8647384BDA2431EDA358321"
  StartDate="19990101"
  EndDate="20000101"
  Code="01">
<Total>50</Total>
</StudentDailyAttendanceTotal>

```

Name	StudentDiscipline
Description	This object contains information about the student's discipline records.
Type	Object
Status	Draft
Updateable	Not Yet Determined

Element	Attrib	Char	SP/Ex ID	SP/Ex Codes	Description
Student Discipline					
	RefId	R			
	Student RefId	R			The GUID of the student whose record this is.
Offense Category		M			The broad category into which this offense falls.

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Element	Attrib	Char	SP/Ex ID	SP/Ex Codes	Description
	Code	R		National Center for Education Statistics: “Student Data Handbook: Elementary, Secondary and Early Childhood Education” 01-Infraction of school rules --An act committed or omitted in violation of any of the established codes of the school or school board of education. 02-Criminal offense --An act committed or omitted in violation of a civil law forbidding or commanding specific conduct and for which punishment is imposed upon conviction. 03-Chronic truancy --The act of staying out of school without permission for an inexcusable amount of time as determined by state and local policy. 99-Other	
Offense Type		O			
	Code	R		There are no SPEEDE/ExPRESS codes for offenses. There are, however, suggested codes in “Recommendations of the Crime, Violence, and Discipline Reporting Task Force” report from NCES, National Cooperative Statistics System, and National Forum on Education Statistics . These are: ALC = Alcohol ARS = Arson BAT = Battery BRK = Breaking & Entering/Burglary DOC = Disorderly Conduct DRG = Drugs – Excluding Alcohol FIT = Fighting HOM = Homicide KID = Kidnapping STL = Larceny/Theft MVT = Motor Vehicle Theft ROB = Robbery (using force) SXB = Sexual Battery SXH = Sexual Harassment SXO = Sexual Offenses TRE = Threat/Intimidation TBC = Tobacco	

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Element	Attrib	Char	SP/Ex ID	SP/Ex Codes	Description
				TRS = Trespassing VAN = Vandalism WPO = Weapons Possession	
Offense Date		M			The date on which that offense took place.
Offense Time		O			The time at which this offense took place.
Reported By		O			The name of the person who reported this incident.
	Code	R		There are suggested codes in “Recommendations of the Crime, Violence, and Discipline Reporting Task Force” report from NCES, National Cooperative Statistics System, and National Forum on Education Statistics. These are: S = Student T = Teacher A = Administrator O = Other School Staff P = Police N = Non-School Personnel U = Unknown	
Referred To		O			The person to whom this student was referred.
Guardian Contacted		O			
	Code	R			A code that says whether the guardian was contacted or not. Allowable values = - “Yes” - “No”
Guardian Contacted/ Date		O			The date on which the guardian was contacted.
Offense Location		O			The location where the offense took place. (e.g., Gym, cafeteria etc.)
	Code	R		There are suggested codes in “Recommendations of the Crime, Violence, and Discipline Reporting Task Force” report from NCES, National Cooperative Statistics System, National Forum on Education Statistics. These are: 1 = School Grounds/On Campus 2 = School Sponsored Activity/Off Campus 3 = School Sponsored Transportation	

Element	Attrib	Char	SP/Ex ID	SP/Ex Codes	Description
Disciplinary Action		OR			
	Code	R		Source: National Center for Education Statistics: “Student Data Handbook: Elementary, Secondary and Early Childhood Education” See Appendix I.	A code that specifies what remedial action was taken for this offense.
Comments		O			Any comments that is associated with this violation.

StudentDiscipline Example

No example

Name	StudentGrade
Description	This object provides grade/mark information about a particular student for a particular term.
Type	Object
Status	Draft
Updateable	Not Yet Determined

Element	Attrib	Char	Description
StudentGrade			
	SectionRefId	R	
	TermRefId	R	
	StudentRefId	R	
	AssignmentCategoryRefId	R	
GradePoints		O	The grade represented as points.
GradePercent		O	The grade represented as a percentage.
GradeDescription		O	The grade represented as a description.

StudentGrade Example

```

<StudentGrade SectionRefId="D0A0A27AD0A8510AD9D75101A8C3DA39"
  TermRefId="7E59D75101A80A70016S75RM097A0726"
  StudentRefId="A75A00101A8C301D02E3A05B359D0A00"
  AssignmentCategoryRefId="98H57J1L13BA8C3D00AA012B359D751Z">
  <GradePoints>639</GradePoints>
  <GradePercent>86%</GradePercent>
  <GradeDescription>B</GradeDescription>
</StudentGrade>

```

Name	StudentMedical
Description	This object contains all the medical information related to the student.
Type	Object
Status	Draft
Updateable	Not Yet Determined

Element	Attrib	Char	SP/Ex ID	SP/Ex Codes	Description
Student Medical		O			This object contains all the medical information related to the student.
	Student RefId	R			The GUID of the student that this object is linked to.
OtherId		O		Reference Identification Qualifier Description: Code qualifying the Reference Identification	The GUID of the student, as specified in a system communicating with this object, such as a community based organization's ID for the student. For a description on this element see the OtherId specification.
Records Locations		OR			The list of facilities most likely to contain most pertinent medical records.
	FacilityName	R			Name of facility.
	KeyContact	R			Doctor or responsible staff name at facility.
Diagnoses		OR			List of history of student's relevant health related diagnoses.
	DiagnosisText	R			Textual description of diagnosis.
	DiagnosisICD9	R			ICD9 code for diagnosis.
	DiagnosisICD10	R			ICD10 code for diagnosis.
	DiagnosisDate	R			Date of Diagnosis.
	TreatmentPlan	R			Treatment plan for diagnosis.
	TreatmentNotes	R			Notes by health staff regarding the results of the treatment.
	FollowupDate	R			Followup date for that diagnosis.
Current Conditions		OR			Relevant health related conditions of the student. Examples include asthma, prone to seizures, narcolepsy, OCD, autism.
	ConditionText	R			Textual description of the relevant current health condition.
	ConditionICD9	R			ICD9 code.
	ConditionICD10	R			OCD10 code.
Immunization		O			This element contains information related to student immunizations. This is further divided into individual fields and is described later in detail.
Screening		O			This element contains the information related to health related screenings. This is further divided into individual fields and is described later in detail.

Element	Attrib	Char	SP/Ex ID	SP/Ex Codes	Description
Health Contact		O			This element contains the information related to health related contacts with the student. This is further divided into individual fields and is described later in detail.
ViewSecurity Level		O			Security level required for viewing this record, as per release authorization. See Appendix K.
EditSecurity Level		O			Security level required for editing this record.
Delete SecurityLevel		O			Security level required for deleting this record.
PublicKey		O			Public key for accessing this record.

StudentMedical Example

```

<StudentMedical StudentRefId="D3E34B359D75101A8C3D00AA001A1652">
  <OtherId Type="06">P00001</OtherId>
  <OtherId Type="28">WB0025</OtherId> <RecordsLocation>
    <FacilityName>Kaiser </FacilityName>
    <KeyContact> John Jones </KeyContact>
  </RecordsLocation>
  <Diagnoses>
    <DiagnosisText> Autism </Diagnosis>
    <DiagnosisICD9> 1234.56 </DiagnosisICD9>
    <DiagnosisDate> 19990101 </DiagnosisDate>
    <TreatmentPlan> 3 month interval checkups by psychiatrist, and monthly evals of school work by school
psychologist </TreatmentPlan>
    <TreatmentNotes>Student communicates via discussions concerning building/constructing things
  </TreatmentNotes>
    <FollowupDate>20000201</FollowupDate>
  </Diagnoses>
  <CurrentConditions>
    <ConditionText> Student is able to understand what is spoken to him, but does not communicate except
through guided conversations around his current activity, which is usually involving building things using tactile
objects
  </ConditionText>
    <ConditionICD9>1234.56</ConditionICD9>
  </CurrentConditions>
  <ViewSecurityLevel> FDS </ViewSecurityLevel>
  <EditSecurityLevel> FDC </EditSecurityLevel>
  <DeleteSecurityLevel> FDC </DeleteSecurityLevel>
  <PublicKey> WER9899E8E99G9898F9G9SD9GS89F8DG98SD9FG8 </PublicKey>
</StudentMedical>

```

Name	StudentParticipation
Description	This object contains information pertaining to student eligibility for and participation in exceptional programs.
Type	Object
Status	Draft
Updateable	Not Yet Determined

Element	Attrib	Char	Description
StudentParticipation		M	This object contains information pertaining to student eligibility for and participation in exceptionality program(s).
	StudentRefId	R	The GUID of the student that this object is linked to.
	IDEA	R	If present the student is in an IDEA program.
	ESL	R	If present the student is in an ESL program.
	ESY	R	If present the student is in an ESY program.
	Section504	R	If present the student is in an ESY program.
	TitleOne	R	If present the student is in a Title I program.
	GiftedTalented	R	If present the student is in a Gifted and Talented program.
	BehavioralDisorder	R	If present the student is in a BehaviorDisorder program.
	Correctional	R	If present the student is in a Correctional program.
ParticipationExceptionality		M	
	RefId	R	This GUID identifies student participation in an exceptionality program(s).
ReferralDate		M	Date student was referred for evaluation/program participation.
EvaluationDate		O	Date the evaluation/assessment process for student was completed.
ReevaluationDate		OR	Date students will be reevaluated for continued placement in an exceptionality program(s).
EligibilityDate		M	Date to eligibility for an exceptionality program(s).
EligibilityDate/ ProgramEligibility		M	True you are going to be placed in a program.
PlacementDate		OR	Date student was placed in a exceptionality program(s).
ProgramPlan		OR	True if student has a exceptionality program(s) plan
ProgramDate		OR	Date exceptionality program(s) was implemented. For IEP – Current IEP Date.
ExitDate		OR	Date student exited exceptionality program(s).
CaseManager		OR	Program Contact Person.

StudentParticipation Example

```
<StudentParticipation StudentRefId="D3E34B359D75101A8C3D00AA001A1652" IDEA ESL ESY Section504
TITLE1 GiftedTalented BehavioralDisorder Correctional >
< ParticipationExceptionalityRefID="A2E34F5-9A742C1A4B3D11CC002B163">
<ReferralDate>19991112</ReferralDate>
<EvaluationDate>19991113</EvaluationDate>
```


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```

<ReevaluationDate>20011119</ReevaluationDate>
<EligibilityDate>19991112</EligibilityDate>
  <ProgramEligibility>
<PlacementDate>19991209</PlacementDate>
<ProgramPlan Code="IEP" </ProgramPlan>
<ProgramDate>19990102</ProgramDate>
<ExitDate>20001115</ExitDate>
<CaseManager>Millie Rubins</CaseManager>
</StudentParticipation>

```

Name	StudentPlacement
Description	This object contains information specific to Exceptional programs students have been placed into.
Type	Object
Status	Draft
Updateable	Not Yet Determined

Element	Attrib	Char	Description
StudentPlacement		M	This object contains information specific to exceptionality program(s) students have been placed into.
	Student RefId	R	The GUID of the student that this object is linked to.
Placement		M	Placement information for the student.
	Type	MR	Placement type for the student 5 character Alpha Numeric <i>District Defined/State Defined Reference in District or State Manuals or Policies</i>
PlacementExceptionality		M	
	Participation Exceptionality RefID	R	The GUID of the student participation exceptionality.
PlacementLocation		OR	Location where student is enrolled in exceptional program
PlacementSpecialNeeds Transportation		O	Does the student require transportation to the location of Placement/Service?
PlacementTransportation Equipment		M	
	BusEquipment RefId	R	Specifies the RefId of a BusEquipment object
PlacementAssistive TechnologiesServices		O	If true, assistive technologies services are required for this student.
PlacementAssistive TechnologyEquipment		O	If true, assistive technology equipment is required for this student.

