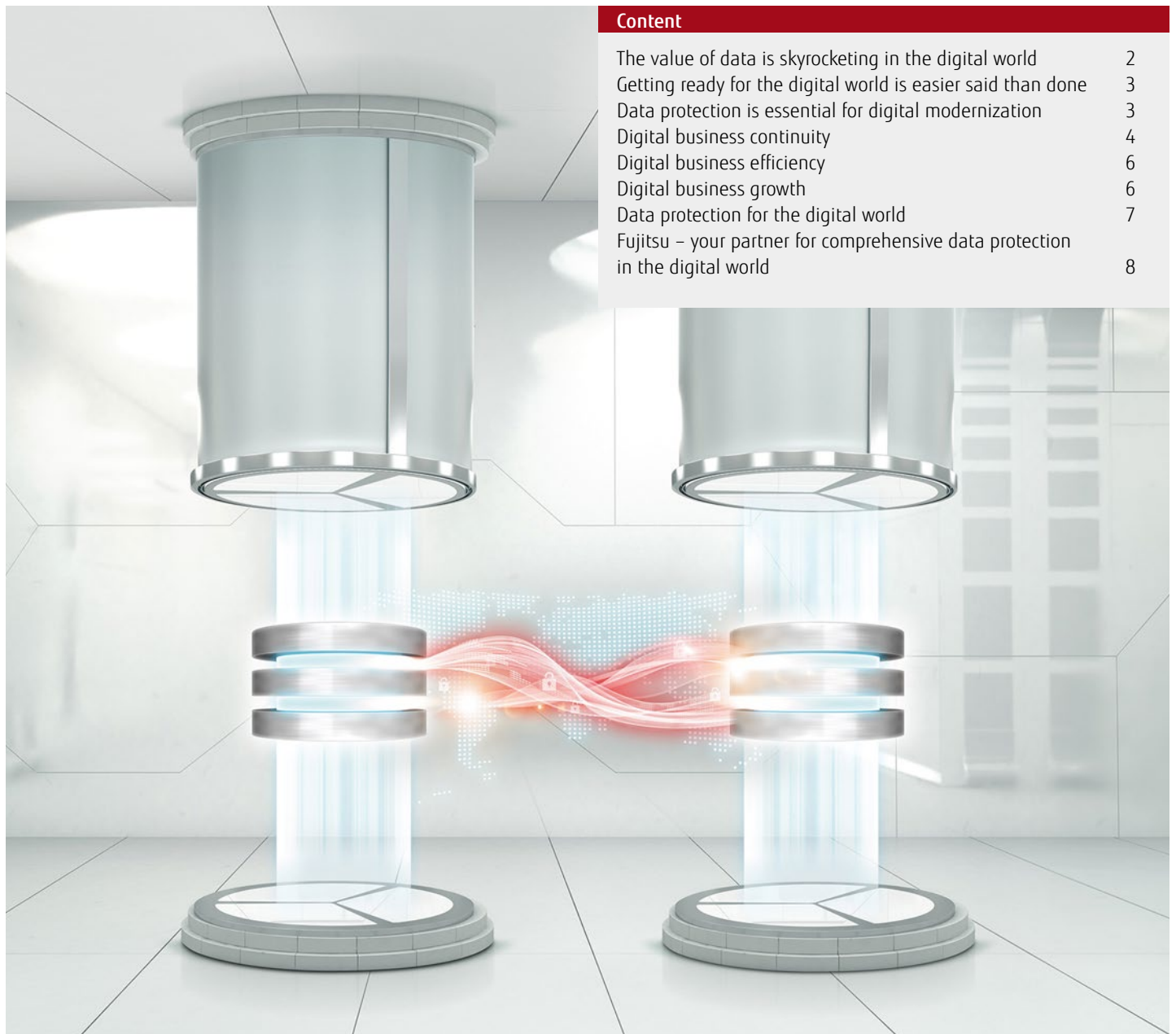


White Paper

Data Protection for a Digital World

As digitization continues to pick up speed, the availability of data is the factor that determines business success in the digital world. At the same time, enterprises must take a different approach to data protection, because there is no longer any kind of expiration date for data.



