



phdir

Public Health Directory Schema

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Revision History

Revision	Date	Last Modified By	Description
1.0	12/03/2002	Rob Tanzola	
1.1	06/23/2003	Stephen Fishman	Modifications and reformatting of schema design

Contents

REVISION HISTORY	2
LIST OF TABLES.....	4
PROPOSED PUBLIC HEALTH DIRECTORY SCHEMA	5
Overview	5
Purpose.....	5
Scope.....	7
SPECIFICATION	10
Overview	10
Attribute Ordering for Alerting.....	10
Tracking Changes to Information.....	10
Notes Regarding Class Definitions and Standardized Vocabularies.....	10
Class specifications for people, organizations, and roles.....	11
phdirPerson.....	11
phdirOrganization.....	21
phdirOrganizationType	27
phdirRole.....	30
phdirExpertise	33
Change Log	35
BIBLIOGRAPHY	37

List of Tables

Table 1: Required LDAP Attributes for phdirPerson	11
Table 2: Optional LDAP Attributes for phdirPerson	12
Table 3: Additional phdir Attributes for phdirPerson.....	16
Table 4: Required LDAP Attributes for phdirOrganization	21
Table 5: Optional LDAP Attributes for phdirOrganization	22
Table 6: Additional phdir Attributes for phdirOrganization.....	24
Table 7: Required LDAP Attributes for phdirOrganizationType	27
Table 8: Optional LDAP Attributes for phdirOrganizationType.....	27
Table 9: Additional phdir Attributes for phdirOrganizationType.....	28

Proposed Public Health Directory Schema

Overview

The Public Health Directory (phdir) is the directory services component of the Public Health Information Network (PHIN) initiative. The phdir will provide the following information about public health professionals, information that will be used by CDC applications and state and local health departments:

- Critical contact
- Public health role
- Expertise
- Additional profile-oriented information

Purpose

The purpose of this document is to specify the information that should be stored in the phdir by defining an LDAP schema for the data. This schema includes subclasses of standard LDAPv3 classes and new classes developed to support the needs of the public health community.

This schema is intended to serve two purposes:

1. To be the implementation schema for the Public Health Directory (phdir) being implemented at CDC.
2. To act as a reference model for LDAP directories in public health.

The proposed directory data model in this document is based in part on the schema of the NEDSS Base System. It is recommended, though not required, that state public health Departments and other CDC partner organizations utilize the finalized phdir schema. Since a variety of schemas used by external partners will be involved in the effort to collect the directory information, much of the phdir will be populated using LDAP Data Interchange Format (LDIF) or Directory Services Markup Language (DSML) messages.

Please note that expertise in LDAP technology is not required for suggesting future revisions to the directory schema design. The most important objective is to determine which attributes will be useful to store for people, organizations, organization types, functions and roles. A simple description of additional attributes accompanied by an

phdir Schema

explanation of their utility will be of great help. Of course, contributions to the more technical aspects of LDAP are also welcome.

In addition to the standards setting aspects of this directory design, an implementation of the directory at CDC will be integral in solutions that serve the following functional needs:

1. A central application for common directory lookup activities - "white pages."
2. A security control mechanism for CDC web-based information systems used by external partners.
3. An emergency contact application for the broadcast of public health alerts with high assurance of communications success.
4. A central store of routing and security information for the support of public health messaging.

State and local health departments and other health organizations may opt to use their instances of the directory for similar functions or other functions as circumstances permit.

Scope

This document provides details of all of the classes and attributes for each class in a format sufficient to add them to an LDAPv3 directory. Please refer to the remainder of the documentation for full coverage of the namespace design, replication design, etc.

Unresolved Issues and Caveats Regarding the phdir Schema Version 1.0

5/26/2003

This schema is subject to continuous change over its lifetime in response to changing requirements. Naturally it is in everyone's interest to keep these changes minimal in order to avoid frequent and substantial changes to the directory repository and the systems that use the directory. Ideally, publication of this schema could be delayed until all issues are resolved in order to provide users with as stable a schema as possible. Unfortunately, such a delay is impossible in the current environment. Development of this schema is subject to two opposing pressures: on the one hand, to publish a schema as rapidly as possible in order to support directory development work at partner organizations, and on the other, to continue to incorporate into the schema new features and requirements from an ever-expanding circle of stakeholders and better understanding of eventual needs. In an effort to balance these opposing pressures, publication of this first version schema is proceeding without further delay, but with emphasis on the fact that unresolved issues remain, some of which may result in significant modifications in subsequent versions.

