

NDR API v2.0 Overview

Overview of the next-generation NDR API

Background

- NSDL Data Repository (NDR)
 - The repository system behind NSDL.org and related NSDL services such as search and OAI
 - A downloadable repository system software package that can be used for a variety of applications
- NDR Features
 - Apps can read and write to the repository using a REST API
 - Provides abstractions for basic Digital Library objects and actions
- NDR Development
 - A new version of the NDR API, v2.0, is under development...

Why a New API?

- Support community member's feature requests
 - Annotations – Support the sharing of comments, star ratings, user tags, etc.
 - Richer metadata – Support for 'native' metadata frameworks (beyond nsdl_dc)
 - Sharing, displaying, reusing annotations and metadata from other groups
- Address known issues
 - Make the API more efficient and easier to use for core use cases
- Address NSF cyberlearning report
 - Going beyond Digital Libraries to support “learning applications”

API Development Overview

- Current NDR API v1.0 provides low-level methods for operating over base objects in the NDR model
 - Resource, Metadata, Aggregation, MetadataProvider, Agent
- The new NDR API v2.0 will provide higher level abstractions, and add new functionality
 - Collections, metadata, resources, annotations, content
 - Enforces consistent use of the base objects and simplifies primary use cases: managing and accessing collections, metadata, and accessing a resource-centric view
 - Provides new functionality for annotations and content

Collections in API v2.0

- A container for collecting groups of metadata (or any XML)
 - A collection in the NDR does not necessarily equate to a library collection
- API operations:
 - Add, modify, delete collections
 - Add, modify, delete the metadata that describes the collection
 - Group collections into aggregate collections
 - Example: Collection A and B make up collection C
 - Example: Collection C, D, E, etc. make up the NSDL.org library

Metadata in API v2.0

- An XML record that describes a resource
 - Support for any XML framework
 - nsdl_dc is the canonical format used by NSDL
 - The resource described by the metadata is referenced in the XML record by URL
- API operations
 - Add, modify, delete metadata records in a collection

Resources in API v2.0

- An object with a URL, for example an educational resource available on the Internet
- API operations
 - View all metadata about a resource from all sources using a single method call (a “resource-centric view”)
 - Returns each metadata record and annotation associated with a resource and information about the collections they are a member of

Content in API v2.0

- A binary or textual piece of content that is stored in the repository
 - The repository generates a resource URL for the content
 - Content resides in a collection
 - Metadata that describes the content is stored in a separate collection, same as other metadata
 - Example: Storing user contributed resources (PowerPoints, PDFs, etc.) that are saved and shared by users in a learning application
- API Operations
 - Add, modify, delete content objects in a collection

Annotations in API v2.0

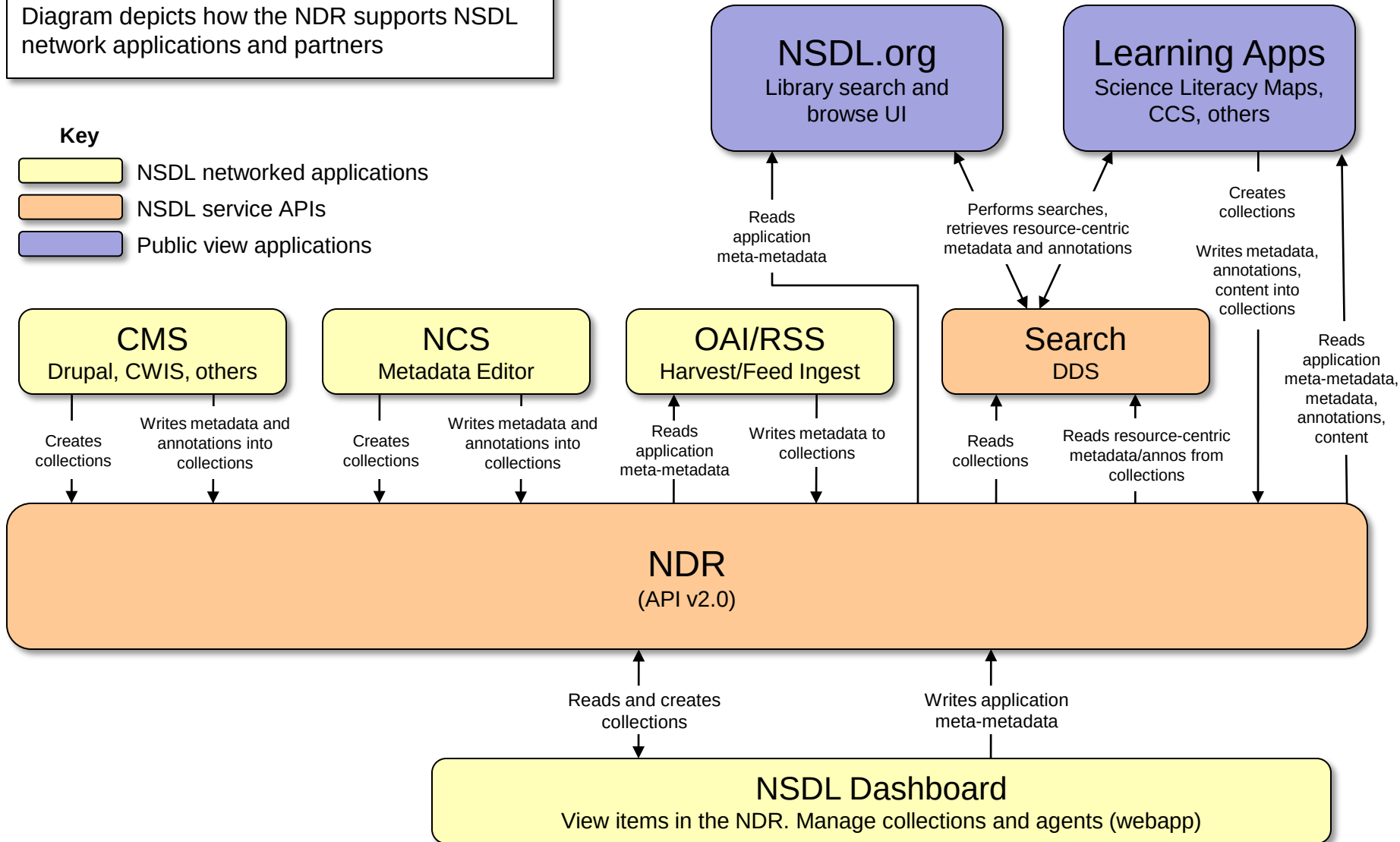
- Metadata or content that describes a resource or another piece of metadata
 - Examples include comments, star ratings, education standards, user tags
 - Annotation records reside in a collection just like metadata records do
 - The resource or metadata described by the annotation is referenced in the XML record by URL or ID
- API Operations
 - Add, modify, delete annotations in a collection

