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**

```sql
SELECT lastname FROM eperson;
```

is now:

**DSpace 5**

```sql
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:

<table>
<thead>
<tr>
<th>constant</th>
<th>object type</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>bitstream</td>
</tr>
<tr>
<td>1</td>
<td>bundle</td>
</tr>
<tr>
<td>2</td>
<td>item</td>
</tr>
<tr>
<td>3</td>
<td>collection</td>
</tr>
<tr>
<td>4</td>
<td>community</td>
</tr>
<tr>
<td>5</td>
<td>site</td>
</tr>
<tr>
<td>6</td>
<td>group</td>
</tr>
<tr>
<td>7</td>
<td>eperson</td>
</tr>
</tbody>
</table>
So for example, a search to list all publication titles would be:

```sql
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;
```