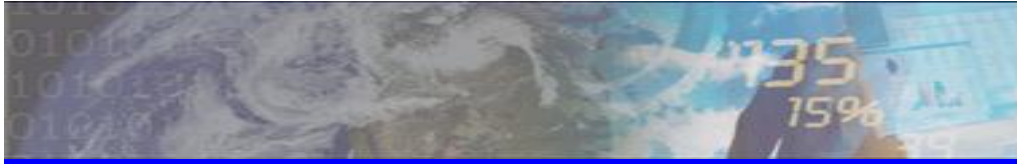




Open System Engineering Environment (OSEE)

Action Tracking System (ATS)

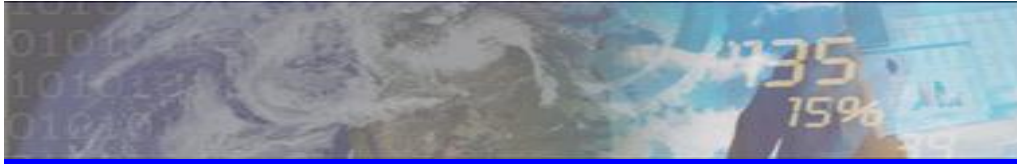
*Copyright © 2005 The Boeing Company
Mesa, Arizona
OSEE Team*



Goal

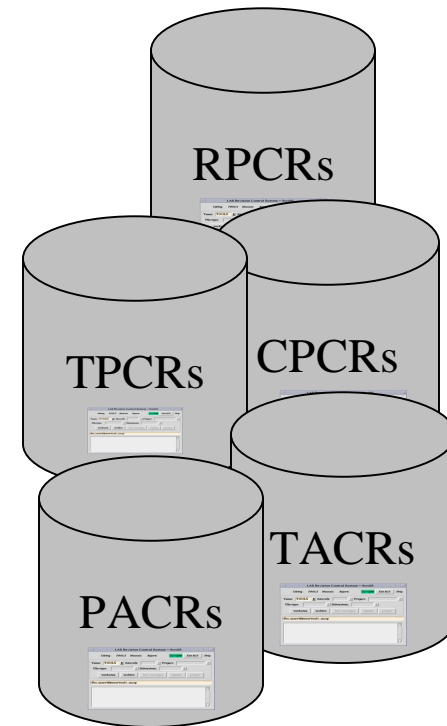
Create a powerful and tightly integrated tracking system within OSEE to manage changes throughout the different aspects of a program's lifecycle while ensuring integrated and automated workflow, processes and traceability.





