# Data Fabric: Weaving Together
# A Hybrid, Multicloud Future

**NetApp®**

### Executive Summary

Perhaps no other industry sector has been subjected to as many economic and political challenges over the past decade than the financial services and insurance market – especially in Europe. Add the ongoing, complex technological changes, and every company has had to adapt quickly.

The 2007-2008 global financial crisis presaged tougher market conditions and tighter oversight for banks and insurers while paving the way for a new breed of insurgent providers threatening the incumbents. In parallel, an era of restructuring, retrenchment and realignment coincided with dramatic changes in customer expectations, a generational shift and rapid technological advances. For organizations struggling with ingrained cultural inertia and the cost of legacy infrastructure, a robust response has been as necessary as it has been challenging.

In this whitepaper, we will explore the macro trends, how those trends have influenced business decision making, and how, in turn, they have informed IT strategy and spend.

Exclusive NetApp insights into the spending habits and intentions of the biggest financial firms operating in Europe makes essential reading – and offers a clue to how those in the sector have responded to upheaval. The numbers confirm a trend toward cloud while casting doubt on forecasts of a cloud-only future. The insights also reveal a $5bn shift in spending from infrastructure to cloud – confirmation that finance firms are embracing a future that is both a fusion of on-premise and public cloud (hybrid), and one that makes use of services from two or more cloud providers (multicloud).

Co-existence brings its own set of challenges: data silos, management complexity, and fragmented user experiences, which will be discussed. Also, we will explore how NetApp can help you build a bespoke data fabric to address the unintended consequences of hybrid, multicloud environments. NetApp can help by decoupling cloud from location, providing a consistent user experience across environments, controlling where applications run and where data resides, and by repatriating data from cloud back to on-premise.

The chapters that follow provide a range of insights and advice. Here are just seven key takeaways:

### #1 Cloud will frame the future. It won't dominate the future.

According to NetApp insights into the spending habits of leading financial services and insurance firms operating in Europe, $5 billion worth of IT expenditure is likely to shift from legacy infrastructure to cloud services. It's nearly 14% of external IT expenditure dedicated to cloud, representing the fastest percentage growth of all IT spend. And yet on-premise, proprietary and dedicated environments still matter to organizations keen to preserve the speed, control, sovereignty, and integrity of their data. The future is hybrid multicloud.

### #2 Hybrid computing offers variety. Not more of the same.

Those who approach public and private cloud as the same environments – but in different locations – are missing an opportunity. They should first think about objectives and then apply workloads to the most suitable environment. Don't simply "lift and shift" applications into the cloud. Start by identifying an application's suitability and then find a way to "lift and transform."

### #3 Hybrid, multicloud computing can result in new data silos.

The benefits of hybrid computing – fusing the strengths of on-premise with those of cloud – are rarely disputed. There is a potential problem, however.  Moving data from one environment to another may prove as challenging as attempting to share business intelligence across organizational silos. Issues of data latency (speed), data sovereignty (location) and data transfer (portability) are not insurmountable but each requires careful thought and planning.

### #4 Multicloud comes with hidden costs. Beware.

Egress comes from the Latin word to mean "going out" or "to exit." This benign sounding six-letter word can have severe consequences. Egress charges are among the most significant – and least transparent – costs associated with cloud computing. If planning to move data from one cloud to another or from cloud to on-premise – and who doesn't believe these to be likely scenarios? – then you must take egress seriously.

### #5 Software and infrastructure dominate cloud spend.

Of the multi-billion dollars spent by leading finance firms in Europe, 44% is spent on software-as-a-service and 37% on infrastructure-as-a-service solutions, according to NetApp insights. Between them, platform-as-a-service and desktop-as-a-service represent less than 20% of all cloud expenditure.

### #6 IoT has an intriguing role to play.

Nearly $200 million is being spent by Europe's finance leaders on Internet of Things infrastructure and services. This is significant for at least two reasons. One, it indicates that internet-enabled sensors will generate yet more data to be managed, processed and manipulated. Two, it means organizations will need to address edge integration in addition to on premise and public cloud integration.