The issues that may precipitate the most significant modifications to the schema are as follows:

phdir Schema

1. Relationship between person, role, and organization

In this version 1.0 schema, a person can have many roles and a person can be affiliated with many organizations, but there is no association between role and organization. Many now feel that this is an oversight, and that in actual practice a person's role is not meaningful unless it is also associated with an organization. For example, suppose a Dr. Smith is director of TB surveillance at State X Department of Health and is also coordinator of occupational TB transmission prevention for a regional hospital commission. The present schema can depict Dr. Smith's two roles and her two organizational affiliations, but is unable to specify which role she plays in which organization. Thus, for example, there is no direct way of querying for the director of TB surveillance at State X Department of Health; to answer this question one has to effectively join the results of two queries.

The phdir technical team has developed a draft solution to this problem that provides for a three-way linkage between person, role, and organization. However, this solution places somewhat unusual demands on the traditional LDAP architecture, and work remains to determine if the solution is practical.

In addition, it is not clear to what degree this level of specification is needed outside of CDC. At some states and other organizations, a linkage between role and organization may not be necessary and may represent unnecessary complexity.

Resolution of these two questions is needed before a decision can be finalized.

2. Pagers, mobile phones, PDAs and other contact methods

In this version 1 schema, each person can have multiple contact methods such as office phones, home phones, email addresses, mobile phones, and pager numbers. Although this seems a reasonable first attempt to support a notification system, it is not actually adequate to support either distribution of routine information or contacting officials after hours in an emergency. Ideally, people will want to elect to receive notifications and emergency alerts via a variety of devices they may possess - computer, mobile phone, pager, PDA - and to specify which of these devices is to be used for routine versus emergency purposes. Some of these devices can be addressed in various ways and used for more than one form of communication - for example, some mobile phones and pagers can receive text messages via an email address. So it is actually less important to know what a person's work phone and pager number is than to know what devices are available for reaching a person, the capabilities of each device (Does it support voice or text? How long can a text message be? Does it support file attachments?), how to address each device (phone number, email address), and whether each is intended for routine or for emergency use. And in the interest of protecting the privacy it is important to know whether a recipient desires a phone number or email address to be "published" (within the directory community).

Given these needs, it seems likely that a reworking of the schema to hold information on contact methods is necessary. Again, the phdir technical team has developed a draft solution, and this solution places similar unusual demands on the traditional LDAP architecture. Also, it may again prove that many organizations will find the simpler information structure satisfactory and that only a subset of organizations will require the more complicated model.

Overview

The core of the phdir directory will be comprised of entries that represent public health professionals, organizations to which they belong, roles that they play and expertise that they possess. This document begins with a discussion of schema requirements, LDAP constraints and strategies for approaching particular areas within the schema design. This document also includes additional details of the object classes and their attributes that will be required to address currently identified public health application needs.

Attribute Ordering for Alerting

Public health alerting applications must be able to discern priority of contact information to guide the order of notification attempts. Standard LDAP schemas do not include any way to indicate an ordered list of contact numbers. In addition, the LDAP specification does not guarantee the order in which values from a multivalued attribute are returned. As a result, a scheme must be devised to support these concepts in the directory. These two issues will be addressed in the device section of future releases of the schema.

Tracking Changes to Information

In general, directories are used to find current information about people and devices. Consequently, the directory standards implemented by many directory servers do not provide a uniform method to access a change log for entries. To address the need for this kind of historical information, many directories provide full logging systems. The configuration of the logs for individual directories and the usage of logs to track changes will be left to the discretion of the administrators of these systems.

Notes Regarding Class Definitions and Standardized Vocabularies

- All full address values are expected as multiline strings with \$ as the line delimiter. This is the format specified in RFC 2252 for attributes adhering to the Postal Address syntax (e.g., postalAddress: 100 Directory Drive\$Atlanta, GA\$30303\$USA). The values of postalAddress and registeredAddress should include addresses in this format.
- The address of a person's primary physical location comprises the following attributes: street, postOfficeBox, postalCode, st (stateOrProvinceName), and l (localityName). Mailing addresses are located in separate attributes.

phdir Schema

- For attributes such as employeeNumber, where external partners may already have their own value, a new attribute will be considered if the value from the external partner is relevant to the community at large.
- Because the audience for the phdir is a very diverse set of institutions, the names used to describe units within the organizations or the roles they play are expected to vary widely (e.g., one state may have a unit titled "Communicable Disease Control Division", while another may call its equivalent unit the "Disease Surveillance Branch"). In addition, organizational units may be aggregated in different ways between institutions. In order to allow searching of the phdir across institutions, the role and organization attributes for a person and the organization type attribute for an organization will be elements from a standard vocabulary. Each standard vocabulary element will be an entry in the directory, and an attribute value for primaryRole will consist of the DN for this entry.

