

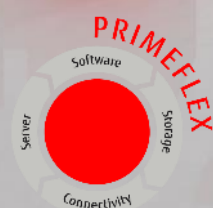
White paper

Data Protection for FUJITSU Integrated System PRIMEFLEX with Veritas Software

FUJITSU Integrated System PRIMEFLEX is your fast track to modern data center infrastructures no matter if converged, hyper-converged or hybrid-cloud. Get insights into how Veritas NetBackup Software can help to protect your business-critical assets in PRIMEFLEX environments.

Content

Introduction – Target group and structure	2
Understanding the Veritas NetBackup Licensing structure	2
Explaining Veritas Backup Policies	2
Analyze your data and review your backup policies	4
Future innovation and investment protection	4
You choose your method of deployment	5
Specifics for FUJITSU Integrated System PRIMEFLEX	6
Choosing the right Backup & Archiving Infrastructure for your Integrated System PRIMEFLEX	7
Links with further information	7



Introduction – Target group and structure



This whitepaper for technical decision makers and influencers covers the following topics:

- NetBackup licensing structure
- Front End Terabytes and backup policies
- Future innovation
- Method of deployment
- Veritas NetBackup in a PRIMEFLEX environment
- Data protection infrastructure with Veritas for PRIMEFLEX

Understanding the Veritas NetBackup Licensing structure



■ General description

The simplified statement: ‘You only pay for what you have chosen to be protected by Veritas NetBackup during the past 90 days’ gives you a basic understanding of the Veritas licensing strategy.

This allows you to control costs and optimize your investments. To gain this benefit the user should:

- know what the companies “active, in use, hot or new data” is and the location of this data
- analyze and clean up this data (for more details, see section: Analyze your data, page 4)

The core benefit of using Veritas to protect your data is having the peace of mind that you are always able to access all non-expired data you have ever protected and backed up – no matter how much there is, or how many copies of “secondary, not in use, cold data” exist.

The following licensing options of Veritas NetBackup Software exist:

■ Purchasing option - Perpetual License

Fujitsu offers Veritas NetBackup licenses (so called perpetual licenses) which can only be purchased in combination with maintenance (the eligibility for software updates and version upgrades as well as hotline support). Customers can choose which support structure they prefer: Maintenance can be provided either as a Fujitsu Support Service or as a Veritas Support Service.

Choosing Fujitsu makes sense in that Fujitsu acts as Single Point of Contact (SPOC) for the whole solution (including the Fujitsu ETERNUS CS Data Protection Appliance as well as Integrated System PRIMEFLEX). This SPOC approach and the technical solution support option of a Fujitsu Integrated System PRIMEFLEX make these two solutions a perfect match.

■ Purchasing option – Subscription License

The other way to purchase Veritas NetBackup software is by choosing so-called subscription licenses through Fujitsu. While the first was a combination of CAPEX and OPEX, the subscription model is a pure OPEX purchasing model with the lifetime of the license bound to the chosen subscription period.

■ Purchasing option for Service Provider

Furthermore, Fujitsu and Veritas together offer a special consumption based license model eligible only for (Managed) Service Providers (VSPP). It uses the same Veritas unit metering technologies, but offers accounting methods requested specifically for this marketplace.

If you are a Service Provider and you would like to know more about the VSPP Program, please contact us at veritas@ts.fujitsu.com

Explaining Veritas Backup Policies



■ The Veritas Capacity Meter model

The way to start with Veritas is by drilling down into how many Front-end Terabytes (FETB) you plan to back up in your environment – no matter which spending model (perpetual/subscription) you choose. The calculation is called the Veritas Capacity Meter model. The unit of metering is counting the Front End Terabytes (FETB) measured as data volume – independent of their current non-compressed or compressed state (but non-deduplicated) on the original source for the backup (server, storage or cloud).

■ Backup Policy – Actively protected

The data to be protected are put into an active backup policy. All active policies add up to the FETB license volume. Inside the VERITAS Web-portal GUI, you will find a web app called “Smart Meter”, showing you the total FETB backup volume that reflects your choices.

It is important to understand that one great benefit from Veritas is the differentiation between “Data to back up” and “Data to restore”. Your FETB volume will be reduced every time you retire a backup policy over the lifetime of the product usage as your data center changes and the data from that source is changing its state to an “as is” state.

This “cold data” is still accessible through NetBackup but does not push your license cost up any further. (To give an example: if you decide no longer backup the 10 MB PowerPoint, the FETB license count will be reduced by those 10 MB, 90 days after the backup policy has run that included it for the last time).

