Scalability and Parallel processing

Big data is no longer just an impressive buzzword. It's become essential to many companies' success in today's business landscape. The advantages gained by an extensive analytics platform, such as the Intelligent Engagement Platform, have separated dynamic organizations from their sluggish counterparts, with profits following. And, these days, the sheer amount of available data is staggering. From social media sites, to search engine results, to advertising, companies looking to take advantage of client/customer information, have a treasure trove at their fingertips.

But, with the exponential increases in the volume of data being produced and processed, many companies' databases are being overwhelmed with the deluge of data they are facing. To manage, store and process this overflow of data, a technique called "data scaling" has become necessary for many organizations dealing with exploding datasets. A scalable data platform accommodates rapid changes in the growth of data, either in traffic or volume. These platforms utilize added hardware or software to increase output and storage of data. When a company has a scalable data platform, it also is prepared for the potential of growth in its data needs.

Common Performance Bottlenecks

Companies should implement scalability into their organization precisely when performance issues arise. These issues can negatively impact the workflow, efficiency and customer retention. There are three common, key performance bottlenecks, that often point the way toward a proper resolution with data scaling:

1. **High CPU Usage** is the most common bottleneck, and the most visible. Slowing and erratic performance is a key indicator of high CPU usage, and can often be a harbinger of other issues. User CPU means the CPU is doing productive work, but needs a server

upgrade; system CPU refers to usage consumed by the operating system, and is usually related to the software; and I/O wait, which is the idling time caused by the CPU waiting for the I/O subsystem.

2. **Low Memory** is the next most common bottleneck. Servers without enough memory to handle an application load can slow the application completely. Low memory can require a RAM upgrade, but this can also be an indicator of a memory leak, which requires finding and repairing the leak within the application's code.

3. **High Disk Usage** is another common bottleneck. This is often caused by maxed out disks, and is a huge indicator of the need for a data scale.

Scaling Up vs. Scaling Out

Once a decision has been made for data scaling, the specific scaling approach must be chosen. There are two commonly used types of data scaling, up and out:

1. **Scaling up**, or vertical scaling, involves obtaining a faster server with more powerful processors and more memory. This solution uses less network hardware, and consumes less power; but ultimately, for many platforms may only provide a short-term fix, especially if continued growth is expected.

2. **Scaling out**, or horizontal scaling, involves adding servers for parallel computing. The scale out technique is a long-term solution, as more and more servers may be added when needed. But going from one monolithic system to this type of cluster may be a difficult, although extremely effective solution.

When to Scale?

Scaling can be difficult, but absolutely necessary in the growth of a successful data-driven company. There are a few signs that it's time to implement a scaling platform. When users

begin complaining about slow performance, or service outages, it's time to scale. Don't wait for the problem to turn into major source of contention in the minds of your customers. This can have a massively negative impact on retaining those customers. If possible, try to anticipate the problem before it becomes severe. In addition to this, increased application latency, slow read queries rises and database writes are also important indicators that a scale is needed.

Developing a comprehensive scalable data platform is key to continuing your company's development. If your data needs are growing, making sure your system can handle the changing flow of information is key to retaining customers and maintaining efficiency, and ultimately, prepare your company for the future.