Class specifications for people, organizations, and roles

Each entry in the directory belongs to one or more directory server classes. A class is like a template stored in the directory that determines which attributes may or may not be included for a directory entry. The new phdir classes will be based on standard LDAPv3 classes with standard attribute names for common pieces of information regarding a person or organization. In addition, new classes in the phdir will specify custom attributes related to the applications using the directory.

phdirPerson

The phdirPerson class will contain information regarding a public health professional. The phdirPerson is based on the inetOrgPerson object defined in RFC 2798. The representation of contact devices (pager, mobile, etc.) may change to support automated access and to provide additional information about device capabilities.

Table 1: Required LDAP Attributes for phdirPerson

Attribute	Description	Type and Multiplicity
cn (commonName)	The person's common name, usually a first name followed by a surname.	case-insensitive string, multi-valued
employeeNumber	The person's unique (system generated) identifier, regardless of his or her place of employment, used primarily by applications to disambiguate entries.	case-insensitive string, multi-

phdir Schema

Attribute	Description	Type and Multiplicity
	All entries will be assigned this ID upon creation or during the data import process.	valued
objectClass	Object class of the entry. Used by the server to determine required and allowed attributes for an entry.	case-insensitive string, multi-valued
sn (surname)	The person's surname, or last name.	case-insensitive string, multi-valued
phdirUID	The person's Unique Identifier within the public health directory (UID).	case-insensitive string, single-valued

Table 2: Optional LDAP Attributes for phdirPerson

Attribute	Description	Type and Multiplicity
businessCategory	Type of business in which the person is involved. Used for broad categories (e.g., clinical, academic, public health).	case-insensitive string, multi-valued
challengePhrase	One-way hashed value of the user's challenge phrase for authentication. Used primarily by CDC applications.	case-insensitive string, multi-valued
description	Text description of the person. Often includes their role or work assignment. (e.g., Manager for the IT Services group)	case-insensitive string, multi-valued
displayName	Preferred name of a person to be displayed when displaying directory entries. Most often	case-insensitive string, multi-

phdir Schema

Attribute	Description	Type and Multiplicity
	a concatenation of given name and surname.	valued
employeeType	The person's type of employment. (e.g., full time)	case-insensitive string, multi-valued
fax (facsimileTelephoneNumber)	The person's fax number.	telephone number, multi-valued
givenName	The person's given, or first, name.	case-insensitive string, multi-valued
homeTelephoneNumber	The person's home telephone number.	telephone number, multi-valued
initials	The person's initials.	case-insensitive string, multi-valued
l (localityName)	City or town in which the person resides.	case-insensitive string, multi-valued
labeledURI	Specifies a Uniform Resource Identifier (URI), defined in RFC 2396 that is relevant in some way to the entry, such as a personal or department website. Values placed in the attribute should consist of a URI (currently only URLs are supported) optionally followed by one or more space characters and a label.	case-sensitive string, multi-valued

phdir Schema

Attribute	Description	Type and Multiplicity
mail	The person's email address.	case-insensitive string, multi-valued
manager	Distinguished Name (DN) of the person's manager. The DN is the Directory Server name to uniquely distinguish an entry.	DN, multi-valued
mobile	The person's mobile phone number.	telephone number, multi-valued
pager	The person's pager number.	telephone number, multi-valued
physicalDeliveryOfficeName	Location where physical deliveries can be made to the person.	case-insensitive string, multi-valued
postalAddress	The person's mailing address.	case-insensitive string, multi-valued
postalCode	The postal code for the mailing address (such as a United States zip code).	case-insensitive string, multi-valued
postOfficeBox	The person's post office box.	case-insensitive string, multi-valued
preferredDeliveryMethod	The person's preferred method of contact or delivery. This attribute should contain values	case-insensitive string, single-

