SAGA Async Advert Adaptor

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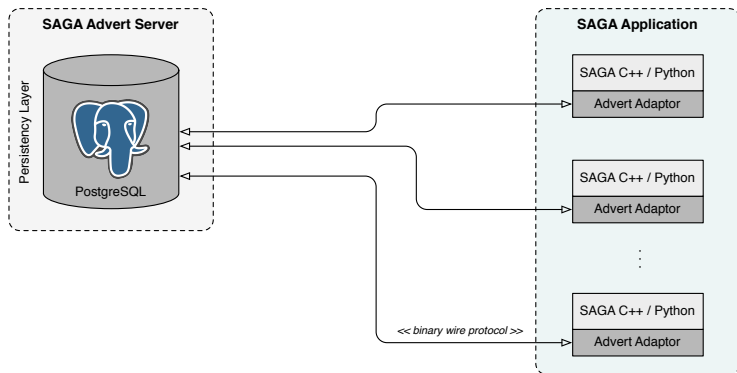
Sync Advert Adaptor

Figure: Default Advert and Fast Advert Adpator communication layout.

Sync Advert Adaptor

Communication layout

- Each Adaptor instance has a single connection to the database.
- Directories / Entries are opened with recursive queries.
- This leads to multiple Request/Response roundtrips.
- Each Attribute needs one query.
- This leads to one Request/Response roundtrip per attribute.
- Polling is needed to see if something has changed.

Fast Advert Adaptor

- Reduced query count.
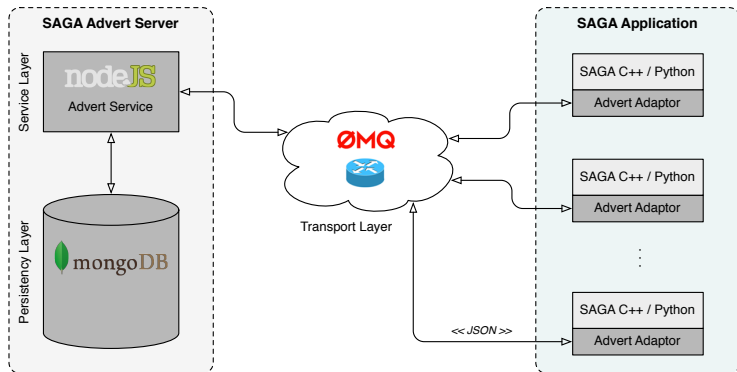- Still needs polling !

Async Advert Adaptor

Figure: Async Advert Adpator communication layout.

Async Advert Adaptor

Communication layout

- Two ZMQ connections per Adaptor instance.
- One Request/Response connection to send commands.
- One Publish/Subscribe connection to receive notifications.
- No recursive database layout.
- Directories / Entries are transported as a union.

Roundtrips

- Only one roundtrip to open an Diretory / Entry.
- No extra roundtrip to query an attribute.
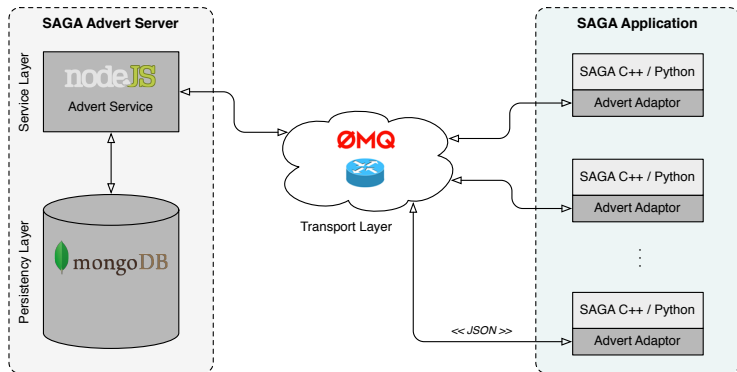- No polling to the server.

Architecture

Figure: Async Advert Adpator Architecture

Technology

NodeJS

- The Advert Server is implemented in the NonBlocking JavaScript framework NodeJS.
- Manages incommming connections.
- Publishes messages to the Advert Adaptor client.
- Communicates with the DataBase.

MongoDB

- MongoDB is used as the Database persitency layer.
- Document based, each directory/entry modeled as document.

Technology

ZeroMQ

- ZeroMQ sockets connect the Advert Adaptor to the server.
- REQUEST/RESPONSE socket used so send commands to the server.
- PUBLISH/SUBSCRIBE socket used to notify the Advert Adaptor clients.

JSON

- JSON is used as a lightweight data interchange format.
- The Advert Addaptor sends JSON coded commands e.g. Open, Close, Create to the Server.
- The server responds with a JSON coded diretory / entry.
- The server publishes JSON coded document ID's to the Advert Adaptor Clients.

Technology

Links

- http://nodejs.org/
- http://www.mongodb.org/
- http://www.zeromq.org/
- http://www.json.org/

Howto install the Async Advert Adaptor

SAGA Core

First make sure you have a fully working SAGA Core installation on your system ! Installation details can be found on
http://www.saga-project.org/documentation/installation

Howto install the Async Advert Adaptor

Get ZeroMQ

Befor the installation of the Async Advert Adaptor we need to install
ZeroMQ (Release 2.1). Download the POSIX tarball from
http://www.zeromq.org/intro:get-the-software and install it.

Install ZeroMQ

tar xvzf zeromq-2.1.10.tar.gz
cd zeromq-2.1.10
./configure –prefix=/choose/your/install/path/zeromq-2.1.10
make
make install

Howto install the Async Advert Adaptor

Get AsyncAdvertAdaptor

After the installation of ZeroMQ it is time to get the Async Advert Adpator from the SVN repository.

Install Async Advert Adaptor

svn co https://svn.cct.lsu.edu/repos/saga-adaptors/async_advert_adaptor
cd async_advert_adaptor
./configure –with_zmq=/install/path/zeromq-2.1.10
make
make install

Effective usage

Directories / Entries are transported as unions

Keep in mind that directories / entries are transported as unions over the wire. That means all attributes and vector attributes are transmitted with every directory / entry.

Usage hints

- Try to keep attribute count per directoy / entry as low as possible.
- Don't use a single entry to coordinate all workers.
- Assign every worker to it's own entry.
- Try to keep entry count peer directory as low as possible.
- Use different directories to model dependancies.