

## Adding IBM LTFS EE tape tier to an IBM SCSA managed storage cloud

IBM® SmartCloud® Storage Access (SCSA) is designed to be an easy to deploy, simple to use cloud storage software featuring a web-based, self-service portal for storage provisioning, monitoring, and reporting. SCSA helps users rapidly provision storage capacity on demand and to collaborate with other users. IBM Linear Tape File System Enterprise Edition (LTFS EE) gives organizations an easy way to use cost-effective IBM tape drives and libraries within a tiered storage infrastructure. By using tape libraries instead of disks for Tier 2 and Tier 3 data storage—data that is stored for long-term retention—organizations can improve efficiency and reduce costs. Figure 1 highlights adding a tape tier to the cloud storage service. This solution guide will describe how SCSA and LTFS EE can now work together to add the value of tape to your SCSA managed storage cloud.

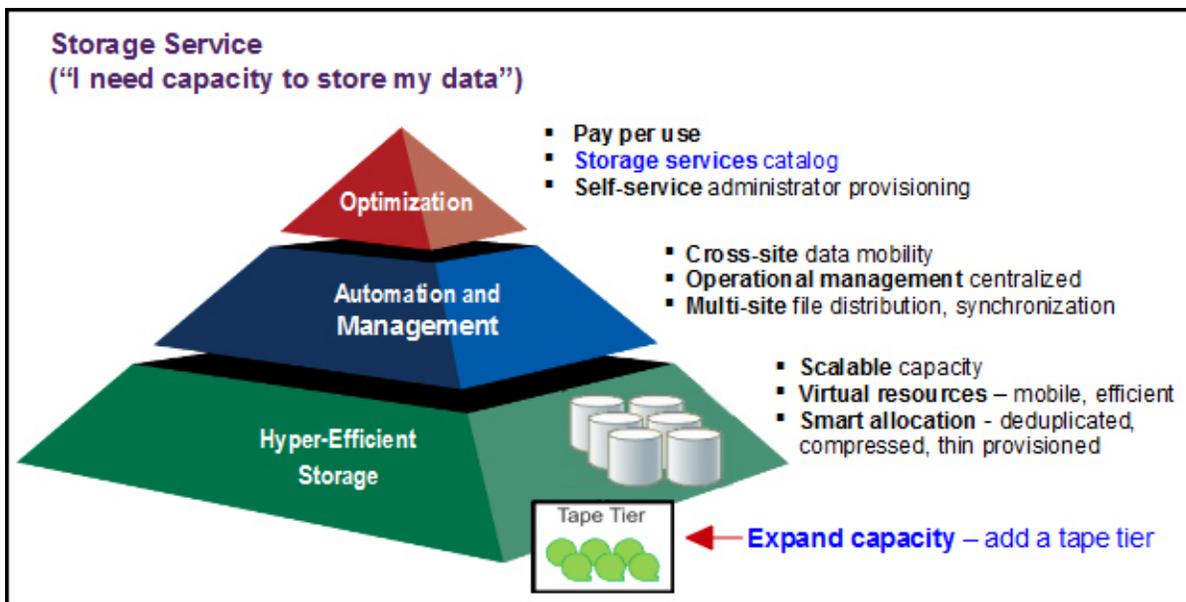


Figure 1. Expand capacity with a tape tier managed by the storage service

### Did you know?

IBM Systems and Technologies Group (STG) Lab Services developed a customized adapter for SCSA that is able to support other storage such as General Parallel File System (GPFS™). LTFS EE is based on GPFS and provides hierarchical storage management, so the adapter lets SCSA and LTFS EE work together, with SCSA focusing on storage provisioning and LTFS EE focusing on data migration to tapes for long term retention. Combining the SCSA ease of use for storage cloud management and the seamless integration of LTFS with GPFS for a low-cost, scalable storage tier, increases the storage cloud value by adding a tape tier to address business requirements for data archival.

