



Architecture and Environment

- Architecture: J2EE based using open standards, such as Java Server Faces (JSF) for Web user interface (UI) development, Java Content Repository (JCR) for data management and SOAP for Web services
- Operating system: Windows®, Linux®
- Application server: JBoss®
- Database: MySQL™, DB2®, Oracle®
- Authentication mechanism: Windows Domain, LDAP, ANSYS EKM software
- Browser: Internet Explorer® version 6 and above, Firefox® version 3 and above

Performance and Scalability

- Can be deployed on a single server or a cluster; cluster environment allows easy scalability by adding more nodes for additional user requests and provides failover support
- Designed from ground up for supporting very large simulation files in a distributed environment (i.e., on local or global file servers)
- Only metadata is stored in the database (no file content)
- Only a single copy of file content is stored on disk, even if it is used or copied in multiple locations or has multiple versions with changes to metadata only
- Efficient file caching reduces time and bandwidth required for file transfers across a WAN

General Data Management

- Data is stored within the system as a tree of objects; objects include files, folders, saved queries, users, groups, applications, etc.
- Each object can have a set of properties (metadata) associated with it; metadata from known file types are extracted automatically during file upload
- New metadata tags and dependencies can be added dynamically
- References or shortcuts to other objects can be created; referential integrity can be enforced automatically
- Upstream and downstream object dependencies can be visualized using a graph
- Basic data management operations such as create, read, update, delete, copy, move, rename, lock, unlock, extract, automatic deletion and alert notification are provided
- Files can be uploaded or downloaded using HTTP, SOAP or FTP
- Files can remain in original location (e.g., local file server or shared file system) and a soft link maintained, eliminating the need for file transfers
- Lifecycle management allows tracking of lifecycle stages of an

object. Permissions and retention policy can be set based on lifecycle stages; signoff process can be defined for electronic reviews

Analysis Data Management

- Any file type and any folder structure can be managed without requiring configuration
- Out-of-box support for metadata extraction and report extraction is provided for simulation files: ANSYS® FLUENT®, ANSYS® Mechanical™ APDL, ANSYS® Workbench™, ANSYS® CFX®, ANSYS® POLYFLOW® and HFSS™; metadata is automatically extracted on file upload
- Metadata and report extraction for Nastran and ABAQUS® file types are available as a separately-licensed feature
- Metadata and reports from other file types can be extracted through configuration
- ANSYS Workbench projects can be managed in the ANSYS EKM application and new design points executed for what-if studies
- Inputs and outputs for an analysis can be tracked and visually displayed in a graph; analysis can be identified as out-of-date if an input file is modified or made obsolete by a new version; downstream analyses or files that will be impacted by a change to the current analysis can also be viewed
- Upstream and downstream analyses for a file can be tracked and visually displayed in a graph; files can be easily identified as obsolete if the upstream analysis is out-of-date; downstream analyses or files that will be impacted by a change to the current file can also be viewed
- Analyses can be executed manually or automatically; automatic execution is performed asynchronously and can be monitored and cancelled from within ANSYS EKM software; email notification is sent on job completion; all information relating to the execution (application launched, inputs, transcript, etc.) is captured

Configuration Management

- Any object (including files and folders) can be placed under version control
- Objects under version control can be checked out to get exclusive control and checked in to store modifications and increment the version
- Revision history of an object can be displayed in a graphical or tabular form
- Multi-level branching is supported
- Multiple branches or versions can be easily compared to identify differences

Searching

- Keyword-based full text search is supported for object properties and common file formats such as TXT, DOC, PDF, PPT, XML, HTML, RTF, etc.; files are automatically indexed on upload
- Advanced search using object or child properties is supported; complex search criteria using “and/or” conditions and sub-expressions can be defined interactively
- Reports created in ANSYS EKM software can be searched based on report content
- Complex searches can be saved for later execution

Reporting

- Comparison reports can be created to compare multiple objects (including files and folders); numerical values can be compared using bar, column and line charts
- Simulation details reports can be created to extract detailed settings of simulation input files
- Simulation mining reports can be created to dynamically extract desired data (such as force, moment, flux, contours, plots, etc.) from simulation result files
- Report books can be created to collect data from multiple objects and present it in a single view
- Reports can be compared against each other
- Reports can be viewed or downloaded in HTML, PDF, XLS or XML formats
- Reports store references to files from which they were created, which can be viewed in a dependency graph
- Reports can be refreshed when any dependent file has changed

Process Management

- Workflows and custom applications can be defined to coordinate all aspects of a simulation process (manage users, data, CAE tools, computing resources, etc.)
- Workflows and custom applications can be dynamically published and executed within the system
- Support for completely automated, manual or hybrid processes is provided
- Support for single-user or multi-user processes is provided
- Common processes such as sequential task execution, what-if analysis, parametric analysis, electronic reviews, etc., can be modeled
- Complex processes involving decision nodes (if-else), concurrent execution (for-each), iterations (do-while), etc., can be modeled
- Powerful scripting languages (Python® and BeanShell) can be used for automation and representation of complex logic
- Integration with job submission systems (Windows® Compute Cluster, LSF®, SGE, etc.) allows asynchronous execution of time-intensive simulations
- Progress and status of a workflow or batch execution can be tracked with email notifications and graphical displays

Security and Access Control

- Login using username and password is required for accessing or modifying any data within system
- Authentication is managed by pluggable authentication modules like LDAP, Windows Domain Server, etc.
- Authorization is controlled using an access control list (ACL) associated with each object; ACL contains users and groups who have permission for executing a particular action (read, modify, create, delete, etc.) on an object
- Groups can be created for defining user roles and associated permissions; a user may belong to any number of groups
- Custom authorization may be performed (e.g., for enforcing export control requirements)

User Interface

- Web UI uses DHTML and AJAX to provide look, feel and interactivity of desktop applications; advanced UI components, such as trees, tables, tabs, hierarchical menus, modal dialogs, wizards, etc., are provided
- ANSYS EKM File Transfer Client provides a highly interactive Java Swing user interface for transfer of multiple files and folders
- All UI labels and error messages are localizable and customizable

Web Service

- ANSYS EKM software can be accessed as a web service from non-browser desktop clients using SOAP
- All basic data management features, such as create, read, update, delete, search, file upload/download, etc., are provided in the SOAP API

Configuration and Customization

- IT environment and system policies are specified through XML configuration files
- New data types and metadata can be defined and existing data types modified through simple XML files
- Lifecycles can be defined through XML files
- Workflows can be defined interactively through ANSYS EKM Studio or through XML files
- Custom applications can be defined through XHTML and scripts (BeanShell or Python)
- Scripting interface exposes a rich set of methods that can be used in a supported scripting language (BeanShell or Python); scripts can be used to create custom applications, or embedded within custom type, lifecycle and workflow XML files to define complex logic and automation tasks
- Detailed documentation for configuration and customization is provided