Content	
The value of data is skyrocketing in the digital world	2
Getting ready for the digital world is easier said than done	3
Data protection is essential for digital modernization	3
Digital business continuity	4
Digital business efficiency	6
Digital business growth	6
Data protection for the digital world	7
Fujitsu – your partner for comprehensive data protection in the digital world	8

Digitization continues to pick up speed. Experts believe that by 2019 some 40% of all IT projects will be launched to develop new digital services and offerings in order to generate new revenue. The main focus of these developments will be on Big Data, IoT and AI. As more and more business enterprises embrace these and other technologies, the faster data volumes will grow – exceeding today’s already remarkable pace. The flood of data will continue to rise with the expected implementation of 50 billion IoT sensors by 2020, and more than 200 billion things connected through the Internet by 2030. This data is a lucrative source of business not only for start-ups that want to revolutionize the world with their new ideas, but also for enterprises of all sizes doing business in various sectors that want to be strong competitors in the digital markets.

The value of data is skyrocketing in the digital world

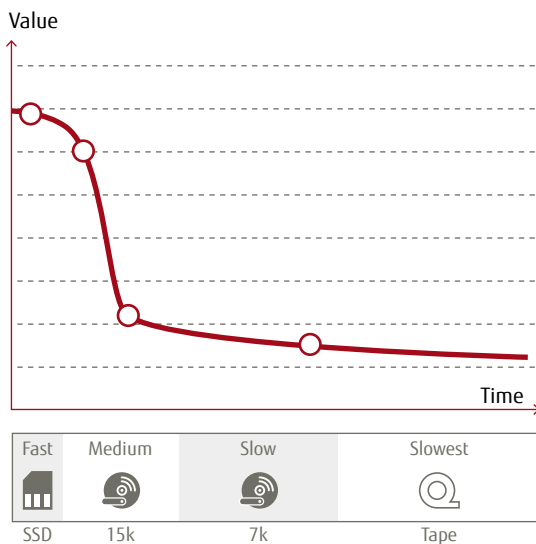
In the past, current data and “old” data were of equal value. However, in the digital world, there is no longer any kind of expiration date for data. Quite often the value of data is now increasing over time. Existing storage and archiving environments are now being evaluated in terms of their purpose and function as part of a rethinking process.

In a traditional physical business, data has the highest value when it is created and frequently accessed by production applications. High performance is often required at this stage. In today’s digital enterprise, there is a constant iterative process of data creation, processing,

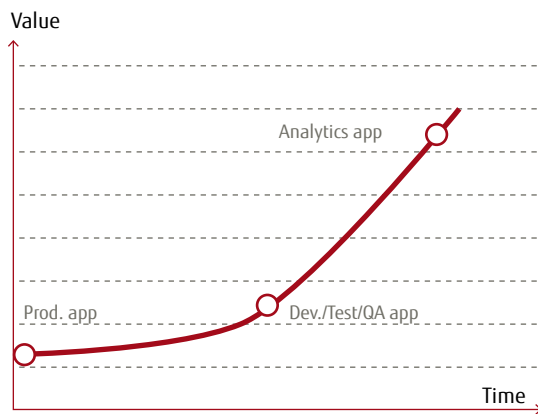
analysis and sharing/selling. Data created by an IoT sensor or social media app may have little value at the time of creation. The value increases exponentially when data is used to develop applications, is further analyzed for targeted outcomes and sold to consumers or other vendors. Today data value does not always fit into an exponential “decay-with-time” model, and data value is now more dynamically based on various applications using data throughout its entire life cycle. Access needs to be consistently fast for use by application development, analytics, publishing, etc. The data itself must satisfy enterprise needs by being inherently protected, always resilient and fully compliant.

Evolution of data – old is gold!

