BullSequana Edge

Gaining the digital edge

Trusted partner for your **Digital Journey**

Atos

Foreword

By 2022 Gartner predicts that 80% of enterprise-generated data will be created and processed outside of the data center and cloud infrastructures compared with 10% today*. Edge computing will pick up this job; extending cloud computing capabilities and allowing us to deal with the data tsunami being created by the Internet of Things (IoT) revolution.

Edge will allow us to move away from a reliance on centralized data centers and remove the issue of networks having to transmit ever-increasing volumes of data. It will help us make optimal use of the growing reservoir of unstructured data produced by IoT devices and of rapidly maturing analytics technologies and will enable IoT devices to make full use of artificial intelligence and offer ever more opportunities for innovation.

It means real-time information processing at the source enabling faster reaction times. It will change the factories of the future, create smart cities and has the potential to completely change the way we travel through autonomous vehicles.

Over the last five years, Atos has made a continuous and significant investment in the competencies, technologies and resources needed to help you embrace the edge computing revolution.

These investments now come together in Atos Codex Datalake Engine and BullSequana Edge – solutions we have specifically designed to enable the rapid adoption of edge computing, so you can take full advantage of the IoT and AI revolution.

* Source: Smarter with Gartner, What Edge Computing Means for Infrastructure and Operations, October 3, 2018

The evolving cloud

Cloud computing is now the predominant mechanism for IT service delivery. Enterprises appreciate the benefits it brings – the agility, scalability, cost efficiency and more. The current approach, however, needs to evolve in the long run.
The rapid advance in technologies such as the Internet of Things (IoT), big data analytics, machine learning and artificial intelligence (AI) requires an alternative.

Why? Because ingesting massive data sets from geographically distributed edge devices and processing it in the cloud generates critical issues. Today's networks are not yet ready for the incredible growth expected in data to be transferred. Potential risks include low latency, bandwidth congestion, poor scalability, not to mention privacy, sovereignty and security issues.

With crucial production environments needing real-time (or near real-time) reactions in closed-loop environments, there is a pressing need to transfer real-time data processing and analysis nearer to the source of data. Compute capability needs to be provided inside an environment where connectivity and response times can be
tightly controlled.

Edge computing provides a perfect response to these high-stakes challenges.

A huge data explosion

The IoT is fast becoming an essential source of data; its volumes limitless. Unlimited AI, social networks, applications, sensors and captors, among other things, are only adding to the soaring data and content. By 2030, the total volume produced could reach 1 yottabyte – that's a trillion terabytes or a million trillion megabytes.

Data shifts to the edge

Around 75% of data is expected to be produced at the edge by 2020, with only 25% still produced within the data center.

A growing complexity of the data

More and more complex and unstructured data is produced at the edge. Data is produced from many various sources in different formats including text, voices, images, video streams, sounds and sensors.

Exactly what is edge computing?

Edge computing is an important element of the post-cloud era, extending rather than replacing the cloud. It allows data to be processed rapidly at the edge, close to where devices are generating it.
The decentralized and distributed nature of edge computing avoids unnecessary network transmission to the cloud and enables the near real-time actuation of connected things.
Simply put, edge computing makes large-scale AI at the edge not only possible but also cost-effective. In doing so, it opens the door to unprecedented innovation.

The Atos edge vision

The exponential growth of intelligent sensors and devices is generating an unprecedent amount of data. This is reshaping IT architectures, as increasingly powerful processing and machine learning inference capabilities are required at the edge of the networks to enable next generation, transformative AI and IoT applications.

BullSequana Edge has been designed to meet these challenges, delivering powerful AI inference and streaming analytics capabilities while ensuring that the data at the edge remains safe and secure.

5 edge computing core strengths

Real-time
Addresses IoT latency issues, enabling a near real-time response by bringing computation close to data sources.

Video analytics
Capacity to analyze massive (1GIGA bits data per second) and complex video data in real time.

Security and privacy
Data in motion and data at rest as well as the physical server are protected by an advanced chain of security measures.

Cost reduction
Massive and complex data induct high satellite and cloud provider costs. BullSequana Edge can be completely used independently.

Local autonomy
It can communicate through radio, private LTE or Wi-Fi networks. Can be mounted in a 2U form factor rack. Reduced dependence on cloud and data center availability and connectivity.

BullSequana Edge offer

2 core solutions

Atos Edge Computer Vision

It enables a large set of intelligent cameras to collaborate holistically in real-time, permitting tracking of operations without interruption.
Features:

- Advanced feature extraction (person, faces, emotion, behavior), or privacy by design
- Digital signature used for personalized operations
- Feature sharing and classification
- Automatic actions based on feature analytics
- Real-time and post-event actions or post event analytics
- A powerful search function accelerates the search of a specific person from multiple criteria

Product design:

- Exceptional hardware acceleration for machine learning applications
- Can be equipped with two powerful NIVIDIA GPUs, or optional FPGAs/ASIC accelerators to deliver high-performance machine learning inferences
- The architecture is based on micro-services and guarantees the scalability of the solution as well as the operational efficiency
- The Web interface offers a graphical application view to track and search

Atos Edge Data Analytics

Tenfold potential of sensor analysis with real-time ingestion and monitoring without interruption.