### #7 It's time to unlock the power of AI.

According to one estimate, artificial intelligence-based services will soon be worth $9.5 trillion to $15.4 trillion annually[1]. To make the most of AI, organizations need to acquire, organize and use data in a continuous and virtuous cycle. Data silos and technology complexity present serious challenges, as does the increasing volumes of structured, unstructured and semi-structured data – data that needs to be stored, shared and processed. By adopting a data fabric approach, organizations can overcome these barriers.

## Cloud will frame the future
# $5bn
of enterprise IT spending will shift from legacy infrastructure to cloud services by 2022

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1. Notes from the AI frontier: Applications and value of deep learning, McKinsey Global Institute, April 2018
https://www.mckinsey.com/featured-insights/artificial-intelligence/notes-from-the-ai-frontier-applications-and-value-of-deep-learning

## Financial Services and Insurance: Macro Trends

Organizations in the sector face three interlocking challenges:

### External pressures

**Tough market condition.**

Low interest rates, slow growth and risk avoidance characterize European banking post-financial crash

**Tighter oversight.**

Ever greater regulatory burden is leading to restricted decision making

### Internal pressures

**Internal compliance.**

In-house control, influenced by habit and traditional processes, is limiting new thinking.

**Cultural inertia.**

Stratified and siloed, many finance firms are deprived of cross-functional synergies and data sharing.

**Legacy infrastructure.**

Decades-old technology creating complex and slow IT estates.

### Market evolution

**The rise of the insurgent.**

FinTechs, InsureTechs and others are arriving without cultural or technology baggage.

**Changing user expectations.**

Coupled by a generational shift, ease-of-use and ease-of-access are now customer norms.

**Open Banking.**

Third-party access to payments and customer data is reshaping the market and customer relationships.

### External pressures

**Tough market conditions.** The response to the 2007-2008 financial crisis has not been the same everywhere. For example, compare the market capitalization of the largest financial institutions in the United States with those in Europe. With some notable exceptions, those in Europe have slowed while those across the Atlantic have continued to grow. The reason? Ever greater regulation across the Continent and a broad decision to focus on retail banking at the expense of higher stakes investment banking. As long as interest rates remain low, margins will remain tight. As margins remain tight, the ability to invest and adapt becomes more difficult.

The result is a two-speed financial market. European banks are evolving in a fragmented environment where GDP growth rates have rarely matched[2] those of the United States[3]. And unlike the United States, where the performance of banks and insurance firms has kept pace with costs, many European organizations have struggled to keep up.

**Tighter oversight.** Demands of the regulators on both banks and insurers, meanwhile, has meant restricted operations while placing greater responsibility on institutions to protect the personal information of bank customers, and insurers to provide greater transparency. While European regulators have been active, those on the other side of the Atlantic have chosen a laissez faire approach.

Operating in such an environment leaves companies with two options: to cut costs or to invest their way out of trouble. Some have chosen a combination of the two but many have relied on cost reduction, asking their IT departments in particular to carry the brunt of this belt-tightening.

### Internal pressures

**Internal compliance.** As much as the external financial watchdog is seen as a constraint on innovation and agility, the problem is invariably closer to home. Internal compliance, schooled for decades by traditional processes and entrenched habits, is restricting the space for new thinking and risk-taking.

**Cultural inertia.** Internal compliance is just one way in which cultural lethargy manifests itself. Many in established organizations find that their business is stratified and siloed, depriving them of the synergies that come with cross-functional activities and data sharing. When efforts to set up separate innovation hubs that seek to replicate the energy, invention and autonomy of the fintech fail; they fail because the underlying culture and compliance regime hasn't changed.

**Legacy infrastructure.** While fintech and insuretech competitors arrive without the baggage of old technology, established institutions have decades long legacy to manage and integrate. Mergers and acquisitions have likely complicated the IT estate further. This is not simply about outdated hardware, it's about outmoded processes. If the processes are rooted in a mainframe era when banks could only add new features and functions once or twice a year, it's little surprise that creating an environment where developers have the potential to make hundreds of adaptations a day proves challenging.

