[ ] CASK DAP

Cask Data Application Platform

Why is Hadoop hard?

Though Apache Hadoop™has demonstrated its value in many use-cases, developers spend too much time working with infrastructure issues instead of their core concerns. As a consequence, Hadoop will never be a mainstream technology for data applications unless that can be changed.

If you are building a data application and managing enterprise-scale data, you will need to address:

- Consistency of data
- Scalability of performance and storage
- Monitoring and management
- Security of access and modification
- and so forth...

Consistency of data can be handled by using a platform providing transactions. Scalability requires elastic scale. Monitoring and management requires logging, metrics and a testing and debugging framework. Security requires authentication and the handling of credentials.

To do all of this, you'll need to build an entire platform that provides an infrastructure for Hadoop.

A Platform for Data Applications

The Cask Data Application Platform (DAP) is an application server providing such a platform for the development, deployment and management of data applications and the management of data.

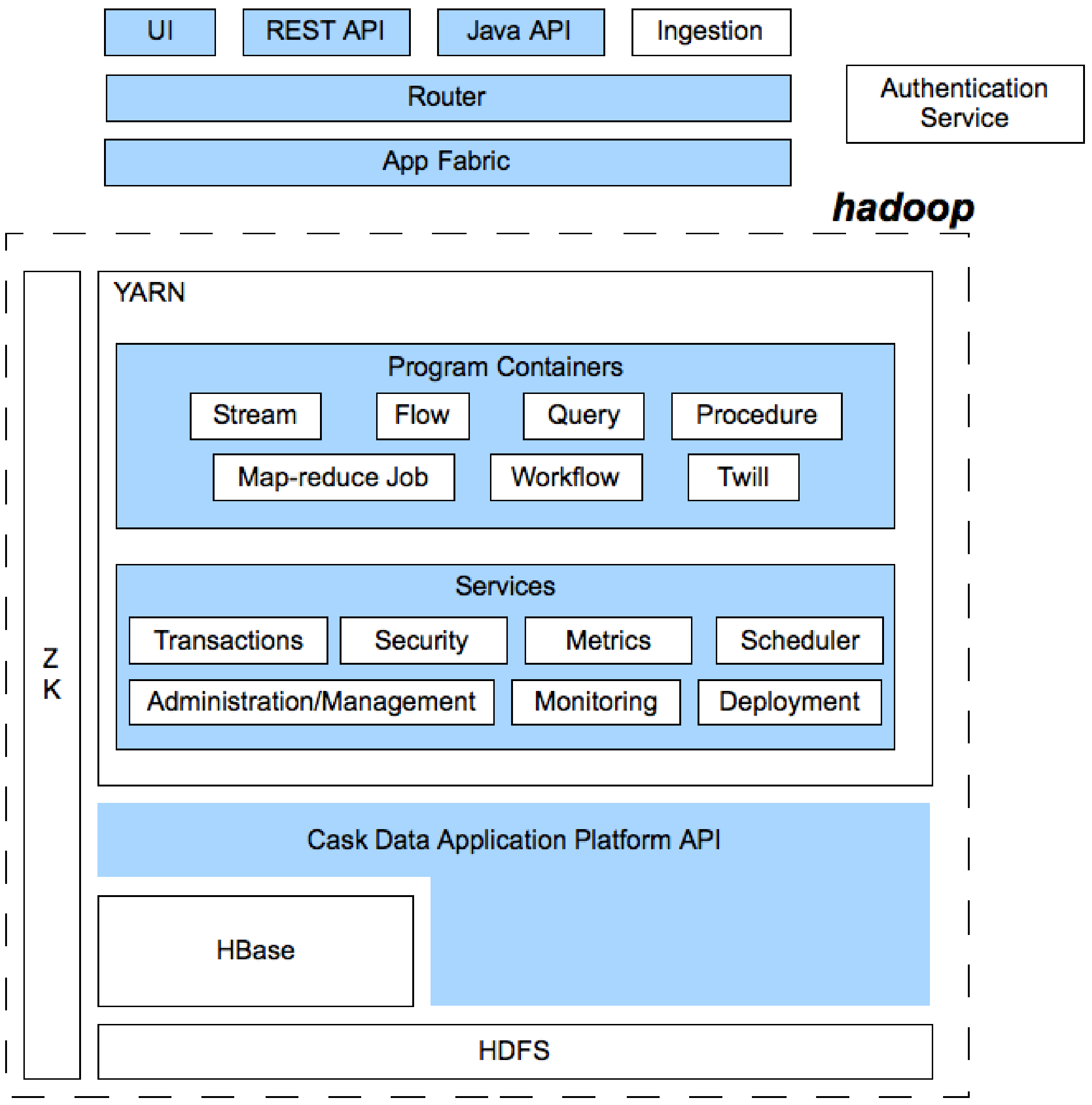
Out-of-the-box, its features include transaction management, dataset abstractions, QoS, performance, scalability, security, metrics and log collection, service discovery and a web-based management dashboard.

