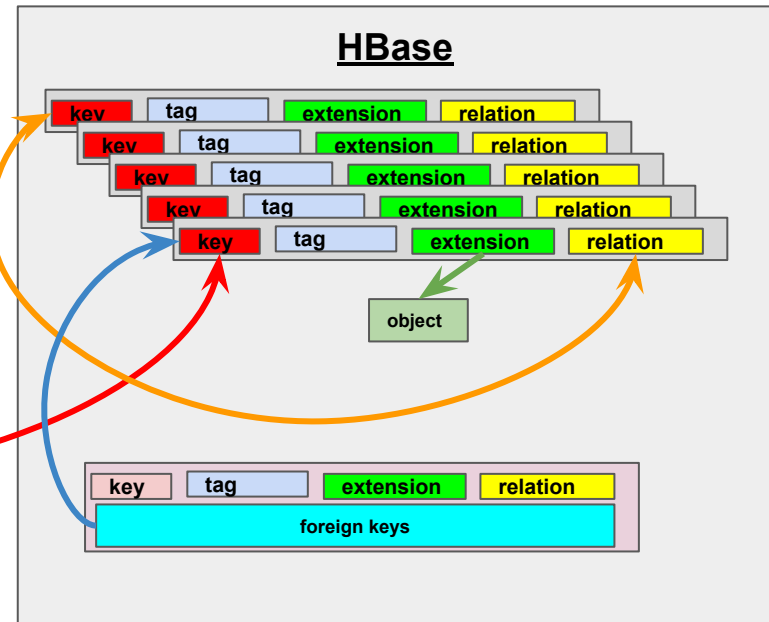
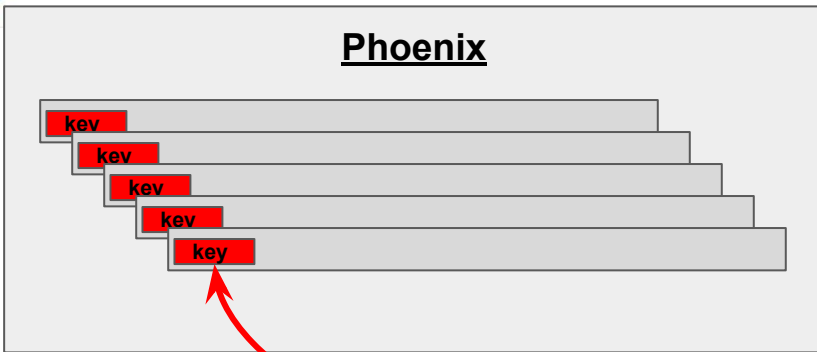
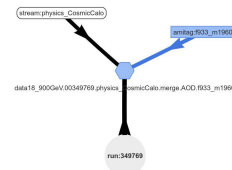




Phoenix++ Architecture

Adding flexibility to Phoenix storage.

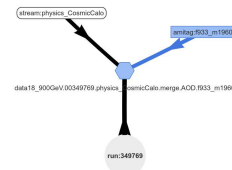


- Both database share the same keys
- User sees one interface to both
 - All data of one key is represented by one **Element**
- HBase db is much smaller
- Phoenix db is read-only
- HBase db is modifiable, it can contain
 - **Simple Tags**
 - They can be also used in search filter
 - **Extensions** with any object
 - E.g. Trigger statistics and overlap, duplicated events list,...
 - **Relations** to other elements
 - E.g. overlaps between datasets

- HBase can also contain Elements without Phoenix partner: **Hubs**
 - They represent collections of Elements
 - E.g. Amitag, Stream, Run, Project,...
 - They can be extended and searched in the same way as other Elements



Phoenix++ Interface



- API - done
- REST Web Service (also serving CLI) - done
 - Serving text; xml or json can be added
- Graphical Web Service - under development
 - Adapting existing GraphDB WS

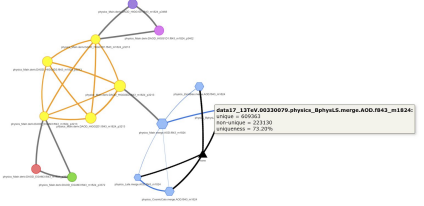
```

ElementFactory ef = ...;
Dataset dprototype1 = new Dataset();
dprototype1.set("runnumber", 140571).
    .set("project", "data09_900GeV").
    ...;
Dataset dataset1 = (Dataset)ef.search(dprototype1).get(0);
...
Dataset dataset2 = (Dataset)ef.search(dprototype2).get(0);
dataset2.add(new Overlap(10, 30, 50, 40, dataset1));
dataset2.add(new Tag("mytag", "myvalue"));
ef.update(dataset2);
  
```

Event Index
 Problems or Questions? Ask [support](#)?

Available runs

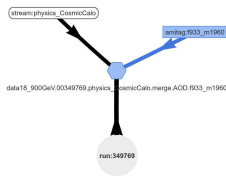
Run ID	Run Name	Run Name	Run Name
140571	140571	140571	140571
140572	140572	140572	140572
140573	140573	140573	140573
140574	140574	140574	140574
140575	140575	140575	140575
140576	140576	140576	140576
140577	140577	140577	140577
140578	140578	140578	140578
140579	140579	140579	140579
140580	140580	140580	140580
140581	140581	140581	140581
140582	140582	140582	140582
140583	140583	140583	140583
140584	140584	140584	140584
140585	140585	140585	140585
140586	140586	140586	140586
140587	140587	140587	140587
140588	140588	140588	140588
140589	140589	140589	140589
140590	140590	140590	140590
140591	140591	140591	140591
140592	140592	140592	140592
140593	140593	140593	140593
140594	140594	140594	140594
140595	140595	140595	140595
140596	140596	140596	140596
140597	140597	140597	140597
140598	140598	140598	140598
140599	140599	140599	140599
140600	140600	140600	140600



<http://localhost:8888/EventIndex/REST.jsp?element=Event&search=eventnumber:57555&tag=golden:mychoice>



Phoenix++ Implementation



- Prototype running on the LAL (partial) replica of the CERN Phoenix storage
 - The same schema
 - Subset of data
 - No authentication, simple configuration
- Can easily use any other Phoenix schema
- Can be moved to CERN
 - Authentication, configuration ?...
- Included in the **Core EI** GIT repository