StudentPlacement Example

```

<StudentPlacement StudentRefId="D3E34B359D75101A8C3D00AA001A1652">
  < Placement>
    <ParticipationExceptionalityRefId=" A2E34F559A742C1A4B3D11CC002B163">
    <Placement Type = "Public Residential School">

```

```

<Location>Hidden Valley Elementary</Location>
<SpecialNeedsTransportation>
  <TransportationEquipment BusEquipmentRefId="D3E34B359D7890123456789012345678">
</SpecialNeedsTransportation >
<AssistiveTechnologiesServices>False</AssistiveTechnologiesServices>
<AssistiveTechnologyEquipment>False</AssistiveTechnologyEquipment>
</Placement>
</StudentPlacement>

```

Name	StudentScore
Description	This object provides score information about a particular assignment.
Type	Object
Status	Draft
Updateable	Not Yet Determined

Element	Attrib	Char	Description
StudentScore			
	SectionRefId	R	
	StudentRefId	R	
	AssignmentRefId	R	
ScorePoints		O	The score represented as points.
ScorePercent		O	The score represented as a percent.
ScoreDescription		O	Text description of the score.

StudentScore Example

```

<StudentScoreSection RefId="D0A0A27AD0A8510AD9D75101A8C3DA39"
  StudentRefId="A75A00101A8C301D02E3A05B359D0A00"
  AssignmentRefId="359D75101AD0A9D7A8C3DAD0A8510VD2">
  < ScorePoints>45</ScorePoints>
  < ScorePercent>90%</ScorePercent>
  < ScoreDescription>Excellent</ScoreDescription>
</StudentScore>

```

Name	StudentSectionAttendance
Description	This object provides attendance for a specific class section.
Type	Object
Status	Draft
Updateable	Not Yet Determined

Element	Attrib	Char	Description
StudentSectionAttendance			
	SectionRefId	R	
	StudentRefId	R	
	Date	R	(CCYYMMDD)
AttendanceCode		M	
	RefId	R	

StudentSectionAttendance Example

```

<StudentSectionAttendance SectionRefId="D0A0A27AD0A8510AD9D75101A8C3DA39"
  StudentRefId="A75A00101A8C301D02E3A05B359D0A00">
  <Date="20001106">
  <AttendanceCodeRefId="1A0000359D75101A8C3D00AA00A2E35B">
</StudentSectionAttendance>

```

Name	StudentSectionAttendanceTotal
Description	This object provides a running total attendance for a particular section over a given date range.
Type	Object
Status	Draft
Updateable	Not Yet Determined

Element	Attrib	Char	Description
StudentSectionAttendanceTotal			
	SectionRefId	R	
	StudentRefId	R	
	AttendanceCodeRefId	R	
StartDate		M	Starting date for the date range (CCYYMMDD).
EndDate		M	Ending date for the date range (CCYYMMDD).
NumberOccurrence		M	The number of occurrences of the attendance code over the date range.

StudentSectionAttendanceTotal Example

```

<StudentSectionAttendanceTotal SectionRefId="D0A0A27AD0A8510AD9D75101A8C3DA39"
  StudentRefId="A75A00101A8C301D02E3A05B359D0A00"
  AttendanceCodeRefId="64R309LA00101A8C3W0632E3A05B359S">
  <StartDate="20001101">
  <EndDate="20001201">
  <NumberOccurrence>3</NumberOccurrence>
</StudentSectionAttendanceTotal>

```

Name	StudentSibling
Description	This object contains all information related to student siblings.
Type	Object
Status	Draft
Updateable	Not Yet Determined

Element	Attrib	Char	SP/Ex ID	SP/Ex Codes	Description
StudentSibling		M			This element contains information about the student's sibling.
	Student RefId	R			The GUID of the student's sibling.
Relationship		O			The Relationship between this student and the sibling.
	Code	R	IN106-1069	See Appendix F.	A SPEEDE/ExPRESS code for the relationship of the sibling. Same as student contact.

StudentSibling Example

```
<StudentSibling StudentRefId="D3E34B35-9D75-101A-8C3D-00AA001A1652">
  <Relationship Code="14"/>
</StudentSibling>
```

Name	TermInfo
Description	This object allows SIS and gradebook applications to synchronize each other's term tables.
Type	Object
Status	Draft
Updateable	Not Yet Determined

Element	Attrib	Char	Description
TermInfo		M	
	RefId	R	GUID that identifies the TermInfo.
	SchoolRefId	R	
Description		M	Text-based description of the term.
StartDate		M	Starting date of the term (CCYYMMDD).
EndDate		M	Ending date of the term (CCYYMMDD).
Weight		O	The specific factor of the term, used in calculating a grade across multiple Terms.'

TermInfo Example

```
<TermInfo RefId="7E59D75101A80A70016S75RM097A0726"
  SchoolRefId="A2E35B359D75101A8C3D00AA001A0000">
  <Description>Quarter 1</Description>
  <StartDate>20000105</StartDate>
  <EndDate>20000401</EndDate>
  <Weight>25.0</Weight>
</TermInfo>
```

Name	TimeWorked
Description	This object contains information about the time worked by an employee on a specific job.
Type	Object
Status	Draft
Updateable	Not Yet Determined

Element	Attrib	Char	Description
TimeWorked		M	
	TWorkedRefId	R	Guidfor this object. The application that owns this object is responsible for generating this unique Id. This ID can be generated using a combination of existing attributes of the object.
EmployeeId		M	Employee ID.
SiteId		M	As defined in the Purchasing object.
JobCode		M	Code for position worked.
RegularHours		O	Regular hours worked.
OvertimeHours		O	Overtime hours worked.
PayPeriod		M	Pay period hours were worked in.

Time Worked Example

```

<TimeWorked TWorkedRefId="CCD1254884EE54687FF4567DACD34653">
  <EmployeeId>590651225</EmployeeId>
  <SiteId>Walnut Grove</SiteId>
  <JobCode>J4</JobCode>
  <RegularHours>8</RegularHours>
  <OvertimeHours>2</OvertimeHours>
  <PayPeriod>20</PayPeriod>
</TimeWorked>

```

Name	VendorInfo
Description	This object contains basic vendor information.
Type	Object
Status	Draft
Updateable	Not Yet Determined

Element	Attrib	Char	Description
VendorInfo		M	
	VendorRefId	R	Vendor Id.
Name		O	As defined by the StudentPersonal object.
Address		O	As defined by the StudentPersonal object.
PhoneNumber		OR	As defined by the StudentPersonal object.
Email		OR	As defined by the StudentPersonal object.
CustomerId		O	Account number or other Id.
Send1099		O	Send 1099 to this vendor.
	Code	R	Allowable values: "Yes" "No"
FederalTaxId		O	Federal tax ID for this vendor.

VendorInfo Example

```

<VendorInfo VendorRefId="AB3647C568654CH45678DD34EF564E22">
  <Name>ABC School Supply</Name>
  <Address>...</Address>
  <PhoneNumber>2012356645</PhoneNumber>
  <Email>jdr@ABC.com</Email>
  <CustomerId>0023556</CustomerId>
  <Send1099 Code="No"/>
  <FederalTaxId>5640232536</FederalTaxId>
</VendorInfo>

```

Name	W4
Description	This object contains the information completed on a W4 tax form.
Type	Object
Status	Draft
Updateable	Not Yet Determined

Element	Attrib	Char	Description
W4		M	
	EmployeeRefId	R	Employee ID.
W4Date		M	Date W4 was completed.
MaritalStatus		M	
	Code	R	Allowable values: "M" – Married "S" – Single "MSR" – Married but withhold at single rate
FedAllowancesNumber		M	Number of federal allowances.
StateAllowancesNumber		M	Number of State allowances.
StatePr		M	State for state allowances.
	Code	R	ANSI X12 codes for states/provinces as defined by the Address/StatePr element of the StudentPersonal Object.
Exempt		M	
	Code	R	Allowable values: "Y" – Yes "N" – No

W4 Example

```

<W4 EmployeeRefId="DD5906EFD512EFDA253764EDA5897321">
  <W4Date>19981201</W4Date>
  <MaritalStatus Code="M"/>
  <FedAllowancesNumber>5</FedAllowancesNumber>
  <StateAllowancesNumber>3</StateAllowancesNumber>
  <StatePr Code="NY"/>
  <Exempt Code="N"/>
</W4>

```

APPENDIX A: OPEN ISSUES

In order to ensure a completely interoperable SIF implementation, the Infrastructure Working Group recognizes that there are several areas that remain to be addressed. Knowing that these issues will benefit from actual experience with the framework and because of the desire to release a specification that can be used to deploy workable frameworks, the working group has elected to defer the definition of specifications for these issues until a later time.

ZIS-ZIS REGISTRATION SYMMETRY

ISSUE

When a ZIS registers itself with another ZIS, is the registration symmetrical? For example, ZIS_A registers with ZIS_B. Obviously ZIS_A can now subscribe to events in ZIS_B, provide objects to ZIS_B, and get ZIS_B's SIF_ZoneStatus. Is the reverse true?

