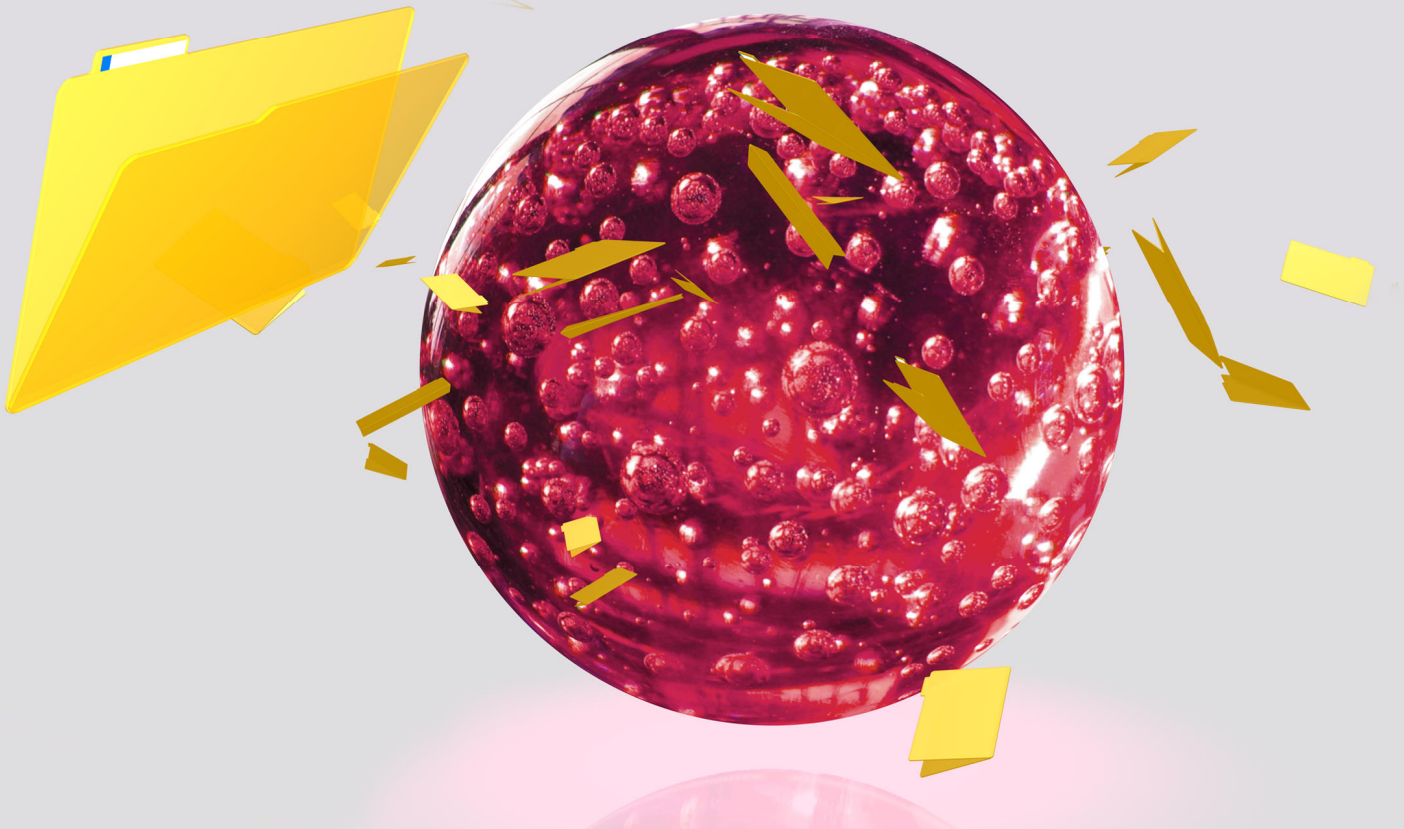


PAM for FILES file server archiving at its best

Whitepaper
NetApp Integration



CONTENT

The ONTAP operating system offers an interface for intercepting file access on the NetApp filer. The policy interface allows implementing sophisticated file blocking functionality on a Netapp filer from the convenience of your 3rd party application running on a Windows platform.

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Introduction

PAM for FILES is a software product for archiving files from Windows operating system operation on local harddisk or mapped drives which seems to be local to the operating system. NetApp offers a HW solution for storing files, which is not dependent on any MS Windows operating system; it is a stand-alone solution running the ONTAP operating system.