Today: Storage tiers over time



Digital business: Data value over time

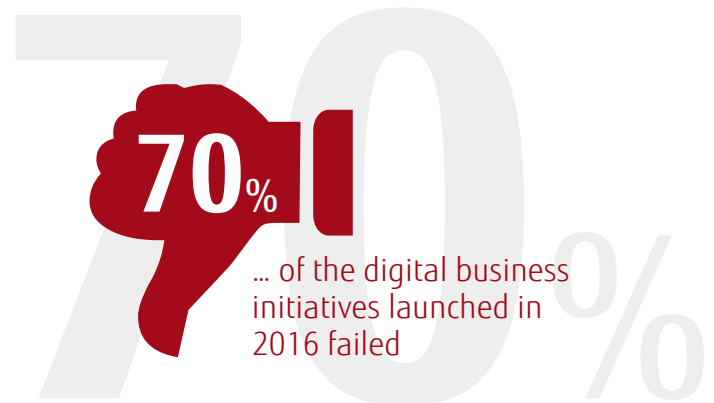


Need to reshape storage environments!

Getting ready for the digital world is easier said than done

Business executives have recognized the opportunities that are possible with digitization – with regard to their business competitiveness, customer retention and winning over new customers as well. However, 70% of the digital business initiatives launched in 2016 failed. Why? The answer is sobering: There was a lack of connected thinking! Departments sometimes push their own programs forward so that various approaches to IT investment can be taken at the same time.

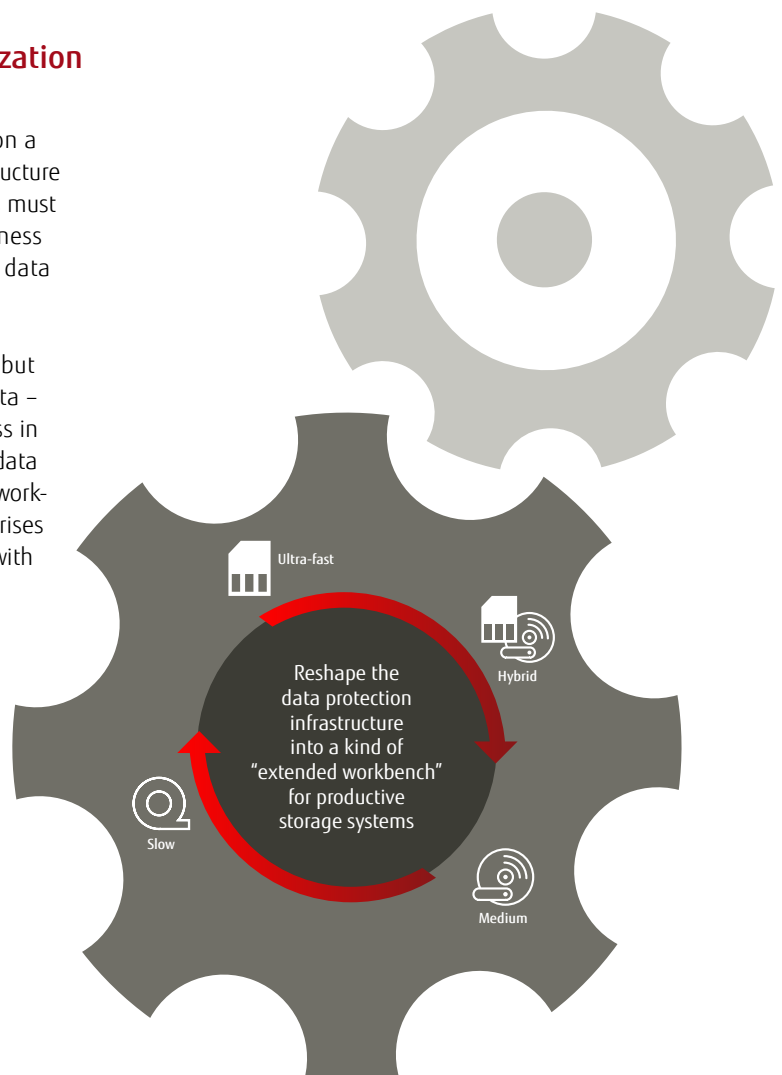
This results in complex formations of applications and solutions for a large number of very diverse platforms. This prevents the realization of consistent processes and coherent user experiences. Having a holistic strategy for digital modernization is the only effective approach that promises success – it ensures that an impressive user experience is ultimately achieved, and the implementation of a completely integrated back-end infrastructure guarantees that added value is generated for the business enterprise.