Front-End-Terabyte (in a Veritas backup policy) – explained

Here is a detailed but technically accurate example:

Assume you have a PowerPoint file that is 8 MB in size and you schedule a daily backup of the fileserver on which the 8 MB .ppt file exists. As in so many companies, once the file is created, it is modified during the first two weeks while someone is working on it. Afterwards no update occurs, and the file exists on the fileserver forever. What would your backup costs look like?

The first backup of the file counts 8 MB towards FETB. Then on a daily basis, only the incremental changes are backed up. Three things can happen:

- 1) Despite the changes, the overall file size stays the same
→ no change in the FETB count
- 2) The overall file size gets smaller as the person working on the PPT removes some content
→ your FETB count gets smaller
- 3) The overall file size gets bigger as the person working on the PPT adds some content
→ your FETB count gets bigger

However, the interesting part is the change and retention, its impact on the backend storage and the FETB license cost. Let us assume the following file modifications:

- 1) Daily change rate is 1 MB during the aforementioned two weeks
- 2) Backup policy is a daily backup with 14 days retention period
- 3) The person working on the file modifies the .ppt during the first two weeks as follows (see first row in below table):
 - 6 times deleting 1 MB
 - 8 times adding 1 MB of content

	DAY 1	DAY 2	DAY 3	DAY 4	DAY 5	DAY 6	DAY 7	DAY 8	DAY 9	DAY 10	DAY 11	DAY 12	DAY 13	DAY 14
Change amount (MB) added to or subtracted from active file	+1	-1	+1	-1	+1	-1	+1	-1	+1	-1	+1	-1	+1	+1
FETB front-end TB, actual file size on any given day	9MB	8MB	9MB	8MB	9MB	8MB	9MB	8MB	9MB	8MB	9MB	8MB	9MB	10MB
Back-end cumulative backup storage space used	9MB	9MB	10MB	10MB	11MB	11MB	12MB	12MB	13MB	13MB	14MB	14MB	15MB	16MB

Pay license fee for only this storage (arrow pointing to 10MB FETB)

Consumption may fluctuate throughout cycle (arrow pointing to 16MB Back-end)

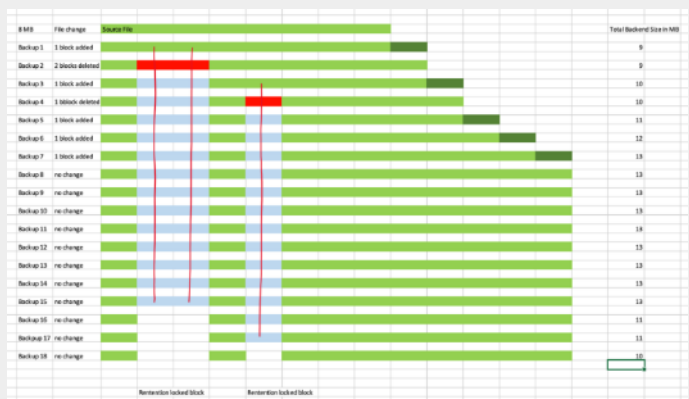
After 14 days, the net result of the file counts 10 MB FETB. However, on the Backend Storage the capacity is calculated as follows:

- 1) Originally you stored 8 MB and decided to keep it for 14 days
- 2) Then 6 times a 1 MB chunk was removed on the front end and becomes de-referenced in the backend, but is kept for the retention time of 14 days. However, the backend storage space is not actually freed up immediately.
- 3) Additionally, a 1 MB chunk was added 8 times

By the end of the period, the backend storage requirement has increased to 16 MB. Your impact on the FETB license cost is simply the file increase to 10 MB. You are not paying license fees for the increased backend storage capacity at any point.

- For completeness: After 14 days when the retention on the first backup starts to expire, the backend cleanup of the de-referenced chunks will start to happen. Since those changes happened with the daily backups over a period of 14 days, you will end up with the 10 MB-size 14 days after the last backup, which contained changes to the file.

However, with every daily backup where you have included that file into the backup, the retention period is refreshed. That means, even if you do not modify the file in the next two years you keep that file for an additional 14 days, which means it is 10 MB on your FETB license cost. Other than a few kilobytes of meta data checking, there is no impact and no data transmission in your network for this stagnant file.



