# Blekko Delivers Fast, High-Quality Search Results Using 10 Gigabit Ethernet Solutions

## Mellanox Vantage 6048 Switches Provide Superior Performance

### Search Industry Challenges

Every month, search engines handle over 16 billion searches*, and a billion Internet users rely on them to find the content they need among trillions of Web pages. For search companies, it's a challenge to serve up just the right information, and to respond quickly every time.

Enter Blekko, a new kind of search company, which answers the call for high-quality search results without sacrificing speed. Blekko delivers results by enabling users to indicate the informational sites they consider most valuable through slashtags. Individuals can create their own curated lists or use others'-- tapping into a whole "search community."

Blekko launched in November 2010 and served up over a million queries on its first day of operation. Since the launch, Blekko has engaged over 55,000 registered users of the service, and it has seen its search traffic double every month. By enabling humans to filter out irrelevant materials that a computer just can't, this small startup is on track to becoming a leading search player.

### Handling Increased Complexity

Blekko's data center is populated by clusters of computers that continually find, read "parse" retrieve, and store HTML content from billions of Web pages. These computers are running a NoSQL database management system that not only ranks and orders the results of searches, but also slices and dices them according to each user's slashtags. Although this system improves search results, it imposes extra burdens on Blekko, which seeks to answer each query in less than one-quarter of a second. This substantially adds to the complexity of traffic within Blekko's data center and requires higher performance networks.

### Challenge: Maximizing Bandwidth to Minimize Latency

Blekko has deployed a scalable compute and storage architecture that is built by iterating on modules consisting of 48 machines in three racks connected to a 48 port GigE switch. Unlike companies that offer simpler searches with predominantly north-south traffic between machines, Blekko has a continual "maze" of both north-south and east-west traffic to orchestrate within and between each cluster. This means that they also have more communications between nodes than traditional search engines do, and cannot tolerate high levels of oversubscription, which increases latency in the presence of side-to-side traffic. Instead, they need a different kind of network architecture to compensate.

### OVERVIEW

*Blekko, a new kind of search company that answers the call for high-quality personalized search results sought a way to boost bandwidth and accelerate search results. Mellanox Vantage 6048 10 Gigabit Ethernet switches were used as the core backbone for their compute and storage clusters. The new Mellanox switches are providing extremely high throughput, low-latency, non-blocking traffic, and have been key to Blekko's successful launch.*

## Mellanox 10GigE Switches for Ultra-Low Latency

As Blekko was readying to launch, the company sought a solution for preventing the kind of bandwidth problems that could delay the delivery of search results. This was especially important as the company wanted to engage new users, and give them a reason to return. But early stress tests of the clusters revealed subpar performance, and Blekko realized that the switches they were using from another vendor were the cause.

"We can fix our software to reduce delays, but if a switch is inducing latency, that's much harder to correct," said Chuck McManis, Vice President of Operations, Blekko. "We needed the lowest-latency switches from the start, and Mellanox had them."

Blekko selected Mellanox's Vantage 6048 10 Gigabit Ethernet switches as the core backbone for their compute and storage clusters. Each 6048 switch provides 48 ports of 10GigE line-rate connectivity and non-blocking switching throughput of 960 Gbps. Within the cluster, each group of 48 machines is connected to a BladeNetworks 8052 top-of-rack switch, and the four 10 Gigabit Ethernet uplink ports from the top-of-rack switch are aggregated in a 40 Gigabit channel. With 48 Gigabits going in, and 40 Gigabits going to the center of the network, the network bandwidth over-subscription rate is a low 1.2:1. Eight ports on the Vantage 6048 are used for inter-cluster and other communications, allowing the remaining 40 ports to connect up to ten groups of 48 machines, each for a cluster size of 480 machines.

The result: each machine is networked to every other machine within the cluster with 833 Megabits of bandwidth. Between clusters, there can be up to 80 Gigabits of bandwidth, although in practice only 40 Gigabits are used.

The new Mellanox switches are providing extremely high throughput, low-latency, non-blocking traffic, and have been key to Blekko's successful launch. To keep the system running at optimum performance and efficiency, Blekko is also using Mellanox's Unified Fabric Manager™ (UFM™) software, which offers intelligent network orchestration, and congestion monitoring and management tools. The software is particularly useful to Blekko as a diagnostic tool to identify any sources of latency or congestion.

In addition, the Vantage 6048 switches have delivered significant savings for Blekko. "Had we not had access to these switches, we would have had to double the cost of our installation," said McManis. "Mellanox had the best 48-port, 10GigE switch on the market, with a very low price per port and high bandwidth. We'd been considering use of a chassis switch, which would have required a larger cluster, and Mellanox provided a better solution," Said Chuck McManis, Vice President of Operations, Blekko.

Mellanox's switches also offer the industry's lowest power consumption of 6.3 watts/port, and make data centers more efficient by consolidating multiple/redundant network tiers. For McManis, this has also been a benefit. "By keeping the cost of power to infrastructure down, we are boosting our processor use efficiency," he noted. "We can fix our software to reduce delays, but if a switch is inducing latency, that's much harder to correct," said McManis. "We needed the lowest-latency switches from the start, and Mellanox had them."

*Source: comScore

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