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Ralf Kornberger  
Leibniz Computing Center

## Leibniz Computing Center Delivers IT Innovation to Its 100,000 Users with F5's BIG-IP Solution

### Industry

Information Technology Services

### Challenges

- Handle increasing web site traffic
- Solve Network Address Translation issues
- Maintain a leadership role in IT innovation

### Solution

F5 BIG-IP® Local Traffic Manager™ with IPv6

### Benefits

- Improved network performance and application availability
- IPv6 capability in place to address new standards
- Improved scalability
- Reduced operating costs

### Overview

The Leibniz Computing Center (Leibniz-Rechenzentrum, LRZ) in Munich, Germany provides general IT services for Munich's universities and for the Bavarian Academy of Sciences and Humanities. The center also runs a powerful communications infrastructure called the Munich Scientific Network (Münchner Wissenschaftsnetz, MWN), which connects the central server systems and the decentralized systems of Munich's universities and other scientific facilities as well as computers in 40 student residences.

The team of IT specialists at the LRZ was searching for a solution to cope with the rapid increase in traffic the center was handling. As a respected leader in IT innovation, the LRZ recognized the need to implement a solution to meet current as well as future needs. By implementing F5 BIG-IP Local Traffic Manager (LTM), the LRZ improved application performance on its expansive network, reduced operating costs, and prepared its infrastructure to meet emerging standards.

### Challenges

The Leibniz Computing Center's goal was to find a way to distribute its services, including web applications and RADIUS, over several servers. The server load balancers (SLBs) from Foundry Networks the center was using

needed to be replaced because they were becoming outdated.

There were also technical challenges that needed to be addressed; the load balancers had repeatedly experienced problems with Network Address Translation. This problem led to further issues, particularly with the proxy servers. “We knew that the old SLB components would have to be replaced if we were going to maintain operational reliability and meet new demands on the networks in the future,” explained Ralf Kornberger of the LRZ's IT department.

The Munich Scientific Network is based on the concept of a “distributed, cooperative IT supply.” It not only allows access to the Internet, it provides constant access to data, programs, and other computers as well as joint use of terminals and much more.

Managing these networks and applications poses significant challenges because the MWN covers more than 60 locations with over 220 buildings. It encompasses 300 kilometers of fiber optic cable between the buildings, 1,100 kilometers of fiber-optic cable and 3,000 kilometers of copper cable inside the buildings, and more than 1,000 active network components. The MWN links more than 55,000 systems, including servers, PCs, printers, and more. In addition, 700 or more access points at numerous





university locations enable wireless access to the network.

It is easy to see how these numbers—not to mention the tens of thousands of visitors to the web sites associated with the LRZ—equate to a huge volume of traffic.

“Before we upgraded our traffic management, the encryption algorithms and the high load on the CPU undermined the normal operation of the web server farm’s individual computers,” Kornberger recalled. To reduce the load on the computers, the IT experts had two options available: to supply each of the servers with its own encryption card or to perform encryption centrally with the aid of an extra component.

The LRZ determined that separate cards would have cost far more than a solution with a centralized encryption unit. Another factor that supported a centralized solution was that it would be easy to extend to other services.

Finally, the center recognized that the days of the old IPv4 are numbered. While IPv4 offers more than four billion addresses with which computers and other terminals can be addressed, the experts agree that this will only meet demand until around 2010. This means a new generation of IP protocol is already in the starting blocks. As a result, old load balancer components will need to be replaced to address these future needs.

### Solution

All of these factors tipped the scales in favor of BIG-IP LTM from F5. The LRZ was particularly interested in BIG-IP LTM because its IPv6 feature is already integrated in the Application Delivery Networking solution. “It was this innovation that was the real deciding factor,” Kornberger remarked.

Kornberger is aware from statistics that many Asian university network users are already on IPv6. As an innovative IT organization in Germany with an important responsibility as a role model, the center needs to stay ahead of the pack. Along with the Internet services affected by new IP standards, it is clear that new technical innovations, such as cell phones with Internet access and web-enabled cars and home appliances, will hit the market in the coming years. The need for addresses in the rest of the world will also increase greatly.

“With the BIG-IP platform and its integrated IPv6 capability, we are ideally equipped for the future,” Kornberger said.

Apart from its IPv6 capability, F5’s BIG-IP LTM is also ideally suited to managing the LRZ’s large data loads on both layer 4 and layer 7, and it is scalable to meet future demands. With industry-leading hardware that is flexible and easy to manage, the BIG-IP system offers a long useful life and reliability and provides the LRZ with the opportunity to significantly reduce overall operating costs.

With BIG-IP LTM, the LRZ benefits from the fastest standardized traffic management solution in the industry. F5’s unique TMOS architecture combines a powerful switching fabric with customized hardware optimizers. This gives the center excellent network performance that ensures the secure and reliable availability of its applications. TMOS also gives the center the flexibility to customize its traffic management using F5’s iRules control language.

“Management is intuitive and, thanks to the web interface, very user friendly,” Kornberger remarked. Once the system is up and running, it is very easy to integrate an extra server. “And there are no problems with troubleshooting,” said the IT expert, showing pride at what the center has achieved. As hoped, BIG-IP LTM is helping the LRZ live up to its function as a role model.

This role shouldn’t be underestimated. After all, it is the LRZ’s reputation for innovation that continually lures entrepreneurs and university representatives to visit the center and find out about the very latest, most important, and most efficient trends in IT.

“We don’t go about our work with the professed intention of being elitist, but what we do is good,” said Kornberger with a grin. And it’s the 100,000 or so users who access the Leibniz Computing Center’s services every day who benefit.

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