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EOSDIS Core System Project

Release 6B
Interoperability Subsystem (IOS) Database Design and Database Schema Specifications for the ECS Project

September 2002

Raytheon Company
Upper Marlboro, Maryland

Release 6B
Interoperability Subsystem (IOS)
Database Design and Database Schema Specifications for the ECS Project

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Preface

This document describes the database design and database schema specifications for the Interoperability Subsystem (IOS). It is one of eleven documents comprising the detailed database design and database schema specifications for the as-delivered ECS subsystems. A complete list of the eleven documents follows:

311-CD-620-001	Release 6B Data Management (DM) Subsystem Database Design and Database Schema Specifications for the ECS Project
311-CD-621-001	Release 6B Ingest Subsystem (INS) Database Design and Database Schema Specifications for the ECS Project
311-CD-622-001	Release 6B Interoperability Subsystem (IOS) Database Design and Database Schema Specifications for the ECS Project
311-CD-623-001	Release 6B Planning and Data Processing Subsystem (PDPS) Database Design and Database Schema Specifications for the ECS Project
311-CD-624-001	Release 6B Science Data Server (SDSRV) Subsystem Database Design and Database Schema Specifications for the ECS Project
311-CD-625-001	Release 6B Storage Management (STMGT) Subsystem Database Design and Database Schema Specifications for the ECS Project
311-CD-626-001	Release 6B Subscription Server (SUBSRV) Subsystem Database Design and Database Schema Specifications for the ECS Project
311-CD-627-001	Release 6B Management Support Subsystem (MSS) Database Design and Database Schema Specifications for the ECS Project
311-CD-628-001	Release 6B Configuration Registry (REGIST) Database Design and Database Schema Specifications for the ECS Project
311-CD-630-001	Release 6B PDS Subsystem Database Design and Database Schema Specifications for the ECS Project
311-CD-631-001	Release 6B Name Server Subsystem Database Design and Database Schema Specifications for the ECS Project

This document is a contract deliverable with an approval code 2. As such, it does not require formal Government acceptance. Contractor approved changes to this document are handled in accordance with change control requirements described in the EOS Configuration Management Plan. Changes to this document will be made by document change notice (DCN) or by complete revision.

Entity relationship diagrams (ERDs) presented in this document have been exported directly from software tools and in some cases contain too much detail to be easily readable within hard copy page constraints. The reader is encouraged to view these diagrams in Portable Document Format (PDF) on the ECS Data Handling System (EDHS) world wide web (WWW) site. The universal resource locator (URL) is: http://edhs1.gsfc.nasa.gov. Any questions should be addressed to:

Data Management Office
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Abstract

This document outlines the Release 6B “as-built” database design and database schema specifications for the Interoperability Subsystem (IOS). It includes the entity relationship diagram (ERD), physical database table definitions, and database software listings for triggers, procedures, and scripts. The ERD describes data entities and the association between these entities used within the IOS. Other information is also included to support database installation and life cycle maintenance.

Keywords: data, database, design, specifications, configuration, installation, parameters, scripts, security, data model, replication, performance tuning, SQL server, Sybase, database security, triggers, procedures, scripts.

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Appendix A. Interoperability Subsystem Entity Relationship Diagrams

Abbreviations and Acronyms

1. Introduction

1.1 Identification

This *Interoperability Subsystem (IOS) Database Design and Database Schema Specifications* document, Contract Data Requirement List (CDRL) Item Number 050, whose requirements are specified in Data Item Description (DID) 311/DV2, is a required deliverable under the Earth Observing System (EOS) Data and Information System (EOSDIS) Core System (ECS), Contract NAS5-60000.

1.2 Scope

The *IOS Database Design and Database Schema Specifications* document describes the database that supports the data requirements for the IOS, Release 6B.

1.3 Purpose

The purpose of the *IOS Database Design and Database Schema Specifications* document is to support the administrators of the IOS database throughout its life cycle. Additionally, this document communicates the database specifications in sufficient detail to support other ongoing installation and operational activities (e.g., configuration management, data administration, system installation and maintenance).

1.4 Audience

The IOS *Database Design and Database Schema Specifications* document is intended to be used and maintained by the ECS maintenance and operations staff. The document is organized as follows:

Section 1 provides information regarding the identification, scope, purpose, and audience.

Section 2 provides a listing of related documents used to develop this document.

Section 3 contains the design overview of the database design including the entity relationship diagram (ERD) representing the physical data model, the database tables and columns, flat file usage and fields, triggers, and stored procedures.

Section 4 provides a description of database performance and tuning features, (i.e., indexes, named caches, and segments) for the IOS database implementation.

Section 5 provides a high level description of the security infrastructure including listings of anticipated users, roles, groups, and login permissions expected for preliminary operational use.

Section 6 provides listings of the scripts used for database installation, de-installation, backup and recovery, and other miscellaneous administration functions.

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2. Related Documents

2.1 Applicable Documents

The following documents, including Internet links, are referenced in this document, or are directly applicable, or contain policies or other directive matters that are binding upon the content of this volume.

305-CD-610	Release 6A Segment Design Specification for the ECS Project
920-TDG-009	DAAC Hardware Database Mapping/GSFC
920-TDN-009	DAAC Hardware Database Mapping/NSIDC
920-TDE-009	DAAC Hardware Database Mapping/EDC
920-TDL-009	DAAC Hardware Database Mapping/LARC
920-TDS-009	DAAC Hardware Database Mapping/SMC
920-TDG-010	DAAC Database Configuration/GSFC
920-TDN-010	DAAC Database Configuration/NSIDC
920-TDE-010	DAAC Database Configuration/EDC
920-TDL-010	DAAC Database Configuration/LARC
920-TDS-010	DAAC Database Configuration/SMC
920-TDG-011	DAAC Sybase Log Mapping/GSFC
920-TDN-011	DAAC Sybase Log Mapping/NSIDC
920-TDE-011	DAAC Sybase Log Mapping/EDC
920-TDL-011	DAAC Sybase Log Mapping/LARC
920-TDS-011	DAAC Sybase Log Mapping/SMC
922-TDG-013	Disk Partitions/GSFC
922-TDN-013	Disk Partitions/NSIDC
922-TDE-013	Disk Partitions/EDC
922-TDL-013	Disk Partitions/LARC
922-TDS-013	Disk Partitions/SMC

These documents are maintained as part of the ECS baseline and available on the world wide web at the URL: http://cmdm.east.hitc.com/baseline. Please note that this is a partial mirror site in that some items are not available (they are identified) since this is OPEN to all. This site may also be reached through the EDHS homepage. Scroll page to the connections line and click on the ECS Baseline Information System link.

2.2 Information Documents

The following documents, although not directly applicable, amplify or clarify the information presented in this document. These documents are not binding on this document.

313-CD-610	Release 6B CSMS/SDPS Internal ICD for the ECS Project
609-CD-610	Release 6B Operations Tools Manual for the ECS Project
611-CD-610	Release 6B Mission Operation Procedures for the ECS Project

These documents are accessible via the EDHS homepage.

3. Database Design

3.1 Design Overview

Data requirements for IOS fall into four logical groupings:

Advertising information – data describing the approved or pending

Collection metadata – data summarizing the science content of advertised ECS data collections.

Primary key management - data used to generate a unique primary key for a table in the IOS database.

Database initialization data – data used to initially populate tables in the IOS database on a clean install.

The IOS database implements a majority of the persistent data requirements for the IOS database. Other non-database data requirements, used for system support, are implemented in flat files-see Section 3.2 for descriptions of these flat files. The database is designed to satisfy IOS business rules while maintaining data integrity, consistency, and performance. Database tables are implemented using the Sybase Relational Database Management System (RDBMS). All components of the IOS database and flat files are described in the following sections; information is presented in sufficient detail to support operational needs.

3.1.1 Physical Data Model Entity Relationship Diagram

Entity relationship diagrams (ERDs) were developed for use as a "roadmap" to the IOS database. These ERDs are found in Appendix A. An ERD is a schematic of the physical data structure that illustrates the dependencies and relationships between database entities (i.e., tables). On ERDs, database entities are represented by rectangles and relationships are represented by arrows as shown by the key in Figure 3-1. Details on the syntax used by the *Power Designor Data Architect* Computer Aided Software Engineering (CASE) tool may be found in the *Powersoft: Power Designor for PowerBuilder* Reference Guide. The ERDs presented in Appendix A for the IOS database were produced using the *Power Designor* tool.

The ECS Conceptual Model for the Science Data Processing Segment (SDPS) was developed using an Object Oriented (OO) CASE tool. However, since Sybase implements a RDBMS with an Object wrapper, the syntax (model notation) is converted from OO to relational and the terminology changes-the "attribute" becomes "column" and "class" becomes "table." Since the specifications of some entities in this document are transferred from the OO Conceptual Model repository, there are many cases where the OO terminology is retained—as, for example, in the table and column names and definitions.

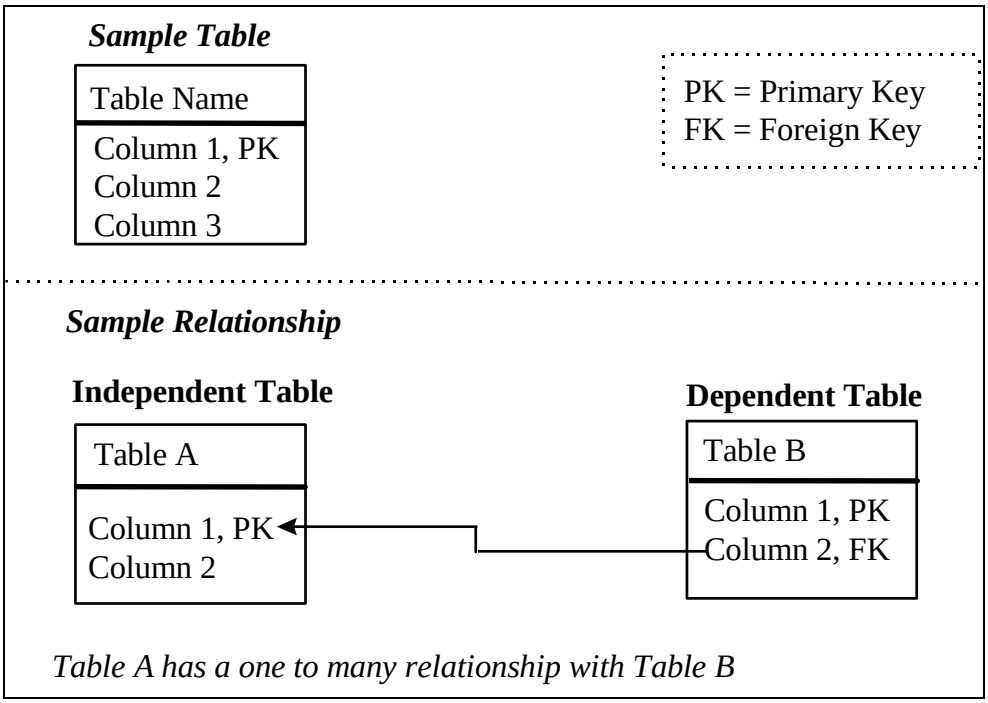

Figure 3-1. ERD Key

3.1.2 Database Table Specifications

Table 3-1 contains a listing of all the database tables named within the IOS database. This list is presented in alphabetical order corresponding to the database tables illustrated in the ERD (reference Figure 3-1). The database tables listed immediately following Table 3-1 is presented in the same order as the table.