phdir Schema

Attribute	Description	Type and Multiplicity
	such as "email" or "work phone".	valued
preferredLanguage	A person's preferred written or spoken language.	case-insensitive string, single-valued
registeredAddress	Postal address suitable for reception of expedited documents, where the recipient must verify delivery.	case-insensitive string, multi-valued
secretary	DN of the person's secretary or administrative assistant.	DN, multi-valued
seeAlso	DNs of another directory entry related to the person.	DN, multi-valued
st (stateOrProvinceName)	State or province in which the person is located.	case-insensitive string, multi-valued
street	Street address at which the person is located.	case-insensitive string, multi-valued
telephoneNumber	The person's work telephone number.	telephone number, multi-valued
title	The person's job title.	case-insensitive string, multi-valued
userCertificate	Binary representation of the person's certificate. It is to be stored and requested in	binary, multi-

phdir Schema

Attribute	Description	Type and Multiplicity
	the binary form as 'userCertificate;binary'.	valued
userPassword	Password with which the person can bind to the directory. Format: {encryption method}encrypted password (e.g., {ssh}9LsFG7RT+dFnPErwSfxDlaQTn6dbIFGklMNFRr==)	octet string, multi-valued
uid (userID)	Identifies the person's userid, usually a login ID.	case-insensitive string, multi-valued

Table 3: Additional phdir Attributes for phdirPerson

Attribute	Description	Type and Multiplicity
phdirAlternateContact	DN pointing to an alternate contact.	DN, multi-valued
phdirAlphaPager	Number of the person's alphanumeric pager.	telephone number, multi-valued
phdirCounty	The Federal Information Processing Standards (FIPS) code of the county in which a person is located.	case-insensitive string, single-valued
phdirCreatedTimestamp	The date and time when an entry was created. The format should be combined date and time format based on the ISO 8601 standard. (e.g., 2002-12-31T14:12:44Z)	case-insensitive string, single-valued

phdir Schema

Attribute	Description	Type and Multiplicity
phdirDirectoryProxy	DN pointing to an individual to act as a proxy for changes to directory information.	DN, multi-valued
phdirDirectPhone	Phone number of the direct line to a person's office.	telephone number, multi-valued
phdirFax2 (phdirFacsimileTelephoneNumber2)	The person's first alternate fax number.	telephone number, single-valued
phdirFax3 (phdirFacsimileTelephoneNumber3)	The person's second alternate fax number.	telephone number, single-valued
phdirHighestDegree	Highest academic degree achieved.	case-insensitive string, multi-valued
phdirHomeMail	The person's home email address.	case-insensitive string, single-valued
phdirHomeMail2	The person's first alternate home email address.	case-insensitive string, single-valued
phdirHomeMail3	The person's second alternate home email address.	case-insensitive string, single-valued

phdir Schema

Attribute	Description	Type and Multiplicity
phdirHomeTelephoneNumber2	The person's first alternate home telephone number.	telephone number, single-valued
phdirHomeTelephoneNumber3	The person's second alternate home telephone number.	telephone number, single-valued
phdirPreviousName	The person's previous name (e.g., maiden name), if applicable.	case-insensitive string, single-valued
phdirMail2	The person's first alternate email address.	case-insensitive string, single-valued
phdirMail3	The person's second alternate email address.	case-insensitive string, single-valued
phdirMobile2	The person's first alternate mobile phone number.	telephone number, single-valued
phdirMobile3	The person's second alternate mobile phone number.	telephone number, single-valued
phdirModifiedTimestamp	The date and time when an entry was modified. The format should be combined date and time format based on the ISO 8601	case-insensitive string, single-

phdir Schema

Attribute	Description	Type and Multiplicity
	standard. (e.g., 2002-12-31T14:12:44Z)	valued
phdirOtherDegree	Other academic degrees achieved.	case-insensitive string, multi-valued
phdirPager2	The person's first alternate pager number.	telephone number, single-valued
phdirPager3	The person's second alternate pager number.	telephone number, single-valued
phdirProfessionalLicense	Identifiers of professional licenses held per jurisdiction.	case-insensitive string, multi-valued
phdirPrimaryExpertise	DN of the person's primary area of expertise.	case-insensitive string, single-valued
phdirPrimaryOrganization	DN of the person's primary organizational affiliation with regard to public health.	DN, single-valued
phdirPrimaryRole	DN of the person's primary role in public health.	DN, single-valued
phdirPublicHealthCommission	Person's public health commission.	case-insensitive string, multi-

phdir Schema

Attribute	Description	Type and Multiplicity
		valued
phdirSatellitePhone	The person's satellite phone number	telephone number, multi-valued
phdirSecondaryExpertise	DNs of other areas of expertise.	DN, multi-valued
phdirSecondaryOrganization	DNs of other organizational affiliations.	DN, multi-valued
phdirSecondaryRole	DNs of other roles in public health.	DN, multi-valued

phdirOrganization

The phdirOrganization is the representation of any organization that is a part of or is a partner of public health. The organizations are a combination of internal CDC organizations and other organizations related to the public health mission. Entries can represent organizations in the usual sense of a corporate or government entity, or they can represent internal divisions of a larger organization. Guidelines regarding the specific organizations that will exist in the directory are not yet defined, but will be addressed in future documentation of the use cases for the phdir. phdirOrganization entries usually reference groups of one or more phdirPerson entries.

