

DELL EMC ISILON AND EDAG GROUP

ESSENTIALS

- Continuous manufacturing quality improvement
- Avoid unexpected downtime
- Reduce maintenance cost
- Automate materials ordering while lowering costs
- Proven Big Data infrastructure
- Future-proof storage scalability with no performance loss
- Transparent cloud support
- Up to 60PB in a single volume
- Easy-to-manage storage
- Expand with no downtime
- Enterprise-ready for world-wide collaboration

Smart automotive solutions

Engineering the smart automotive factory

As the world transitions to a single, global marketplace, and time-to-market shrinks, meeting manufacturing performance and quality targets to remain competitive becomes ever more demanding. Today's leading automotive OEMs and suppliers depend more than ever on Big Data solutions including real-time analytics and Artificial Intelligence (AI) technologies, such as real-time analytics and artificial intelligence, to realize the modern factory, with features such as predictive maintenance, predictive quality, and automated resource management a priority. Such solutions rely heavily on Big Data analytics and Artificial Intelligence (AI) to meet these demands efficiently, enabling continuous cost and quality improvement.

Deploying advanced smart factory solutions requires expertise and infrastructure optimized to meet the careful balance of cost, reliability, and performance – all at a time when international competition is on the rise, and consulting and IT budgets are under downward pressure. Factories of today and tomorrow are increasingly dependent on Big Data Analytics as well as machine learning and artificial intelligence to eliminate waste. Such Smart Factory solutions demand carefully architected high performance compute and storage that is future-proofed to scale and adapt continuously with ever the growing complexity of the modern automobile, even as budgets shrink – all while minimizing total cost of ownership (TCO).

You need partners that can deliver services combined with infrastructure optimized for large data sets, combined with high-performance compute and storage that:

- Manufacturing line modeling with continuous improvement
- Predictive quality
- Smart maintenance
- Native Big Data streaming analytics
- Scales easily to grow with future production requirements
- provides transparent access to legacy solutions for easy migration
- expands without downtime
- is globally accessible
- has robust data protection
- lowers TCO to stay within shrinking budgets (and schedules)
- Is enterprise-ready

You also need a solution that can be deployed in any technology environment, on-premise or in the cloud, that intelligently distributes storage demands – thus enabling automotive factories to maximize total production and improve quality while cutting overall costs.

EDAG KEY BENEFITS

- Full Production Automation
- Shorter Commissioning Time
- Higher Quality and Efficiency
- Cost Optimization

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Dell EMC Isilon® Scale-out NAS (Network Attached Storage) reduces costs and improves operational efficiency by consolidating processes, workspaces, and entire manufacturing line data onto a unified storage solution for AI, real-time analytics, and long-term archiving, thus reducing total cost of ownership while eliminating common performance bottlenecks. Featuring the OneFS® operating system, Isilon storage scales from terabytes to more than 60 petabytes of capacity in a multi-tiered, single file system—expanding with no downtime.

EDAG® delivers industry-leading applications for a fully integrated range of services for vehicle, electrics/electronics and production plant development. As leading independent engineering experts, EDAG services span from individual stages of the product creation process, to all factory and production systems-related services, including cross processes, with single-source support throughout the implementation stage. Partnering with Dell EMC, EDAG is in an ideal position to further expand their role as the world's largest independent engineering partner to the automotive industry.

EDAG Engineering Smart Factory Solutions

Manufacturers today cannot afford failures or interruptions – production must continue even if modifications and optimizations are pending. Leveraging the methods and techniques of the digital factory, the complete production planning or optimization process can be digitally mapped, simulated, and transferred to reality.

With the goal of creating a digital twin of the factory, resources and production processes can be planned and tested – using actual control software avoids errors and reduces costs, accelerates planning and promotes innovation. Each of these solutions requires Big Data – continuous monitoring of the manufacturing line; real-time data analytics combined with the power of inferencing (Deep Learning) to make real-time decisions. Both immediate as well as long term historical data must be analyzed to look for short- and long-term trends. Some examples of services offered in such a solution include:

Predictive Quality

Whoever is in global competition feels the cost pressure on production daily. As a partner, we aim to reduce cost for the whole of the production line, as well as within each stage of manufacturing. Data is analyzed in real-time to predict quality. This process increases factory throughput while reducing waste and overall cost.

Predictive Maintenance

EDAG engineers will model individual manufacturing stages, such as milling, annealing, assembly and test. Such models will be analyzed continuously to predict need for equipment maintenance. Decisions on exact timing of maintenance can then be made based on minimizing cost and production disruption. For legacy equipment lacking full instrumentation, EDAG engineers will leverage years of industry experience to identify and deploy sensors as needed to further automate both manufacturing and maintenance of key line equipment.

Materials Management

With continuous real-time analytics and deep learning, we can predict when components will be needed, for just-in-time component ordering. Using a best-practice cost calculation, we can determine the best price for all parts of the product. We draw on the many years of expertise of our engineers from product development, production engineering and implementation to find the cost drivers in the manufacturing process and develop solutions to ensure your long-term competitiveness.