■ A Terabyte is a Terabyte

The Front End Terabyte (FETB) license volume is not inflated by how often you do your backup or how many copies of the data you want to keep accessible. In every single active backup policy you can configure how many copies should be created and to what target(s) these copies should be sent. You can back up data to the cloud, in the cloud or from the cloud, irrespective of the media and the data optimization technology (compression/de-duplication, erasure coding) in the backend.

It is also independent of how often the data changes or how frequently you want to run your backup. Moreover, you do not need to worry about how long you want to keep your backups or the retention period – as long as you have capacity on your backup storage like the Fujitsu ETERNUS CS Appliance, you can do whatever you like. With our support for NAS and our unique tape automation functionality, you can pump Exabytes of data into the void.

Analyze your data and review your backup policies

A very good exercise to sharpen the Front End Terabytes is to analyze what is there and find out what data can be archived or even deleted.

Fujitsu offers complementary solutions to NetBackup e.g. Veritas [APTARE IT Analytics](#) or [Information Studio](#) that allow you to gain insights into your data. You can determine things like:

- When was the data last accessed?
- Is the data orphaned, because the user who created it is no longer with the company?
- Is it a duplicate data? And more.

The solution Information Studio does not stop here. Through its built-in information classifier, you can even manage intricate tasks like the risk profiling of data, which can check, for example, whether it contains PII (Personally Identifiable Information) like passport data, credit card details, etc. This exists to help drive informed decisions as to which data can/should be archived or safely deleted, but also which data can be moved to the cloud and which data should not.

To complement this system, Fujitsu also offers the Veritas archiving solution [Veritas Enterprise Vault](#) (for performing mail and file archiving or eDiscovery). The optimum implementation that combines backup and archiving in one solution is the [Fujitsu Storage ETERNUS CS8000](#). This data protection appliance offers not only supreme performance for backup and restore, but can also be partitioned in dual-use mode with archiving. Fujitsu customers especially appreciate the Virtual Tape library (VTL) functionality as well as the path-to-tape (PTT) automation – making it a super solution for manifesting both worlds on one system.

Backup is not long-term archiving!

Archive solutions typically offer functionality like universal WORM and file/mail content indexing or automatic secure deletion after retention periods have passed.

Future innovation and investment protection

■ Advantage of NetBackup Capacity Meter Model

The Veritas NetBackup Capacity Meter Model (based on FETB) has another great advantage. This license model provides a single key for all existing NetBackup features and functions as well as offering investment protection for upcoming future developments.

What do we mean by that?

- Over the past few years, many customers have decreased their utilization of Oracle databases, and instead adopted MySQL databases. In parallel, they have decreased the amount of physical servers while increasing the amount of virtual servers. Back in the old days, it was typical that customers had to license every database environment separately and per server.
- Today's Veritas investment protection does not ask for any of this:
With NetBackup you can back up any data source or type including files, VMs, containers, databases or lakes of big data.
In addition, what is remarkable, too is that with the introduction of the current licensing model, those customers were not required to perform any Veritas re-licensing tasks – it all transitioned smoothly.

NetBackup Capacity Meter

In recognition of the high adoption rate of virtualization in today's companies and the immense data growth this is driving, Veritas recently introduced a flexible element in the data type count in the form of the NetBackup Capacity Meter.

With the '1 TB NetBackup license' you can protect either 1 TB of data on physical servers or 1.5 TB of data on virtual servers. Veritas calls this "Flex-licensing". This means a big bargain for your Fujitsu Integrated System PRIMEFLEX.

■ Erasure coding

With the advent of scale-out databases (Hadoop, HBASE, MongoDB, etc.) Veritas has also embraced technologies such as erasure coding. Many Backup and Recovery (B&R) vendors have chosen to retrofit traditional backup and recovery technologies in order to service modern scale-out environments. This means they typically require an agent or client to be installed for client-server communication and data movement. While this may work for smaller environments, the drawbacks for larger environments are severe. You have to not only install and maintain the software on all nodes and check for dependencies, but also potentially plan maintenance and downtime windows, which can be a daunting task.

■ NetBackup Parallel Streaming™

Veritas designed a revolutionary new technology called [NetBackup Parallel Streaming™](#) that complements modern, scale-out workload architectures found in Big Data, Hyper-converged and Open Source systems. It breaks with the old paradigms of the mandatory installed backup client. The two major advantages are:

- The backup and restore process works completely agentless through APIs, thus eliminating complexity and dependencies;
- Plus, the technology is enabled on the NetBackup side with a NetBackup release independent software plug-in, which means that you do not need to perform any upgrade tasks on the backup servers in order to gain the benefits of protecting a new workload.

