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Standardization helps Volkswagen boost R&D efforts

Migrating from UNIX to Red Hat® Enterprise Linux® for Workstations gave the automaker's R&D engineers a stable platform for resource- and graphics-intensive workloads.

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Challenge

Research and development (R&D) engineers at German automotive manufacturer Volkswagen rely on computer-aided engineering (CAE) for many of their tasks, from analyzing aerodynamics during vehicle development to simulating the impact of a collision. CAE replaced much of the manual work engineers were doing to calculate results and perform crash tests, providing better insights and graphical outputs to inform design improvements.

In the early days of CAE, Volkswagen's R&D engineers ran their simulations on a variety of UNIX desktop operating environments, as well as CAE products and tools from close to 100 vendors. These vendors used a variety of UNIX variants and Linux distributions, making quality control and assurance difficult.

As simulations became more advanced, this complexity also began to affect productivity. Volkswagen sought a solution that would provide more robust workstation capabilities to create photorealistic simulations that show what happens inside a vehicle in great detail. The team also needed an environment with enterprise support to simplify operating system management for R&D engineers.

Solution

After exploring potential operating systems, the R&D engineering team chose Red Hat Enterprise Linux for Workstations, a 64-bit version optimized for high-performance, resource- and graphics-intensive workloads like CAE.

ABOUT VOLKSWAGEN

The Volkswagen Group, with headquarters in Wolfsburg, Germany, is one of the world's leading automobile manufacturers and the largest carmaker in Europe. The Group comprises 10 brands from five European countries: Volkswagen Passenger Cars, Audi, SEAT, Cupra, ŠKODA, Bentley, Lamborghini, Porsche, Ducati, and Volkswagen Commercial Vehicles. The passenger car portfolio ranges from small cars to luxury-class vehicles, and Ducati offers motorcycles. The Volkswagen Group operates globally, with 114 production facilities in 19 European countries and 10 countries in the Americas, Asia, and Africa—and has approximately 684,000 employees worldwide. The Group's vehicles are sold in more than 150 countries.

Key factors in choosing Red Hat Enterprise Linux included:

- **Stability**
- **Commercial support**
- **Built-in security updates**
- **Long life cycle for running older applications**
- **Availability of hardware and software vendor certifications**

Results

Engineers in Volkswagen R&D now use Red Hat Enterprise Linux for CAE to support the latest professional graphics processing units (GPUs) and access the high volumes of memory and data needed for powerful processing.

Benefits from standardizing on Red Hat Enterprise Linux include:

Better support for resource-intensive computing: Support for large amounts of RAM—a deciding factor in Volkswagen R&D's choice of an operating system—remains important as processing and other needs change. The engineers needed an operating system that supported not only powerful CPUs from Intel and AMD but also large amounts of memory. The Red Hat Enterprise Linux for Workstations devices that Volkswagen R&D run today offer a massive 768 GB of RAM.

Red Hat Enterprise Linux for Workstations can meet the demands of the latest and greatest hardware, including the newest professional GPUs.

Improved third-party software compatibility: Standardizing on Red Hat Enterprise Linux helps the automaker's third-party vendors ensure their software is compatible and certified to meet Volkswagen's security and performance needs. To ensure compatibility, Volkswagen R&D set up a workgroup with other industry contributors and automotive software providers to standardize on Red Hat Enterprise Linux.

Focusing on a single Linux distribution avoids duplication of efforts to prepare different versions for different vendors, but also makes troubleshooting faster and easier.

Simplified security compliance and maintenance: Initially, Volkswagen's IT department worried about the security of using a Linux distribution, but the R&D team quickly demonstrated how Red Hat Enterprise Linux helped them meet all compliance requirements.

Red Hat provides confirmed security patches for any bugs or vulnerabilities that R&D engineers can quickly apply. Then they can send the IT department a complete list of the patches installed for faster verification.

Collaborative troubleshooting and ongoing support: In addition, a Red Hat Technical Account Manager (TAM) provides consistent, ongoing support for the company's CAE Linux client team, such as collaborative troubleshooting sessions using a screen sharing approach for complex challenges.

Volkswagen continues exploring new versions of the operating system as they are introduced. The majority of workstations are running Red Hat Enterprise Linux 8, with some new workstations provisioned with version 9.