DAP's container model allows for the integration of different processing paradigms with these features. It provides a common environment, the abstraction of a unified API, the lifecycle management and a programming model for data applications and their data.

You can run applications ranging from simple Map-reduce jobs through complete ETL (extract, transform, load) pipelines all the way up to complex, enterprise-scale data-intensive applications. Developers can build and test their applications end-to-end in a full-stack single-node installation. Cask DAP can be run either standalone, deployed within the Enterprise or hosted in the Cloud.

How It Works

Cask DAP functions as a middle-tier application platform. As seen in the diagram below, it provides an interface (using either HTTP REST or Java APIs) to clients through a Router along with services and features that run inside YARN containers in Hadoop.



These services and features include:

- **Dataset Abstractions:** with transactions provided by using Cask Tephra, these abstractions provide generic, reusable Java implementations of common data patterns;
- **Streams:** the realtime means for bringing data from external systems into the Server;
- **Realtime Processing using Flows:** developer-implemented, real-time Stream processors, comprised of one or more *Flowlets* wired together into a directed acyclic graph;
- **Batch Processing:** using Map-reduce Jobs and Workflow Schedules, as in conventional Hadoop systems;
- **Ad-Hoc SQL Queries:** for datasets that implement methods for obtaining the schema and scanning the data record by record, you can access and query data using SQL;
- **Stored Procedures:** allowing synchronous calls into the Server from an external system and the performance of server-side processing on-demand, similar to a stored procedure in a traditional database;
- **Metrics, Logging and Monitoring:** system and user-defined metrics, along with standard SLF4J logs, a testing framework and the ability to attach a remote debugger;
- **Management Dashboard:** available for deploying, querying and managing the Server;

- **Different Runtimes:** single-node (useful for learning, prototyping and testing), Sandbox (hosted in the cloud) and Enterprise;
- **YARN containers:** services are run in YARN containers in Hadoop, providing access to HBase and HDFS, and the scalability and performance of Hadoop without the complexity.

Getting Started

You can get started with Cask DAP by building directly from the latest source code:

```
git clone https://github.com/cask/dap.git
cd dap
mvn clean package
```

After the build completes, you will have a distribution of the Cask DAP Single-node SDK under the `dap-distribution/target/` directory.

(To build for installation on a Hadoop Cluster, see the Cask Building and Installation Guide, a copy of which is included in the source distribution in `/docs/developer-guide/source/install.rst`.)

Take the `dap-<version>.tar.gz` file and unzip it into a suitable location.

Step 1: Installation and Startup

Start the Cask DAP from a command line in the SDK directory:...

Step 2: The Dashboard

When you first open the Dashboard, you'll be greeted by:...

Step 3: Inject Data

Click on the Flow name (LogAnalyticsFlow),...

Step 4: Query Procedure

Now let’s see the results of our event....

Step 5: Modify the Code

Now let’s try something different....

Step 6: Redeploy and Restart

We now need to stop the existing Application. ...

Step 7: Checkout the Results

Click on the name of the Procedure ...

Step 8: Stop the Server

To stop the Server...

Where to Go Next

Now that you've had a look at Cask DAP SDK, take a look at:

- Examples, located in the `/examples` directory of the Cask DAP SDK;
- Selected Examples (demonstrating basic features of the Cask DAP) are located on-line, at <http://cask.com/developers/docs/dap/current/en/examples.html
- Developer Guides, located in the source distribution in `/docs/developer-guide/source` or online at http://cask.com/developers/docs/dap/current/en/index.html;

How to Contribute

Interested in helping to improve Cask DAP? We welcome all contributions, whether in filing detailed bug reports, submitting pull requests for code changes and improvements, or by asking questions and assisting others on the mailing list.

Bug Reports & Feature Requests

Bugs and tasks are tracked in a public JIRA issue tracker. Details on access will be forthcoming.

Pull Requests

We have a simple pull-based development model with a consensus-building phase, similar to Apache's voting process. If you'd like to help make Cask DAP better by adding new features, enhancing existing features, or fixing bugs, here's how to do it:

1. If you are planning a large change or contribution, discuss your plans on the `cask-dap-dev` mailing list first. This will help us understand your needs and best guide your solution in a way that fits the project.
2. Fork Cask DAP into your own GitHub repository.
3. Create a topic branch with an appropriate name.
4. Work on the code to your heart's content.
5. Once you're satisfied, create a pull request from your GitHub repo (it's helpful if you fill in all of the description fields).
6. After we review and accept your request, we'll commit your code to the cask/dap repository.

Thanks for helping to improve Cask DAP!

Mailing List

Cask DAP User Group and Development Discussions: cask-dap-dev@googlegroups.com

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