



UGS

*Transforming the
process of innovation*



PLM World Managing ECAD & Software In Teamcenter Engineering

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Teamcenter Product Management
May 12, 2006



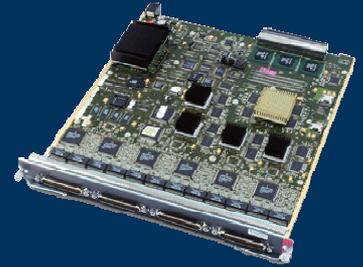
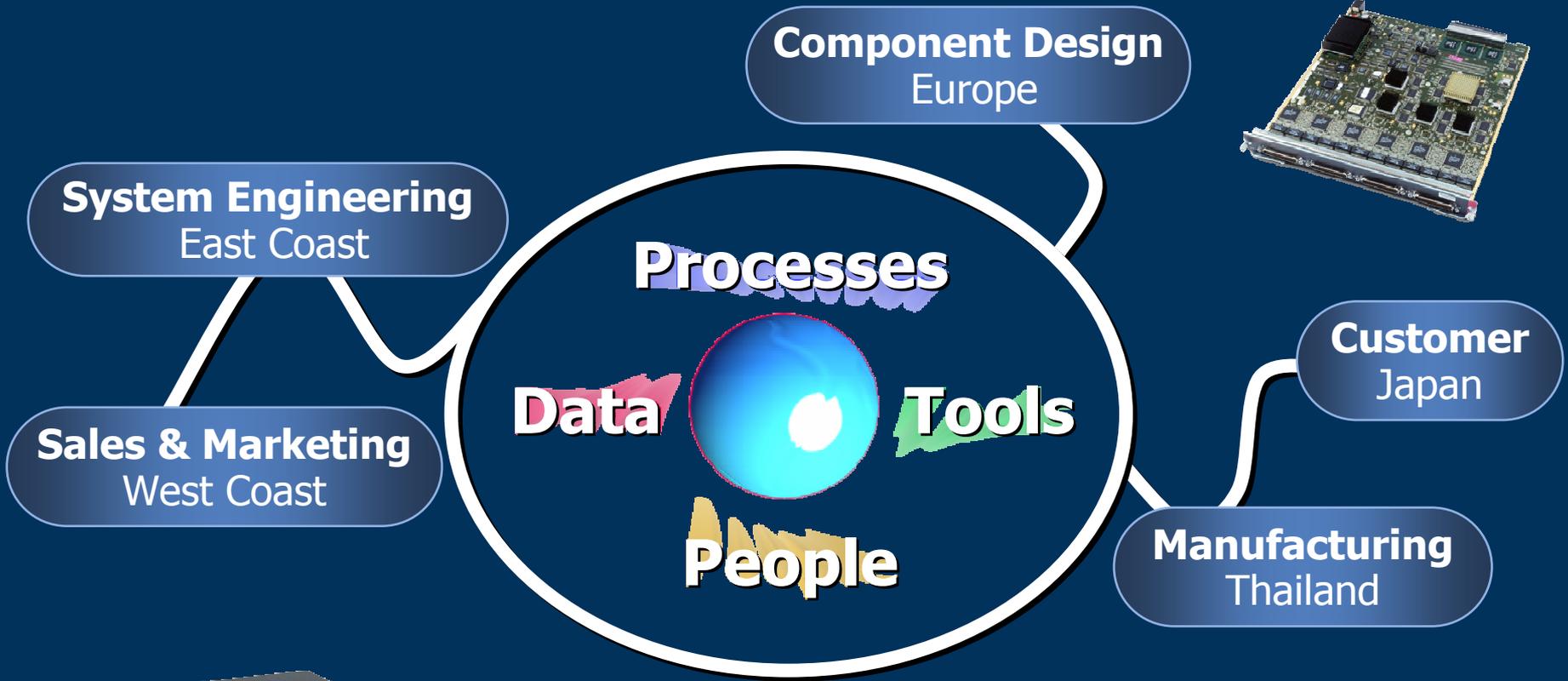
Agenda



- ▶ Introduction
- ▶ Teamcenter Vision
- ▶ Managing Design Information
 - ▶ PCB
 - ▶ Software
- ▶ Questions



Complex Design Chain



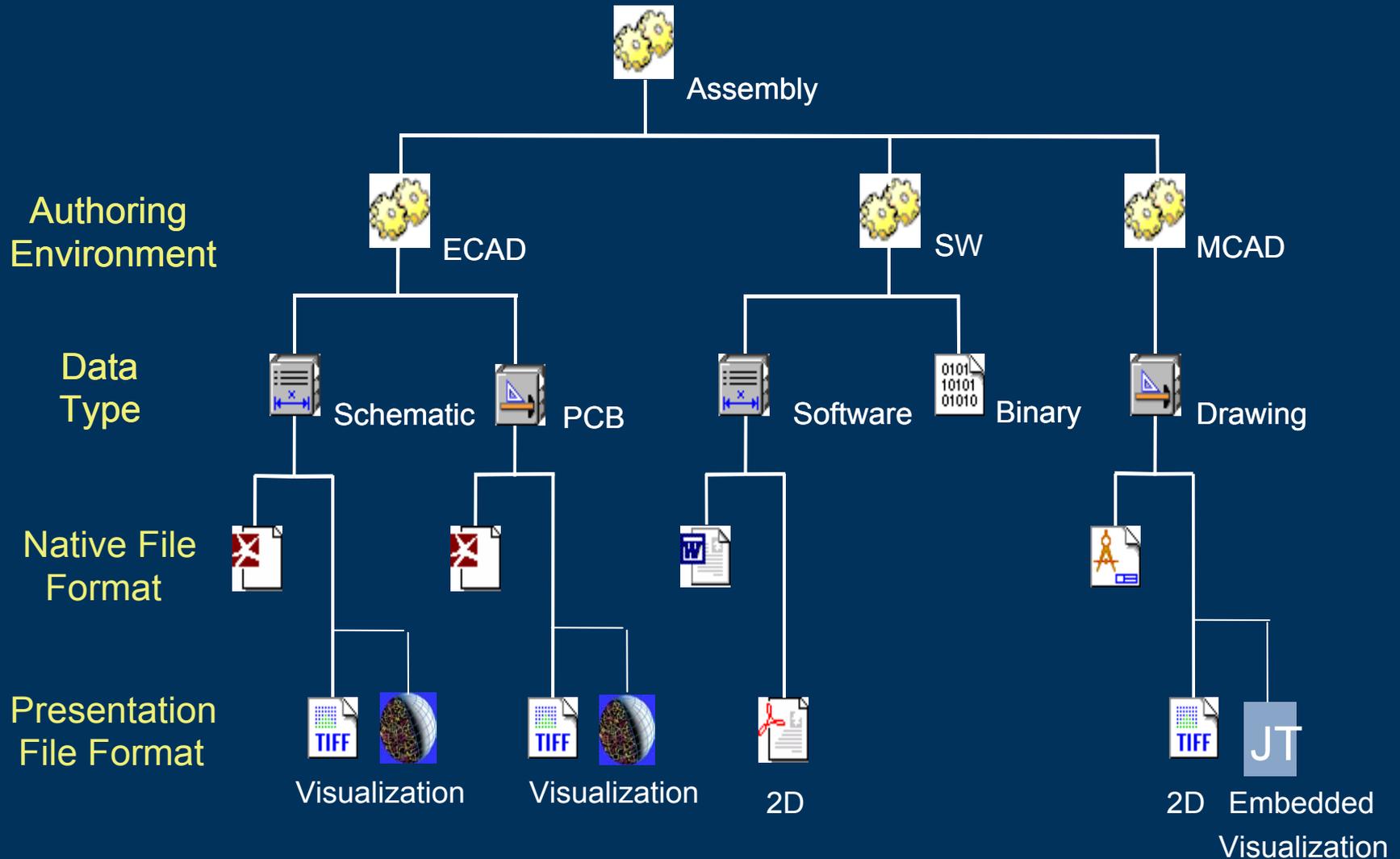


Throughout the Design and Introduction Process

- ▶ Increases design time
- ▶ Uninformed engineering decisions
 - ▶ Un-necessary product costs
 - ▶ Lower product quality
- ▶ Creates procurement difficulties
- ▶ Creates delays in manufacturing
- ▶ Impacts time to volume and time to profit