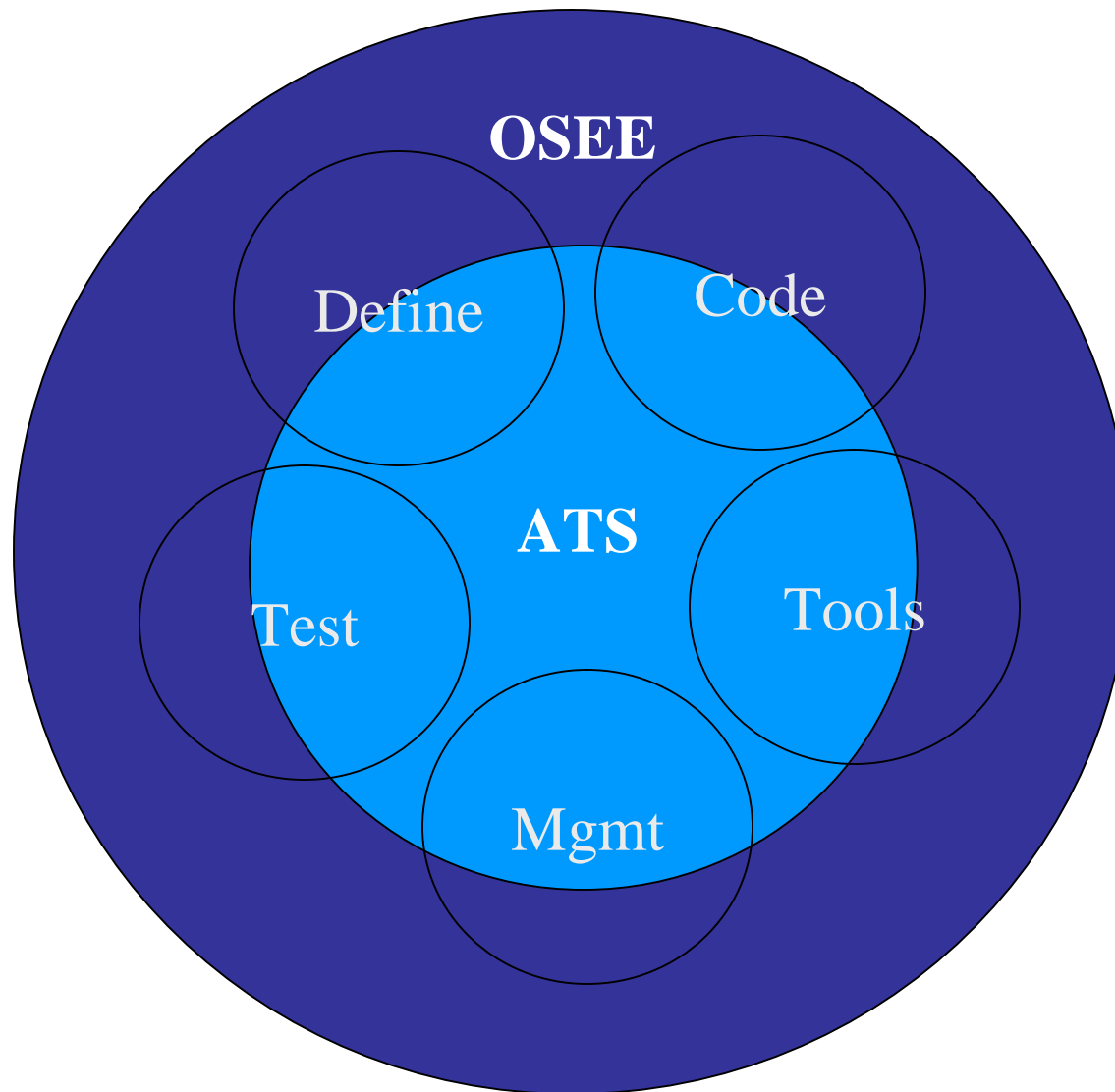
Legacy Change Tracking

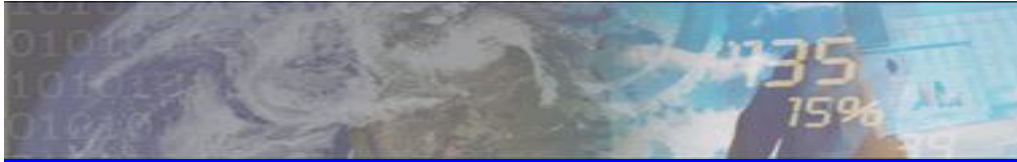
- Different tracking systems
 - Different repositories
 - Different GUIs
 - Developed in multiple different languages
 - Disconnected development teams
 - Duplicating “common” data
-
- Manual to No Traceability
 - Metrics difficult to capture and use
 - No common “My World” view
 - Single point of failure for resolving tool problems





OSEE Action Tracking System (ATS)