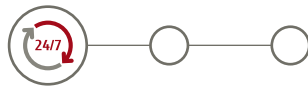
Data protection is essential for digital modernization

Business success in the digital world is only possible if based on a clear data management strategy and a high-performance infrastructure that can support this strategy during daily operations. Enterprises must also take a different approach to data protection because business demands are changing dynamically. What's more, the value of data over time is also changing.

One thing is clear: Data protection is not a matter of backups, but rather the recovery and restoration of data. The availability of data – both new and old – is the factor that determines business success in the digital world. And that's why businesses must develop their data protection infrastructure by reshaping it into a kind of "extended workbench" for their productive storage systems. By doing this enterprises will then be in a position to satisfy digital business requirements with high levels of agility, reliability and efficiency.



Digital business continuity



The goal of many enterprises in a digital business environment is to ensure constant data availability – 24 hours per day, seven days per week. Having this 24/7 availability is the prerequisite that enables enterprises to offer their customers “always-on business.” Those businesses wanting to successfully mitigate availability risks, and reliably ensuring that RTOs and RPOs are in place for a particular application, must combine various concepts and solutions. This begins with the online storage systems – this should be the starting point for an effective data protection strategy.

When it comes to online storage systems, mirroring and asynchronous replication are effective measures that can restore data availability within just a few seconds or minutes if an outage occurs. FUJITSU Storage ETERNUS DX and ETERNUS AF have all the functions required for uninterrupted operation that will protect business-critical data. Data can be managed locally, centrally and remotely to support very flexible disaster recovery concepts. The ETERNUS Storage Cluster offers options that are especially economical. If a primary system or site experiences an outage, the secondary system automatically takes over operations to keep things up and running. This failover can take place in both directions and between various ETERNUS AF All-Flash and ETERNUS DX Hybrid Storage systems.

While high-availability disaster-resilient online storage systems serve as the basis for “always-on business,” they are not substitutes for backups. It is also important to remember that for example viruses or unintentional deletions that go unnoticed will also be replicated. And high-availability alone is not much help if data is corrupted or a ransomware attack encrypts your data.

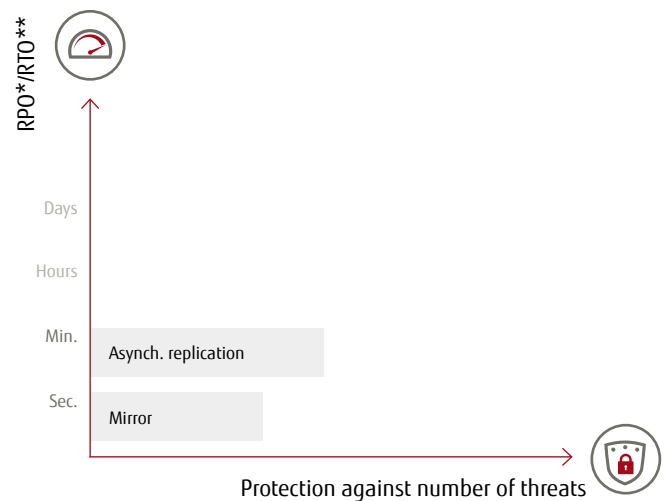
Travel back in time with snapshots

Snapshot technology has become an effective “multi-talent” over the years. A number of trigger points can be set for a specified time frame and – if a rollback becomes necessary – the system can be quickly shifted back to a status existing earlier in the time frame. Snapshots are ideal for restoring data that has been corrupted or inadvertently deleted.

Today it should be a generally accepted fact that snapshots are integrated deep in virtual environments and offer all the functions needed to recover individual files, directories, virtual machines, databases and applications. In virtual environments the technology should offer a few more functions, e.g., for backup up several hundred or thousand VMs, the automatic detection of unprotected VMs and the option of booting from backup storage. It is also helpful if a real test environment can be set up quickly with real data. This will allow for the testing real production data – without having an impact on the productive system.