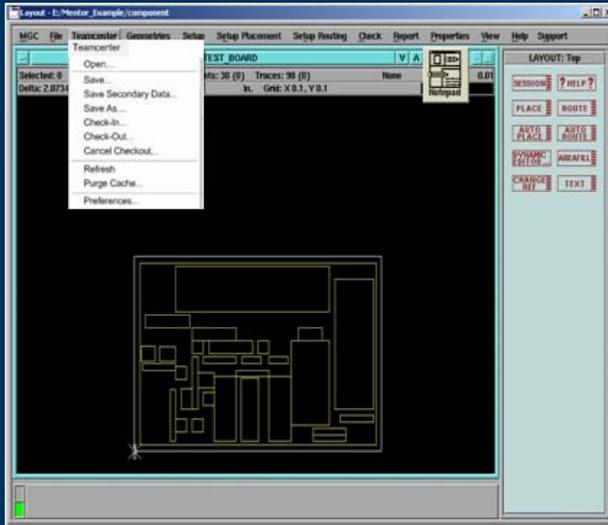


Vision – Single Source of Design Data



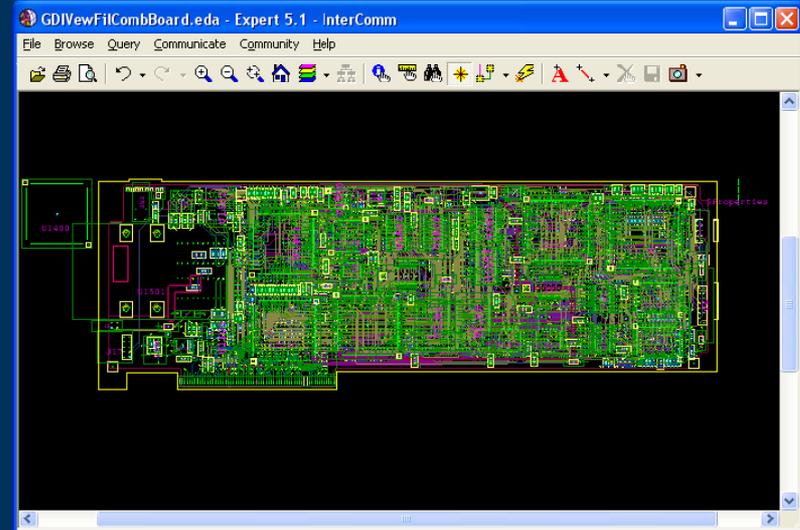


ECAD Integrations and Viewing



CAD-centric integrations

- ▶ PCB design tools
 - ▶ Cadence Allegro
 - ▶ Mentor Board Station
- ▶ File vaulting, BOM extraction, derived file generation



ECAD-neutral visualization

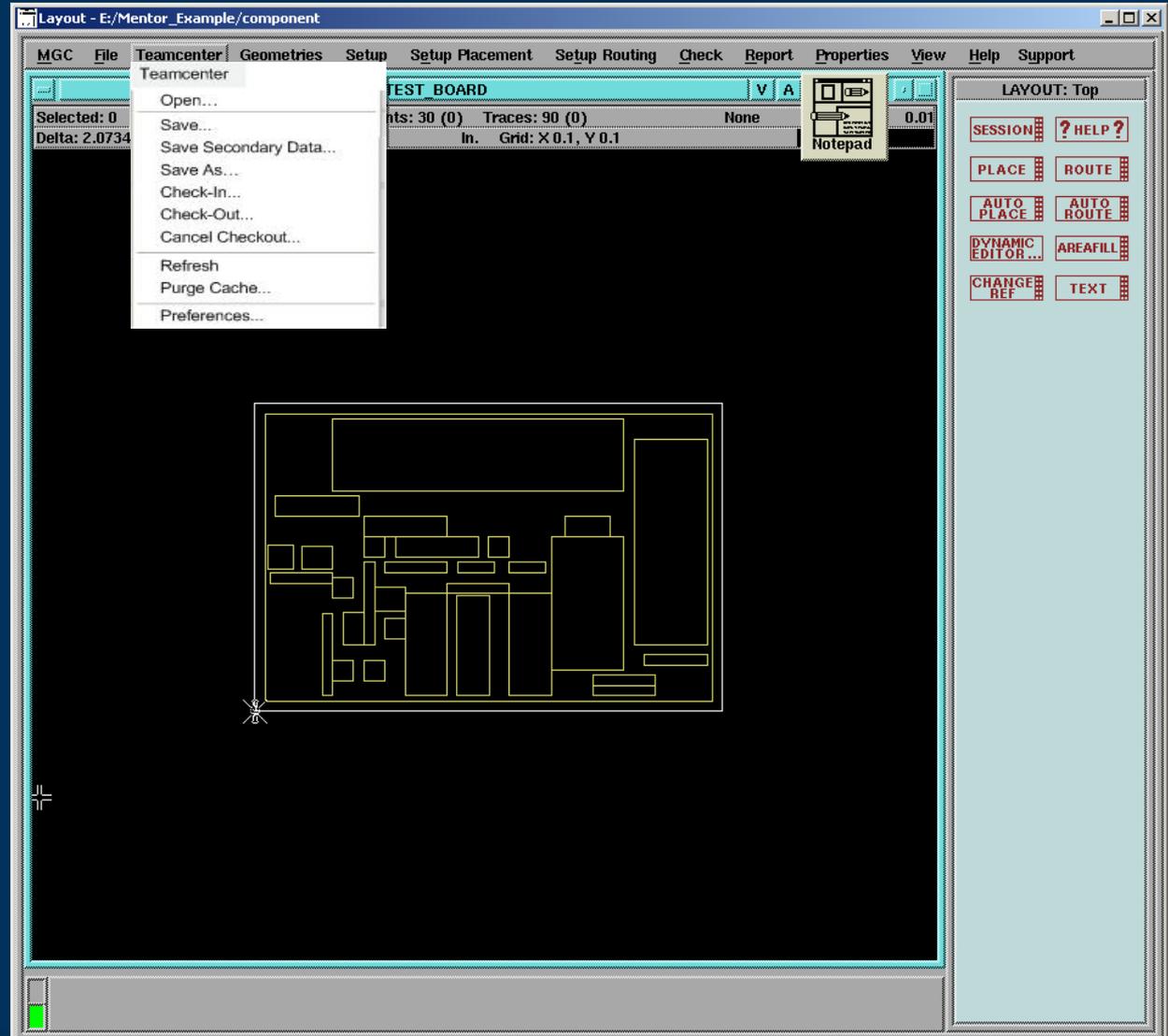
- ▶ Open framework
- ▶ Visualization of schematic data, board data, viewable data, fabrication data, assembly data, drawings



- ▶ CAD-centric integration
 - ▶ Single UI across ECAD tools
- ▶ BOM Extraction
 - ▶ Product Structure creation
 - ▶ BOM extracted from ECAD design
- ▶ ECAD data in Teamcenter
 - ▶ ECAD-native design archive
 - ▶ ECAD/MCAD interchange files (.idf)
 - ▶ Fabrication data archive
 - ▶ Assembly data archive
- ▶ PCB Viewer Neutral



ECAD-Centric Functionality





Open



Open

The screenshot shows the Teamcenter software interface with the 'Teamcenter' menu open and the 'Open' option selected. A yellow arrow points from the 'Open' text box to the 'Open...' menu item. Below the main window, the 'Open DataSet' dialog box is open, displaying a search criteria table and a tree view of data sets.

Open DataSet

Search: Item ID

Criteria:

Name	Value
Item ID	*

Tree View:

- Home
- Item ID
- Object
- Type
- Rela...
- DECCOUNTER (Item)
- RESISTOR (Item)
- RPAK (Item)
- assy1 (Item)
- assy2 (Item)
- assy3 (Item)
- ItemTonyC (Item)
- TonyCItem (Item)
- Item1122670463-view (view B...)
- Item1122670463 (Item ...)
- TonyCItem (ItemR...)
- Item1122670463/Rev1 (ItemR...)
- TonyCZip (Zip)
- TonyCItem2 (Item)

Buttons: Open for Reference, Open for Modification, Cancel



Save



Save

The screenshot shows a PCB layout software window titled "Layout - E:/Mentor_Example/component". The menu bar includes MGC, File, Teamcenter, Geometries, Setup, Setup Placement, Setup Routing, Check, Report, Properties, View, Help, and Support. The "Teamcenter" menu is open, showing options: Open..., Save..., Save Secondary Data..., Save As..., Check-In..., Check-Out..., Cancel Checkout..., Refresh, Purge Cache..., and Preferences... A yellow arrow points from the "Save" text in the yellow box to the "Save..." option in the Teamcenter menu.

Two "Save" dialog boxes are overlaid on the main window:

- Save Cadence:** Features a "BOM Generation" section with a radio button selected for "BOM" and another for "No BOM". Buttons for "OK", "Cancel", and "Help" are at the bottom.
- Save Mentor:** Features a "BOM Generation" section with radio buttons for "Board BOM" (selected), "Schematic BOM", and "No BOM". Buttons for "OK", "Cancel", and "Help" are at the bottom.

The background shows a PCB layout with a grid and various components. A "Notepad" icon is visible in the top right corner of the software window.



Save Secondary Data



**Save
Secondary
Data**

The screenshot shows the Teamcenter software interface with the 'Save Secondary Data' dialog box open. The dialog box is titled 'Save Secondary Data' and contains the following information:

- Dataset Information:**
 - Type: Fabrication
 - Name: DS_EDAFab00001
 - Description: DS Description
- File Selection:**
 - Files in the tree: xxx.art, yyy.dxf, yyy.art
 - Selected files: xxx.art, yyy.dxf

Buttons for OK, Cancel, and Help are located at the bottom of the dialog box.



Save As



Save As

The screenshot shows the Teamcenter software interface with the 'Save As' menu open. A yellow box with the text 'Save As' has an arrow pointing to the 'Save As...' option in the menu. Below the menu, a 'Save As' dialog box is displayed. The dialog box contains a table of objects, 'Item Information' fields, and 'Dataset Information' fields.

