

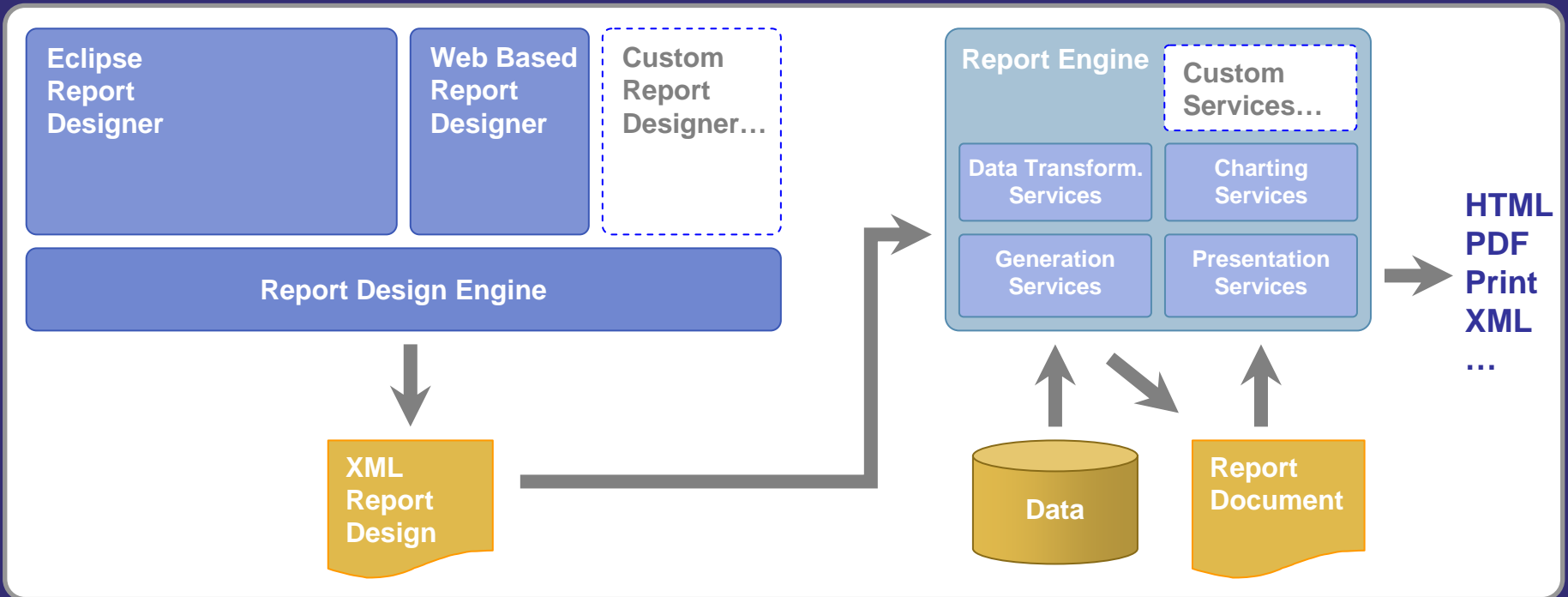
# Introduction to the BIRT Report Object Model

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# BIRT Overview

- Eclipse top-level project
- Initially focused on embedded reporting for Java developers
- Highly extensible
- Target user is Java developer
  - Will evolve to support report content developers
- Users & contributors wanted!
- Timeline
  - Nov, 2004: BIRT project accepted
  - Early 2005: All BIRT code put under CVS
  - EclipseCon: 1.0M1 build available, looking for QA eyes
  - May, 2005: Release 1

# BIRT Architecture



- Report Object Model defines XML design format
- Report Design Engine is API for the ROM
- Engine executes a ROM-defined design

# Example BIRT Report



## Employee Details

Run on 2/28/05  
For internal use only

Employee ID: 2  
 Name: Adrian M. Chandler  
 Address: 403 West California Avenue  
 City, State, Zip: San Francisco, CA 94333-0001  
 Home Phone: (415) 231-8282  
 Hire Date: 12/10/82

Date	JobTitle
12/10/88	Development Manager
1/15/92	Director of Development
12/10/84	Lead Programmer
12/10/82	Programmer
12/10/86	Senior Programmer

Date	Salary
12/10/82	\$35,000
12/10/83	\$37,000
12/10/84	\$40,000
12/10/85	\$43,000
12/10/86	\$50,000
12/10/88	\$56,000
12/10/90	\$62,000
1/15/92	\$80,000

# ROM Overview

- ROM = Report Object Model
- ROM provides a rich report creation model
  
- Data Definition
  - Data Sources, Data Sets
- Visual Layout: Report Items
  - Grid, Text, Label, Data, Table, List, Image
- Parameters
- Styles
- Scripting
- Extensibility

# Data Source Element

- Defines a connection to a data provider
- BIRT supports JDBC in Release 1
- Others added through extensions
- Example JDBC data source properties
  - Driver
  - URL
  - User Name
  - Password
- Just define it; BIRT takes care of opening, closing it
- Any number of data sources per report
  - Customer info from Oracle, Sales info from SQL-Server

