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Available Pages

- Report Bursting
  - Advantages of Pentaho Bursting
  - Pentaho Bursting
  - Pentaho Bursting Achitecture
  - Pentaho Bursting Case Study

Report Bursting

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Introduction

Report Bursting has a fairly long history (for the computer industry). It can be traced back to the days when printers were the size of washing machines and printer paper was perforated fan-fold with green bars on it. Large reports would be created with 'page breaks' between each section of the report and someone would have to stand and physically break, or 'burst', the pages at that point by flicking the edge of the perforations with their finger.

Bursting is still used today but generally involves much less finger-flicking. Some reporting bursting solutions still use the approach of taking one long data set and breaking it up into many parts, however Pentaho uses an approach than is more sophisticated.

Advantages of Pentaho Bursting

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Report Bursting Pentaho Bursting

Pentaho Bursting has many advantages over other reporting solutions:

Scalable

By using messaging the content creation and delivery process can be distributed and clustered. New resources can even be added to the burst process while it is executing.

Controllable

The Burst Rule and Burst Process can be scheduled, audited, and controlled. The processes execute on your schedule as batch processes that are protected from end-user interference.

Secure

The Business Rule and Business Process use your business logic to generate queries that can apply row-based security and to determine the best recipients.

Implement Best Practices

You can implement your organization's best practices for reporting and information delivery.
Information overload is reduced by customizing the content and using thresholds and business rules to boil the information down to the important cases.
Delivery thru email provides user's with offline access.
Delivery of content as spreadsheets allows client-side analysis

Simple...

You focus on two separate and distinct tasks.
1.How do we identify the cases or triggers that start the information delivery process
2.What gets delivered where for each case

...Yet Sophisticated

You can use business rules, database queries, web service calls, scripting, and workflows to customize the system as much as you need.

Integration

Since the Burst Rule and the Burst Process are separate processes Burst Rule could be implemented in any custom application and messaging, web services, or workflow orchestration used to initiate each Burst Process.

Pentaho Bursting

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Advantages of Pentaho Bursting | Report Bursting | Pentaho Bursting Achitecture

There are several disadvantages to the original approach to bursting. Firstly it is very difficult to scale the bursting to large datasets because a single query or dataset does not lend itself to clustering or distributed processing. Secondly large datasets result in a large single process that cannot be controlled easily. Thirdly it is difficult to introduce complex logic or variations at the level of the individual report.

Pentaho Bursting uses different approach. Re-usable template processes are used to define a Burst Rule and a Burst Process.

The Burst Rule

The Burst Rule is used to identify the particular cases, situations, or triggers that require content to be generated or information to be delivered. For example it could determine departments that have exceeded budgets, employees that have too much overtime, suppliers with too many incorrect deliveries etc. This rule can be a simple query or can be a complex workflow involving multiple business rules and multiple data-sources. The Burst Rule typically iterates over the cases identified by the business rules and processes each case one at a time. The entire dataset needed to run all the rules and generate the content is never read into memory at one time.

To distribute and cluster the bursting process messaging (JMS) can be used by the Burst Rule to broadcast each case in a JMS message for a cluster of reporting servers to work on. A persistent message queue guarantees delivery and ensures that the Burst Process can be resumed after hardware failure.

The Burst Process

The Burst Process is a workflow that generates content and saves it or delivers it. This process is designed to handle a single situation identified by the Burst Rule. The process receives parameters from the Burst Rule and can use those parameters to customize the process and the content that is generated. For example the process could use a parameter such as the department to generate a different query, select a different report template, or use a web service to determine the recipient(s) for the information.

Pentaho Bursting Achitecture

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Pentaho Bursting Report Bursting Pentaho Bursting Case Study

Pentaho Bursting is a feature of the Pentaho Reporting Server and the Pentaho BI Platform. As you can see from the sections above there are many components required to build a successful Report Bursting system such as:

- Triggers: Business rules, events, integration points
- Workflow: Ability to customize logic
- Services and messaging: clustering / scalability
- Business Intelligence components: reporting, rules engines, email, print, workflow integration etc
- System Control: SNMP / JMX integration
- Auditing: Reporting and analysis of what has been generated and delivered

The Pentaho BI Platform contains all of these components in a scalable, customizable, embeddable system that is available as an Open Source product.

More Information

For a more detailed description of the Pentaho architecture a white paper is freely available at: Pentaho's SourceForge.net download page.

Pentaho Bursting Case Study

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Pentaho Bursting Achitecture

Report Bursting

Bursting case study using MySQL 5.0