The background features a central globe with the ANSYS logo overlaid. The globe is surrounded by a complex network of glowing blue and orange energy trails, suggesting a global or interconnected system. The overall aesthetic is high-tech and futuristic.

APECS with ANSYS Engineering Knowledge Manager

**NETL 2009 Workshop on
Advanced Process
Engineering Co-Simulation
October 20-21, 2009**

What is EKM?

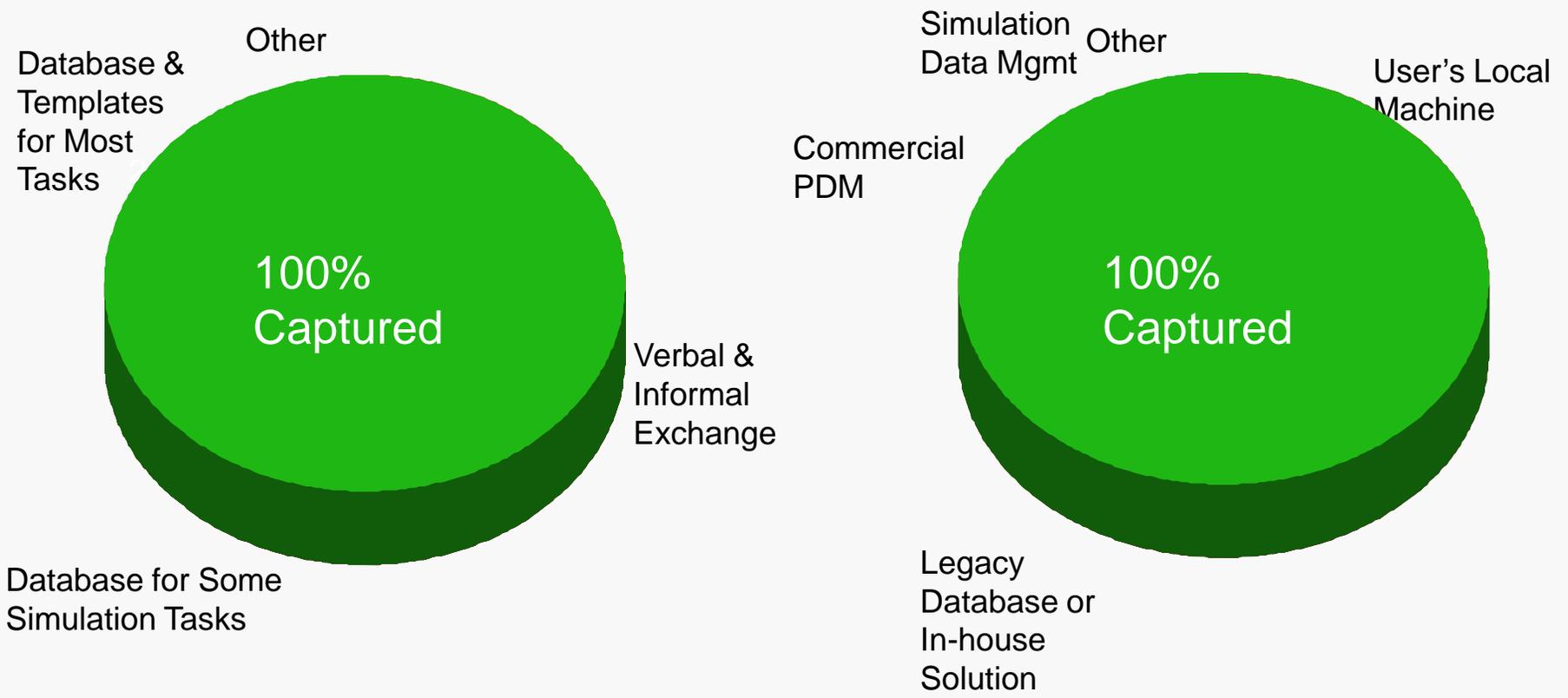


The ANSYS Simulation Process and Data Management (SPDM) Initiative

Industry Survey: Current Situation



Knowledge Capture Engineering Knowledge Management*

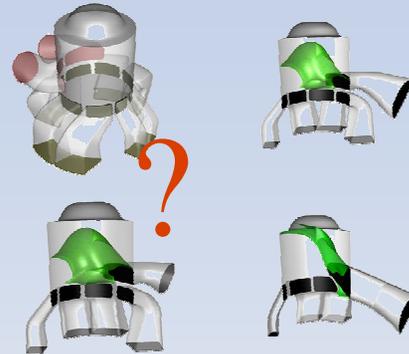


* Data: CPDA 2007 PLM Road Map Conference

Why Manage Simulation Data?



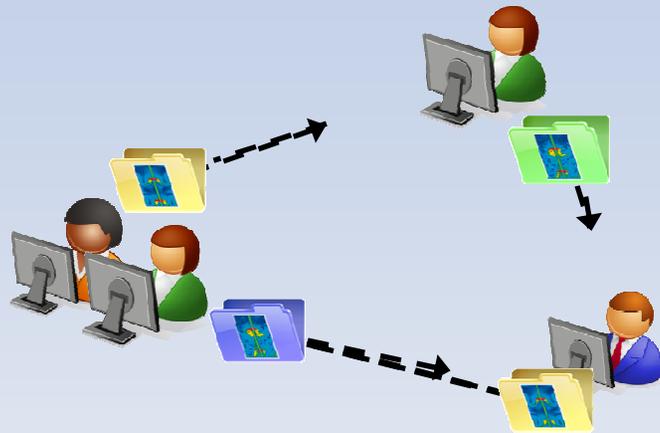
Scenario 1



Scenario 2

- **Managing simulation data reduces engineering costs**
 - Eliminate wasted time looking for data
 - Enable re-use
 - Don't do the same thing more than once
