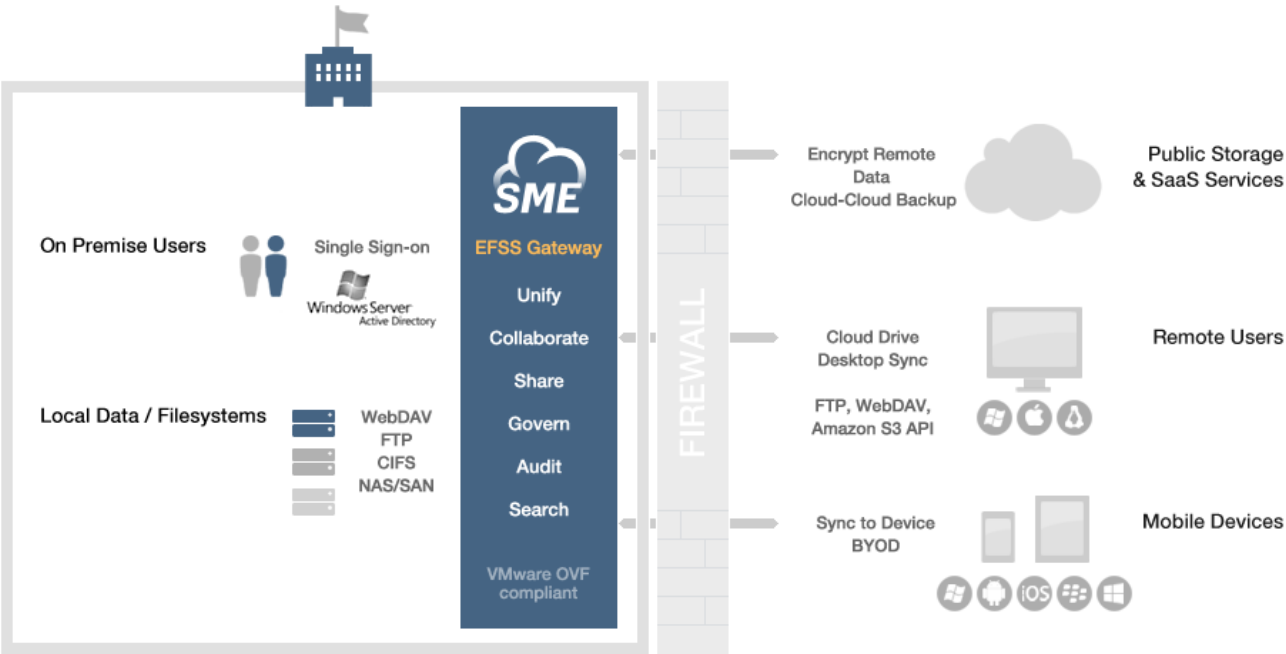




# Enterprise File Share and Sync (EFSS) Architecture

The Storage Made Easy solution is storage agnostic and can be used as a multi-tenant Enterprise File Share and sync solution with one or more public or private storage clouds.

The solution allows IT to regain control of "cloud data sprawl" by unifying private / public company data and privately used employee cloud data solutions into a single converged infrastructure. This can easily be managed and be used to set and enforce governance and audit controls for file access and sharing in addition to providing deep content search of indexed data.



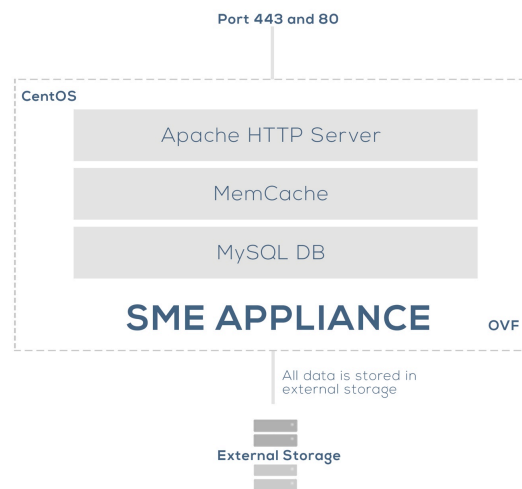
This approach provided a solution to the "shadow IT" conundrum and makes it possible for companies to find a balance between the protection of corporate data and employee data by allowing businesses to monitor, secure and audit all data silos, be they private or cloud or company or employee, from a single access point.



