

**ASAM ODS, Peak ODS Server and openMDM®
as a company-wide information hub
for test and simulation data**

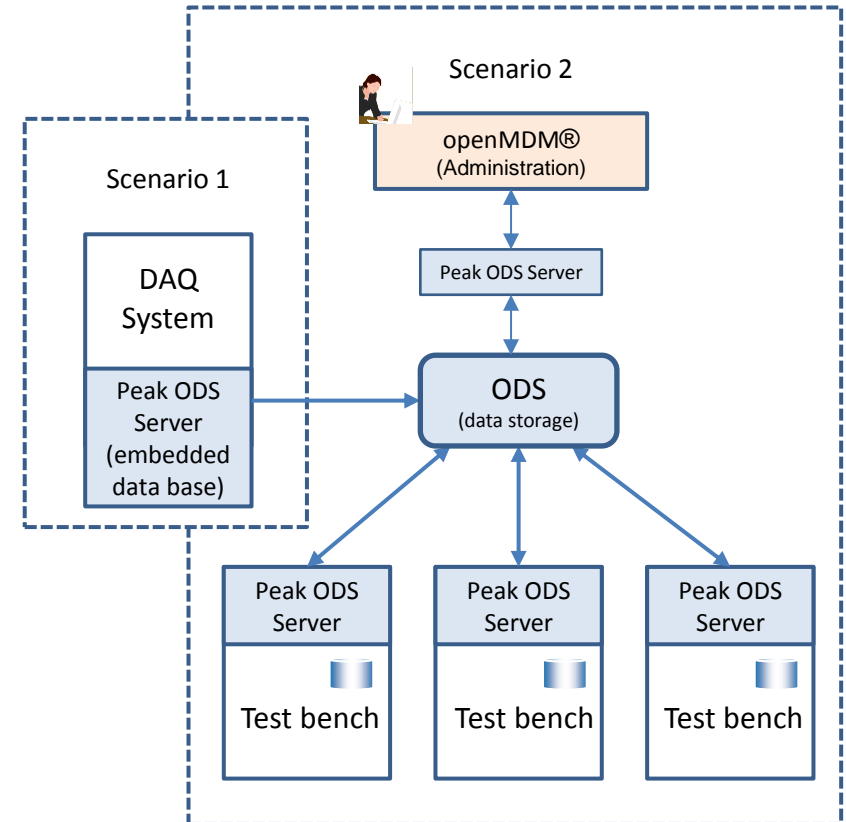


Overview

- ASAM ODS provides for over a decade a standard, that has proven itself as a reliable basis for the management of test and simulation data
- openMDM® is an modular software framework that can be used to implement ODS-based applications economical by configuration and administration
- In conjunction with Peak ODS Server herewith a wide range of application scenarios can be implemented:
 - Embedded solution
 - Single-user solution
 - Department solution
 - Collaboration solution
 - Distributed solution
 - Big data solution
- This is the basis for building up an enterprise-wide information hub for test and simulation data