This new backup & recovery technology was designed specifically following the same principles on which scale-out architectures are built (Web-Scale architectures like Google or Azure). As the needs of the cluster grow, and more data nodes are added to increase processing power and storage capacities, NetBackup Parallel Streaming allows the user to add additional Backup Hosts in order to meet the growing bandwidth requirements. In this manner, backup and recovery scalability mirrors the needs of the cluster environment without ever having to install clients or agents on Name Node or Data Node servers.

You choose your method of deployment

■ Deployment options

Regardless of whether you protect the data in a physical, virtual or cloud environment, the NetBackup itself can also be deployed in any shape or form:

- From choosing a physical server in a Build-your-own approach
- Or as a NetBackup Appliance model as well as a virtual appliance
- In a virtual machine
- Or in the cloud (e.g. AMIs = Amazon Machine Image in the AWS Cloud)

That independence and flexibility now matches very well with the Fujitsu PRIMEFLEX Integrated System characteristics. Choosing Veritas NetBackup provides such a holistic solution that customers have the peace of mind to be able to run even multiple PRIMEFLEX solutions with different OS environments in parallel. That is true for all the different backup methods Veritas is flexibly providing.

■ Backup methods

Backup administrators can always choose between these types of backups for their policies:

- Full Backup: transferring the complete physical or virtual server data
- File-Incremental: building on a full backup, only the changed/new files are being transferred
- Block-Incremental: building on a full backup, only the changed/new blocks are being transferred
- Synthetic Full Backup: Synthetic backups are created from a full backup and from all subsequent incrementals. When you do a synthetic full, you roll up the incrementals back to the last full and create, in essence, an artificial new full backup without actually having to do any backup on the client.

■ Restore methods

- Instant VM recovery: performs a remote mount of an ESXi data store – starts the VM and then begins to transfer the data back to the ESXi cluster using VMware Storage vMotion
- Instant VM access: using the unique Veritas Provisioning File System, an administrator can even launch the simultaneous restore of hundreds of VMs. This form of restore can act as a best practice for site recovery management (only available with Veritas NBU appliance)
- Full restore: regardless of whether physical or virtual servers, and whether it is via Fiber channel or IP
- Single File restore: regardless of which file system you are using

The advantage of performing a “synthetic full backup” in fully software-defined environments, as with PRIMEFLEX HCI, is the ability in the restore process to restore the complete VM at any point in time selected. Therefore, instead of having to perform multiple sequential restore operations, the customer can access the full copy of the virtual machine at once.

Specifics for FUJITSU Integrated System PRIMEFLEX

We thought it would be interesting though to detail what Veritas has developed specifically for the different Fujitsu Integrated Systems PRIMEFLEX solution scenarios:



■ PRIMEFLEX for Microsoft Azure Stack Hub or Nutanix Enterprise Cloud on PRIMERGY

These two web-scale cluster solutions represent a perfect match to deploy Veritas NetBackup Parallel Streaming. It is not limited to solely backing up the VM and container cluster environment – you can also create backup policies to back up attached Hadoop Data Lakes.



■ PRIMEFLEX for Microsoft Azure Stack HCI

With Windows Server 2016, Microsoft switched their backup technology from VSS (Volume Shadow Copy Services) to the new WMI (Windows Management Instrumentation) backup method – more deeply integrated with Hyper-V. The preferred backup method is to use block-level incremental backup (BLIB), as it reduces the size of the virtual machine backup image. BLIB uses Microsoft's resilient change tracking (RCT) to perform faster backup of the virtual machines. BLIB backups support recovery of the full virtual machine and of individual files.



■ PRIMEFLEX for VMware vSphere or PRIMEFLEX for VMware vSAN

There is a VMware VADP (VMware vStorage API for Data Protection) Interface where Veritas fully implements the VMware methodology of how to put VMs into a “consistent” state (without pausing the active VM) and then performing a backup of that VM. Without reinventing the wheel, Veritas operates based on VMware CBT (Changed

Block tracking) technology.

Nevertheless, Veritas does more than just this: Veritas understands the data stream and the contained file system structure during data transmission – irrespective of the file system or OS used in the VM. That makes it possible to present a full copy of the requested VM and its content at any selected recovery point together with global deduplication. Veritas customers can strategically rely on the company's policy to be always the first to adopt updates in this VMware framework for data protection.