The following are some examples of organizations that would appear in the directory:

- State health departments
- Local health departments
- Public health laboratories
- Private laboratories that participate in the Laboratory Response Network
- Professional and advocacy organizations such as CSTE, ASTHO, NACCHO, APHL
- Clinical professional organizations, such as AMA and AAP, that subscribe to CDC content
- Non-public health government departments that with whom CDC collaborates, such as the Justice Department, FBI, and Department of Defense

Note: The directory entries for organizations are represented by dynamic groups. A dynamic group is one where membership is determined by a search filter. The phdirOrganization class is a subclass of the widely used groupofurls class. This decision is subject to change as more requirements are gathered, particularly those that relate to replication.

Table 4: Required LDAP Attributes for phdirOrganization

Attribute	Description	Type and Multiplicity
cn (commonName)	Common name of the organization. Values for this attribute will come from the standardized vocabulary lists.	case-insensitive string, multi-valued
objectClass	Object class of the entry. Used by the server to determine required and allowed attributes for an	case-insensitive

phdir Schema

Attribute	Description	Type and Multiplicity
	entry.	string, multi-valued
phdirUID	The organization's Unique Identifier within the public health directory (UID).	case-insensitive string, single -valued

Table 5: Optional LDAP Attributes for phdirOrganization

Attribute	Description	Type and Multiplicity
businessCategory	Type of business in which the organization is involved. Use for categorization within public health. Values for this attribute will come from the standardized vocabulary lists.	case-insensitive string, multi-valued
description	Text description of the organization.	case-insensitive string, multi-valued
fax (facsimileTelephoneNumber)	The organization's fax number.	telephone number, multi-valued
l (localityName)	City or town which the organization resides.	case-insensitive string, multi-valued
memberURL	LDAP filter used to search the directory to determine the members of this group.	case-sensitive string, multi-valued
physicalDeliveryOfficeName	Location where physical deliveries can be made to the organization. Usually includes building number and/or office	case-insensitive string, multi-

phdir Schema

Attribute	Description	Type and Multiplicity
	location within a building.	valued
postalAddress	The organization's mailing address.	case-insensitive string, multi-valued
postalCode	The postal code for this address (such as a United States zip code).	case-insensitive string, multi-valued
postOfficeBox	The organization's post office box.	case-insensitive string, multi-valued
preferredDeliveryMethod	The organization's preferred method of contact or delivery. This attribute should contain values such as "email" or "phone".	case-insensitive string, single-valued
registeredAddress	Postal address suitable for reception of expedited documents, where the recipient must verify delivery.	case-insensitive string, multi-valued
searchGuide	Specifies information for suggested search criteria when using the entry as the base object in the directory tree for a search operation.	case-sensitive string, multi-valued
seeAlso	DNs to information relevant to the organization.	DN, multi-valued
st (stateOrProvinceName)	State or province in which the organization is located.	case-insensitive string, multi-valued

phdir Schema

Attribute	Description	Type and Multiplicity
street	Street address at which the organization is located.	case-insensitive string, multi-valued
telephoneNumber	The organization's telephone number.	telephone number, multi-valued
userPassword	Password with which the entry can bind to the directory.	octet string, multi-valued

Table 6: Additional phdir Attributes for phdirOrganization

Attribute	Description	Type and Multiplicity
phdirLocalContactPerson	DNs of local (internal) staff responsible for liaison with the organization.	DN, multi-valued
phdirCounty	The FIPS code of the county in which an organization is located.	case-insensitive string, single-valued
phdirCreatedTimestamp	The date and time when an entry was created. The format should be combined date and time format based on the ISO 8601 standard. (e.g., 2002-12-31T14:12:44Z)	case-insensitive string, single-valued
phdirJurisdiction	The FIPS codes of the areas within the organization's jurisdiction. FIPS codes for states, counties, and/or cities are valid. City and county FIPS codes must be prefixed with two	case-insensitive string, multi-valued