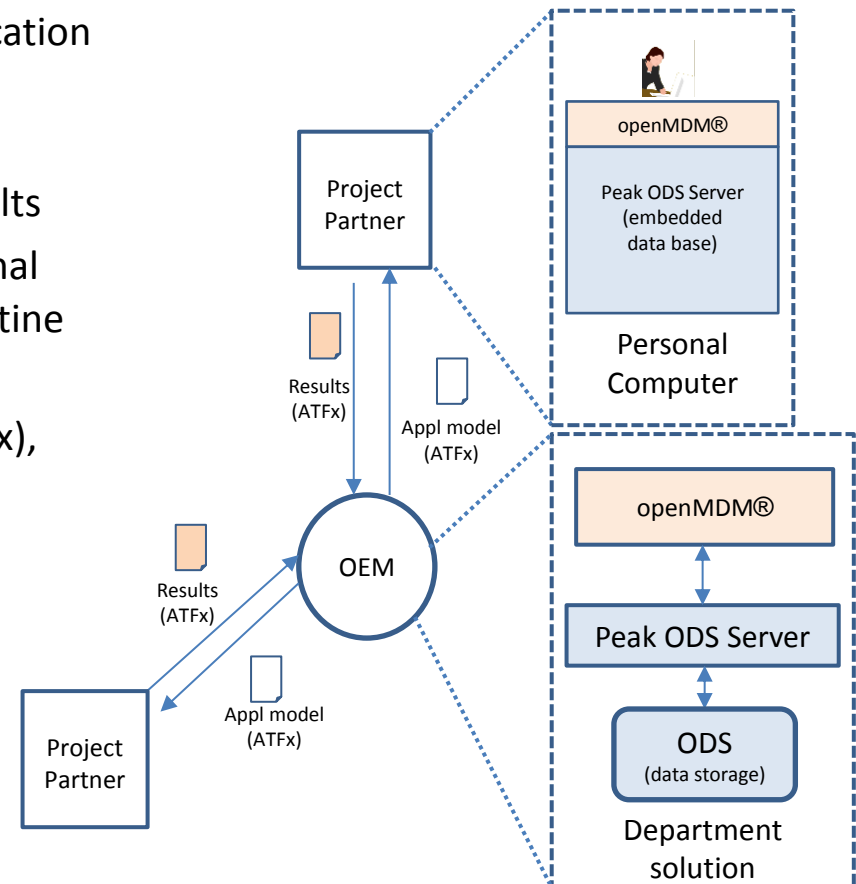
Embedded solution

- ASAM ODS is an integrated part of an automation or measurement system
- ODS server runs directly on the hardware of the measurement system
- This requires a very slim and resource efficient ODS server
- Example (Scenario 1): Embedding of Peak ODS Server in Materials Testing Machines of a German vendor (max. memory 400 MB)
- openMDM® is for dialog-based definition and maintenance of the ODS application model (Administration)



Single-user solution

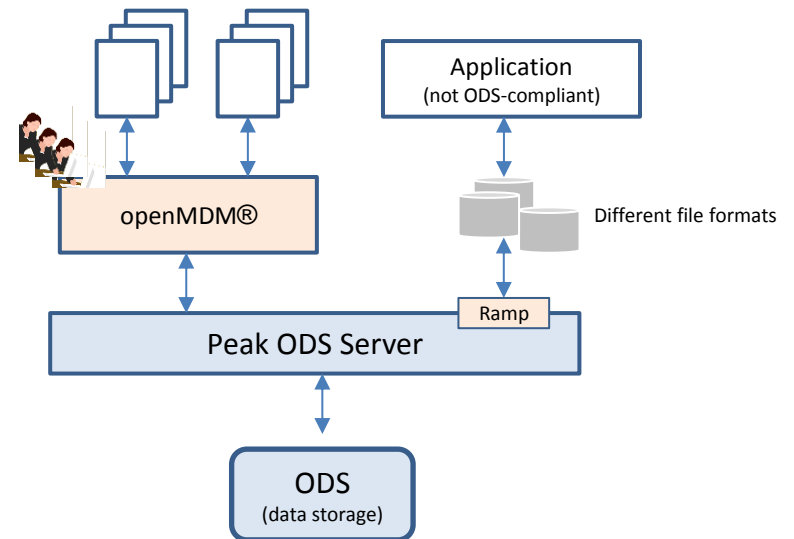
- Exchange of test data and predefined application models in development collaborations
- ASAM ATFx file format for synchronising application models and delivery of test results
- Application can be deployed on local personal computers via an automatic installation routine
- Example: Application with defined user components of openMDM® (out-of-the-box), Peak ODS Server and open source database Derby for a cooperative network of several OEMs and suppliers
- Fast and cost-effective delivery of slim ODS-based solutions for a large number of distributed users



