BPS8: BIRT Report Document

Draft 2: September 06, 2005

Abstract

This document specifies the BIRT report document format.

Document Revisions

Version	Date	Description of Changes
Draft 1	08/07/2005	First draft
Draft 2	09/06/2005	Updated based on feedbacks

Contents

1. Introduction

Report document is an entity that stores information to support a set of report document interfaces defined in this document. BIRT 2.0 provides at least one reference implementation of the report document interfaces, but does not prevent others from implementing their own report document formats. BIRT does not even require that a report document is a single file; instead, report document is an abstract concept and can refer to a folder and its contents. For ease of file management, a BIRT report document could be implemented as a (report) archive, which is also how the reference implementation is based on. An alternative single-file implementation could be created based on structured storage.

BIRT report document interfaces are divided into several dependent groups, and a report document implementation is not required to support all the interfaces. For example, a simple implementation may skip security information, or information to support progressive viewing. If information pertinent to a specific feature does not exist in the report document, the feature is disabled at presentation time. For example, if pagination information does not exist in the report document, page on demand viewing is disabled at presentation time and report is shown as a single page.

2. Supported Features

2.1 Supported Features

The report document format(s) needs to fulfill the following functional requirements:

1. Page-on-demand report viewing (HTML only).
2. Interactive viewing features such as click-to-sort, expand/collapse groups, filtering on result set, etc.
3. Table of content with navigation to the page containing the TOC item.
4. Viewing report in multiple output formats.
5. Device-dependent pagination for output formats such as PDF.
6. Generation and presentation time scripting.
7. Full text-search based on report output and highlighting the matching result. (Not supported in Release 2)
8. Extract report data unfiltered or filtered.
9. Very large report with several Giga-bytes of data.
10. Progressive viewing, a feature to start viewing generated pages for a large report before the report is fully generated.
11. Reportlet, a feature to render an individual component in a report, i.e., a table, a list, a chart, etc.
12. Extensible security features.

It is preferred that the report document is

1. Small in size to facilitate fast report generation.

2. Self-contained for ease of management.

2.2 Information Stored in Report Document

The following table summarizes the information that is stored in a report document.

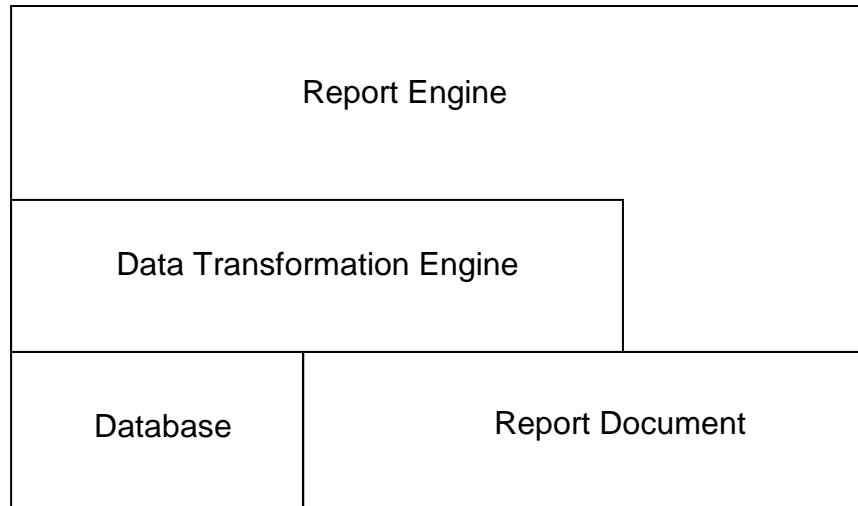| Feature	Description	Availability
Core Information	Stores global information such as report parameter values, global references, etc.	BIRT 2.0
Report Data	Stores data retrieved from database.	BIRT 2.0
Database Image	Stores images retrieved from database.	BIRT 2.0
Data Index	Stores (multiple) indices into report data to enhance search/extraction performance	Post BIRT 2.0
Rendering Hints and Pagination Information	Stores pagination information for one or more rendering environment. Most useful for HTML rendering environment. Stores rendering hints for each page.	HTML pagination in BIRT 2.0
TOC Bookmarks	Stores each TOC entry as a special bookmark; stores a TOC tree based on TOC entries	BIRT 2.0
Bookmarks	Stores mapping between a bookmark and a page number	BIRT 2.0
Sub-reports	Stores sub-reports generated as a result of bursting.	Post BIRT 2.0
Security Info	Stores security extensions in terms of access control list (ACL) at a group/row/column level	Post BIRT 2.0
Reportlet Helper	Stores mapping between a report item instance and its starting page number	BIRT 2.0
Report Design	Stored for completeness and ease of file management.	BIRT 2.0
Report Resources	Stores localized strings and/or images. Stored for completeness and ease of file management.	BIRT 2.0
Thumbnails	Stores user-created thumbnail images or thumbnail images generated by engine emitter as a result of rendering the first several pages of the report.	Post BIRT 2.0