phdir Schema

Attribute	Description	Type and Multiplicity
	digit state FIPS codes in order to uniquely identify city and county within the United States. For example, Los Angeles County, California is to be represented as "06037".	
phdirLabeledURI	Specifies a Uniform Resource Identifier (URI), defined in RFC 2079, that is relevant in some way to the entry, such as a departmental website. Values placed in the attribute should consist of a URI (currently only URLs are supported) optionally followed by one or more space characters and a label. (e.g., http://www.ietf.org/ The Internet Engineering Task Force)	case-sensitive string, multi-valued
phdirModifiedTimestamp	The date and time when an entry was modified. The format should be combined date and time format based on the ISO 8601 standard. (e.g., 2002-12-31T14:12:44Z)	case-insensitive string, single-valued
phdirPrimaryOrganization	DN of phdirOrganization containing this phdirOrganization.	DN, single-valued
phdirPrimaryOrganizationType	DN of the organization's primary organization type.	DN, single-valued
phdirResponsibleIndividual	DNs of individuals responsible for the organization.	DN, multi-valued
phdirSecondaryOrganization	DNs of phdirOrganizations	DN, multi-

phdir Schema

Attribute	Description	Type and Multiplicity
	containing this phdirOrganization.	valued
phdirSecondaryOrganizationType	DNs of the organization's secondary organization types.	DN, multi-valued

phdirOrganizationType

The phdirOrganizationType is a grouping of organizations to aid in searching the directory. For example, the phdirOrganization representing the FBI could be part of the phdirOrganizationType with a cn of "Law Enforcement Agencies". Guidelines regarding the specific organization types that will exist in the directory are not yet defined, but will be addressed in future documentation of the use cases for the phdir. phdirOrganization entries usually reference groups one or more phdirOrganization entries.

Note: The directory entries for organizations are represented by dynamic groups. A dynamic group is one where membership is determined by a search filter.. The phdirOrganizationType class is a subclass of the widely used groupofurls class. This decision is subject to change as more requirements are gathered, particularly those that relate to replication.

Table 7: Required LDAP Attributes for phdirOrganizationType

Attribute	Description	Type and Multiplicity
cn (commonName)	Common name of the organization type. Values for this attribute will come from the standardized vocabulary lists.	case-insensitive string, multi-valued
objectClass	Object class of the entry. Used by the server to determine required and allowed attributes for an entry.	case-insensitive string, multi-valued
phdirUID	The organization type's Unique Identifier within the public health directory (UID).	case-insensitive string, single-valued

Table 8: Optional LDAP Attributes for phdirOrganizationType

Attribute	Description	Type and Multiplicity
description	Text description of the organization type.	case-insensitive string, multi-

phdir Schema

Attribute	Description	Type and Multiplicity
		valued
memberURL	LDAP filter used to search the directory to determine the members of this group.	case-sensitive string, multi-valued

Table 9: Additional phdir Attributes for phdirOrganizationType

Attribute	Description	Type and Multiplicity
phdirCreatedTimestamp	The date and time when an entry was created. The format should be combined date and time format based on the ISO 8601 standard. (e.g., 2002-12-31T14:12:44Z)	case-insensitive string, single-valued
phdirLabeledURI	Specifies a Uniform Resource Identifier (URI), defined in RFC 2079, that is relevant in some way to the entry, such as a departmental website. Values placed in the attribute should consist of a URI (currently only URLs are supported) optionally followed by one or more space characters and a label. (e.g., http://www.ietf.org/The Internet Engineering Task Force)	case-sensitive string, multi-valued
phdirModifiedTimestamp	The date and time when an entry was modified. The format should be combined date and time format based on the ISO 8601 standard. (e.g., 2002-12-31T14:12:44Z)	case-insensitive string, single-valued

phdir Schema

Attribute	Description	Type and Multiplicity
phdirPrimaryOrganizationType	DN of the organization type's primary organization type.	DN, single-valued
phdirSecondaryOrganizationType	DNs of the organization type's secondary organization types.	DN, multi-valued

phdirRole

The phdirRole class represents a public health role in the phdir. phdirRole entries usually reference groups of one or more phdirPerson or phdirRole entries.

In the phdir, phdirRoles will be used to accomplish various tasks related to identifying sets of phdirPerson entries, one of which could be the identification of people for alerting. A phdirRole will be created for each set of users in a contact group, allowing the alerting system to query the directory for users. The system would then attempt to contact the people in the contact group based on the contact information stored in the directory.