COMMENTS

Registration symmetry would make the system simpler, but would make certain topologies more difficult. For example, if multiple ZIS connect to a ZIS that acts as a public resource (at the US Department of Education, for example) and registrations are symmetrical, a connected ZIS could now use the public ZIS to get SIF_ZoneStatus from all the ZIS it's connected to (and the ZIS they're connected to, and so on).

Registration asymmetry would allow a ZIS_A to register with ZIS_B to initiate communications (ZIS_A is effectively an Agent in ZIS_B's zone), but would require ZIS_B to register separately to act (effectively) as an Agent in ZIS_A's zone.

MESSAGE COMPRESSION

ISSUE

Should SIF_Register have an element for message compression negotiation or can the compression be done transparently by the transport protocol?

COMMENTS

Compression may add significant value especially in situations where large objects are passed with ALL fields included. Photos are another example where compression may be beneficial. If compression will be supported at the message level, the framework would have to compress the XML data, express it as Base64, and then send the Base64 data. Having the transport perform compression looks pretty attractive.

RESYNC

ISSUE

The spec should make a recommendation for dealing with backup/restore situations. If a provider of an object suddenly has to restore their database, what should happen with SIF, if anything? Is there a need for a resync message that would be sent by the agent who has just restored their data?

COMMENTS

It was suggested that each Agent should keep a transaction log. If the corresponding application is backed up to a previous state, it could request the Agent roll forward through the transactions and bring the application up to date.

PERMISSIONS/ACCESS CONTROL

ISSUE

Need to specify a way to provide fine-grained access control.

COMMENTS

Since the ZIS might report an event to subscribers before the owner of the object confirms that the event reporter had the rights to change the object. The object owner should be able to tell the ZIS how to filter event reports before passing them on.

POSSIBLE SOLUTIONS

1. Add an element to the SIF_Provide message that allows the provider to specify which fields of the object other Agents may change, and/or whether other agents may add/delete instances of the object.
2. Require that the ZIS verify all events with the object owner before distributing them to other agents. The ZIS could report the event to the object owner first, then based on the response, either report it to the other Agents or report an access violation error to the original event reporter.
3. Other suggestions?

DEFINITION OF AGENTSTATUS OBJECT

ISSUE

Need a counterpart to the SIF_ZoneStatus object that provides detailed information about an agent including the vendor and vendor version number. A ZIS could request this object from the agent as one way to determine if an agent was alive and well.

STANDARDIZED LOGGING FORMAT

ISSUE

Having a standardized log format that is easily accessible to the ZIS administrator will accelerate efforts to debug SIF issues.

STANDARDIZED ADMINISTRATION MESSAGES

ISSUE

An administrator may administer several zones each ZIS written by a different vendor. Do we need a standardized set of messages to allow a single application to configure any ZIS?

COMMENTS

A common interface may be desirable but could we get the same results by having all vendors provide a web-based front end?

ABILITY TO CANCEL A REQUEST

ISSUE

The November 1999 draft implied a method of canceling a Request but there was no method defined.

COMMENTS

The ability to cancel a Request has been removed from the current draft and more research will be needed. An initial suggestion was a modification to the Request message to allow for canceling a previous Request.

APPENDIX B: INFRASTRUCTURE STATUS AND ERROR CODES

STATUS CODES

A SIF_Status element is returned in a SIF_Ack when it is necessary to communicate additional information to the caller.

For example, an agent may be constructed to send a SIF_Register message each time its starts up. If this SIF_Register message is the same as the previous one, the message performs no useful function. Instead of returning a SIF_Error element, a SIF_Ack message will contain a SIF_Status/SIF_Code element to indicate that the agent is already registered using these parameters.

A SIF_Status/SIF_Code is also used to tell an agent that it is taking longer than expected to process the agent's request and to expect another SIF_Ack message in the future. It is also used by the transport protocol to support the "Pull" message delivery model. If a message is successfully retrieved, SIF_Status/SIF_Code will signal success and SIF_Status/SIF_Data will contain the message.

If no additional information needs to be communicated to the caller, it is permissible to return a SIF_Ack without a SIF_Status element. Please reference the Message Processing section for the proper SIF_Ack structure to return.

Value	Status Definition
0	Success. SIF_Status/SIF_Data may contain additional data.
1	Immediate SIF_Ack. Message is persisted or processing is complete. Discard the referenced message.
2	Intermediate SIF_Ack. Message processing will take time. The message referenced MUST STILL be persisted. Expect a "Final" SIF_Ack at a later time.
3	Final SIF_Ack. Processing of a previously "Intermediate" SIF_Acked message is complete. Discard the referenced message
4	Already registered using this protocol.
5	Already subscribed to this object.
6	Already registered as the provider for this object.
7	Already have a message with this SIF_MsgId from you.
8	Receiver is sleeping.
9	No messages available. This is returned when an agent is trying to pull messages from a ZIS and there are no messages available.

ERROR CODES

The following table describes the SIF functional areas where an error may occur. When a SIF_Error element is returned within a SIF_Ack message the SIF_Error/SIF_Category element must contain one of the values from the table.

Value	Category Definition
0	Unknown (This should NEVER be used if possible)
1	XML Validation
2	Encryption
3	Authentication
4	Access and Permissions
5	Registration
6	Provision
7	Subscription
8	Request and Response
9	Event reporting and processing
10	Transport
11	System (OS, Database, Vendor localized, etc.)

The next tables present the error codes that must be used when constructing a SIF_Error element. The value of SIF_Error/SIF_Code must come from these lists unless the functional category is “System” which may include error codes not defined in these tables.

CODES FOR XML VALIDATION ERRORS

Code	Definition
1	Generic error
2	Message is not well-formed
3	Generic validation error
4	Invalid value for element
5	No Message Type Element
6	Missing mandatory element

CODES FOR AUTHENTICATION ERRORS

Code	Definition
1	Generic error
2	Generic authentication error (with signature)
3	Missing sender's certificate
4	Invalid certificate
5	Sender's certificate is not trusted
6	Expired certificate
7	Invalid signature
8	Invalid encryption algorithm (only accepts MD4)
9	Missing public key of the receiver (when decrypting message)
10	Missing receiver's private key (when decrypting message)

CODES FOR ENCRYPTION ERRORS

Code	Definition
1	Generic error

CODES FOR ACCESS CONTROL ERRORS

Code	Definition
1	Generic error
2	No permission to Register
3	No permission to Provide this object
4	No permission to Subscribe to this event
5	No permission to Request this object
6	No permission to Respond to this object request
7	No permission to Report event
8	No permission to Administer policies

CODES FOR REGISTRATION ERRORS

Code	Definition
1	Generic error
2	The SIF_SourceId is invalid
3	Requested transport protocol is unsupported
4	Requested authentication level is unsupported
5	Requested encryption level is unsupported
6	Requested Maximum Packet Size is too small
7	ZIS requires an encrypted transport
8	ZIS requires authenticated messages
9	Agent is registered for push mode.

CODES FOR PROVISION ERRORS

Code	Definition
1	Generic error
2	SIF_SourceId is unregistered
3	Invalid object
4	Object already has a provider (SIF_Provide message)
5	Not the provider of the object (SIF_Unprovide message)

CODES FOR SUBSCRIPTION ERRORS

Code	Definition
1	Generic Error
2	The SIF_SourceId is unregistered
3	Invalid object
4	Not a subscriber of the object (SIF_Unsubscribe message)

CODES FOR REQUEST AND RESPONSE ERRORS

Code	Definition
1	Generic Error
2	The SIF_SourceId is unregistered
3	Invalid object
4	No Provider
5	ZIS unable to contact Provider
6	Request has been canceled. Do not send further Responses

CODES FOR EVENT REPORTING AND PROCESSING ERRORS

Code	Definition
1	Generic error
2	The SIF_SourceId is unregistered
3	Invalid event

CODES FOR TRANSPORT ERRORS

Code	Definition
1	Generic error
2	Requested protocol is not supported
3	Secure channel requested and no secure path exists
4	Unable to establish connection

CODES FOR SYSTEM ERRORS

Code	Definition
1	Generic error

APPENDIX C: CONVENTIONS TO BE FOLLOWED FOR XML

Note: These conventions are to be followed in addition to the rules governing element names etc.

- Element names must all begin with upper case letter followed by lower case. For compound words, use upper case to start each sub word. For example Barcode & StudentScore are both valid elements.
- Denotes one occurrence
- ? Denotes zero or one occurrences
- + Denotes one or more occurrences
- * Denotes zero or more occurrences
- All attributes must follow the same naming conventions as elements.
- Whenever an object is related to another object, like Student, this relationship is formed by the inclusion of a StudentId element with the unique student identifier specified as the RefId="x" attribute forming the link using the XML attribute with an "IDREF" datatype. Refer to the StudentScore object to see an example of this.

APPENDIX D: USE OF SIF_ENCRYPTIONLEVEL AND SIF_AUTHENTICATIONLEVEL

An important design principal for the SIF specification is that the ZIS administrator is the central authority in a given zone regarding the operation of that zone. This includes things like which agents may participate in the zone, the specific actions that an agent may perform, and what security each agent is required to provide when communicating with the ZIS.

In more complex configurations, there will be multiple zones each, conceivably, with their own zone policies. Because of varying levels of security, one zone's definition of a "secure" channel may be quite different from another zone's definition. In order to ensure that each zone is using the same definition of a "secure" channel, the SIF_EncryptionLevel and SIF_AuthenticationLevel elements were defined. These elements are present so those participants in a ZIS system have a common point of reference regarding the definition of a SecureChannel.

In the paragraphs to follow, there are references to agent to ZIS communications as well as ZIS to remote ZIS communications. When the term "agent" is used, you may also apply the term "remote ZIS".

REGISTRATION

The primary use of the SIF_EncryptionLevel and SIF_AuthenticationLevel elements is in the area of agent to ZIS and ZIS to ZIS registration. By using these elements as part of the SIF_Register message, the ZIS controls the level of security that will be used to communicate with the registering agent or ZIS. By having the ZIS control the levels of security, the ZIS administrator can tailor each zone for optimal performance based on the needs of the zone.

The Register process begins with an agent (or remote ZIS) sending a SIF_Register message to the ZIS. The ZIS will examine the SIF_AuthenticationLevel and SIF_EncryptionLevel elements in the SIF_Header of the SIF_Register message comparing the requested levels against the levels that are permitted by the ZIS. If no levels were specified in the SIF_Register message, the ZIS interprets this as a SIF_Register message with the SIF_EncryptionLevel set to "0" and the SIF_AuthenticationLevel set to "0".