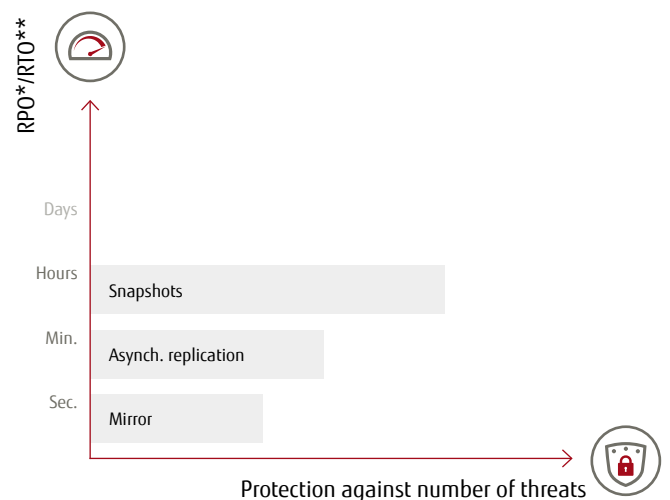
Snapshots are an important element in backup strategies because they offer fast and easy access to data, not to mention that they support immediate recovery when used in conjunction with backup applications. Of course, snapshots cannot be seen as complete replacements for backups, mainly because they typically reside on the same storage systems as the primary data copy. If something happens to the storage system, it not only effects the primary data, but also the snapshot copy stored on this system. Or consider another scenario: Perhaps a software bug is causing data corruption in a database. This data corruption may not be detected for several days or weeks. Snapshots will usually not be able to cover this time period.

Data protection begins with online storage systems



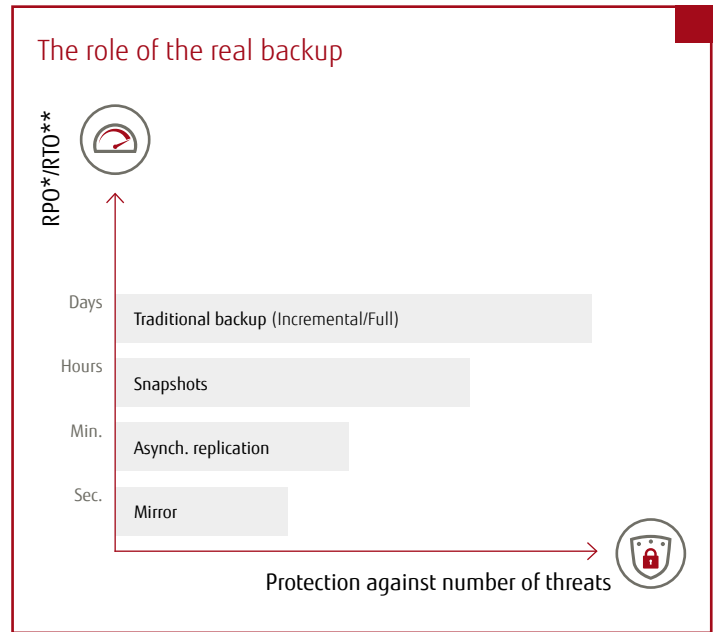
* RPO: Recovery Point Objective: The point in time you have to go back to in order to find the last valid and saved copy of lost data
 ** RTO: Recovery Time Objective: The amount of time needed to restore the last valid and saved copy of lost data

