

OSID V3 Specifications hierarchy package

Version Draft 3

This specifications represent a draft for OSID V3 interface definitions. These definitions may change at any time.

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Package Description	osid.hierarchy package
Interfaces	osid.hierarchy.HierarchyProfile
	osid.hierarchy.HierarchyManager
	osid.hierarchy.HierarchyProxyManager
	osid.hierarchy.HierarchyTraversalSession
	osid.hierarchy.HierarchyDesignSession
	osid.hierarchy.HierarchyLookupSession
	osid.hierarchy.HierarchySearchSession
	osid.hierarchy.HierarchyAdminSession
	osid.hierarchy.HierarchyNotificationSession
	osid.hierarchy.HierarchyStructureReceiver
	osid.hierarchy.Hierarchy
	osid.hierarchy.HierarchyRecord
	osid.hierarchy.HierarchyQuery
	osid.hierarchy.HierarchyQueryRecord
	osid.hierarchy.HierarchyForm
	osid.hierarchy.HierarchyFormRecord
	osid.hierarchy.HierarchySearchOrder
	osid.hierarchy.HierarchySearchOrderRecord
	osid.hierarchy.HierarchySearch
	osid.hierarchy.HierarchySearchRecord
	osid.hierarchy.HierarchySearchResults
	osid.hierarchy.HierarchySearchResultsRecord
	osid.hierarchy.HierarchyReceiver
	osid.hierarchy.HierarchyList
	osid.hierarchy.Position
	osid.hierarchy.PositionList



Package	osid.hierarchy
Title	Hierarchy Open Service Interface Definitions
Version	3.0.0
Description	The Hierarchy OSID provides a means for accessing and managing hierarchucal relationships among OSID lds. An OSID ld may have onr or more parents or children and the hierarchy itself represents a directed acyclic graph. The hierarchy service defines a set of interfaces used among other OSIDs that utilize hierarchies and can also be used to abstract a hierarchical data into a standalone service.



Interface	osid.hierarchy	.HierarchyProfile
Implements of	osid.OsidProfile	
Description 7	Γhe hierarchy profile describes the interoperability	among hierarchy services.
Method	supportsVis	sibleFederation
Description	Tests if federation is visible. Visible federation allo	ws for selecting among multiple hierarchies.
Detum		true if visible federation is supported, false
Return	poolean	otherwise
Compliance r	mandatory	This method must be implemented.
Method	supportsHie	rarchyTraversal
Description	Tests if hierarchy traversal is supported.	
Return L	poolean	true if hierarchy traversal is supported, false otherwise
Compliance r	mandatory	This method must be implemented.
Method		erarchyDesign
	Tests if hierarchy design is supported.	
Return	poolean	true if hierarchy design is supported, false otherwise
Compliance r	mandatory	This method must be implemented.
Method	supportsHierarchy	/StructureNotification
Description	Tests if hierarchy structure notification is supporte	d.
Return t	poolean	true if hierarchy structure notification is supported, false otherwise
Compliance r	mandatory	This method must be implemented.
Method	supportsHi	erarchyLookup
Description	Tests if a hierarchy lookup is supported.	
Return	poolean	true if hierarchy lookup is supported, false otherwise
Compliance r	mandatory	This method must be implemented.
Method	supportsHierarchySearch	
Description	Tests if a hierarchy search is supported.	
	poolean	true if hierarchy search is supported, false otherwise
	mandatory	This method must be implemented.
Method	supportsHi	ierarchyAdmin erarchyAdmin
Description	Tests if a hierarchy administration is supported.	
	poolean	true if hierarchy administration is supported, false otherwise
	mandatory	This method must be implemented.
Method		archyNotification
LIESCRIPTION	Tests if hierarchy notification is supported. Messa modified, or deleted.	
Return	poolean	true if hierarchy notification is supported, false otherwise
	mandatory	This method must be implemented.
Method		odeSequencing
Description	Tests if hierarchy node sequencing for ordering no	
	poolean	true if node sequencing is supported, false otherwise
Compliance r	mandatory	This method must be implemented.



Method	getHierarchyRecordTypes		nyRecordTypes
Description	Gets the supported Hie	rarchy types.	
Return	osid.type.TypeList		a list containing the supported Hierarchy record types
Compliance	mandatory		This method must be implemented.
Method		supportsHier	archyRecordType
Description	Tests if the given Hiera	rchy record type is suppo	rted.
Parameters	osid.type.Type hierarchyRecordType		a Type indicating a Hierarchy record type
Return	boolean		true if the given record Type is supported, false otherwise
Compliance	mandatory		This method must be implemented.
Method	getHierarchySearchR		earchRecordTypes
Description	Gets the supported Hierarchy search record typ		98.
Return	osid.type.TypeList		a list containing the supported Hierarchy search record types
Compliance	mandatory		This method must be implemented.
Method	supportsHierarchySearchRecordType		
Description	Tests if the given Hierarchy search record type is supported.		supported.
Parameters	osid.type.Type	hierarchySearchRecordType	a Type indicating a Hierarchy search record type
Return	boolean		true if the given Type is supported, false otherwise
Compliance	mandatory		This method must be implemented.



Interface	osid.hierarchy	.HierarchyManager	
11	osid.OsidManager		
Implements	osid.hierarchy.HierarchyProfile		
	The hierarchy manager provides access sessions to traverse and manage hierrachies of Ids. The sessions included in this manager are: • HierarchyTraversalSession: a basic session traversing a hierarchy • HierarchyDesignSession: a session to design a hierarchy		
Description	 HierarchyStructureNotificationSession: a session for notififxations within a hierarchy structure HiererachyLookupSession: a session looking up hiererachies HiererachySearchSession: a session for searching for hierarchies HierarchyAdminSession: a session for creating and deleting hierarchies HierarchyNotificationSession: a session for subscribing to changes in hierarchies 		
Method		yTraversalSession	
Description	Gets the OsidSession associated with the hierar		
Return	osid.hierarchy.HierarchyTraversalSession	a HierarchyTraversalSession	
Errors	OPERATION_FAILED	unable to complete request	
	UNIMPLEMENTED	supportsHierarchyTraversal() is false	
Compliance	optional	This method must be implemented if	
Method	gotUiovachy/Trayor	supportsHierarchyTraversal() is true. salSessionForHierarchy	
Description	Gets the OsidSession associated with the hierar		
Parameters	osid.id.Id hierarchyId	the Id of the hierarchy	
Return	osid.hierarchy.HierarchyTraversalSession	the new HierarchyTraversalSession	
	NOT_FOUND	hierarchyId not found	
	NULL_ARGUMENT	hierarchyid is null	
Errors	OPERATION_FAILED	unable to complete request	
	UNIMPLEMENTED	supportsHierarchyTraversal() or	
-	ONTHI LEMENTED	supportsVisibleFedaration() is false	
		This method must be implemented if	
Compliance	optional	supportsHierarchyTraversal() and	
Method	a chlicus vol	supportsVisibleFederation() are true.	
Description	Gets the OsidSession associated with the hierar		
Return	osid.hierarchy.HierarchyDesignSession	a HierarchyDesignSession	
	OPERATION_FAILED	unable to complete request	
Errors	UNIMPLEMENTED	supportsHierarchyDesign() is false	
0		This method must be implemented if	
Compliance	optional	supportsHierarchyDesign() is true.	
Method	getHierarchyDesig	gnSessionForHierarchy	
Description	Gets the OsidSession associated with the topolo		
Parameters	osid.id.Id hierarchyId	the Id of the graph	
Return	osid.hierarchy.HierarchyDesignSession	a HierarchyDesignSession	
	NOT_FOUND	hierarchyId is not found	
Erroro	NULL_ARGUMENT	hierarchyId is null	
Errors	OPERATION_FAILED	unable to complete request	
	UNIMPLEMENTED	supports/(isibleFodoration() is false	
		supportsVisibleFederation() is false This method must be implemented if	
Compliance	optional	supportsHierarchyDesign() and	
- Compilation	55.5.161	supports/lisibleFederation() are true.	
	·		



Method	getHierarchyStruct	ureNotificationSession	
Description	Gets the session for subscribing to notifications of	changes within a hierarchy structure.	
Return	osid.hierarchy.HierarchyStructureNotificationSession		
	OPERATION FAILED	unable to complete request	
Errors	UNIMPLEMENTED	supportsHierarchyStructureNotification() is	
		false	
		This method must be implemented if	
Compliance	optional	supportsHierarchyStructureNotification() is true.	
Method	getHierarchvStructureNo	tificationSessionForHierarchy	
Description	Gets the session for subscribing to notifications of	changes within a hierarchy structure for the given	
Description	hierarchy.		
Parameters	osid.id.Id hierarchyId	the Id of the graph	
Return	osid.hierarchy.HierarchyStructureNotificationSession	a HierarchyStructureNotificationSession	
	NOT_FOUND	hierarchyId is not found	
	NULL_ARGUMENT	hierarchyId is null	
Errors	OPERATION FAILED	unable to complete request	
		supportsHierarchyStructureNotification() or	
	UNIMPLEMENTED	supportsVisibleFederation() is false	
		This method must be implemented if	
Compliance	optional	supportsHierarchyStructureNotification() and	
	- Parising	supportsVisibleFederation() are true.	
Method	getHierarch	yLookupSession	
Description	Gets the OsidSession associated with the hierarchy lookup service.		
Return	osid.hierarchy.HierarchyLookupSession	a HierarchyLookupSession	
	OPERATION FAILED	unable to complete request	
Errors	UNIMPLEMENTED	supportsHierarchyLookup() is false	
Compliance	ONLY II CELLENTED	This method must be implemented if	
	optional	supportsHierarchyLookup() is true.	
Method	getHierarchySearchSession		
Description	Gets the OsidSession associated with the hierard		
Return	osid.hierarchy.HierarchySearchSession	a HierarchySearchSession	
	OPERATION FAILED	unable to complete request	
Errors	UNIMPLEMENTED	supportsHierarchySearch() is false	
		This method must be implemented if	
Compliance	optional	supportsHierarchySearch() is true.	
Method	getHierarch	yAdminSession	
Description	Gets the hierarchy administrative session.	yaummeession	
Return	osid.hierarchy.HierarchyAdminSession	a HierarchyAdminSession	
Hotain			
F.,,,,,,	OPERATION_FAILED	unable to complete request	
Errors	OPERATION_FAILED	·	
	OPERATION_FAILED UNIMPLEMENTED	supportsHierarchyAdmin() is false	
Errors Compliance	OPERATION_FAILED	supportsHierarchyAdmin() is false This method must be implemented if	
	OPERATION_FAILED UNIMPLEMENTED optional	supportsHierarchyAdmin() is false This method must be implemented if supportsHierarchyAdmin() is true.	
Compliance	OPERATION_FAILED UNIMPLEMENTED optional	supportsHierarchyAdmin() is false This method must be implemented if supportsHierarchyAdmin() is true. otificationSession	
Compliance Method	OPERATION_FAILED UNIMPLEMENTED optional getHierarchyN	supportsHierarchyAdmin() is false This method must be implemented if supportsHierarchyAdmin() is true.	
Compliance Method Description	OPERATION_FAILED UNIMPLEMENTED optional getHierarchyN Gets a hierarchy notification session.	supportsHierarchyAdmin() is false This method must be implemented if supportsHierarchyAdmin() is true. otificationSession	
Method Description Parameters Return	OPERATION_FAILED UNIMPLEMENTED optional getHierarchyN Gets a hierarchy notification session. osid.hierarchy.HierarchyReceiver receiver	supportsHierarchyAdmin() is false This method must be implemented if supportsHierarchyAdmin() is true. otificationSession notification callback	
Compliance Method Description Parameters	OPERATION_FAILED UNIMPLEMENTED optional getHierarchyN Gets a hierarchy notification session. osid.hierarchy.HierarchyReceiver receiver osid.hierarchy.HierarchyNotificationSession	supportsHierarchyAdmin() is false This method must be implemented if supportsHierarchyAdmin() is true. otificationSession notification callback a HierarchyNotificationSession	
Method Description Parameters Return	OPERATION_FAILED UNIMPLEMENTED optional getHierarchyN Gets a hierarchy notification session. osid.hierarchy.HierarchyReceiver receiver osid.hierarchy.HierarchyNotificationSession OPERATION_FAILED	supportsHierarchyAdmin() is false This method must be implemented if supportsHierarchyAdmin() is true. otificationSession notification callback a HierarchyNotificationSession unable to complete request	