### Market evolution

**The rise of the insurgent.** Thanks to emerging technologies, the barrier to market entry has been lowered. In come challenger banks, fintechs, insuretechs and a variety of other players including digital platform providers and, even, car makers offering finance by way of leasing. The old rules no longer apply. Two technologies above all others have perhaps been most responsible

for this shift. First, cloud computing eliminated the need for huge upfront expenditure on storage capacity and processing power. Second, a smartphone-inspired app ecosystem put easy-to-use banking and insurance applications into the hands of consumers 24/7, regardless of location. In a recent survey of financial services and insurance companies, 83% believe that the likes of Amazon, Apple and Facebook could become major competitors in offering financial products in the not too distant future[4].

Many of the newcomers are not necessarily looking to take on the established banks and insurers head on. Instead, they are seeking to do one thing incredibly well: the foreign exchange specialist, the mortgage specialist, the peer-to-peer lending specialist, the short-term insurance specialist and so on. The most successful of these newcomers have been able to enter the market at speed and with absolute clarity. This is banking unbundled. And for the more established players, with an array of service offerings and commitments, the ability to combat and replicate new entrants presents a major challenge.

**Changing user expectations and a generational shift.** The rise of the insurgent has been matched by changing user expectations. If internet and mobile banking 1.0 meant replicating the bank branch experience without a kindly teller to help navigate through the confusion of financial terminology, consumers are now demanding something different. They want a single screen mortgage application rather than a 19-page PDF replica of the original paper-based form. They want an app that makes splitting a restaurant bill simple and efficient. They want insurance defined by need not by policy, on-demand not by monthly, quarterly or yearly cycles. New entrants are fulfilling such needs. Traditional banks and insurers must follow.

**Open banking.** A final market evolution still playing out comes in the shape of open banking. Enshrined in the European Union's PSD2 directive, the regulation mandates that organizations open up their payments infrastructure and access to customer data allowing greater innovation – and wider participation – in the financial services market. Providing the relevant hooks means organizations must rethink their infrastructure and relationships with the wider market. Little surprise, therefore, that Open Banking APIs – rated 5.68 on a 7-point scale[5] – were identified as the technology thought to have the greatest impact over the coming months, ahead of advanced analytics, machine learning and artificial intelligence. From strongbox to part of an ever-evolving ecosystem, organizations are asking: Who owns the customer relationship? The question has never been more pertinent.

None of this is to assume that more established banks and insurers lack opportunity. Far from it. Incumbent players have inherent strengths. They have name recognition and, with it, trust. They have demonstrated the resilience to respond to the biggest financial crisis in a generation while newcomers have yet to be stress-tested. And they have access to an enormous amount of valuable data capable of providing unparalleled understanding of customer behavior and needs.

But the financial incumbents must make much better use of the data they possess. They must turn that data into knowledge, that knowledge into insights, and those insights into actions. The first step involves modernizing the technology estate and then tackling the data challenges likely to follow. We will explore both in the next section.

28% of enterprise IT spending will shift to the cloud by 2022[6]
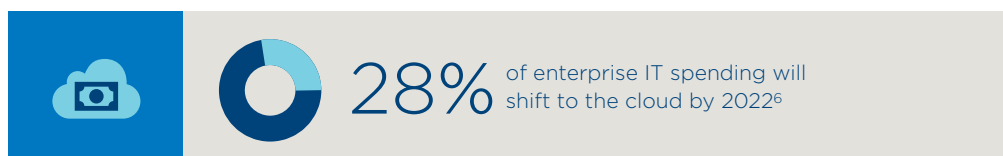
## What the IT department did next: From on-premises to hybrid: IT estate transformation

IT infrastructure, if not today then tomorrow, will be a fusion of old and new, of local and remote, of virtual and physical.

It will be hybrid because more and more organizations are choosing to mesh on-premise with public cloud. And it will be multicloud because organizations prefer to select a number of public cloud providers rather than relying on just one; choosing a combination of AWS, Microsoft Azure and Google Cloud according to taste, experience and function.