To support progressive viewing, a temp checkpoint file may be generated during report generation. Since it is not part of the final report document, it is skipped from the table.

Report annotations are not stored in report document. Instead, it is stored in a different report view file. Annotation is not supported in BIRT 2.0.

Drill through is defined in report design, and rendered at presentation time, which might lead to the storage of drill through links as page hints.

3. Report Document Related Operations

The following diagram displays the relationship between report document, data engine, and report engine.

```
┌─────────────────────────────────────────────────────────┐
│                                                         │
│                   Report Engine                         │
│                                                         │
│   ┌──────────────────────────────────────┐             │
│   │                                       │             │
│   │        Data Transformation Engine     │             │
│   │                                       │             │
│   │   ┌──────────────┬───────────────────────────┐     │
│   │   │              │                           │     │
│   │   │   Database   │      Report Document      │     │
│   │   │              │                           │     │
│   └───┴──────────────┴───────────────────────────┘     │
└─────────────────────────────────────────────────────────┘
```

The interfaces between report document and DTE, between report document and report engine, between DTE and report engine, and between report engine and engine hosts needs to be defined or enhanced.

3.1.1 Report Engine External Interfaces

With the availability of a report document, certain operations are now available through the engine. They are summarized by the following table.

Operations	Description
Retrieve Data & MetaData[1]	Gets data and metadata that are associated with a specific dataset, a report item, or a report item instance. Additional filtering criterions and extraction column specifications can be supplied.
Retrieve Page Count[2]	Gets the # of pages in the report. If the report is being generated, the # of pages that can be viewed at the time of the call.
Retrieve TOC[2]	Retrieve TOC at a specific level. Each TOC entry has referenced TOC bookmark embedded.
Retrieve Report Design[2]	Retrieves report design as a stream so that one may rerun the report based on different parameters subsequently.
Retrieve Report Resources[2]	Retrieves resources (localized strings or images) stored in the report document
Retrieve	Retrieves thumbnails from the report document

Thumbnails[2]	
View Page	Views a specific report page in HTML format
View Report Item	Views a specific report item given the ID to the report item instance
View Document	Views the whole report as a single output page, given a report document instance
Re-run Report	Rerun a report based on a report document to ensure it is up to date

[1]. The same operation is also available in interface between DtE and report engine.

[2]. The same operation is also available in interface between report engine and report document.

All the operations here are subject to security rules. For example, extracting data from a report with Group Level Security returns only the data that are visible to the user.

3.1.2 Report Engine/Report Document Interface

In addition to some of the operations marked (as [2]) in 3.1.1, the following operations are supported through the Report Engine/Report Document interface(s).

Operations	Description
Retrieve Core Report Information	Retrieves core information stored for the report.
Retrieve Page Hints	Given a page number, retrieves all the hints for report item instances in the page. Used for page-on-demand viewing.
Retrieve Report Item Hints	Given a report item instance identifier, retrieves all the hints for the report item instance. Used for Reportlet and interactive viewing.
Bookmark Access	Given a bookmark, retrieves the first page that it appears in. The Bookmark could be a TOC bookmark.

3.1.3 DTE/Report Document Interface

DTE is the component that interacts with report document for (large amount of) data. Interfaces between DTE and report document may need to be down to file access level for performance reasons.

3.1.4 Report Engine/DTE Interface

The following operations need to be added to the current Report Engine/DTE interface.

Operations	Description
Retrieve Database Image	Retrieves a database image stored at report generation time.

Retrieve Data & MetaData	See 3.1.1

4. Report Document Related APIs

Detailed API changes will be provided in a separate API document.