spring-data-cassanra的简单使用 - 一碗豆浆

之前写了JAVA操作cassandra驱动包，现在来看看spring-data对cassandra的支持。这里是spring-data-cassandra的官方文档：http://docs.spring.io/spring-data/cassandra/docs/1.5.0.M1/reference/html/

这个目录下还有api、版本日志等：http://docs.spring.io/spring-data/cassandra/docs/1.5.0.M1/

1. 引入jar包

```
<!-- 这里对应的是cassandra3.0之后的版本 -->
<dependency>
   <groupId>org.springframework.data</groupId>
    <artifactId>spring-data-cassandra</artifactId>
    <version>1.5.0.M1</version>
</dependency>
```

2. 定义域模型（实体类）
不存在复合主键的情况：

```
package com.my.domin.pojo;

import org.springframework.data.cassandra.mapping.Column;
import org.springframework.data.cassandra.mapping.PrimaryKey;
import org.springframework.data.cassandra.mapping.Table;

@Table
public class Person
{
    // 主键
    @PrimaryKey
    private String id;

    // 列名 与数据库列名一致时可不加
    @Column(value = "name")
    private String name;

    private int age;

    // 支持构造函数
    public Person(String id, String name, int age)
    {
        this.id = id;
        this.name = name;
        this.age = age;
    }

    public String getId()
    {
        return id;
    }

    public void setId(String id)
    {
        this.id = id;
    }

    public String getName()
    {
        return name;
    }

    public void setName(String name)
    {
        this.name = name;
    }

    public int getAge()
    {
        return age;
    }

    public void setAge(int age)
    {
        this.age = age;
    }

    @Override
    public String toString()
    {
        return "Person [id=" + id + ", name=" + name + ", age=" + age + "]";
    }

}
```

对应的CQL建表语句

```
CREATE TABLE mydb.person (
    id text PRIMARY KEY,
    age int,
    name text
)
```

可以看出和JPA的注解很类似，不同的是cassandra主键用的是@PrimaryKey，而且允许使用构造函数。
如果存在复合主键，则要先映射一个主键的实体类，再映射一个包含这个主键的实体类

```
package com.my.domin.pojo;

import org.springframework.cassandra.core.Ordering;
import org.springframework.cassandra.core.PrimaryKeyType;
import org.springframework.data.cassandra.mapping.PrimaryKeyClass;
import org.springframework.data.cassandra.mapping.PrimaryKeyColumn;

@PrimaryKeyClass
public class Person2Key
{

    // 分区键
    @PrimaryKeyColumn(name = "id", ordinal = 0, type = PrimaryKeyType.PARTITIONED)
    private String id;

    // 集群键
    @PrimaryKeyColumn(name = "name", ordinal = 1, type = PrimaryKeyType.CLUSTERED,
ordering = Ordering.DESCENDING)
    private String name;

    public String getId()
    {
        return id;
    }

    public void setId(String id)
    {
        this.id = id;
    }


    public String getName()
    {
        return name;
    }

    public void setName(String name)
    {
        this.name = name;
    }

    @Override
    public String toString()
    {
        return "Person2Key [id=" + id + ", name=" + name + "]";
    }

}
```

```
package com.my.domin.pojo;

import org.springframework.data.cassandra.mapping.PrimaryKey;
import org.springframework.data.cassandra.mapping.Table;

@Table(value = "person2")
public class Person2
{
    @PrimaryKey
    private Person2Key pKey;

    private int age;

    public Person2Key getpKey()
    {
        return pKey;
    }

    public void setpKey(Person2Key pKey)
    {
        this.pKey = pKey;
    }

    public int getAge()
    {
        return age;
    }

    public void setAge(int age)
    {
        this.age = age;
    }

    @Override
    public String toString()
    {
        return "Person2 [pKey=" + pKey + ", age=" + age + "]";
    }

}
```

对应的CQL建表语句

```
CREATE TABLE mydb.person2 (
    id text,
    name text,
    age int,
    PRIMARY KEY (id, name)
) WITH CLUSTERING ORDER BY (name DESC)
```