In short, organizations are choosing the platform that best suits their workloads on a case-by-case basis. This in turn is influencing the way we approach IT delivery and execution in at least two ways:

First, cloud is now fully mainstream in most organizations. That doesn't mean it is the dominant or only environment but it does mean that it has gone beyond non-core business processes and beyond test environments. With more sympathetic regulatory approval – not least from the European Banking Authority – and a greater understanding that public cloud security is as strong, if not stronger, than in-house security, there are few no-go areas

for cloud. Credit risk management, payment transactions and customer due diligence are all now in play. Gartner estimates 28% of enterprise IT spend will shift to cloud by 2022, up from 19% in 2018[7].

Trends in financial services driving cloud adoption include a need to:

- Crunch large amounts of data to create enhanced business intelligence
- Create customer-facing apps that drive self-service banking and insurance; and
- Develop agile, DevOps approaches to service build to ensure shortened time-to-market

Second, cloud has raised user expectations. The user in this case is not the external customer but the internal developer and the line-of-business executive. For the latter, the ease of getting business projects started with minimal upfront costs and apps that can be scaled up and down on demand is increasingly attractive. For the former, the ability to be able to spin up and down in quick order, to be able to access heavy duty processing

4. NTT DATA Global Study Finds 61% of Financial Services and Insurance Companies Plan to Move Away from Traditional Business
   https://www.bloomberg.com/press-releases/2019-07-16/ntt-data-global-study-finds-61-of-financial-services-and-insurance-companies-plan-to-move-away-from-traditional-business
5. Innovation in Retail Banking 2018, https://www.efma.com/assets/content/study/2018/Innovation_In_Retail_Banking_2018_preview.pdf
6. Gartner, 2018 https://www.gartner.com/en/newsroom/press-releases/2018-09-18-gartner-says-28-percent-of-spending-in-key-IT-segments-will-shift-to-the-cloud-by-2022
7. Gartner, 2018, https://www.gartner.com/en/newsroom/press-releases/2018-09-18-gartner-says-28-percent-of-spending-in-key-IT-segments-will-shift-to-the-cloud-by-2022

environments in an instant is a potential game changer. The cloud experience is now being demanded across the IT estate. That means public cloud-like services on-premise.

While cloud has emerged as a hugely significant part of the estate it is not about to replace on-premise infrastructure entirely, as might have been predicted five years ago. According to a recent survey, only one in five companies plan to move 60% or more of their workloads to the cloud[8].

This simply underscores the argument for a mixed estate. As IDC notes, "The proliferation of application deployment models and data formats across hybrid IT has resulted in organizational data being widely and unpredictably spread across multiple repositories.[9]"

### The trouble with data

A hybrid, multicloud world creates unintended consequences. In particular, it can affect the seamless control, integration and transfer of data. Broadly speaking, it presents challenges around three key areas of data usage:

- Data latency
- Data sovereignty
- Data portability

All have a material impact on the front- and backend services finance and insurance firms provide.

Take portability. Compatibility between one platform and another – and from one public cloud to another – cannot be assumed. Egress charges – those associated with the withdrawal data – are high and often hidden. For organizations contemplating the costs associated with data transfer, three questions loom large:
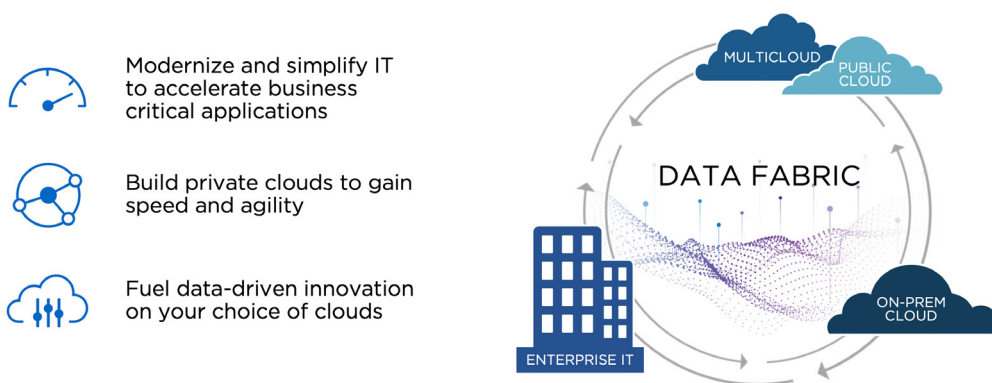
- How much data needs moving and how often?
- What data needs to be transferred?
- When does the data need to be relocated?