Table 3-1. Database Tables (1 of 3)

Database Table Name	Logical Grouping
EcDbDatabaseVerions	Database Version Information
IoAdAdvDescription	Advertisement Information
IoAdAdvMaster	Advertisement Information
IoAdAdvMasterKey	Advertisement Information
IoAdAdvUR	Advertisement Information
IoAdAdvXref	Advertisement Information
IoAdAlgorithmPackage	Collection Metadata
IoAdAltitudeResolution	Collection Metadata
IoAdAnalysisCollectionXref	Data Source
IoAdAnalysisSource	Data Source

Table 3-1. Database Tables (2 of 3)

Database Table Name	Logical Grouping
IoAdApprovedAdv	Advertisement Information
IoAdBoundingRectangle	Collection Metadata
IoAdCampaign	Data Source
IoAdCampaignCollectionXref	Data Source
IoAdCollectionXref	Collection Metadata & Advertisement
IoAdContact	Collection Contact Metadata
IoAdContactAddress	Collection Contact Metadata
IoAdContactAdvXref	Collection Contact Metadata
IoAdContactEmail	Collection Contact Metadata
IoAdContactKey	Collection Contact Metadata
IoAdContactOrganization	Collection Contact Metadata
IoAdContactPerson	Collection Contact Metadata
IoAdContactTelephone	Collection Contact Metadata
IoAdDepthResolution	Collection Metadata
IoAdECSCollection	Collection Metadata & Data Source
IoAdECSCollectionKeyword	Collection Metadata
IoAdGroup	Advertisement Information
IoAdGroupKey	Advertisement Information
IoAdInstallableServiceAdv	Advertisement Information
IoAdInstrument	Data Source
IoAdInstrumentCollectionXref	Data Source
IoAdMimeServiceAdv	Advertisement Information
IoAdMultipleTypeCollection	Collection Metadata
IoAdPersonOrganizationXref	Collection Contact Metadata
IoAdPlatform	Data Source
IoAdPlatformCollectionXref	Data Source
IoAdProductAdv	Advertisement Information
IoAdProviderAdv	Advertisement Information
IoAdRangeDateTime	Collection Metadata
IoAdReferencePaper	Collection Metadata
IoAdRefPaperCollectionXref	Collection Metadata
IoAdRequest	Advertisement Information
IoAdRequestKey	Advertisement Information
IoAdReview	Collection Metadata
IoAdSensor	Data Source
IoAdSensorCollectionXref	Data Source
IoAdServiceAdv	Advertisement Information
IoAdSignature	Advertisement Information
IoAdSignatureServiceAdv	Advertisement Information

Table 3-1. Database Tables (3 of 3)

Database Table Name	Logical Grouping
IoAdSingleTypeCollection	Collection Metadata
IoAdSiteInfo	Advertisement Information
IoAdSpatial	Collection Metadata
IoAdSpatialKeywordClass	Collection Metadata
IoAdTemporalKeywordClass	Collection Metadata

The following report is produced by the Power Designer CASE tool and edited for format consistency. The report provides specifications on the IOS database tables. The report is sorted in alphabetical order by table name. Specifications include the table name, a brief description of the table, and the columns comprising the table. The column information includes the column name and the column attributes, i.e., type (format of the data stored within the database), primary key indicator(s), and a mandatory indicator for determining if the column must contain data when the row exists. In some cases the content of the column specification "Type" will reference a domain value (refer to Section 3.1.4 for more information on the domain values).

Description: Table 3-2 identifies the current version level of the IOS database.

Table 3-2. EcDbDatabaseVersions

Name	Type	P	M
EcDbSchemaVersionID	Smallint	Yes	Yes
EcDbDropVersion	Char(64)	Yes	Yes
EcDbCCurrentVersionFlag	Char(1)	No	No
EcDbDatabaseName	Varchar(255)	No	No
EcDbDropDescription	Vachar(255)	No	No
EcDbDropInstallDate	Datetime	No	No
EcDbSybaseVersion	varchar(255)	No	No
EcDbSybaseServer	varchar(255)	No	No
EcDbComments	varchar(255)	No	No
EcDbUpdateProcess	varchar(255)	No	No

Description: Table 3-3 stores a general description of an advertisement.

Table 3-3. IoAdAdvDescription

Column List

Name	Type	P	M
advId	numeric(8)	Yes	Yes
description	varchar(255)	No	Yes
seqNumber	int	Yes	Yes

Description: Table 3-4 stores the general information of approved advertisements.

Table 3-4. IoAdAdvMaster

Column List:

Name	Type	P	M
advGroupId	numeric(8)	No	Yes
advId	numeric(8)	Yes	Yes
advType	varchar(80)	No	Yes
expirationDate	datetime	No	No
logicalServerName	varchar(40)	No	No
serverType	varchar(40)	No	No
siteId	int	No	Yes
startDate	datetime	No	Yes
title	varchar(100)	No	Yes
uniqueId	numeric(6)	No	Yes
upperTitle	varchar(100)	No	No

Description: Table 3-5 is a look up table to maintain the highest value of advId.

Table 3-5. IoAdAdvMasterKey

Column List:

Name	Type	P	M
advIdUnique	numeric(6)	Yes	Yes

Description: Table 3-6 stores the address of the service advertisement universal reference.

Table 3-6. IoAdAdvUR

Column List:

Name	Type	P	M
advUR	varchar(255)	No	Yes
seqNumber	int	Yes	Yes
serviceId	numeric(8)	Yes	Yes

Description: Table 3-7 maintains the references between product advertisement and service advertisement.

Table 3-7. IoAdAdvXref

Column List

Name	Type	P	M
leftAdvId	numeric(8)	Yes	Yes
rightAdvId	numeric(8)	Yes	Yes

Description: Table 3-8 stores the algorithm package information associated with the single type collections.

Table 3-8. IoAdAlgorithmPackage

Column List:

Name	Type	P	M
AlgorithmPackageVersion	char(80)	Yes	Yes
AlgorithmPackageName	char(80)	Yes	Yes
collectionId	numeric(8)	No	No
contactId	numeric(8)	No	No
PackageAcceptanceDate	datetime	No	No

Description: Table 3-9 stores the altitude resolution associated with the ECS collections.

Table 3-9. IoAdAltitudeResolution

Column List:

Name	Type	P	M
AltitudeResolution	float (8)	No	Yes
collectionId	numeric(8)	Yes	Yes

Description: Table 3-10 maintains the cross-reference between analysis sources and the ECS collections.

Table 3-10. IoAdAnalysisCollectionXref

Column List:

Name	Type	P	M
AnalysisShortName	char(20)	Yes	Yes
collectionId	numeric(8)	Yes	Yes

Description: Table 3-11 defines analysis sources germane to ECS.

Table 3-11. IoAdAnalysisSource

Column List:

Name	Type	P	M
AnalysisLongName	varchar(80)	No	No
AnalysisShortName	char(20)	Yes	Yes

Description: Table 3-12 identifies approved advertisements.

Table 3-12. IoAdApprovedAdv

Column List:

Name	Type	P	M
advId	numeric(8)	Yes	Yes

Description: Table 3-13 stores the spatial area coverage for ECS collection.

Table 3-13. IoAdBoundingRectangle

Column List:

Name	Type	P	M
collectionId	numeric(8)	Yes	Yes
EastBoundingCoordinate	numeric(11,6)	No	Yes
NorthBoundingCoordinate	numeric(11,6)	No	Yes
SouthBoundingCoordinate	numeric(11,6)	No	Yes
WestBoundingCoordinate	numeric(11,6)	No	Yes

Description: Table 3-14 stores the scientific endeavors to which the collection is associated.

Table 3-14. IoAdCampaign

Column List:

Name	Type	P	M
CampaignLongName	varchar(80)	No	No
CampaignShortName	char(20)	Yes	Yes

Description: Table 3-15 maintains the cross-reference between campaign and ECS collection.

Table 3-15. IoAdCampaignCollectionXref

Column List:

Name	Type	P	M
CampaignShortName	char(20)	Yes	Yes
collectionId	numeric(8)	Yes	Yes

Description: Table 3-16 contains the cross-reference between single type collection and multiple type collection.

Table 3-16. IoAdCollectionXref

Column List:

Name	Type	P	M
collectionIdAgg	numeric(8)	Yes	Yes
collectionIdRef	numeric(8)	Yes	Yes

Description: Table 3-17 stores the contact information of the advertisement.

Table 3-17. IoAdContact

Column List:

Name	Type	P	M
contactId	numeric(8)	Yes	Yes
contactRole	char(16)	No	Yes
siteId	int	No	Yes
uniqueId	numeric(6)	No	Yes

Description: Table 3-18 stores the address of points of contact for the advertisement.

Table 3-18. IoAdContactAddress

Column List:

Name	Type	P	M
addressId	numeric(8)	Yes	Yes
City	char(30)	No	No
ContactId	numeric(8)	Yes	Yes
Country	char(10)	No	No
PostalCode	char(20)	No	No
StateProvince	char(20)	No	No
StreetAddress	char(80)	No	No

Description: Table 3-19 contains the cross-reference between contact and advertisement.

Table 3-19. IoAdContactAdvXref

Column List:

Name	Type	P	M
advId	numeric(8)	Yes	Yes
contactId	numeric(8)	Yes	Yes

Description: Table 3-20 stores the Email address of the points of contact for the advertisement.

Table 3-20. IoAdContactEmail

Column List:

Name	Type	P	M
contactId	numeric(8)	No	No
ElectronicMailAddress	varchar(255)	Yes	Yes

Description: Table 3-21 is a look up table to maintain the highest value of the contactId.

Table 3-21. IoAdContactKey

Column List:

Name	Type	P	M
contactIdUnique	numeric(6)	Yes	Yes

Description: Table 3-22 stores the name of the organizations.

Table 3-22. IoAdContactOrganization

Column List:

Name	Type	P	M
contactOrganizationName	varchar(255)	No	No
organizationId	numeric(8)	Yes	Yes

Description: Table 3-23 stores the name of the points of contact for the advertisement.

Table 3-23. IoAdContactPerson

Column List:

Name	Type	P	M
ContactFirstName	char(30)	No	Yes
contactId	numeric(8)	Yes	Yes
ContactJobPosition	varchar(255)	No	No
ContactLastName	varchar(30)	No	Yes
ContactMiddleName	varchar(30)	No	No

Description: Table 3-24 stores the phone information of the points of contact for the advertisement.

Table 3-24. IoAdContactTelephone

Column List:

Name	Type	P	M
contactId	numeric(8)	No	No
TelephoneNumber	char(23)	Yes	Yes
TelephoneNumberType	char(5)	No	Yes

Description: Table 3-25 stores the depth resolution associated with ECS collections.

Table 3-25. IoAdDepthResolution

Column List:

Name	Type	P	M
collectionId	numeric(8)	Yes	Yes
DepthResolution	float	No	Yes

Description: Table 3-26 stores the ECS collection associated to the product advertisement.

Table 3-26. IoAdECSCollection

Column List:

Name	Type	P	M
ArchiveCenter	char(20)	No	Yes
collectionId	numeric(8)	Yes	Yes
guideURL	varchar(100)	No	No
ProcessingCenter	char(20)	No	No
productURL	varchar(100)	No	No
RevisionDate	datetime	No	No
ShortName	char(8)	No	Yes
SuggestedUsage	text	No	No
VersionID	int	No	Yes
VersionDescription	varchar(255)	No	No

Description: Table 3-27 stores all types of keywords used in searching ECS collections.

Table 3-27. IoAdECSCollectionKeyword

Column List:

Name	Type	P	M
collectionId	numeric(8)	Yes	Yes
ECSDisciplineKeyword	char(24)	No	No
ECSParameterKeyword	char(80)	No	No
ECSTermKeyword	char(50)	No	No
ECSTopicKeyword	char(32)	No	No
ECSVariableKeyword	char(80)	No	No
keywordId	numeric(8)	Yes	Yes

Description: Table 3-28 stores the moderation group for the advertisement.

Table 3-28. IoAdGroup

Column List:

Name	Type	P	M
acl	char(50)	No	No
groupDescription	varchar(255)	No	No
groupId	numeric(8)	Yes	Yes
groupName	char(50)	No	No
moderator	char(100)	No	No
siteId	int	No	Yes
uniqueId	numeric(6)	No	Yes

Description: Table 3-29 is a look up table to maintain the highest value of the groupId currently being used.

Table 3-29. IoAdGroupKey

Column List:

Name	Type	P	M
groupIdUnique	numeric(6)	Yes	Yes

Description: Table 3-30 stores the software information, which is installed to the client site upon request.

Table 3-30. IoAdInstallableServiceAdv

Column List:

Name	Type	P	M
ftpURL	varchar(100)	No	No
packageSize	int	No	No
serviceId	numeric(8)	Yes	Yes

Description: Table 3-31 stores the instrument information associated with ECS collection.

Table 3-31. IoAdInstrument

Column List:

Name	Type	P	M
InstrumentLongName	char(80)	No	No
InstrumentShortName	char(20)	Yes	Yes

Description: Table 3-32 maintains the cross-reference between ECS collection and Instrument.

Table 3-32. IoAdInstrumentCollectionXref

Column List:

Name	Type	P	M
collectionId	numeric(8)	Yes	Yes
InstrumentShortName	char(20)	Yes	Yes

Description: Table 3-33 stores the MIME (Multipurpose Internet Mail Extension) service advertisement.

Table 3-33. IoAdMimeServiceAdv

Column List:

Name	Type	P	M
serviceId	numeric(8)	Yes	Yes
serviceURL	varchar(100)	No	No

Description: Table 3-34 stores the multiple type ECS collections.

Table 3-34. IoAdMultipleTypeCollection

Column List:

Name	Type	P	M
AggregationType	char(20)	No	No
collectionId	numeric(8)	Yes	Yes

Description: Table 3-35 maintains the cross-reference between Contact Person and Contact Organization.

Table 3-35. IoAdPersonOrganizationXref

Column List:

Name	Type	P	M
contactId	numeric(8)	Yes	Yes
organizationId	numeric(8)	Yes	Yes

Description: Table 3-36 stores the platforms associated with the acquisition of the collection.

