Database architecture (R)evolution: New hardware vs. new software

The MIT Faculty has made this article openly available. Please share how this access benefits you. Your story matters.

<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>As Published</td>
<td><a href="http://dx.doi.org/10.1109/ICDE.2010.5447682">http://dx.doi.org/10.1109/ICDE.2010.5447682</a></td>
</tr>
<tr>
<td>Publisher</td>
<td>Institute of Electrical and Electronics Engineers (IEEE)</td>
</tr>
<tr>
<td>Version</td>
<td>Final published version</td>
</tr>
<tr>
<td>Accessed</td>
<td>Sat Mar 30 23:42:00 EDT 2019</td>
</tr>
<tr>
<td>Citable Link</td>
<td><a href="http://hdl.handle.net/1721.1/69994">http://hdl.handle.net/1721.1/69994</a></td>
</tr>
<tr>
<td>Terms of Use</td>
<td>Article is made available in accordance with the publisher's policy and may be subject to US copyright law. Please refer to the publisher's site for terms of use.</td>
</tr>
<tr>
<td>Detailed Terms</td>
<td></td>
</tr>
</tbody>
</table>
Database Architecture (R)evolution: New Hardware vs. New Software

Stavros Harizopoulos *1, Tassos Argyros 2, Peter A. Boncz 3, Dan Dietterich 4, Samuel Madden 5, Florian M. Waas 6

* Panel Moderator
1 HP Labs, USA
2 Aster Data, USA
3 CWI, The Netherlands
4 Netezza, USA
5 MIT, USA
6 Greenplum, USA

I. PANEL OVERVIEW

The last few years have been exciting for data management system designers. The explosion in user and enterprise data coupled with the availability of newer, cheaper, and more capable hardware have lead system designers and researchers to rethink and, in some cases, reinvent the traditional DBMS architecture. In the space of data warehousing and analytics alone, more than a dozen new database product offerings have recently appeared, and dozens of research system papers are routinely published each year. Among these efforts, one school of thought promotes research on exploiting and anticipating new hardware (many-core CPUs [4, 7, 8], GPUs [3], FPGAs [5, 11], flash SSDs [6], other non-volatile storage technologies). Another school of thought focuses on software and algorithmic issues (column and hybrid stores [1, 10, 13], scale out architectures using commodity hardware [2, 9, 10, 13], optimizations in network and OS software stack [9]). And, at the same time, there are approaches that combine hardware-specific optimizations with from-scratch database software design [12].

In this panel, we will ask our panelists, a mix of industry and academic experts, which of those trends will have lasting effects on database system design, and which directions hold the biggest potential for future research. We are particularly interested in the differences in views and approaches between academic and industrial research.

Some of the questions that will be addressed during the panel are the following:

- Column-store start-ups are flourishing, yet “big” database vendors so far adhere to row-oriented data processing. Why?
- Are flash SSDs simply faster disks, or a whole new and exciting research playground?
- Scale out (shared nothing) database architectures are constantly gaining ground against scale up (shared memory/disk) ones. Will this trend hold or will history repeat itself?

ACKNOWLEDGMENT

We would like to thank the ICDE 2010 General Chairs, Umeshwar Dayal and Vassilis Tsotras, and the ICDE 2010 Panel Chairs, Anastassia Ailamaki and Carlo Zaniolo, for suggesting the panel topic and assisting with the panel’s organization.

REFERENCES