It is not always easy to address those questions upfront, yet the answers will have a huge impact on the time, money and resource required.

Data portability is acting as a reality check for many financial services firms. The cost of preserving data is only now coming into view. While choosing one public cloud provider and sticking with it might appear like an obvious solution, it goes against the economics by which all good finance companies operate. No company wants to be tied to a single vendor. Instead they want access to two to three suppliers per service which in turn drives up quality and drives down price.

Just at a time when financial services firms are waking up to the value of the data they hold, so it is becoming more difficult to access that data across the entirety of estate.

**Data Fabric: Simplifying the Complexities of Hybrid Multicloud**



Modernize and simplify IT to accelerate business critical applications

Build private clouds to gain speed and agility

Fuel data-driven innovation on your choice of clouds

The NetApp analysis also indicates that leading finance firms are currently spending **13.7%** of their annual external IT budgets on cloud services. Cloud services are made up of software-as-a-service, infrastructure-as-a-service, platform-as-a-service and desktop-as-a-service.

The NetApp insights also suggests that **$196 million** will be spent on Internet of Things infrastructure and services. IoT usage will not only generate more data but organizations will need to address edge integration in addition to on premise and public cloud integration.

**13.7%** financial services external IT budget spent on cloud services today
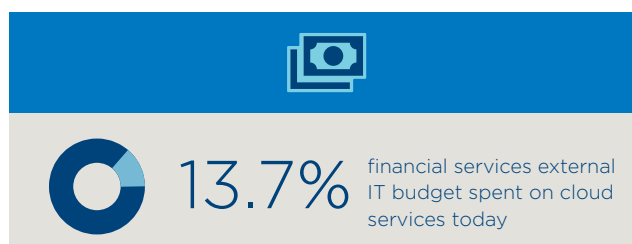
8. EFMA-Infosys survey, 2018
9. IDC Market Spotlight, sponsored by NetApp. "The Critical Role of Data Services for Hybrid Cloud in the Age of Digital Transformation." September 2017 https://datavisionary.netapp.com/uk/the-critical-role-of-data-services-for-hybrid-cloud-in-the-age-of-digital-transformation

### Introducing your data fabric

This is where data fabric comes in, turning the concept of a seamless IT environment into reality. NetApp empowers your organization to build a bespoke data fabric in order to simplify and integrate data services across cloud and on-premise environments. A bespoke data fabric provides an overlay that covers the entirety of your IT estate.

NetApp, the leading hybrid cloud data services company, partners with the largest financial services companies – including retail banking, capital markets, hedge funds and insurance – to take the advantage of their vast volumes of readily available data to improve business performance and efficiency. Companies can:

- Achieve a customer-centric vision for better insights and business intelligence by breaking siloes and leveraging data assets through the integration of banking applications, creating a single source of truth

- Manage end-to-end industry-specific compliance processes such as AML-KYC, FRTB and MIFID, as well as Cloud Data Compliance in line with GDPR principles

- Adopt banking-as-a-service (BaaS) to unlock financial ecosystem collaboration opportunities presented by Open Banking

- Support cost/income ratio reduction initiatives through the ability to build financial models based on operating expenditure (Opex) vs capital expenditure (Capex)

- Improve banking operations efficiency, business continuity and recovery strategies, while becoming your customers' trusted partner, securely managing their personal and sensitive data

- Deliver better digital business and new digital experiences with cloud as a vehicle to enable new data technologies, platforms, systems and infrastructures. This includes harnessing value from artificial intelligence, blockchain, and cognitive augmented reality

- Modernize the workplace with digital cloud-based-solutions offering mobility and collaborative suites to accelerate cross-functional engagement, including DevOps and artificial intelligence projects