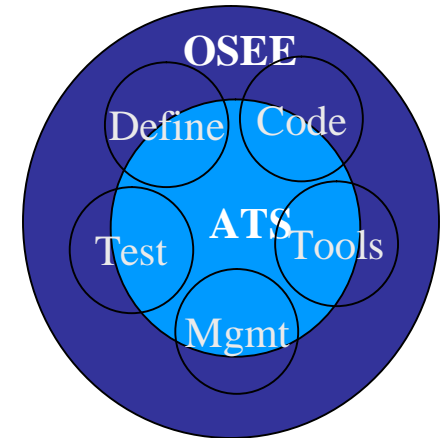




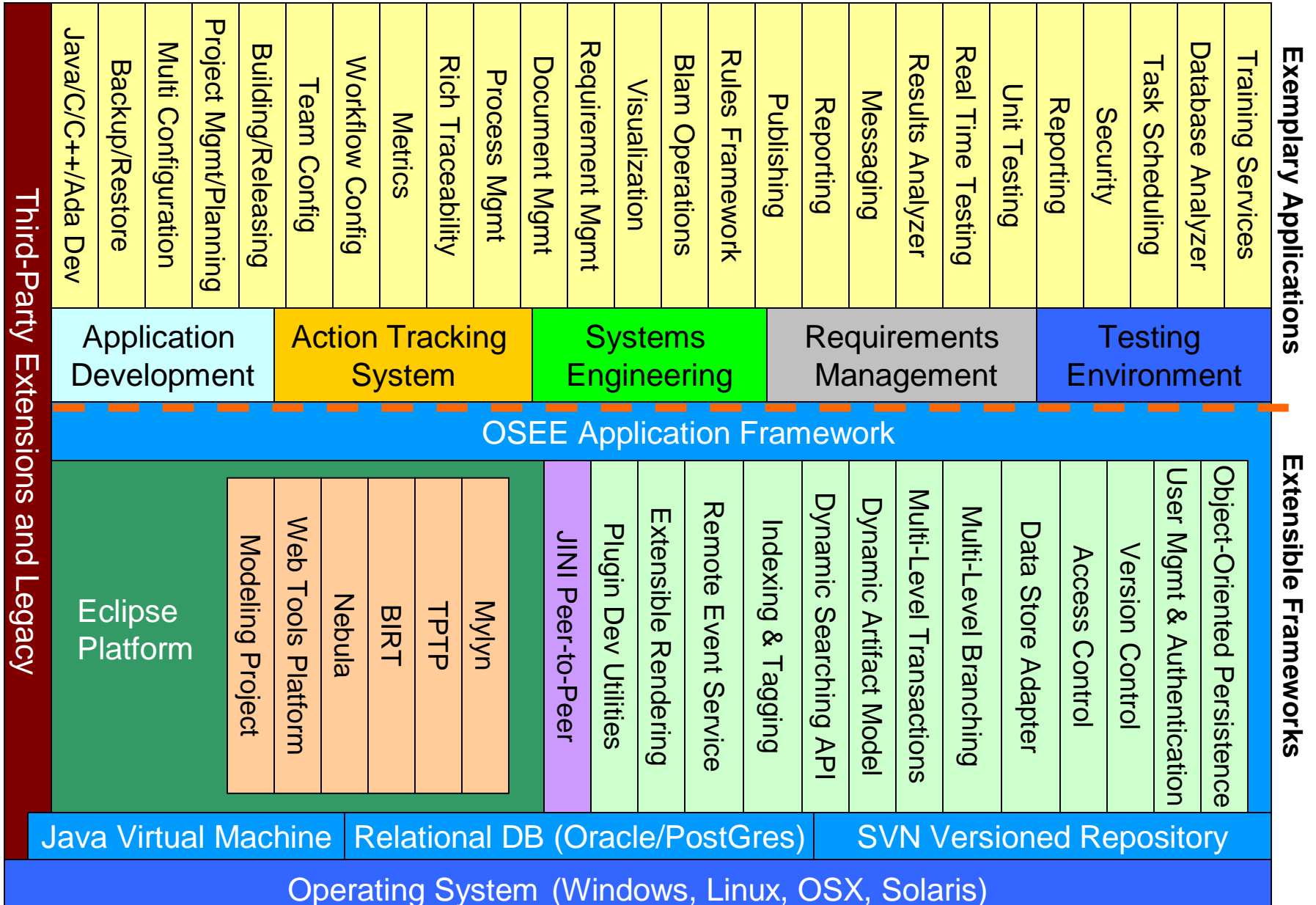
OSEE ATS

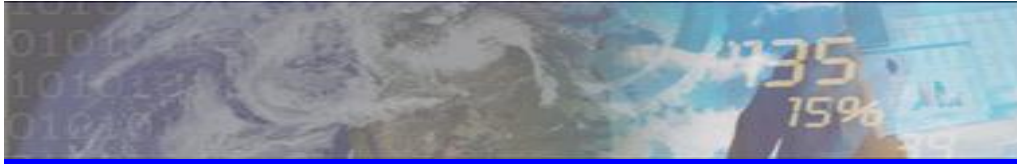
Tight Integration

- Actions viewing and editing are tied directly into the OSEE workbench
- Duplication errors are minimized as items are automatically linked and data is shared
- Drag/Drop capabilities built into ATS
- Bug Icon allows quick Action creation against any OSEE integrated tool
- Popup Menus (Java editor) give access to ATS while in any aspect
- Decreased tool/process development/maintenance cost

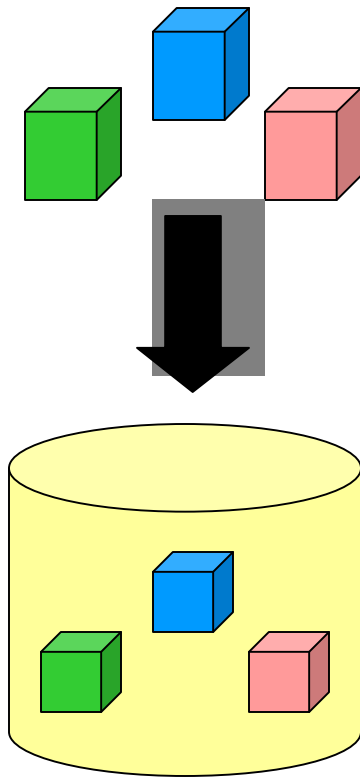


Open System Engineering Environment Architecture

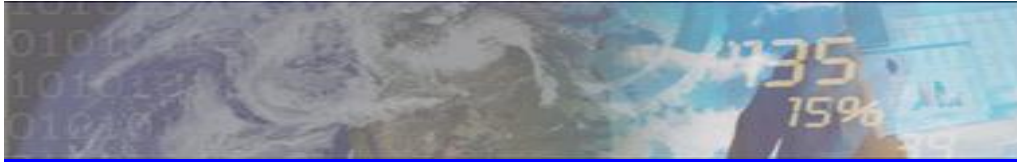




Common Data



- ATS accesses information already stored in OSEE
- ATS data is shared among other perspectives and plugins
- Drag and Drop enables linking to data instead of creating copies
- Program/Project information configures ATS



OSEE ATS

ATS World

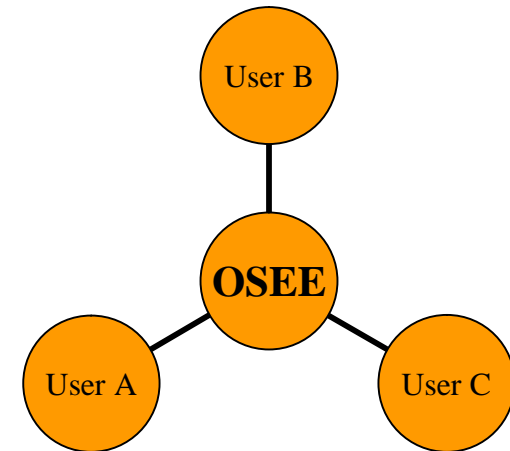
- “My World” view built into OSEE to show user what to work on next
- Populated by generic and custom searches
- Powerful Action querying, filtering and sorting
- Global, Project and User Filters available
- Customizable column order, visibility, title stored globally or locally
- Integrated Metrics and Project planning