Interface	osid.hierarchy.Hi	erarchyProxyManager
Implemente	osid.OsidProxyManager	
Implements	osid.hierarchy.HierarchyProfile	
Description	in this manager accept an Authentication objectincluded in this manager are: HierarchyTraversalSession: a basic session HierarchyDesignSession: a session to design	n a hiererachy session for notififxations within a hierarchy structure g up hiererachies
	 HierarchyAdminSession: a session for creating and deleting hierarchies HierarchyNotificationSession: a session for subscribing to changes in hierarchies 	
Mathad	·	-
Method Description		TraversalSession
Parameters	Gets the OsidSession associated with the hierar	proxy authentication
Return	osid la is a graph with a specific provider of the control of the	' '
neturn	osid.hierarchy.HierarchyTraversalSession	a HierarchyTraversalSession
	NULL_ARGUMENT	authentication is null
_	OPERATION_FAILED	unable to complete request
Errors	PERMISSION_DENIED	authentication is invalid
	UNIMPLEMENTED	supportsHierarchyTraversal() is false
	UNSUPPORTED	the authentication service is not supported
Compliance	optional	This method must be implemented if
-	·	supportsHierarchyTraversal() is true.
Method	getHierarchyTraver	rsalSessionForHierarchy
Description	Gets the OsidSession associated with the hierar osid.id.Id hierarchyId	the Id of the hierarchy
Parameters	osid.authentication. Authentication	proxy authentication
Return	osid.hierarchy.HierarchyTraversalSession	a HierarchyTraversalSession
	NOT FOUND	hierarchyid not found
	NULL_ARGUMENT	hierarchyId or authentication is null
	OPERATION FAILED	unable to complete request
Errors	PERMISSION DENIED	authentication is invalid
		supportsHierarchyTraversal() or
	UNIMPLEMENTED	supportsVisibleFederation() is false
	UNSUPPORTED	the authentication service is not supported
		This method must be implemented if
Compliance	optional	supportsHierarchyTraversal() and
		supportsVisibleFederation() are true.
Method		nyDesignSession
Description	Gets the OsidSession associated with the hierar	
Parameters	osid.authentication.Authentication authentication	proxy authentication
Return	osid.hierarchy.HierarchyDesignSession NULL_ARGUMENT	a HierarchyDesignSession authentication is null
	OPERATION_FAILED	unable to complete request
Errors	PERMISSION_DENIED	authentication is invalid
LIIUIS	UNIMPLEMENTED	supportsHierarchyDesign() is false
	UNSUPPORTED	the authentication service is not supported
	TONOGET ORIED	
		This method must be implemented if
Compliance	optional	This method must be implemented if supportsHierarchyDesign() is true.



Parameters Osid.id. osid.authent Osid.hie NULL_A OPERA PERMIS UNIMPI UNSUP Compliance optiona Method Description Gets the Parameters osid.authent Return osid.hiera NULL_A OPERA OPERA PERMIS UNIMPI UNSUP	OsidSession associated with the total hierarchyId cation.Authentication authentication rarchy.HierarchyDesignSession RGUMENT TON_FAILED SION_DENIED EMENTED PORTED	authentication is null unable to complete request authentication is invalid supportsHierarchyStructureNotification() is false
Parameters Return Osid.id. osid.authent NULL_A OPERAT PERMIS UNIMPI UNSUP Compliance Method Description Parameters Return OPERAT OPERAT PERMIS UNIMPI UNSUP Compliance Optional	Id hierarchyId cation.Authentication rarchy.HierarchyDesignSession RGUMENT TON_FAILED SION_DENIED EMENTED PORTED getHierarchySt session for subscribing to notification cation.Authentication rchy.HierarchyStructureNotificationSes RGUMENT TON_FAILED SION_DENIED EMENTED EMENTED Session for subscribing to notification rchy.HierarchyStructureNotificationSes RGUMENT TON_FAILED SION_DENIED EMENTED	the Id of the hierarchy proxy authentication a HierarchyDesignSession hierarchyid or authentication is null unable to complete request authentication is invalid supportsHierarchyDesign() or supportsVisibleFederation() is false the authentication service is not supported This method must be implemented if supportsHierarchyDesign() and supportsVisibleFederation() are true. **TructureNotificationSession** ons of changes within a hierarchy structure. proxy authentication sion a HierarchyStructureNotificationSession authentication is null unable to complete request authentication is invalid supportsHierarchyStructureNotification() is false
Return osid.authent NULL_A OPERA PERMIS UNIMPI UNSUP Compliance optiona Method Description Gets the Parameters osid.authent Return osid.hiera NULL_A OPERA PERMIS UNIMPI UNSUP Compliance optiona OPERA PERMIS UNIMPI UNSUP Compliance optiona	authentication rarchy.HierarchyDesignSession RGUMENT TON_FAILED SION_DENIED EMENTED PORTED getHierarchySt session for subscribing to notification rchy.HierarchyStructureNotificationSes RGUMENT TON_FAILED SION_DENIED EMENTED getHierarchySt session for subscribing to notification rchy.HierarchyStructureNotificationSes RGUMENT TON_FAILED SION_DENIED EMENTED	proxy authentication a HierarchyDesignSession hierarchyid or authentication is null unable to complete request authentication is invalid supportsHierarchyDesign() or supportsVisibleFederation() is false the authentication service is not supported This method must be implemented if supportsHierarchyDesign() and supportsVisibleFederation() are true. **ructureNotificationSession** ons of changes within a hierarchy structure. proxy authentication sion a HierarchyStructureNotificationSession authentication is null unable to complete request authentication is invalid supportsHierarchyStructureNotification() is false
Return osid.hie Berrors OPERAT PERMIS UNIMPI UNSUP Compliance optiona Method Description Gets the Parameters osid.authent Return osid.hiera Return OPERAT PERMIS UNIMPI UNSUP Compliance optiona OPERAT	rarchy.HierarchyDesignSession RGUMENT TON_FAILED SION_DENIED EMENTED PORTED getHierarchySt session for subscribing to notification cation.Authentication authentication rchy.HierarchyStructureNotificationSes RGUMENT TON_FAILED SION_DENIED EMENTED	a HierarchyDesignSession hierarchyid or authentication is null unable to complete request authentication is invalid supportsHierarchyDesign() or supportsVisibleFederation() is false the authentication service is not supported This method must be implemented if supportsHierarchyDesign() and supportsVisibleFederation() are true. cructureNotificationSession ons of changes within a hierarchy structure. proxy authentication a HierarchyStructureNotificationSession authentication is null unable to complete request authentication is invalid supportsHierarchyStructureNotification() is false
Errors NULL_A OPERAT PERMIS UNIMPRODUCT OPTION O	RGUMENT TON_FAILED SION_DENIED EMENTED PORTED getHierarchySt session for subscribing to notification cation.Authentication authentication irchy.HierarchyStructureNotificationSes RGUMENT TON_FAILED SION_DENIED EMENTED	hierarchyid or authentication is null unable to complete request authentication is invalid supportsHierarchyDesign() or supportsVisibleFederation() is false the authentication service is not supported This method must be implemented if supportsHierarchyDesign() and supportsVisibleFederation() are true. IntervetureNotificationSession ons of changes within a hierarchy structure. proxy authentication sion a HierarchyStructureNotificationSession authentication is null unable to complete request authentication is invalid supportsHierarchyStructureNotification() is false
Errors OPERA PERMIS UNIMPI UNSUP Compliance optiona Method Description Gets the Parameters osid.authent Return osid.hiera OPERA PERMIS UNIMPI UNSUP Compliance optiona	getHierarchySt session for subscribing to notification cation.Authentication authentication rchy.HierarchyStructureNotificationSes RGUMENT ION_FAILED SION_DENIED EMENTED	unable to complete request authentication is invalid supportsHierarchyDesign() or supportsVisibleFederation() is false the authentication service is not supported This method must be implemented if supportsHierarchyDesign() and supportsVisibleFederation() are true. InterventificationSession ons of changes within a hierarchy structure. proxy authentication authentication is null unable to complete request authentication is invalid supportsHierarchyStructureNotification() is false
Errors PERMIS UNIMPI UNSUP Compliance optiona Method Description Gets the Parameters osid.authent Return osid.hiera NULL_A OPERAT PERMIS UNIMPI UNSUP Compliance optiona	GEMENTED GetHierarchySt session for subscribing to notification cation.Authentication authentication irchy.HierarchyStructureNotificationSes RGUMENT ION_FAILED SION_DENIED EMENTED	authentication is invalid supportsHierarchyDesign() or supportsVisibleFederation() is false the authentication service is not supported This method must be implemented if supportsHierarchyDesign() and supportsVisibleFederation() are true. InterventificationSession ons of changes within a hierarchy structure. proxy authentication sion a HierarchyStructureNotificationSession authentication is null unable to complete request authentication is invalid supportsHierarchyStructureNotification() is false
UNIMPLUNSUP Compliance optiona Method Description Gets the osid.authent osid.hiera Return NULL_A OPERAT PERMIS UNIMPLUNSUP Compliance optiona	getHierarchySt session for subscribing to notificatio cation.Authentication authentication rchy.HierarchyStructureNotificationSes RGUMENT TON_FAILED SION_DENIED EMENTED	supportsVisibleFederation() is false the authentication service is not supported This method must be implemented if supportsHierarchyDesign() and supportsVisibleFederation() are true. cructureNotificationSession ons of changes within a hierarchy structure. proxy authentication sion a HierarchyStructureNotificationSession authentication is null unable to complete request authentication is invalid supportsHierarchyStructureNotification() is false
Compliance optional Method Description Gets the osid.authent osid.hiera Return OPERAT PERMIS UNIMPI UNSUP Compliance optional	getHierarchySt session for subscribing to notificatio cation.Authentication authentication rchy.HierarchyStructureNotificationSes RGUMENT TON_FAILED SION_DENIED EMENTED	the authentication service is not supported This method must be implemented if supportsHierarchyDesign() and supportsVisibleFederation() are true. FructureNotificationSession ons of changes within a hierarchy structure. proxy authentication a HierarchyStructureNotificationSession authentication is null unable to complete request authentication is invalid supportsHierarchyStructureNotification() is false
Compliance optional Method Description Gets the Parameters osid.authent Return osid.hiera NULL_A OPERAT PERMIS UNIMPI UNSUP Compliance optional	getHierarchySt session for subscribing to notificatio cation.Authentication authentication rchy.HierarchyStructureNotificationSes RGUMENT TON_FAILED SION_DENIED EMENTED	This method must be implemented if supportsHierarchyDesign() and supportsVisibleFederation() are true. Inductor entered the supports visible for the support
Method Description Gets the Parameters osid.authent Return osid.hiera NULL_A OPERAT PERMIS UNIMPI UNSUP Compliance optiona	getHierarchySt session for subscribing to notificatio cation.Authentication authentication rchy.HierarchyStructureNotificationSes RGUMENT ION_FAILED SION_DENIED EMENTED	supportsHierarchyDesign() and supportsVisibleFederation() are true. structureNotificationSession on sof changes within a hierarchy structure. proxy authentication a HierarchyStructureNotificationSession authentication is null unable to complete request authentication is invalid supportsHierarchyStructureNotification() is false
Method Description Gets the Parameters osid.authent Return osid.hiera NULL_A OPERAT PERMIS UNIMPI UNSUP Compliance optiona	getHierarchySt session for subscribing to notificatio cation.Authentication authentication rchy.HierarchyStructureNotificationSes RGUMENT ION_FAILED SION_DENIED EMENTED	supportsVisibleFederation() are true. ructureNotificationSession ons of changes within a hierarchy structure. proxy authentication a HierarchyStructureNotificationSession authentication is null unable to complete request authentication is invalid supportsHierarchyStructureNotification() is false
Description Gets the Parameters osid.authent osid.hiera NULL_A OPERATE PERMIS UNIMPI UNSUP Compliance optiona	session for subscribing to notification cation. Authentication authentication rchy. HierarchyStructureNotificationSess RGUMENT TON_FAILED SION_DENIED EMENTED	proxy authentication session authentication is null unable to complete request authentication is invalid supportsHierarchyStructureNotification() is false
Description Gets the Parameters osid.authent osid.hiera NULL_A OPERATE PERMIS UNIMPI UNSUP Compliance optiona	session for subscribing to notification cation. Authentication authentication rchy. HierarchyStructureNotificationSess RGUMENT TON_FAILED SION_DENIED EMENTED	proxy authentication sion a HierarchyStructureNotificationSession authentication is null unable to complete request authentication is invalid supportsHierarchyStructureNotification() is false
Parameters osid.authent osid.hiera Return osid.hiera NULL_A OPERA PERMIS UNIMPI UNSUP Compliance optiona	session for subscribing to notification cation. Authentication authentication rchy. HierarchyStructureNotificationSess RGUMENT TON_FAILED SION_DENIED EMENTED	proxy authentication sion a HierarchyStructureNotificationSession authentication is null unable to complete request authentication is invalid supportsHierarchyStructureNotification() is false
Return osid.hiera NULL_A OPERA PERMIS UNIMPI UNSUP Compliance optiona	rchy.HierarchyStructureNotificationSes RGUMENT TON_FAILED SION_DENIED EMENTED	a HierarchyStructureNotificationSession authentication is null unable to complete request authentication is invalid supportsHierarchyStructureNotification() is false
Errors NULL_AOPERATE	RGUMENT TON_FAILED SION_DENIED EMENTED	authentication is null unable to complete request authentication is invalid supportsHierarchyStructureNotification() is false
Errors OPERA PERMIS UNIMPI UNSUP Compliance optiona	ION_FAILED SION_DENIED EMENTED	unable to complete request authentication is invalid supportsHierarchyStructureNotification() is false
Errors PERMIS UNIMPI UNSUP Compliance optiona	SION_DENIED EMENTED	authentication is invalid supportsHierarchyStructureNotification() is false
UNIMPI UNSUP Compliance optiona	EMENTED	supportsHierarchyStructureNotification() is false
UNIMPI UNSUP Compliance optiona		false
UNSUP optional		
Compliance optiona	PORTED	the continue the effective continue to the form of the first of
		the authentication service is not supported
		This method must be implemented if
Method		supportsHierarchyStructureNotification() is
Method		true.
	getHierarchyStructur	eNotificationSessionForHierarchy
Description	Gets the session for subscribing to notifications of changes within a hierarchy structure for the given hierarchy.	
osid id		the Id of the hierarchy
Parameters ———	cation.Authentication authentication	proxy authentication
	rchy.HierarchyStructureNotificationSes	· · · ·
	RGUMENT	hierarchyid or authentication is null
	TON FAILED	unable to complete request
DEDMIC	SION DENIED	authentication is invalid
Errors	_	supportsHierarchyStructureNotification() is
UNIMPI	EMENTED	false
UNSUP	PORTED	the authentication service is not supported
		This method must be implemented if
Compliance optiona		supportsHierarchyStructureNotification() and
		supportsVisibleFederation() are true.
Method		archyLookupSession
	OsidSession associated with the h	
	cation.Authentication authentication	proxy authentication
Return osid.hie		
	rarchy.HierarchyLookupSession	authorication is pull
	RGUMENT	
OPERA	RGUMENT TON_FAILED	unable to complete request
OPERA	RGUMENT	
OPERATE PERMIS	RGUMENT TON_FAILED	unable to complete request
OPERA Errors PERMIS UNIMPI	RGUMENT TON_FAILED SION_DENIED	unable to complete request authentication is invalid
OPERATE PERMIS UNIMPI	RGUMENT TON_FAILED SION_DENIED EMENTED PORTED	unable to complete request authentication is invalid supportsHierarchyLookup() is false
Return osid.hie		a HierarchyLookupSession authentication is null