## Software Stack

The Storage Made Easy Enterprise File Share and Sync Solution is built using open Internet technologies. The base operating system used is hardened Linux CentOS. HTTPD Apache Server is used for serving http requests and Memcached is used for temporary data caching. File Metadata is stored using a MySQL database.

The web interface is written using PHP / HTML / Ajax, and Cloud protocol adapters are written using Perl.



A standard firewall friendly protocol HTTPS is used for communicating with the clients.

The basic premises of the SME solution is to act as a cloud gateway and audit, control and encryption point. Files and data are stored in the remote Private or Public Cloud Storage Provider. The SME solution only retains file metadata i.e. file name, size (if available), and any security permissions.

The Apache Server is stateless and can run on a separate host from the MySQL DB Server. This allows flexibility in deployment topologies for scalability and high availability using proven deployment configurations supported by Apache Web Servers (e.g. multiple web servers behind a load balancer) and MySQL DB (replication, data sharding). Please refer to our High Availability White Paper for further information.

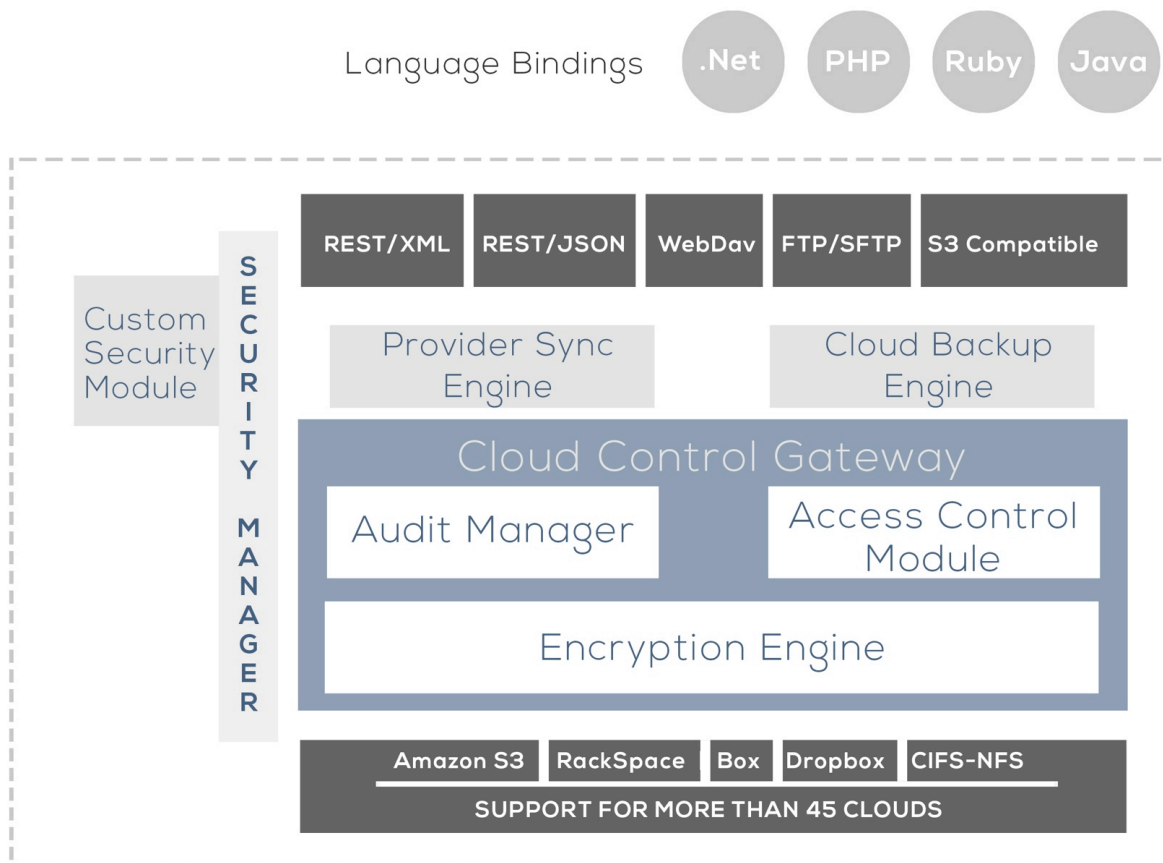


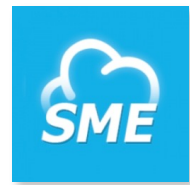
## Components

SME is built as an open modular platform. All functionality is available via the SME REST API and major components have hook points to integrate external system e.g, authentication , a new storage provider, payment gateway etc.