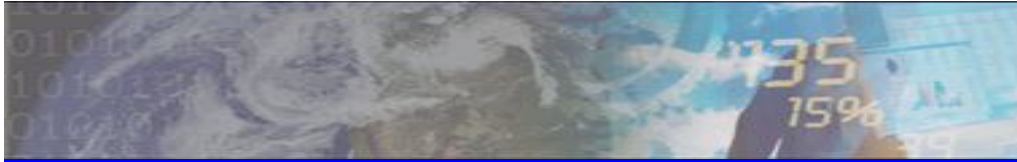




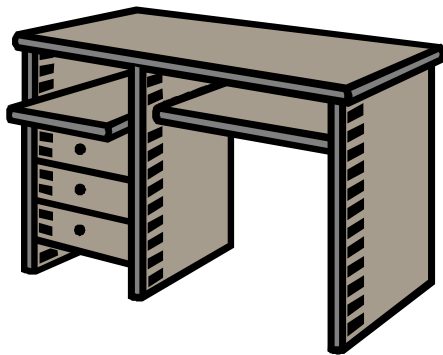
Notification

- Email notifications of state transitions
- Users can subscribe to notifications of Action activity
- Non-invasive auto notification within workbench (Like MS-Outlook's email notification)
- Notifications as Actions age or due dates expire



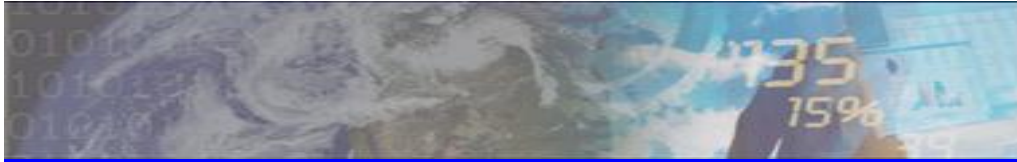


Training



- ATS provides tutorials and users guide integrated into OSEE help system
- Training in use of OSEE platform aspects (Define, Code, Test, etc) transferable to ATS
- Powerful routing and ATS World View show when user needs to do something
- Design of UI focuses user in on what they need to do





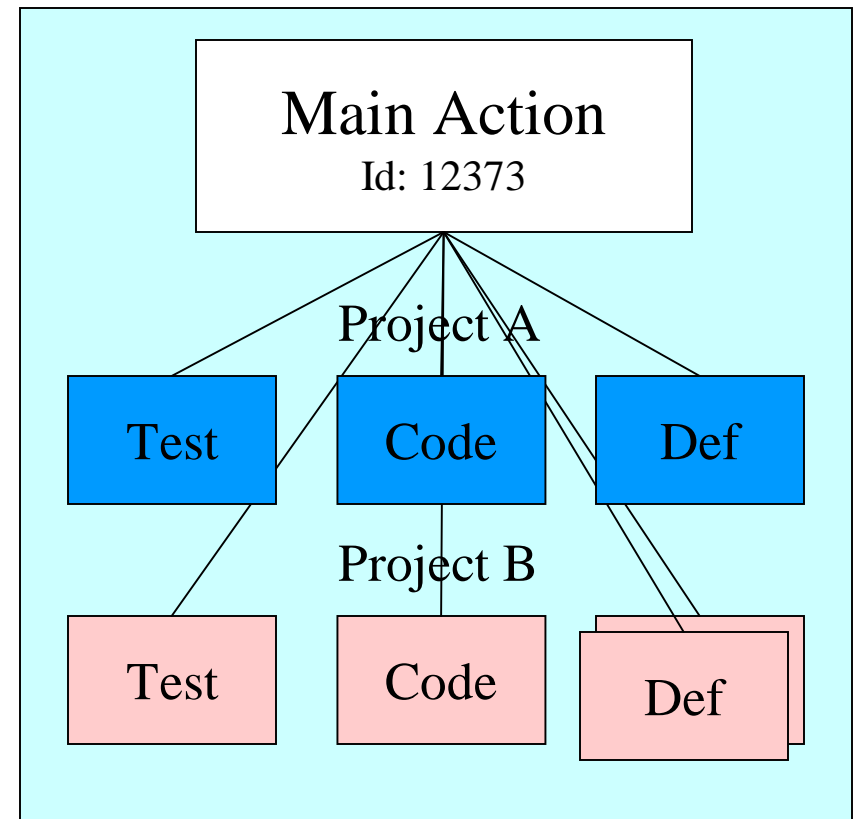
Assignment and Routing

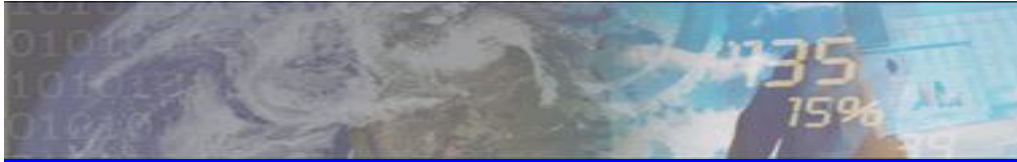
- Built-in configuration to automatically routing actions to appropriate leads / team members.
- Team members can have extended privileges for signup and completion of Actions.
- Single or multiple assignees for Actions and Tasks keep bottlenecks to a minimum
- Email notification upon assignment



Project Branching

- Main action created and has one “id” number.
- Project A creates necessary Aspects.
- Other projects are notified that their baseline has a change.
- Other projects (B) could implement the same fixes using data from Project A through their own Aspects.
- Project B’s Aspects leverage off Project A’s Aspects.





Metrics & Earned Value Rollup

- ATS collects Metrics throughout all aspects of OSEE
- Status, metrics and EV data can be accessed on a per-item basis or at any layer.