Description Gets the OsidSession associated with the hierarchy search service. proxy authentication proxy	Method	modelli ama waku Caa wak Caasia w		
Parameters		getHierarchySearchSession		
Return				
NULL_ARGUMENT authentication is null OPERATION_FAILED unable to complete request PERMISSION_DENIED authentication is invalid UNIMPLEMENTED unbelled in authentication service is not supported This method must be implemented if supportsHierarchySearch() is frue. Method getHierarchyAdminSession Parameters osid.authentication_Authentication authentication proxy authentication is null OPERATION_FAILED unable to complete request Errors PERMISSION_DENIED authentication is null OPERATION_FAILED unable to complete request Errors PERMISSION_DENIED authentication is invalid UNIMPLEMENTED supportsHierarchyAdmin() is false UNSUPPORTED the authentication service is not supported This method must be implemented if supportsHierarchyAdmin() is true. Method getHierarchyAdmin() is true. Method getHierarchyNotificationSession Description Gets the hierarchy notification session. Parameters osid.hierarchy.HierarchyReceiver receiver notification callback osid.authentication.Authentication authentication proxy authentication Sescription Operation_Authentication authentication proxy authentication Description Operation_Authentication authentication proxy authentication Description Operation_Authentication authentication proxy authentication Description Operation_Authentication authentication proxy authentication Description_Authentication authentication proxy authentication Description_Authentication_Authentication proxy authentication Description_Authentication_Authentication proxy authentication Description_Authentication_Auth				
Errors Errors PERMISSION_DENIED UNIMPLEMENTED Description Permanus Permission Description Permission Description Permission Parameters Method Description Permission Description Permission Permis	netuiii			
PERMISSION_DENIED authentication is invalid				
UNIMPLEMENTED unsupportsHierarchySearch() is false unsupported the authentication service is not supported the authentication service is not supported optional optional supportsHierarchySearch() is true. Method getHierarchyAdminSession Description Gets the hierarchy administrative session. Parameters osid_authentication_Authentication authentication proxy authentication proxy authentication osid_hierarchy.HierarchyAdminSession at HierarchyAdminSession NULL_ARGUMENT authentication is null OPERATION_FAILED unable to complete request PErrors PERMISSION_DENIED authentication is invalid unimplemented if the authentication service is not supported optional getHierarchyNotificationSession Perameters osid_authentication_authentication proxy authentication proxy authentication Parameters osid_authentication_authentication proxy authentication proxy authentication proxy authentication proxy authentication proxy authentication session Return osid_hierarchy.HierarchyNotificationSession at HierarchyNotificationSession NULL_ARGUMENT authentication is null operation. OPERATION_FAILED unable to complete request proxy authentication is invalid unimplemented if proxy authentication is invalid unimplemented if operation. NULL_ARGUMENT authentication is invalid unimplemented if proxy portsHierarchyNotification() is false unimplemented if authentication service is not supported the authentication be implemented if			· ·	
UNSUPPORTED	Errors			
This method must be implemented if supportsHierarchySearch() is true.				
Method Gets the hierarchy administrative session.		UNSUPPORTED		
SupportsHierarchysearch() is true.	Compliance	ontional	· ·	
Description Gets the hierarchy administrative session. Parameters osid.authentication authentication authentication authentication authentication authentication authentication soid.hierarchy.HierarchyAdminSession a HierarchyAdminSession NULL_ARGUMENT authentication is null OPERATION_FAILED unable to complete request PERMISSION_DENIED authentication is invalid UNIMPLEMENTED unable to complete request UNSUPPORTED unable to complete request UNSUPPORTED authentication service is not supported This method must be implemented if supportsHierarchyAdmin() is true.	Сотприилос	·		
Parameters		getHierarch	yAdminSession	
Return osid.hierarchy.HierarchyAdminSession a HierarchyAdminSession NULL_ARGUMENT authentication is null OPERATION_FAILED unable to complete request PERMISSION_DENIED authentication is invalid UNIMPLEMENTED supportsHierarchyAdmin() is false UNSUPPORTED the authentication service is not supported This method must be implemented if supportsHierarchyAdmin() is true. Method getHierarchyNotificationSession Description Gets the hierarchy notification session. Parameters osid.hierarchy.HierarchyReceiver osid.authentication authentication proxy authentication Return osid.hierarchy.HierarchyNotificationSession a HierarchyNotificationSession NULL_ARGUMENT authentication is null OPERATION_FAILED unable to complete request PERMISSION_DENIED authentication is invalid UNIMPLEMENTED supportsHierarchyNotification() is false UNSUPPORTED the authentication service is not supported Compliance optional				
NULL_ARGUMENT authentication is null			proxy authentication	
Errors OPERATION_FAILED PERMISSION_DENIED UNIMPLEMENTED UNSUPPORTED Optional Optional Optional Osid.hierarchy.Hierarch	Return			
PERMISSION_DENIED authentication is invalid UNIMPLEMENTED supportsHierarchyAdmin() is false the authentication service is not supported This method must be implemented if supportsHierarchyAdmin() is true.				
UNIMPLEMENTED UNSUPPORTED compliance com	Errors	OPERATION_FAILED	unable to complete request	
UNSUPPORTED the authentication service is not supported This method must be implemented if supportsHierarchyAdmin() is true. Method Description Gets the hierarchy notification session. Parameters osid.hierarchy.HierarchyReceiver receiver osid.authentication.Authentication authentication proxy authentication Return osid.hierarchy.HierarchyNotificationSession NULL_ARGUMENT authentication is null OPERATION_FAILED unable to complete request PERMISSION_DENIED authentication is invalid UNIMPLEMENTED supportsHierarchyNotification() is false UNSUPPORTED Compliance optional This method must be implemented if		PERMISSION_DENIED	authentication is invalid	
This method must be implemented if supportsHierarchyAdmin() is true. Method Gets the hierarchy notification session.		UNIMPLEMENTED	supportsHierarchyAdmin() is false	
Method Gets the hierarchy notification session.		UNSUPPORTED	the authentication service is not supported	
Method Gets the hierarchy notification session.	Compliance	antional	This method must be implemented if	
Description Gets the hierarchy notification session.	Compliance	ориона	supportsHierarchyAdmin() is true.	
Description Gets the hierarchy notification session.	Method	getHierarchvN	otificationSession	
Return osid.hierarchy.HierarchyNotificationSession a HierarchyNotificationSession NULL_ARGUMENT authentication is null OPERATION_FAILED unable to complete request PERMISSION_DENIED authentication is invalid UNIMPLEMENTED supportsHierarchyNotification() is false UNSUPPORTED the authentication service is not supported Compliance optional	Description			
Return osid.authentication authentication proxy authentication proxy authentication authentication authentication authentication authentication session authentication session null OPERATION_FAILED unable to complete request PERMISSION_DENIED authentication is invalid unimplemented	Doromotoro		notification callback	
RIVIL_ARGUMENT OPERATION_FAILED Unable to complete request PERMISSION_DENIED UNIMPLEMENTED UNSUPPORTED Compliance Authentication is null unable to complete request authentication is invalid supportsHierarchyNotification() is false the authentication service is not supported This method must be implemented if	Parameters	osid.authentication.Authentication authentication	proxy authentication	
PERMISSION_DENIED unable to complete request PERMISSION_DENIED authentication is invalid UNIMPLEMENTED supportsHierarchyNotification() is false UNSUPPORTED the authentication service is not supported This method must be implemented if	Return	osid.hierarchy.HierarchyNotificationSession	a HierarchyNotificationSession	
PERMISSION_DENIED authentication is invalid UNIMPLEMENTED supportsHierarchyNotification() is false UNSUPPORTED the authentication service is not supported Compliance optional This method must be implemented if		NULL_ARGUMENT	authentication is null	
UNIMPLEMENTED supportsHierarchyNotification() is false UNSUPPORTED the authentication service is not supported This method must be implemented if		OPERATION_FAILED	unable to complete request	
UNSUPPORTED the authentication service is not supported This method must be implemented if	Errors	PERMISSION DENIED	authentication is invalid	
UNSUPPORTED the authentication service is not supported This method must be implemented if		UNIMPLEMENTED	supportsHierarchyNotification() is false	
Compliance optional This method must be implemented if				
L'AMBILIANCE L'ADTIONAL				
	Compliance	optional	supportsHierarchyNotification() is true.	



Interface	osid.hierarchy.Hier	archyTraversalSession	
Implements	osid.OsidSession		
	This session defines methods for traversing a hiercrhy. Each node in the hierarchy is a unique OSID Id. The hierarchy may be traversed recursively to establish the tree structure through getParents() and getChildren(). To relate these Ids to another OSID, getAncestors() and getDescendants() can be used for retrievals that can be used for bulk lookups in other OSIDs. Any Id available in an associated OSID is known to this hierarchy. A lookup up a particular Id in this		
Description	hierarchy for the purposes of establishing a starting point for traversal or determining relationships should use the Id returned from the corresponding OSID object, not an Id that has been stored, to avoid problems with Id translation or aliasing. A user may not be authorized to traverse the entire hierarchy. Parts of the hierarchy may be made invisible through omission from the returns of getParents() or getChildren() in lieu of a PERMISSION_DENIED error that may disrupt the traversal through authorized pathways.		
Method		erarchyId	
Description	Gets the hierarchy Id associated with this session		
Return	osid.id.Id	the hierarchy Id associated with this session	
Compliance Method	mandatory	This method must be implemented.	
Description	Gets the hierarchy associated with this session.	ierarchy	
Return	osid.hierarchy.Hierarchy the hierarchy associated with this session		
Hetum	OPERATION_FAILED	unable to complete request	
Errors	PERMISSION DENIED	authorization failure	
Compliance	mandatory	This method must be implemented.	
Method	canAccessHierarchy		
Description	Tests if this user can perform hierarchy queries. A return of true does not guarantee successful authorization. A return of false indicates that it is known all methods in this session will result in a PERMISSION_DENIED. This is intended as a hint to an application that may opt not to offer lookup operations.		
Return	boolean	false if lookup methods are not authorized, true otherwise	
Compliance	mandatory	This method must be implemented.	
Method	getRoots		
Description	Gets the root nodes of this hierarchy.	I.i.	
Return	osid.id.IdList	the root nodes	
Errors	OPERATION_FAILED PERMISSION_DENIED	unable to complete request authorization failure	
Compliance	mandatory	This method must be implemented.	
Method	· ·	Parents	
Description	Tests if this Id contains any parents.	i di circo	
Parameters	osid.id.Id id	the Id to query	
Return	boolean	true if this Id contains parents, false otherwise	
	NOT_FOUND	id is not found	
Fuueus	NULL_ARGUMENT	id is null	
Errors	OPERATION_FAILED	unable to complete request	
	PERMISSION_DENIED	authorization failure	
Compliance	mandatory	This method must be implemented.	