Object	Type	Rela...	Owner	Group	CO	Rel...
Mailbox	MailF...		infodba	dba	false	false
Newstuff	Newst...		infodba	dba	false	false
EDAFolder	Folder		infodba	dba	false	false

Item Information

Type:

ItemID:

Revision:

Name:

Dataset Information

BOM Generation: BOM No BOM

Name:

Description:



Check-In



Check-In

The screenshot shows a PCB layout software window titled "Layout - E:/Mentor_Example/component". The "Teamcenter" menu is open, with "Check-In..." selected. A yellow arrow points from the "Check-In" text box to this menu item. Two dialog boxes are open: "Save Cadence" and "Save Mentor". Both dialog boxes have "BOM Generation" selected and "Board BOM" (or "BOM") selected. The "Save Mentor" dialog also has "Schematic BOM" and "No BOM" options. The background shows a PCB layout with a "TEST_BOARD" layer selected, showing 30 components and 90 traces. The status bar indicates "In. Grid: X 0.1, Y 0.1".



Check-Out



Check-Out

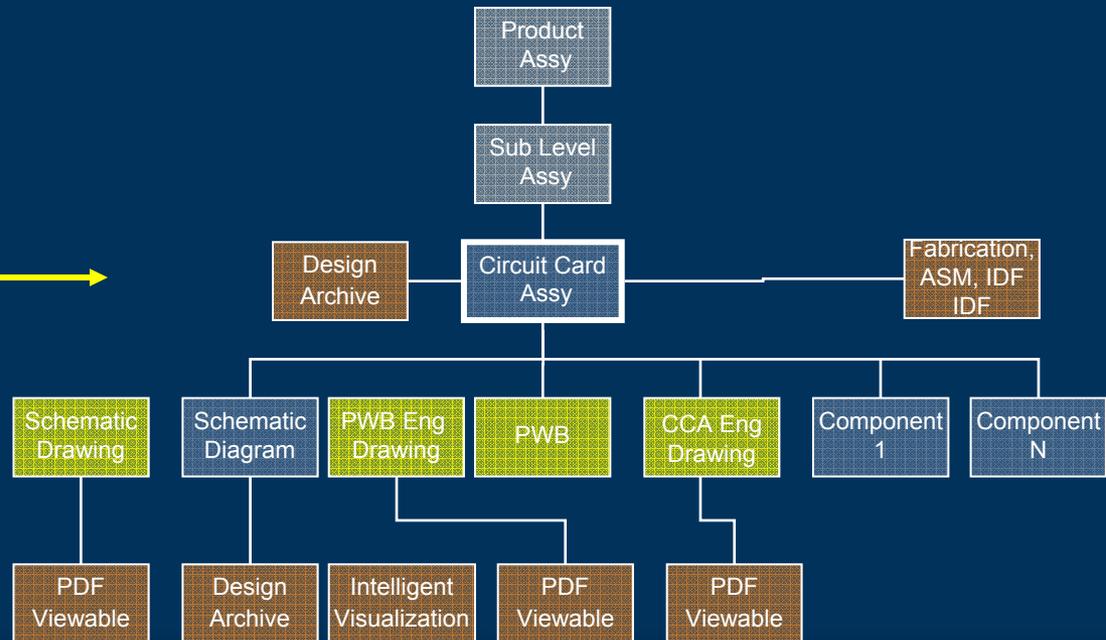
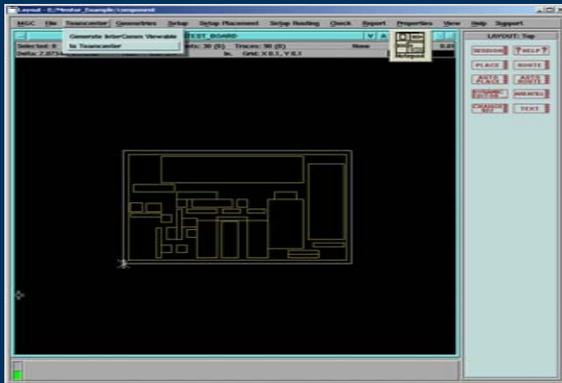
The screenshot shows the Mentor Graphics software interface with the 'Teamcenter' menu open. The 'Check-Out...' option is highlighted. A 'CheckOut' dialog box is displayed in the foreground, featuring a 'Change ID:' text box, a 'Comments:' text area, and 'OK' and 'Cancel' buttons. The background interface includes a menu bar with options like 'MGC', 'File', 'Teamcenter', 'Geometries', 'Setup', 'Setup Placement', 'Setup Routing', 'Check', 'Report', 'Properties', 'View', 'Help', and 'Support'. A toolbar shows 'TEST_BOARD' and 'Notepad' icons. A right-hand panel titled 'LAYOUT: Top' contains various tool icons such as 'SESSION', 'PLACE', 'ROUTE', 'AUTO PLACE', 'AUTO ROUTE', 'DYNAMIC EDITOR...', 'AREAFILL', 'CHANGE REF', and 'TEXT'.



BOM Extraction



- ▶ Component information is extracted from:
 - ▶ Schematic Files
 - ▶ Board Layout Files
- ▶ Product Structure is automatically populated