For Example:

- ATS state provides status of state completion via Tasks
- Task status rolls up to Workflow status
- Workflow status rolls up to Action status
- Action status rolls up to Project status
- Metrics can also be provided based on Action queries
 - % complete of a User
 - Hours spent on a change

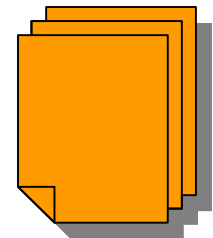
100%

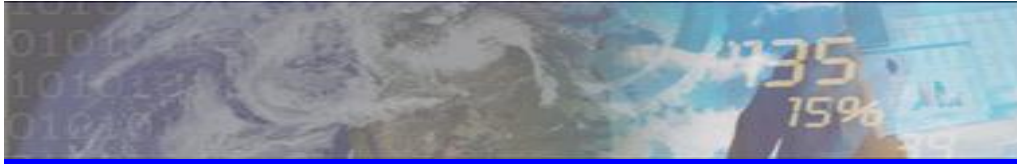




Built-In and Customizable Reviews

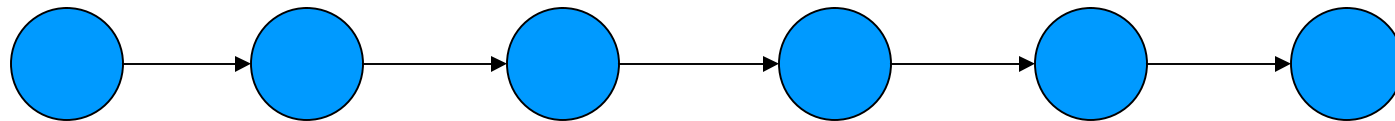
- Integrated into the workflow of each Action; No Separate Tool
- Review Types
 - Formal – Meeting with group of reviewers
 - Distributed – Group, electronically distributed
 - Pair-wise – Two reviewers, One Computer, Existing Document
 - Pair-wise – Development – Develop in teams, reviewing constantly
- Any Action or lifecycle artifact (code, document, requirement, etc...)
- Define – MS Word, Excel: annotations or rev-tracking
- Any Text – Java, C, C++, Ada, etc: Annotation Plug-in





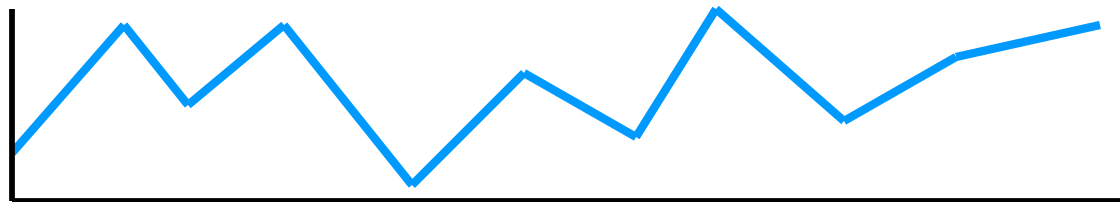
Traceability

- Automatic as Actions, Workflows and Tasks move through their workflow
- Drag/Drop, Popups and Menus automatically create traceability links
- Minimal Textual traceability tagging



Reporting and Graphing

- Using OSEE's Reporting and Graphing framework, reports and graphs can be easily created and run by:
 - Creating report/graph format template
 - Creating SQL query to retrieve data for report/graph
 - Executing Report/Graph with template and SQL
- Reports/Graphs can be integrated into OSEE to provide global use
- Output to Screen, HTML, PDF, XML, csv, Excel
- Reports/Graphs can be developed to request input dynamically

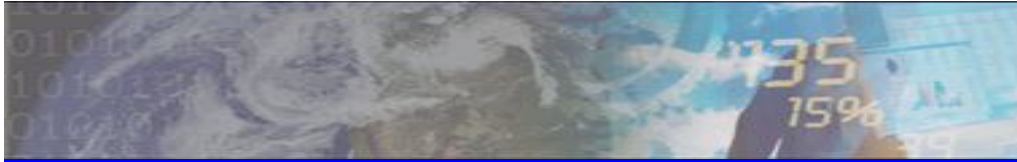




Project Planning / Estimating

- Able to easily access and share information and data between projects
- Easier to determine all aspects of changes that went into an insertion or fix
- Metrics and data stored for cost reduction efforts
- Algorithms can be used for automated estimating
- Enables storage and retrieval of % rework metrics
- Built-in Man-Days-Left calculations





OSEE ATS

OSEE SkyNet (Yes, from Terminator)

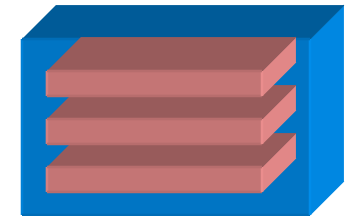
Artifact - Main building block/object of OSEE

Example: Task Artifact



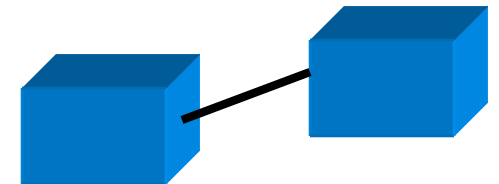
Attribute - Pieces of data attached to an "Artifact"