Method		IC	Parent
Description T	Tests if an Id is a direct		raient
		id	the Id to query
Parameters —		parentId	the Id of a parent
	JSIU.IU.IU	parentiu	true if this parentId is a parent of id, false
Return b	ooolean		otherwise
	NOT FOUND		id is not found
	_		
Frrors —	NULL_ARGUMENT		id or parentId is null
	OPERATION_FAILED		unable to complete request
	PERMISSION_DENIED)	authorization failure
	mandatory		This method must be implemented.
	If parentId not found return false.		
Method			Parents
	Gets the parents of the given id.		I .
	osid.id.Id id		the Id to query
	osid.id.IdList		the parents of the id
	NOT_FOUND		id not found
Errors	NULL_ARGUMENT		id is null
Liiois	OPERATION_FAILED		unable to complete request
P	PERMISSION_DENIED		authorization failure
Compliance n	mandatory		This method must be implemented.
Method		isA	ncestor
	Tests if an Id is an ance		
		id	the Id to query
T di dilictors	osid.id.Id	ancestorId	the Id of an ancestor
Return h	poolean		true if this ancestorId is a parent of id, false
			otherwise
	NOT_FOUND		id not found
Frrore -	NULL_ARGUMENT OPERATION_FAILED		id or ancestorId is null
<u>C</u>			unable to complete request
P	PERMISSION_DENIED		authorization failure
Compliance n	mandatory This method m		This method must be implemented.
Provider Notes If	If ancestorId not found return false.		
Method		getA	ncestors
Description G	Gets the ancestors of the	e given id.	
C	osid.id.Id	id	the Id to query
Parameters	andinal	lovolo	the maximum number of levels to include. A value of
	cardinal	levels	1 returns the same set as getParents().
	osid.id.IdList		the ancestors of the id
N	NOT_FOUND		id not found
Erroro	NULL_ARGUMENT		id is null
Errors	OPERATION_FAILED		unable to complete request
	PERMISSION_DENIED)	authorization failure
	mandatory		This method must be implemented.



Method		hasChildren	
Description	Tests if this Id has any children.		
Parameters	osid.id.Id	id	the Id to query
Return	boolean	1	true if this Id has children, false otherwise
	NOT FOUND		id not found
_	NULL_ARGUMENT		id is null
Errors	OPERATION FAILED		unable to complete request
	PERMISSION DENIE	D	authorization failure
Compliance	mandatory		This method must be implemented.
Method			isChild
Description	Tests if a node is a dire		
Davamatana	osid.id.Id	id	the Id to query
Parameters	osid.id.Id	childId	the Id of a child
Detum	haalaan	•	true if this childId is a child of the Id, false
Return	boolean		otherwise
	NOT_FOUND		id not found
Errors	NULL_ARGUMENT		id or childId is null
Ellois	OPERATION_FAILED		unable to complete request
	PERMISSION_DENIED		authorization failure
Compliance	mandatory		This method must be implemented.
Provider Notes	If childId not found return false.		
Method	get		tChildren
Description	Gets the children of the		
Dougmatara	osid.id.Id id		the Id to query
Parameters		<u> </u>	
Return	osid.id.IdList	1 -	the children of the id
	osid.id.IdList NOT_FOUND		the children of the id id not found
	osid.id.IdList NOT_FOUND NULL_ARGUMENT	1	the children of the id id not found id is null
Return	osid.id.IdList NOT_FOUND NULL_ARGUMENT OPERATION_FAILED		the children of the id id not found id is null unable to complete request
Return	osid.id.IdList NOT_FOUND NULL_ARGUMENT OPERATION_FAILED PERMISSION_DENIE		the children of the id id not found id is null unable to complete request authorization failure
Return Errors Compliance	osid.id.IdList NOT_FOUND NULL_ARGUMENT OPERATION_FAILED	D	the children of the id id not found id is null unable to complete request authorization failure This method must be implemented.
Return Errors Compliance Method	osid.id.IdList NOT_FOUND NULL_ARGUMENT OPERATION_FAILED PERMISSION_DENIE mandatory	D is D e	the children of the id id not found id is null unable to complete request authorization failure
Return Errors Compliance	osid.id.IdList NOT_FOUND NULL_ARGUMENT OPERATION_FAILED PERMISSION_DENIE mandatory Tests if a node is a desc	isDecendant of another.	the children of the id id not found id is null unable to complete request authorization failure This method must be implemented.
Return Errors Compliance Method	osid.id.IdList NOT_FOUND NULL_ARGUMENT OPERATION_FAILED PERMISSION_DENIE mandatory Tests if a node is a descosid.id.Id	isDecendant of another.	the children of the id id not found id is null unable to complete request authorization failure This method must be implemented. escendant the Id to query
Return Errors Compliance Method Description	osid.id.IdList NOT_FOUND NULL_ARGUMENT OPERATION_FAILED PERMISSION_DENIE mandatory Tests if a node is a desc	isDecendant of another.	the children of the id id not found id is null unable to complete request authorization failure This method must be implemented. escendant the Id to query the Id of a descendant
Return Errors Compliance Method Description	osid.id.IdList NOT_FOUND NULL_ARGUMENT OPERATION_FAILED PERMISSION_DENIE mandatory Tests if a node is a descosid.id.Id	isDecendant of another.	the children of the id id not found id is null unable to complete request authorization failure This method must be implemented. escendant the Id to query the Id of a descendant true if this descendantId is a child of the Id, false
Errors Compliance Method Description Parameters	osid.id.IdList NOT_FOUND NULL_ARGUMENT OPERATION_FAILED PERMISSION_DENIE mandatory Tests if a node is a descondid.id.Id osid.id.Id boolean	isDecendant of another.	the children of the id id not found id is null unable to complete request authorization failure This method must be implemented. escendant the Id to query the Id of a descendant true if this descendantId is a child of the Id, false otherwise
Return Errors Compliance Method Description Parameters Return	osid.id.IdList NOT_FOUND NULL_ARGUMENT OPERATION_FAILED PERMISSION_DENIE mandatory Tests if a node is a descosid.id.Id osid.id.Id boolean NOT_FOUND	isDecendant of another.	the children of the id id not found id is null unable to complete request authorization failure This method must be implemented. escendant the Id to query the Id of a descendant true if this descendantId is a child of the Id, false otherwise id not found
Errors Compliance Method Description Parameters	osid.id.IdList NOT_FOUND NULL_ARGUMENT OPERATION_FAILED PERMISSION_DENIE mandatory Tests if a node is a descosid.id.Id osid.id.Id boolean NOT_FOUND NULL_ARGUMENT	isDecendant of another.	the children of the id id not found id is null unable to complete request authorization failure This method must be implemented. escendant the Id to query the Id of a descendant true if this descendantId is a child of the Id, false otherwise id not found id or descendant is null
Return Errors Compliance Method Description Parameters Return	osid.id.IdList NOT_FOUND NULL_ARGUMENT OPERATION_FAILED PERMISSION_DENIE mandatory Tests if a node is a descosid.id.Id osid.id.Id boolean NOT_FOUND NULL_ARGUMENT OPERATION_FAILED	cendant of another.	the children of the id id not found id is null unable to complete request authorization failure This method must be implemented. escendant the Id to query the Id of a descendant true if this descendantId is a child of the Id, false otherwise id not found id or descendant is null unable to complete request
Return Errors Compliance Method Description Parameters Return Errors	osid.id.IdList NOT_FOUND NULL_ARGUMENT OPERATION_FAILED PERMISSION_DENIE mandatory Tests if a node is a desc osid.id.Id osid.id.Id boolean NOT_FOUND NULL_ARGUMENT OPERATION_FAILED PERMISSION_DENIE	cendant of another.	the children of the id id not found id is null unable to complete request authorization failure This method must be implemented. escendant the Id to query the Id of a descendant true if this descendantId is a child of the Id, false otherwise id not found id or descendant is null unable to complete request authorization failure
Return Errors Compliance Method Description Parameters Return	osid.id.IdList NOT_FOUND NULL_ARGUMENT OPERATION_FAILED PERMISSION_DENIE mandatory Tests if a node is a desc osid.id.Id osid.id.Id boolean NOT_FOUND NULL_ARGUMENT OPERATION_FAILED PERMISSION_DENIE mandatory	isDecendant of another. id descendantId	the children of the id id not found id is null unable to complete request authorization failure This method must be implemented. escendant the Id to query the Id of a descendant true if this descendantId is a child of the Id, false otherwise id not found id or descendant is null unable to complete request



Method		getDescendants		
Description	Gets the descendants			
	osid.id.Id	lid	the Id to query	
Parameters	cardinal	levels	the maximum number of levels to include. A value of	
			1 returns the same set as getChildren().	
Return	osid.id.IdList		the descendants of the id	
	NOT_FOUND		id not found	
Errors	NULL_ARGUMENT		id is null	
	OPERATION_FAILED		unable to complete request	
	PERMISSION_DENIE	<u>D</u>	authorization failure	
Compliance	mandatory		This method must be implemented.	
Method			UpBreadthFirst	
Description	l .	-	ard. A hierarchy with multiple parents may return	
		ne same Id at different lev	<u> </u>	
Parameters	osid.id.Id	startNodeId	the Id of the start node	
- arameters	cardinal	levels	the maximum number of levels to include	
Return	osid.hierarchy.Positi	onList	the ancestors of the id	
	NOT_FOUND		id not found	
Errors	NULL_ARGUMENT		id is null	
Effors	OPERATION_FAILED)	unable to complete request	
	PERMISSION DENIED		authorization failure	
Compliance	mandatory		This method must be implemented.	
Method	traverseUpDepthFirst		eUpDepthFirst	
Description	Traverses the hierarchy from the start node upw		ard. A hierarchy with multiple parents may return	
Description	multiple positions for the	ne same Id at different lev	els of the hierarchy.	
Parameters	osid.id.Id	startNodeId	the Id of the start node	
T di dilicici 3	cardinal	levels	the maximum number of levels to include	
Return	osid.hierarchy.Positi	onList	the ancestors of the id	
	NOT_FOUND		id not found	
Errors			na not round	
EIIUIS	NULL_ARGUMENT		id is null	
	NULL_ARGUMENT OPERATION_FAILED)		
			id is null	
Compliance	OPERATION_FAILED		id is null unable to complete request	
Compliance Method	OPERATION_FAILED PERMISSION_DENIE	ED	id is null unable to complete request authorization failure	
Method	OPERATION_FAILED PERMISSION_DENIE mandatory	traverse D	id is null unable to complete request authorization failure This method must be implemented.	
	OPERATION_FAILED PERMISSION_DENIE mandatory Traverses the hierarch	traverse D	id is null unable to complete request authorization failure This method must be implemented. DwnBreadthFirst nward. A hierarchy with multiple parents may return	
Method Description	OPERATION_FAILED PERMISSION_DENIE mandatory Traverses the hierarch	traverseDo y from the start node dow	id is null unable to complete request authorization failure This method must be implemented. DwnBreadthFirst nward. A hierarchy with multiple parents may return	
Method	OPERATION_FAILED PERMISSION_DENIE mandatory Traverses the hierarch multiple positions for the	traverseDown the start node down the same ld at different levels	id is null unable to complete request authorization failure This method must be implemented. DwnBreadthFirst nward. A hierarchy with multiple parents may return els of the hierarchy.	
Method Description	OPERATION_FAILED PERMISSION_DENIE mandatory Traverses the hierarch multiple positions for th osid.id.Id	traverseDe y from the start node downe same ld at different level startNodeId levels	id is null unable to complete request authorization failure This method must be implemented. DwnBreadthFirst nward. A hierarchy with multiple parents may return els of the hierarchy. the Id of the start node	
Method Description Parameters	OPERATION_FAILED PERMISSION_DENIE mandatory Traverses the hierarch multiple positions for th osid.id.Id cardinal	traverseDe y from the start node downe same ld at different level startNodeId levels	id is null unable to complete request authorization failure This method must be implemented. DwnBreadthFirst nward. A hierarchy with multiple parents may return els of the hierarchy. the Id of the start node the maximum number of levels to include	
Method Description Parameters Return	OPERATION_FAILED PERMISSION_DENIE mandatory Traverses the hierarch multiple positions for th osid.id.Id cardinal osid.hierarchy.Positi	traverseDe y from the start node downe same ld at different level startNodeId levels	id is null unable to complete request authorization failure This method must be implemented. DwnBreadthFirst nward. A hierarchy with multiple parents may return els of the hierarchy. the Id of the start node the maximum number of levels to include the descendants of the id	
Method Description Parameters	OPERATION_FAILED PERMISSION_DENIE mandatory Traverses the hierarch multiple positions for th osid.id.Id cardinal osid.hierarchy.Positi NOT_FOUND	traverseDo y from the start node downerse same ld at different levels startNodeId levels onList	id is null unable to complete request authorization failure This method must be implemented. DwnBreadthFirst nward. A hierarchy with multiple parents may return els of the hierarchy. the Id of the start node the maximum number of levels to include the descendants of the id id not found	
Method Description Parameters Return	OPERATION_FAILED PERMISSION_DENIE mandatory Traverses the hierarch multiple positions for th osid.id.Id cardinal osid.hierarchy.Positi NOT_FOUND NULL_ARGUMENT	traverseDo y from the start node downe same ld at different level startNodeId levels onList	id is null unable to complete request authorization failure This method must be implemented. DwnBreadthFirst nward. A hierarchy with multiple parents may return els of the hierarchy. the Id of the start node the maximum number of levels to include the descendants of the id id not found id is null	



