LDBC Graphalytics v0.9
(graphalytics.org)

Wing Lung Ngai (Tech. lead 2016-2017),
Tim Hegeman, Stijn Heldens, Alexandru Iosup,

New members of the team : Alexandru Uta, Ahmed Musaafir,
Contributors: Arnau Prat-Pérez, Mihai Capotă, Petr Koupy, Yinglong Xia, Peter Boncz
Project History

- 2013 - Performance studies on distributed graph processing
- 2014 - IPDPS article
- 2015 - Performance studies on GPU-based graph processing
- 2015 - First prototype of Graphalytics (v0.2)
- 2016 - VLDB article (v0.3)
- 2017 (now) - The benchmark is ready! (v0.9)
- end 2017 -> Global competition (v1.0)
Benchmark Specification
(LDBC Graphalytics 0.9)

http://github.com/ldbc/ldbc_graphalytics_docs
Benchmark Specification
System-under-test (platform @ environment)

Platform (software):
● large diversity in architecture design, languages, paradigms

Environment (hardware):
● community / high-end, many-cores / multi-cores
For each *target-scale*
- 6 algorithms:
  - BFS, WCC, PR, CDLP, LCC, SSSP
- 5 datasets
  - both real-world and synthetic
- 5x repetitions
- In total, 150 benchmark runs.

### Target-scale

<table>
<thead>
<tr>
<th>Label</th>
<th>Scale</th>
<th>Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>S</td>
<td>7.5-7.9</td>
<td>~50M</td>
</tr>
<tr>
<td>M</td>
<td>8.0-8.4</td>
<td>~160M</td>
</tr>
<tr>
<td>L</td>
<td>8.5-8.9</td>
<td>~500M</td>
</tr>
<tr>
<td>XL</td>
<td>9.0-9.4</td>
<td>~1.6B</td>
</tr>
</tbody>
</table>
Benchmark Specification
Graph-processing job & Performance metrics

- Loading Time [seconds]
- Makespan [seconds]
- Processing Time [seconds]
- EVPS (edge and vertices per seconds) [unit]
- PPP (Price-per-performance) [dollar / unit]
- EPP (Energy-per-performance) [watts / unit] (v2.0)
User Participation
(LDBC Graphalytics 0.9)

http://graphalytics.org
User Participation
How to run the Graphalytics benchmark?

Our website graphalytics.org

- documentation
- platform drivers (5+)
- benchmark resources
User Participation

How to add your platform driver?

Platform Variables
❖ platform_name="Xgraph"
❖ platform_acronym="xgraph"
❖ platform_version="1.0"
❖ developer_name="John Smith"

Boilerplate code
 Platform interaction
 Algorithm implementation
 Code optimization

mvn archetype:generate -B \
-DarchetypeGroupId=science.atlarge.graphalytics \
-DarchetypeArtifactId=graphalytics-platforms-default-archetype \
-DarchetypeVersion=0.9.0 \
-DgroupId=science.atlarge.graphalytics \
-Dpackage=science.atlarge \
-DartifactId="graphalytics-platforms-${platform_acronym}" \
-Dversion=0.1-SNAPSHOT \
-Dplatform-name="${platform_name}" \
-Dplatform-acronym="${platform_acronym}" \
-Dplatform-version="${platform_version}" \
-Ddeveloper-name="${developer_name}"
User Participation
How to view/submit benchmark results?

Json Result Format

```
"id": "b634810",
"specification": "0.9.0",
"system": {
    "platform": {...}, "environment": {...},
    "pricing": "...

},
"benchmark": {
    "type": "standard",
    "target_scale": "L",
    ...

},
"result": {
    ...........

}
```

Full Disclosure Report

![Graphalytics Benchmark 0.9.0](image)
Global Competition
(LDBC Graphalytics v1.0)

Coming soon (ETA 1 - 3 months)
Global Competition

- LDBC global competition
  - coherent to the LDBC guideline (TPC pricing model)
  - ranking method: single value-of-merit
  - e.g. price-per-performance (PPP) score for large-scale L

- Graphalytics global competition
  - broader participation (prototype to production)
  - ranking method: pair-wise comparison
  - e.g. diverse set of performance metrics, target-scales...
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Looking forward to your participation!