其中的WITH CLUSTERING ORDER BY (name DESC) 对应主键类里的ordering = Ordering.DESCENDING，按照name降序存储，只有集群键才能在建表时设置降序存储。
其实还有更加复杂的复合分区键、复合集群键组合成的主键，看懂了上面应该就能举一反三了，而且用的不多，这里就不写了。

3. 定义spring-data接口

```
package com.my.repository;

import java.util.List;

import org.springframework.data.cassandra.repository.Query;
import org.springframework.data.repository.CrudRepository;
import org.springframework.stereotype.Repository;
import com.my.domin.pojo.Person2;

@Repository
public interface PersonRepository extends CrudRepository<Person2, String>
{
    @Query("select * from Person2 where id= ?1 and name= ?2")
    List<Person2> findByIdAndName(String id, String name);
}
```

我们可以看看继承的CrudRepository这个仓库接口类

```
/*
 * Copyright 2008-2011 the original author or authors.
 *
 * Licensed under the Apache License, Version 2.0 (the "License");
 * you may not use this file except in compliance with the License.
 * You may obtain a copy of the License at
 *
 *      http://www.apache.org/licenses/LICENSE-2.0
 *
 * Unless required by applicable law or agreed to in writing, software
 * distributed under the License is distributed on an "AS IS" BASIS,
 * WITHOUT WARRANTIES OR CONDITIONS OF ANY KIND, either express or implied.
 * See the License for the specific language governing permissions and
 * limitations under the License.
 */
package org.springframework.data.repository;

import java.io.Serializable;

/**
 * Interface for generic CRUD operations on a repository for a specific type.
 *
 * @author Oliver Gierke
 * @author Eberhard Wolff
 */
@NoRepositoryBean
public interface CrudRepository<T, ID extends Serializable> extends Repository<T, ID>
{

    /**
```

```
     * Saves a given entity. Use the returned instance for further operations as the
save operation might have changed the
     * entity instance completely.
     *
     * @param entity
     * @return the saved entity
     */
    <S extends T> S save(S entity);

    /**
     * Saves all given entities.
     *
     * @param entities
     * @return the saved entities
     * @throws IllegalArgumentException in case the given entity is {@literal null}.
     */
    <S extends T> Iterable<S> save(Iterable<S> entities);

    /**
     * Retrieves an entity by its id.
     *
     * @param id must not be {@literal null}.
     * @return the entity with the given id or {@literal null} if none found
     * @throws IllegalArgumentException if {@code id} is {@literal null}
     */
    T findOne(ID id);

    /**
     * Returns whether an entity with the given id exists.
     *
     * @param id must not be {@literal null}.
     * @return true if an entity with the given id exists, {@literal false} otherwise
     * @throws IllegalArgumentException if {@code id} is {@literal null}
     */
    boolean exists(ID id);

    /**
     * Returns all instances of the type.
     *
     * @return all entities
     */
    Iterable<T> findAll();

    /**
```

```
     * Returns all instances of the type with the given IDs.
     *
     * @param ids
     * @return
     */
    Iterable<T> findAll(Iterable<ID> ids);

    /**
     * Returns the number of entities available.
     *
     * @return the number of entities
     */
    long count();

    /**
     * Deletes the entity with the given id.
     *
     * @param id must not be {@literal null}.
     * @throws IllegalArgumentException in case the given {@code id} is {@literal
null}
     */
    void delete(ID id);

    /**
     * Deletes a given entity.
     *
     * @param entity
     * @throws IllegalArgumentException in case the given entity is {@literal null}.
     */
    void delete(T entity);

    /**
     * Deletes the given entities.
     *
     * @param entities
     * @throws IllegalArgumentException in case the given {@link Iterable} is
{@literal null}.
     */
    void delete(Iterable<? extends T> entities);

    /**
     * Deletes all entities managed by the repository.
     */
    void deleteAll();
```

```
}
```

这里面实现了一组CURD方法，如果要写一些条件查询的话可以参考

```
@Query("select * from Person where id= ?1 and name= ?2 ALLOW FILTERING")
 List<Person> findByIdAndName(String id, String name);
```

