StorMagic

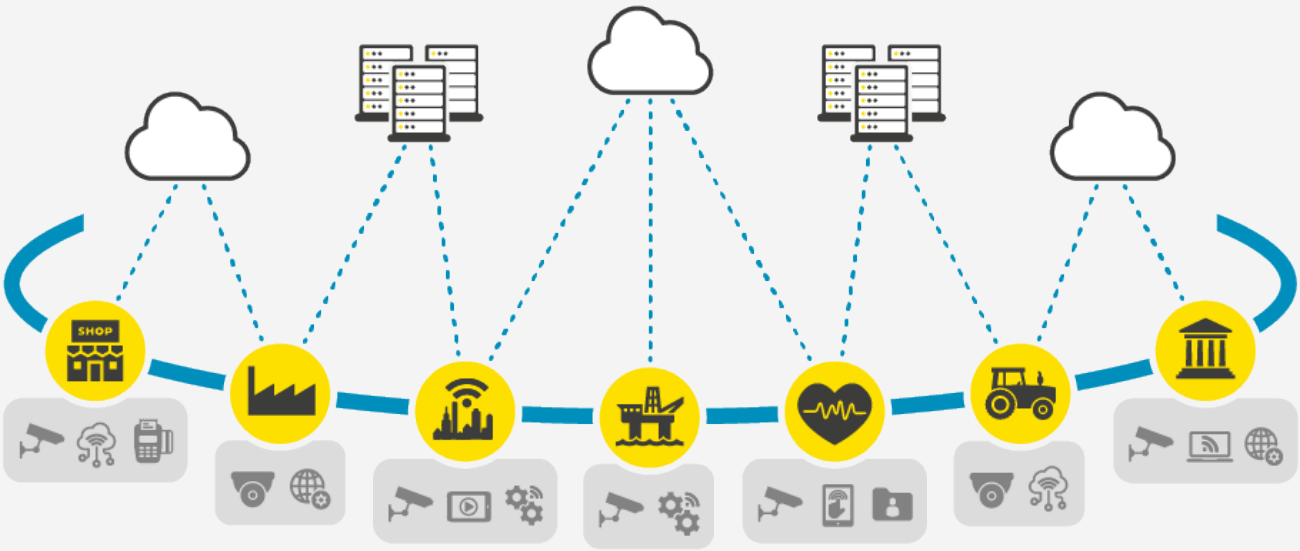
FOREVER DATA
OVERVIEW

FOREVER DATA OVERVIEW

Data is forever being generated at the edge. In fact, it is predicted that three times more data will be generated at the edge than in the cloud or datacenters this year.* This data must be managed in a unique way, as edge (and SME) locations often lack traditional IT infrastructures. The sheer volume of data from dozens, hundreds, or thousands of locations, multiplied by the many different sources of data (IoT, POS, video, smart machines, employees, customers, processes, etc.), requires the ability to parse, utilize, and maintain edge data differently.

Data at and from the edge is *forever data*: data that is forever being created, forever being utilized, and that must be protected and managed, perhaps forever. To take advantage and derive value, organizations should develop forever data strategies to store, protect, and use their data, both at and from the edge.

** You may have seen some version of this quote from Gartner: "By 2022, as a result of digital business projects, 75 percent of enterprise-generated data will be created and processed outside the traditional, centralized data center or cloud, up from less than 10 percent in 2018." [1] Many IT providers use this quote on their websites and elsewhere to emphasize the importance of the edge and edge computing, including us. In fact, the original version of the quote had the prediction dated "By 2025," and was later amended to 2022. That's now!*



WHAT'S YOUR EDGE?

There are many definitions of edge computing and its benefits. These sum them up well:

"Edge computing brings compute, storage, and applications closer to where users, facilities, and connected things generate, consume, and/or leverage data." [2]

"This is done so that data, especially real-time data, does not suffer latency issues that can affect an application's performance. In addition, companies can save money by having the processing done locally, reducing the amount of data that needs to be processed in a centralized or cloud-based location... Increasingly, though, the biggest benefit of edge computing is the ability to process and store data faster, enabling for more efficient real-time applications that are critical to companies." [3]

For some organizations, the edge is dozens to thousands of sites, whether retail stores or wind turbines. For others, the edge is made up of hundreds or thousands of IoT sensors or smart machines across factory floors, warehouses, or vehicles. And for SMEs (small-medium enterprises), the edge may be one or a few locations – essentially the edge and datacenter wrapped into one – with similar issues as large enterprises at a different scale.