Method	traverseDownDepthFirst		
Description	Traverses the hierarchy from the start node downward. A hierarchy with multiple parents may return		
	multiple positions for the	<u>same Id at different leve</u>	els of the hierarchy.
Parameters	osid.id.Id	startNodeId	the Id of the start node
Farameters	cardinal levels		the maximum number of levels to include
Return	osid.hierarchy.PositionList		the descendants of the id
	NOT_FOUND		id not found
Errors	NULL_ARGUMENT		id is null
Ellois	OPERATION_FAILED		unable to complete request
	PERMISSION_DENIE)	authorization failure
Compliance	mandatory		This method must be implemented.



Interface		osid.hierarchy.Hie	erarchyDesignSession
Implements	osid.OsidSession		
	This session provides methods to manage a hierarchy. Each node is expressed as an OSID Id that		
Description			expresses relationships among these lds. However,
	changing the hierarchy	may have implications, su	ch as inherited data, in the associated OSID.
Method		getHi	erarchyId
Description	,	ssociated with this session	1.
Return	osid.id.Id		the hierarchy Id associated with this session
Compliance	mandatory		This method must be implemented.
Method		getH	lierarchy
Description	Gets the hierarchy asso	ciated with this session.	
Return	osid.hierarchy.Hierar	chy	the hierarchy associated with this session
Errors	OPERATION_FAILED		unable to complete request
	PERMISSION_DENIE	D	authorization failure
Compliance	mandatory		This method must be implemented.
Method			ifyHierarchy
		•	rn of true does not guarantee successful authorization.
Description			ing any update will result in a
2000			int to an application that may opt not to offer these
	operations to an unauthorized user.		folgo if above in a this biography is not suthevised
Return	boolean		false if changing this hierarchy is not authorized,
Compliance	mandatory		true otherwise This method must be implemented.
Method	manageory	20	dRoot
Description	Adds a root node.	ac	dicot
Parameters	osid.id.Id	lid	the Id of the node
	ALREADY_EXISTS	ļ -	id is already in hierarchy
	NOT FOUND		id not found
Errors	NULL ARGUMENT		id is null
	OPERATION FAILED		unable to complete request
	PERMISSION DENIE	 D	authorization failure
Compliance	mandatory		This method must be implemented.
Method		ad	dChild
Description	Adds a child to a Id.		
Parameters	osid.id.Id	id	the Id of the node
Parameters	osid.id.Id	childId	the Id of the new child
	NOT_FOUND		id or childId not found
Erroro	NULL_ARGUMENT		id or childId is null
Errors	OPERATION_FAILED		unable to complete request
	PERMISSION_DENIE	D	authorization failure
Compliance	mandatory		This method must be implemented.



Method			moveAhead
Description	I .	the same hierarchy level	for sequencing by moving a node ahead of a reference
	node.	T	lu +1 (u
Parameters	osid.id.Id	id	the Id of the node to move
	osid.id.Id	referenceId	id is ordered in front of this reference node
	INVALID_ARGUM	1EN I	id or referenceId not in a sequence
-	NOT_FOUND	_	id or referenceId not found
Errors	NULL_ARGUMEN		id or referenceId is null
	OPERATION_FAIL		unable to complete request
	PERMISSION_DE	:NIED	authorization failure
Compliance	optional		This method must be implemented if HierarchyManager.supportsNodeSequencing() is true.
Method			moveBehind
Description	Reorders nodes at	the same hierarchy level	for sequencing by moving a node behind a reference node.
Parameters	osid.id.Id	id	the Id of the node to move
- arameters	osid.id.Id	referenceId	id is ordered behind this reference node
	INVALID_ARGUM	IENT	id or referenceId not in a sequence
	NOT_FOUND		id or referenceId not found
Errors	NULL_ARGUMEN	Т	id or referenceId is null
	OPERATION_FAIL	LED	unable to complete request
	PERMISSION_DE	NIED	authorization failure
0			This method must be implemented if
Compliance	optional		HierarchyManager.supportsNodeSequencing() is true.
Method			removeRoot
Description	Removes a root no		
Parameters	osid.id.Id	id	the Id of the node
	NOT_FOUND		id was not found or not in hierarchy
Errors	NULL_ARGUMEN		id is null
20.0	OPERATION_FAIL		unable to complete request
	PERMISSION_DE	NIED	authorization failure
Compliance	mandatory		This method must be implemented.
Method			removeChild
Description	Removes a child from		lu z Lau
Parameters	osid.id.Id	id	the Id of the node
	osid.id.Id	childId	the Id of the child to remove
	NOT_FOUND		id or childId was not found
Errors	NULL_ARGUMEN		id or childId is null
	OPERATION_FAIL		unable to complete request
	PERMISSION_DE	NIED	authorization failure
Compliance	mandatory		This method must be implemented.
Method	Demand district		emoveChildren
Description Parameters	Removes all childre osid.id.Id	en from an Id. id	the Id of the node
Farantelers		ĮΙU	
	NOT_FOUND NULL_ARGUMEN		an node identified by the given Id was not found id is null
Errors			unable to complete request
	OPERATION_FAIL		authorization failure
	PERMISSION_DENIED		
Compliance	mandatory	ווובט	This method must be implemented.



Interface	osid.hierarchy.Hierarchy	StructureNotificationSession
Implements	osid.OsidSession	
Description	session is intended for consumers needing to syn polling. Notifications are cancelled when this sess	ucture of a hierarchy. For notifications of changes to
Method		erarchyId
Description	Gets the hierarchy Id associated with this session	
Return	osid.id.Id	the hierarchy Id associated with this session
Compliance	mandatory	This method must be implemented.
Method		lierarchy
Description	Gets the Hierarchy associated with this session.	nerarchy
Return	osid.hierarchy.Hierarchy	the Hierarchy associated with this session
	OPERATION FAILED	unable to complete request
Errors	PERMISSION DENIED	authorization failure
Compliance	mandatory	This method must be implemented.
Method		chyStructureNotifications
Description	Tests if this user can register for Hierarchy node successful authorization. A return of false indicate in a PERMISSION_DENIED. This is intended as notification operations.	es that it is known all methods in this session will result
Return	boolean	false if notification methods are not authorized, true otherwise
Compliance	mandatory	This method must be implemented.
Method	registerForNe	wHierarchyNodes
Description	Register for notifications of new hierarchy nodes. invoked when a new Hierarchy node is added.	
Errors	OPERATION_FAILED	unable to complete request
	PERMISSION_DENIED	authorization failure
Compliance	mandatory	This method must be implemented.
Method	registerForC	hangedAncestor
Description	node. HierarchyStructureReceiver.newAnces HierarchyStructureReceiver.deletedAncestor experiences a change in ancestry.	**
Parameters	osid.id.Id nodeId	the Id of the hierarchy node to monitor
	NOT_FOUND	a hierarchy node was not found identified by the given Id
Errors	NULL_ARGUMENT	nodeId is null
	OPERATION_FAILED	unable to complete request authorization failure
Compliance	PERMISSION_DENIED mandatory	This method must be implemented.
Compliance		Triis metrioù must de implementeu.



Method		registerForCh	angedDescendant
	_	-	structure that impacts the descendants of the specified
LIBECTINIAN	node. HierarchyStructureReceiver.newDescendant() or		
Decomption	HierarchyStructureReceiver.deletedDescendant() is invoked when the specified hierarchy node		
	<u>experiences a change ir</u>	offspring.	
Parameters	osid.id.Id	nodeId	the Id of the hierarchy node to monitor
	NOT FOUND		a hierarchy node was not found identified by the
	NOT_FOUND		given Id
Errors	NULL_ARGUMENT		nodeId is null
	OPERATION_FAILED		unable to complete request
	PERMISSION_DENIE)	authorization failure
Compliance	mandatory		This method must be implemented.
Method		registerForDele	tedHierarchyNodes
	Registers for notification	of deleted hierarchy nod	es.HierarchyStructureReceiver.deletedNode() is
I Description	invoked when a hierarch		ob. The furefry Structure Receive Fractice and activate () is
⊢rr∩re ⊢	OPERATION_FAILED		unable to complete request
	PERMISSION_DENIE)	authorization failure
Compliance	mandatory		This method must be implemented.
Method		registerForDelo	etedHierarchyNode
	Registers for notification	of a deleted hierarchy no	ode. HierarchyStructureReceiver.deletedNode() is
Description	•	ied hierarchy node is dele	, , ,
	<u> </u>		
Parameters	osid.id.Id	nodeId	the Id of the Hierarchy node to monitor
	NOT_FOUND		a hierarchy node was not found identified by the
_			given Id
_	NULL_ARGUMENT		nodeId is null
	OPERATION_FAILED		unable to complete request
	PERMISSION_DENIE)	authorization failure
Compliance	mandatory		This method must be implemented.



Interface	osid.hierarchy.Hie	erarchyLookupSession
Implements	osid.OsidSession	
	This session provides methods for retrieving Hierarchy objects. The Hierarchy represents a structure of OSID Ids.	
	This session defines views that offer differing behaviors when retrieving multiple objects.	
Description	comparative view: elements may be silently omi plenary view: provides a complete set or is an elements.	
	Generally, the comparative view should be used for most applications as it permits operation even if there is data that cannot be accessed. For example, a browsing application may only need to examine the Hierarchies objects it can access, without breaking execution. However, an assessment may only be useful if all Hierarchy objects referenced by it are available, and a test-taking applicationmay sacrifice some interoperability for the sake of precision.	
Method		ıpHierarchies
Description	Tests if this user can perform Hierarchy lookups. A return of true does not guarantee successful authorization. A return of false indicates that it is known all methods in this session will result in a PERMISSION_DENIED. This is intended as a hint to an application that may opt not to offer lookup operations to unauthorized users.	
Return	boolean	false if lookup methods are not authorized, true otherwise
Compliance	mandatory	This method must be implemented.
Method	useComparat	iveHierarchyView
Description	•	translate elements based on this session, such as is used when greater interoperability is desired at the
Compliance	mandatory	This method is must be implemented.
Method	usePlenary	HierarchyView
Description		red. Methods will return what is requested or result in
Compliance	mandatory	This method is must be implemented.
Method		lierarchy
Description	Gets the Hierarchy specified by its Id. In plenary results. Otherwise, the returned Hierarchy may have a duplicate Id was assigned to a Hierarch	nave a different Id than requested, such as the case
Parameters	osid.id.Id hierarchyId	the Id of the Hierarchy to rerieve
Return	osid.hierarchy.Hierarchy	the returned Hierarchy
	NOT_FOUND	no Hierarchy found with the given Id
Errors	NULL_ARGUMENT	hierarchyId is null
	OPERATION_FAILED	unable to complete request
	PERMISSION_DENIED	authorization failure
Compliance	mandatory	This method must be implemented.