Department solution

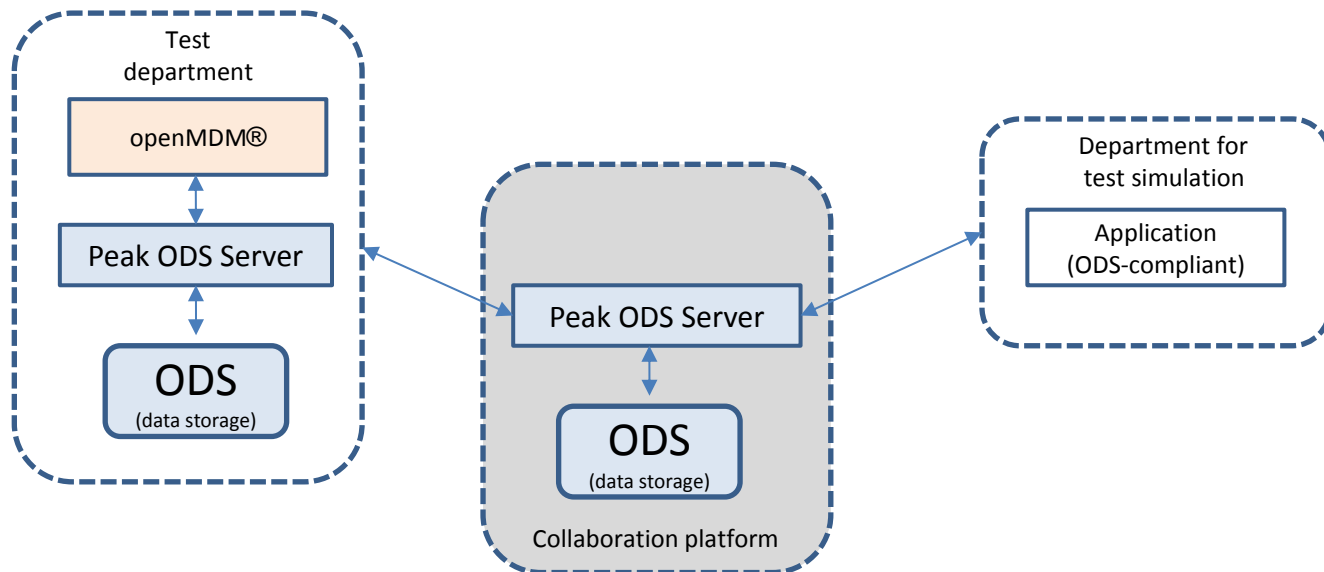
- Multiple users of one department (e.g. Engine, NVH) use one common application with a department-specific tailored business model
- Different test benches and analysis systems are connected to the application
- Example: Connecting different versions of AVL PUMA/Santorin systems via Peak ODS Server and Peak ODS Importer
- Loading ramps for the integration of not ODS-compliant applications