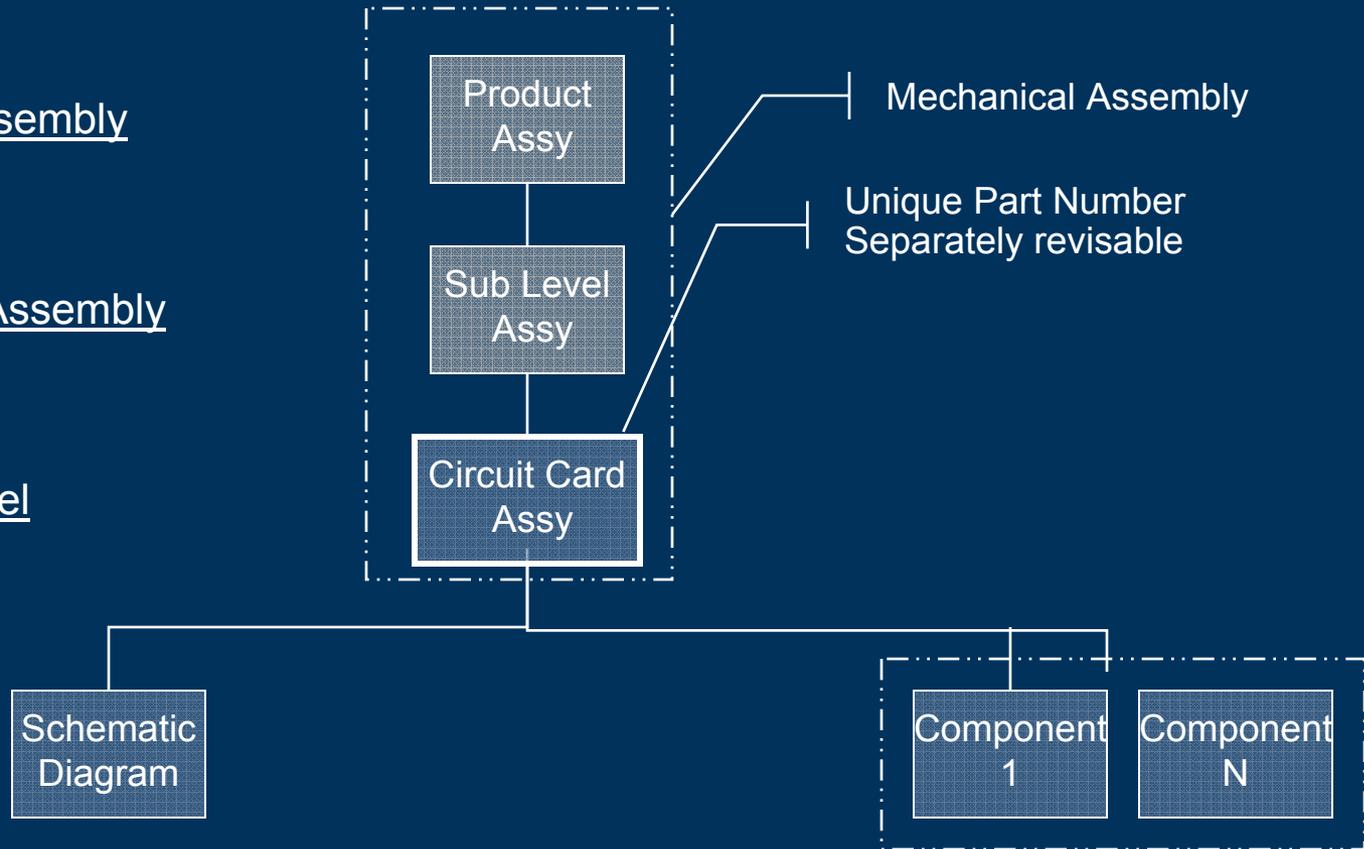
Product Structure



Top Level Assembly

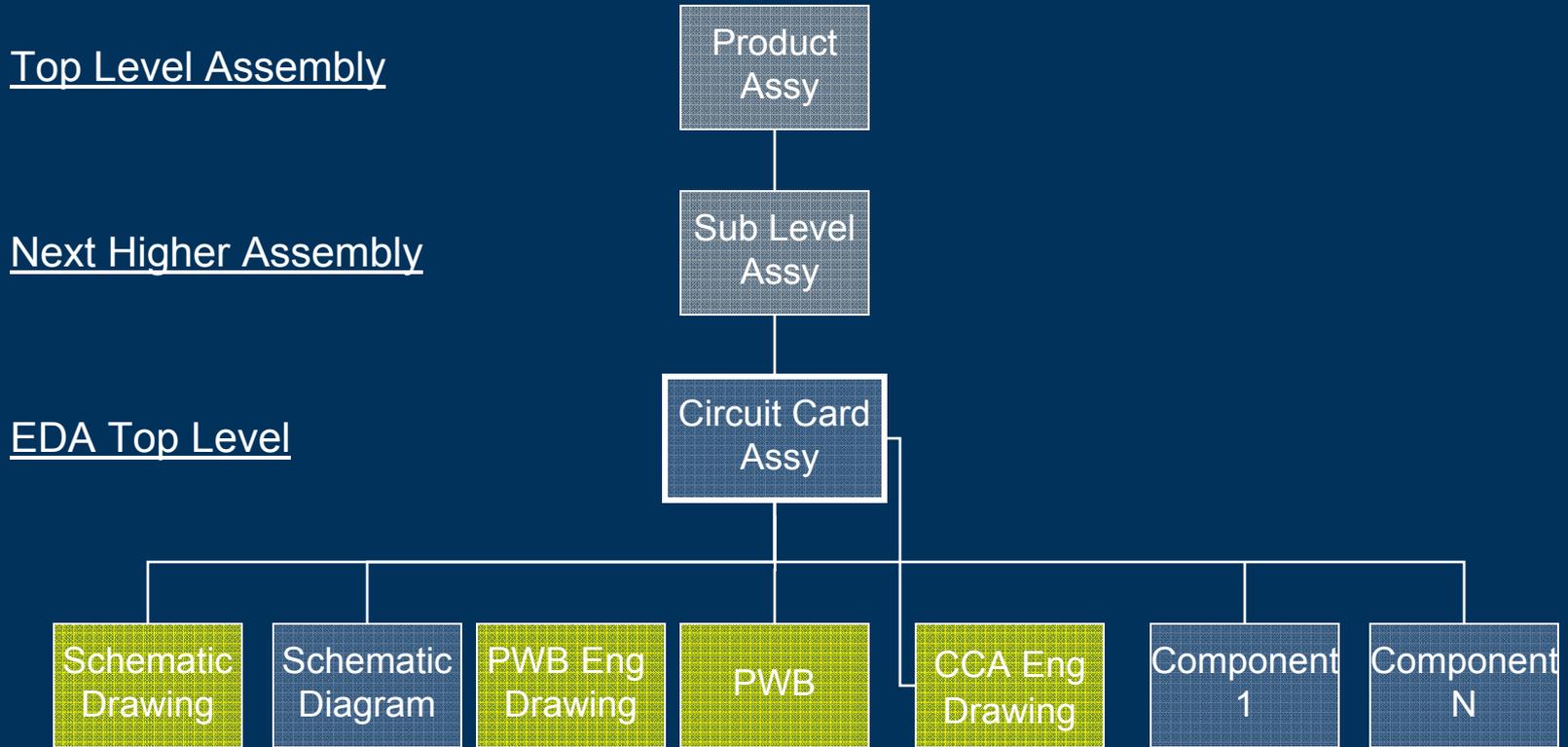
Next Higher Assembly

EDA Top Level



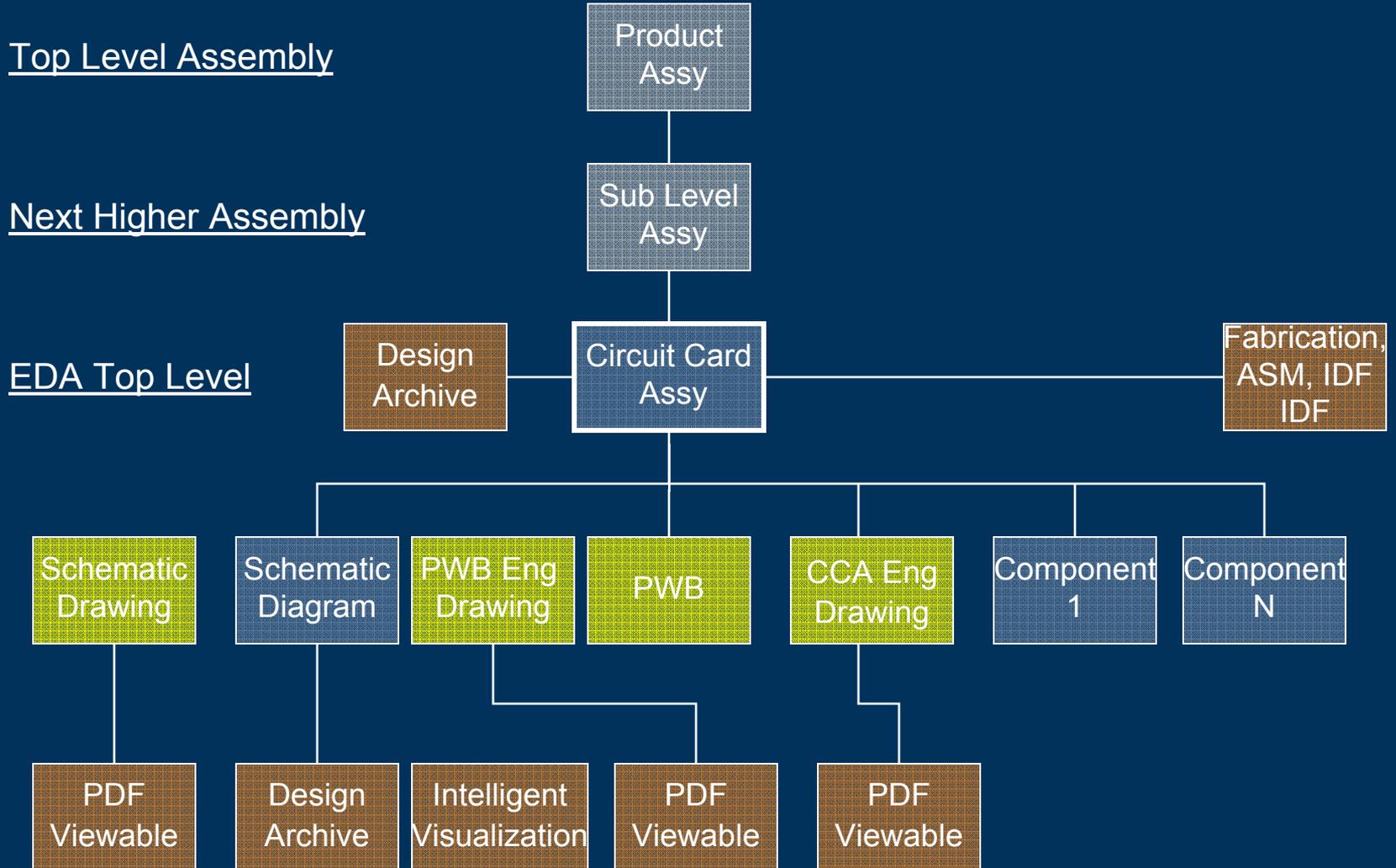


Product Structure





Product Structure

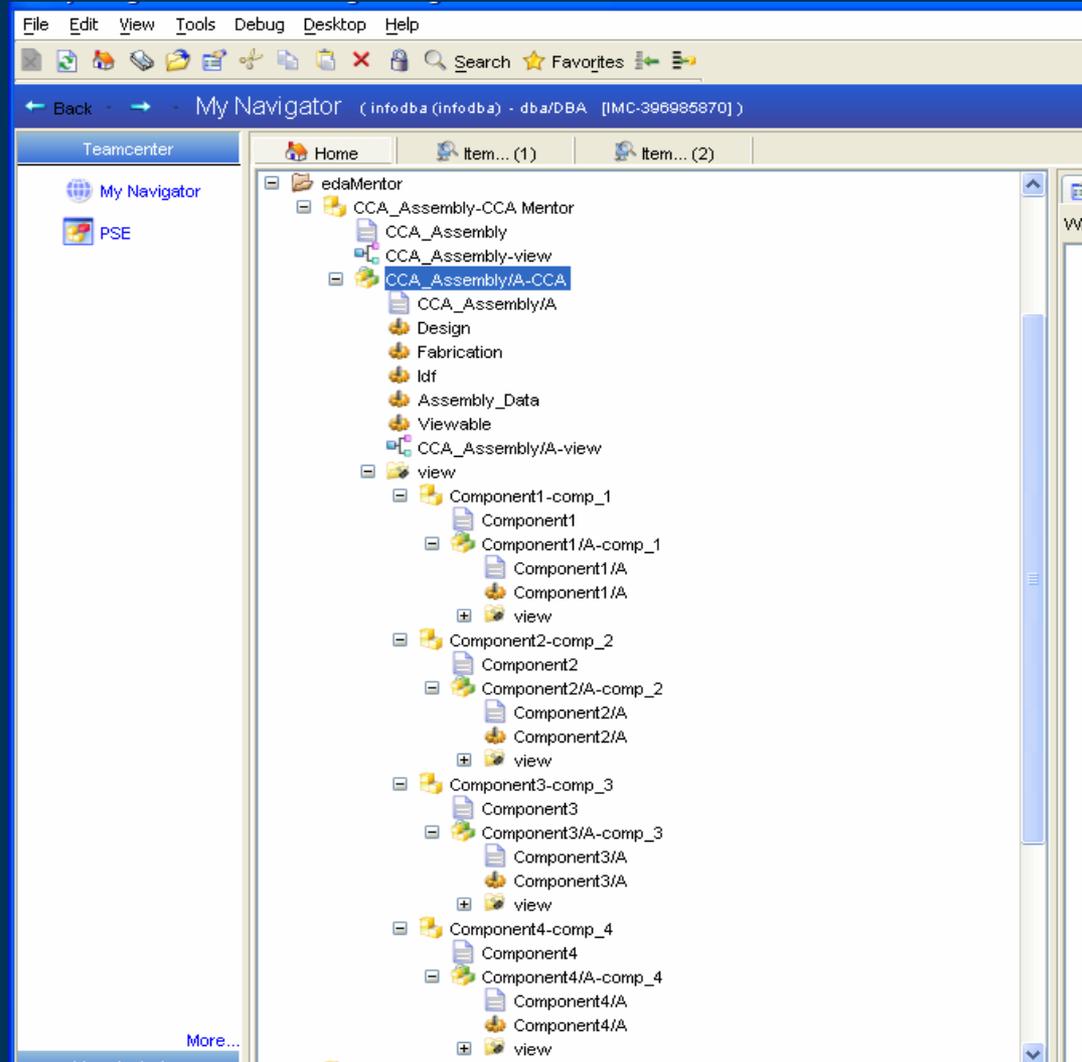




Teamcenter Interface



- ▶ Product structure browsing
- ▶ View BOM
- ▶ Search for:
 - ▶ ECAD Designs
 - ▶ Fabrication
 - ▶ Assembly
 - ▶ MCAD/ECAD .idf Files
 - ▶ Design documents

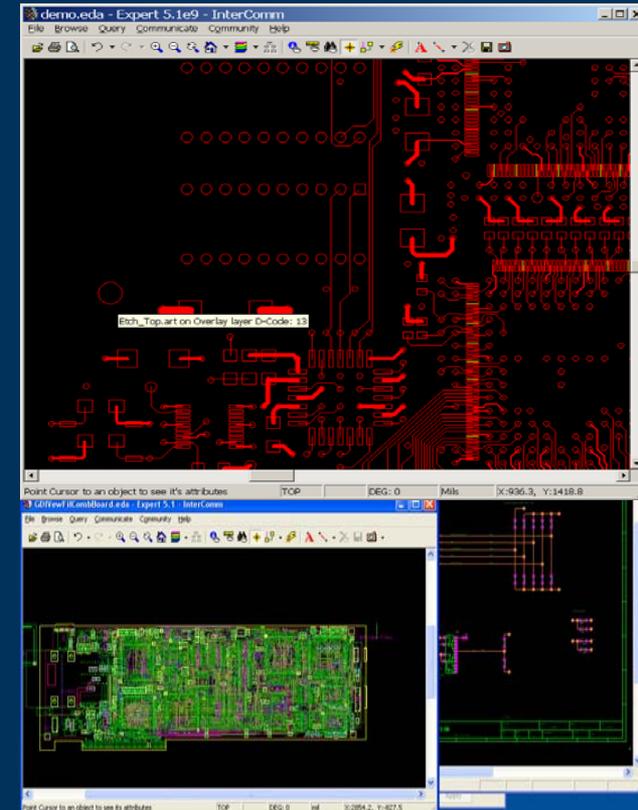




Viewer Neutral Support



- ▶ Provide a framework to 3rd party visualization companies so they can integrate their tools with Teamcenter to:
 - ▶ Create Viewable file at Check in or on Demand and save it in the Tc product structure
 - ▶ Save Mark-up & Annotations with the visualization file
 - ▶ Launch viewable file from Teamcenter clients
- ▶ This will be available to all viewer suppliers late 2006





Summary



