Metadata for all DSpace objects

Since DSpace 5, all DSpace objects (bitstream, bundle, item, collection, community, site, group, eperson) can have metadata (in DSpace 4 and earlier, this applied only to items). The advantage is that such metadata can have a flexible schema, which can be changed dynamically (e.g. from the administration web interface), without altering the underlying database schema (DDL). This will allow an easy implementation of future changes like:

- collection/community names in multiple languages
- bundles could be implemented as metadata on bitstreams
- arbitrary metadata for authors (if authors are made into a first-class object)

All metadata has the following form: `namespace.element.qualifier = value`

This page outlines the changes to the database schema between DSpace 4 and DSpace 5 that reflect this change. The terms object, resource and entity are used interchangeably.

Changes

A consequence of the implementation of Metadata on all DSpace objects is that most entity (e.g. bitstream, eperson, ...) attributes (e.g.) moved into the `metadatavalue` table.
e.g.:

DSpace 4

```
SELECT lastname FROM eperson;
```

is now:

DSpace 5

```
SELECT text_value FROM metadatavalue
WHERE metadata_field_id = (
  SELECT metadata_field_id
  FROM metadatafieldregistry mfr, metadataschemaregistry msr
  WHERE mfr.metadata_schema_id = msr.metadata_schema_id
  AND short_id = 'eperson'
  AND element = 'lastname'
  AND qualifier IS NULL
);
```

Column names like `item_id` or `community_id` have been mostly replaced with the tuple (`resource_id`, `resource_type_id`) where resource_type_id is a constant specifying object type:

constant	object type
0	bitstream
1	bundle
2	item
3	collection
4	community
5	site
6	group
7	eperson

So for example, a search to list all publication titles would be:

```
SELECT text_value FROM metadatavalue
JOIN handle as h ON h.resource_id = metadatavalue.dspace_object_id
WHERE metadata_field_id = (
  SELECT metadata_field_id
  FROM metadatafieldregistry mfr, metadataschemaregistry msr
  WHERE mfr.metadata_schema_id = msr.metadata_schema_id
  AND short_id = 'dc'
  AND element = 'title'
  AND qualifier IS NULL
)
AND resource_type_id=2;
```

Example change

Example `eperson` table in DSpace 4 (simplified to show only relevant parts):

eperson_id	firstname	lastname
1001	John	Smith
1002	Jane	Doe

Example `eperson` and `metadatavalue` tables in DSpace 5 (simplified to show only relevant parts):

`eperson`:

eperson_id
1001
1002

`metadatavalue`:

resource_type_id	resource_id	metadata_field_id	text_value
7	1001	123	John
7	1001	124	Smith
7	1002	123	Jane
7	1002	124	Doe

See also

Unable to locate Jira server for this macro. It may be due to Application Link configuration.

Relevant DB schema changes: V5.0_2014.09.26__DS-1582_Metadata_For_All_Objects.sql

DSpace 5 DB schema: Storage Layer#RDBMS/DatabaseStructure