SECURITY VALUES ARE NOT ACCEPTABLE TO THE ZIS

If the ZIS does not support or does not wish to support the SIF_EncryptionLevel and SIF_AuthenticationLevel values requested, it will return a SIF_Ack with an Error Category of "5" (Registration) along with an Error Code to describe the specific reason the request was denied. The agent having received the SIF_Ack must discard the SIF_Register request. The

agent may initiate a new SIF_Register request using different settings for the transport and/or security settings and begin the SIF_Register cycle once again.

SECURITY VALUES ARE ACCEPTABLE TO THE ZIS

If the SIF_AuthenticationLevel and SIF_EncryptionLevel values are ones that the local ZIS policy supports, the ZIS will return a SIF_Ack with a Status Code of “1”. This signals that the SIF_Register request was accepted by the ZIS. It also signals that the agent can discard the SIF_Register message if it has persisted it locally.

The ZIS will also place a SIF_Register message of its own in the agent’s queue on the ZIS. This ZIS initiated SIF_Register message contains specific connection information that the agent’s transport must use to contact the ZIS in the future. This allows the ZIS to control traffic and share resources by controlling exactly how the agent must communicate with the ZIS.

The agent receives this message either by a Push to the location that the agent’s SIF_Register message specified or by a Pull if the agent is using this mode. If the Pull mode is use, the agent contacts the ZIS using the same transport configuration as it used to send the original SIF_Register message.

The agent must examine the contents of the SIF_Register message including the SIF_EncryptionLevel and SIF_Authentication level as they specify the settings the agent must use when contacting the ZIS in the future.

AGENT CAN SUPPORT THE CONFIGURATION IN THE ZIS SIF_REGISTER MESSAGE

If the agent is able to support the configuration specified, it must return a SIF_Ack with a Status Code of “1” indicating acceptance of the communication configuration. The final step in the SIF_Register process will be for the agent to contact the ZIS sending the ZIS originated SIF_Register back to the ZIS using the communication settings contained in the SIF_Register message. Upon receiving the message from the agent, the ZIS will update its configuration to indicate that a successful registration has taken place. The ZIS then returns a SIF_Ack with a Status Code of “1” indicating acceptance. The agent can discard the SIF_Register message. All future communications with the ZIS must use the transport and communications just exchanged.

AGENT CAN NOT SUPPORT THE CONFIGURATION IN THE ZIS SIF_REGISTER MESSAGE

If the agent cannot support the configuration as requested, it must return a SIF_Ack with an Error Category of “5” (Registration) and an Error Code signaling why the agent cannot use this configuration. The most common responses are that the agent cannot use the specific transport protocol type, the agent doesn’t support the requested SIF_AuthenticationLevel, or

the agent doesn't support the requested SIF_EncryptionLevel. Upon receiving the SIF_Ack from the agent, the ZIS will ignore the original SIF_Request from the agent. The ZIS will continue to use the original SIF_Register information for the agent, if any has been previously established.

ASSURING SECURITY FOR REQUESTERS/RESPONDERS

A secondary use of the SIF_EncryptionLevel and SIF_AuthenticationLevel is to provide assurance to a message originator that a minimum level of security will be maintained if the message must travel outside of the current zone managed by the local ZIS.

Because of policy or legislation, providers of extremely sensitive data must never expose that data over an insecure channel. As such, this data typically requires a higher level of encryption and authentication than other types of data.

If a SIF_AuthenticationLevel and a SIF_EncryptionLevel is specified in the SIF_Header of the message, the specification states that it is not permissible to transfer the data zone-to-zone using a level that is lower than those requested. Although a well-designed SIF system should employ the highest levels of security when engaging in zone-to-zone communication, mistakes can happen. If a path to the receiver is about to pass to a security level that is lower than requested, the ZIS must return a SIF_Ack with an Error Category of "10" (Transport) and an Error Code of "3" indicating that a secure channel can not be established. If the message being rejected was a SIF_Response to a previous SIF_Request, the ZIS must also send the SIF_Ack to the intended destination to indicate that an error occurred and not to expect a resolution to the SIF_Request.

This verification of levels only occurs when the message crosses from ZIS to ZIS. Once the target ZIS has received a message, the target ZIS's policies are in effect. This means that the sender and/or receiver may be operating at a lower security level with its local ZIS than the message requested and yet be assured that a high level of security will be maintained once the message leaves the zone.

APPENDIX E: STATE, COUNTRY, AND LANGUAGE CODES

US STATE OR PROVINCE CODE

Code (Standard State/Province) as defined by appropriate government agency

STATES/TERRITORIES

AL	Alabama	MO	Missouri
AK	Alaska	MT	Montana
AZ	Arizona	NE	Nebraska
AR	Arkansas	NV	Nevada
CA	California	NH	New Hampshire
CZ	Canal Zone	NJ	New Jersey
CO	Colorado	NM	New Mexico
CT	Connecticut	NY	New York
DE	Delaware	NC	North Carolina
DC	District of Columbia	ND	North Dakota
FL	Florida	OH	Ohio
GA	Georgia	OK	Oklahoma
GU	Guam	OR	Oregon
HI	Hawaii	PA	Pennsylvania
ID	Idaho	PR	Puerto Rico
IL	Illinois	RI	Rhode Island
IN	Indiana	SC	South Carolina
IA	Iowa	SD	South Dakota
KS	Kansas	TN	Tennessee
KY	Kentucky	TX	Texas
LA	Louisiana	UT	Utah
ME	Maine	VT	Vermont
MD	Maryland	VA	Virginia
MA	Massachusetts	VI	Virgin Islands
MI	Michigan	WA	Washington
MN	Minnesota	WV	West Virginia
MS	Mississippi	WI	Wisconsin
		WY	Wyoming

CANADIAN PROVINCE CODES

The Canadian Post Office lists the following as “official” codes for Canadian Provinces:

156 - CANADIAN PROVINCES

Code	Description		
AB	Alberta	NT	North West Territories
BC	British Columbia	ON	Ontario
MB	Manitoba	PE	Prince Edward Island
NB	New Brunswick	PQ	Quebec
NF	Newfoundland	SK	Saskatchewan
NS	Nova Scotia	YT	Yukon

COUNTRY CODE (COUNTRY OF CITIZENSHIP)

Code identifying the country

This international standard provides a two-letter alphabetic code for representing the names of countries, dependencies, and other areas of special geopolitical interest. The source of this code set is the “Codes for Representation of Names of Countries and Their Subdivisions – Part 1: Country Codes (ISO 3166-1: 1997 (E/F)).” It is available from ANSI.

26 – COUNTRY CODES

<u>Code</u>	<u>Description</u>		
AD	Andorra	CM	Cameroon
AE	United Arab Emirates	CN	China
AF	Afghanistan	CO	Colombia
AG	Antigua & Barbuda	CR	Costa Rica
AI	Anguilla	CS	Czechoslovakia (No Longer Exists)
AL	Albania	CU	Cuba
AM	Armenia	CV	Cape Verde
AN	Netherlands Antilles	CX	Christmas Island
AO	Angola	CY	Cyprus
AQ	Antarctica	CZ	Czech Republic
AR	Argentina	DD	German Democratic Republic (No Longer Exists)
AS	American Samoa	DE	Germany
AT	Austria	DJ	Djibouti
AU	Australia	DK	Denmark
AW	Aruba	DM	Dominica
AZ	Bosnia And Herzegovina	DO	Dominican Republic
BB	Barbados	DZ	Algeria
BD	Bangladesh	EC	Ecuador
BE	Belgium	EE	Estonia
BF	Burkina Faso	EG	Egypt
BG	Bulgaria	EH	Western Sahara
BH	Bahrain	ER	Eritrea
BI	Burundi	ES	Spain
BJ	Benin	ET	Ethiopia
BM	Bermuda	FI	Finland
BN	Brunei Darussalam	FJ	Fiji
BO	Bolivia	FK	Falkland Islands (Malvinas)
BR	Brazil	FM	Micronesia
BS	Bahamas	FO	Faroe Islands
BT	Bhutan	FR	France (No Longer Exists)
BU	Burma (No Longer Exists)	GA	Gabon
BV	Bouvet Island	GB	United Kingdom (Great Britain)
BW	Botswana	GD	Grenada
BY	Belarus (Formerly Byelorussian Soviet Socialist Republic)	GE	Georgia
BZ	Belize	GF	French Guiana
CA	Canada	GH	Ghana
CC	Cocos (Keeling) Islands	GI	Gibraltar
CD	Congo, The Democratic Republic Of The (Formerly Zaire)	GL	Greenland
CF	Central African Republic	GM	Gambia
CG	Congo	GR	Greece
CH	Switzerland	GS	South Georgia And The South Sandwich Islands
CI	Côte D’Ivoire (Ivory Coast)	GT	Guatemala
CK	Cook Islands	GU	Guam
CL	Chile	GW	Guinea-Bissau

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GY	Guyana	MX	Mexico
HK	Hong Kong	MY	Malaysia
HM	Heard Island & McDonald Islands	MZ	Mozambique
HN	Honduras	NA	Namibia
HR	Croatia	NC	New Caledonia
HT	Haiti	NE	Niger
HU	Hungary	NF	Norfolk Island
ID	Indonesia	NG	Nigeria
IE	Ireland	NI	Nicaragua
IL	Israel	NL	Netherlands
IN	India	NO	Norway
IO	British Indian Ocean Territory	NP	Nepal
IQ	Iraq	NR	Nauru
IR	Islamic Republic Of Iran	NT	Neutral Zone (No Longer Exists)
IS	Iceland	NU	Niue
IT	Italy	NZ	New Zealand
JM	Jamaica	OM	Oman
JO	Jordan	PA	Panama
JP	Japan	PE	Peru
KE	Kenya	PF	French Polynesia
KG	Kyrgyzstan	PG	Papua New Guinea
KH	Cambodia (Formerly, Democratic Kampuchea)	PH	Philippines
KI	Kiribati	PK	Pakistan
KM	Comoros	PL	Poland
KN	St. Kitts And Nevis	PM	St. Pierre & Miquelon
KP	Korea, Democratic People's Republic Of	PN	Pitcairn
KR	Korea, Republic Of	PR	Puerto Rico
KW	Kuwait	PT	Portugal
KY	Cayman Islands	PW	Palau
KZ	Kazakhstan	PY	Paraguay
LA	Lao People's Democratic Republic	QA	Qatar
LB	Lebanon	RE	Réunion
LC	Saint Lucia	RO	Romania
LI	Liechtenstein	RU	Russian Federation
LK	Sri Lanka	RW	Rwanda
LR	Liberia	SA	Saudi Arabia
LS	Lesotho	SB	Solomon Islands
LT	Lithuania	SC	Seychelles
LU	Luxembourg	SD	Sudan
LV	Latvia	SE	Sweden
LY	Libyan Arab Jamahiriya	SG	Singapore
MA	Morocco	SH	St. Helena
MC	Monaco	SI	Slovenia
MD	Moldova, Republic Of	SJ	Svalbard & Jan Mayen Islands
MG	Madagascar	SK	Slovakia
MH	Marshall Islands	SL	Sierra Leone
MK	Macedonia (Formerly Yugoslav Republic Of)	SM	San Marino
ML	Mali	SN	Senegal
MM	Myanmar	SO	Somalia
MN	Mongolia	SR	Suriname
MO	Macau	ST	Sao Tome & Principe
MP	Northern Mariana Islands	SU	Union Of Soviet Socialist Republics (No Longer Exists)
MQ	Martinique	SV	El Salvador
MR	Mauritania	SY	Syrian Arab Republic
MS	Montserrat	SZ	Swaziland
MT	Malta	TC	Turks & Caicos Islands
MU	Mauritius	TD	Chad
MV	Maldives	TF	French Southern Territories
MW	Malawi	TG	Togo
		TH	Thailand
		TJ	Tajikistan