Table 3-36. IoAdPlatform

Column List:

Name	Type	P	M
PlatformLongName	char(80)	No	No
PlatformShortName	char(20)	Yes	Yes

Description: Table 3-37 maintains the cross-reference between Platform and ECS collection.

Table 3-37. IoAdPlatformCollectionXref

Column List:

Name	Type	P	M
collectionId	numeric(8)	Yes	Yes
PlatformShortName	char(20)	Yes	Yes

Description: Table 3-38 stores the product advertisement.

Table 3-38. IoAdProductAdv

Column List:

Name	Type	P	M
productId	numeric(8)	Yes	Yes
providerId	numeric(8)	No	No

Description: Table 3-39 stores the provider advertisement.

Table 3-39. IoAdProviderAdv

Column List:

Name	Type	P	M
providerId	numeric(8)	Yes	Yes
providerURL	varchar(100)	No	No

Description: Table 3-40 stores the start/end time of a collection.

Table 3-40. IoAdRangeDateTime

Column List:

Name	Type	P	M
collectionId	numeric(8)	Yes	Yes
presentFlag	numeric(1)	No	No
RangeBeginningDate	datetime	Yes	Yes
RangeEndingDate	datetime	Yes	Yes

Description: Table 3-41 stores the reference document of a collection.

Table 3-41. IoAdReferencePaper

Column List:

Name	Type	P	M
AccessInstructions	varchar(255)	No	No
AuthorAffiliation	varchar(64)	No	No
AuthorName	varchar(64)	No	No
PublicationDate	datetime	No	No
ReferencePaperReference	char(20)	Yes	Yes
Title	varchar(100)	No	No

Description: Table 3-42 maintains the cross-reference between Reference Paper and ECS collection.

Table 3-42. IoAdRefPaperCollectionXref

Column List:

Name	Type	P	M
collectionId	numeric(8)	Yes	Yes
ReferencePaperReference	char(20)	Yes	Yes

Description: Table 3-43 stores the information that external providers make a request to change the current approved advertisement.

Table 3-43. IoAdRequest

Column List:

Name	Type	P	M
newAdvId	numeric(8)	No	No
oldAdvId	numeric(8)	No	No
oldAdvModTime	datetime	No	No
oequestId	numeric(8)	No	No
oequestTime	datetime	No	No
siteId	int	Yes	Yes
type	int	No	Yes
uniqueId	numeric(6)	Yes	Yes
who	varchar(255)	No	No
why	varchar(255)	No	No

Description: Table 3-44 is a look up table to maintain the highest value of the new AdvId.

Table 3-44. IoAdRequestKey

Column List:

Name	Type	P	M
requestIdUnique	numeric(6)	Yes	Yes

Description: Table 3-45 stores the dates for the QA peer review for a single type collection.

Table 3-45. IoAdReview

Column List:

Name	Type	P	M
collectionId	numeric(8)	Yes	Yes
FutureReviewDate	datetime	No	No
reviewId	numeric(8)	Yes	Yes
ScienceReviewDate	datetime	No	No

Description: Table 3-46 stores the sensory subcomponents of an instrument.

Table 3-46. IoAdSensor

Column List:

Name	Type	P	M
sensorLongName	char(80)	No	No
sensorShortName	char(20)	Yes	Yes

Description: Table 3-47 maintains the cross-reference between Sensors and ECS collection.

Table 3-47. IoAdSensorCollectionXref

Column List:

Name	Type	P	M
collectionId	numeric(8)	Yes	Yes
SensorShortName	char(20)	Yes	Yes

Description: Table 3-48 stores the service advertisement.

Table 3-48. IoAdServiceAdv

Column List:

Name	Type	P	M
providerId	numeric(8)	No	No
serviceId	numeric(8)	Yes	Yes

Description: Table 3-49 stores the signature service associated with the signature service advertisement.

Table 3-49. IoAdSignature

Column List:

Name	Type	P	M
GlParamList	varchar(255)	No	Yes
seqNumber	int	Yes	Yes
serviceId	numeric(8)	Yes	Yes

Description: Table 3-50 stores the signature service advertisement. Signature service is the C++ operation to perform the service.

Table 3-50. IoAdSignatureServiceAdv

Column List:

Name	Type	P	M
internalName	varchar(100)	No	Yes
serviceClass	varchar(100)	No	Yes
serviceId	numeric(8)	Yes	Yes
serviceName	varchar(100)	No	Yes
serviceSignatureId	numeric(8)	No	No
serviceURId	numeric(8)	No	No

Description: Table 3-51 stores the information specific to a single type collection.

Table 3-51. IoAdSingleTypeCollection

Column List:

Name	Type	P	M
accessConstraints	varchar(255)	No	No
citationforExternalPublication	varchar(255)	No	No
CollectionId	numeric(8)	Yes	Yes
MaintenanceandUpdateFrequency	varchar(80)	No	No
ProcessingLevelID	char(32)	No	No

Description: Table 3-52 stores the DAAC, which an advertisement belongs to.

Table 3-52. IoAdSiteInfo

Column List:

Name	Type	P	M
local	bit	No	Yes
siteId	int	Yes	Yes
siteName	varchar(40)	No	Yes

Description: Table 3-53 stores the spatial extent of ECS collection.

Table 3-53. IoAdSpatial

Column List:

Name	Type	P	M
collectionId	numeric(8)	Yes	Yes
latitudeResolution	float(8)	No	No
longitudeResolution	float(8)	No	No
spatialCoverageType	char(25)	No	Yes

Description: Table 3-54 stores the keyword of spatial region for ECS collection.

Table 3-54. IoAdSpatialKeywordClass

Column List:

Name	Type	P	M
collectionId	numeric(8)	Yes	Yes
SpatialKeyword	char(10)	Yes	Yes

Description: Table 3-55 stores the keyword of temporal characteristics for ECS collection.

Table 3-55. IoAdTemporalKeywordClass

Column List:

Name	Type	P	M
collectionId	numeric(8)	Yes	Yes
TemporalKeyword	char(10)	Yes	Yes

3.1.3 Column Specifications

Brief definitions of each of the columns[1] within the IOS database and their applicable valid values, or references to other documents containing the valid values, are contained herein.

Column: AccessConstraints

Description: Restrictions and legal prerequisites for accessing the collection. These include any access constraints applied to assure the protection of privacy or intellectual property, and any special restrictions or limitations on obtaining the collection. This is a SDSRV Subsystem column.

Valid Values: See 420-TP-015

Column: AccessInstructions

Description: Instructions describing how to obtain electronic access to a stand-alone document. May simply be an anonymous ftp site address, or a World Wide Web homepage URL.

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[1] The term “column” is used interchangably with the term “attribute” where it refers to a database structure. The ECS Conceptual Model was developed using Object Oriented terminology. This model is converted to a relational structure for physical implementation within Sybase. The descriptions of some "columns” are derived from the Object Oriented Conceptual Model.

Column: acl

Description: The name of the access control list used by the moderator to create/update/delete approved advertisement for the given group.

Column: addressId

Description: The unique ID which identifies the address of the contact.

Column: advGroupId

Description: The IDs which uniquely identify the group that advertisement belong to.

Column: advId

Description: An ID which uniquely identifies an advertisement.

Note: AdvId is generated from siteId and uniqueId. Refer to stored procedure "IoAdgetAvdMasterKey".

Column: advIdUnique

Description: The last value of advId used.

Note: This key is used by the store procedure "IoAdAdvMasterKey" to generate the next advId in sequence.

Column: advType

Description: The type of advertisement.

Column: advUR

Description: The address of the service advertisement UR.

Column: AggregationType

Description: This attribute will contain the criteria by which multiple type collections have been grouped. It will describe the major categorization which applies to the data therein. Possible collection groupings include: INSTRUMENT, for all collections associated with a given collecting instrument such as CERES-this is a common aggregation criteria for ECS 'dataset': PROJECT, for all data associated with a given project that may or may not be related to a single instrument, such as FIRE-this is often an aggregation criteria for ECS 'products': SUPERGRANULE, for collections of granules that a data provider wishes to be orderable as a single related grouping, such as SSM/I TIME SERIES-this is a concept adopted from MSFC use; EVENT, for a predetermined/tagged set of granules that have been found to be related to a particular geophysical phenomena or event, such as MIDWEST FLLOOD '93 or OZONE HOLE

or MT.PINATUBO-this is a new ECS concept, also suggested by the University of Virginia Atmospheric researchers. This is a SDSRV Subsystem column.

Valid Values: See 420-TP-015

Column: AlgorithmPackageVersion

Description: This attribute specifies the version of the full package being delivered. This is a SDSRV Subsystem column.

Valid Values: See 420-TP-015

Column: AlgorithmPackageName

Description: This attribute is the name given to the complete delivered package submitted for algorithm integration and test. This is a SDSRV Subsystem column.

Valid Values: See 420-TP-015

Column: AltitudeResolution

Description: The minimum distance possible between two adjacent altitude values, expressed in Altitude Distance Units of measure. This is a SDSRV Subsystem column.

Valid Values: See 420-TP-015.

Column: AnalysisLongName

Description: The expanded or long name of the analysis source identified using AnalysisShortName. AnalysisLongName is intended to categorize collections by the processes which collected (e.g., census survey) or produced them (e.g., NMC 16-level Nested Grid Model). This is a SDSRV Subsystem column.

Valid Values: See 420-TP-015

Column: AnalysisShortName

Description: AnalysisShortname is the unique identifier of the collection or analysis process(s) which best characterize the ECS Collection or Granule. ECS Collections or Granules may be characterized by both a collection and an analysis data set which include data collected using the NWS ASOS network (PlatformType = Network, PlatformShortName = ASOS) which was processed using an NMC analysis model (e.g., AnalysisType = Model, AnalysisShortName = RAFS, AnalysisDescription = Regional Area Forecast System, AnalysisTechinque = Regional Optimal Interpolation.) This is a SDSRV Subsystem column.

Valid Values: See 420-TP-015

Column: ArchiveCenter

Description: Center where collection is archived. This is a SDSRV Subsystem column.

Valid Values: See 420-TP-015

Column: AuthorAffiliation

Description: The name of an agency or center with which the author of the document works for or is affiliated with.

Column: AuthorName

Description: The name of the author of the reference paper.

Column: CampaignLongName

Description: The expanded name of the campaign/experiment (e.g., Global Climate Observing System). This is a SDSRV Subsystem column.

Valid Values: See 420-TP-015

Column: CampaignShortName

Description: The unique identifier by which a campaign/project/experiment is known. The campaign/project is the scientific endeavor associated with the acquisition of the collection. Collections may be associated with multiple campaigns. This is a SDSRV Subsystem column.

Valid Values: See 420-TP-015

Column: CitationforExternalPublication

Description: The recommended reference to be used when referring to this collection in publications. This is a SDSRV Subsystem column.

Valid Values: See 420-TP-015

Column: City

Description: The city of the person or organization of the point of contact. This is a SDSRV Subsystem column.

Valid Values: See 420-TP-015

Column: collectionId

Description: The unique ID, which identifies an ECS collection. This is a SDSRV Subsystem column.

Valid Values: See 420-TP-015

Column: collectionIdAgg

Description: The aggregate type of collections.

Column: collectionIdRef

Description: The collection which is included in the collectionIdAgg.

Column: ContactFirstName

Description: First name of the individual to which the contact role (producer, archiver, distributor, or data originator) applies. People are points of contact, rather than organization, in cases where the association of the person to the data set is more significant than the association of the organization to the data set. They may also be included if both a single person and organization are provided as points of contact. This is a SDSRV Subsystem column.

Valid Values: See 420-TP-015

Column: contactId

Description: The unique ID, which identifies the contact information.

Note: contactId is generated from uniqueId and siteId. Refer to the store procedure "IoAdGetContactKey". This is a SDSRV Subsystem column.

Valid Values: See 420-TP-015

Column: contactIdUnique

Description: The highest value of the ContactId that is currently used.

Column: ContactJobPosition

Description: The title of the individual (i.e., Team Leader, Principal Investigator). This is a SDSRV Subsystem column.

Valid Values: See 420-TP-015

Column: ContactLastName

Description: Last name of the individual with the contact role (producer, archiver, distributor, or data originator) applies. People are points of contact, rather than organization, in cases where the association of the person to the data set is more significant than the association of the organization to the data set. They may also be included if both a single person and organization are provided as points of contact. This is a SDSRV Subsystem column.

Valid Values: See 420-TP-015

Column: ContactMiddleName

Description: The middle name of the point of contact. This is a SDSRV Subsystem column.

Valid Values: See 420-TP-015

Column: ContactOrganizationName

Description: This is the name of the organization. This is a SDSRV Subsystem column.