### SmartCloud® Storage Access Overview

IBM SmartCloud Storage Access Release 1.2 is designed to enable enterprises to implement a private cloud storage service where users can request and receive storage capacity, upload and download files into the company's private cloud, and administrators can easily monitor and report usage with just a few clicks. In addition to the storage cloud file access with IBM Scale Out Network Attached Storage (SONAS) and IBM Storwize® V7000 Unified (V7000U), SCSA R1.2 includes self-service storage provisioning for IBM Storwize V7000, SVC, and XIV® storage systems for SAN (block) access. SCSA can also support federated authentication for collaboration among multiple enterprises and allow overall cloud administrators to export consumption data for charge back purposes. SCSA can be used to perform common private cloud operations, including:

- Provisioning and de-provisioning file storage and block storage space
- Creating working environments to give team-specific access to file space, and block storage attached to hosts
- Providing request and approval work flow support
- Providing access to file space with file protocols such as Common Internet File System (CIFS) and Network File System (NFS), and access to block space with Fibre Channel (FC) protocol
- Setting automatic email notification for usage warning policy
- Automatic expiration policy
- Monitoring and reporting capability
- Service level customization
- REST API for 3rd party integration
- Globalization support

Figure 2 shows what a storage cloud looks like with the IBM SmartCloud Storage Access solution.

