

# Gigabit Ethernet Server Farm Aggregation with BLADE Network Technologies' RackSwitch *Solutions Brief*

## Introduction

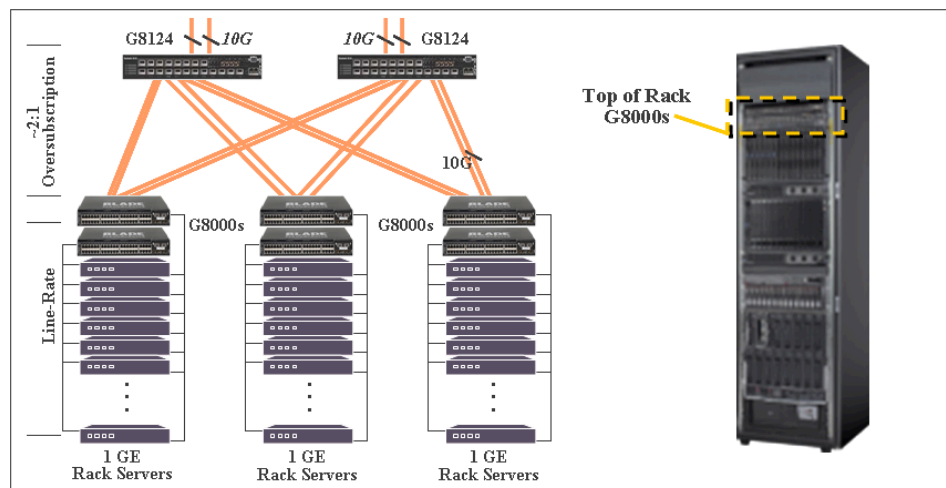
Enterprise data centers are increasingly implementing clusters of servers or “server farms” to accomplish computing needs far beyond the capability of one machine. With a server farm, a given task or workload can be distributed among several high-speed servers or processors to dramatically reduce the run time and increase overall efficiency. The servers and storage may be virtualized to increase utilization and provide flexibility to the data center. Server farms are commonly used for computational-intensive applications in both commercial and research environments, as well as for cloud computing, video content creation & delivery, and other Web 2.0 applications.

The server cluster is typically co-located with a 1/10 Gigabit Ethernet network switch which enables communication between the processors and provides user access to the cluster. BLADE Network Technologies' (BLADE's) top-of-rack Gigabit and 10 Gigabit RackSwitch™ products are ideal Ethernet switches for these data center server farms.

## Server Farm Overview

Figure 1 shows a typical enterprise server farm design. Rack servers, storage devices and top-of-rack switches are all housed in a rack enclosure. Each rack server or storage node, connects to the top-of-rack RackSwitch G8000 with a gigabit Ethernet connection. For redundancy purposes, a second gigabit Ethernet port on each server connects to a second top-of-rack RackSwitch G8000. All gigabit Ethernet connections between the rack servers and RackSwitch are line-rate. Moreover, the RackSwitch G8000 is a non-blocking switch, allowing all servers to transmit and receive data simultaneously without any contention. A 2:1 ratio of throughput is achieved from the RackSwitch G8000s to the RackSwitch G8124 distribution switches. That is, each RackSwitch G8000 has two 10 gigabit Ethernet uplink ports for 20Gbps bandwidth to the RackSwitch G8124 backbone switches; while aggregating up to 48Gbps of traffic from the attached rack servers. The RackSwitch G8124 switches create a high-speed, line-rate 10 gigabit Ethernet distribution layer between RackSwitch G8000s.

Figure 1. 1-GE Server Farm with BLADE Top-of-Rack RackSwitch G8000



### **BLADE RackSwitch G8000**

The BLADE RackSwitch G8000 provides 48 Gigabit Ethernet server ports and 4 10-Gigabit Ethernet uplink ports in a compact one rack-unit (RU) form-factor. The RackSwitch G8000 is a purpose built, high-performance Ethernet switch designed for data center top-of-rack server aggregation. Leveraging BLADE's years of experience designing embedded blade switches for the blade server market, the RackSwitch G8000 features front-to-back or back-to-front cooling, compatible with data center hot-aisle and cold aisle designs. In addition, all switch ports are accessible at the rear of the unit in close proximity to server ports, and all user-configurable components are accessible from the front panel.

### **BLADE RackSwitch G8124**

The RackSwitch G8124 offers 24 10 Gigabit Ethernet ports in a 1 RU footprint. Designed with top performance in mind, the RackSwitch G8124 provides line-rate, high-bandwidth switching, filtering, and traffic queuing without delaying data, and large data-center grade buffers to keep traffic moving. Redundant power and fans along with numerous high availability features ensure that the RackSwitch G8124 is always available for business-sensitive traffic.

### **Power & Cooling**

As computing density increases in the data center, a corresponding increase in power and cooling occurs. Inefficiencies in cooling can drive up operational costs and limit the performance of server farms. Over its lifetime, a computer that runs 24/7 consumes electricity worth many times its initial purchase cost. For this reason, the critical design parameter for server farms tends to be performance per watt, rather than cost of peak performance.

BLADE's top-of-rack switches are designed not only for high performance and low latency, but also for very ultra-low power consumption. On average, the RackSwitch G8000 and G8124 consume only 120 Watts, 35% lower than the nearest competitor (See Figure 2). Overall data energy efficiency is further enhanced by the RackSwitch products' unique front-to-back or back-to-front air flow design.

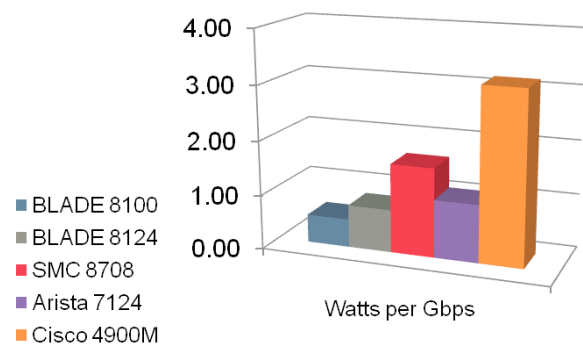


Figure 2. Watts/Gbps for Ethernet switches

### **Conclusion**

With the advent of cloud computing and dynamic data centers, Ethernet is the clear interconnect for server-to-server communications as well as storage networks. Gigabit and 10G Ethernet are cost effective, standardized and well-understood. With BLADE's heritage of over 5 million data center Ethernet ports and virtual, cooler and easier designs, the BLADE RackSwitch is a clear choice for any top-of-rack application.