"With the ability to place infrastructure and applications close to where data is generated and consumed, organizations of all types are looking to edge technology as a method of improving business agility and creating new customer experiences." [4]

Whatever edge means to your organization, it's important to give your edge an edge with a forever data strategy.

For more information, see our **Edge Computing – A Beginner's Guide**

FOREVER IS NOW. ENTER EDGE-FIRST STRATEGIES.

Organizations of all types and sizes need to take an edge-centric, edge-first approach now to capitalize on the possibilities or risk being overwhelmed by the onslaught. The edge is creating a volume of data not experienced before, and it's not just quantity. Not all data is important, so categorization and organization become paramount prerequisites of successful edge data use.

Organizations must figure out how to manage data at and from the edge so they can best utilize and extract value, as they are faced with:

- huge volumes of unstructured data
- many different data formats
- the need to move edge data to the cloud, and back
- transforming (filtering, thinning, categorizing) data to eliminate what's not needed, yet retaining the right data for business impact (data enrichment)
- getting data to the right place for real-time decision making - processing and understanding data quickly to see trends, demands, and patterns - and taking action

FOREVER DATA IN PRACTICE: EDGE-FIRST EXAMPLES [5]

Manufacturing

An industrial manufacturer deployed edge computing to monitor manufacturing, enabling real-time analytics and machine learning at the edge to find production errors and improve product manufacturing quality. Edge computing supported the addition of environmental sensors throughout the manufacturing plant, providing insight into how each product component is assembled and stored -- and how long the components remain in stock. The manufacturer can now make faster and more accurate business decisions regarding the factory facility and manufacturing operations.

Retail

Retail businesses can also produce enormous data volumes from surveillance, stock tracking, sales data, and other real-time business details. Edge computing can help analyze this diverse data and identify business opportunities, such as an effective endcap or campaign, predict sales and optimize vendor ordering, and so on. Since retail businesses can vary dramatically in local environments, edge computing can be an effective solution for local processing at each store.

Improved Healthcare

The healthcare industry has dramatically expanded the amount of patient data collected from devices, sensors, and other medical equipment. That enormous data volume requires edge computing to apply automation and machine learning to access the data, ignore "normal" data and identify problem data so that clinicians can take immediate action to help patients avoid health incidents in real time.

Transportation

Autonomous vehicles require and produce anywhere from 5 TB to 20 TB per day, gathering information about location, speed, vehicle condition, road conditions, traffic conditions and other vehicles. And the data must be aggregated and analyzed in real time, while the vehicle is in motion. This requires significant onboard computing -- each autonomous vehicle becomes an "edge." In addition, the data can help authorities and businesses manage vehicle fleets based on actual conditions on the ground.

Farming

Consider a business that grows crops indoors without sunlight, soil or pesticides. The process reduces grow times by more than 60%. Using sensors enables the business to track water use, nutrient density and determine optimal harvest. Data is collected and analyzed to find the effects of environmental factors and continually improve the crop growing algorithms and ensure that crops are harvested in peak condition.

EDGE BY INDUSTRY

A study by McKinsey & Company [6] forecasts edge use cases across many different types of industries. Not surprisingly, industries with many locations, remote and/or mobile operations, and/or diverse customers represent prevalent edge markets.

Industry	% of Total Edge Use Cases
Travel, Transport, and Logistics	24%
Global Energy and Materials	13%
Retail	10%
Public Sector and Utilities	10%
Advanced Industries	10%
Healthcare	10%
Cross-Vertical	9%
Infrastructure	6%
Chemicals and Agriculture	5%
Consumer	4%
Media and Entertainment	1%
Banking and Insurance	1%

Network Optimization

Edge computing can help optimize network performance by measuring performance for users across the internet and then employing analytics to determine the most reliable, low-latency network path for each user's traffic. In effect, edge computing is used to "steer" traffic across the network for optimal time-sensitive traffic performance.

Workplace Safety

Edge computing can combine and analyze data from on-site cameras, employee safety devices and various other sensors to help businesses oversee workplace conditions or ensure that employees follow established safety protocols -- especially when the workplace is remote or unusually dangerous, such as construction sites or oil rigs.

FOREVER IS THE FUTURE

Forever data is about data at and from the edge. It starts at the edge and may be processed there to enable real-time decisions and actions. It may go to the cloud or a datacenter for additional processing, aggregation, analysis, and use. And it may come back to the edge, providing new insight, direction, and value.