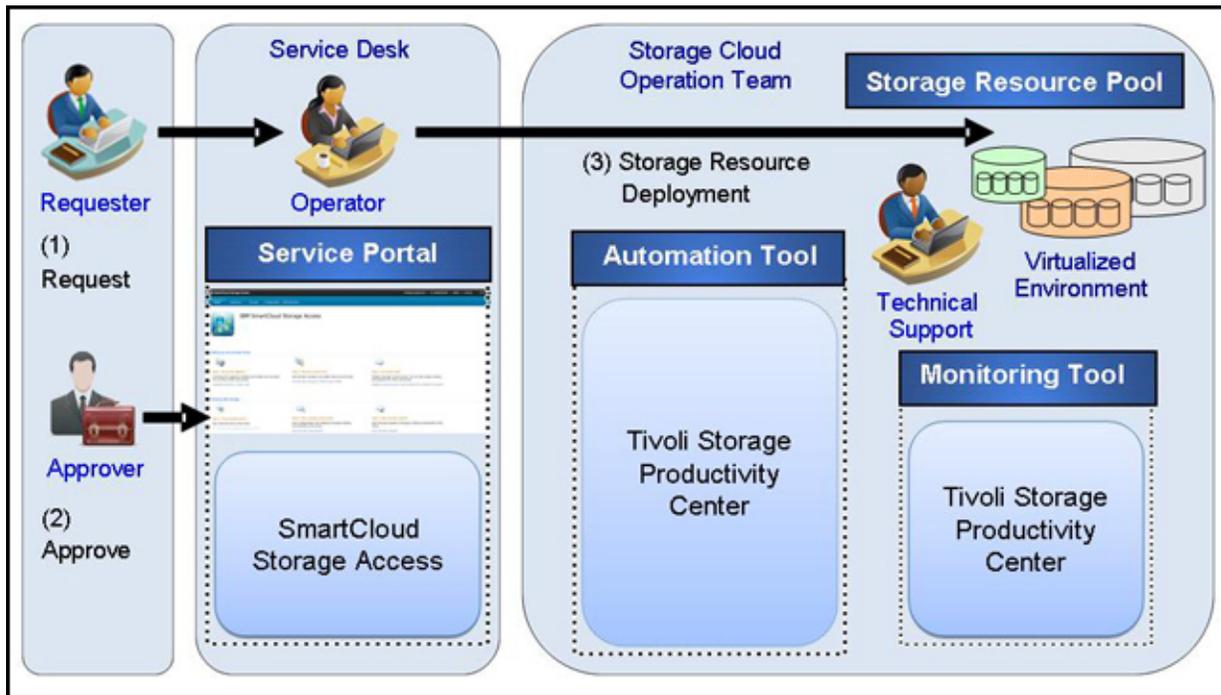


Figure 2. High level view of the SCSA solution

## Linear Tape File System Enterprise Edition Overview

LTFS EE for the IBM System Storage® TS3500 Tape Library provides seamless integration of LTFS with IBM General Parallel File System (GPFS) by creating an LTFS tape tier. You can run any application designed for disk files on tape using LTFS EE. LTFS EE can play a major role in reducing the cost of storage for data that does not need the access performance of primary disk. With LTFS EE you can enable the use of LTFS for the policy management of tape as a storage tier in a GPFS environment and use tape as a critical tier in the storage environment. LTFS EE supports IBM Linear Tape-Open (LTO) Ultrium 6 and 5 tape drives, and IBM System Storage TS1140 Tape Drives installed in TS3500 Tape Libraries. Using LTFS EE to replace disks with tape in Tier 2 and Tier 3 storage can improve data access over other storage solutions as it improves efficiency and streamlines management for files on tape. As shown in Figure 3 LTFS EE simplifies the use of tape by making it transparent to the user and manageable by the administrator under a single infrastructure.