TK	Tokelau	VC	St. Vincent & The Grenadines
TM	Turkmenistan	VE	Venezuela
TN	Tunisia	VG	British Virgin Islands
TO	Tonga	VI	United States Virgin Islands
TP	East Timor	VN	Viet Nam
TR	Turkey	VU	Vanuatu
TT	Trinidad & Tobago	WF	Wallis & Futuna Islands
TV	Tuvalu	WS	Samoa
TW	Taiwan, Province Of China	YD	Democratic Yemen (No Longer Exists)
TZ	Tanzania, United Republic Of	YE	Yemen
UA	Ukraine (Formerly Ukrainian Soviet Socialist Republic)	YT	Mayotte
UG	Uganda	YU	Yugoslavia
UM	United States Minor Outlying Islands	ZA	South Africa
US	United States Of America	ZM	Zambia (No Longer Exists-See Congo, The Democratic Republic Of)
UY	Uruguay	ZW	Zimbabwe
UZ	Uzbekistan	ZZ	Unknown Or Unspecified Country
VA	Vatican City State (Holy See)		

LANGUAGE CODES

67 - IDENTIFICATION CODE – NISO Z39.53

Language Codes for Identification Code Qualifier (66) = LD

<u>Code</u>	<u>Description</u>		
ACE	Achinese	BAS	Basa
ACH	Acoli	BAT	Baltic (Other)
ADA	Adangme	BEJ	Beja
AFA	Afro-Asiatic (Other)	BEL	Byelorussian
AFH	Afrihili (Artificial language)	BEM	Bemba
AFR	Afrikaans	BEN	Bengali
AJM	Aljamia	BER	Berber languages
AKK	Akkadian	BHO	Bhojpuri
ALB	Albanian	BIK	Bikol
ALE	Aleut	BIN	Bini
ALG	Algonquian languages	BLA	Siksika
AMH	Amharic	BRA	Braj
ANG	English, Old (ca. 450-1100)	BRE	Breton
APA	Apache languages	BUG	Buginese
ARA	Arabic	BUL	Bulgarian
ARC	Aramaic	BUR	Burmese
ARM	Armenian	CAD	Caddo
ARN	Araucanian	CAI	Central American Indian (Other)
ARP	Arapaho	CAM	Khmer
ART	Artificial (Other)	CAR	Carib
ARW	Arawak	CAT	Catalan
ASM	Assamese	CAU	Caucasian (Other)
ATH	Athabaskan languages	CEB	Cebuano
AVA	Avaric	CEL	Celtic languages
AVE	Avestan	CHA	Chamorro
AWA	Awadhi	CHB	Chibcha
AYM	Aymara	CHE	Chechen
AZE	Azerbaijani	CHG	Chagatai
BAD	Banda	CHI	Chinese
BAI	Bamileke languages	CHN	Chinook jargon
BAK	Bashkir	CHO	Choctaw
BAL	Baluchi	CHR	Cherokee
BAM	Bambara	CHU	Church Slavic
BAN	Balinese	CHV	Chuvash
BAQ	Basque	CHY	Cheyenne
		COP	Coptic

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COR	Cornish	GUA	Guarani
CPE	Creoles and Pidgins, English-based (Other)	GUJ	Gujarati
CPF	Creoles and Pidgins, French-based (Other)	HAI	Haida
CPP	Creoles and Pidgins, Portuguese-based (Other)	HAU	Hausa
CRE	Cree	HAW	Hawaiian
CRP	Creoles and Pidgins (Other)	HEB	Hebrew
CUS	Cushitic (Other)	HER	Herero
CZE	Czech	HIL	Hiligaynon
DAK	Dakota	HIM	Himachali
DAN	Danish	HIN	Hindi
DEL	Delaware	HMO	Hiri Motu
DIN	Dinka	HUN	Hungarian
DOI	Dogri	HUP	Hupa
DRA	Dravidian (Other)	IBA	Iban
DUA	Duala	IBO	Igbo
DUM	Dutch, Middle (ca. 1050-1350)	ICE	Icelandic
DUT	Dutch	IJO	Ijo
DYU	Dyula	ILO	Iloko
EFI	Efik	INC	Indic (Other)
EGY	Egyptian	IND	Indonesian
EKA	Ekajuk	INE	Indo-European (Other)
ELX	Elamite	INT	Interlingua (International Auxiliary Language Association)
ENG	English	IRA	Iranian (Other)
ENM	English, Middle (1100-1500)	IRI	Irish
ESK	Eskimo Languages	IRO	Iroquoian languages
ESP	Esperanto	ITA	Italian
EST	Estonian	JAV	Javanese
ETH	Ethiopic	JPN	Japanese
EWE	Ewe	JPR	Judeo-Persian
EWO	Ewondo	JRB	Judeo-Arabic
FAN	Fang	KAA	Kara-Kalpak
FAR	Faroese	KAB	Kabyle
FAT	Fanti	KAC	Kachin
FIJ	Fijian	KAM	Kamba
FIN	Finnish	KAN	Kannada
FIU	Finno-Ugrian (Other)	KAR	Karen
FON	Fon	KAS	Kashmiri
FRE	French	KAU	Kanuri
FRI	Friesian	KAW	Kawi
FRM	French, Middle (ca. 1400-1600)	KAZ	Kazakh
FRO	French, Old (ca. 842-1400)	KHA	Khasi
FUL	Fula	KHI	Khoisan (Other)
GAA	Gǝ	KHO	Khotanese
GAE	Gaelic (Scots)	KIK	Kikuyu
GAG	Gallegan	KIN	Kinyarwanda
GAL	Oromo	KIR	Kirghiz
GAY	Gayo	KOK	Konkani
GEM	Germanic (Other)	KON	Kongo
GEO	Georgian	KOR	Korean
GER	German	KPE	Kpelle
GIL	Gilbertese	KRO	Kru
GMH	German, Middle High (ca. 1050-1500)	KRU	Kurukh
GOH	German, Old High (ca. 750-1050)	KUA	Kuanyama
GON	Gondi	KUR	Kurdish
GOT	Gothic	KUS	Kusaie
GRB	Grebo	KUT	Kutenai
GRC	Greek, Ancient (to 1453)	LAD	Ladino
GRE	Greek, Modern (1453-)	LAH	Lahnd
		LAM	Lamba
		LAN	Langue d'oc (post-1500)
		LAO	Lao

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LAP	Lapp	ORI	Oriya
LAT	Latin	OSA	Osage
LAV	Latvian	OSS	Ossetic
LIN	Lingala	OTA	Turkish, Ottoman
LIT	Lithuanian	OTO	Otomian languages
LOL	Mongo	PAA	Papuan-Australian (Other)
LOZ	Lozi	PAG	Pangasinan
LUB	Luba-Katanga	PAL	Pahlavi
LUG	Ganda	PAM	Pampanga
LUI	Luiseno	PAN	Panjabi
LUN	Lunda	PAP	Papiamento
LUO	Luo (Kenya and Tanzania)	PAU	Palauan
MAC	Macedonian	PEO	Old Persian (ca. 600-400 B.C.)
MAD	Madurese	PER	Persian
MAG	Magahi	PLI	Pali
MAH	Marshall	POL	Polish
MAI	Maithili	PON	Ponape
MAK	Makasar	POR	Portuguese
MAL	Malayalam	PRA	Prakrit languages
MAN	Mandingo	PRO	Provençal, Old (to 1500)
MAO	Maori	PUS	Pushto
MAP	Austronesian (Other)	QUE	Quechua
MAR	Marathi	RAJ	Rajasthani
MAS	Masai	RAR	Rarotongan
MAX	Manx	ROA	Romance (Other)
MAY	Malay	ROH	Raeto-Romance
MEN	Mende	ROM	Romany
MIC	Micmac	RUM	Romanian
MIN	Minangkabau	RUN	Rundi
MIS	Miscellaneous (Other)	RUS	Russian
MKH	Mon-Khmer (Other)	SAD	Sandawe
MLA	Malagasy	SAG	Sango
MLT	Maltese	SAI	South American Indian (Other)
MNI	Manipuri	SAL	Salishan languages
MNO	Manobo languages	SAM	Samaritan Aramaic
MOH	Mohawk	SAN	Sanskrit
MOL	Moldavian	SAO	Samoan
MON	Mongolian	SCC	Serbo-Croatian (Cyrillic)
MOS	Mossi	SCO	Scots
MUL	Multiple languages	SCR	Serbo-Croatian (Roman)
MUN	Munda (Other)	SEL	Selkup
MUS	Creek	SEM	Semitic (Other)
MWR	Marwari	SHN	Shan
MYN	Mayan languages	SHO	Shona
NAH	Aztec	SID	Sidamo
NAI	North American Indian (Other)	SIO	Siouan languages
NAV	Navajo	SIT	Sino-Tibetan (Other)
NDE	Ndebele (Zimbabwe)	SLA	Slavic (Other)
NDO	Ndonga	SLO	Slovak
NEP	Nepali	SLV	Slovenian
NEW	Newari	SND	Sindhi
NIC	Niger-Kordofanian (Other)	SNH	Sinhalese
NIU	Niuean	SOM	Somali
NOR	Norwegian	SON	Songhai
NSO	Northern Sotho	SPA	Spanish
NUB	Nubian languages	SRR	Serer
NYA	Nyanja	SSO	Sotho
NYM	Nyamwezi	SUK	Sukuma
NYN	Nyankole	SUN	Sundanese
NYO	Nyoro	SUS	Susu
NZI	Nzima	SUX	Sumerian
OJI	Ojibwa	SWA	Swahili