Valid Values: See 420-TP-015

Column: contactRole

Description: Classification of individuals who are associated with a given collection. This is a SDSRV Subsystem column "ContactRole."

Valid Values: See 420-TP-015

Column: Country

Description: The country of the address of the point of contact. This is a SDSRV Subsystem column.

Valid Values: See 420-TP-015

Column: DepthResolution

Description: The minimum distance possible between two adjacent depth values, expressed in depth distance units of measure - mandatory. This is a SDSRV Subsystem column.

Valid Values: >0.0, See 420-TP-015

Column: Description

Description: The description for the Advertisement.

Column: EastBoundingCoordinate

Description: Eastern-most limit of coverage expressed in geodetic longitude.

Valid Values: [-180.0 <= East Bounding Coordinate <= 180.0]

Column: **EcDbComments**

Description: Notes or comments on the database version level.

Column: **EcDbCurrentVersionFlag**

Description: Flag indicating if this row represents the current database version entry

Valid Values: 1= yes, 0 = no

Column: EcDbDatabaseName

Description: The name of the database for which this database version level is applied.

Column: EcDbDropDescription

Description: The official descriptions of the ECS software drop appropriate for this database version level.

Column: EcDbDropInstallDate

Description: The date and time that the database version level was installed.

Column: EcDbDropVersion

Description: The official names of the ECS software drop appropriate for this database version level.

Column: EcDbSchemaVersionId

Description: The subsystem-specific identifier for this database schema version.

Column: EcDbSybaseServer

Description: The name of the baseline Sybase SQL server controlling this database.

Valid Values: See 920-TDx-009

Column: EcDbSybaseVersion

Description: The software release version of the Sybase SQL server in place when this database version level was initially installed.

Column: EcDbUpdateProcess

Description: The installation method by which this database version level was installed.

Column: ECSDisciplineKeyword

Description: Keyword used to describe the general discipline area of the collection. A collection can conceivably cover several disciplines. This is a SDSRV Subsystem column.

Valid Values: See 420-TP-015

Column: ECSParameterKeyword

Description: Keyword used to describe specific characteristics of a collection at a higher level of detail than provided by ECSVariableKeyword. This is a SDSRV Subsystem column.

Valid Values: See 420-TP-015

Column: ECSTermKeyword

Description: Keyword used to describe the science parameter area of the collection. A collection can conceivably cover many such parameters. This is a SDSRV Subsystem column.

Valid Values: See 420-TP-015

Column: ECSTopicKeyword

Description: Keyword used to describe the general topic area of collection. A collection can conceivably cover several topics. This is a SDSRV Subsystem column.

Valid Values: See 420-TP-015

Column: ECSVariableKeyword

Description: Keyword used to describe the specific science parameter content of the collection. A collection can conceivably cover many specific parameters. The keyword valid values are the lowest level physical parameter terms which are normally searched by a user; i.e., a user enters a keyword which when found may connect with one or more parameters from collections. The keywords are also the lowest level words, which describe product content without being the server specific measurement (held in Parameter class). While there is a controlled list of these parameters, additional can be made by an as yet unspecified configuration control process. This is a SDSRV Subsystem column.

Valid Values: See 420-TP-015

Column: ElectronicMailAddress

Description: The address of the electronic mailbox of the organization or individual. The address, following NASA Global Change Master Directory format, should be of the form 'network name>network address'. Examples of network names are NSN, SPAN, telemail, ARPANET, and Internet. Examples of network address are NSSDCA::NG.MIKEMARTIN/NASA, MMARTIN@JPL.MILVAX, or miken@eos.hitc.com. This is a SDSRV Subsystem column.

Valid Values: See 420-TP-015

Column: expirationDate

Description: Date that the advertisement will be expired.

Column: ftpURL

Description: The address of FTP site from where the software can be downloaded.

Column: FutureReviewDate

Description: Date of next planned AQ peer review. This is a SDSRV Subsystem column.

Valid Values: See 420-TP-015

Column: GlParamList

Description: The compressed list contains metadata information.

Column: groupDescription

Description: The brief description of the group.

Column: groupId

Description: The unique IDs, which identify the group.

Note: GroupId is generated from uniqueId and siteId. Refer to the stored procedure "IoAdGetGroupKey".

Column: groupIdUnique

Description: The highest value of the groupId.

Column: groupName

Description: This attribute is used to tie a “kind” of metadata to physical processing in the DBWrappers. For example: “QAGranule” relates the DsMdQaGranules table for a function (Physical Delete) and sequence of SQL code (EXEC DsDbProcDeleteQaGranule) to process the data. This is a SDSRV Subsystem column “GroupName.”

Valid Values: See 420-TP-015

Column: guideURL

Description: The address of UR where the guide information for the collection is stored.

Note: The data origin of this attribute has not been determined. Potential source is Document Data Server.

Column: InstrumentLongName

Description: The expanded name of the primary sensory instrument (e.g., Advanced Spaceborne Thermal Emission and Reflective Radiometer). This is a SDSRV Subsystem column.

Valid Values: See 420-TP-015

Column: InstrumentShortName

Description: The unique identifier of an instrument. (e.g., ASTER). This is a SDSRV Subsystem column.

Valid Values: See 420-TP-015

Column: internalName

Description: The type of service for an instrument.

Column: keywordId

Description: The unique IDs, which identify the keyword.

Column: LatitudeResolution

Description: The minimum difference between two adjacent latitude values expressed in Geographic Coordinate Units of measure. This is a SDSRV Subsystem column.

Valid Values: See 420-TP-015

Column: leftAdvId

Description: The advId, which represents a product advertisement.

Column: local

Description: The Boolean value to identify the local DAAC.

Column: logicalServerName

Description: The logical server name is the cross-reference name to the physical server where the advertisement data is located. It is a static identification to the physical server which may vary.

Valid Values: “sdsrv@gsfc”, “sdsrv@LaRc”, “sdsrv@edc”, “sbsrv@nsidc”, “sbsrv@gsfc”, “sbsrv@LaRc”, “sbsrv@edc”, “dim@nsidc”, “dim@gsfc”, “dim@LaRc”, “dim@edc”, “dim@nsidc”

Column: LongitudeResolution

Description: The minimum difference between two adjacent longitude values expressed in Geographic Coordinate Units of Measure. This is a SDSRV Subsystem column.

Valid Values: See 420-TP-015

Column: MaintenanceandUpdateFrequency

Description: The frequency with which changes and additions are made to the collection after the initial dataset begins to be collected/processed. This is a SDSRV Subsystem column "MaintenanceUpdateFrequency."

Valid Values: See 420-TP-015

Column: moderator

Description: The name of the moderator assigned to the group.

Column: newAdvId

Description: The unique ID, which identifies the new approved advertisement, specified in additions or modifications.

Valid Values: See AdvId valid values.

Column: NorthBoundingCoordinate

Description: Northern-most coordinate of the limit of coverage expressed in geodetic latitude.

Valid Values: [-90.0< = North Bounding Coordinate < = 90.0], [North Bounding Coordinate => South Bounding Coordinate]

Column: oldAdvId

Description: The old approved advertisement specified in deletion or modification.

Valid Values: See AdvId valid values.

Column: oldAdvModTime

Description: The modification time of the old approved advertisement.

Column: organizationId

Description: The unique ID, which identifies the contact organization. This is a SDSRV Subsystem column.

Valid Values: See 420-TP-015

Column: PackageAcceptanceDate

Description: The date that the particular version of the package is accepted.

Column: packageSize

Description: The size of the software in kilobytes.

Column: PlatformLongName

Description: The expanded or long name of the platform associated with an instrument. This is a SDSRV Subsystem column.

Valid Values: See 420-TP-015

Column: PlatformShortName

Description: The unique identifier of a specific platform (e.g., AM1, TRMM, PM). This is a SDSRV Subsystem column.

Valid Values: See 420-TP-015

Column: PostalCode

Description: The zip or other postal code of the address of the point of contact. This is a SDSRV Subsystem column.

Valid Values: See 420-TP-015

Column: presentFlag

Description: If this is 1, then it means the RangeEndingDate is present in the table, IoAdRangeDateTime. If this is 0, then the effective RangeEndingDate is the current date.

Column: ProcessingCenter

Description: Center where collection was or is being processed (i.e., name of DAAC or SCF). This is a SDSRV Subsystem column.

Valid Values: See 420-TP-015

Column: ProcessingLevelID

Description: This attribute reflects the classification of the science data processing level, which defines in general terms the characteristics of the output of the processing performed. This is a SDSRV Subsystem column.

Valid Values: See 420-TP-015

Column: productId

Description: The unique ID, which identifies the product advertisement.

Note: The productId is equivalent to AdvId in the IoAdAdvMaster table.

Valid Values: See AdvId valid values.

Column: productURL

Description: The address of UR where providers store the product information.

Note: This field is optional. Providers can enter the UR location along with product advertisement submission.

Column: providerId

Description: The unique ID which identifies a provider advertisement.

Note: The providerId is equivalent to advId in the IoAdvMaster table.

Column: providerURL

Description: The address of UR which stores the provider advertisement.

Column: PublicationDate

Description: The date of formal or informal publication of the reference paper.

Column: RangeBeginningDate

Description: The year (and optionally month, or month and day) when the temporal coverage period being described began. This is a SDSRV Subsystem column.

Valid Values: See 420-TP-015

Column: RangeEndingDate

Description: The last year (and optionally month, or month and day) of the temporal coverage period being described (GSFC AVHRR). This date represents the end date of the latest granule contained in the product. This is a SDSRV Subsystem column.

Note: MM/DD/YY format is product specific for sage_atmos_dyn, sage_atmos_comp, erbe_erp. MMDDYYYY format is product specific for LARC_FIRE, LARC_GTE

Valid Values: See 420-TP-015

Column: ReferencePaperReference

Description: Contains the unique ID of the Reference Paper is issued by publisher, such as 'NOS NSG', or 'JPL Publication 91-29'.

Column: requestId

Description: The unique ID assigned to each DAAC.

Column: requestIdUnique

Description: The highest value of the new AdvId which is used currently.

Column: requestTime

Description: This is the time of the request.

Column: reviewId

Description: The unique ID, which identifies the review for the given collection.

Column: RevisionDate

Description: Represents the date and possibly the time that this directory entry was created or the latest date and time of its modification or update. This is a SDSRV Subsystem column.

Valid Values: See 420-TP-015

Column: rightAdvId

Description: The advId which represents a service advertisement.

Column: ScienceReviewDate

Description: Date of last QA peer review.

Column: SensorLongName

Description: The expanded name of the sensor. This is a SDSRV Subsystem column.

Valid Values: See 420-TP-015

Column: SensorShortName

Description: A sensor is defined sensory sub-component of an instrument (e.g., InstrumentShortName = ASTER, NumberofSensors = 3, SensorShortName = SWIR, SensorShortName = TR, SensorShortName = VNIR). This is a SDSRV Subsystem column.

Note: If the instrument has only one sensor or the sensor is an instrument (e.g., AVHRR), the information should go to both Sensor table and Instrument table.

Valid Values: See 420-TP-015

Column: seqNumber

Description: Sequence number of line in which the address of service UR is stored.

Column: serverType

Description: This data represents the name of the server that contains the advertising data from a particular source.

Valid Values: "SDSRV", "SBSRV", "DIM"

Column: serviceClass

Description: The name of the C++ class the operation belongs to. This is a SDSRV Subsystem column (ServiceClass).

Valid Values: See 420-TP-015

Column: serviceId

Description: The unique ID which identifies the Mime service advertisement. This is a SDSRV Subsystem column (ServiceId).

Note: The Mime service is the Internet (WWW) service.

Valid Values: See 420-TP-015

Column: serviceName

Description: The name of a C++ operation. This is a SDSRV Subsystem column (ServiceName).

Valid Values: See 420-TP-015

Column: serviceSignatureId

Description: The ID which identifies the signature service.

Column: serviceURId

Description: The ID which identifies the address of service UR.

Column: serviceURL

Description: The address of UR for the MIME service.

Note: MIME service is the Internet (WWW) service.

Column: ShortName

Description: This name will identify the short name associated with the collection or granule. This includes the ECS Technical Baseline product names (e.g., CERO2, MOD12). This is the official reference name used in identifying the contents of the data collection. This is a SDSRV Subsystem column.

Valid Values: See 420-TP-015

Column: siteId

Description: The numeric ID assigned to the DAAC.

Note: The value of the siteId for the home DAAC is always 1. The value of each remote DAAC's siteId varies from DAAC to DAAC

Column: siteName

Description: The name of the DAAC.

Column: SouthBoundingCoordinate

Description: Southern-most limit of coverage expressed in geodetic latitude.