Open Knowledge Initiative Method	g skill and	archica DyTda
Method		archiesByIds
Description	Gets a Hierarchy corresponding to the given IdList. In plenary mode, the returned list contains all of the hierarchies specified in the Id list, in the order of the list, including duplicates, or an error results if an Id in the supplied list is not found or inaccessible. Otherwise, inaccessible Hierarchy objects may be omitted from the list and may present the elements in any order including returning a unique set.	
Parameters	osid.id.IdList hierarchyIdList	the list of Ids to rerieve
Return	osid.hierarchy.HierarchyList	the returned Hierarchy list
	NOT_FOUND	an Id was not found
Errors	NULL_ARGUMENT	hierarchyIdList is null
Ellois	OPERATION_FAILED	unable to complete request
	PERMISSION_DENIED	authorization failure
Compliance	mandatory	This method must be implemented.
Method	getHierarch	iesByGenusType
		genus Type which does not include hierarchies of
Description	types derived from the specified Type. In plenar	
		urned list may contain only those repositories that are
Davamatava	accessible through this session. In both cases, th	
Parameters	osid.type.Type hierarchyGenusType	a hierarchy genus type
Return	osid.hierarchy.HierarchyList	the returned Hierarchy list
Errors	NULL_ARGUMENT	hierarchyGenusType is null
EHOIS	OPERATION_FAILED PERMISSION DENIED	unable to complete request authorization failure
Compliance	mandatory	This method must be implemented.
Method	getHierarchiesByParentGenusType	
Wicthou	Gets a HierarchyList corresponding to the given hierarchy genus Type and include any additional	
	1	Type. In plenary mode, the returned list contains all
Description		the returned list may contain only those hierarchies
	that are accessible through this session. In both of	· · · · · · · · · · · · · · · · · · ·
Parameters	osid.type.Type hierarchyGenusType	a hierarchy genus type
Return	osid.hierarchy.HierarchyList	the returned Hierarchy list
	NULL_ARGUMENT	hierarchyGenusType is null
Errors	OPERATION_FAILED	unable to complete request
	PERMISSION_DENIED	authorization failure
Compliance	mandatory	This method must be implemented.
Method	getHierarchi	esByRecordType
	Gets a HierarchyList corresponding to the given	hierarchy record Type. The set of hierarchies
Description	1	In plenary mode, the returned list contains all known
Description		urned list may contain only those hierarchies that are
	accessible through this session. In both cases, th	
Parameters	osid.type.Type hierarchyRecordType	
		the returned Hierarchy list
Return	osid.hierarchy.HierarchyList	·
Return	NULL_ARGUMENT	hierarchyRecordType is null
	NULL_ARGUMENT OPERATION_FAILED	hierarchyRecordType is null unable to complete request
Return	NULL_ARGUMENT	hierarchyRecordType is null



Method	getHierarchies		
	Gets all Repositories. In plenary mode, the returned list contains all known hierarchies or an error		
Description	results. Otherwise, the returned list may contain of	only those hierarchies that are accessible through this	
	session. In both cases, the order of the set is not	specified.	
Return	osid.hierarchy.HierarchyList a list of Hierarchies		
Енчоно	DPERATION_FAILED unable to complete request		
Errors	PERMISSION_DENIED	authorization failure	
Compliance	mandatory	This method must be implemented.	



Interface	osid hierarchy b	lierarchySearchSession	
Implements	osid.OsidSession		
Description	This session provides methods for searching among Hierarchy objects. The search query is constructed using the HierarchyQuery interface. getHierarchiesByQuery() is the basic search method and returns a list of Hierarchy objects. A more advanced search may be performed with getHierarchiesBySearch(). It accepts a HierarchySearch interface in addition to the query interface for the purpose of specifying additional options affecting the entire search, such as ordering. getHierarchiesBySearch() returns a HierarchySearchResults interface that can be used to access the resulting HierarchyList or be used to perform a search within the result set through HierarchySearch.		
	l · · · · · · · · · · · · · · · · · · ·	indicated by their respective record types. The record	
	query interface is accessed via the Hierarchu		
Method		rchHierarchies	
Description	authorization. A return of false indicates that it i	Tests if this user can perform Hierarchy searches. A return of true does not guarantee successful authorization. A return of false indicates that it is known all methods in this session will result in a PERMISSION_DENIED. This is intended as a hint to an application that may opt not to offer search operations to unauthorized users.	
Return	boolean false if lookup methods are not authorized, true otherwise		
Compliance	mandatory This method must be implemented.		
Method	getHierarchyQuery		
Description	Gets a hierarchy query interface.		
Return	osid.hierarchy.HierarchyQuery	the hierarchy query	
Compliance	mandatory	This method must be implemented.	
Method	getHier	archiesByQuery	
Description	Gets a list of Hierarchy objects matching the		
Parameters	osid.hierarchy.HierarchyQuery hierarchyQuery	the search query	
Return	osid.hierarchy.HierarchyList	the returned HierarchyList	
	NULL_ARGUMENT	hierarchyQuery is null	
Errors	OPERATION_FAILED	unable to complete request	
EIIOIS	PERMISSION_DENIED	authorization failure	
	UNSUPPORTED hierarchyQuery is not of this service		
Compliance	mandatory	This method must be implemented.	
Method	getHid	erarchySearch	
Description	Gets a hierarchy search interface.		
Return	osid.hierarchy.HierarchySearch	the hierarchy search interface	
Compliance	mandatory	This method must be implemented.	
Method		rchySearchOrder	
Description	Gets a hierarchy search order interface. The H HierarchySearch to specify the ordering of re	· · · · · · · · · · · · · · · · · · ·	
Return	osid.hierarchy.HierarchySearchOrder	the hierarchy search order interface	
Compliance	mandatory	This method must be implemented.	



Method	getHierarchiesBySearch		
Description	Gets the search results matching the given search		arch query using the given search.
Parameters	osid.hierarchy.HierarchyQuery	hierarchyQuery	the search query
Parameters	osid.hierarchy.HierarchySearch	hierarchySearch	the search interface
Return	osid.hierarchy.HierarchySearchResults		the search results
	NULL_ARGUMENT		hierarchyQuery or hierarchySearch is null
	OPERATION_FAILED		unable to complete request
Errors	PERMISSION_DENIED		authorization failure
	UNSUPPORTED		hierarchyQuery or hierarchySearch is not of this
	UNSUPPORTED		service
Compliance	mandatory		This method must be implemented.



Interface	osid.hierarchy.HierarchyAdminSession	
Implements	osid.OsidSession	
Description	This session creates and removes hierarchies. The data for create and update is provided by the consumer via the form object.	
Method	canCreat	eHierarchies
Description	Tests if this user can create Hierarchy objects. A authorization. A return of false indicates that it is k PERMISSION_DENIED. This is intended as a hi operations to unauthorized users.	nown creating a Hierarchy will result in a nt to an application that may not wish to offer create
Return	boolean	false if Hierarchy creation is not authorized, true otherwise
Compliance	mandatory	This method must be implemented.
Method	canCreateHierard	chyWithRecordTypes
Description	are supported, this method tests which record(s) a Providing an empty array tests if a Hierarchy can	() can be used to examine which record interfaces are required for creating a specific Hierarchy. be created with no records.
Parameters	osid.type.Type[] hierarchyRecordTypes	
Return	boolean	true if Hierarchy creation using the specified Types is supported, false otherwise
Errors	NULL ARGUMENT	hierarchyRecordTypes is null
Compliance	mandatory	This method must be implemented.
Method	getHierarchy	yFormForCreate
Description	Gets the hierarchy form for creating new hierarchies. A new form should be requested for each create transaction. This method is used for creating new hierarchies, where only the Hierarchy Type is known.	
Return	osid.hierarchy.HierarchyForm	the hierarchy form
Compliance	mandatory	This method must be implemented.
Method	create	Hierarchy
Description	Creates a new Hierarchy.	
Parameters	osid.hierarchy.HierarchyForm hierarchyForm	the form for this Hierarchy
Return	osid.hierarchy.Hierarchy	the new Hierarchy
Errors	ALREADY_EXISTS INVALID_ARGUMENT NULL_ARGUMENT OPERATION_FAILED PERMISSION_DENIED	attempt at duplicating a property the underlying system is enforcing to be unique one or more of the form elements is invalid hierarchyForm is null unable to complete request authorization failure
Compliance	UNSUPPORTED	a hierarchyForm is not of this service This method must be implemented.
Compliance	· · ·	
Method Description	CanUpdateHierarchies Tests if this user can update Hierarchy objects. A return of true does not guarantee successful authorization. A return of false indicates that it is known updating a Hierarchy will result in a PERMISSION_DENIED. This is intended as a hint to an application that may not wish to offer update operations to unauthorized users.	
Return	boolean	false if Hierarchy modification is not authorized, true otherwise
Compliance	mandatory	This method must be implemented.
Compliance	I I I a I I U I I I	mis memou must be implemented.



Method	canl	JpdateHierarchy	
		archy. A return of true does not guarantee successful	
		it is known updating the Hierarchy will result in a	
Description	PERMISSION_DENIED. This is intended as a hint to an application that may not wish to offer u		
	operations to unauthorized users.		
Parameters	osid.id.Id hierarchyId	the Id of the Hierarchy	
Datama	· · ·	false if hierarchy modification is not authorized, true	
Return	boolean	otherwise	
Errors	NULL_ARGUMENT	hierarchyId is null	
Compliance	mandatory	This method must be implemented.	
Provider Notes		eptable to return false to indicate the lack of an update	
	available.		
Method		rchyFormForUpdate	
Description		ing hierarchy. A new hierarchy form should be requested	
	for each update transaction.	lu =1 4 u u u	
Parameters	osid.id. Id hierarchyId	the Id of the Hierarchy	
Return	osid.hierarchy.HierarchyForm	the hierarchy form	
Function	NOT_FOUND	hierarchyId is not found	
Errors	NULL_ARGUMENT	hierarchyId is null	
Compliance	OPERATION_FAILED	unable to complete request	
Compliance	mandatory	This method must be implemented.	
Method	updateHierarchy		
Description	Updates an existing hierarchy.	the Talef the Hieronoby	
Parameters	osid.id.Id hierarchyId	the Id of the Hierarchy the form containing the elements to be updated	
	osid.hierarchy.HierarchyForm hierarchyForm	the form containing the elements to be updated	
	INVALID_ARGUMENT NOT_FOUND	hierarchyId is not found	
	NULL ARGUMENT	hierarchyId or hierarchyForm is null	
Errors	OPERATION_FAILED	unable to complete request	
	PERMISSION DENIED	authorization failure	
	UNSUPPORTED	hierarchyForm is not supported	
Compliance	mandatory	This method must be implemented.	
Method		eleteHierarchies	
mourou		etecenteral cines ets. A return of true does not guarantee successful	
		it is known deleting a Hierarchy will result in a	
Description		s a hint to an application that may not wish to offer delete	
	operations to unauthorized users.	s a milit to an application that may not wish to oner delete	
		false if Hierarchy deletion is not authorized, true	
Return	boolean	otherwise	
Compliance	mandatory	This method must be implemented.	
Method	cani	DeleteHierarchy	
	Tests if this user can delete a specified Hiera	archy. A return of true does not guarantee successful	
Description	authorization. A return of false indicates that it is known deleting the Hierarchy will result in a		
Description			
	operations to unauthorized users.		
Parameters	osid.id.Id hierarchyId	the Id of the Hierarchy	
Return	boolean	false if deletion of this Hierarchy is not authorized,	
		true otherwise	
Errors	NULL_ARGUMENT	hierarchyId is null	
Compliance	mandatory	This method must be implemented.	
Provider Notes	•	eptable to return false to indicate the lack of an delete	
	available.		



Method	deleteHierarchy		Hierarchy
Description	Deletes a Hierarchy.		
Parameters	osid.id.Id	hierarchyId	the Id of the Hierarchy to remove
	NOT_FOUND		hierarchyId not found
Errors	NULL_ARGUMENT		hierarchyId is null
EIIOIS	OPERATION_FAILED		unable to complete request
	PERMISSION_DENIE	D	authorization failure
Compliance	mandatory		This method must be implemented.
Method	addIdToHierarchy		oHierarchy
Description	Adds an Id to a Hierard	chy for the purpose of cre	ating compatibility. The primary Id of the Hierarchy is
Description	determined by the provi	der. The new Id performs	as an alias to the primary Id.
Parameters	osid.id.Id	hierarchyId	the Id of an Hierarchy
Faranteters	osid.id.Id	aliasId	the alias Id
	ALREADY_EXISTS		aliasId is already assigned
	NOT_FOUND		hierarchyId not found
Errors	NULL_ARGUMENT OPERATION_FAILED		hierarchyId or aliasId is null
			unable to complete request
	PERMISSION_DENIE	D	authorization failure
Compliance	mandatory		This method must be implemented.