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SWZ	Swazi	UMB	Umbundu
SYR	Syriac	UND	Undetermined
TAG	Tagalog	URD	Urdu
TAH	Tahitian	UZB	Uzbek
TAJ	Tajik	VAI	Vai
TAM	Tamil	VEN	Venda
TAR	Tatar	VIE	Vietnamese
TEL	Telugu	VOT	Votic
TEM	Timne	WAK	Wakashan languages
TER	Tereno	WAL	Walamo
THA	Thai	WAR	Waray
TIB	Tibetan	WAS	Washo
TIG	Tigre	WEL	Welsh
TIR	Tigrinya	WEN	Sorbian languages
TIV	Tivi	WOL	Wolof
TLI	Tlingit	XHO	Xhosa
TOG	Tonga (Nyasa)	YAO	Yao
TON	Tonga (Tonga Islands)	YAP	Yap
TRU	Truk	YID	Yiddish
TSI	Tsimshian	YOR	Yoruba
TSO	Tsonga	ZAP	Zapotec
TSW	Tswana	ZEN	Zenaga
TUK	Turkmen	ZUL	Zulu
TUM	Tumbuka	ZUN	Zuni
TUR	Turkish		
TUT	Altaic (Other)		
TWI	Twi		
UGA	Ugaritic		
UIG	Uighur		
UKR	Ukrainian		

APPENDIX F: RELATIONSHIP CODES

Individual Relationship Code

Code indicating the relationship between two individuals or entities

Note to User: This code indicates the relationship between the student and the person being reported in the current IN1 loop. It is not included in the postsecondary transcript. If the current IN1 loop refers to the student or a non-person entity, then leave this data element blank.

<u>Code</u>	<u>Description</u>		
01	Spouse	58	Adoptive Mother
02	Son or Daughter	59	Adoptive Parents
03	Father or Mother	61	Aunt
04	Grandfather or Grandmother	62	Brother
05	Grandson or Granddaughter	63	Brother-in-Law
06	Uncle or Aunt	74	Daughter
07	Nephew or Niece	75	Daughter-in-Law
08	Cousin	76	Dependent
09	Adopted Child	79	Ex-wife
10	Foster Child	80	Family Member
11	Son-in-law or Daughter-in-law	81	Father-in-Law
12	Brother-in-law or Sister-in-law	82	Fiancé (Male)
13	Mother-in-law or Father-in-law	83	Fiancée (Female)
14	Brother or Sister	86	Foster Daughter
15	Ward	87	Foster Father
17	Stepson or Stepdaughter	88	Foster Mother
18	Self	90	Foster Son
19	Child	97	Grandfather
20	Employee	98	Grandmother
21	Unknown	99	Grandparents
22	Handicapped Dependent	A2	Great Aunt
23	Sponsored Dependent	A3	Ex-husband
24	Dependent of a Minor Dependent	A4	Half Brother
25	Ex-spouse	A5	Half Sister
26	Guardian	A6	Husband
27	Student	A9	Mother-in-Law
28	Friend	B1	Nephew
29	Significant Other	B2	Niece
30	Both Parents	B3	Parents-in-Law
31	Court Appointed Guardian	B4	Partnership
32	Mother	B5	Partner
33	Father	B7	Sister
34	Other Adult	B8	Sister-in-Law
37	Agency Representative	C1	Son
48	Stepfather	C2	Son-in-Law
49	Stepmother	C3	Step Brother
50	Foster Parent	D3	Uncle
51	Emergency Contact	D4	Wife
52	Employer	D5	Teacher
53	Life Partner	D6	School Counselor
55	Adopted Daughter	D7	School Principal
56	Adopted Son	D8	Other School Administrator
57	Adoptive Father	D9	Coach
		E1	Activity Sponsor

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E2	Supervisor	G2	Educator/Teacher/Instructor
E4	Minister or Priest	G6	Medical Care Provider
E5	Ecclesiastical or Religious Leader	G8	Other Relationship
E7	Probation Officer	G9	Other Relative
E9	Advisor	ZZ	Mutually Defined

APPENDIX G: STATUS REASON AND GRADE LEVEL CODES

Status Reason Code (Reason for Entry or Exit)

Code indicating the status reason

<u>Code</u>	<u>Description</u>
B27	Student is eligible to continue or return or both
B28	Student is on suspension or dismissal
B29	Student is expelled (from PreK - grade 12)
B31	Not currently enrolled
B38	Dropped
B39	Academic Probation
B40	Suspended
B51	Student on Suspension or Dismissal; Eligible to Apply for Re-entry
B52	According to established regulations or statutes
D03	Student has attended a nonpublic school or home education program in- or out-of-state this year
D04	Student was received from another attendance reporting unit in the same school
D05	Student was received from a school in the same district
D06	Student was received from another public school outside the district either in- or out-of-state
D07	Student was received from a nonpublic school either in or out of the district or has returned after having been enrolled in a home education program; The student must have been enrolled previously in a public school this year
D08	Student unexpectedly reentered the same school after withdrawing or being discharged
D09	Student was expected to attend a school but did not enter as expected for unknown reasons
D10	Student was promoted, retained, or transferred to another attendance-reporting unit in the same school
D11	Student was promoted, retained, or transferred to another school in the same district
D12	Student withdrew to attend another public school in the same district
D13	Student withdrew to attend another public school in- or out-of-state
D14	Student Over Compulsory Attendance Age Left School Voluntarily with No Intention of Returning
D15	Student Graduated from School with a Standard Diploma
D16	Student Graduated from School with a Special Diploma
D17	Student Left School with a Certificate of Completion
D18	Student Left School with a Special Certificate of Completion
D19	Student Left School with a State General Education Development (GED) High School Diploma
D20	Student Withdrew to Attend a Non-Public School or Home Education Program In- or Out-of-State.
D21	Student withdrew from school due to hardship
D22	Student has not entered any school in this or any other state this school year
D23	Previously attended out-of-state public school but is entering a public school in this state for the first time this school year
D24	Returned to Regular Education Program
EB1	Deceased
EB3	Withdrawn
EB4	Graduated

Level of Individual, Test, or Course Code (Grade or Academic Level of Student)

Code identifying level of course, test, or student

<u>Code</u>	<u>Description</u>
01	First grade
02	Second grade
03	Third grade
04	Fourth grade
05	Fifth grade
06	Sixth grade
07	Seventh grade
08	Eighth grade
09	Ninth grade
0K	Kindergarten
10	Tenth grade
11	Eleventh grade
12	Twelfth grade
20	Non-Degree or Temporary Undergraduate in Postsecondary school
21	Postsecondary First Year Student
22	Postsecondary Sophomore
23	Postsecondary Junior
24	Postsecondary Senior
25	Postsecondary Post-Baccalaureate Student
26	Postsecondary Non-Degree Graduate Student
27	Postsecondary Professional Student
28	Postsecondary Master's Degree Student
29	Postsecondary Doctoral Student
30	Postdoctoral Student
31	Postsecondary Bachelor Preliminary Year
32	Postsecondary Fifth Year Student
33	Postsecondary Masters Qualifying Year
AD	Adult
AS	Associate Degree
BD	Baccalaureate (Bachelor's) Degree
DD	Doctoral Degree
EL	Elementary School
HG	High School Graduate or Equivalent
HS	Attended high school, but did not graduate
IF	Infant (0 to age 2)
MD	Master's Degree
MS	Middle or Junior High School
P0	Pre-Kindergarten Level 0
P1	Pre-Kindergarten Level 1
P2	Pre-Kindergarten Level 2
P3	Pre-Kindergarten Level 3
P4	Pre-Kindergarten Level 4
P5	Pre-Kindergarten Level 5
PC	Postsecondary Certificate or Diploma
PD	Professional Degree or Certification
PF	Professional
PK	Pre-Kindergarten
PS	Some Postsecondary (e.g. college)
SS	Secondary School
UN	Ungraded
VS	Vocational School

APPENDIX H: STUDENT COURSE ENROLLMENT CODES

Student Course Enrollment Code

<u>Code</u>	<u>Description</u>
B27	Student is eligible to continue or return or both
B28	Student is on suspension or dismissal
B29	Student is expelled (from PreK - grade 12)
B31	Not currently enrolled
B38	Dropped
B39	Academic Probation
B40	Suspended
B51	Student on Suspension or Dismissal; Eligible to Apply for Re-entry
B52	According to established regulations or statutes
D03	Student has attended a nonpublic school or home education program in- or out-of-state this year
D04	Student was received from another attendance reporting unit in the same school
D05	Student was received from a school in the same district
D06	Student was received from another public school outside the district either in- or out-of-state
D07	Student was received from a nonpublic school either in or out of the district or has returned after having been enrolled in a home education program; The student must have been enrolled previously in a public school this year
D08	Student unexpectedly reentered the same school after withdrawing or being discharged
D09	Student was expected to attend a school but did not enter as expected for unknown reasons
D10	Student was promoted, retained, or transferred to another attendance-reporting unit in the same school
D11	Student was promoted, retained, or transferred to another school in the same district
D12	Student withdrew to attend another public school in the same district
D13	Student withdrew to attend another public school in- or out-of-state
D14	Student Over Compulsory Attendance Age Left School Voluntarily with No Intention of Returning
D15	Student Graduated from School with a Standard Diploma
D16	Student Graduated from School with a Special Diploma
D17	Student Left School with a Certificate of Completion
D18	Student Left School with a Special Certificate of Completion
D19	Student Left School with a State General Education Development (GED) High School Diploma
D20	Student Withdrew to Attend a Non-Public School or Home Education Program In- or Out-of-State.
D21	Student withdrew from school due to hardship
D22	Student has not entered any school in this or any other state this school year
D23	Previously attended out-of-state public school but is entering a public school in this state for the first time this school year
D24	Returned to Regular Education Program
EB1	Deceased
EB3	Withdrawn
EB4	Graduated

APPENDIX I: STUDENT DISCIPLINE CODES

Source: National Center for Education Statistics: “Student Data Handbook: Elementary, Secondary and Early Childhood Education”

01 Community service--Service that is done for the community (often measured in hours served). Such service may include clean-up or any other type of work desired by the community.