Valid Values: [-90.0 <= South Bounding Coordinate <=90.0], South Sounding Coordinate <= North Bounding Coordinate]

Column: SpatialCoverageType

Description: This attribute denotes whether the locality/coverage requires horizontal, vertical, or both in the spatial domain and coordinate system definitions. This is a SDSRV Subsystem column.

Valid Values: See 420-TP-015

Column: SpatialKeyword

Description: This attribute specifies a word or phrase that summarizes the spatial regions covered by the collection. This is a SDSRV Subsystem column.

Valid Values: See 420-TP-015

Column: startDate

Description: Date that the advertisement become valid. This is a SDSRV Subsystem column.

Valid Values: See 420-TP-015

Column: StateProvince

Description: The state or province of the address of the point of contact. This is a SDSRV Subsystem column.

Valid Values: See 420-TP-015

Column: StreetAddress

Description: The street of the address of the point of contact. This is a SDSRV Subsystem column.

Valid Values: See 420-TP-015

Column: SuggestedUsage

Description: This attribute describes how this collection or granule may be best used to support earth science/global change research. This is a SDSRV Subsystem column.

Number of organization or individual who is point of contact. The general format of the number includes country, area, and STD codes, as required for the full telephone number. Multi-extensions should be single entries rather than part of a single entry text.

Valid Values: See 420-TP-015

Column: TelephoneNumber

Description: The telephone number of the organization or individual identified as the point of contact. The general format of the number includes country, area and STD codes, as required for the full telephone number. Multi-extensions should be single entries rather than part of a single entry text. This is a SDSRV Subsystem column

Valid Values: See 420-TP-015

Column: TelephoneNumberType

Description: The type of telephone number being provided in this instance of the phone number, in order to reach the organization or individual who serves as a point of contact. Voice number is used to speak to the organization or individual, the TDD/TTY number which hearing-impaired can converse with organization or individual, or the fa(x)csimile of the organization or individual. This is a SDSRV Subsystem column.

Valid Values: See 420-TP-015

Column: TemporalKeyword

Description: This attribute specifies a word or phrase which serves to summarize the temporal characteristics referenced in the collection. This is a SDSRV Subsystem column.

Valid Values: See 420-TP-015

Column: Title

Description: The full title of the reference paper. This is a SDSRV Subsystem column.

Valid Values: See 420-TP-015

Column: title

Description: The full title of the advertisement.

Column: type

Description: The type of request.

Column: uniqueId

Description: The IDs which uniquely identify an advertisement within the local site.

Column: upperTitle

Description: The name of the advertisement in upper case characters.

Column: VersionDescription

Description: Version description of the data collection.

Column: VersionID

Description: Version identifier of the data collection. This is a SDSRV Subsystem column.

Note: The default is "1"

Valid Values: See 420-TP-015

Column: WestBoundingCoordinate

Description: Western-most coordinate of the limit of coverage expressed in geodetic longitude.

Valid Values: [-180.0 <= West Bounding Coordinate <= 180.0]

Column: who

Description: The name of the person or organization who made the request.

Column: why

Description: The explanation of why the change is being requested.

3.1.4 Column Domains

Domains specify the ranges of values allowed for a given column within the database table. Sybase supports the definition of specific domains to further limit the format of data for a given column. Sybase domains are, in effect, user-defined data types

Domain: AdvIdType

Domain: SiteIdType

Domain: UniqueIdType

3.1.5 Column Default Values

A default value is used to supply a value for a column when one is not defined at row insert time. Values default to null values where no other specification is identified for the column in Section 3.1.3; reference 311-CD-107-002 for those columns marked as replicated columns from the SDSRV Subsystem.

3.1.6 Rules

Sybase supports the definition of rules. Rules provide a means for enforcing domain constraints on a given column or combination of columns. Currently, there are no rules defined in the IOS databases.

3.1.7 Views

Sybase allows the definition of views as a means of limiting an application or users access to data in the database. Views create a logical database table from columns found in one or more database tables. There are currently no views defined within the IOS database.

3.1.8 Declarative Integrity Constraints

Sybase allows the enforcement of referential integrity via the use of declarative integrity constraints. Integrity constraints allow the SQL server to enforce primary and foreign key integrity checks automatically without requiring programming. Sybase constraints support "restrict-only" operations. This means that a row can not be deleted or the key values modified if there are rows in other database tables having a foreign key dependency on that row. Cascade delete and update operations cannot be performed if a declarative integrity constraint has been used. The following information in Tables 3-56 through 3-75 describes the declarative integrity constraints contained in the IOS database.

Table 3-56. Dependencies on Table: IoAdAdvMaster

Reference by List

Referenced by	Primary Key	Foreign Key
IoAdAdvXref	advId	rightAdvId
IoAdApprovedAdv	advId	advId
IoAdContactAdvXref	advId	advId
IoAdProductAdv	advId	productId
IoAdProviderAdv	advId	providerId
IoAdRequest	advId	newAdvId
IoAdAdvXref	advId	leftAdvId
IoAdADvDescription	advId	advId
IoAdServiceAdv	advId	serviceId

Table 3-57. Dependencies on Table: IoAdAnalysisSource

Reference by List

Referenced by	Primary Key	Foreign Key
IoAdAnalysisCollectionXref	AnalysisShortName	AnalysisShortName

Table 3-58. Dependencies on Table: IoAdCampaign

Reference by List

Referenced by	Primary Key	Foreign Key
IoAdCampaignCollectionXref	CampaignShortName	CampaignShortName

Table 3-59. Dependencies on Table: IoAdContact

Reference by List

Referenced by	Primary Key	Foreign Key
IoAdContactAddress	contactId	contactId
IoAdContactEmail	contactId	contactId
IoAdContactOrganization	contactId	organizationId
IoAdContactPerson	contactId	contactId
IoAdContactTelephone	contactId	contactId
IoAdAlgorithmPackage	contactId	contactId
IoAdContactAdvXref	contactId	contactId

Table 3-60. Dependencies on Table: IoAdContactOrganization

Reference by List

Referenced by	Primary Key	Foreign Key
IoAdPersonOrganizationXref	organizationId	organizationId

Table 3-61. Dependencies on Table: IoAdContactPerson

Reference by List

Referenced by	Primary Key	Foreign Key
IoAdPersonOrganizationXref	contactId	contactId

Table 3-62. Dependencies on Table: IoAdECSCollection

Reference by List

Referenced by	Primary Key	Foreign Key
IoAdAnalysisCollectionXref	collectionId	collectionId
IoAdBoundingRectangle	collectionId	collectionId
IoAdCampaignCollectionXref	collectionId	collectionId
IoAdECSCollectionKeyword	collectionId	collectionId
IoAdMultipleTypeCollection	collectionId	collectionId
IoAdRangeDateTime	collectionId	collectionId
IoAdRefPaperCollectionXref	collectionId	collectionId
IoAdSingleTypeCollection	collectionId	collectionId
IoAdSpatial	collectionId	collectionId
IoAdSpatialKeywordClass	collectionId	collectionId
IoAdTemporalKeywordClass	collectionId	collectionId
IoAdInstrumentCollectionXref	collectionId	collectionId
IoAdPlatformCollectionXref	collectionId	collectionId
IoAdSensorCollectionXref	collectionId	collectionId

Table 3-63. Dependencies on Table: IoAdGroup

Reference by List

Referenced by	Primary Key	Foreign Key
IoAdAdvMaster	groupId	advGroupId

Table 3-64. Dependencies on Table: IoAdInstrument

Reference by List

Referenced by	Primary Key	Foreign Key
IoAdInstrumentCollectionXref	InstrumentShortName	InstrumentShortName

Table 3-65. Dependencies on Table: IoAdMultipleTypeCollection

Reference by List

Referenced by	Primary Key	Foreign Key
IoAdCollectionXref	collectionId	collectionIdRef
IoAdCollectionXref	collectionId	collectionIdAgg

Table 3-66. Dependencies on Table: IoAdPlatform

Reference by List

Referenced by	Primary Key	Foreign Key
IoAdPlatformCollectionXref	PlatformShortName	PlatformShortName

Table 3-67. Dependencies on Table: IoAdProductAdv

Reference by List

Referenced by	Primary Key	Foreign Key
IoAdECSCollection	productId	collectionId

Table 3-68. Dependencies on Table: IoAdProviderAdv

Reference by List

Referenced by	Primary Key	Foreign Key
IoAdServiceAdv	providerId	providerId
IoAdProductAdv	providerId	providerId

Table 3-69. Dependencies on Table: IoAdReferencePaper

Reference by List

Referenced by	Primary Key	Foreign Key
IoAdRefPaperCollectionXref	ReferencePaperReference	ReferencePaperReference

Table 3-70. Dependencies on Table: IoAdSensor

Reference by List

Referenced by	Primary Key	Foreign Key
IoAdSensorCollectionXref	SensorShortName	SensorShortName

Table 3-71. Dependencies on Table: IoAdServiceAdv

Reference by List

Referenced by	Primary Key	Foreign Key
IoAdInstallableServiceAdv	serviceId	serviceId
IoAdMimeServiceAdv	serviceId	serviceId
IoAdSignatureServiceAdv	serviceId	serviceId

Table 3-72. Dependencies on Table: IoAdSignatureServiceAdv

Reference by List

Referenced by	Primary Key	Foreign Key
IoAdAdvUR	serviceId	serviceId
IoAdSignature	serviceId	serviceId

Table 3-73. Dependencies on Table: IoAdSingleTypeCollection

Reference by List

Referenced by	Primary Key	Foreign Key
IoAdAlgorithmPackage	collectionId	collectionId
IoAdReview	collectionId	collectionId
IoAdCollectionXref	collectionId	collectionIdRef

Table 3-74. Dependencies on Table: IoAdSiteInfo

Reference by List

Referenced by	Primary Key	Foreign Key
IoAdContact	siteId	siteId
IoAdGroup	siteId	SiteId
IoAdAdvMaster	siteId	SiteId
IoAdRequest	siteId	SiteId

Table 3-75. Dependencies on Table: IoAdSpatial

Reference by List

Referenced by	Primary Key	Foreign Key
IoAdAltitudeResolution	collectionId	collectionId
IoAdDepthResolution	collectionId	collectionId

3.1.9 Triggers

The Sybase RDBMS supports the enforcement of business rules for data integrity via the use of trigger code. A trigger is defined as a set of activities or checks that are performed automatically by the RDBMS whenever an update command occurs for a given database table. The term *update* is defined to identify those database commands that result in inserting (adding) a row, changing a column within an existing row, and deleting a row. When creating a trigger, one specifies for which type of *update* the trigger will be automatically performed insert, update, delete, or a combination of the three. Insert triggers are performed automatically whenever a row is inserted into the table. Update triggers are performed automatically whenever a row is updated in the table. Delete triggers are performed automatically whenever a row is deleted from the table.

Triggers are implemented at the database table level. Table 3-76 below provides an alphabetically ordered set of triggers used to assure data integrity for the IOS database. This table includes the trigger name, the database table it is related to, and a brief description of the trigger. Table 3-76 is followed immediately by trigger source code listings. Each trigger listing is found in the same order as in Table 3-76.

Table 3-76. Trigger Descriptions (1 of 2)

Database Table	Trigger Name	Trigger Type	Description
IoAdApprovedAdv	IoAdApprovedAdvDuplicateCheck	Insert Update	Create an error return if the approved ad description conflicts with logically unique information in an existing ad.
IoAdContactAddress	IoAdGenerateAddressId	Insert	Trigger that generates Address Id which is maximum Address Id + 1.
IoAdContact	IoAdGenerateContactId	Insert	Trigger that generates Contact Id which is concatenation of Site Id + Contact Id
IoAdGroup	IoAdGenerateGroupId	Insert	Trigger that generates Group Id which is Site Id + Group Id.

Table 3-76. Trigger Descriptions (2 of 2)

Database Table	Trigger Name	Trigger Type	Description
IoAdECSCollectionKeyword	IoAdGenerateKeywordId	Insert	Trigger that generates Keyword Id which is maximum Keyword Id + 1.
IoAdReview	IoAdGenerateReviewId		Trigger that generates Review Id which is maximum Review Id + 1.
IoAdRequest	IoAdRequestDuplicateCheck	Insert	Trigger that generates Request Id which is Site Id + Request Id. Raise an error if this request's ad description conflicts with logically unique information in an existing approved ad.
IoAdAdvMaster	IoAdSetMaster	Insert	Sets the Advertisement Id which is Site Id + Unique Id and sets the UpperTitle column to uppercase of Title column in the database table
IoAdAdvMaster	IoAdUpperTitle	Update	Sets the UpperTitle column to uppercase.