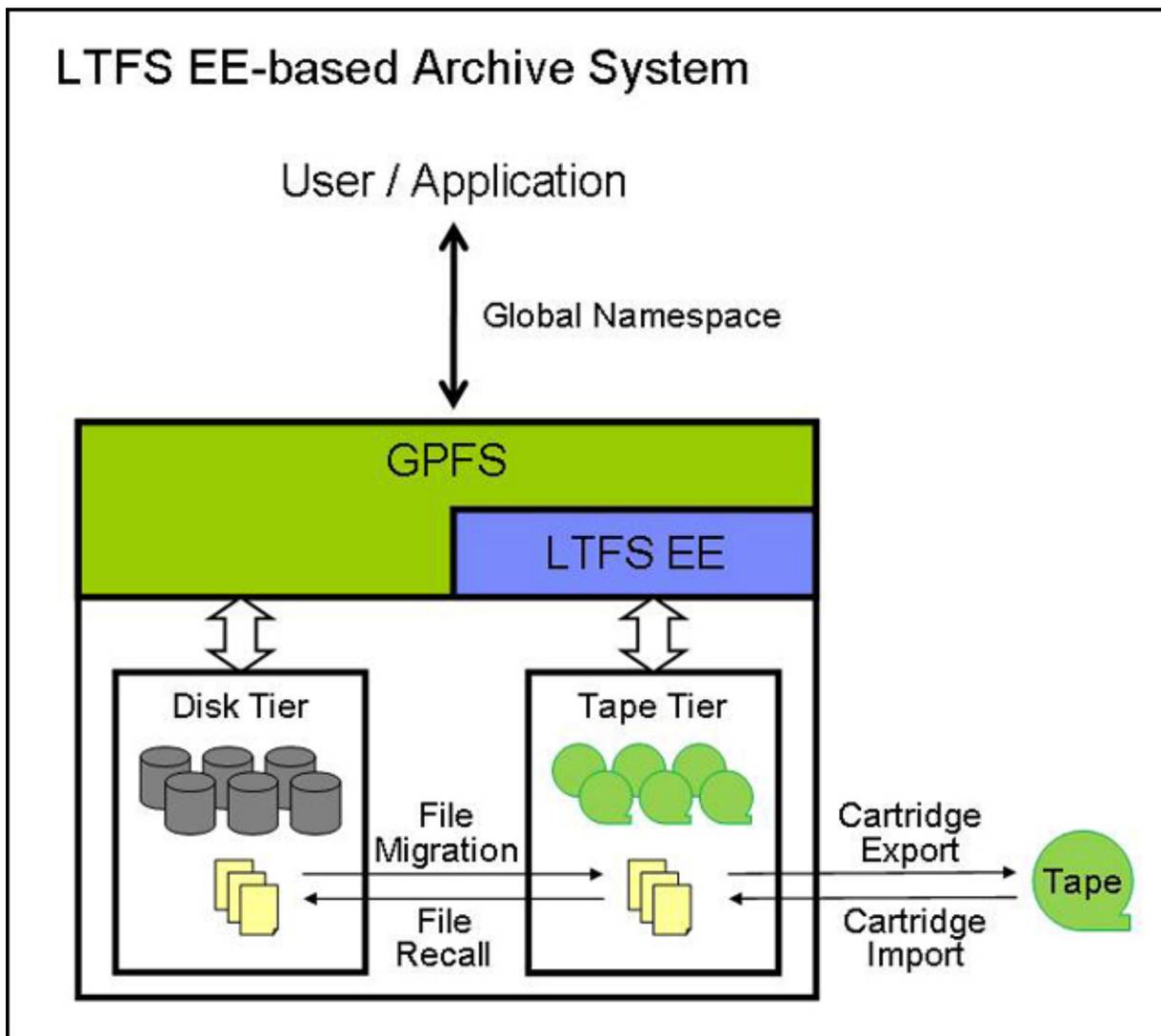


Figure 3. High level architecture of LTFS EE showing tape tier integrated into GPFS

## SCSA and LTFS EE integration with STG lab services customized adapter

The software architecture of SCSA defines some common cloud operations and provides the mechanism to accept new types of storage. SCSA supports file storage devices such as IBM Scale Out Network Attached Storage (SONAS) and IBM Storwize V7000 Unified (V7000U). By embedding a customized adapter in SCSA it is able to support other storage environments such as GPFS. STG Lab Services provides professional support to clients to build a highly scalable, cost effective private storage cloud by combining SCSA and LTFS EE. The GPFS adapter for SCSA, developed by STG Lab Services, enables SCSA's integration with LTFS EE. LTFS EE is based on GPFS to provide hierarchical storage management, so the adapter lets SCSA and LTFS EE work together, with SCSA focusing on storage provision and LTFS EE focusing on data migration to tapes for long term retention. Figure 4 shows the overall architecture of SCSA and LTFS EE with the STG customized adapter.