 - Modify existing models rather than building from scratch
 - Protects intellectual property
 - Stored, organized, searchable, controlled access

Why Manage Simulation Processes?



Scenario 1



Scenario 2

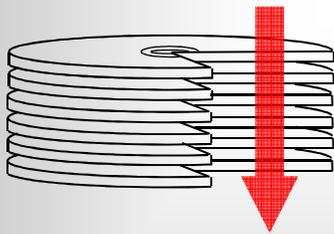
- **Managing simulation processes and workflows**
 - Enables effective knowledge transfer to new engineers
 - Enables management of methods and control of handoffs
 - Enables a collaborative environment for distributed workgroups
 - Create reusable templates to capture best practices and minimize reinventing methods

Engineering Knowledge Manager



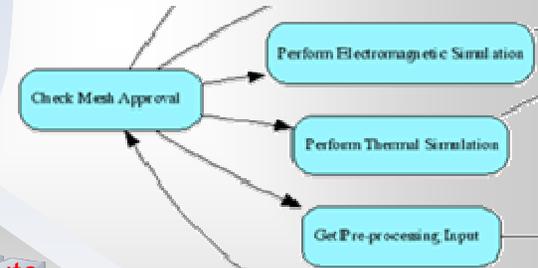
DATA MANAGEMENT

- File Repository
- Meta-Data Extraction
- Advanced Search
- Data Mining
- Report Generation

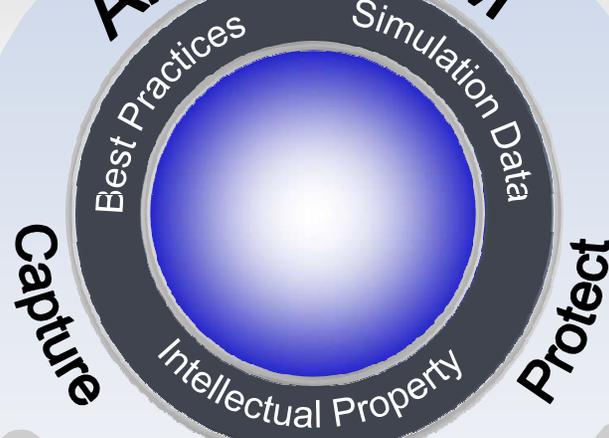


PROCESS MANAGEMENT

- Automate Processes
- Manage Workflows
- Design Systems
- E-mail Notification
- Track Progress