Test benches and analysis systems



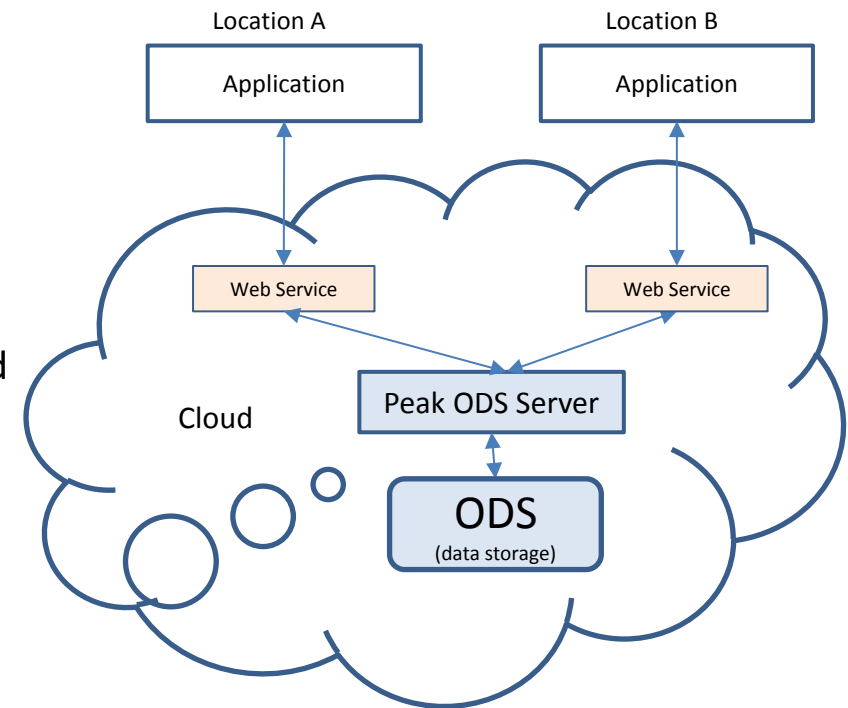
Collaboration solution

- Multiple departments with their own department specific solutions use an ODS-based collaboration platform with a commonly agreed application model
- Example: Corporate management of experimental and simulation results in the area of vehicle safety



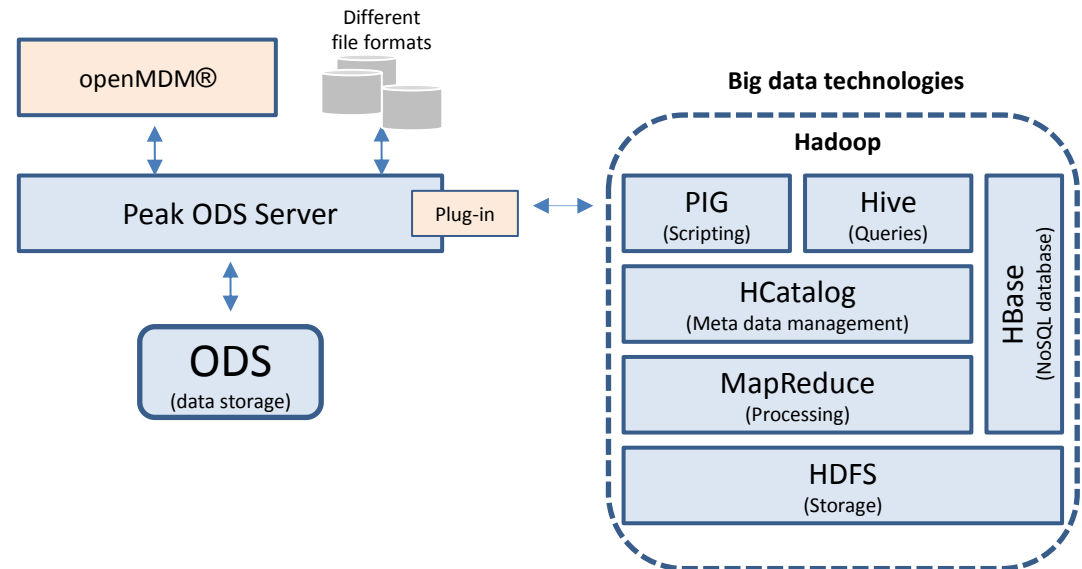
Distributed solution

- One or more applications use ASAM ODS over the cloud
- Connection is made using Web Services
- Connecting Peak ODS Server via Web Services
- ASAM ODS Web Services were released in October 2014 as an ASAM companion standard