Example: Description, POC, Metrics, Resolution, Req Content



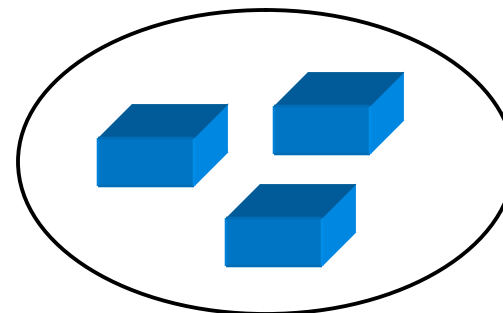
Relation - Link between Artifacts with Rationale

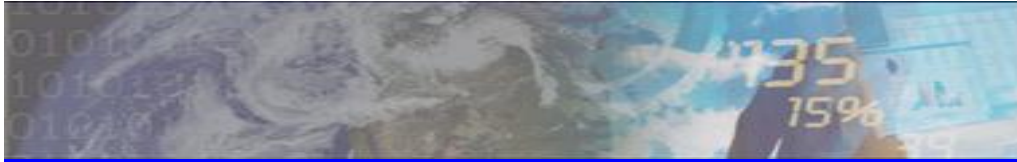
Example: Action related to Task to be completed



Group - Collection of artifacts

Example: These actions all belong to build 3





ATS Terms

Actionable Item (AI) – Item that can be impacted by an Action. AIs are what the user has to select from when creating an Action. Examples: Flight Box, Lab Computer, Code Subsystem.

Team Workflow Definition – Teams are created to perform that work associated with the Action. They are related to the AIs that they are responsible for and are configured with Leads and Members to route the Actions and perform the work. A workflow is configured that the team will follow to perform the work.

Workflow Diagram – State machine that shows the path the Team will follow to perform the work associated with the Action.

Action – Top level grouping object. An Action is written against any number of AIs. The Team Workflows are then created for each team configured to perform work for an AI.

Team Workflow - Instantiation of a Workflow Diagram needed to perform the work. Each team independently moves through their workflow state machine however ATS can be configured such that certain gates must be met from other Teams or outside events before a workflow can continue.

Task – Within states of a Team Workflow, smaller-light-weight Tasks can be created to further separate the work that needs to be completed for that state. Normally, the state can not continue until the Task is completed.

Versions – ATS has built in project/release planning. Versions are created to group Team Workflows (Actions) into Builds and Releases.

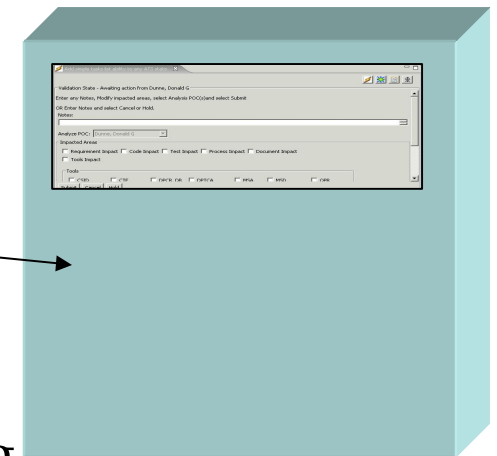


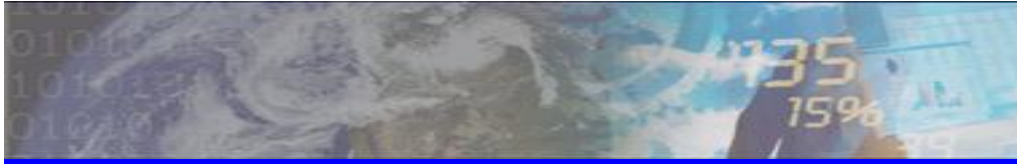


OSEE ATS

Action

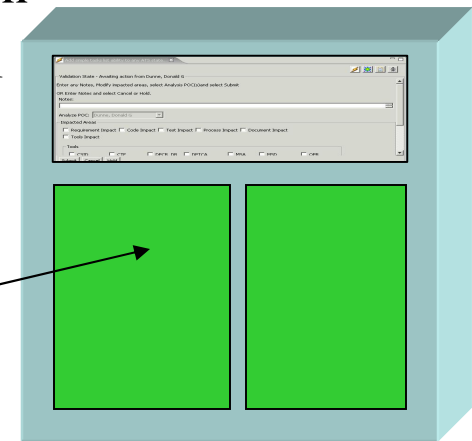
- Highest level object in ATS
- Can be created by any user without exact knowledge of what is impacted
- Known information is auto-filled by ATS
- Supports multi-project
- Contains Actionable Items identified as needing change
- Actions show up in assignee's ATS World as needing to be completed





Team Workflow

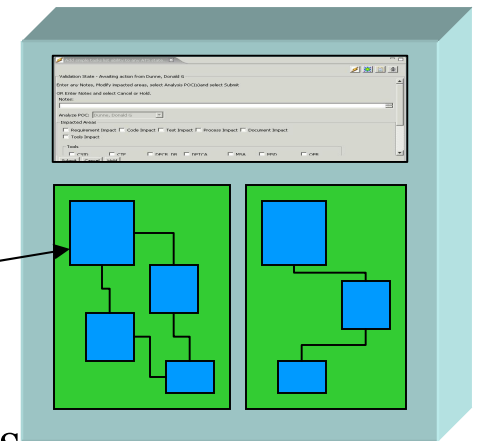
- Change object instantiated when a configured Actionable Item is impacted (or perceived to be impacted) by an Action
- Team Workflow is by default independent of other Team Workflows
- Team Workflows can be added or cancelled as Action matures
- Team Workflows are “managed” by configured Team Workflow Definition leads
- Team Workflow Definition leads are responsible for assignment and management of changes to their product
- Team Workflows show up in assignee’s ATS World as needing to be completed