# Data Set Element

- Represents a specific data set
  - SQL query, stored procedure
  - Flat file, XML, CSV
  - EJB, POJO, SOAP
  - Defined using scripting
  - Whatever you want: just create an extension
- JDBC & scripted data sets appear in Release 1
- Query
- Input parameters, output parameters
- Produces a set of data rows
- Column information
- Any number of data sources & data sets
  - Master/detail, side-by-side, one-after-another

# Data Transform

- Report data operations
  - Sort, sum, group, filter, etc.
- Based on:
  - Data set
  - Report structure
- Push to data source if possible
  - Sort, filter, etc.
- Perform in BIRT if necessary
  - Limited feature data source (XML, flat files)
  - References scripting
- Net: say what you want; BIRT gets it done

# Table Element

- ROM Table = HTML table + data set iterator
- Parts of a table
  - Header, Footer
  - Detail
  - Groups: Header, Footer
- Data-related properties
  - Data set
  - Parameter bindings
  - Filters
  - Sorting
- Wide variety of aggregates (totals)

# Label, Data & Image Elements

- Simple report items: displays single value
- Label
  - One piece of text
  - Complete i18n/l10n support
- Data
  - Data row column, expression or aggregate
- Image
  - URL or embedded image
- Wide variety of CSS-based formatting
- Conditional formatting, conditional visibility

# Grid Element

- Grid Element = HTML table
- Provides quick & easy placement of report items
  - Left/center/right titles & headings
  - Side-by-side tables & charts
  - Label: value
- Provides full CSS formatting rules
  - Borders, colors
  - Padding, margins
  - Alignment

# Text Element

- Text = text + HTML formatting + data values
  - Modern version of “mail merge”
  - Analogy to PHP, JSP
- Create titles, form letters, other blocks of text
- HTML formatting works for all output formats
- `<value-of>` tag provides
  - Insert any kind of data: expression, script, etc.
  - Provide formatting of value
- Additional formatting features
  - Keep with next, widow & orphan prevention
  - Line spacing, paragraph indent

# Example Report Items



Image

## Employee Details

Run on 2/28/05  
For internal use only

Text

Grid

Employee ID: 2  
 Name: Adrian M. Chandler  
 Address: 403 West California Avenue  
 City, State, Zip: San Francisco, CA 94333-0001  
 Home Phone: (415) 231-8282  
 Hire Date: 12/10/82

Data  
Items

Date	JobTitle
12/10/88	Development Manager
1/15/92	Director of Development
12/10/84	Lead Programmer
12/10/82	Programmer
12/10/86	Senior Programmer

Table

Date	Salary
12/10/82	\$35,000
12/10/83	\$37,000
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12/10/85	\$43,000
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1/15/92	\$80,000

Table

Grid

# List Element

- List = anything + data set iterator
- Example: form letter w/text, charts, tables
- List bands
  - Header, footer
  - Detail
  - Groups: header, footer
- List has no visual properties, it is purely an iterator
- Band can contain multiple items
  - Subreports
  - Conditional content

# Chart Element

- Powerful charting capabilities
- Bar charts, pie charts, line charts, etc.
- Many customization items
- Multiple Y-axes
- Great color choices

# Report Parameters

- Passes data from user into report
- Some uses
  - Custom filters
  - Custom formatting
- Properties
  - Name, type, prompt
  - Static or dynamic choice lists
- Use default BIRT JSP pages for UI, or create your own
- For custom pages
  - Craft pages by hand
  - Generate them using parameter metadata

# Styles

- Separates layout from formatting
  - Ensure consistent formatting within a report
  - Ensure consistency across reports (after Release 1)
- Very similar to CSS styles
  - Most CSS properties and settings
  - Adds report-specific properties
- Cascade rules based on CSS
  - Container-to-content
  - Pre-defined selectors for most report items
  - Also, position-based: list & table bands, group levels

# Scripting

- Real-world reports often require application-specific code
  - Computed columns
  - Value expressions
  - Conditional formatting
  - Report execution events
  - More!
- ROM uses JavaScript
- Expressions & scripts have same syntax
  - Excellent Java integration
- Add custom business logic to report
- Or, access logic in Java (for separation of logic & presentation)

# Extensibility – Report Items

- Define your own report items
  - Examples: stop lights, gauges, web controls
- Define a new extended element
  - Properties, methods
- Custom property sheet, builder (optional)
- Custom run-time behavior (optional)
- Custom rendering
  - To image, or direct to HTML, PDF, etc.
- Full access to report data, styles, etc.
- Extension appears same as built-in item

# Extensibility – Data Sources & Data Sets

- Open Data Access framework
- Examples: SOAP, EJB, web logs, CSV
- Define a driver for your custom data provider
- Design-time features
  - Specialized properties
  - Design time UI
- Runtime features
  - Data source (connection) implementation
  - Data set implementation

# Call to Action!

- Download BIRT and walk through a tutorial
  - <http://www.eclipse.org/birt>
- Attend *BOF*
  - General discussion
  - Usability testing Thurs. 12-2
- Join us for an informal chat at the Poster Reception
  - Today 5:30 - 7:30, Atrium
- Help us in Usability Testing
  - Wed/Thu conference hours, Oak Room (sign-up sheet on message board)
- See us at the Actuate booth in the Exhibit Hall
- BIRT news group
- Contact Project Management Committee (PMC)

Paul Rogers

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# Q & A