ANSYS EKM



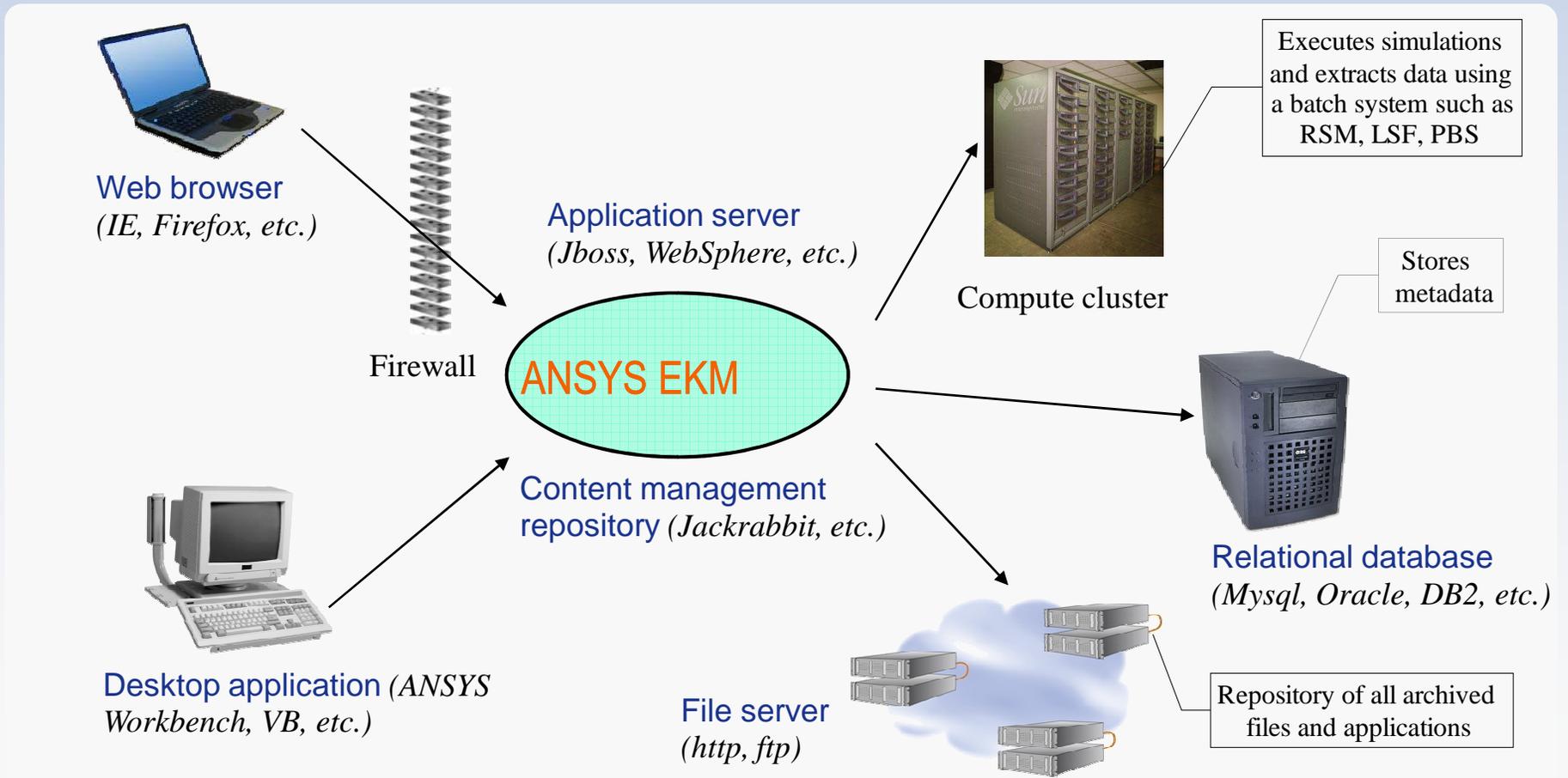
Enterprise Access
Web Enabled

Application Portal
Job Submission

ACCESS MANAGEMENT

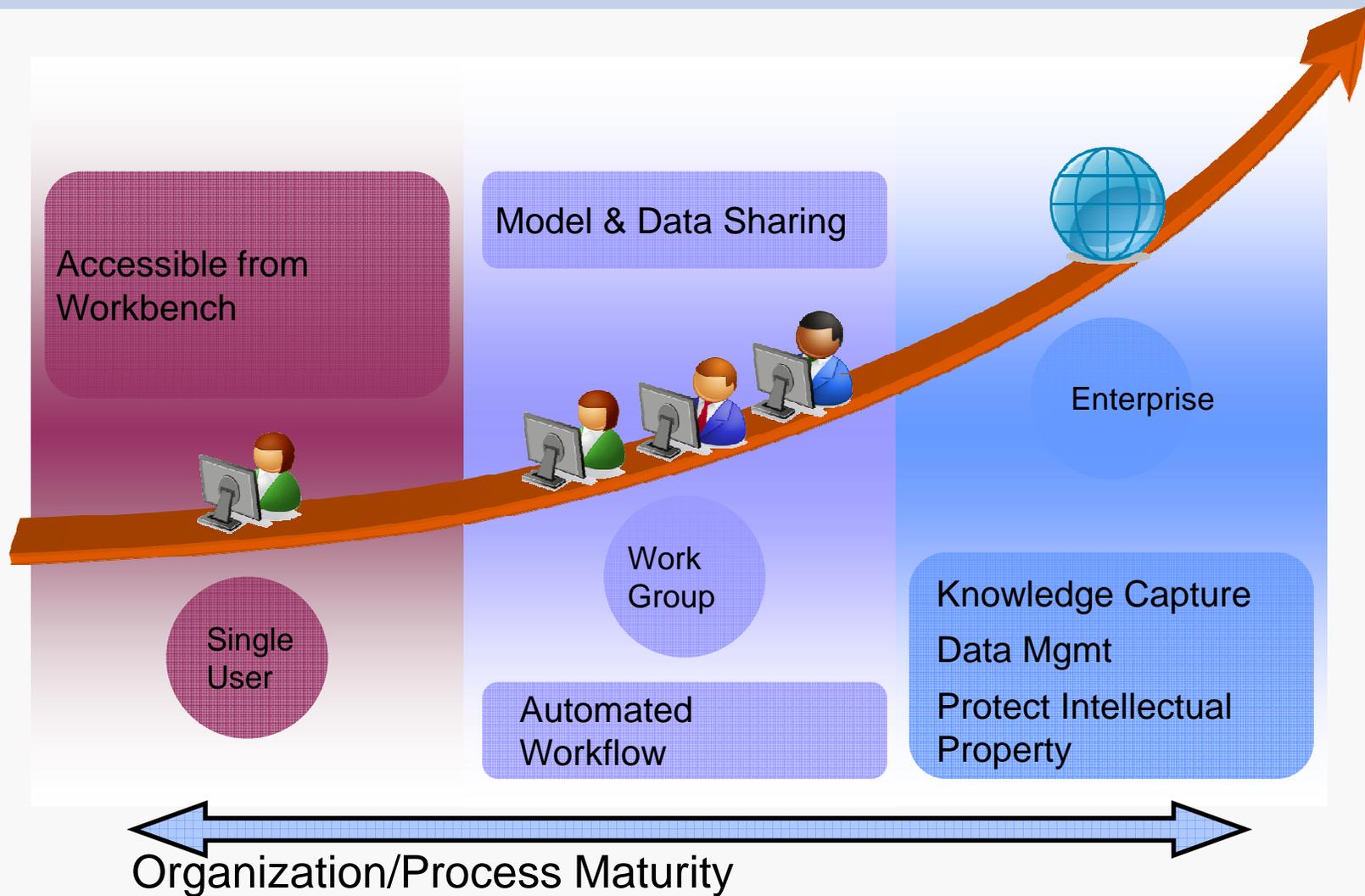
ANSYS EKM Differentiators

IT Scalability (Architecture/Technologies)



ANSYS EKM Differentiators

A User Scalable Solution



ANSYS EKM Differentiators

A CAE-focused Solution



- **Process automation**
 - Reduce simulation process complexity and enable repeated processes to be organized within a single resource
 - Capture and store best practices in a searchable managed system
- **Tight integration with ANSYS and other CAE products**
 - Automatic extraction of extensive metadata on upload
 - Straightforward configuration of non-ANSYS simulation files
- **Variation analysis to determine the differences between simulations**
 - Report comparisons
 - Detailed reports on simulation settings

ANSYS EKM Differentiators

A CAE-focused Solution