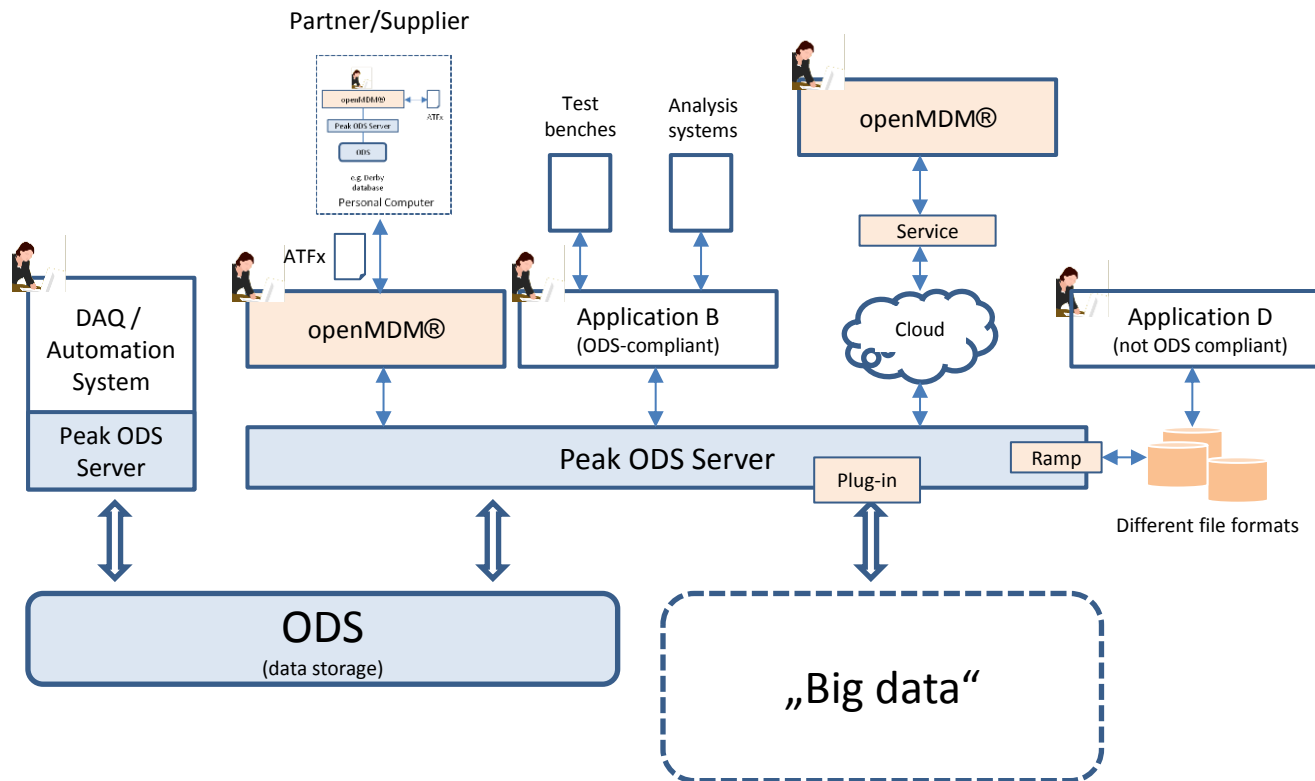
Big data solution

- Use of big data technologies for the low cost management of large test data stocks
- Example: Connecting Hadoop technologies as a building block for the Peak ODS Server
- Use cases:
 - Batch processing: Transmission and storage of large amounts of data from different ODS-database applications via exports
 - Online processing: Direct storage and reading data in Hadoop by the ODS application (e.g. openMDM®)
- Challenge: Management of meta data (e.g. mapping of ODS data models based on NoSQL or In-Memory databases)



Conclusion

ASAM ODS, Peak ODS Server and openMDM®: A versatile, economical and future-proof basis for building up an enterprise-wide information hub for test and simulation data



Peak ODS Server

Features

- Professional, modern application design based on Java
- Components: ODS Server, Corba File Server, Corba Nameservice, ODS Client
- Standard: ASAM ODS 5.3
- Databases: Oracle, MS SQL Server, MySQL, Apache Derby
(others possible, but not tested yet)
- Storage modes for mass data:
Blob data in database, External component files, Single point storage
- Operating Systems: Windows, Linux, Unix
- Economical license model

Peak ODS Server: A real and comprehensive ODS server