■ PRIMEFLEX for VMware VCF

Veritas NetBackup offers full VMware vRealize Suite support. Veritas enables the data protection for 2-tier customers to perform a wide range of Per-VM-Self-Service functions in a fully software-defined datacenter environment.



■ PRIMEFLEX for SAP HANA / PRIMEFLEX for SAP Landscapes

Veritas not only fully supports the “SAP backint” interface, but also the more recent “SAP Snapshot method”.

On top of that, the Veritas engineers have enhanced the NetBackup optimization functions to extend also into SAP environments.

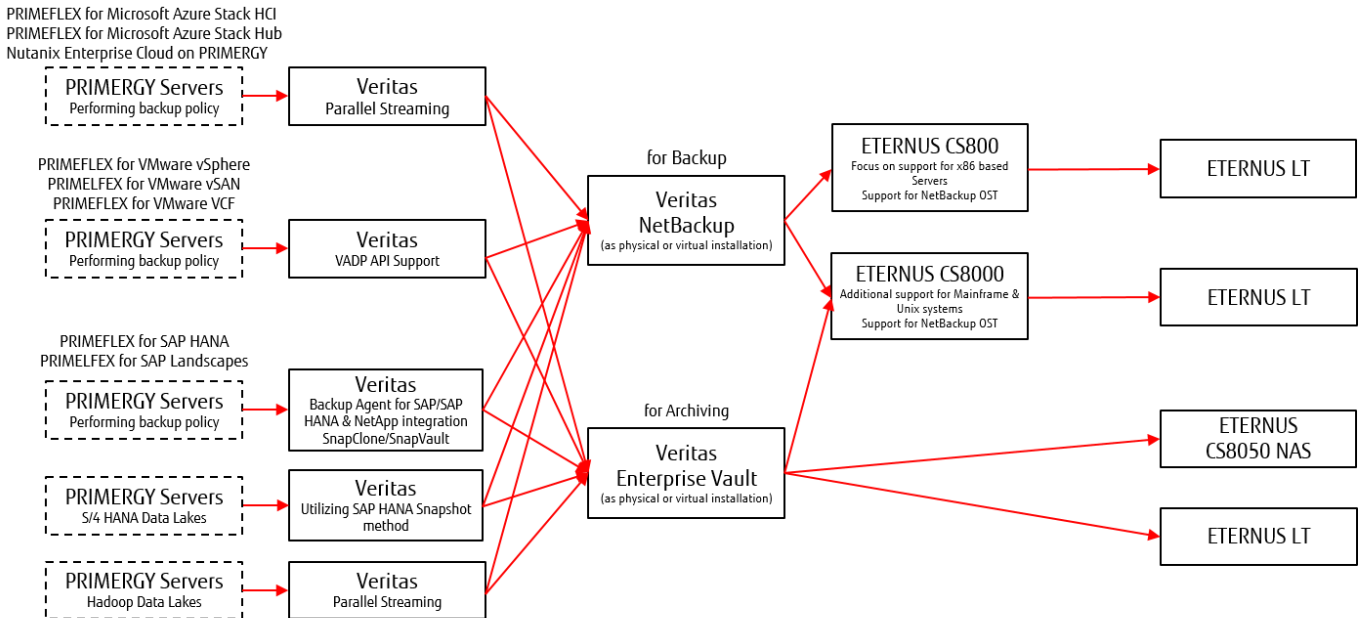
These functions massively reduce impact on CPU, memory and network utilization on the production systems.

Choosing the right Backup & Archiving Infrastructure for your Integrated System PRIMEFLEX

Long before choosing the PRIMEFLEX appliance selling approach as a go-to-market for converged, hyper-converged and hybrid cloud solutions, Fujitsu developed the ETERNUS CS Data protection appliance for backup and archiving.

Also fully integrated into Fujitsu WebArchitect, this appliance looks back on 30 years of successful project business.

Below is a schematic overview of how Fujitsu suggests designing an end-to-end PRIMEFLEX + Veritas + ETERNUS CS environment.



Links with further information

- Internet:
 - www.veritas.com
 - www.veritas.com/fujitsu
 - www.fujitsu.com/veritas
 - www.fujitsu.com/primeflex
 - www.fujitsu.com/emeia/data-protection
- Data Protection Video (general): [How to protect your business-critical data](#)
- White paper: [Data Protection for the Digital World](#)
- Brochure: [NetBackup Appliances](#)

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