Gaining
the digital edge

Atos

Foreword

By 2022 Gartner predicts that 75% 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.

"Edge computing will allow us to deal with the data tsunami being created by the Internet of Things revolution."

Thierry Breton
Chairman and CEO of Atos

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. It provides the following benefits:

- Responsiveness: addresses IoT latency issues, enabling a near real-time response for actuators by bringing computation close to data sources.
- 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.
- Autonomy: reduced dependence on cloud and datacentre availability and connectivity.
- Interactivity: enables the real-time analysis of multi-source and multi-format data. It can communicate through radio or GSM or Wi-Fi networks. It is designed to run in factories, shop floors, airports or on transportation such as ships, and can be mounted in a 2U form factor rack.

BullSequana Edge provides a complete package to support three main categories of use cases

Use case one: Atos Edge Computer Vision

The Atos Edge Computer Vision provides:

- 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

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

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

Use case two: Atos Edge Data Analytics

Atos Edge Data Analytics:

- 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

Product design:

- Streaming Analytics solutions such as Spark and Kafka can be flexibly deployed on this stack
- Through its powerful GPUs BullSequana Edge also supports accelerated machine learning algorithms enabled by RAPIDS and similar frameworks

Use case three: Atos Edge Data Container(EDC)

Atos Edge Data Container:

- Is a complete infrastructure, ready to run at the edge
- Delivers an all-in-one solution, serving as a decentralized IT system
- Is a secure, highly standardized, industrial solution

Product design

- Ranges from a small rack up to complete containerized data centers
- Includes UPS, air conditioning, storage and security capabilities and can embed Atos Edge Computer Vision, Atos Edge Real-time Analysis applications and other implemented production applications
- Can run autonomously in non-data center environments; no need for a white room or local IT teams to operate
- Can be customized for multiple use cases

Putting Edge to work

Edge computing makes the promise of IoT a reality by enabling organizations to improve their business models with predictive and prescriptive solutions. Some industry examples are:

Manufacturing

Atos Edge Data Analytics is the solution for predictive maintenance, inventory management, intelligent logistics, fleet tracking or for connected workers.

Predictive maintenance is becoming a priority. Sensors measure parameters from vibration, temperature to noise levels or energy consumption. Edge data analytics determine the state of the equipment, potential anomalies and delivers early indications of failure. Factories need to be agile while delivering short production cycles with a high degree of product variation. BullSequana Edge enables real-time streaming and real-time decision-making to improve agility and efficiency. Its responsiveness and autonomy enable real-time analytics with limited connectivity.

Retail

Atos Edge Data Analytics is the solution to better understand your customer preferences, personalized information and inventory tracking.

Atos Edge Data Analytics enable the implementation of advanced inventory tracking and management to optimize stock levels dynamically. Transportation and logistics can also be dynamically adapted to fulfill priorities. Data at the point of sale or in the warehouse can be combined with data from various sources such as prevailing weather, special offers or seasonal events to improve quality of service, optimize commercial spaces or deliver very personalized information. BullSequana Edge autonomy means you can install edge servers on shop floors. Its responsiveness allows you to correlate data from multiple sources and deliver real-time analysis. And its security protects your data from intrusion.

Smart Cities

Atos Edge Computer Vision is the solution to maximize video intelligence for different purposes, ranging from security to the improvement of city services, pedestrian traffic flows, parking lot optimization, car traffic monitoring and optimization, and improved information centres. It provides an AI-based virtual assistant to improve operator tasks with personalized and automated tracking, and limited disruption. It can be combined with real-time analysis for more sophisticated and automated services such as water treatment, street light energy consumption, the prevention of potential accidents or reinforced local security. BullSequana Edge's responsiveness, security and autonomy mean that it can be deployed in various environments and multi-camera surroundings to serve any requirement and address large-scale smart city projects.

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