3.1.10 Stored Procedures

In addition to triggers, the Sybase RDBMS supports the implementation of stored procedures for the purpose of enforcing business rules that ensure data integrity within the database. Stored procedures are parsed and compiled SQL code that reside in the database and may be called by name by an application, trigger or another stored procedure. Table 3-77 contains a summary listing of the stored procedures in the IOS database including the procedure name and a brief definition of the purpose of the procedure. Each stored procedure within the IOS database is listed following Table 3-77.

Table 3-77. Summary List of Stored Procedures (1 of 2)

Procedure Name	Description	Calls	Called By
datawarning	Notify the DBA when the data segment threshold is in danger of being crossed.	Not applicable	Sybase when data segment threshold exceeded.
IoAdAdvDuplicateCheck	Check if the new ad (@new)'s data duplicates any existing approved ad- except for an older version of it (@old).	IoAdProviderDuplicateCheck IoAdProductDupChkForApproved IoAdDupChkForRequest IoAdSigServiceDuplicateCheck IoAdServiceDuplicateCheck	IOS custom code
IoAdCreateCompositeId	Generate Composite Key from siteId and uniqueId.	Not applicable	IOS custom code
IoAdGetAdvMasterKey	Generate key AdvId from siteId and uniqueId.—Raise an error if update and select from IoAdAdvMasterKey- table not successful.	Not applicable	IOS custom code
IoAdGetContactKey	Generate key ContactId from siteId and uniqueId.-- Raise an error if update and select from IoAdContactKey- table not successful.	Not applicable	IOS custom code
IoAdGetGroupKey	Generate key GroupId from siteId and uniqueId. Raise an error if update and select from IoAdGroupKey- table not successful.	Not applicable	IOS custom code
IoAdGetRequestKey	Generate key RequestId from siteId and uniqueId. Raise an error if update and select from IoAdRequestKey- table not successful.	Not applicable	IOS custom code

Table 3-77. Summary List of Stored Procedures (2 of 2)

Procedure Name	Description	Calls	Called By
IoAdProductDupChkForApproved	Procedure that detects the duplication of key fields in this entity.	Not applicable	IoAdAdvDuplicateCheck
IoAdProductDupChkForRequest	Procedure that detects the duplication of key fields in this entity.	Not applicable	IoAdAdvDuplicateCheck
IoAdProviderDuplicateCheck	Procedure that detects the duplication of key fields in this entity.	Not applicable	IoAdAdvDuplicateCheck
IoAdServiceDuplicateCheck	Procedure that detects the duplication of key fields in this entity.	Not applicable	IoAdAdvDuplicateCheck
IoAdSigServiceDuplicateCheck	Procedure that detects the duplication of key fields in this entity.	Not applicable	IoAdAdvDuplicateCheck
logdump	Dumps the log when the log segment threshold is crossed.	Not applicable	Sybase when log segment threshold exceeded.
logwarning	Notifies the DBA when the log segment threshold is in danger of being crossed.	Not applicable	Sybase when database reaches specified percentage of log segment size.
ProcDeleteCollection	Deletes a collection based on ESDT shortname and version.	Not applicable	IOS custom code.

3.2 Flat File Usage

A flat file is an operating system file that is read and written serially. It is generally independent with respect to other files that exist and is generally static in nature. There are cases when the implementation of certain persistent data is better suited to a flat file than to a database (e.g., system configuration data, external interface data, log files). IOS file usage is detailed in this section via file, field, and domain definitions.

3.2.1 File Descriptions

No files used.

3.2.2 Field Specifications

Not applicable.

3.2.3 Domain Definitions

Domain definitions specify the nature and valid content of fields within a file (e.g., specific values for a limited set of data, ranges of numeric data, units of measure for applicable data). This information is generally used by software to edit incoming data for validity prior to writing or changing data within the file. Use of domain values in updating (adding and changing) records within files preserves the integrity of the data within the file. This section is not applicable to IOS.

4. Performance and Tuning Factors

4.1 Indexes

An index provides a means of locating a row in a database table based on the value of one or more columns, without having to scan all data in the table. An index may be arranged in ascending or descending sort order. If used appropriately, indexes can significantly decrease the time it takes to retrieve data. Sybase allows the definition of two types of indexes, clustered and non-clustered.

In a *clustered* index, the rows in a database table are physically stored in sequence--determined by the index. Clustered indexes are particularly useful, when the data is frequently retrieved in sequential order. Only one clustered index may be defined per database table as data may be stored in only one physical sequence.

Non-clustered indexes differ from their clustered counterpart, in that data is not physically stored in sorted order—newly added rows are stored at the end of the database table.

Indexes can be defined as *unique*. In this case, only one index entry (row in the indexed table) can have a given set of values for the columns comprising the index.

Primary and foreign key constraints on a table are implemented by *primary key* and *foreign key* indexes created automatically by the SQL server.

A list of all the indexes defined for database tables in the IOS database is given in Table 4-2 along with a description of each index. Table 4-1 provides a key for using/interpreting this listing of indexes.

Table 4-1. Index Key

Index Type Code	Description
P	Primary Key
F	Foreign Key
U	Unique
C	Clustered
Sort	Sort order ASCending or DESCending

Table 4-2. Indexes (1 of 3)

Table	Index Name	Column Code	P	F	U	C	Sort
EcDbDatabaseVerions	pk_ECDBDATABASEVERIONS	EcDbSchemaVersionId, EcDbDropVersion	Y	N	Y	N	ASC
IoAdAdvDescription	pk_ioadadvdescription	advId seqNumber	Y	N	Y	Y	ASC ASC
IoAdAdvMaster	pk_ioadadvmaster	advId	Y	N	Y	Y	ASC
IoAdAdvMasterKey	pk_ioadadvmasterkey	advIdUnique	Y	N	Y	Y	ASC
IoAdAdvUR	pk_ioadadvur	serviceId seqNumber	Y	N	Y	Y	ASC ASC
IoAdAdvXref	pk_ioadadvxref	leftAdvId rightAdvId	Y	N	Y	Y	ASC ASC
IoAdAlgorithmPackage	pk_ioadalgorithmpackage	AlgorithmPackageName AlgorithmPackageVersion	Y	N	Y	Y	ASC ASC
IoAdAltitudeResolution	pk_ioadaltituderesolution	collectionId	Y	Y	Y	Y	ASC
IoAdAnalysisCollectionXref	pk_ioadanalysiscollectionxref	collectionId AnalysisShortName	Y	N	Y	Y	ASC ASC
IoAdAnalysisSource	pk_ioadanalysissource	AnalysisShortName	Y	N	Y	Y	ASC
IoAdApprovedAdv	pk_ioadapprovedadv	advId	Y	Y	Y	Y	ASC
IoAdBoundingRectangle	pk_ioadboundingrectangle	collectionId	Y	Y	Y	Y	ASC
IoAdCampaign	pk_ioadcampaign	CampaignShortName	Y	N	Y	Y	ASC
IoAdCampaignCollectionXref	pk_ioadcampaigncollectionxref	collectionId CampaignShortName	Y	N	Y	Y	ASC ASC
IoAdCollectionXref	pk_ioadcollectionxref	collectionIdAgg collectionIdRef	Y	N	Y	Y	ASC ASC
IoAdContact	pk_ioadcontact	contactId	Y	N	Y	Y	ASC
IoAdContactAddress	pk_ioadcontactaddress	addressId contactId	Y	N	Y	Y	ASC ASC
IoAdContactAdvXref	pk_ioadcontactadvxref	advId contactId	Y	N	Y	Y	ASC ASC
IoAdContactEmail	pk_ioadcontactemail	ElectronicMailAddress	Y	N	Y	Y	ASC
IoAdContactKey	pk_ioadcontactkey	contactIdUnique	Y	N	Y	Y	ASC
IoAdContactOrganization	pk_ioadcontactorganization	organizationId	Y	Y	Y	Y	ASC

Table 4-2. Indexes (2 of 3)

Table	Index Name	Column Code	P	F	U	C	Sort
IoAdContactPerson	pk_ioadcontactperson	contactId	Y	Y	Y	Y	ASC
IoAdContactTelephone	pk_ioadcontacttelephone	TelephoneNumber	Y	N	Y	Y	ASC
IoAdDepthResolution	pk_ioaddepthresolution	collectionId	Y	Y	Y	Y	ASC
IoAdECSCollection	pk_ioadecscollection	collectionId	Y	Y	Y	Y	ASC
IoAdCollectionKeyword	pk_ioadecscollectionkeyword	keywordId collectionId	Y	N	Y	Y	ASC ASC
IoAdGroup	Group_Name_Idx	groupName	N	N	Y	Y	ASC
IoadGroup	pk_ioadgroup	groupId	Y	N	Y	N	ASC
IoAdGroupKey	pk_ioadgroupkey	groupIdUnique	Y	N	Y	Y	ASC
IoAdInstallableServiceAdv	pk_ioadinstallableserviceadv	serviceId	Y	Y	Y	Y	ASC
IoAdInstrument	pk_ioadinstrument	InstrumentShortName	Y	N	Y	Y	ASC
IoAdInstrumentXref	pk_ioadinstrumentcollectionxre	collectionId InstrumentShortName	Y	N	Y	Y	ASC ASC
IoAdMimeServiceAdv	pk_ioadmimeserviceadv	serviceId	Y	Y	Y	Y	ASC
IoAdMultipleTypeCollection	pk_ioadmultipletypecollection	collectionId	Y	Y	Y	Y	ASC
IoAdPersonOrganizationXref	pk_ioadpersonorganizationxref	contactId organizationId	Y	N	Y	Y	ASC ASC
IoAdPlatform	pk_ioadplatform	PlatformShortName	Y	N	Y	Y	ASC
IoAdPlatformCollectionXref	pk_ioadplatformcollectionxref	collectionId PlatformShortName	Y	N	Y	Y	ASC ASC
IoAdProductAdv	pk_ioadproductadv	productId	Y	Y	Y	Y	ASC
IoAdProviderAdv	pk_ioadprovideradv	providerId	Y	Y	Y	Y	ASC
IoAdRangeDateTime	pk_ioadrangedatetime	collectionId RangeBeginningDate RangeEndingDate	Y	N	Y	Y	ASC ASC ASC
IoAdReferencePaper	pk_ioadreferencepaper	ReferencePaperReference	Y	N	Y	Y	ASC
IoAdReferencePaperCollectionXref	pk_ioadrefpapercollectionxref	collectionId ReferencePaperReference	Y	N	Y	Y	ASC ASC

Table 4-2. Indexes (3 of 3)

Table	Index Name	Column Code	P	F	U	C	Sort
IoAdRequest	pk_ioadrequest	uniqueId siteId	Y	N	Y	Y	ASC ASC
IoAdRequestKey	pk_ioadrequestkey	requestIdUnique	Y	N	Y	Y	ASC
IoAdReview	pk_ioadreview	reviewId collectionId	Y	N	Y	Y	ASC ASC
IoAdSensor	pk_ioadsensor	SensorShortName	Y	N	Y	Y	ASC
IoAdSensorCollectionXref	pk_ioadsensorcollectionxref	collectionId SensorShortName	Y	N	Y	Y	ASC ASC
IoAdServiceAdv	pk_ioadserviceadv	serviceId	Y	Y	Y	Y	ASC
IoAdSignature	pk_ioadsignature	serviceId seqNumber	Y	N	Y	Y	ASC ASC
IoAdSignatureServiceAdv	pk_ioadsignatureserviceadv	serviceId	Y	Y	Y	N	ASC
IoAdSignatureServiceAdv	Signature_InternalName_Idx	internalName	N	N	N	Y	ASC
IoAdSingleTypeCollection	pk_ioadsingletypecollection	collectionId	Y	Y	Y	Y	ASC
IoAdSiteInfo	pk_ioadsiteinfo	siteId	Y	N	Y	Y	ASC
IoAdSpatial	pk_ioadspatial	collectionId	Y	Y	Y	Y	ASC
IoAdSpatialKeywordClass	pk_ioadspatialkeywordclass	collectionId SpatialKeyword	Y	N	Y	Y	ASC ASC
IoAdTemporalKeywordClass	pk_ioadtemporalkeywordclass	collectionId TemporalKeyword	Y	N	Y	Y	ASC ASC

4.2 Segments

Sybase supports the declaration of segments. A segment is a named pointer to a storage device(s). Segments are used to physically allocate a database object to a particular storage device. Segments defined for the IOS and all other subsystem databases are described in Table 4-3.

Table 4-3. Segment Descriptions

Segment Name	Description
default	Default data segment used if no other segment specified in the create statement
logsegment	SYSLOGS, Transaction Logs
systemsegment	System tables and indexes

4.3 Named Caches

A cache is a block of memory that is used by Sybase to retain and manage data pages that are currently being processed. A *named cache* is a block of memory that is named and used by the RDBMS to store frequently accessed data pages. Assigning a database table to a named cache causes accessed pages to be loaded into memory and retained. The named cache does not need to be allocated to accommodate the entire database table since the RDBMS manages the cache according to use. Named caches greatly increase performance by eliminating the time associated for disk input and output (I/O). There are no named caches that are currently defined for the IOS database. As the DAACs become operational and data access patterns well known, named caches may be defined by ECS development or the maintenance operations staff.

