零基础学习Spark 1.x应用开发系列课程

RDD操作详解

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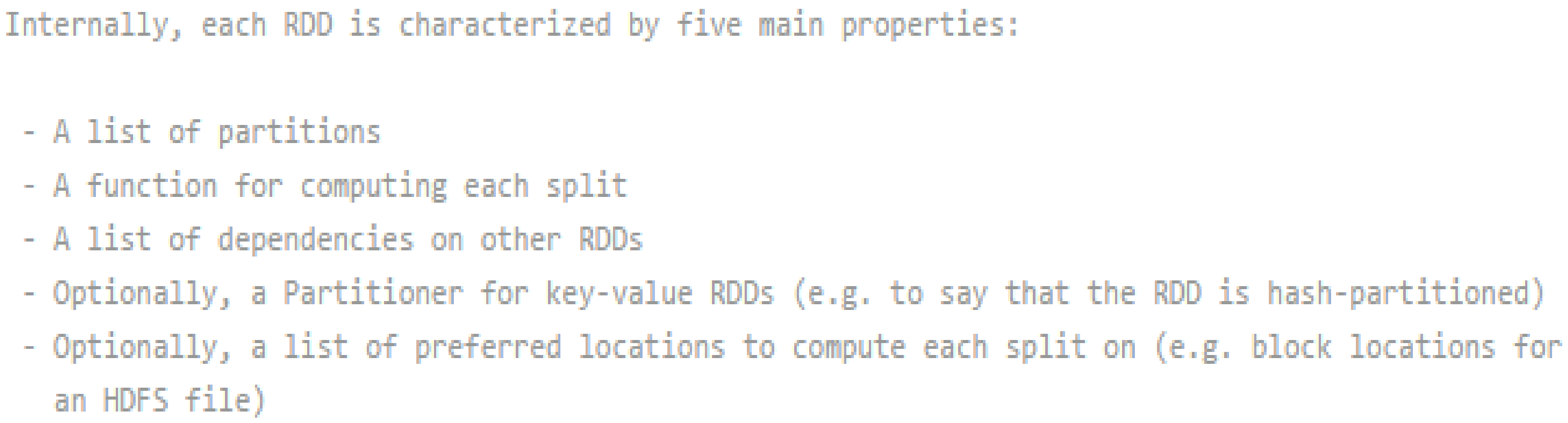
Spark Core—RDD

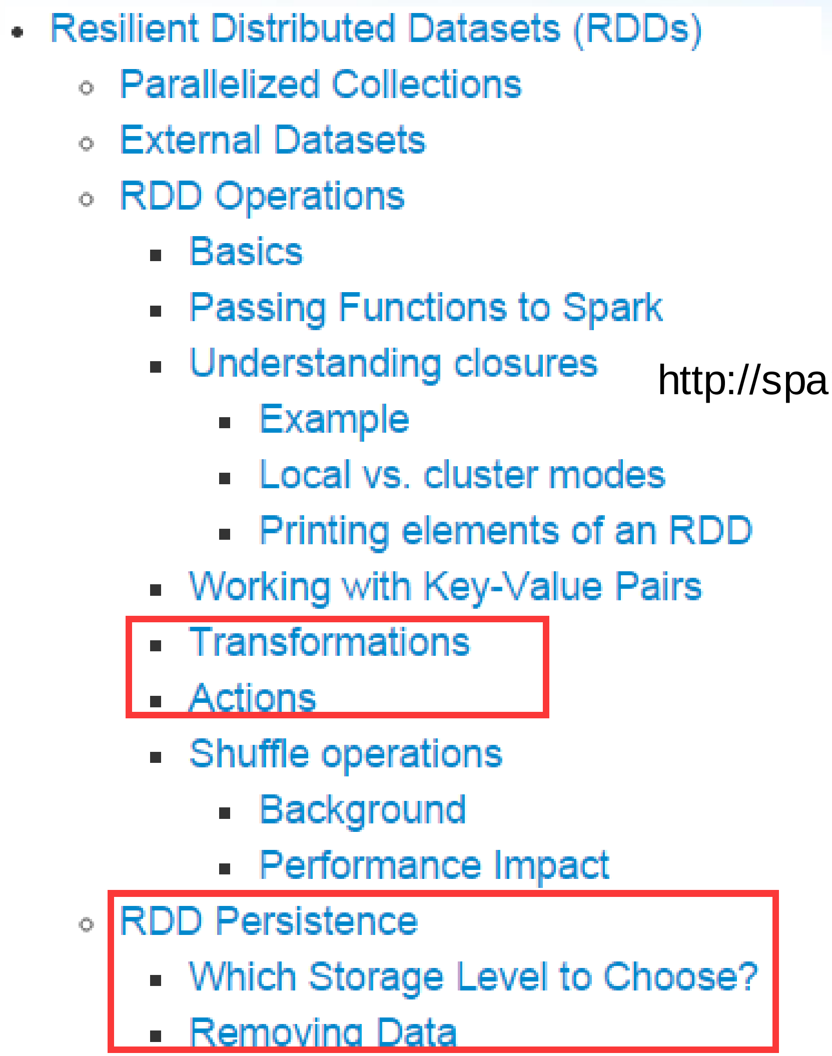
A Resilient Distributed Dataset (RDD), the **basic abstraction** in Spark. Represents an **immutable**, **partitioned** collection of elements that can be operated on **in parallel**.



```
Internally, each RDD is characterized by five main properties:

 - A list of partitions
 - A function for computing each split
 - A list of dependencies on other RDDs
 - Optionally, a Partitioner for key-value RDDs (e.g. to say that the RDD is hash-partitioned)
 - Optionally, a list of preferred locations to compute each split on (e.g. block locations for
   an HDFS file)
```