NDR Networked Applications for NSDL

Diagram depicts how the NDR supports NSDL network applications and partners

Key

- NSDL networked applications
- NSDL service APIs
- Public view applications



Appendix: API Details

Comparison of API v1.0 and v2.0

NDR API v1.0 Methods

- Agent requests
 - `addAgent, modifyAgent`
- Aggregator requests
 - `addAggregator, modifyAggregator, countMembers, listMembers`
- Metadata requests
 - `addMetadata, modifyMetadata`
- MetadataProvider requests
 - `addMetadataProvider, modifyMetadataProvider, countMembers, listMembers`
- Resource requests
 - `addResource, modifyResoruce, findResoruce`
- All objects
 - `delete, describe, get, find`

API v1.0 Base Objects

- Resource
 - Represents a URL to and educational resource, book, journal article, video, etc. The fundamental information unit in the NDR
- Metadata
 - An XML record that contains information about a resource or group (collection) of resources
- Aggregator
 - Represents a grouping of Agents, Agents, or other Aggregators.
- MetadataProvider
 - A grouping of metadata that comes from a particular source. The provenance of any Metadata object in the NDR may be determined by it's MetadataProvider
- Agent
 - Represents an institution or other entity providing information to the NDR. Allows for restriction by group of objects

API v1.0 Base Relationships

- **memberOf** (Subject: {Resource, Aggregator, Agent}; Object: Aggregator)
 - Indicates that the given object is a member of an aggregation. A Resource, Aggregator, or Agent may have any number of memberOf relationships.
- **metadataFor** (Subject: Metadata; Object: {Resource, Aggregator, Agent})
 - Indicates that a Metadata object contains metadata about another. A Metadata object must have at least one metadataFor relationship.
- **metadataProvidedBy** (Subject: Metadata; Object: MetadataProvider)
 - Indicates that a given Metadata object came from a particular source. A Metadata object must have exactly one metadataprovidedBy relationship.
- **aggregatorFor** (Subject: Aggregator; Object: Agent)
 - Indicates that a particular aggregation was created by or belongs to a specific Agent. An Aggregator object must have exactly one aggregatorFor relationship.
- **associatedWith** (Subject: Aggregator; Object: Resource)
 - Indicates that a particular resource is representative of a given aggregation. In other words, the contents of the Resource are in some way indicative of the nature of the contents of the Aggregation.
- **metadataproviderFor** (Subject: MetadataProvider; Object: Agent)
 - Indicates that a particular source of Metadata is attributed to an Agent.

NDR API v2.0 Methods: Enforce and Simplify

- Collection requests
 - Methods: `addCollection`, `modifyCollection`, `deleteCollection`, `getCollectionRecord`, `listCollectionRecords`, `findCollections`
 - Operates over base objects: `Aggregator`, `MetadataProvider`, `Metadata` (for collection)
- Metadata requests (metadata-centric view)
 - Methods: `addMetadata`, `modifyMetadata`, `deleteMetadata`, `getMetadata`, `listMetadata`
 - Operates over base objects: `Resource`, `Metadata`
- Resource requests (resource-centric view) (read-only)
 - Methods: `getResourceMetadata`, `listResourceMetadata`
 - Operates over base objects: `Resource`, `Metadata`

NDR API v2.0 Methods

New Functionality

- Annotation requests
 - Methods: `addAnnotation`, `modifyAnnotation`, `deleteAnnotation`, `listAnnotations`
 - Operates over base objects: `Annotation (new)`, `Resource`, `MetadataProvider`, `Aggregation`
- Content requests
 - Methods: `addContent`, `modifyContent`, `deleteContent`
 - Operates over base objects: `Content`, `Resource`

References

- API v1.0 Documentation:
 - <http://wiki.nsdsl.org/images/7/71/Api.pdf>
 - <http://wiki.nsdsl.org/index.php/Community:NDR/API>
- API v2.0 Documentation:
 - Overview of current API v2.0 proposal:
<http://wiki.nsdsl.org/index.php/Community:NDR/API/2.0/ProposedSpecifications>
 - API v2.0 proposal, first take:
<http://wiki.nsdsl.org/index.php/Community:NDR/API/2.x/APIRequestsByObject>

Feedback

- Please provide feedback via the NDR community forum:

<http://nsdlnetwork.org/forums/community-feedback/nsdl-data-repository-ndr-api-20>