Solution

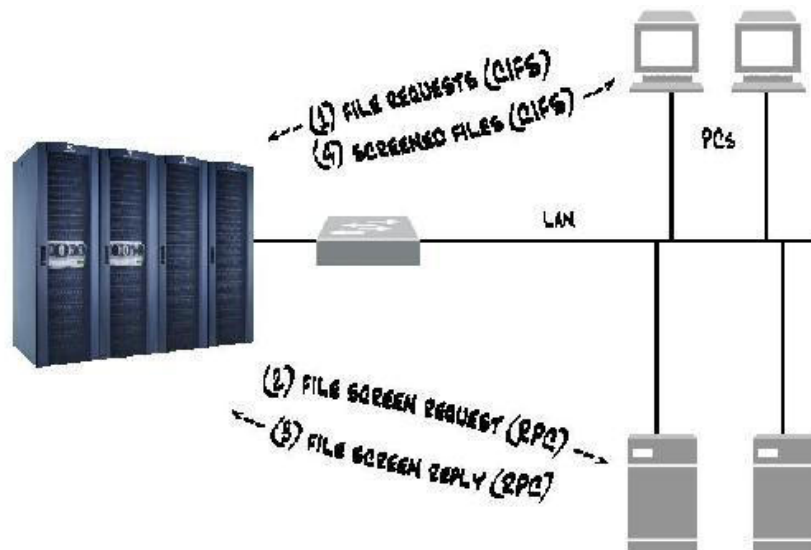
Corporate information is captured, managed and maintained from one location ensuring a secure foundation for file storage and distribution. The major benefit for centralizing the information is the opportunity to duplicate the archive and create a mirrored store for backup and disaster recovery situations. Off site secondary locations are becoming more popular as technology advancements bring added risk management difficulties. Also, consumer technologies such as USB flash memory, IM, mobile devices amongst others have become prominent in the workplace, adding to the threat of losing sensitive corporate data. By implementing a centralized archiving solution, there is no risk of losing or manipulating the data if employees remove it from company premises.

NetApp provided functionality

The ONTAP operating system offers an interface for intercepting file access on the NetApp filer. The Fpolicy interface allows implementing sophisticated file blocking functionality on a Netapp filer from the convenience of your 3rd party application running on a Windows platform. It has the following possibilities:

- Register one or more fpolicy servers with one or more filers
- Receive notifications of opens, creates and renames of files
- Tell the filer to block access to any file it's sent a notification for

The following picture depicts the fpolicy's base idea:



Clients make requests via CIFS (the Common Internet File System, Microsoft's file sharing protocol) to a Netapp filer. The filer sends details via RPC about the request--which include the file extension, desired access type, canonical and display names for the file, and proposed new names for a rename operation--to one of a set of fpolicy servers that have registered themselves with the filer. The server decides, based on the information on the request and possibly the file contents, whether to allow access to the file or replace the shortcut, and sends a reply RPC to the filer, which then either satisfies the original request from the client normally, or signals that access has been denied.