Resilient Distributed Datasets



- Resilient Distributed Datasets (RDDs)
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  - External Datasets
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http://spark.apache.org/docs/1.3.1/programming-guide.html

create RDDs

- ◆ **Parallelized Collections**
- ◆ **External Datasets**

Spark Core—RDD

Transformations

- Create a new dataset from and existing one.

- **Lazy** in nature. They are executed only when some action is performed.

- Example :
  - map(func)
  - filter(func)
  - distinct() …

Actions

- Returns to the driver program a value or exports data to a storage system after performing a computation.

- Example:
  - count()
  - reduce(func)
  - collect
  - take()…

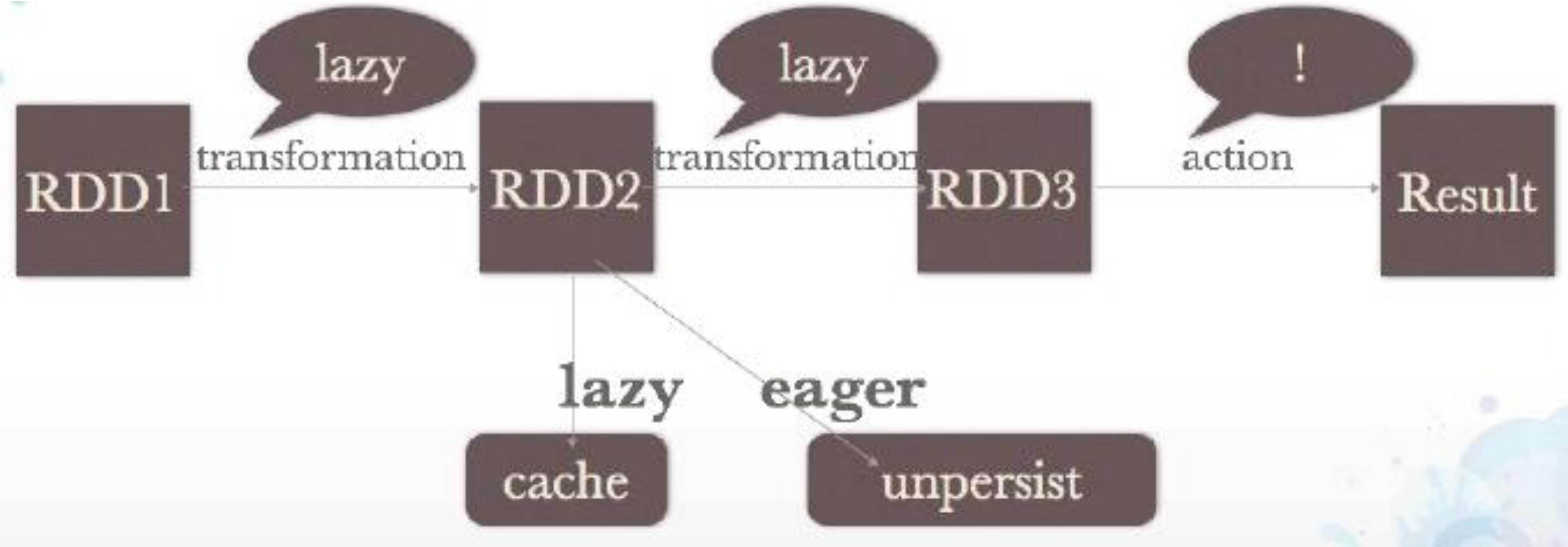
Persistence

- For caching datasets in-memory for future operations.