As we work with customers around the world, we see themes emerge – common objectives companies are pursuing. Your data fabric keeps data at the heart of your business so you can:

- Realize the promise of cloud

- Deliver a public cloud experience on-premise

- Fuel your enterprise apps

- Develop and deploy your applications faster
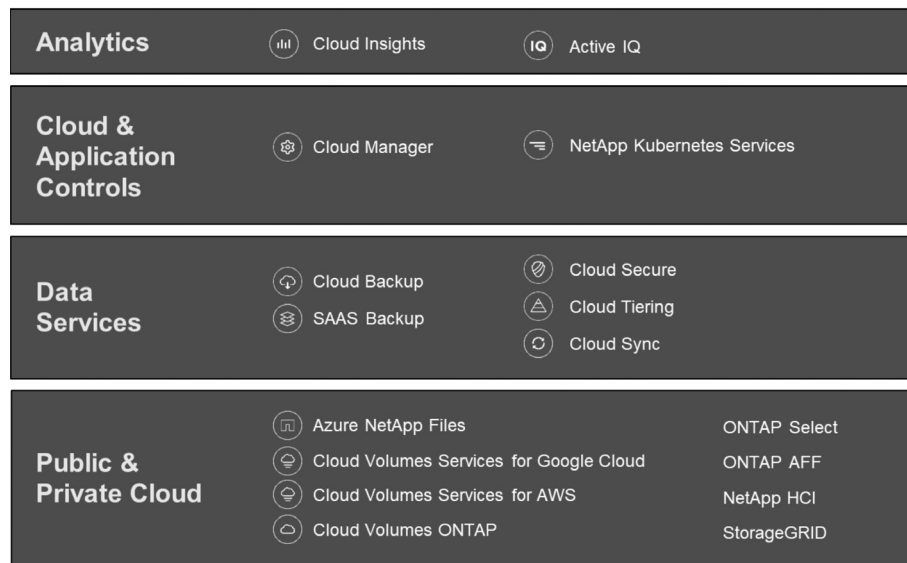
- Accelerate your journey to AI

Only NetApp offers the full range of capabilities you need to build and manage your unique data fabric, which provides a common framework to simplify the integration and orchestration of data services across your choice of clouds.



We partner with our customers to help them take advantage of their vast volumes of readily available data to improve business performance and efficiency

**BUILDING YOUR DATA FABRIC**

| Modernize Workplace | Better digital Business & UX with Cloud | Banking as Service |
| Customer Centricity & Business Intelligence | Compliance & Regulation (AML, KYC, FRTB,...) | Cost / Income Ratio |
| Open Banking | Secure Data: Protect – Detect - Respond | Resiliency, Recovery & Business Continuity |

NetApp offers a set of capabilities that span public and private cloud, data services, application controls, and analytics. NetApp's Fabric Orchestrator is an extensible cloud service that helps you create and manage your data across your hybrid multicloud environment.

**Fabric orchestrator**

| Analytics | Cloud Insights | Active IQ | |
|---|---|---|---|
| Cloud & Application Controls | Cloud Manager | NetApp Kubernetes Services | |
| Data Services | Cloud Backup / SAAS Backup | Cloud Secure / Cloud Tiering / Cloud Sync | |
| Public & Private Cloud | Azure NetApp Files / Cloud Volumes Services for Google Cloud / Cloud Volumes Services for AWS / Cloud Volumes ONTAP | ONTAP Select / ONTAP AFF / NetApp HCI / StorageGRID | |

### Your data fabric with no compromise on data sovereignty and security

As discussed, the geography of data matters to financial services organizations. So, too, does ensuring the privacy of the data held. NetApp's newly-acquired Cognigo technology combines AI-powered personally identifiable information recognition, privacy management, and policy enforcement for monitoring and remediating GDPR violations in structured, unstructured and cloud data. The technology will be embedded into NetApp's Cloud Volumes ONTAP, providing AI-driven compliance[10], an important addition given that, according to Gartner, an estimated 80% of organizations will fail to develop a consolidated data security policy across silos, leading to potential noncompliance, security breaches and financial liabilities[11].

