



VM At BMW

By Stephen Force

The Bayerische Motorwerke (in English, Bavarian Motor Works), known by the acronym BMW is a major German automobile and motorcycle manufacturer. Best known for its automobiles and motorcycles, BMW has excelled in many other areas. During World War I, the famous Baron Von Richthofen's airplane was powered by a BMW engine. Indeed, the immediately recognizable BMW emblem depicts, in the proud Bavarian colors of blue and white, an airplane propeller surrounded by the letters B M W.

Headquartered just north of Munich, Germany, BMW is world renowned for its sporty, well-built road machines. Although headquartered in conservative Munich, the capitol city of Bavaria, BMW has a distinctly international feel. Worldwide acceptance of BMW products, coupled with factories located in Austria, South Africa, USA (South Carolina), Berlin, as well as throughout Bavaria, has brought enviable international expertise to BMW.

BMW has, over time, developed a vast and impressive I/S infrastructure to support its diverse and expansive global enterprise. This infrastructure has helped BMW become, and remain, one of the top manufacturing organizations in the world.

Those who own BMW products know firsthand the pride and quality craftsmanship by which BMW is known. This pride and quality are not only in the design, engineering and manufacturing areas of BMW, but are also apparent throughout BMW's skilled I/S staff.

BMW historically has used VM for Computer-Aided Design (CAD) support and as a carrier for VSE guests. However, VM is now taking on more roles in the open system area.

Several years ago, BMW opted for a VM-based CATIA CAD product since the VM CAD-based systems require less system overhead and fewer people to support the operating systems.

The VM and VSE technical support manager, Wolfgang Rohde, is responsible for all BMW VM and VSE systems. Rohde has supported BMW's VM systems for more than 12 years and has helped guide VM's progress from initial installation to become a major part of BMW's computing infrastructure.

From offices located in the BMW Research and Development (R&D) center, 3 kilometers (2 miles) away from BMW headquarters, Rohde's staff of eight systems programmers support nine VM/ESA 1.2.1 systems. Two of these VM systems support CAD activities at the BMW Munich's R&D center. Since CAD is an integral part of BMW's product design and engineering, these two VM/ESA images run on a powerful IBM 9021-900 mainframe computer.

Other BMW CAD and manufacturing VM systems are located throughout Bavaria as well

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as in Bavaria's neighbor to the South, Austria. These VM systems run on a mix of IBM and Amdahl processors. All VM systems are supported from the Munich location. The VM systems located at other sites are supported by Rohde's staff remotely.

BMW's VM systems support several hundred concurrent CATIA users. According to Rohde, "We have 650 CAD screens cabled to the VM systems, between 220 to 280 active CATIA users per 15 minute intervals, around 700 to 800 users logged on from 3900 total userids defined in the VM directory."

CAD users generate tremendous amounts of data. A drawing, often called a model, can easily be several million bytes in size. Proper storage and timely retrieval of the model data are vital to BMW. Mechanisms for data management are in place, as Rohde explains, "CATIA has its own file system, which is called FSM (File Sharing Monitor). Organization data-like model numbers, drawing numbers and things like that are kept in a VM-based ORACLE relational database."

Networks: SNA And TCP/IP

Since BMW is an international concern, naturally it has an extensive I/S network, which spans the globe. Because of supporting I/S access requirements in distant and diverse countries, BMW's networking team must possess both the knowledge of and the ability to apply advanced network and telecommunications functions. BMW's global I/S needs require both SNA and TCP/IP networks. The BMW network staff must be able to support such a diverse and complicated network system.

BMW's VM systems are connected to both the BMW SNA and TCP/IP networks. This means that any UNIX workstations connected by Ethernet to the BMW-FDDI backbone can access a VM system. As VM is also connected to an Ethernet via an IBM 8232, every workstation that knows the Internet Protocol (IP) address or IP name of the desired host VM system can connect VM via TCP/IP. For MVS application access, the VM system is fully integrated into the BMW SNA network, providing full access to the MVS environment.

At the LAN-level, BMW uses a combination of MS-DOS and IBM's OS/2 operating systems connected via token-ring network topology. Several of these LANs are connected to BMW's backbone.

VM In BMW's Open Systems' Vision

BMW, like most other organizations, is changing with the realities of current I/S trends. Reduction of mainframe hosts, exploiting the flexibility of workstations, a neutral interface between applications and database, and the separation of data and processing

are a few reasons offered by Rohde as to why BMW has embraced the open systems' philosophy.

When asked if he sees VM becoming more or less strategic at BMW, Rohde replies, "I think VM's role is changing at BMW because more host screens are being replaced by workstations. My intention is to keep the VM host as a big file server with all the backup, archive, batch and security tools, the high availability of VM/ESA, and connected hardware like automated tape silos."

TCP/IP is an important part of BMW's open system philosophy. Several components of TCP/IP are being used, with the File Transfer Protocol (FTP) currently being one of the more strategic.

CATIA-based UNIX workstations are becoming more prevalent. Explains Rohde, "Currently, we have 85 CATIA workstations worldwide. Environments of anywhere from five to 20 UNIX-based CAD workstations are connected to a server, which then transfers the CATIA models to the VM Host via FTP. These UNIX workstations consist of IBM's AIX, Sun, SGI, HP and ULTRIX systems."

ADSTAR Distributed Storage Manager (ADSM)

Many BMW employees daily use PCs with MS-DOS and Microsoft's Windows-based applications installed. These PCs are connected to a LAN and use LAN-based file-and-print servers to provide support for end users.

Currently IBM's OS/2 LAN Server 2.0 and 3.0 are used to provide this LAN print-and-file server support. These OS/2-based servers are connected to VM via the token-ring network topology. Following BMW's intent to position VM as an enterprise file server, Rohde's staff has installed ADSM. ADSM allows BMW's OS/2 LAN file servers to store critical data safely on huge mainframe disk volumes rather than on smaller, less reliable and secure LAN servers. With ADSM Release 1.0 (plus PTF's) in production, the OS/2 LAN servers can exploit the power and stability of VM's time-tested data-management facilities.

Conclusion

Enterprise I/S needs have never remained static and BMW is no exception. By taking the prudent approach of bringing the "new" into the "old" without discarding time-tested I/S systems, BMW is positioned to exploit new technologies without major risks. VM will remain a major part of BMW's total I/S solution by taking on new roles as they evolve. **VM**

ABOUT THE AUTHOR

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