Note: The directory entries for organizations are represented by dynamic groups. A dynamic group is one where membership is determined by a search filter.. The phdirRole class is a subclass of the widely used groupofurls class. This decision is subject to change as more requirements are gathered, particularly those that relate to replication.

Table 10: Required LDAP Attributes for phdirRole

Attribute	Description	Type and Multiplicity
cn (commonName)	Common name of the public health role. Values for this attribute will come from the standardized vocabulary lists.	case-insensitive string, multi-valued
objectClass	Object class of the entry. Used by the server to determine required and allowed attributes for an entry.	case-insensitive string, multi-valued
phdirUID	The role's Unique Identifier within the public health directory (UID).	case-insensitive string, single -valued

Table 11: Optional LDAP Attributes for phdirRole

Attribute	Description	Type and Multiplicity
description	Text description of the public health role.	case-insensitive string, multi-valued

phdir Schema

Attribute	Description	Type and Multiplicity
memberURL	LDAP filter used to search the directory to determine the members of this group.	case-sensitive string, multi-valued
owner	DN for the role owner.	DN, multi-valued
seeAlso	DNs to information relevant to the role.	DN, multi-valued

Table 12: Additional phdir Attributes for phdirRole

Attribute	Description	Type and Multiplicity
phdirCreatedTimestamp	The date and time when an entry was created. The format should be combined date and time format based on the ISO 8601 standard. (e.g., 2002-12-31T14:12:44Z)	case-insensitive string, single-valued
phdirLabeledURI	Specifies a Uniform Resource Identifier (URI), defined in RFC 2079, that is relevant in some way to the entry, such as a website for all managers. Values placed in the attribute should consist of a URI (currently only URLs are supported) optionally followed by one or more space characters and a label.	case-sensitive string, multi-valued
phdirModifiedTimestamp	The date and time when an entry was modified. The format should be combined date and time format based on the ISO 8601 standard. (e.g., 2002-12-31T14:12:44Z)	case-insensitive string, single-valued
phdirResponsibleIndividual	DNs of individuals responsible for the role.	DN, multi-valued

phdir Schema

Attribute	Description	Type and Multiplicity
phdirPrimaryRole	DN of the primary phdirRole of which this role is a specialization. (e.g., a role for "directory administrator" having a phdirPrimaryRole of "system administrator")	DN, single-valued
phdirSecondaryRole	DNs of other phdirRoles of which this role is a specialization. (e.g., a role for "directory administrator" having a phdirSecondaryRole of "system administrator")	DN, multi-valued

phdirExpertise

The phdirExpertise class represents a public health topic in the phdir. phdirExpertise entries usually reference groups of one or more phdirPerson or phdirExpertise entries.

In the phdir, phdirExpertise will be used to accomplish various tasks related to identifying sets of phdirPerson entries, one of which could be the identification of people for alerting. A phdirExpertise will be created for each set of users in a contact group, allowing the alerting system to query the directory for users. The system would then attempt to contact the people in the contact group based on the contact information stored in the directory.

Note: The directory entries for organizations are represented by dynamic groups. A dynamic group is one where membership is determined by a search filter. The phdirExpertise class is a subclass of the widely used groupofurls class. This decision is subject to change as more requirements are gathered, particularly those that relate to replication.

Table 10: Required LDAP Attributes for phdirExpertise

Attribute	Description	Type and Multiplicity
cn (commonName)	Common name of the expertise. Values for this attribute will come from the standardized vocabulary lists.	case-insensitive string, multi-valued
objectClass	Object class of the entry. Used by the server to determine required and allowed attributes for an entry.	case-insensitive string, multi-valued
phdirUID	The expertise's Unique Identifier within the public health directory (UID).	case-insensitive string, single -valued

Table 11: Optional LDAP Attributes for phdirExpertise

Attribute	Description	Type and Multiplicity
description	Text description of the expertise.	case-insensitive string,

phdir Schema

Attribute	Description	Type and Multiplicity
		multi-valued
memberURL	LDAP filter used to search the directory to determine the members of this group.	case-sensitive string, multi-valued
owner	DN for the expertise owner.	DN, multi-valued
seeAlso	DNs to information relevant to the expertise.	DN, multi-valued