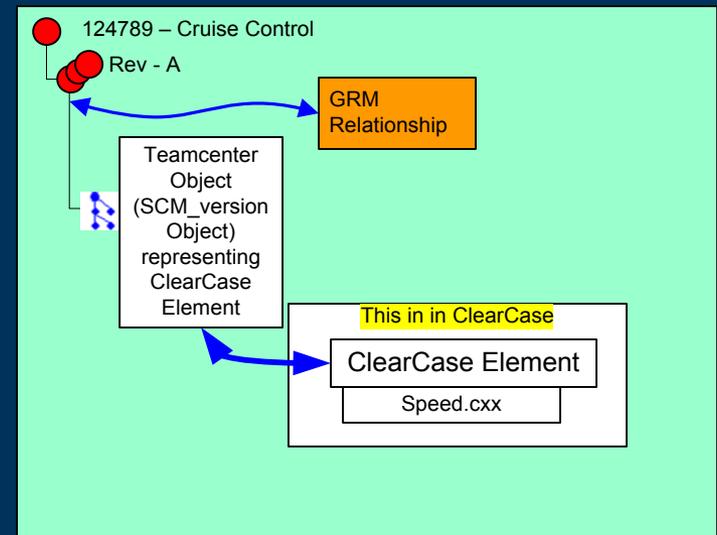
- ▶ CAD-centric integration
 - ▶ Single UI across ECAD tools
- ▶ BOM Extraction
 - ▶ Product Structure creation
 - ▶ BOM extracted from:
 - ▶ Schematic
 - ▶ Board Layout
- ▶ PCB Viewer Neutral
 - ▶ Support 3rd party visualization tools
- ▶ PCB Data Stored in Tc
 - ▶ ECAD-native design archive
 - ▶ Secondary data
 - ▶ ECAD/MCAD interchange files (.idf)
 - ▶ Fabrication data archive
 - ▶ Assembly data archive
 - ▶ Visualization file with Mark-ups and Annotations



ClearCase Integration

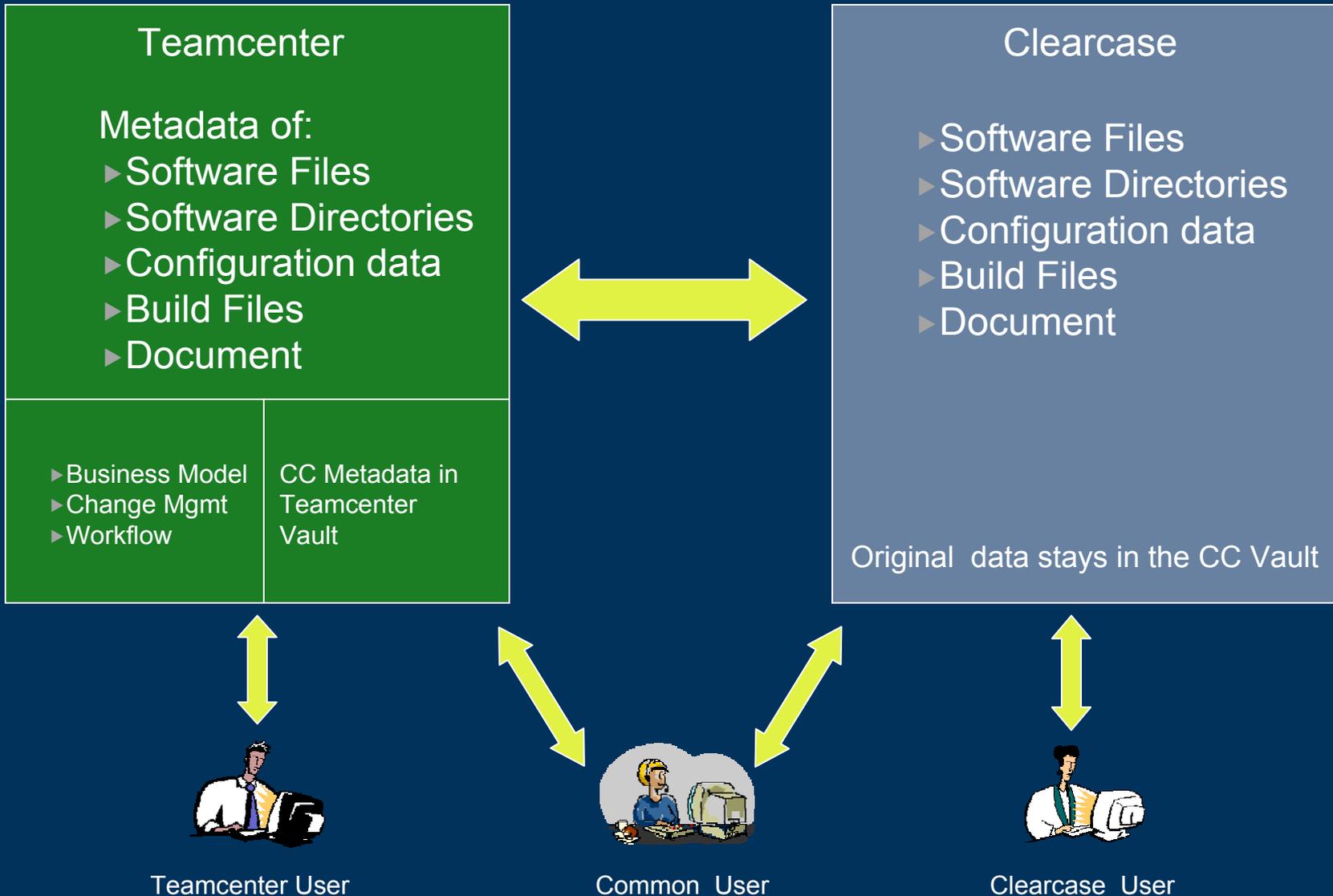


- ▶ Access ClearCase Metadata information from within Teamcenter
 - ▶ Clearcase object is part of product structure
 - ▶ Allows querying and accessing views and VOBs
 - ▶ Get info and update of ClearCase files and directories
 - ▶ Open a ClearCase view and look at the content
- ▶ ClearCase objects can be
 - ▶ Vaulted
 - ▶ Participate in workflow