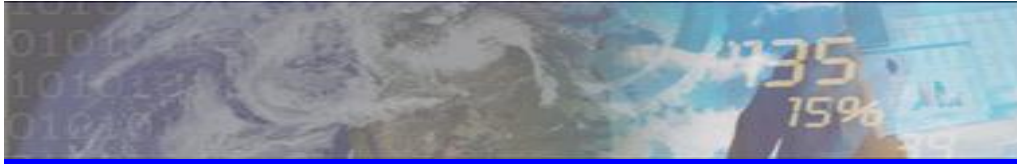




Team Workflow States

- Each team workflow can be configured with its own workflow (or state machine) that requires certain fields and conditions for transition to the next state
- Statusable by % complete and hours spent
- Assigned to one or more users
- Configured with both optional and required fields
- Available states to transition to are automatically determined from configuration and configured/programmatic conditions

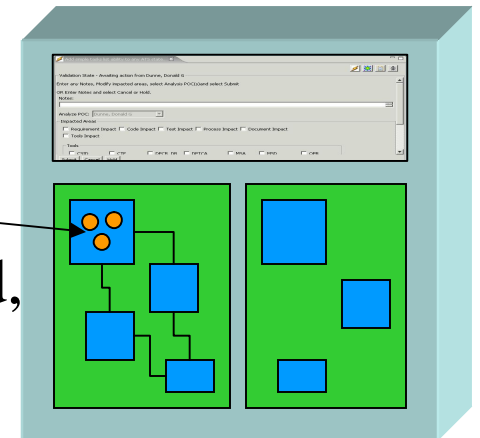




OSEE ATS

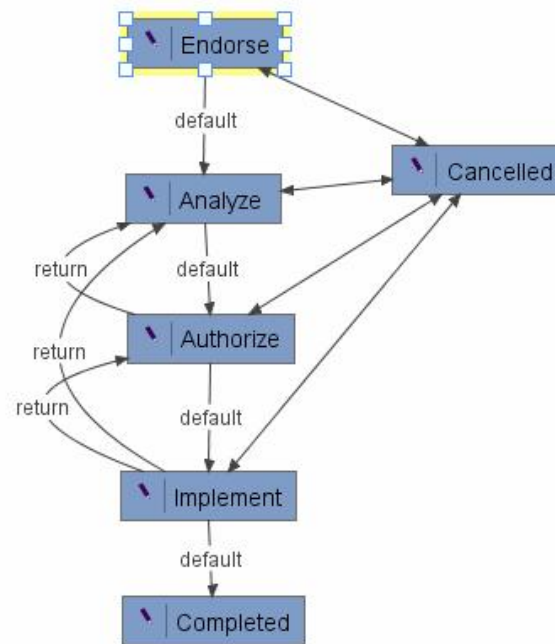
Tasks

- Lowest level object and workhorse of the Action Tracking System
- Allows splitting of Team Workflow state's work into smaller pieces
- Separately assignable and statusable
- Follows simple state flow of InWork, Completed, or Cancelled
- Tasks show up in assignee's ATS World as needing to be completed
- State can not transition until all Tasks are complete
- Metrics from Tasks roll up to Team Workflow, Action, Versions and other user specified Groups of Actions



ATS Workflow / Configuration

Workflow Diagram = Graphical diagram stored as XML in OSEE that ATS uses in real-time to “drive” through the workflow (state machine). Also contains required/optional fields that will be displayed for entry in each state. Minor changes can be applied in real-time.



State Machine = Actions, Products, Aspects and Tasks are all separate state machines with their own workflow and routing.

State = State of State Machine that can be assigned, tasked, etc. Usually owned by only one person (Assignee).



Action Tracking System (ATS)

Editors provide overview of Action that is printable, emailable and hyperlinked to related Actions, Requirements, Code and Test.

ATS Navigator contains:

Generic ATS searches, reports and operations.

Project specific searches, reports and operations.

Graphical display of Actions and their related objects. Includes indication of object currently being viewed and user responsible for performing work.

Views of Actions based on searching and filtering.

Sortable columns like Priority, Change Type. Colors and graphics help visualization.

Metrics built into system and rolled up from lower level Tasks to higher level Actions.

The screenshot displays the Action Tracking System (ATS) interface. The main window shows an action titled "OSEE Bug Fixes for 2.71.?" with the state "Action Implement State" and ID "PV05N". Below this, a table lists related products:

Product Config	Status	Aspect	Description
OSEE, LBA	Ready	ATS, Define, OTE_SW, UserSupport	ATS, Define, OTE_SW, UserSupport impacts for Action OSEE Bug Fixes for 2.71.?