Features:

- Enables organizations to improve their business models with predictive and prescriptive solutions
- Make data trustworthy and useable – with strong data governance within a robust data architecture to ensure data quality, security and privacy
- Manage the complete data life-cycle – from data ingestion, data cleansing, data blending, data discovery, audit, data lineage and policy enforcement
- Enable compatibility and minimizing risk – by providing on-site data storage to give full control of the data and its lifecycle, as well as full control over the infrastructure, the applications and the operations.
- Is designed to enable open source based hyperconverged infrastructure solutions which enable flexible resource sharing between nodes, with centralized management and security hardening.

2 core solutions enhanced by Edge Data Container for your specific needs

- **High storage capacities**
  Ranges from a small rack up to complete secured, air-conditioned containerized data centers
- **Extreme Environments**
  High performance in dust, heat, humidity
- **Isolated areas**
  Delivers an all-in-one solution, serving as a decentralized IT system

Autonomy
Can run autonomously in non-data center environments; no need for a white room or local IT teams to operate

- **Security**
  Highly sensitive data Is a secure, highly standardized, industrial solution
- **Applications**
  Edge Computer Vision, Edge Data Analytics and other applications can run on Edge Data Container

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Putting Edge use cases

Manufacturing

Becoming agile is one of the biggest stakes for factories. Industrials manage short product production cycles with a high degree of product variation. To facilitate processes, production line data needs to be analyzed in real time although limited connectivity.

BullSequana Edge's solutions: Edge data analytics and Edge computer vision facilitate reaching industrial goals. • Atos Edge Data analytics enhances predictive maintenance, inventory management, intelligent logistics, fleet tracking and connected workers. Its machine learning algorithms create local inference for massive and complex data analysis. You take decisions in real-time at the right time, locally. • Manufactures have complex camera networks for security and quality purposes. Edge Computer Vision analyzes multi-camera quality control inspection. It is designed for high massive video data analysis in real-time and in complex environments (dust, heat, humidity

Energy & Utilities

All energy infrastructure components are undergoing major changes on distributed generation (solar, wind), electric grid bidirectionality, effective energy storage, water conservation and on distribution infrastructure worldwide. Edge computing is game-changing in intelligent operation/ automation & predictive maintenance. Edge Data Analytics identifies malfunctions and optimize maintenance from the data provided by sensors. Upfront scheduling of maintenance services and asset optimization are improved.

Retail

Retailers are facing new challenges to strengthen revenues despite e-commerce competition. Thus, loss prevention and margin increase are critical. Today, most of losses are due to shortage in shelves and theft (Around 2% of loss per year and increasing with automatic pay stations). Edge computer vision analyzes movements on shelves to improve restocking process. The multi-camera data analysis captures theft trials and alerts security before theft is committed. To drive higher revenues, retailers take advantage of in-store data: product shortage on shelves, heat mapping, shopper tracking and price matching. Edge Data Analytics improves processes, customer experience and revenue by providing real-time data analysis.

Smart Cities

Smart Cities are complex environments in which massive complex data improves situational awareness to ensure safety and security. Edge computing in combination with AI (Artificial Intelligence) improves emergency and security operations. Edge computer vision enables real-time search and tracking of people of interest based on criteria to accelerate post event investigation. In addition, it detects automatically and in real-time abnormal situation/behavior identification. You have the right information on-time to ensure safety, even in low connectivity conditions.

Transports

Edge computing transforms transports in terms of connectivity (connected car/plane/rail), telematics (fleet trucking route optimization, condition-based maintenance), and autonomy (advanced driver-assistance systems, autonomous vehicles). Connected cars, trucks, buses, ships, trains and other vehicles can continuously and bi-directionally communicate with ecosystems and environments. Edge computer vision and Edge Data analytics empower smart services like traffic management, predictive maintenance, convenience services, after-sales solutions with massive complex and video data analysis in real time. BullSequana Edge enables smart transport different modes of transport & traffic management, and enable various users to be better informed as well as to make safer, more coordinated and "smarter" use of transport.

Why Atos?

Atos is uniquely positioned to support organizations in the post-cloud era, helping them understand, deploy and fully leverage edge computing.

Our clients have tremendous knowledge of their industries and challenges. To fully benefit from edge computing, they need a partner who understands their business as well as they do, a partner with hands-on experience and a partner who can provide them with best-in-class people, technologies, computing capabilities and alliances. These are all essential elements to make edge computing a reality today.

Atos delivers a complete edge computing solution, including hardware, software, professional services and ready-to-go use cases. This environment is a prerequisite to consolidate data in a data lake engine while training new analytical models, developing inference models and analyzing real-time data streams – using an edge server in a micro data center at the edge.

BullSequana Edge

Powering Intelligence in your IoT

About Atos

Atos is a global leader in digital transformation with over 110,000 employees in 73 countries and annual revenue of over € 11 billion.

European number one in Cloud, Cybersecurity and High-Performance Computing, the Group provides end-to-end Orchestrated Hybrid Cloud, Big Data, Business Applications and Digital Workplace solutions.
The group is the Worldwide Information Technology Partner for the Olympic & Paralympic Games and operates under the brands Atos, Atos Syntel, and Unify.
Atos is a SE (Societas Europaea), listed on the CAC40 Paris stock index.

The purpose of Atos is to help design the future of the information technology space. Its expertise and services support the development of knowledge, education as well as multicultural and pluralistic approaches to research that contribute to scientific and technological excellence. Across the world, the group enables its customers, employees and collaborators, and members of societies at large to live, work and develop sustainably and confidently in the information technology space.

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Let's start a discussion together

Find out more about us:: **atos.net/BullSequanaEdge**

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