Table 12: Additional phdir Attributes for phdirExpertise

Attribute	Description	Type and Multiplicity
phdirCreatedTimestamp	The date and time when an entry was created. The format should be combined date and time format based on the ISO 8601 standard. (e.g., 2002-12-31T14:12:44Z)	case-insensitive string, single-valued
phdirLabeledURI	Specifies a Uniform Resource Identifier (URI), defined in RFC 2079, that is relevant in some way to the entry, such as a website for all managers. Values placed in the attribute should consist of a URI (currently only URLs are supported) optionally followed by one or more space characters and a label.	case-sensitive string, multi-valued
phdirModifiedTimestamp	The date and time when an entry was modified. The format should be combined date and time format based on the ISO 8601 standard. (e.g., 2002-12-31T14:12:44Z)	case-insensitive string, single-valued
phdirResponsibleIndividual	DNs of individuals responsible for the role.	DN, multi-valued

phdir Schema

Attribute	Description	Type and Multiplicity
phdirPrimaryExpertise	DN of the primary phdirExpertise of which this role is a specialization. (e.g., an expertise for "air quality" having a phdirPrimaryExpertise of "environmental health")	DN, single-valued

Change Log

- Added "ph" prefix to all custom phdir attributes.
- Revised contact priority example.
- Added several attributes, including phdirCounty (for orgs and people), phdirJurisdiction, phdirPreviousName, phdirAlternateContact, phdirDirectoryProxy, phdirDirectPhone, phdirHomeMail, phdirHomeMail2, phdirHomeMail3, phdirProfessionalLicense, phdirResponsibleIndividual, phdirCreatedTimestamp, phdirModifiedTimestamp, phdirSatellitePhone, phdirAlphaPager.
- Removed RFC related paragraphs.
- Added detail to attribute descriptions.
- Minor changes to paragraphs to highlight items such as controlled vocabulary and to enhance clarity.
- Made notes regarding contact devices and the kinds of orgs that will be included.
- Added a list of organizations to help people understand the scope of the organizations that will appear in the directory.
- Added comments about the next steps, like the changes for devices.

phdir Schema

- Removed information about prioritized contact methods. This will be addressed in a different way in future schema definitions.
- Added information about logging.
- Changed prefix for attributes from "ph" to "phdir".
- Changed phdirPrimaryOrg to phdirPrimaryOrganization, and same for all similar attributes.
- Added phdirOrganizationType class and phdirPrimaryOrganizationType and phdirSecondaryOrganizationType attributes on phdirOrganization.
- Added phdirPrimaryRole and phdirSecondaryRole to phdirRole to allow for better parent/child relationships of phdirRoles.
- Removed caveat on universal unique identifier for person on basis that phidirUID attribute has been added
- Removed caveat on controlled vocabulary on basis that controlled vocabulary version 1 is being released simultaneously to this document
- phdirFax2 was changed from multi-valued to single-valued
- phdirFax3 was changed from multi-valued to single-valued
- phdirHomeMail was changed from multi-valued to single-valued
- phdirHomeMail2 was changed from multi-valued to single-valued
- phdirHomeMail3 was changed from multi-valued to single-valued
- phdirHomeTelephoneNumber2 was changed from multi-valued to single-valued
- phdirHomeTelephoneNumber3 was changed from multi-valued to single-valued
- phdirMail2 was changed from multi-valued to single-valued
- phdirMail3 was changed from multi-valued to single-valued
- phdirMobile2 was changed from multi-valued to single-valued
- phdirMobile3 was changed from multi-valued to single-valued
- Renamed phdirOtherExpertise to phdirSecondaryExpertise to be more consistent with nomenclature in the rest of the schema
- phdirPager2 was changed from multi-valued to single-valued
- phdirPager3 was changed from multi-valued to single-valued
- phdirPrimaryExpertise was changed from multi-valued to single-valued
- phdirUID was added as an attribute to phdirPerson, phdirOrganization, phdirOrganizationType and phdirRole
- Renamed phdirSuperOrganizztion within phdirOrganization class to phdirPrimaryOrganization to be more consistent with nomenclature in the rest of the schema and changed the attribute from multi-valued to single-valued
- Added phdirSecondaryOrganization to phdirOrganization class to allow for better parent/child relationships of phdirOrganizations
- Split Optional LDAP Attributes for phdirOrganziation table into two tables to be more consistent with rest of document
- Added phdirPrimaryOrganizationType to phdirOrganizationType class to allow for better parent/child relationships of phdirOrganizationTypes
- Added phdirSecondaryOrganizationType to phdirOrganizationType class to allow for better parent/child relationships of phdirOrganizationTypes
- Added phdirExpertise class

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