The "Originator" is "Dunne, Donald G" and the "Change Type" is "Problem" with a "Priority" of 3. The description is "OSEE Bug Fixes. See tasks for details." Below this, an "ATS Release" section shows filters for Product (OSEE), Config (LBA), and Version (2.71.?). A table lists tasks associated with this release:

Status	Product	Aspects	P.	C.	Description
DevComplete	OSEE, LBA	Define	3	3	Import dialog layout improperly sizing component
DevComplete	OSEE, LBA	ATS	3	3	Fix task block in overview tab of ATS objects
InWork	OSEE, LBA	Define	2	2	Traceability Reports
InWork	OSEE, LBA	UserSupport	2	2	Make user requested changes to SkyNet Type Co
InWork	OSEE, LBA	Define	3	3	Simplify selection of artifacts when moving them
InWork	OSEE, LBA	Define	3	3	Provide a simple way to determine the number of

An "ATS Results" section shows an "ATS Extended Status Report" for "My World - Dunne, Donald G - 12/08/2006". The report includes a table with columns for Priority, Change Type, Product, Type, ActionId, and Task.

The "ATS World" section shows a summary table of actions:

Type	State	P...	T..	Active POC	Title	Total %	Hour Est	Total Hrs
Action	Action Implemen...	3	3	Dunne, Donald G	Complete Bracket verify function in ADT	59%	24.00	1.04
Action	Action Identify S...	3	3	Dunne, Donald G	Add relationship information in Hierarchical Report	59%	0.04	0.00
Action	Action Implemen...	3	3	Dunne, Donald G	OSEE Bug Fixes for 2.71.?	59%	0.04	0.03
Action	"OSEE, L Product Imple...	3	3	Dunne, Donald G	OSEE, LBA Impact to Action "OSEE Bug Fixes for 2.71.?"	95%	0.01	0.00
Action	"Use Aspect Implemen...	3	3	Dunne, Donald G	UserSupport Impact from Product OSEE, LBA for Action OSEE Bug Fix...	95%	0.01	38.03
Action	"OTE Aspect Implemen...	3	3	Finkbeiner, A...	OTE_SW Impact from Product OSEE, LBA for Action OSEE Bug Fixes f...	83%	0.01	0.01
Action	"Def Aspect Implemen...	3	3	Brooks, Ryan D	Define Impact from Product OSEE, LBA for Action OSEE Bug Fixes for ...	61%	0.01	22.51
Action	"ATS Aspect Implemen...	3	3	Dunne, Donald G	ATS Impact from Product OSEE, LBA for Action OSEE Bug Fixes for 2...	61%	0.01	25.64
Action	Action Implemen...	3	3	Dunne, Donald G	Investigate ATS performance issues	61%	0.01	0.03

The interface also includes an "ATS Navigator" on the left with a tree view of project elements, and an "Action View" at the bottom showing a graphical hierarchy of objects like "OSEE, LBA", "UserSupport", and "OTE_SW".

Action Tracking System (ATS)

The screenshot displays the ATS interface within an Open System Engineering Environment. Key components include:

- ATS Navigator:** A tree view on the left showing project structure like 'My World', 'My Favorites', and 'OSEE Product'.
- Action Editor:** A central window for editing an action, showing fields for Title, Description, and Proposed Resolution.
- ATS Release:** A window for managing releases, featuring a table of actions with columns for Status, Product, Aspects, P., and C.
- ATS World:** A table listing active actions with columns for Type, State, P., T., Active POC, and Title.
- ATS Results:** A window displaying an 'ATS Extended Status Report' with a table of report data.

Status	Product	Aspects	P.	C.	Description
DevComplete	OSEE, LBA	ATS	4	+	When creating new action, I'm not allowed to select displayed priority option 'None'
DevComplete	OSEE, LBA	Define	3	+	Import dialog layout improperly sizing components
DevComplete	OSEE, LBA	ATS	3	+	Fix task block in overview tab of ATS objects
InWork	OSEE, LBA	Define	2	+	Traceability Reports
InWork	OSEE, LBA	UserSupport	2	+	Make user requested changes to SkyNet Type Configuration
InWork	OSEE, LBA	Define	3	+	Simplify selection of artifacts when moving them in the Artifact Explorer
InWork	OSEE, LBA	Define	3	+	Provide a simple way to determine the number of artifacts changed on a branch

Type	State	P...	T...	Active POC	Title
Action	Action Implemen...	3	+	Dunne, Donald...	Complete Bracket verify
Action	Action Identify S...	3	+	Dunne, Donald...	Add relationship informat...
Action	Action Implemen...	3	+	Dunne, Donald...	OSEE Bug Fixes for 2.71
"OSEE, L Product Impleme...				Dunne, Donald...	OSEE_LBA Impact to Act...
"Use Aspect Implemen...				Dunne, Donald...	UserSupport Impact from
"OTE Aspect Implemen...				Finkbeiner, A...	OTE_SW Impact from Pro...
"Def Aspect Implemen...				Brooks, Ryan D.	Define Impact from Prodi...
"ATE Aspect Implemen...				Dunne, Donald...	ATS Impact from Product
Action	Artihin Implemen...	3	+		Investigate ATS perform...

Priority	Change Type	Product	Type	ActionId	TaskId
2	Improvement	SkyNet	Action	J0B0E	Re

Data in Action edited through same multi-multi-tabbed window. Tabs show based on permissions of user to change data.

Release capabilities provided for any configured product tracked by ATS.

View shows Actions scheduled for release, their current status and the product's Aspects they affect.

Release reports auto-generated and published to website.

Reports can be emailed, printed and exported to Excel for external use.

Errors and Warnings reported and displayed when user interaction is required.

Reporting view shows reports generated during this session of OSEE.

Graphing and Charting reports are also displayable.