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5. Database Security

5.1 Approach

The database security discussed within this section is bounded to security implementation within the Sybase SQL Server DBMS. A Sybase general approach to security is adopted as illustrated in Figure 5-1.

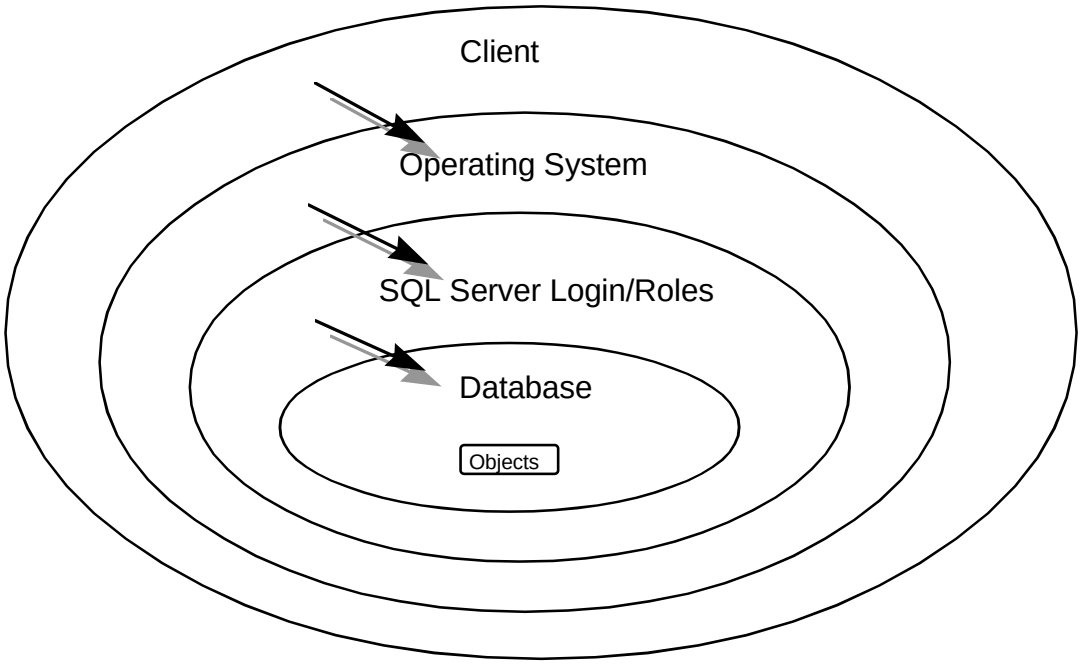

Figure 5-1. Sybase General Approach to SQL Server Security[2]

5.2 Initial Users

The client (user) requires a SQL Server login to access the DBMS The login is assigned to a user with certain related permissions for gaining access to particular objects (e.g., database tables, views, commands) within the database. The System Administrator may grant or revoke objects permissions for a login individually or based on defined group or roles.

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[2] Reference Sybase Student Guide: *Advanced SQL Server AIOSinistration.*

5.3 Groups

Groups are a means of logically associating users with similar data access needs. Once a group has been defined, object and command permissions can be granted to that group. A user who is member of a group inherits all of the permissions granted to that group. No groups have been initially defined in the IOS Subsystem "default database. The DAACs should define database groups to support the database security requirements of their individual DAACs. Security for local DAAC users should be controlled by assigning each user to the appropriate group.

5.4 Roles

Roles were introduced in Sybase to allow a structured means for granting users the permissions needed to perform standard database administration activities and also provide a means for easily identifying such users. There are six pre-defined roles that may be assigned to a user. A definition of each of these roles follows, as well as a description of the types of activities that may be performed by each role.

System Administrator (*sa_role*): This role is used to grant a specific user permissions needed to perform standard system administrator duties including:

- installing SQL server and specific SQL server modules
- managing the allocation of physical storage
- tuning configuration parameters
- creating databases

Site Security Officer (*sso_role*): This role is used to grant a specific user the permissions needed to maintain SQL server security including:

- adding server logins
- administrating passwords
- managing the audit system
- granting users all roles except the *sa_role*

Operator (*oper_role*): This role is used to grant a specific user the permissions needed to perform standard functions for the database including:

- dumping transactions and databases
- loading transactions and databases

Navigator (*navigator_role*): This role is used to grant a specific user the permissions needed to manage the navigation server.

Replication (*replication_role*): This role is used to grant a specific user the permissions needed to manage the replication server.

Sybase Technical Support (*sybase_ts_role*): This role is used to grant a specific user the permissions needed to execute *database consistency checker (dbcc)*, a Sybase supplied utility supporting commands that are normally outside of the realm of routine system administrator activities.

The DAACs should review these roles and assign them to the appropriate login and/or groups.

5.5 Login/Group Object Permissions

During initial database installation logins used by the ECS custom code were created and assigned permissions for access to the IOS Subsystem database. In addition, special database installation login, ios_role, was created to support database installation needs. For each login, the level of access is limited to that associated with their login, group or assigned group/role. Object Permissions are set within the installation scripts of the IOS Subsystem for each object and group/role.

Permissions are identified in Table 5-1. A specification of the object permissions is contained in Table 5-2.

Table 5-1. Permission Key

Permission	Description
A	All
S	Select
I	Insert
U	Update
D	Delete
E	Execute

Table 5-2. Group Specifications

Group/Role	SYBASE LOGIN	Permissions Granted					
		A	S	I	U	D	E
public	EcIoAdServer	Y					
None	sa	Y					

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6. Scripts

The scripts identified in this section may be found in the directory named /ecs/formal/IOS/AdvService/src/Database.

6.1 Installation Scripts

Scripts used to support installation of the IOS database are described in Table 6-1.

Table 6-1. Installation Scripts

Script File	Description
EcIoAdDbBuild	Initializes the schema, loads the triggers, initializes the database with data, initially populates the database, adds server names as user for login, grants permissions to user.
EcIoAdDbPatch	Updates a schema to the current database version level.
EcIoAdDbDump	Used to dumps specified database prior to commencing with installation. This script is not used to perform regularly scheduled database dumps per DAAC maintenance schedule.
EcIoAdDbLoad	Used to load a specified database.
EcDbDesc	List and ndetial the structure of all database objects in a given database.
EcDbChecksum	Provide row count totals for each of the tables in a given database.

6.2 De-Installation Scripts

Scripts used to support de-installation of the IOS database are described in Table 6-2.

Table 6-2. De-Installation Scripts

Script File	Description
EcIoAdDrop	Drops all objects in a specified IOS database.

6.3 Backup and Recovery Scripts

Scripts used to perform backup and recovery of the IOS database are described in Table 6-3.

Table 6-3. Backup and Recovery Scripts

Script File	Description
EcCoDbSyb-DumpDb	Dumps all the databases managed by the SQL server instance.
EcCoDbSyb-DumpTrans	Dumps the transaction log for all databases managed by the SQL server instance.

6.4 Miscellaneous Scripts

Miscellaneous scripts that are applicable to the IOS database are described in Table 6-4.

Table 6-4. Miscellaneous Scripts

Script File	Description
fix_constraints.sql	Adds constraints to tables.
grant_iosuser_permission.sql	Grants permissions to users (including software) for access to the IOS database.

Appendix A. Interoperability Entity Relationship Diagram

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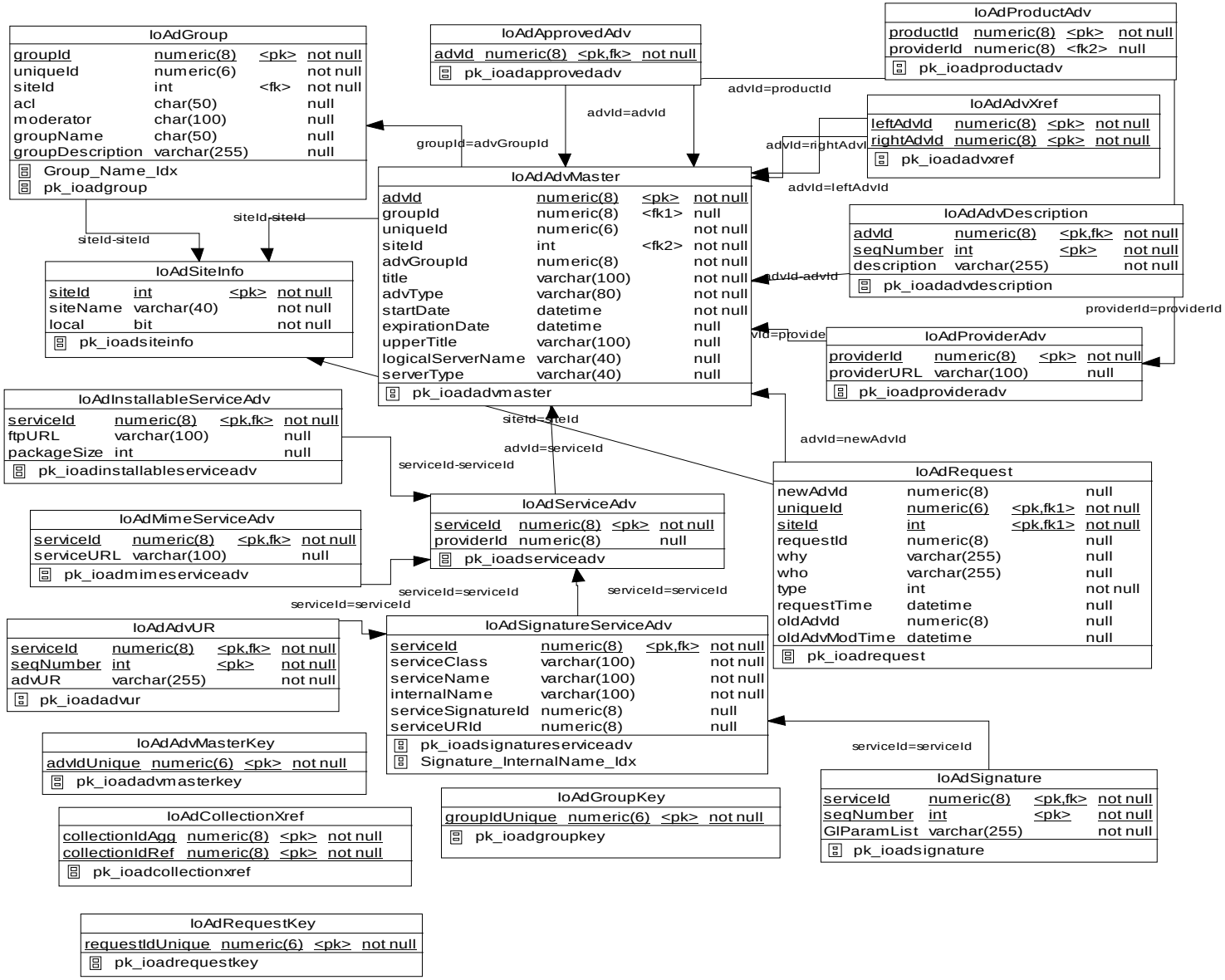