02 Corporal punishment--An act of physical punishment (e.g., paddling a student).

03 Counseling (mandatory)--The act of requiring a student to participate in counseling services regarding the specific occurrence.

04 Demerit--A mark recorded against a student for poor conduct.

05 Detention--The act of mandating a student to attend supervised sessions during non-instructional hours.

06 Documented warning--An instance in which a student is officially admonished and/or advised about expected future action or conduct.

07 Expulsion--An action, taken by school authorities, compelling a student to withdraw from school for reasons such as extreme misbehavior, chronic absenteeism and/or tardiness, incorrigibility, or unsatisfactory achievement or progress in school work.

08 In-school suspension--The temporary dismissal of a student from classes by duly authorized school personnel in accordance with established regulation, served under supervision during school hours.

09 Letter of apology--The act of mandating that a student submit a formal letter of apology for an offense committed. Such an apology may remove the offense from the student’s record.

10 Out-of-school suspension--The temporary dismissal of a student from classes by duly authorized school personnel in accordance with established regulation, served outside of school.

11 Physical activity--An action taken by school officials, as part of a disciplinary process, that forces a student to participate in a physical activity (e.g., running laps or a specified number of push-ups).

12 Privilege restriction--The act of taking away a student’s privileges for a designated length of time (e.g., recess or access to the candy machine).

13 Probation--The act of restricting a student from school or school functions with terms and/or guidelines. Release from suspension is given after necessary terms of the action are met (e.g., a specified period of time during which the offense in question is not recommitted).

14 Referral to juvenile justice system--A disciplinary action in which school officials refer a student to the civil juvenile justice system for further action.

15 Reprimand--An action taken by school officials, as part of the disciplinary process, in which a student is rebuked for an offense.

16 Transfer to alternative program--An action taken by school officials, as part of the disciplinary process, that forces a student to enroll in an alternative program.

17 Transfer to institution--The withdrawal of a student from school by mandate of school officials or a court order and subsequent placement of the student into an institution.

18 Unsatisfactory behavior grades--An instance in which a student receives an official appraisal from school personnel that indicates unsatisfactory behavior.

99 Other

APPENDIX J: EDUCATIONAL TEST AND SUBTEST CODES

Educational Test or Requirement Code (Test Code)

Indicates a particular national, regional, state, or local test or requirement.

The source of this code set is the “List of National and State Student Tests and Subtests Used in Electronic Transfer of Educational Records.” It is available from AACRAO.

1155 - STUDENT TEST CODE

<u>Code</u>	<u>Description</u>
1	California Achievement Tests, 1977
2	California Achievement Tests, 1985
3	California Achievement Tests, 1986
4	Comprehensive Assessment Program Achievement Series, 1980
5	Comprehensive Tests of Basic Skills, 1981
6	Comprehensive Tests of Basic Skills, 1988
7	Iowa Tests of Basic Skills, 1978
8	Iowa Tests of Basic Skills, 1985
9	Tests of Achievement and Proficiency, 1978
10	Tests of Achievement and Proficiency, 1985
11	Metropolitan Achievement Tests, 1978
12	Metropolitan Achievement Tests, 1985
13	Metropolitan Language Instructional Tests, 1979
14	Metropolitan Reading Instructional Tests, 1979
15	National Tests of Basic Skills, 1985
16	National Tests of Basic Skills, 1986
17	National Achievement Tests Comprehensive Assessment Program, 1989
18	Science Research Associates Achievement Tests, 1978
19	Science Research Associates Survey of Basic Skills, 1985
20	Stanford Diagnostic Reading Test, 1984
21	Stanford Achievement Tests, 1982
22	Stanford Achievement Tests, 1987
23	Stanford Achievement Tests, 1988
24	Stanford Test of Academic Skills, 1982
25	Stanford Test of Academic Skills, 1987
26	Stanford Test of Academic Skills, 1988
27	Sequential Tests of Educational Progress, 1979
28	The 3 R's Test, 1982
29	California Achievement Tests
30	Comprehensive Assessment Program Achievement Series
31	Comprehensive Tests of Basic Skills
32	Iowa Tests of Basic Skills
33	Tests of Achievement and Proficiency
34	Metropolitan Achievement Tests
35	Metropolitan Language Instructional Tests
36	Metropolitan Reading Instructional Tests
37	National Tests of Basic Skills
38	National Achievement Tests Comprehensive Assessment Program
39	Science Research Associates Achievement Tests
40	Science Research Associates Survey of Basic Skills
41	Stanford Diagnostic Reading Test
42	Stanford Achievement Tests
43	Stanford Test of Academic Skills
44	Sequential Tests of Educational Progress
45	The 3 R's Test

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46	Iowa Test of Educational Development (Grades 9-12)
555	Local/District Adopted Test
801	American College Testing Program (ACT)
802	Preliminary American College Testing (PACT)
803	The College Board's Scholastic Aptitude Test (SAT I)
804	Preliminary Scholastic Aptitude Test/ National Merit Scholarship Qualifying Test (PSAT/NMSQT)
805	The College Board's Achievement Tests (SAT II)
806	Test of Adult Basic Education (TABE)
807	International Baccalaureate (IB)
808	General Education Development (GED)
809	Test of English as a Foreign Language (TOEFL)
811	Graduate Management Admissions Test (GMAT)
812	Law School Admissions Test (LSAT)
813	Miller Analogies Test
814	Medical Colleges Aptitude Test (MCAT)
815	Dental Admissions Test
816	Optometry Admissions Test
817	Allied Health Professions Admission Test (AHPAT)
818	College Level Examination Program (CLEP) General Examinations
819	College Level Examination Program (CLEP) Subject Examinations
821	Graduate Record Examination (GRE) General Test
822	Graduate Record Examination (GRE) Subject Tests
826	Pre-Professional Skills Test (PPST)
828	Test of Spoken English (TSE)
829	Test of Written English (TWE)
830	Veterinary College Admission Test (VCAT)
831	The College Board's Advanced Placement Program (AP)
9AK	Alaska State Adopted Test or Requirement
9AL	Alabama State Adopted Test or Requirement
9AR	Arkansas State Adopted Test or Requirement
9AZ	Arizona State Adopted Test or Requirement
9CA	California State Adopted Test or Requirement
9CO	Colorado State Adopted Test or Requirement
9CT	Connecticut State Adopted Test or Requirement
9DC	District of Columbia State Adopted Test or Requirement
9DE	Delaware State Adopted Test or Requirement
9FL	Florida State Adopted Test or Requirement
9GA	Georgia State Adopted Test or Requirement
9HI	Hawaii State Adopted Test or Requirement
9IA	Iowa State Adopted Test or Requirement
9ID	Idaho State Adopted Test or Requirement
9IL	Illinois State Adopted Test or Requirement
9IN	Indiana State Adopted Test or Requirement
9KS	Kansas State Adopted Test or Requirement
9KY	Kentucky State Adopted Test or Requirement
9LA	Louisiana State Adopted Test or Requirement
9MA	Massachusetts State Adopted Test or Requirement
9MD	Maryland State Adopted Test or Requirement
9ME	Maine State Adopted Test or Requirement
9MI	Michigan State Adopted Test or Requirement
9MN	Minnesota State Adopted Test or Requirement
9MO	Missouri State Adopted Test or Requirement
9MS	Mississippi State Adopted Test or Requirement
9MT	Montana State Adopted Test or Requirement
9NC	North Carolina State Adopted Test or Requirement
9ND	North Dakota State Adopted Test or Requirement
9NE	Nebraska State Adopted Test or Requirement
9NH	New Hampshire State Adopted Test or Requirement
9NJ	New Jersey State Adopted Test or Requirement
9NM	New Mexico State Adopted Test or Requirement
9NV	Nevada State Adopted Test or Requirement
9NY	New York State Adopted Test or Requirement

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9OH	Ohio State Adopted Test or Requirement
9OK	Oklahoma State Adopted Test or Requirement
9OR	Oregon State Adopted Test or Requirement
9PA	Pennsylvania State Adopted Test or Requirement
9RI	Rhode Island State Adopted Test or Requirement RE
9SC	South Carolina State Adopted Test or Requirement
9SD	South Dakota State Adopted Test or Requirement
9TN	Tennessee State Adopted Test or Requirement
9TX	Texas State Adopted Test or Requirement
9UT	Utah State Adopted Test or Requirement
9VA	Virginia State Adopted Test or Requirement
9VT	Vermont State Adopted Test or Requirement
9WA	Washington State Adopted Test or Requirement
9WI	Wisconsin State Adopted Test or Requirement
9WV	West Virginia State Adopted Test or Requirement
9WY	Wyoming State Adopted Test or Requirement
999	Other Tests Not Listed or Provided by Sender

1158 - SUBTEST CODE

Code indicating a particular subtest of a test

Type: ID

Segments: SBT

Min/Max: 5/5

Transaction Sets: 130

The source of this code set is the “List of National and State Student Test and Subtests Used in Electronic Transfer of Educational Records.” It is available from AACRAO.

CALIFORNIA ACHIEVEMENT TESTS (DE1155 = 1, 2, 3, and 29)

<u>Code</u>	<u>Description</u>		
		9	Mathematics Concepts and Applications
1	Vocabulary	10	Mathematics Total
2	Reading Comprehension	11	Total Battery
3	Reading Total	12	Study Skills
4	Spelling	13	Science
5	Language Mechanics	14	Social Studies
6	Language Expression	100	Complete Battery
7	Language Total	101	Basic Battery
8	Mathematics Computat ion		

COMPREHENSIVE TESTS OF BASIC SKILLS (DE1155 = Codes 5, 6 and 31)

<u>Code</u>	<u>Description</u>		
		10	Language Expression
1	Visual Recognition	11	Total Language
2	Sound Recognition	12	Mathematics Computation
3	Oral Comprehension	13	Mathematics Concepts and Applications
4	Word Attack	14	Reference Skills
5	Vocabulary	15	Science
6	Total Reading Oral	16	Social Studies
7	Reading Comprehension	100	Complete Battery
8	Spelling	101	Basic Battery
9	Language Mechanics		

IOWA TESTS OF BASIC SKILLS (DE1155 = Codes 7, 8 and 32)

<u>Code</u>	<u>Description</u>		
		8	Usage and Expression
1	Listening	9	Language Total
2	Word Analysis	10	Visual Materials
3	Vocabulary	11	Reference Materials
4	Reading Comprehension	12	Work-Study Skills
5	Spelling	13	Mathematics Concepts
6	Capitalization	14	Mathematics Problems
7	Punctuation	15	Mathematics Computation