Teamcenter Clearcase Integration





Overview - Capabilities



- ▶ Relate Clearcase elements to Teamcenter business items
 - ▶ Clearcase data related to view, config spec or label
 - ▶ Teamcenter business items can be part of a product structure
 - ▶ Items can be checked in/out
 - ▶ Items can be part of a work flow
- ▶ Browse Clearcase VOB with Teamcenter UI
- ▶ Administrative
 - ▶ Set up Users
 - ▶ Configure view in Clearcase
 - ▶ Create Items and associate Clearcase Element(s)



Limitations



- ▶ The current user logged in needs to be same as corresponding Teamcenter user.
- ▶ The user won't be able to create any ClearCase artifact from Teamcenter.
- ▶ ClearCase UCM facility will not be available to user through Teamcenter interface.
- ▶ Rich client will only be supported
 - ▶ Web Interface is not be supported.



Create Teamcenter Users



- ▶ ClearCase does not maintain a database of its users
- ▶ Creating the Teamcenter user, the administrator will have to specify the OS user

The screenshot shows the Teamcenter user creation dialog. On the left, there are two tree views: 'Organization' and 'Groups'. The 'Organization' tree shows a hierarchy: Organization > Development > MyGroup > Project Administration > dba > system. The 'Groups' tree shows: Groups > Roles > Users > Persons > Sites > Volumes. The 'Users' group is selected. The main form contains the following fields and controls:

- Person Name: Bhushan Kharabe
- User ID: kharabe
- OS Name: kharabe (circled in red)
- Password: [empty] Clear the password
- Last Login Time: [empty]
- Default Group: Development
- Default Volume: [empty]
- User Status: Active Inactive

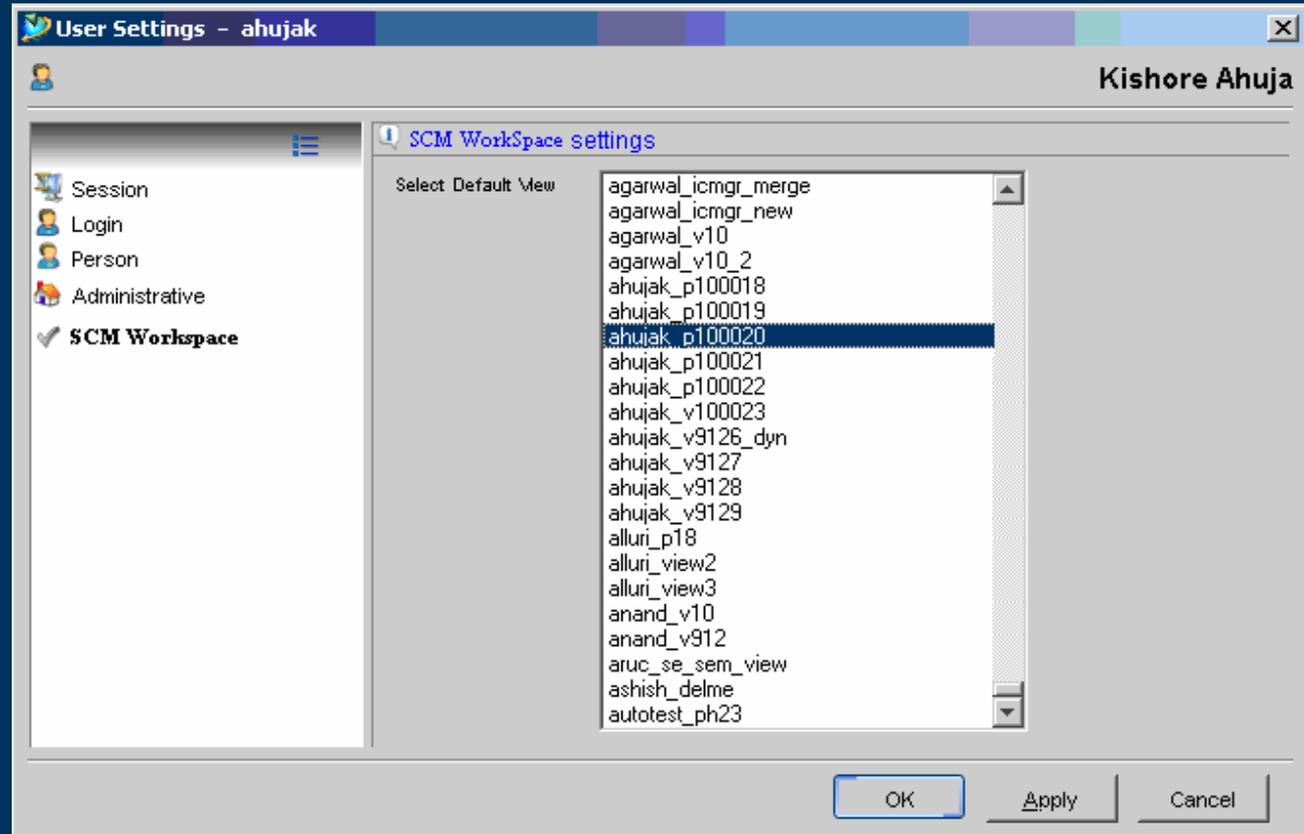
At the bottom, there are four buttons: Create, Modify, Delete, and Clear.



Select ClearCase View



- ▶ In order to access data in ClearCase VOBS, user needs a view
- ▶ Each user will need to select one ClearCase view

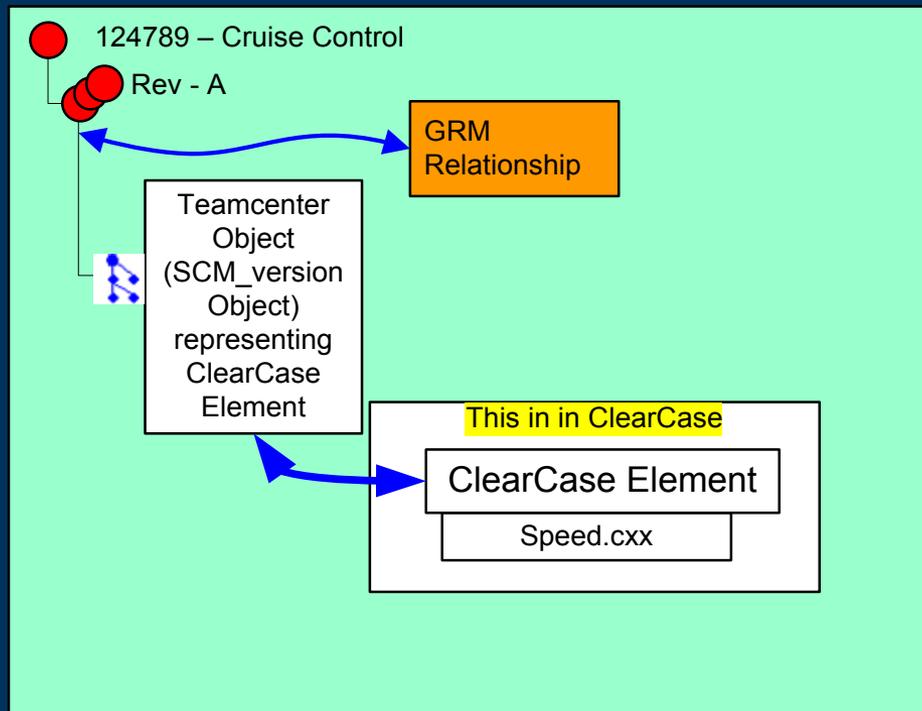




Teamcenter Business Object



- ▶ Teamcenter business objects created in Navigator and PSE can be associated with a ClearCase element(s)





Teamcenter Business Object



A ClearCase element can be associated with these business objects

Teamcenter Business Objects	Operations				Relations	
	Create	Edit	Delete	Cut/Copy/Paste	Associate	Dissociate
Item	Y	Y	Y	Y	SCM_Element_Specification	Remove relation
Item Revision	Y	Y	Y	Y	SCM_Element_Specification	Remove relation
Folder	Y	Y	Y	Y	Contents	Remove relation
Dataset	N	N	N	N	-	-
Form	N	N	N	N	-	-
GDE	N	N	N	N	-	-



Tc/Clearcase Associating Wizard



Select Element - Search for existing element

New SCMVersionObject ✕

Steps

- Select Element
Select Configuration

Select the element that needs to be associated with the Teamcenter object (Search or Navigation of element is through the view selected in user settings):

Use existing element object

Navigate the Vobs

[Search for existing elements](#)

Name

Object	Description	Owner	Group ID
Enter search criteria and press enter.			