Travel back in time with snapshots



Real backups protect business operations

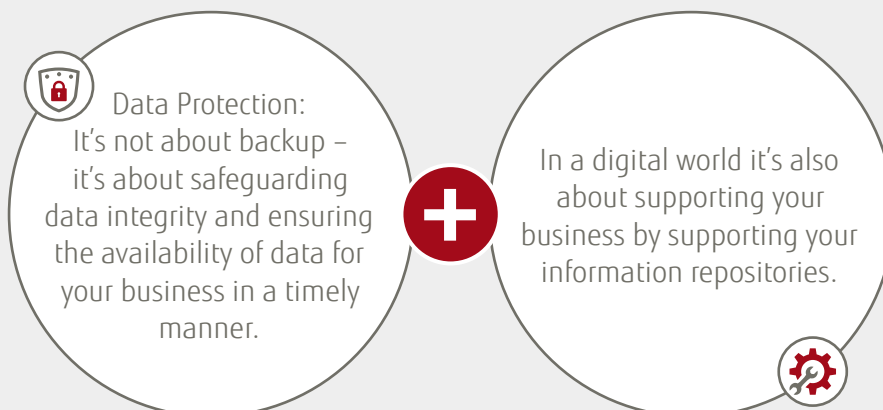
There are really no alternatives to proven backup technology in the digital business world. It supports “time travel” back to older data copies if newer data should ever be corrupted or deleted. What’s more, backup enables the storage of data copies on various media and across long distances at geographically separated sites. This provides a physical and logical separation of backup data from the primary storage. Mirroring, replication and snapshots typically do not provide this separation. Consider for a moment that a software bug is causing data corruption in a database. This data corruption is immediately mirrored or replicated to all data copies and renders these high-availability targets useless. If you also consider that this data corruption is not detected for several days, snapshot technologies will usually not be able to cover this time period. On the other hand, the traditional backup approach alone is not suited for the dynamic rate of change found in today’s daily operations, nor would it be very cost-effective. Thus the only feasible approach is a mix of functions that allows for the achievement of aggressive RPO-RTO targets and also ensures that high-performance backups are possible.



Traditional backups are also quite effective when it comes to warding off the growing number of cyber attacks and similar threats. Ransomware, for example, is becoming quite popular among cyber criminals. This type of malware encrypts user data, rendering it inaccessible. Malware of this sort is typically used for digital extortion: If an enterprise agrees to pay ransom money, hackers promise to restore access to valuable data and systems. Of course, who can really trust hackers to keep such promises? Furthermore, some versions of ransomware use algorithms to encrypt the hostage data, access drives or cloud services – and quite often it is impossible to break these encryption codes. The serious consequences of such attacks were evident in news media reports about recent breaches. In addition to monetary losses, businesses also suffer enormous damage to their image and – depending on the type of industry – some victimized enterprises are also held liable for damages to third parties such as customers or patients.

Prevention is the best way to safeguard data and systems from these kinds of attacks. And backups are the most important measure to take where ransomware is concerned. The following backup concept is highly recommended: Conduct backups on a regular basis. Test backup procedures from time to time to make sure that disaster recovery is possible in the event of an outage. And – most importantly – make sure all backups are stored in an area that is separated from the IT network! Enterprises that follow this kind of backup plan will have a strong foundation for safeguarding their business operations.

Data Protection Strategy for a digital world



Digital business efficiency



Business enterprises have always looked upon backups as being complex, time-consuming and expensive. But today many different data protection appliances are on the market that make life much easier with their economical backup and archiving processes.

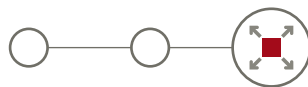
These appliances drastically reduce IT administrator workloads and deliver high performance with functions like replication, deduplication, mirroring, data copies and tape migration. At the same time they reduce the loads on backup servers and networks because they take care of all data handling tasks directly in the storage environment.

And the integration of software and applications closes the online storage gap. This means that snapshots can be easily moved to the backup target. The combination of incremental backup cycles and synthetic complete backups also enable optimal usage of backup windows and the network, which also helps reduce loads on the servers targeted for backup.

High-performance integrated data protection appliances – available as out-of-the-box solutions – are also ideal for complementing hyper-convergent infrastructures. These reliable appliances are quickly and easily integrated in productive environments and deliver high-quality results.



Digital business growth



In the digital world the amount of stored data is skyrocketing as never before. Experts are constantly revising their prognosis about the expected growth rate, but that is really of secondary importance because data volumes will vary from industry to industry. One fact is undisputed: IT administrators will have to deal with exploding amounts of data – both old and new data. To envision what this will be like, try to answer the following questions: How often do you delete data? Does your business already understand that the importance and value of data is changing, and that older data is increasing in value? This could be the result of legal or corporate compliance guidelines, or perhaps it is due to Big Data and the future of analytics.



In the digital business, the balance and interaction between productive and second-tier storage are crucial to success.