Interface	osid.hierarchy.HierarchyNotificationSession		
Implements	osid.OsidSession		
Description	This session defines methods to receive notifications on adds/changes to Hierarchy objects. This session is intended for consumers needing to synchronize their state with this service without the use of polling. Notifications are cancelled when this session is closed. Notifications are triggered with changes to the Hierarchy object itself. Adding and removing Ids result		
Method	in notifications available from the HierarchyNode		
wethod		ierarchyNotifications cations. A return of true does not guarantee successful	
Description	authorization. A return of false indicates that it is k PERMISSION_DENIED. This is intended as a hi notification operations.	nown all methods in this session will result in a	
Return	boolean	false if notification methods are not authorized, true otherwise	
Compliance	mandatory	This method must be implemented.	
Method	registerFor	NewHierarchies	
Description	Register for notifications of new hierarchies. HierarchyReceiver.newHierarchy() is invoked when a new Hierarchy is created.		
Errors	OPERATION_FAILED PERMISSION_DENIED	unable to complete request authorization failure	
Compliance	mandatory This method must be implemented.		
Method	registerForChangedHierarchies		
Description	Registers for notification of updated hierarchies. In when a hierarchy is changed.	HierarchyReceiver.changedHierarchy() is invoked	
Errors	OPERATION_FAILED	unable to complete request	
	PERMISSION_DENIED	authorization failure	
Compliance	mandatory	This method must be implemented.	
Method		hangedHierarchy	
Description	when the specified hierarchy is changed.	HierarchyReceiver.changedHierarchy() is invoked	
Parameters	osid.id.Id hierarchyId	the Id of the hierarchy to monitor	
	NOT_FOUND	a hierarchy was not found identified by the given Id	
Errors	NULL_ARGUMENT	hierarchyId is null	
	OPERATION_FAILED	unable to complete request	
	PERMISSION_DENIED authorization failure		
Compliance	mandatory This method must be implemented.		
Method	registerForDeletedHierarchies		
Description	Registers for notification of deleted hierarchies. HierarchyReceiver.deletedHierarchy() is invoked when a hierarchy is deleted.		
_	OPERATION_FAILED	unable to complete request	
Errors	PERMISSION_DENIED authorization failure		
Errors Compliance	PERMISSION_DENIED mandatory	authorization failure This method must be implemented.	



Method	registerForDeletedHierarchy		
Description	Registers for notification of a deleted hierarchy. Hier when the specified hierarchy is deleted.		chy. HierarchyReceiver.deletedHierarchy() is invoked
Parameters	osid.id.Id	hierarchyId	the Id of the Hierarchy to monitor
	NOT_FOUND	•	a hierarchy was not found identified by the given Id
Errors	OPERATION_FAILED		hierarchyId is null
Ellois			unable to complete request
			authorization failure
Compliance	mandatory		This method must be implemented.



Implements				
The hierarchy receiver is the consumer supplied interface for receiving notifications pertaining to new updated or deleted hierarchy nodes. Method	Interface	osid.repository.HierarchyStructureReceiver		
Method Description The callback for notifications of new hierarchy nodes.	Implements	osid.OsidReceiver		
Description The callback for notifications of new hierarchy nodes.	Description			plied interface for receiving notifications pertaining to new,
Parameters osid.id.Id nodeId the Id of the new node Compliance mandatory This method must be implemented. Method newAncestor Description The callback for notification of a change to the node's ancestry. osid.id.Id nodeId the Id of the registered node osid.id.Id ancestorId the Id of the new ancestor This method must be implemented. Method deletedAncestor Description The callback for notification of a change to the node's ancestry. Osid.id.Id nodeId the Id of the registered node osid.id.Id ancestorId the Id of the registered node osid.id.Id osid.id.Id ancestorId the Id of the deleted ancestor Compliance mandatory This method must be implemented. Method newDescendant Description The callback for notification of a change to the node's descendants. Osid.id.Id nodeId the Id of the registered node osid.id.Id ancestorId the Id of the registered node osid.id.Id ancestorId the Id of the new descednant Compliance mandatory This method must be implemented. Method deletedDescendant Description The callback for notification of a change to the node's descendants. Osid.id.Id nodeId the Id of the new descednant This method must be implemented. Method deletedDescendant Description The callback for notification of a change to the node's descendants. Osid.id.Id nodeId the Id of the registered node Osid.id.Id nodeId the Id of the registered node This method must be implemented. Osid.id.Id nodeId the Id of the deleted descednant This method must be implemented. Compliance mandatory This method must be implemented. Method beletedNode	Method			newNode
This method must be implemented. Method NewAncestor	Description	The callback for not	ifications of new hierard	hy nodes.
Method Description The callback for notification of a change to the node's ancestry.	Parameters	osid.id.Id	nodeId	the Id of the new node
Description The callback for notification of a change to the node's ancestry.	Compliance	mandatory	•	This method must be implemented.
Parameters osid.id.Id nodeId the Id of the registered node osid.id.Id ancestorId the Id of the new ancestor Compliance mandatory This method must be implemented. Method deletedAncestor Description The callback for notification of a change to the node's ancestry. Parameters osid.id.Id nodeId the Id of the registered node osid.id.Id ancestorId the Id of the deleted ancestor Compliance mandatory This method must be implemented. Method newDescendant Description The callback for notification of a change to the node's descendants. Parameters osid.id.Id nodeId the Id of the registered node osid.id.Id ancestorId the Id of the new descednant Compliance mandatory This method must be implemented. Method deletedDescendant Description The callback for notification of a change to the node's descendants. osid.id.Id nodeId the Id of the registered node osid.id.Id nodeId the Id of the deleted descednant Compliance mandatory This method must be implemented. Method deletedNode This method must be implemented.	Method			newAncestor
Sid.id.Id ancestorId the Id of the new ancestor	Description	The callback for not	ification of a change to	the node's ancestry.
Compliance mandatory This method must be implemented.	Darameters		nodeId	the Id of the registered node
Description The callback for notification of a change to the node's ancestry.			ancestorId	
Description The callback for notification of a change to the node's ancestry.		mandatory This method must be implemented.		This method must be implemented.
Parameters osid.id.Id nodeId the Id of the registered node osid.id.Id ancestorId the Id of the deleted ancestor This method must be implemented. Method newDescendant Description The callback for notification of a change to the node's descendants. Parameters osid.id.Id nodeId the Id of the registered node osid.id.Id ancestorId the Id of the new descednant Compliance mandatory This method must be implemented. Method deletedDescendant Description The callback for notification of a change to the node's descendants. Osid.id.Id nodeId the Id of the registered node osid.id.Id nodeId the Id of the registered node osid.id.Id ancestorId the Id of the deleted descednant This method must be implemented. Compliance mandatory This method must be implemented. Method deletedNode				
Compliance	Description			
Compliance mandatory This method must be implemented. Method newDescendant Description The callback for notification of a change to the node's descendants. Compliance mandatory This method must be implemented. Method deletedDescendant Description The callback for notification of a change to the node's descendants. Osid.id.Id nodeId the Id of the registered node Parameters Osid.id.Id nodeId the Id of the deleted descednant Compliance mandatory This method must be implemented. Method	Parameters			
Method newDescendant Description The callback for notification of a change to the node's descendants. Parameters osid.id.Id nodeId the Id of the registered node Compliance mandatory This method must be implemented. Method deletedDescendant Description The callback for notification of a change to the node's descendants. Osid.id.Id nodeId the Id of the registered node osid.id.Id ancestorId the Id of the deleted descednant Compliance mandatory This method must be implemented. Method deletedNode	- "		ancestorId	
Description The callback for notification of a change to the node's descendants. Parameters		mandatory		
Parameters osid.id.Id nodeId the Id of the registered node Compliance mandatory This method must be implemented. Method deletedDescendant Description The callback for notification of a change to the node's descendants. Parameters osid.id.Id nodeId the Id of the registered node osid.id.Id ancestorId the Id of the deleted descednant Compliance mandatory This method must be implemented. Method deletedNode		The sealth and forest		
Compliance mandatory mandatory This method must be implemented.	Description		_	
Compliance mandatory This method must be implemented. Method deletedDescendant Description The callback for notification of a change to the node's descendants. Parameters osid.id.Id nodeId the Id of the registered node osid.id.Id ancestorId the Id of the deleted descednant Compliance mandatory This method must be implemented. Method deletedNode	Parameters			
Method deletedDescendant Description The callback for notification of a change to the node's descendants. Parameters osid.id.Id nodeId the Id of the registered node osid.id.Id ancestorId the Id of the deleted descednant Compliance mandatory This method must be implemented. Method deletedNode	Compliance		ancestoria	
Description The callback for notification of a change to the node's descendants. Parameters Osid.id.Id nodeId the Id of the registered node		l l l l l l l l l l l l l l l l l l l	ما م	
Parameters osid.id.Id nodeId the Id of the registered node osid.id.Id ancestorId the Id of the deleted descednant Compliance mandatory This method must be implemented. Method deletedNode		The callback for not		
Compliance mandatory This method must be implemented. Method deleted Node				
Compliance mandatory This method must be implemented. Method deletedNode	Parameters			•
Method deletedNode	Compliance			
40.000411040				
	Description	the callback for notification of deleted hierarchy nodes.		
Parameters osid.id.Id nodeId the Id of the deleted node				
Compliance mandatory This method must be implemented.	Compliance		1	



Interface	osid.hierarchy.Hierarchy		
Implements	osid.OsidCatalog		
Description	A Hierarchy represents a its Id and any persisted re		ty. Like all OSID objects, a Hierarchy is identified by eld.
			archyRecord
Description	retrieve an object implem	enting the requested rec pe may be the Type ret	rchy record Type. This method must be used to ord interface along with all of its ancestor interfaces. urned in getRecordTypes() or any of its parents in a pyRecordType) is true.
Parameters			the type of the record to retrieve
Return	osid.hierarchy.Hierarch	nyRecord	the agent with the specified record
	NULL_ARGUMENT		hierarchyRecordType is null
	OPERATION_FAILED		unable to complete request
Errors	PERMISSION_DENIED		authorization failure occurred
	UNSUPPORTED		hasRecordType(hierarchyrecordType) is false
Compliance	mandatory		This method must be implemented.



Interface	osid.hierarchy.HierarchyRecord	
Implements	osid.OsidRecord	
Description	A record for a Hierarchy. The methods specified by the record type are available through the underlying object.	
	getHierarchy	
Description	Gets the Hierarchy from which this record originated.	
Return	osid.hierarchy.Hierarchy	the hierarchy
Compliance	mandatory	This method must be implemented.