这里要注意的是cassandra支持的查询是有限制的，可以参考这篇文章 http://zhaoyanblog.com/archives/265.html 。3.0之后的版本改善了许多（如上面的查询3.0以下的版本是不支持的，name为非主键字段），一个是支持了非主键的条件查询，一个是降低了集群键的查询限制条件，这里最好自己在cql中测试一下。
spring-data-cassandra文档里还提到一个分页的仓库接口类PagingAndSortingRepository，这个继承自CrudRepository，而且提供了2个分页方法。但是经过测试是不能用的。。至少我没有测试通过，不知道是没有实现（比较倾向于这个，cassandra分页的确比较麻烦），还是自己没有正确使用。

4. application.xml配置文件
   看名字就知道spring-data-cassandra是和spring一起使用的，下面的配置只是最最基本的，更多的配置选项可以参考 https://my.oschina.net/u/2392555/blog/469893 这篇文章。

```
<?xml version="1.0" encoding="UTF-8"?>
<beans xmlns="http://www.springframework.org/schema/beans"
 xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
 xmlns:cassandra="http://www.springframework.org/schema/data/cassandra"
 xmlns:context="http://www.springframework.org/schema/context"
 xmlns:p="http://www.springframework.org/schema/p"
 xsi:schemaLocation="http://www.springframework.org/schema/data/cassandra
    http://www.springframework.org/schema/data/cassandra/spring-cassandra-1.0.xsd
    http://www.springframework.org/schema/data/cassandra/spring-cql.xsd
    http://www.springframework.org/schema/data/cassandra/spring-cql-1.0.xsd
    http://www.springframework.org/schema/beans
    http://www.springframework.org/schema/beans/spring-beans-3.0.xsd
    http://www.springframework.org/schema/context
    http://www.springframework.org/schema/context/spring-context-3.0.xsd
    ">

    <!-- 引入属性文件 -->
    <context:property-placeholder location="classpath:cassandra.properties" />

    <!-- 自动扫描(自动注入) -->
    <context:component-scan base-package="com.my" />
    <!-- 注解方式配置事物 -->
    <tx:annotation-driven transaction-manager="transactionManager" />

    <!-- spring-cassandra -->
    <cassandra:cluster contact-points="${cassandra_contactpoints}"
port="${cassandra_port}" username="${cassandra_username}"
password="${cassandra_password}" />

    <!-- 当前使用scheam -->
      <cassandra:session keyspace-name="${cassandra_keyspace}" />

    <!-- orm -->
     <cassandra:mapping />

    <!-- 类型转换 -->
      <cassandra:converter />

    <!-- cassandra operater -->
      <cassandra:template id="cqlTemplate" />

    <!-- spring data 接口 -->
      <cassandra:repositories base-package="com.my.repository" />

</beans>
```

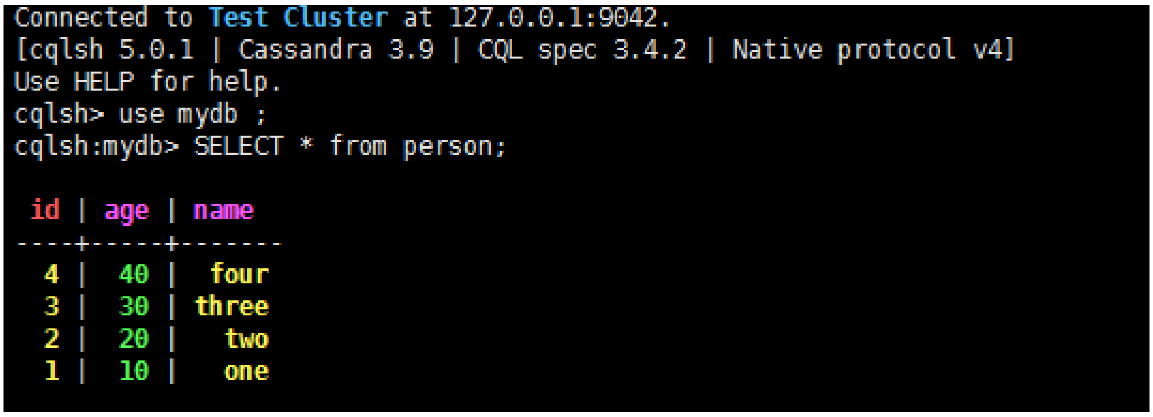
这个配置文件都有注释，没什么可讲的，唯一要注意的是<cassandra:template id="cqlTemplate" /> ，官方文档上写的是<cassandra:template id="cassandraTemplate" />，经过测试官方文档上写的不能使用，改为上面的就好了。
其中cassandra.properties文件配置

```
#cassandra数据库连接
#节点ip
cassandra_contactpoints=192.168.3.89
#端口
cassandra_port=9042
#当前操作键空间
cassandra_keyspace=mydb
#登录用户名
cassandra_username=cassandra
#登录密码
```

```
cassandra_password=cassandra
```