Separately, NetApp Private Storage is a near cloud solution that allows customers to locate solutions in a colocation data center. Holding all data, these owned assets deliver an ultra-fast link to public cloud providers such as AWS and Microsoft Azure – and, crucially, ensure both the ownership and the sovereignty of the data.

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10. An open letter to Cognigo's clients, partners and friends
   https://www.linkedin.com/pulse/open-letter-cognigos-clients-partners-friends-guy-leibovitz/
11. How to Tackle Dark Data, Gartner
   https://www.gartner.com/smarterwithgartner/how-to-tackle-dark-data/

## GROUPE MUTUEL: WEAVING TOGETHER GROWING DATA VOLUMES

To get a sense of the accelerating volumes of business intelligence today's organizations must manage, consider Groupe Mutuel. Between 2010 and 2017, the Swiss insurer's customer base more than doubled from 700,000 to 1.5 million. "That translates to a 35% increase in data per year across the company," explained Pascel Sarech, head of infrastructure, Groupe Mutuel. "We needed a way to keep up with growing demands."

NetApp and Groupe Mutuel worked together to develop an integrated data approach. The insurer wanted faster access to growing data so it could better respond to customer needs – changes in the way they purchase insurance and, consequently, the way insurer's manage claims. From the billing department to the engineering team, every aspect of the insurer's business required access to the data.

**The result:** a data fabric architecture that weaves together data across sites and applications to simplify data management regardless of whether that data resides in the cloud or on-premise data centers. Today's Groupe Mutuel's core applications, website, ERP systems and agile development processes benefit from accelerated movement of data between environments.

## SOCIÉTÉ GÉNÉRALE: BUILDING THE BANK OF THE FUTURE

To mark its 150th year, Société Générale launched its Digital for All program designed to accelerate digital transformation at the French investment bank. "Digital for All was a way to link our story to our digital future," explained Thierry Pinart, deputy CEO for investment banking, private banking, and investor services, Société Générale. "Digital transformation and data management are key to any business, especially a bank."

To bring the commitment to life – and to provide greater infrastructure agility to the bank's 140,000 employees – Société Générale brought in NetApp. In practice, Digital for All meant data for all and required a high-performance tool that could gather sources of information across geographies and across different infrastructure, providing end-to-end visibility of compute and storage in a single view.

The answer was OnCommand Insight. It helps Société Générale proactively identify vulnerabilities and risks, avoid mission critical problems and meet service levels for availability, performance, and utilization. Meanwhile, OnCommand Insight anomaly detection feature offers a proactive monitoring approach, analysing historical usage to improve intelligence and proactively monitoring activity to alert administrators about performance anomalies. "We can now manage load peaks and make sure at the end of the day we've avoided issues and provided a high-quality service to our customers," said Pinart.

## Conclusion

For today's financial services and insurance firms – responding to internal and external pressures, and adapting to changing market conditions – hybrid and multicloud is the natural operating environment.

For those same organizations to make the most of data they own and process requires a data fabric. After all, if employees at every level, not just executive teams, can't access business intelligence, they won't be able to make data-driven decisions. And if developers can't access the same, they won't be able to build responsive apps and services informed by real-time data.

## What happens next?

Think carefully about your cloud and data technology partners. You will want to maximize your current investment while making sure you can adapt to the future. NetApp is the leader in hybrid cloud data services. We provide a full range of services that simplify management of applications and data across cloud and on-premises environments to accelerate digital transformation.

## NetApp Financial Services Proof Points

- Established enterprise pedigree in the global Finance sector with 9,000 financial institutions relying on NetApp data management solutions

- **Royal Bank of Scotland** – reduced operational expense for 80,000 employees by 50% with automated data services and simplified maintenance

- **Société Générale** – transformed operations for 90,000 touch-points, better performance analytics

- **Banque Populaire** – better analytics cost/performance

- **Iberia Bank** – modernized legacy IT from several acquired banks into smaller footprint 5:1 data reduction

- **Groupe Mutuel** – grew and integrated business intelligence for its 1.5 million customers by developing its own data fabric

**■ NetApp**®