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16	Science	19	Social Studies
17	Materials Total	100	Complete Battery
18	Mathematics Total	101	Basic Battery

TESTS OF ACHIEVEMENT AND PROFICIENCY (DE1155 = Codes 9, 10 and 33)

<u>Code</u>	<u>Description</u>		
1	Reading Comprehension	6	Science
2	Mathematics	7	Applied Proficiency Skills
3	Written Expression	8	Total Battery
4	Using Sources of Information	100	Complete Battery
5	Social Studies	101	Basic Battery

METROPOLITAN ACHIEVEMENT TESTS (DE1155 = Codes 11, 12 and 34)

<u>Code</u>	<u>Description</u>		
1	Vocabulary	9	Spelling
2	Word Recognition Skills	10	Language
3	Reading Comprehension	11	Total Language
4	Total Reading	12	Science
5	Mathematics: Concepts	13	Social Studies
6	Mathematics: Problem Solving	14	Research Skills
7	Mathematics: Computation	100	Complete Battery
8	Total Mathematics	101	Basic Battery

NATIONAL TESTS OF BASIC SKILLS (DE1155 = Codes 15, 16 and 37)

<u>Code</u>	<u>Description</u>		
1	Listening	10	Visual Materials
2	Word Analysis	11	Reference Materials
3	Vocabulary	12	Work-Study Skills
4	Reading Comprehension	13	Mathematics Concepts
5	Spelling	14	Mathematics Problems
6	Capitalization	15	Mathematics Computation
7	Punctuation	16	Science
8	Usage and Expression	17	Social Studies
9	Language Total	100	Basic Battery
		101	Complete Battery

SCIENCE RESEARCH ASSOCIATES SURVEY OF BASIC SKILLS (DE1155 = Codes 19 and 40)

<u>Code</u>	<u>Description</u>		
1	Reading Total	11	Spelling
2	Auditory Discrimination	12	Mathematics: Concepts/Problem Solving
3	Letters and Sounds	13	Mathematics: Computation
4	Decoding	14	Reference Materials
5	Listening Comprehension	15	Educational Ability Series
6	Vocabulary	16	Reading Comprehension
7	Reading Comprehension	17	Social Studies
8	Language Arts	18	Science
9	Mechanics	19	Survey of Applied Skills
10	Usage	100	Complete Battery
		101	Basic Battery

STANFORD ACHIEVEMENT TESTS (DE1155 = Codes 21, 22, 23 and 42)

<u>Code</u>	<u>Description</u>		
1	Listening	11	Reference Materials
2	Word Analysis	12	Work-Study Skills
3	Vocabulary	13	Mathematics Concepts
4	Reading Comprehension	14	Mathematics Problems
5	Spelling	15	Mathematics Computation
6	Capitalization	16	Basic Battery
7	Punctuation	17	Complete Battery
8	Usage and Expression	18	Social Studies
9	Language Total	19	Science
10	Visual Materials	100	Complete Battery
		101	Basic Battery

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STANFORD TEST OF ACADEMIC SKILLS (DE1155 = Codes 24, 25, 26 and 43)

<u>Code</u>	<u>Description</u>		
1	Word Reading	9	Reading Rate
2	Reading Comprehension	10	Scanning and Skimming
3	Auditory Discrimination	11	Fast Reading
4	Phonetic Analysis	12	Number System and Numeration
5	Structural Analysis	13	Computation
6	Auditory Vocabulary	14	Applications
7	Vocabulary	15	Mathematics Total
8	Word Parts	100	Complete Battery
		101	Basic Battery

THE 3 R'S TEST (DE1155 = Codes 28 and 45)

<u>Code</u>	<u>Description</u>		
1	Listening	10	Visual Materials
2	Word Analysis	11	Reference Materials
3	Vocabulary	12	Work-Study Skills
4	Reading Comprehension	13	Mathematics Concepts
5	Spelling	14	Mathematics Problems
6	Capitalization	15	Mathematics Computation
7	Punctuation	16	Social Studies
8	Usage and Expression	17	Science
9	Language Total	100	Complete Battery
		101	Basic Battery

IOWA TEST OF EDUCATIONAL DEVELOPMENT, GRADES 9-12 (DE1155 = Code 46)

<u>Code</u>	<u>Description</u>		
1	Vocabulary	7	Quantitative Thinking Total
2	Content Area Reading	8	Core Total
3	Reading Total	9	Literary Materials
4	Expression – Advanced Reading	10	Social Studies
5	Expression Total	11	Science
6	Quantitative Thinking – Advanced Skills	12	Sources of Information
		13	Composite

AMERICAN COLLEGE TESTING PROGRAM (ACT) (DE1155 = Code 801)

<u>Code</u>	<u>Description</u>		
1	English	6	Math: Intermediate Algebra and Geometry
2	English: Usage/Mechanics	7	Math: Plane Geometry and Trigonometry
3	English: Rhetorical Skills	8	Reading
4	Mathematics	9	Reading: Social Studies and Science
5	Math: Preliminary and Elementary Algebra	10	Reading: Arts and Literature
		11	Science Reasoning
		12	Composite

PRELIMINARY AMERICAN COLLEGE TESTING (DE1155 = Code 802)

<u>Code</u>	<u>Description</u>		
1	English	6	Math: Geometry
2	English: Usage and Mechanics	7	Reading
3	English: Rhetorical Skills	8	Reading: Social Studies and Science
4	Mathematics	9	Reading: Arts and Literature
5	Math: Preliminary Algebra and Algebra	10	Science Reasoning
		11	Composite

THE COLLEGE BOARD'S SCHOLASTIC APTITUDE TEST (SAT I) (DE1155 = Code 803)

<u>Code</u>	<u>Description</u>
1	Verbal
2	Reading Comprehension
3	Vocabulary
4	Mathematical
5	Total
6	Test of Standard Written English (TSWE)

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PRELIMINARY SCHOLASTIC APTITUDE TEST/NATIONAL MERIT SCHOLARSHIP QUALIFYING TEST (PSAT/NMSQT) (DE1155 = Code 804)

<u>Code</u>	<u>Description</u>
1	Verbal
2	Mathematical
3	Total

COLLEGE BOARD'S ACHIEVEMENT TESTS (SAT II) (DE1155 = Code 805)

<u>Code</u>	<u>Description</u>
1	English Composition
2	Literature
3	American History
4	European History
5	Mathematics I
6	Mathematics II
7	Biology
8	Chemistry
9	Physics
10	French
11	German
12	Hebrew
13	Latin
14	Spanish
15	World History
16	French Listening
17	Japanese with Listening
18	German Listening
19	Spanish Listening
20	Chinese with Listening
21	English Composition with Essay
22	Italian
23	Mathematics Level IC
24	Mathematics Level IIC
25	Modern Hebrew
26	Writing

TEST OF ADULT BASIC EDUCATION (TABE) (DE1155 = Code 806)

<u>Code</u>	<u>Description</u>
1	Language Arts
2	Mechanics
3	Expression
4	Reading
5	Vocabulary
6	Comprehension
7	Mathematics
8	Computation
9	Concepts/Applications
10	Spelling

INTERNATIONAL BACCALAUREATE (IB) (DE1155 = Code 807)

<u>Code</u>	<u>Description</u>
1	Biology
2	Chemistry
3	English A
4	English B
5	Foreign Language A
6	Foreign Language B
7	History (American)
8	History (European)
9	Mathematics
10	Physics

GENERAL EDUCATION DEVELOPMENT (GED) (DE1155 = Code 808)

<u>Code</u>	<u>Description</u>
1	Mathematics
2	Interpreting Literature and the Arts
3	Science
4	Social Studies
5	Writing Skills

TEST OF ENGLISH AS A FOREIGN LANGUAGE (TOEFL) (DE1155 = Code 809)

<u>Code</u>	<u>Description</u>
1	Listening Comprehension
2	Structure and Written Expression
3	Vocabulary
4	Total

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THE COLLEGE BOARD'S ADVANCED PLACEMENT PROGRAM (DE1155 = Code 831)

<u>Code</u>	<u>Description</u>		
1	U.S. History	16	German Language
2	Art History	17	Govt & Pol - US
3	Art - Drawing	18	Govt & Pol - Comp
4	Art - General	19	Latin - Vergil
5	Biology	20	Latin - Cat Hor
6	Chemistry	21	Calculus AB
7	Comp Sci - A	22	Calculus BC
8	Comp Sci - B	23	Music List & Lit
9	Economics - Micro	24	Music Theory
10	Economics - Macro	25	Physics
11	English Language/Comp	26	Physics C - Mech
12	English Literature/Comp	27	Physics C - E & M
13	European History	28	Psychology
14	French Language	29	Spanish Language
15	French Literature	30	Spanish Literature

APPENDIX K: MEDICAL CODES

COMMON IMMUNIZATION CODES

<u>Code</u>	<u>Description</u>
HIB	
MMR	Mumps, measles, rubella
DPT	Diphtheria, Polio, Tetanus
DT	Diphtheria, Tetanus
PO	Polio
HA	Hepatitis A
HB	Hepatitis B
HC	Hepatitis C

COMMON SCREENING

<u>Code</u>	<u>Description</u>
V	Vision
E	Eyesight
G	Glaucoma
S	Speech
H	Hearing
TB	Tuberculosis
HA	Exposure to Hepatitis A
HB	Exposure to Hepatitis B
HC	Exposure to Hepatitis C

SECURITY LEVELS

<u>Code</u>	<u>Description</u>
FD	Highest level of security. Family and doctor only
FDC	Next highest level. Family, doctor, and certified staff
FDS	Family, doctor, and staff can view or edit this information

If a specific staff category has access, then the category will be defined as free text, based on unique school categories.

RESULT OF MEDICAL OR HEALTH CONTACT

<u>Codes</u>	<u>Description</u>
FOL	Recommend follow-up
REF	Recommend referral
CLO	Current case or issue closed

CONTACT POSITIONS INVOLVED IN MEDICAL CONTACTS

<u>Code</u>	<u>Description</u>
T	Teacher
P	Parent
S	Student
SC	School Counselor
SN	School Nurse
P	Principal
SPSY	School Psychologist
SDOC	School Doctor
PSYCHI	Psychiatrist
PHY	Physician
PSYO	Psychologist
MFCC	Family counselor
CW	Community worker
CL	Clinic staff
CBO	Community based organization staff
LE	Legal system
LAW	Law Enforcement
LHS	Local or City Human Services or welfare staff
CHS	County Human Services or welfare staff
SHS	State Human Services or welfare staff

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