Businesses and organizations should think about their forever data needs and strategies. They should ask questions about:

- The types, volumes, and usage of data at and from the edge
- The costs of moving data and what can be done at the edge
- The agility that processing and decision-making at the edge can provide
- The lifecycle of data from the edge and how to store and protect that data over time
- Their mission-critical applications and customer-facing situations, where speed and uptime are crucial, that may be improved by computing at the edge
- The use of technologies and processes to provide reliability, availability, and security at the edge
- The use of technologies and tools to extract value from edge data

We, and others, talk about "the edge" as if organizations have only one edge type. That, of course, is oversimplifying. Many organizations have multiple edge types and use cases, and each will be unique in its specific needs. However, the concepts of forever data, and the storage, protection, and usage of data at and from the edge, apply to virtually all organizations and edge types.

FOREVER DATA STRATEGY: STORE, PROTECT, AND USE

Forever data concepts are applicable across almost all industries and application types. As data expands at the edge, the ability to store, protect, and use that data for organizational benefit is the goal of a forever data strategy. Our vision is evolving, just as edge data and its organizational importance continues to evolve. Included in our thinking is providing our customers with technologies and capabilities:

- eliminating data silos and removing data redundancy
- allowing data enrichment, increasing the value of the content
- performing complex transformations and analytics per your needs, not someone else's predefined workflows
- managing data sovereignty and centrally dealing with security and compliance
- making it easy to adopt new technologies as better ways to store, protect, transform, and use data are developed

STORE

A prime decision in any forever data strategy is what data to process and store at the edge. "There are currently two main strategies that seem to be effective for dealing with the data that is created by edge devices. The first of these strategies is to incorporate edge intelligence. Edge intelligence comes in many different forms, but in some cases it can be used to minimize the data footprint. The idea behind this technique is to allow the edge device (or a connected appliance) to preprocess its data. Rather than sending every bit of the data created by the device to the cloud, it may make more sense (depending on the device type) to send only the data that is of interest. [...]

Another way that organizations are starting to decrease their edge costs is through edge storage. At its simplest, this means streaming data to an on-site storage appliance rather

than to the cloud. This approach frees the organization from having to pay a per-gigabyte per-month storage fee to a cloud provider, while also freeing up a significant amount of internet bandwidth." [7]

High availability at the edge is a requirement of a forever data strategy. Organizations must be confident that critical data from myriad devices can be retained and accessible during any failures or outages. Many business-critical applications run at the edge and any disruptions have negative consequences. It is crucial that edge locations consider and provide highly available solutions to keep operations operating.

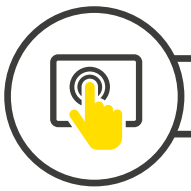
StorMagic SvSAN provides high availability at the edge.

PROTECT

One of the benefits of edge computing is data sovereignty – keeping data close to its source and under the guise of applicable laws. One of the challenges of edge computing, however, is security. "IoT devices are notoriously insecure, so it's vital to design an edge computing deployment that will emphasize proper device management, such as policy-driven configuration enforcement, as well as security in the computing and storage resources -- including factors such as software patching and updates -- with special attention to encryption in the data-at-rest and in-flight." [8]

Security for data at and from the edge is another requirement of a forever data strategy. Customer and organizational data must be secured and protected in addition to being available. Encryption and management of encryption keys provide real security, compliance, and peace of mind.

StorMagic SvSAN provides encryption at the edge and **StorMagic SvKMS** centrally manages all encryption keys from any location.



USE

The point of gathering data is to use it. Having data in the right place at the right time is an important part of a forever data strategy. Unstructured data can be particularly challenging to manage and use. Data should be easily accessible, no matter its type or location. Intelligent search, rich metadata, and integrated analytics can help extract maximum value and aid efficiency.

StorMagic ARQvault excels at putting unstructured data in the right place, keeping it actively available (and affordable) to retain and use, and providing fast, intelligent search and analysis capabilities.

FOREVER DATA SOLUTIONS

StorMagic is focused on forever data and our Forever Data solutions are designed to help you store, protect, and use your data at and from the edge.

- We support any type of data, anywhere
- Your data is always protected and available, even forever
- Your data is easy to find, manage, and use
- Your data is moved to the right place – be that the right storage tier, at the edge, to the cloud or datacenter, and/or back to the edge

For more information on StorMagic's Forever Data solutions, and for additional resources that explain how they work and the benefits they can bring, please **visit the StorMagic website**.

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