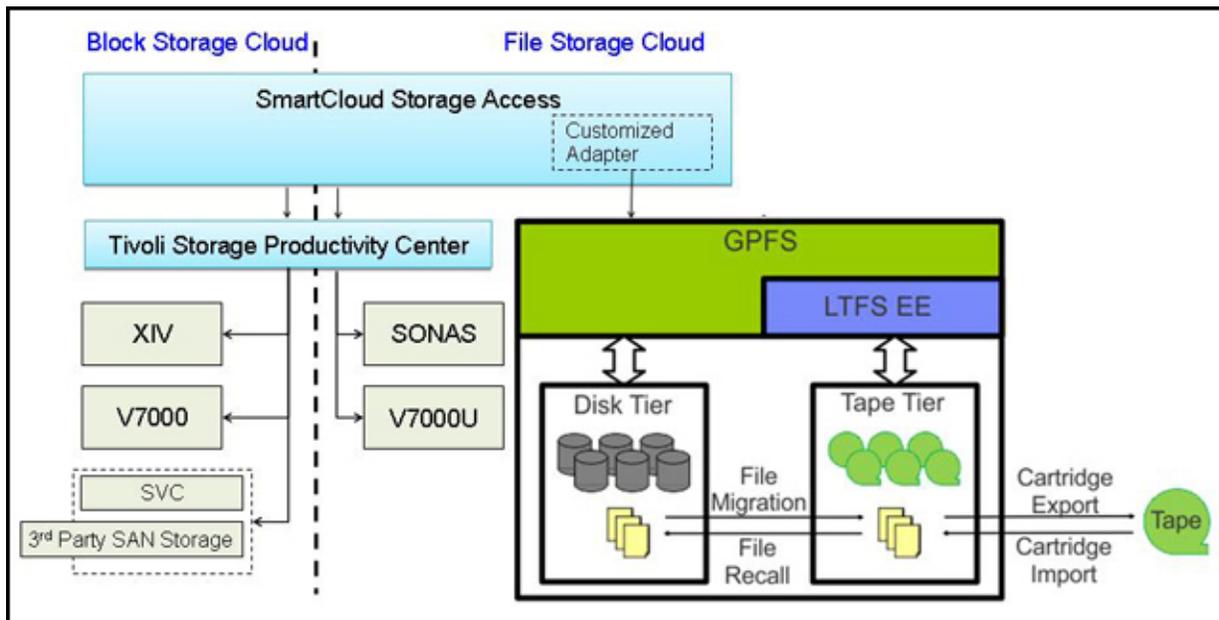


Figure 4. SCSA and LTFS EE architecture with the STG customized adapter

The solution of SCSA with LTFS EE adds the tape value propositions to the storage cloud solution. Enterprises can achieve end to end automation that can contribute to significant effort reduction in resource provisioning, management, and tracking utilization. By adding the LTFS EE tape tier to the SCSA managed storage cloud ease of use improves and the total cost of ownership goes down. Table 1 describes the benefits of the four typical use cases within the storage cloud tape tier: archiving, backup, tiered storage, and data exchange.

Use Case	Requirements	Benefits
Archiving	<ul style="list-style-type: none"> <li>● Large amount of data, larger files</li> <li>● Infrequently accessed</li> <li>● Longer retention periods</li> <li>● Easy data access</li> </ul>	<ul style="list-style-type: none"> <li>● Simplicity with file system interface</li> <li>● Scalable</li> <li>● Low Total Cost of Ownership (TCO)</li> </ul>
Backup	<ul style="list-style-type: none"> <li>● Backup to file systems</li> <li>● Simple backup solution</li> <li>● Easy data access for restore</li> </ul>	<ul style="list-style-type: none"> <li>● Easy to use with standard copy tools</li> <li>● Scalable</li> <li>● Low TCO</li> </ul>
Tiered and Scalable Storage	<ul style="list-style-type: none"> <li>● Tiered storage</li> <li>● Automated placement and migration</li> <li>● Easy data access</li> </ul>	<ul style="list-style-type: none"> <li>● Easy to use via file system interface</li> <li>● Powerful GPFS policies</li> <li>● Scalable</li> <li>● Low TCO</li> </ul>
Data Exchange	<ul style="list-style-type: none"> <li>● Export entire directories to tape</li> <li>● Import files and directories with seamless data access</li> <li>● Leverage global namespace</li> </ul>	<ul style="list-style-type: none"> <li>● Export of tape cartridge copies</li> <li>● Efficient import without reading data</li> <li>● Import and export within global namespace</li> </ul>

Table 1. Use case benefits of adding LTFS EE to SCSA

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To discuss the savings of using LTFS EE with SCSA contact Systems and Technology Group Lab Services at:

<http://www-03.ibm.com/systems/services/labservices/contact.html>

## Additional reference materials:

- **IBM Systems Lab Services and Training**  
<http://www.ibm.com/systems/services/labservices/contact.html>
- **Implementing the IBM General Parallel File System (GPFS) in a Cross-Platform Environment, Sg24-7844**  
<http://www.redbooks.ibm.com/abstracts/sg247844.html>
- **IBM Linear Tape File System Enterprise Edition V 1.1 Installation and Configuration Guide, SG24-8143**  
<http://www.redbooks.ibm.com/abstracts/sg248143.html>
- **IBM SmartCloud Storage Access V 1.2 Implementation Guide, SG24-8120**  
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