Examining these questions and the consequences of unbridled data growth is important if we want to profit from efficient and cost-effective data handling. Answers to these questions will give us an idea of what future-proof second-tier and archive storage environments will need to look like in order to supplement productive storage (online storage for clients, file storage, database servers, application servers, etc.). In the digital business world, the balance and interaction between productive storage, second-tier storage and archive storage determines just how fast, flexible and cost-effective the data center can respond to the demands of the business.

Second-tier and archive storage can play a decisive role in this equation:

- Reliable storage of old and inactive data that cannot be deleted.
- Reduced storage costs resulting from space-saving online storage and migration of data to an affordable, lower-cost storage tier, plus smaller backup windows and faster recovery.
- Efficient file management based on cross-platform index and search functions, plus storage in compliance with corporate and legal regulations, not to mention economical long-term archiving.

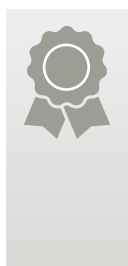
Data protection for the digital world

When it comes to digital business, IT departments are under great pressure to prevent outages or downtime. To ensure “always-on business” they often resort to using the typical rule of thumb known as 3-2-1. This rule suggests that you should always make three copies of your data, store them on at least two different storage technologies and keep one copy at an external site. Though this concept may seem simple and effective, it is far too broad and general for application in daily operations.

What’s more, depending on the type of business, this approach could result in high workloads and unnecessary costs. A more transparent and clearly defined approach based on the classification of data protection requirements would be more revealing. And this approach would definitely lead to considerable improvements in the effectiveness and efficiency of data protection. Here is a classification guideline for a data protection strategy based on bronze, silver and gold levels.

Data protection requirements are different ...

Example for data protection classification



BRONZE-Level

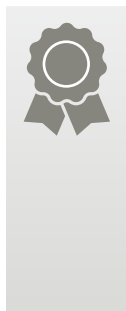
Backup topology

1 location
1 copy is enough
(tape or disk)

Retention period: Days

Low SLA:

Focus on fast backup



SILVER-Level

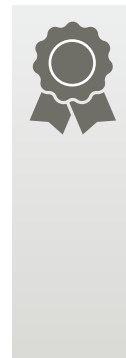
Backup topology

1 or 2 locations
1 or 2 copies on disk
At least 1 copy on tape

Retention period: Weeks

High SLA:

Align backup and recovery



GOLD-Level

Backup topology

2 locations
At least 2 copies on disk
At least 2 copies on tape
1 tape copy to a safe (vaulting)

Retention period: Months

Highest SLA:

Focus on maximum data availability and fast recovery

Fujitsu’s data protection solutions make it easy to keep backup and archiving speed, capacity and cost in balance. They offer lower total cost of ownership as opposed to traditional multiple component solutions, and they enable rigorous consolidation of backup infrastructures. Our comprehensive portfolio of appliances, tape solutions and data protection software offers everything to optimize your data protection environment according to your specific needs.



Secondary storage

ETERNUS CS8000 (backup and archive to disk and tape) and **ETERNUS CS800** (backup to disk with deduplication) target appliances execute data handling tasks directly on the storage, working together with all backup software.

Commvault HyperScale™ appliance is a flexible hyper-converged solution that integrates computing, storage and full lifecycle data protection in a single platform

Veritas NetBackup appliances are fully integrated solutions from one mold that can be deployed in less than 30 minutes.



Long term storage

ETERNUS LT tape libraries perfectly meet the requirements of low-cost backup and long-term archiving.

Fujitsu – your partner for comprehensive data protection in the digital world

When it comes to backup and archiving, we have more than 50 years of experience and are one of the few IT providers who give customers the comprehensive support they need. And most importantly: We know that the road to the digital world is not just a matter of having the right technology, but also depends on having just the right digital strategy for your business. That’s why Fujitsu – as your reliable partner for IT infrastructures – is at your side, helping you develop solutions that are perfectly tailored to meet your specific requirements. Our strategic alliances and collaborative development projects with leading manufacturers ensure that you will be able to deploy only the very best solutions to boost your business success.