ISILON / ECS KEY BENEFITS

Scalability

Up to 10s of PB per volume

- Single namespace
- Best ROI with 85% disk efficiency

Performance at Scale

Performance increases with capacity

- Designed for concurrency
- Ready for Machine-learning
- Multiple price-performance tiers

Automated Tiering

Restart archived simulation environment in minutes

- Seamless, policy-based tiering
- Tier to Cloud with CloudPools®
- Precisely match performance requirements to \$/GB

Ease of Management

Single point of management

- Eliminate islands of storage
- Consolidate workloads including ADAS, CAD/CAE/PLM, Analytics, IoT/IoV/ConnectedCar

Predictability

Eliminate unexpected downtime

- Just-in-time capacity expansion
- Buy for today; expand tomorrow
- Non-disruptive OS upgrades
- Hardware upgrades without migration

BENEFITS OF EDAG AND DELL EMC

Solutions and Services that Grow with the Factory

Isilon is powered by the Isilon OneFS operating system, which automatically load-balances client requests to assure a best-in-class user experience. As manufacturing expands, and more data is captured, Isilon capacity is added without fear of performance degradation. Storage performance increases with capacity – assuring a consistent, high-performance experience now, and in the future.

Reduced Cost

Isilon expands from terabytes to over 60 petabytes in a single volume namespace, without user interruption nor performance degradation. This means you can buy what you need today, and rest assured that as your manufacturing ramps-up, and more automation is deployed, Isilon performance will too. And critical to Big Data applications, Isilon also features industry-leading disk utilization of up to 80% which translates directly into reduced cost.

Reduced Time-to-Production

Isilon's scale-out architecture means you can count on maximum storage performance today and in the future. You can predictably and cost-effectively grow your production environment without fear of any performance degradation that impacts efficiency and performance – a common challenge in today's manufacturing infrastructure. Adding Isilon nodes to an existing cluster happens at the click of a button – without user interruption – eliminating unnecessary downtime and engineering delays.

Certified Deep-Learning Solutions

Artificial Intelligence is becoming more and more critical to competitive manufacturing. Dell EMC Isilon provides the performance, parallelism, scalability and management required to support increasingly complex AI workflows – including Smart Factory. Dell EMC makes adopting AI simple with the NVidia Development Pod with Isilon, as well as the Dell EMC Ready Solution for AI. Both solutions combine high-performance all-flash storage with NVidia GPU-based server solutions. Isilon all-flash storage can be added as a performance tier to the rest of your manufacturing data, making it easy to use without the need to move or replicate data.

Data Flexibility

With solutions that offer local archiving, within an Isilon cluster, hybrid cloud solutions – with data residing on-or-off prem on object-based storage such as Dell EMC ECS, or public cloud, Isilon offers the flexibility to precisely match data value with storage cost. Isilon offers tools like SmartPools® and CloudPools®, policy-driven automated tiering solutions allowing you to move data to the optimal price/performance tier across Isilon and cloud, depending on the age and need for your data.

Multi-cloud Storage Services

With Dell EMC Cloud Storage Services for Automotive, your data resides on a managed cloud that is made available concurrently to multiple public cloud solutions such as Microsoft, Google, and Amazon, with sub-millisecond latencies. With free ingress and minimized egress fees to/from public cloud, and no fees to/from on-prem, you enjoy maximum flexibility and ROI without cloud-vendor lock-in.

Manage your Factory – not your Infrastructure

With features like automated tiering, non-disruptive upgrades, and single volume scaling of up to 60PB, pre-tested and certified AI-solutions and flexible, multi-cloud solutions and services, Isilon makes infrastructure management a part-time job.

Complete Digital Factory Services

Having recently celebrated over 50 years in the industry, EDAG has advanced the support of the digital factory. Today, EDAG is a leading partner of car manufacturers as well as medium-sized businesses, developing many techniques and methods, including:

- Pre-construction planning & problem detection
- Feasibility studies and simulations
- Early manufacturing engineering
- Digital supply-chain networking
- Protection-driven product development
- Methodological support of the digital factory
- Integrated methods and tools including virtual commissioning
- Ergonomic assessments and studies

DIGITAL FACTORY

THE USE OF THE DIGITAL FACTORY IN THE FULLY INTEGRATED ENGINEERING PROCESS OFFERS MAJOR ADVANTAGES



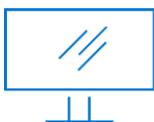
About EDAG Engineering

EDAG is an independent engineering services provider to the global automotive industry. The company serves leading domestic and international vehicle OEMs and sophisticated automotive suppliers through a global network of about 60 sites in major automotive centers of the world.

EDAG offers complementary engineering services across its Vehicle Engineering, Electrics/Electronics and Production Solutions businesses. Based on these extensive capabilities, EDAG can support clients across the entire value chain from the original design idea to product development and prototype construction all the way to the delivery of turnkey production systems. As a technology and innovation leader, EDAG also operates established centers of excellence that design landmark technologies for future applications in the automotive industry: lightweight construction, electric mobility, car IT, integral safety and new production technologies.

About Dell EMC storage

Dell EMC Isilon provides an enterprise-grade, scale-out NAS platform that scales from terabytes to more than 10s of PB of capacity in a single file system. Industry-leading data protection guards against hardware failures and intentional or unintentional data corruption. And Isilon stays simple to manage, regardless of how large your automotive environment grows – reducing costs and allowing you to manage design development – not storage.



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