Details of the SME REST API, and a test harness, can be found at:

[https://storagemadeeasy.com/for\\_developers/](https://storagemadeeasy.com/for_developers/)





## Protocol Adaptors

At the top of the SME Architecture diagram are protocol adaptors. They enable access to the data of any mapped storage provider using any of the protocol adaptors shown.

Out of the box SME supports the following protocols:

- REST/XML and REST/JSON: SME proprietary API. This is used by all the SME client tools, is fully documented and can be used to develop custom applications.
- WebDav/HTTPS: Standard WebDav is a protocol that is especially useful for iOS apps (Pages, Keynote, Numbers) which support WebDav

## Provider Sync Engine

The provider Sync Engine is used to discover new data added to the Storage Provider outside of the SME solution. The Sync engine can run in realtime, scheduled and manual modes.

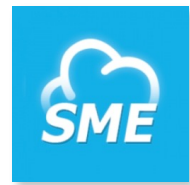
- Real-time: New data is checked every time a storage provider is accessed. For optimum performance only a relevant subset of data is checked for new data.
- Scheduled: The Storage provider is accessed at schedule intervals.
- Manual: A user or Administrator initiates a sync.

## Multi-Site Backup Engine

This is used to backup files updated via the SME platform to another storage provider for business continuity purposes.

## Access Control Module

The ACL module is responsible for applying permissions. Every operation is verified by the access control module to ascertain that the user has permission to perform the operation. If a third party identity management system is in force then this will be a delegated operation.



## Audit Manager

The Audit module is used by all components to generate audit records for all file interactions. The granularity of this can be controlled at a per user per company level.

## Encryption Engine

The Encryption engine is used to encrypt data before sending to a remote storage provider. It uses 256 bit encryption to encrypt data at rest. Further details on how this works and security can be referenced in the SME Security white paper.

## Security Manager

The Security Manager Is used to authenticate users. The 'out-of-the-box' platform defaults to SME authentication and Microsoft Active Directory / LDAP or OAuth 2.0 can be additionally configured. Custom security managers can also be developed if required.

## Payment Gateway (not referenced in diagram)

The Payment Gateway enables Integration with external billing systems and is provided with default support for Paypal. Custom payment gateways can also be integrated.

## Storage Connectors

SME supports more that 45 private storage providers and public cloud storage providers including Amazon S3, OpenStack, CleverSafe, Cloudian, Microsoft Azure, Google Storage, WebDav, FTP etc. Additional providers can be easily developed using a storage providers native API.

## Protocol Adaptors

The protocol adaptors are the front end adaptors that are additional to the SME API. They enable access over either a compatible S3 API, FTP/S, or Secure WebDav.



## Client Applications

The Storage Made Easy provides a comprehensive range of Applications for the Enterprise File Share and Sync Solution, all of which can be branded.

### Desktop Apps (Windows, Mac Linux)

The solution provides not only desktop sync but also a true Cloud Drive for an integrated on-demand desktop experience. In addition to this client App integrations for Outlook and Mac Mail are included in the desktop client solution and all are fully brandable.

### Mobile Apps (iOS,Android, Windows Phone, BlackBerry)

Brandable mobile Apps are provided for all of the major mobile platforms and a feature of these Apps is sync to device.

### Browser Plugin's (Chrome, Safari, Firefox)

Browser Plugin's exist for the major browser platforms and enhance the browser experience. In the Chrome browser a Gmail Chrome extensions is provided for secure short links support.

## Enterprise Application Integration

Best of breed Enterprise integrations are available for SaaS solutions such as Salesforce, BaseCamp, Office 365, SharePoint, Jive, and Huddle. Support is also provided for IMAP email backup.

## WordPress Support

WordPress Plugin Support is also provided and two Plugin's are available. One for sharing files via WordPress, and the other for easily backing up a whole WordPress site.



# Enterprise File Share and Sync (EFSS) Architecture

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