5. 使用测试

cassandra数据库person表中数据如下：

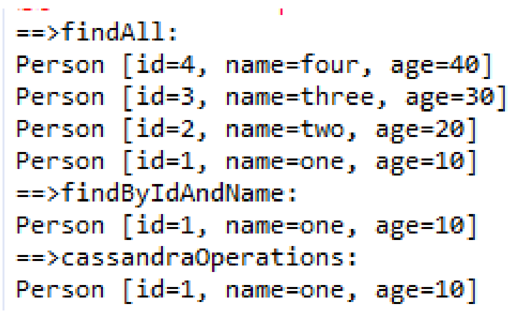


```
Connected to Test Cluster at 127.0.0.1:9042.
[cqlsh 5.0.1 | Cassandra 3.9 | CQL spec 3.4.2 | Native protocol v4]
Use HELP for help.
cqlsh> use mydb ;
cqlsh:mydb> SELECT * from person;

 id | age | name
----+-----+-------
  4 |  40 |  four
  3 |  30 | three
  2 |  20 |   two
  1 |  10 |   one
```

测试方法：

```
package com.my.serviceImpl;

import java.util.Iterator;
import java.util.List;

import org.springframework.beans.factory.annotation.Autowired;
import org.springframework.data.cassandra.core.CassandraOperations;
import org.springframework.stereotype.Service;

import com.datastax.driver.core.querybuilder.QueryBuilder;
import com.datastax.driver.core.querybuilder.Select;
import com.my.domin.pojo.Person;
import com.my.repository.PersonRepository;
import com.my.service.PersonService;

@Service
public class PersonServiceImpl implements PersonService
{
    @Autowired
    private PersonRepository personRepository;

    @Autowired
    private CassandraOperations cassandraOperations;

    @Override
    public void test()
    {
        //通过Repository查询
        Iterable<Person> iterable = personRepository.findAll();
        Iterator<Person> it = iterable.iterator();
        System.out.println("==>findAll:");
        while (it.hasNext())
        {
            Person p = it.next();
            System.out.println(p.toString());
        }

        //通过Repository 自定义查询查询
        List<Person> list = personRepository.findByIdAndName("1", "one");
        System.out.println("==>findByIdAndName:");
        for (Person person : list)
        {
            System.out.println(person.toString());
        }
        //通过cassandraOperations查询
        Select select = QueryBuilder.select().from("person");
        select.where(QueryBuilder.eq("id", "1"));
        Person person = cassandraOperations.selectOne(select, Person.class);
        System.out.println("==>cassandraOperations:");
        System.out.println(person.toString());

    }

}
```

打印结果



```
==>findAll:
Person [id=4, name=four, age=40]
Person [id=3, name=three, age=30]
Person [id=2, name=two, age=20]
Person [id=1, name=one, age=10]
==>findByIdAndName:
Person [id=1, name=one, age=10]
==>cassandraOperations:
Person [id=1, name=one, age=10]
```

这里面包含2种使用方法，一个是使用自己定义的仓库接口类，另一个是spring-data-cassandra提供的CassandraOperations类。CassandraOperations使用方式很多，上面只是列举了一种，其他具体应用官方文档都有说明。

6. 到这里就告一段落了，官方文档还有很多内容，等有时间再去慢慢看了。