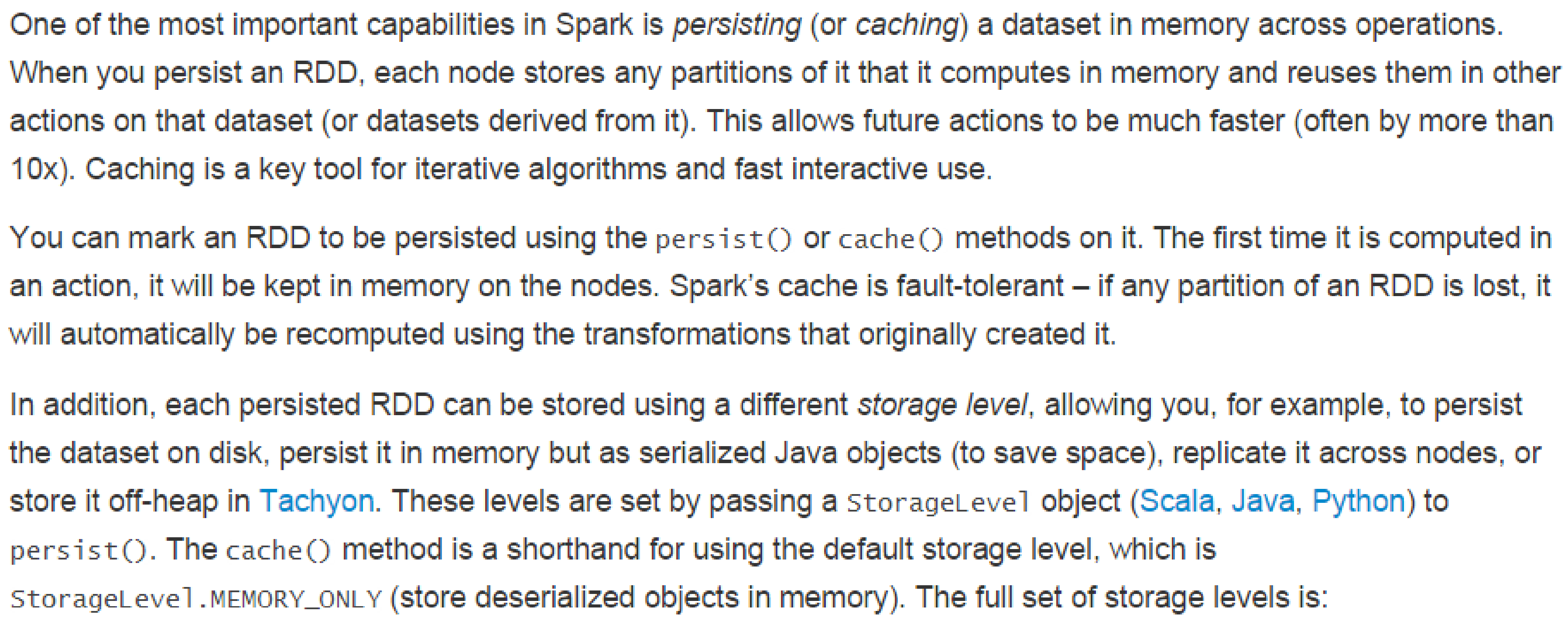
- Option to store on disk or RAM or mixed (Storage Level).

- Example:
  - persist()
  - cache()

Spark Core—RDD



RDD Persistence



One of the most important capabilities in Spark is *persisting* (or *caching*) a dataset in memory across operations. When you persist an RDD, each node stores any partitions of it that it computes in memory and reuses them in other actions on that dataset (or datasets derived from it). This allows future actions to be much faster (often by more than 10x). Caching is a key tool for iterative algorithms and fast interactive use.

You can mark an RDD to be persisted using the `persist()` or `cache()` methods on it. The first time it is computed in an action, it will be kept in memory on the nodes. Spark's cache is fault-tolerant – if any partition of an RDD is lost, it will automatically be recomputed using the transformations that originally created it.

In addition, each persisted RDD can be stored using a different *storage level*, allowing you, for example, to persist the dataset on disk, persist it in memory but as serialized Java objects (to save space), replicate it across nodes, or store it off-heap in Tachyon. These levels are set by passing a `StorageLevel` object (Scala, Java, Python) to `persist()`. The `cache()` method is a shorthand for using the default storage level, which is `StorageLevel.MEMORY_ONLY` (store deserialized objects in memory). The full set of storage levels is:

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