< Back Next > Cancel



Tc/Clearcase Associating Wizard



Select Element - Navigate VOBs to get an element

New SCMVersionObject ✕

Steps

- Select Element
Select Configuration

Select the element that needs to be associated with the Teamcenter object by navigating the Vobs (User has the option of using the default view or chose from different view)

Search for existing element

Navigate the Vobs

Navigate the Vobs

Use Selected View Use different view

```
dhoperit_view_pnq
dhoperit_ets_pnq
w2k_x_hottig_v91
snap_pnqauto_v10
udu_test_views
reddysri_v91
vobman_admin
```

< Back Next > Cancel



Tc/Clearcase Associating Wizard



Select Element - Explore VOB to select element

The screenshot shows a dialog box titled "New SCMVersionObject" with a close button (X) in the top right corner. The main title of the dialog is "Select Element". On the left side, there is a "Steps" pane with a tree view containing "Select Element" (selected) and "Select Configuration". The main area of the dialog contains the instruction: "Select the element that needs to be associated with the Teamcenter object by navigating the Vobs". Below this instruction is a list of folders arranged in three columns. The first folder, "adminvob", is selected and highlighted with a blue border. At the bottom of the dialog, there are three buttons: "< Back", "Next >", and "Cancel".

New SCMVersionObject [X]

Select Element

Steps

- Select Element
- Select Configuration

Select the element that needs to be associated with the Teamcenter object by navigating the Vobs

adminvob	integration	pom
applications	ip_autonomy	pom_src
autotest	ip_iona	sap
bhushan_vob	ip_plmxml	schema_compiler
entcc	ip_wolf_app_registry	server_src
gmpdm	ip_xml4c	sml
gnat	j2ee_src	src
gnat_src	java	tool_shed
iman	misc	ug
iman_aix	mrp	ugman
iman_hpp	mrp_src	web
iman_sol	om	web_src
iman_wnti	om_src	
imported_products	oracle	
install	ove	

< Back Next > Cancel



Tc/Clearcase Associating Wizard



Select configuration – Use current view

New SCMVersionObject ✕

Select Configuration

Steps

- Select Element
- Select Configuration**

Select the version of the element that needs to be associated with the Teamcenter object using any one of the following:

- Use current view configuration
- Select Label
- Select Branch
- Select precise version

[Use Current View Configuration](#)

Configuration Rule
element * CHECKEDOUT
element * ../ccintegration_v10/LATEST -mkbranch kharabe_cci_v10
element * P10.0.0.24 -mkbranch ccintegration_v10
element * /main/0



Tc/Clearcase Associating Wizard



Select configuration – select label

New SCMVersionObject ✕

Select Configuration

Steps

- Select Element
- Select Configuration**

Select the version of the element that needs to be associated with the Teamcenter object using any one of the following:

- Use current view configuration
- Select Label
- Select Branch
- Select precise version

Select Label

TRY_P10.0.0.24
HYD_P10.0.0.24
CYP_P10.0.0.23
SDL_P10.0.0.23

Configuration Rule
element * P10.0.0.24

< Back Next > Cancel



Select configuration – Select branch

New SCMVersionObject ✕

Select Configuration

Steps

- Select Element
- Select Configuration**

Select the version of the element that needs to be associated with the Teamcenter object using any one of the following:

- Use current view configuration
- Select Label
- Select Branch
- Select precise version

Select Branch

xp_chu_8110xp_chu_9002
xp_chu_p100015
xp_chu_p100018a
xp_chu_p100018b

Configuration Rule
element * ../xp_chu_8110xp_chu_9002/LATEST

< Back Next > Cancel



Select configuration – Precise version

New SCMVersionObject ✕

Select Configuration

Steps

- Select Element
- Select Configuration**

Select the version of the element that needs to be associated with the Teamcenter object using any one of the following:

- Use current view configuration
- Select Label
- Select Branch
- Select precise version

Select Precise Branch

- aie_im_test.cxx@@\main
- aie_im_test.cxx@@\main\0
- aie_im_test.cxx@@\main\ai_e_se
- aie_im_test.cxx@@\main\ai_e_se\3

Configuration Rule
main\ai_e_se\3

< Back Next > Cancel



Completion screen of element selection

New SCMVersionObject ✕

Selected Element and Configuration

Seps	
Select Element	You have selected the following element and configuration, please select finish to complete associating this SCM element with Teamcenter object.
Select Configuration	

Selected Element

Selected Configuration Rule
element * ../xp_chu_8110xp_chu_9002/LATEST

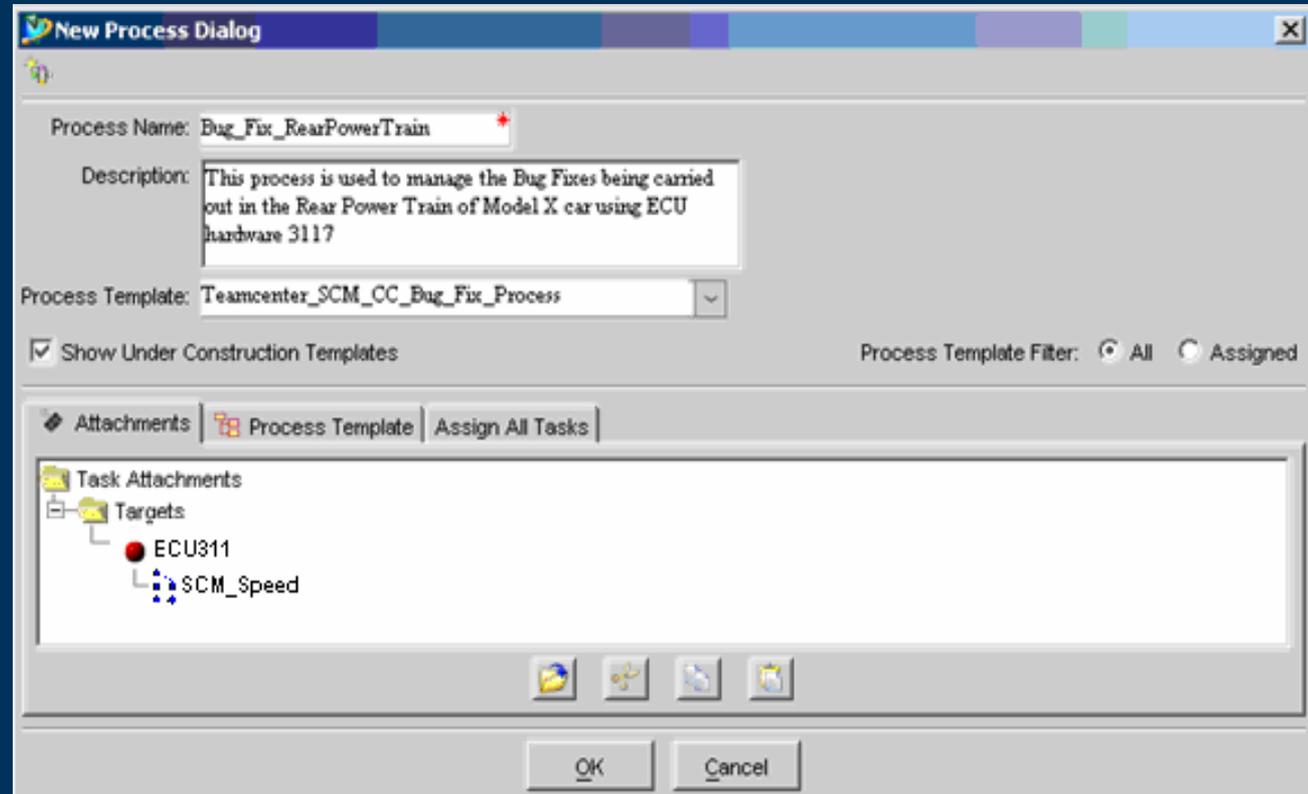
< Back Finish Cancel



Creating a Workflow Process



- ▶ Define a Workflow process that represents your software development process
- ▶ Associate ClearCase data with Teamcenter business objects,
- ▶ ClearCase data can participate in your Workflow processes indirectly





Check out Teamcenter Object



- ▶ You can place a check out lock on the Teamcenter object and or the ClearCase object

The screenshot shows a dialog box titled "CheckOut" with a standard Windows-style title bar. The dialog contains the following elements:

