Billing and Pool Queue Plots

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Billing /Accounting

*dCache Book, Chapter 15.*

• dCache has built-in monitoring capabilities which provide an overview of the activity and performance of the installation’s doors and pools. There are two options for how this data can be represented and stored:
  – a set of log files written to a known location
  – a database (the billing database).

• These options can be enabled simultaneously. If the database option is selected, the data in those tables will also be displayed as a set of histogram plots on the installation’s web page.
Billing Logs

Plain text log files, written to known location (/var/lib/dcache/billing/yyyy/mm), named:

- billing-<yyyy.MM.dd>.log
- billing-error-<yyyy.MM.dd>.log

Four kinds of messages stored:

- mover message (MoverInfoMessage)
- remove message (RemoveFileInfoMessage)
- door message (DoorRequestInfoMessage)
- storage message (StorageInfoMessage)

A very detailed description of the formatting of the entries (and how to customize them) can be found in:

/usr/share/dcache/defaults/billing.properties

Note that with 2.6, there is a new boolean attribute on the mover message, ‘p2p’, denoting a pool-to-pool transfer. This is available for use (and present in the database) but has not been added to the default format for backwards compatibility.
Billing Logs

The summary table based on these logs is still available as a web page at http://<httpdhost>:2288/billing but has not been incorporated into the new webadmin pages.

### dCache Billing

#### Total Request Overview

<table>
<thead>
<tr>
<th>Action</th>
<th>Total Request Count</th>
<th>Request Failed</th>
</tr>
</thead>
<tbody>
<tr>
<td>request:door</td>
<td>28</td>
<td>4</td>
</tr>
<tr>
<td>store:pool</td>
<td>13645</td>
<td>13645</td>
</tr>
<tr>
<td>transfer:pool</td>
<td>30</td>
<td>0</td>
</tr>
<tr>
<td>remove:pool</td>
<td>84</td>
<td>0</td>
</tr>
</tbody>
</table>

#### Pool Statistics

<table>
<thead>
<tr>
<th>Pool</th>
<th>Mover Transfers</th>
<th>Restores from HSM</th>
<th>Stores to HSM</th>
<th>Total Errors</th>
</tr>
</thead>
<tbody>
<tr>
<td>w-dmsdca02-1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>9548</td>
</tr>
<tr>
<td>Total</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>9548</td>
</tr>
</tbody>
</table>
Billing Database

Has been around since 1.9.12.
The schema has been extended, indices and triggers added, and one table (costinfo) eliminated.

It now consists of four fine-grained tables (billinginfo, storageinfo, doorinfo and hitinfo), along with a corresponding set of aggregate tables (hourly to daily), and a set of views over the fine-grained data (for the sake of guaranteeing reads with results always of a fixed size).

For configuration and customization, see chapter 15 of the dCache Book.

A note concerning the hitinfo tables: these record disk cache hits and misses; however, they will remain unpopulated unless

poolmanager.cache-hit-messages.enabled=true

Since there is additional cost to sending these messages, it is not enabled by default.
Billing Plots

A fixed set of plots which display

- (Giga)bytes read and written for disk and backend
- Pool-to-pool (giga)bytes written
- Number of read and write transfers for disk and backend
- Number of pool-to-pool transfers
- Connection time (max, min, average)
- Cache hits and misses

The data is grouped into four columns showing 24-hour (by hour), 7-day, 30-day and 365-day (by day).

To generate plots, you need to set

```
billingToDb=yes
generatePlots=true
```

The plots are refreshed at an interval of every five minutes; this can be changed via

```
billing.plot.refresh-threshold (in minutes)
```

There is a limited set of options for the type of data representation:

```
billing.plot.default-style (CONNECTED, OUTLINE, FILLED)
billing.plot.default-scale (lin, log)
```

NOTE: The billing infrastructure has been rewritten since 2.2 to enable running the billing cell/service on a different host from the httpd service.
dCache User Workshop

Berlin/Wilhelminenhof 28/05/2013

CONNECTED, log

BILLING HISTORY PLOTS

Read Transfers (365 days since Fri May 25 00:00:00 CDT 2012)
Pool Queue Plots

New feature with 2.6

Based on the pool queue statistics table:

Data is stored in round-robin database such as used for network data. To generate plots, set:

`poolqplots.enabled=true`
Pool Queue Plots

Names are ordered alphabetically, ascending or descending.

Filter provided for convenient selection of subset of pools (regular expression – here “CMSSTOR3”)

Grid expands & contracts dynamically (max 4 to a row)
Questions or Comments
Welcome