- **Data mining of simulation results**
 - Accessibility to results for non-expert users
 - Plug-ins for specialized data extraction/post-processing can be defined
- **Host simulation files in a central repository, distributed repositories or locally**
 - Transparent collaboration through shared folders
- **CAE-focused: *Individual analysts and engineers need pragmatic solutions that let them work more productively***

- **There is a growing need for a consistent and reliable management of simulation processes and data**
- **SPDM helps engineers to:**
 - Improve working relationships
 - Establish a collaborative environment
 - Reduce the time to find data
 - Document the work, know-how and best practices
 - Automate processes and reduce errors
 - Concentrate on physics and functionality
- **ANSYS EKM provides**
 - A scalable SPDM Solution with a strong CAE focus
 - Tight integration with ANSYS and other products

- **Repository for all APECS Models, Solvers, and Instances**
- **Provides organization for APECS Models (Categories, Types)**
- **Storage and organization of Model Attributes**
 - Species
 - Multiple APECS Solvers
 - Inlet / Outlet ports
 - PCA Reports
 - Etc.
- **Tightly integrated to numerous ANSYS products**
 - Will use EKM / DesignXplorer interface for future APECS capabilities

EKM within APECS (2)



Folders

- [-] IAB Meeting March 2009
- [-] KBC-demo
- [-] Mixers
- [-] Models-with-multiple-solvers
- [-] Multiphase
 - [-] Euler
 - [-] Euler-Euler
 - [-] Unsteady pipe model
 - [-] Unsteady pipe with unique port
 - [-] Parameters
 - [-] Ports
 - [-] Solvers
 - [-] Euler unsteady multiphase pipe with unique port
 - [-] FileSystem
 - [-] Grid
 - [-] Instances
 - [-] 000000001-1242145395
 - [-] 000000002-1242146558
 - [-] 000000003-1252000497
 - [-] Parameters
 - [-] Ports
 - [-] inlet
 - [-] outlet
 - [-] unique-inlet-port-for-vapor-phase
 - [-] unique-outlet-port-for-vapor-phase