Figure A-1. Advertisements

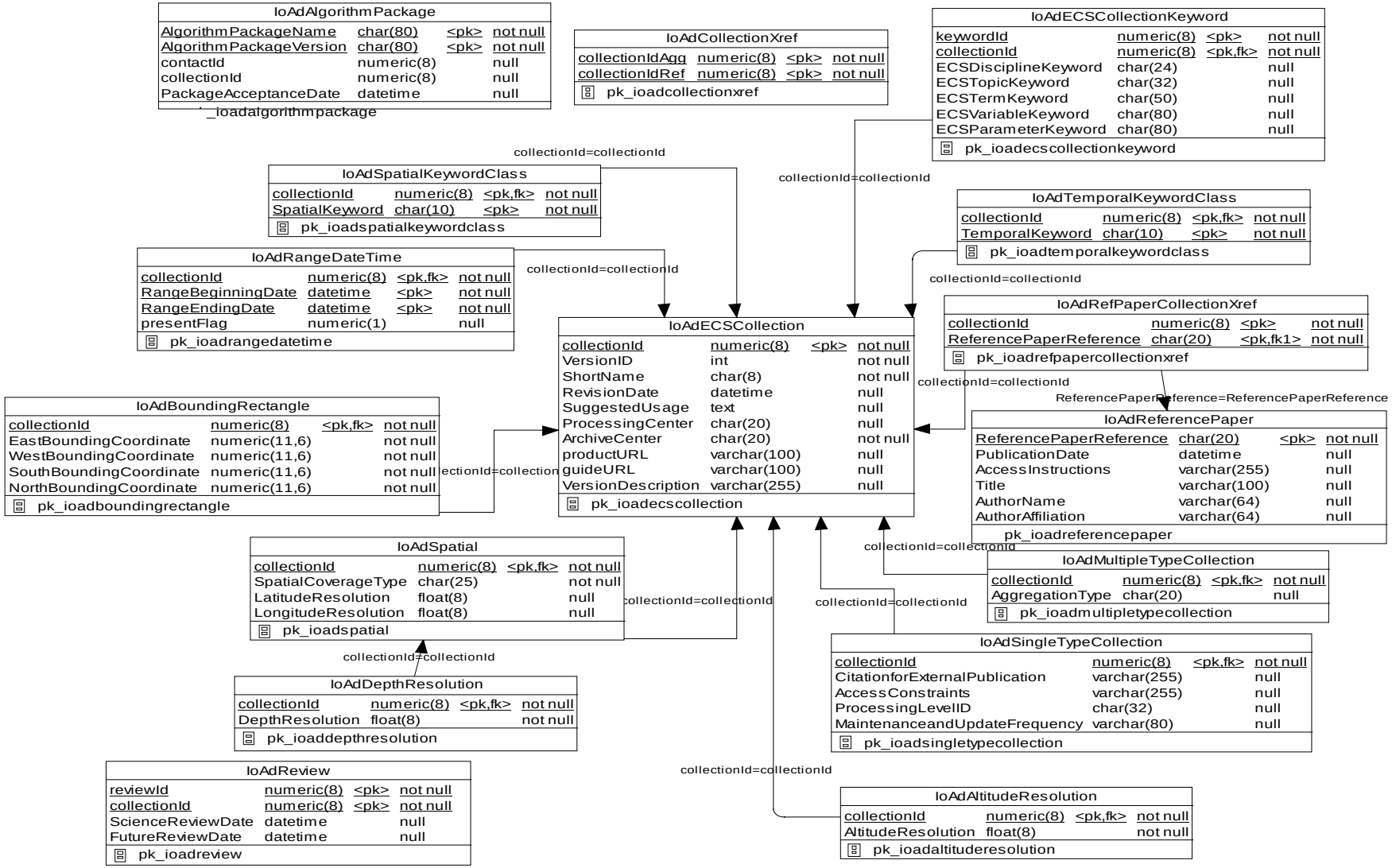

Figure A-2. Collection

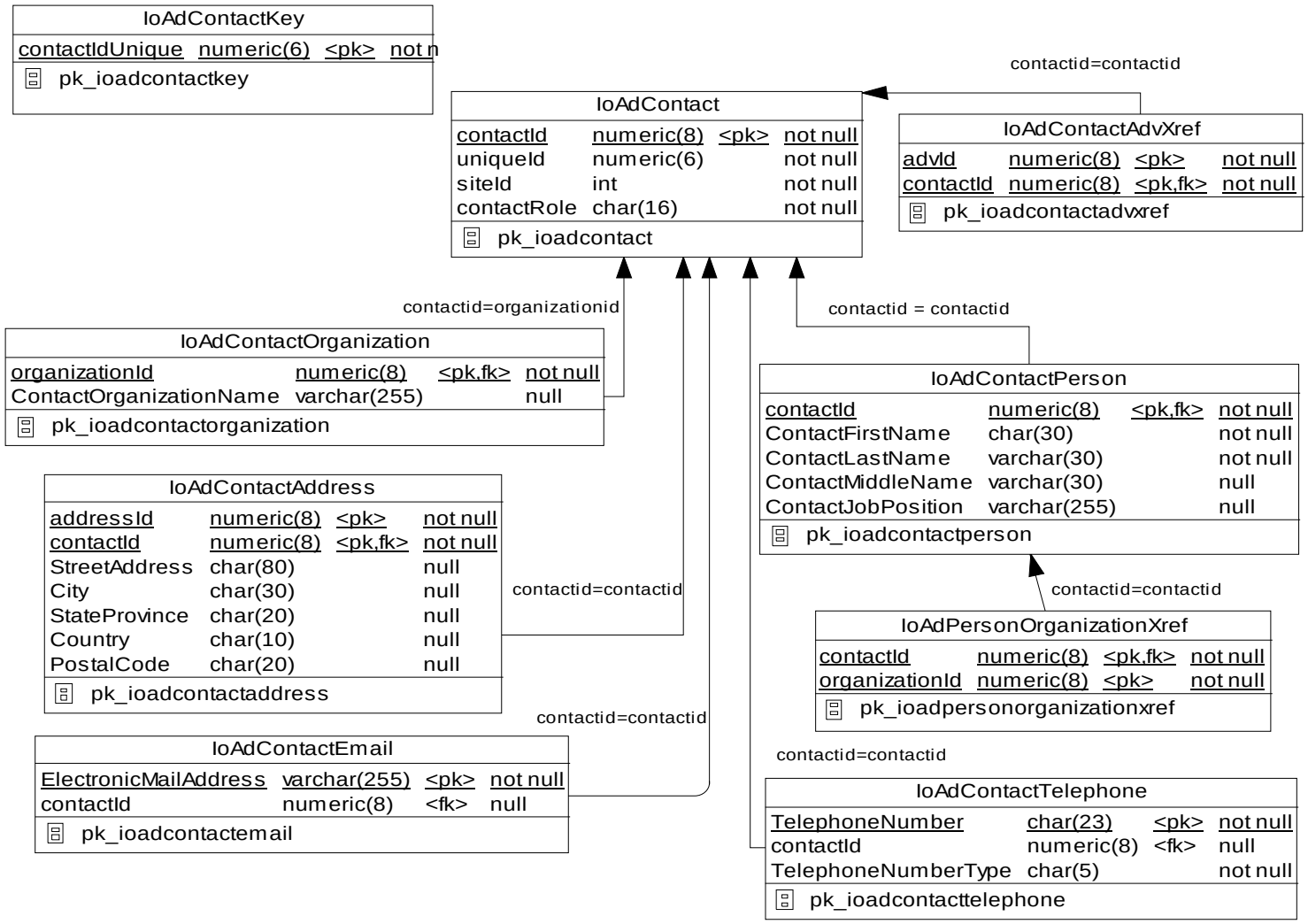

Figure A-3. Collection Contact

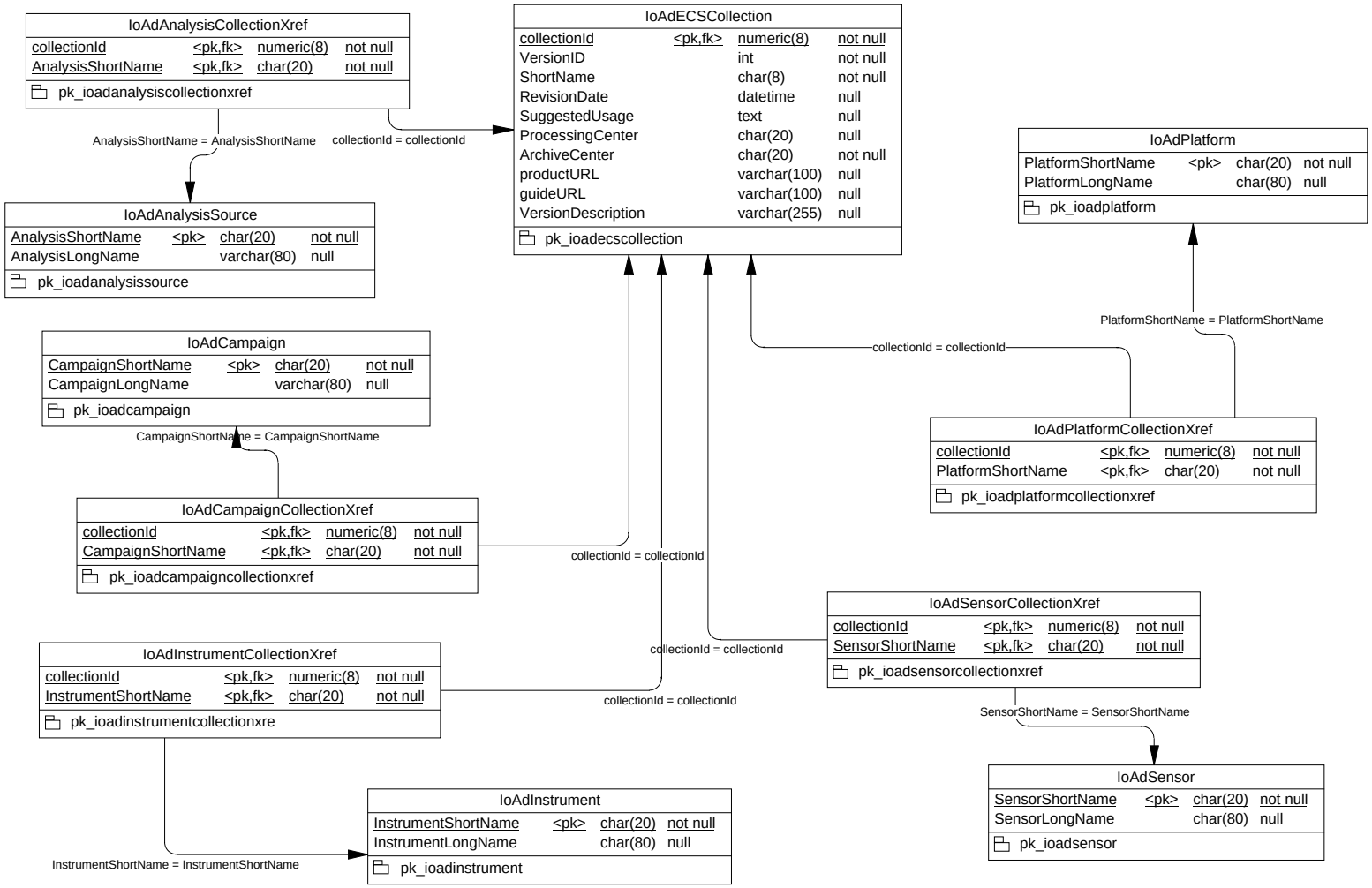

Figure A-4. Data Source

EcDbDatabaseVersions			
EcDbSchemaVersionId	smallint	<pk>	not n
EcDbDropVersion	char(64)	<pk>	not n
EcDbDropDescription	varchar(255)		null
EcDbCurrentVersionFlag	char(1)		null
EcDbDatabaseName	varchar(255)		null
EcDbDropInstallDate	datetime		null
EcDbSybaseVersion	varchar(255)		null
EcDbSybaseServer	varchar(255)		null
EcDbComments	varchar(255)		null
EcDbUpdateProcess	varchar(255)		null
PK_ECDBVERSIONS			

Figure A-5. Database Versioning

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Abbreviations and Acronyms

ANSI	American National Standards Institute
ASCII	American Standard Code for Information Exchange
CASE	Computer Aided Software Engineering
CD	contractual delivery 213-001
CDRL	contract data requirements list
CI	configuration item
COTS	commercial off-the-shelf (hardware or software)
CSCI	computer software configuration item
DAAC	Distributed Active Archive Center
DBCC	Database Consistency Checker
DBMS	Database Management System
DCN	Document Change Notice
DID	data item description
DMS	Data Management Subsystem
ECS	EOSDIS Core System
EDC	EROS Data Center
EDHS	ECS Data Handling System
EOSDIS	Earth Observing System Data and Information System
EROS	Earth Resources Observation System
ERD	Entity Relationship Diagram
ESDIS	Earth Science Data and Information System (GSFC)
ESDT	Earth science data types
ESN	EOSDIS Science Network (ECS)
FK	Foreign Key
GSFC	Goddard Space Flight Center
GUI	graphic user interface
HDF	hierarchical data format

HDF-EOS	an EOS proposed standard for a specialized HDF data format
HTML	HyperText Markup Language
HTTP	Hypertext Transport Protocol
I/O	input/output
ICD	interface control document
INGST	Ingest Services CSCI
IOS	Interoperability Subsystem
LaRC	Langley Research Center (DAAC)
MSS	Management Support Subsystem
N/A	not applicable
NAS	National Academy of Science
NASA	National Aeronautics and Space Administration
NSIDC	National Snow and Ice Data Center (DAAC)
ODL	Object Definition Language
PCF	Process Control File
PDF	Portable Document Format
PDPS	Planning and Data Processing Subsystem
PGE	Product Generation Executive
PK	Primary Key
QA	Quality Assurance
SDSRV	Science Data Server CSCI
SQL	Structured Query Language
STMGT	Storage Management Software CSCI
SUBSRV	Subscription Server
WWW	World-Wide Web