Interface	osid.hierarchy.HierarchyQuery		
Implements	osid.OsidCatalogQuery		
Description	This is the query interface for searching hierarchies. Results are returned if all the specified elements match. Each method match request produces an AND term while multiple invocations of a method produces a nested OR, except for accessing the HierarchyQuery record.		AND term while multiple invocations of a method
Method		m	atchId
Description	Matches an Id of a nod boolean AND.	e in this hierarchy. Multiple	e nodes can be added to this query which behave as a
Parameters	osid.id.Id	id	Id to match
	boolean	match	true if a positive match, false for negative match
Errors	NULL_ARGUMENT		id is null
Compliance	mandatory		This method must be implemented.
	getHierarc		
Method			nyQueryRecord
Method Description	retrievals of the same ty	nterface corresponding to rpe may return the same u	the given Hierarchy record Type. Multiple record nderlying object and do not result in adding terms to be add AND terms to the other elements set in this
	retrievals of the same ty the query. Multiple reco	nterface corresponding to rpe may return the same u	the given Hierarchy record Type. Multiple record nderlying object and do not result in adding terms to be add AND terms to the other elements set in this a hierarchy record type
Description	retrievals of the same ty the query. Multiple reco- form.	nterface corresponding to ype may return the same under the retrievals of different type hierarchyRecordType	the given Hierarchy record Type. Multiple record nderlying object and do not result in adding terms to be add AND terms to the other elements set in this
Description Parameters	retrievals of the same ty the query. Multiple recor- form. osid.type.Type	nterface corresponding to ype may return the same under the retrievals of different type hierarchyRecordType	the given Hierarchy record Type. Multiple record nderlying object and do not result in adding terms to be add AND terms to the other elements set in this a hierarchy record type
Description Parameters	retrievals of the same ty the query. Multiple reconform. osid.type.Type osid.hierarchy.Hierar	nterface corresponding to ype may return the same under the retrievals of different type hierarchyRecordType	the given Hierarchy record Type. Multiple record nderlying object and do not result in adding terms to be add AND terms to the other elements set in this a hierarchy record type the hierarchy query record
Description Parameters	retrievals of the same ty the query. Multiple recor- form. osid.type.Type osid.hierarchy.Hierar NULL_ARGUMENT	nterface corresponding to the may return the same used to retrievals of different type hierarchyRecordType chyQueryRecord	the given Hierarchy record Type. Multiple record nderlying object and do not result in adding terms to be add AND terms to the other elements set in this a hierarchy record type the hierarchy query record hierarchyRecordType is null
Description Parameters Return	retrievals of the same ty the query. Multiple recor- form. osid.type.Type osid.hierarchy.Hierar NULL_ARGUMENT OPERATION_FAILED	nterface corresponding to the may return the same used to retrievals of different type hierarchyRecordType chyQueryRecord	the given Hierarchy record Type. Multiple record nderlying object and do not result in adding terms to be add AND terms to the other elements set in this a hierarchy record type the hierarchy query record hierarchyRecordType is null unable to complete request



Interface	osid.hierarchy.HierarchyQueryRecord	
Implements	osid.OsidRecord	
Description	A record for a HierarchyQuery. The methods specified by the record type are available through the underlying object.	
	getHierarchyQuery	
Description	Gets the HierarchyQuery from which this record originated.	
Return	osid.hierarchy.HierarchyQuery	the hierarchy query
Compliance	mandatory	This method must be implemented.



Interface	osid.hierarchy.HierarchyForm		
Implements	osid.OsidCatalogForn	n	
Description	This is the form for creating and updating Hierarchy objects. Like all OsidForm objects, various data elements may be set here for use in the create and update methods in the HierarchyAdminSession. For each data element that may be set, metadata may be examined to provide display hints or data constraints.		
Method		getHierarc	hyFormRecord
Description	Gets the HierarchyFor	Gets the HierarchyFormRecord interface corresponding to the given hierarchy record interface Type	
Parameters	osid.type.Type	hierarchyRecordType	the hierarchy record type
Return	osid.hierarchy.Hierar	chyFormRecord	the record
	NULL_ARGUMENT		hierarchyRecordType is null
	OPERATION_FAILED		unable to complete request
Errors	PERMISSION_DENIED		authorization failure occurred
	UNSUPPORTED		hasRecordType(hierarchyRecordType) is false
Compliance	mandatory		This method must be implemented.



Interface	osid.hierarchy.HierarchyFormRecord	
Implements	osid.OsidRecord	
Description	A record for a HierarchyForm. The methods specified by the record type are available through the underlying object.	
	getHierarchyForm	
Description	Gets the HierarchyForm from which this record originated.	
Return	osid.hierarchy.HierarchyForm	the hierarchy form
Compliance	mandatory	This method must be implemented.



Interface	osid.hierarchy.HierarchySearchOrder	
Implements	osid.OsidCatalogSearchOrder	
Description	An interface for specifying the ordering of search	results.
Method	getHierarchyS	SearchOrderRecord SearchOrderRecord
Description	Gets the hierarchy sarch record interface corresponding to the given repository record Type. Multiple retrievals return the same underlying object.	
Parameters	osid.type.Type hierarchyRecordType	a hierarchy record type
Return	osid.hierarchy.HierarchySearchOrderRecord	the hierarchy search order record interface
	NULL_ARGUMENT	hierarchyRecordType is null
	OPERATION_FAILED	unable to complete request
Errors	PERMISSION_DENIED	authorization failure occurred
	UNSUPPORTED	hasRecordType(hierarchyRecordType) is false
Compliance	mandatory	This method must be implemented.



Interface	osid.hierarchy.HierarchySearchOrderRecord	
Implements	osid.OsidRecord	
Description	A record for a HierarchySearchOrder. The methods specified by the record type are available through the underlying object.	
	getHierarchySearchOrder	
Description	Gets the HierarchySearchOrder from which this record originated.	
Return	osid.hierarchy.HierarchySearchOrder	the hierarchy search order
Compliance	mandatory	This method must be implemented.



Interface	osid.hierarchy.HierarchySearch	
Implements	osid.OsidSearch	
Description	HierarchySearch defines the interface for specif	ying hierarchy search options.
Method	searchWithin	HierarchyResults
Description	Execute this search using a previous search resu	lt.
Parameters	osid.hierarchy.HierarchySearchResults results	results from a query
Errors	INVALID_ARGUMENT	results is not valid
	NULL_ARGUMENT	results is null
Compliance	mandatory	This method must be implemented.
Method		ongHierarchies
Description	Execute this search using a given list of hierarchic	
Parameters	osid.id.IdList hierarchyIds	list of hierarchies
Errors	NULL_ARGUMENT	hierarchyIds is null
Compliance	mandatory	This method must be implemented.
Method		rarchyResults
Description	Specify an ordering to the search results.	
Parameters	osid.hierarchy.HierarchySearchOrder hierarchySearchOrder	hierarchy search order
Errors	NULL_ARGUMENT	hierarchySearchOrder is null
Litors	UNSUPPORTED	hierarchySearchOrder is not of this service
Compliance	mandatory	This method must be implemented.
Method	getHierarchySearchRecord	
Description	Gets the record corresponding to the given hierarchy search record Type. This method must be used to retrieve an object implementing the requested record interface along with all of its ancestor interfaces.	
Parameters	osid.type.Type hierarchySearchRecordType	a hierarchy search record type
Return	osid.hierarchy.HierarchySearchRecord	the hierarchy search interface
	NULL_ARGUMENT	hierarchySearchRecordType is null
	OPERATION_FAILED	unable to complete request
Errors	PERMISSION_DENIED	authorization failure occurred
	UNSUPPORTED	hasSearchRecordType(hierarchyRecordType) is false
Compliance	mandatory	This method must be implemented.



Interface	osid.hierarchy.HierarchySearchRecord	
Implements	osid.OsidSearchRecord	
Description	A record for a HierarchySearch. The methods specified by the record type are available through the underlying object.	
	getHierarchySearch	
Description	Gets the HierarchySearch from which this record originated.	
Return	osid.hierarchy.HierarchySearch	the hierarchy search
Compliance	mandatory	This method must be implemented.



Interface	osid.hierarchy.HierarchySearchResults		
Implements	osid.OsidSearchResu		
Description	· ·	•	s of a search and is used as a vehicle to perform a
Description	search within a previous	s result set.	
Method		getHi	erarchies
Description	Gets the hierarchy list re	esulting from the search.	
Return	osid.hierarchy.Hierar	chyList	the hierarchy list
Compliance	mandatory		This method must be implemented.
Method	getHierarchySearchResultsRecord		
Description	Gets the record corresponding to the given hierarchy search record Type. This method must be used to retrieve an object implementing the requested record interface along with all of its ancestor interfaces.		
Parameters	osid.type.Type hierarchySearchRecordType		a hierarchy search record type
Return	osid.hierarchy.Hierarcl	hySearchResultsRecord	the hierarchy search interface
	NULL_ARGUMENT		hierarchySearchRecordType is null
	OPERATION_FAILED		unable to complete request
Errors	PERMISSION_DENIED		authorization failure occurred
	UNSUPPORTED hasSearchRecordType(hierarype) is false		hasSearchRecordType(hierarchySearchRecordT
			ype) is false
Compliance	mandatory		This method must be implemented.



Interface	osid.hierarchy.HierarchySearchResultsRecord	
Implements	osid.OsidSearchRecord	
Description	A record for a HierarchySearchResults. The methods specified by the record type are available through the underlying object.	
	getHierarchySearchResults	
Description	Gets the HierarchySearchResults from which this record originated.	
Return	osid.hierarchy.HierarchySearchResults the hierarchy search results	
Compliance	mandatory	This method must be implemented.



Interface	osid.hierarchy.HierarchyReceiver		
Implements	osid.OsidReceive	er	
Description		The hierarchy receiver is the consumer supplied interface for receiving notifications pertaining to new, updated or deleted Hierarchy objects.	
Method			newHierarchy
Description	The callback for no	tifications of new hierarcl	nies.
Parameters	osid.id.Id	hierarchyId	the Id of the new Hierarchy
Compliance	mandatory This method must be implemented.		This method must be implemented.
Method	changedHierarchy		
Description	The callback for no	The callback for notification of updated hierarchies.	
Parameters	osid.id.Id	hierarchyId	the Id of the updated Hierarchy
Compliance	mandatory This method must be implemented.		
Method	deletedHierarchy		
Description	the callback for notification of deleted hierarchies.		
Parameters	osid.id.Id hierarchyId		the Id of the deleted Hierarchy
Compliance	mandatory	mandatory This method must be implemented.	



Interface	osid.hierarchy.HierarchyList		
Implements	osid.OsidList		
Description	Like all OsidLists, HierarchyList provides a means for accessing Id elements sequentially either one at a time or many at a time. Examples: while (hl.hasNext()) { Hierarchy hierarchy = hl.getNextHierarchy(); } or while (hl.hasNext()) { Hierarchy[] hierarchies = gl.getNextHierarchies(hl.available());		
Method			tHierarchy
Description	Gets the next Hierarch	y in this list.	
Return	osid.hierarchy.Hierar	chy	the next Hierarchy in this list. The hasNext() method should be used to test that a next Hierarchy is available before calling this method.
	ILLEGAL STATE		no more elements available in this list
Errors	OPERATION_FAILED		unable to complete request
Compliance	mandatory This method must be implemented.		This method must be implemented.
Method		getNext	Hierarchies
Description	Gets the next set of Hierarchy objects in this list. The specified amount must be less than or equal to the return from available().		
Parameters	cardinal	n	the number of Hierarchy elements requested which must be less than or equal to available()
Return	an array of Hierarchy Hierarchy [1]		an array of Hierarchy elements. The length of the array is less than or equal to the number specified.
Errors	ILLEGAL_STATE		no more elements available in this list
LIIUIS	OPERATION_FAILED		unable to complete request
Compliance	mandatory This method must be implemented.		



r		
Interface	osid.hierarchy.Position	
Implements		
Description	This interface is a container for the node Id and le	vel for use with the hierarchy traversal methods.
Method	get	NodeId
Description	Gets the node ld.	
Return	osid.id.Id	the Id of this node
Compliance	mandatory	This method must be implemented.
Method	ge	tLevel
Description	Gets the level of this node in relation to the starting node as specified in the traversal method. Descendants are assigned increasingly positive levels. Ancestors are assigned increasingly negative levels.	
Return	integer	the node level
Compliance	mandatory	This method must be implemented.
Method	hasParents	
Description	Tests if this node has any parents.	
Return	boolean	true if this Id has parents, false otherwise
Compliance	mandatory	This method must be implemented.
Method	get	Parents
Description	Gets the parents of this node.	
Return	osid.id.IdList	the parents of the id
Compliance	mandatory	This method must be implemented.
Method	hasChildren	
Description	Tests if this node has any children.	
Return	boolean	true if this Id has children, false otherwise
Compliance	mandatory	This method must be implemented.
Method	getChildren	
Description	Gets the children of the given Id.	
Return	osid.id.IdList	the children of the id
Compliance	mandatory	This method must be implemented.



Interface	osid.hierarchy.PositionList		
Implements	osid.OsidList	osid.OsidList	
Description	Like all OsidLists, PositionList provides a means for accessing Id elements sequentially either one at a time or many at a time. Examples: while (pl.hasNext()) { Position position = pl.getNextPosition(); } or while (pl.hasNext()) { Position[] positions = pl.getNextPositions(pl.available());		
Method		getNe	xtPosition
Description	Gets the next Position	n this list.	
Return	osid.hierarchy.Positio	n	the next Position in this list. The hasNext() method should be used to test that a next Position is available before calling this method.
-	ILLEGAL STATE		no more elements available in this list
Errors			unable to complete request
Compliance	mandatory		This method must be implemented.
Method		getNex	rtPositions
Description	Gets the next set of Position objects in this list. The specified amount must be less than or equal to the return from available().		
Parameters	cardinal	n	the number of Position elements requested which must be less than or equal to available()
Return	osid.hierarchy.Position[] an array of Position elements. The length of the array is less than or equal to the number specified.		1 .
Errors	ILLEGAL_STATE		no more elements available in this list
	OPERATION_FAILED		unable to complete request
Compliance	mandatory This method must be implemented.		