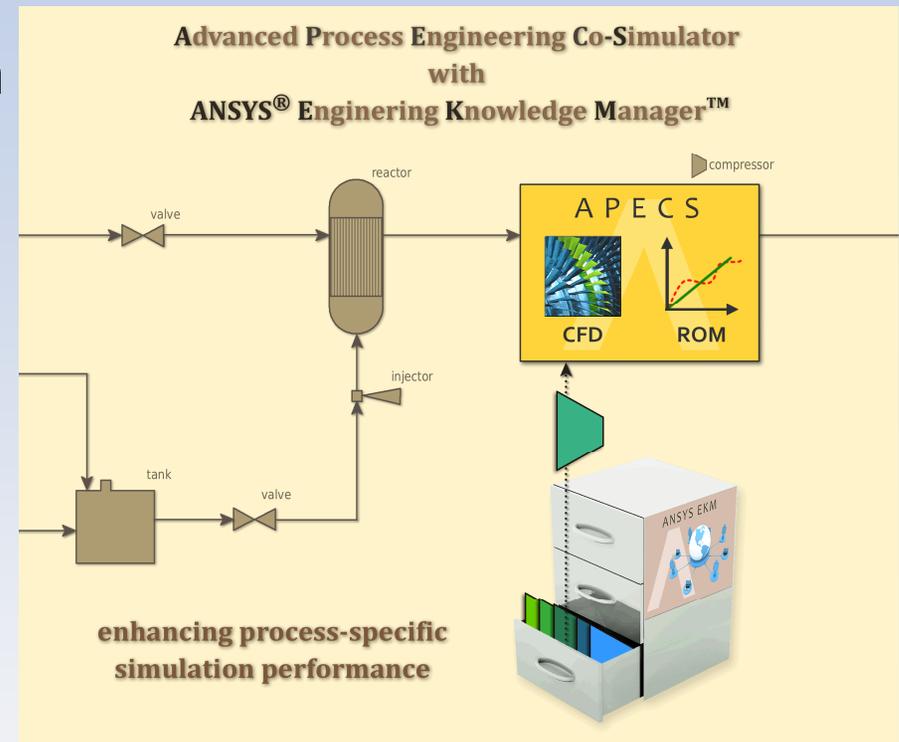
- [-] Mixture
- [-] PCA
- [-] Pipes

Name	Size	Type	Date Modified	Modified By
[-] calculate-pressure-drop		Folder	8/4/09 7:15 PM	root
[-] converged		Folder	8/4/09 7:15 PM	root
[-] density-transferred		Folder	8/4/09 7:15 PM	root
[-] file-system		Folder	8/4/09 7:15 PM	root
[-] geometry-parameterization		Folder	8/4/09 7:15 PM	root
[-] geometry_model_name		Folder	8/4/09 7:15 PM	root
[-] geometry_parameter_1		Folder	8/4/09 7:15 PM	root
[-] geometry_parameter_2		Folder	8/4/09 7:15 PM	root
[-] geometry_scale_factor		Folder	8/4/09 7:15 PM	root
[-] maximum-iterations		Folder	8/4/09 7:15 PM	root
[-] maximum-timesteps		Folder	8/4/09 7:15 PM	root
[-] model-views		Folder	8/4/09 7:15 PM	root
[-] molecular-weight-transferred		Folder	8/4/09 7:15 PM	root
[-] public-species		Folder	8/4/09 7:15 PM	root
[-] specific-heat-transferred		Folder	8/4/09 7:15 PM	root
[-] temperature-maximum		Folder	8/4/09 7:15 PM	root
[-] temperature-minimum		Folder	8/4/09 7:15 PM	root
[-] thermal-conductivity-transferred		Folder	8/4/09 7:15 PM	root
[-] time-average-outputs		Folder	8/4/09 7:15 PM	root
[-] timestep		Folder	8/4/09 7:15 PM	root
[-] viscosity-transferred		Folder	8/4/09 7:15 PM	root

R&D 100 Award



- APECS with ANSYS EKM won the 2008 R&D 100 Award
- “One of the 100 most technologically significant products introduced into the marketplace in 2007”
 - Sponsored by *R&D Magazine*
 - www.rdmag.com/awards.html
 - “The Oscars of Invention”



- **ANSYS EKM is an integral part of APECS**
- **Provides *organization* and *storage* for APECS Models, Solvers, Instances, Attributes**
- **DEMO**