PAM for FILES solution

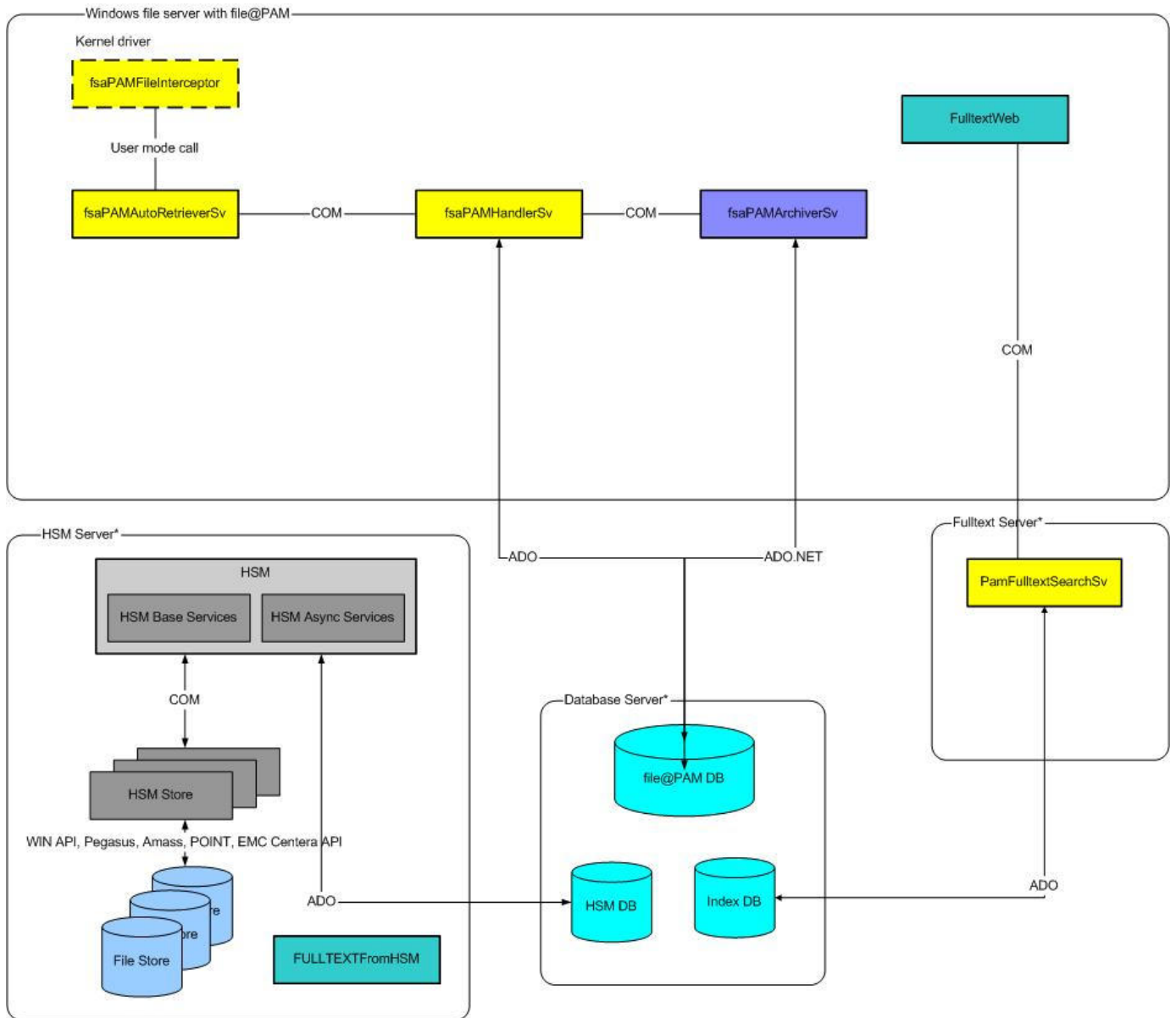
PAM for FILES's AutoRetrieveSv is file system kernel driver running on MS Windows, which intercepts all file access calls and replaces all the shortcuts by its origins if needed. This service will be enhanced to act as NetApp's policy server.

It will work as follows:

- ❑ AutoRetrieverSv registers itself as fpolicy server of NetApp filer.
- ❑ Any file access on NetApp is intercepted and forwarded to the AutoRetrieverSv service.
- ❑ The AutoretrieverSv analyzes the file, in case of being a shortcuts it retrieves the origin from HSM and replaces it on the NetApp.
- ❑ It triggers to the NetApp server, that the operation ended with success and the client application gains access to the file.

PAM for FILES system architecture

- ❑ Handler service (fsaPAMHandlerSv) – archives, retrieves, restores and recovers the archived files.
- ❑ Archiver service (fsaPAMArchiverSv)– archives, indexes the files regarding to schedule rules and its conditions (e.g. archiving every day at 10 o'clock every XLS file greater than 100kB to the near-line storage).
- ❑ Autoretriever service (fsaPAMAutoRetrieverSv) – it retrieves an archived files if a user opens a stub, attaches and detaches the Windows kernel driver.
- ❑ Fulltext web, PamFulltextSearchSv – enables to search in the archived file database.



Supported NetApp Filers

PAM for FILES will support the following ONTAP versions: 6.4, 6.5 and 7.0, whereby the only difference will be in the granularity of operations, the later, the better granularity and performance is achieved.

List of supported file access flags on various ONTAP versions:

```
// DOT 6.4:

#define FS_OP_OPEN           0x0001    // file opens
#define FS_OP_CREATE        0x0002    // file creates
#define FS_OP_RENAME        0x0004    // file renames

// DOT 6.5:

#define FS_OP_CLOSE         0x0008    // file closes (CIFS only)
#define FS_OP_DELETE        0x0010    // file deletes
#define FS_OP_DELETE_DIR    0x0020    // directory deletes
#define FS_OP_RENAME_DIR    0x0040    // directory renames (CIFS only)
#define FS_OP_CREATE_DIR    0x0080    // directory creates

// DOT 7.0:

#define FS_OP_GETATTR       0x0100
#define FS_OP_SETATTR       0x0200
#define FS_OP_LINK          0x0400    // NFS only
#define FS_OP_SYMLINK       0x0800    // NFS only
#define FS_OP_LOOKUP        0x1000    // NFS only
#define FS_OP_READ          0x2000
#define FS_OP_WRITE         0x4000
```