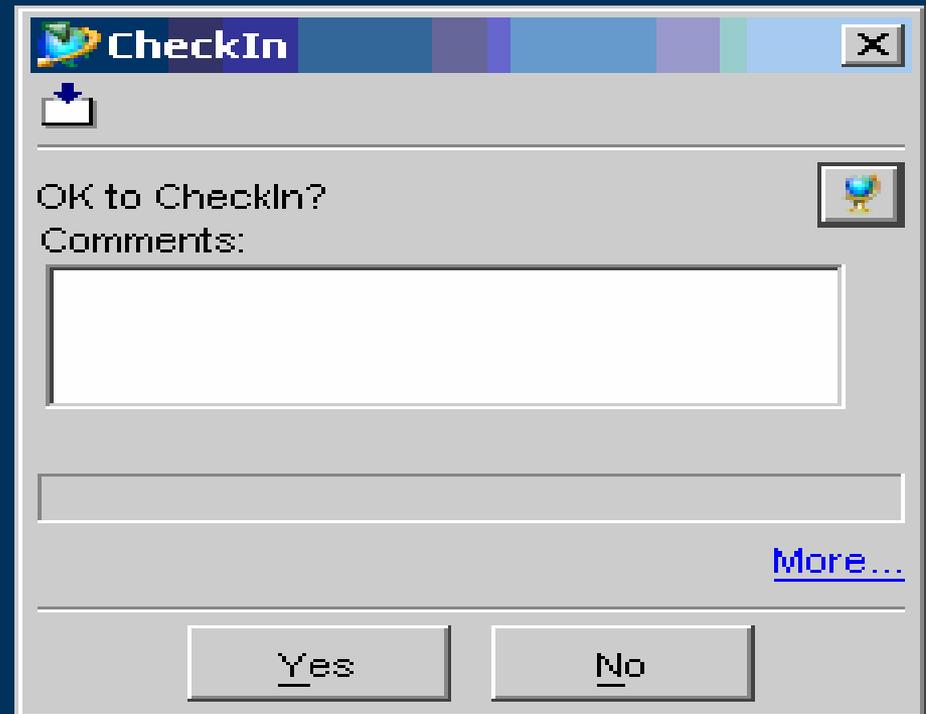
- A "Change ID:" label followed by a text input field.
- A "Comments:" label followed by a larger text area.
- A checked checkbox with the label "Check out ClearCase Element as well".
- The text "OK to CheckOut?" followed by a small globe icon.
- A horizontal line with a "More..." link on the right side.
- At the bottom, two buttons labeled "Yes" and "No".



Check in Teamcenter Object



- ▶ You can check in the Teamcenter object and/or the ClearCase object





Teamcenter Clearcase Integration



- ▶ Tc Engineering
 - ▶ Available Tc 2005 SR1 (V10.0.1) 6/06
 - ▶ ClearCase Release 2002.05.00.

- ▶ Supported on all the platforms that Teamcenter currently supports
 - ▶ Windows
 - ▶ All major flavors of UNIX (HP, Sol, AIX)



Summary



- ▶ Relate Clearcase elements to Teamcenter business items
 - ▶ Clearcase data related to view, config spec or label
 - ▶ Teamcenter business items can be part of a product structure
 - ▶ Items can be checked in/out
 - ▶ Items can be part of a work flow
- ▶ Browse Clearcase VOB with Teamcenter UI
- ▶ Administrative
 - ▶ Set up Users
 - ▶ Configure view in Clearcase
 - ▶ Create Items and associate Clearcase Element(s)



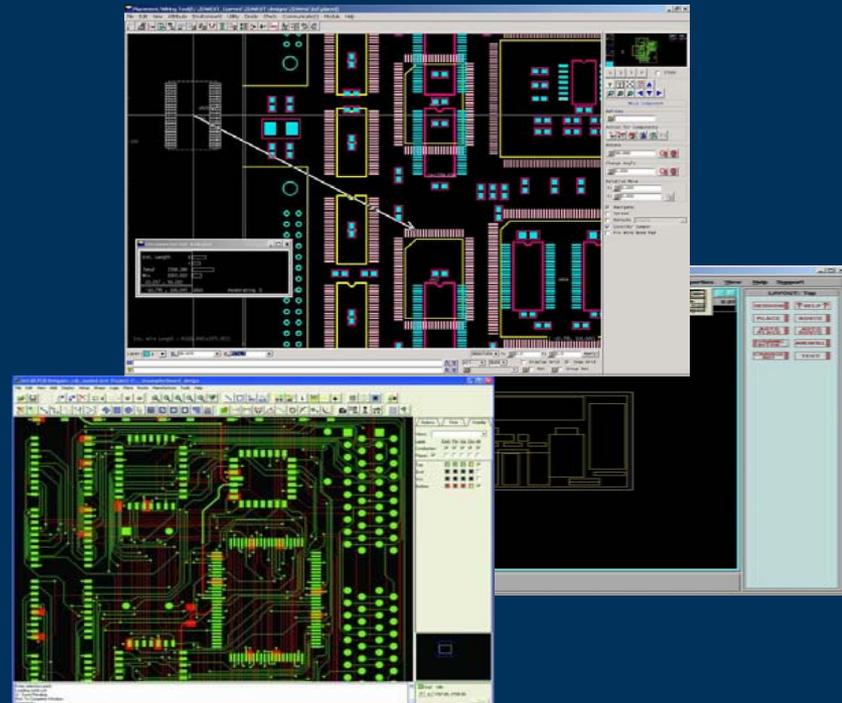
PCB Tool Supported in Tc2005 SR1



- ▶ Supported schematic capture and board layout:
 - ▶ Cadence Allegro Flow
 - ▶ Design Entry HDL 210 / 610 or CIS 210 Release SPB 15.5
 - ▶ PCB Design 220 / 610 Release SPB 15.5
 - ▶ Mentor Board Station Flow
 - ▶ Design Manager EN2004

Future

- ▶ Cadence Orcad Flow
- ▶ Mentor Expedition Flow (Veribest)
- ▶ Mentor PADs Flow
- ▶ Protel
- ▶ Zuken System Designer (CR5000)





Embedded Software Manager



► Its mainly about -

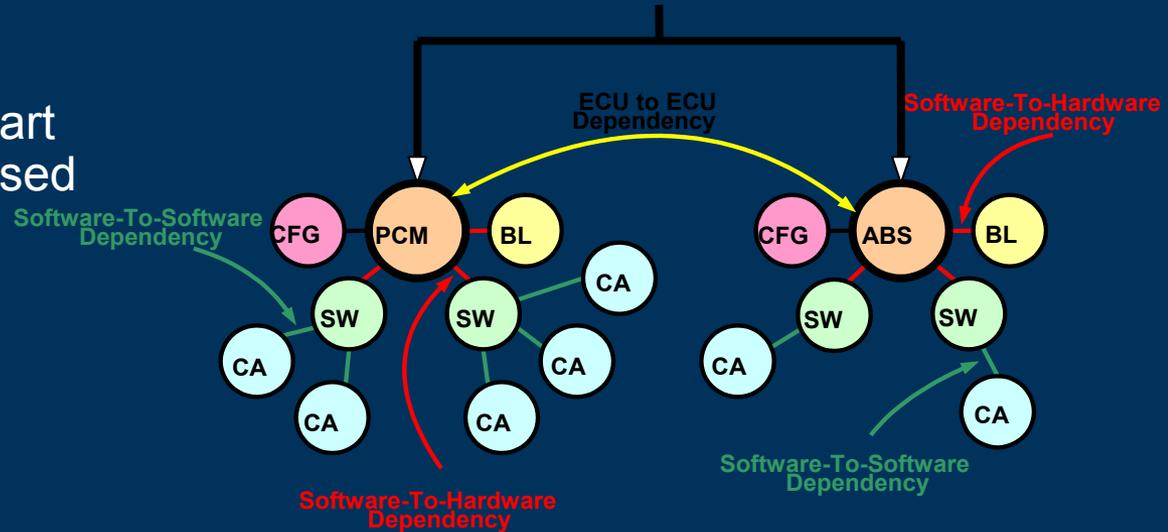
► Managing Software as a part after they have been released

- Revisions, Workflows, Configuration, Change Management etc.,

► Managing Dependency

- ECU to ECU
- Software to Software
- Software to ECU

► Giving companies the ability to know what in service software goes with specific ECU's and the relationships with other software modules



Item	Item
000008/A-VehicleAssembly (view)	Item
000010/A-PC-ECU (view)	Item
000017/A-PC-Calibration	Calibration
000018/A-PC-Bootloader	Bootloader
000020/A-PC-Configuration	Configuration
000021/A-PC-AppSoftware	AppSoftware
000036/A-PC-AddOnAppSoftware	AppSoftware
000047/A-PC-ECU-Hardware (view)	Item
PC-ECU-SourceInterfacePort.1	Connection_Terminal
WheelSpeed-SourcePort.1	Connection_Terminal
WheelSpeed-SourcePort.2	Connection_Terminal
WheelSpeed-SourcePort.3	Connection_Terminal
WheelSpeed-SourcePort.4	Connection_Terminal
PC-ECU-TargetInterfacePort.1	Connection_Terminal
PC-ECU-DummyPort.1	Connection_Terminal
WheelSpeed-TargetPort.1	Connection_Terminal
WheelSpeed-TargetPort.2	Connection_Terminal
WheelSpeed-TargetPort.3	Connection_Terminal
WheelSpeed-TargetPort.4	Connection_Terminal
PC-Processor	Processor
000011/A-ABS-ECU (view)	Item
000050/A-ABS-AppSoftware	AppSoftware
000051/A-ABS-Bootloader	Bootloader
000052/A-ABS-Cal	Calibration
000053/A-ABS-Config	Configuration
000054/A-ABS-ECU-Hardware (view)	Item
ABS-ECU-InterfacePort.1	Connection_Terminal
WheelSpeed-SourcePort.1	Connection_Terminal
WheelSpeed-SourcePort.2	Connection_Terminal
WheelSpeed-SourcePort.3	Connection_Terminal
WheelSpeed-SourcePort.4	Connection_Terminal
AE-Processor	Processor
000029/A-CAN-Connection	Connection
000030/A-WheelSpeed-CAN-Frame (view)	Frame
000031/A-FLWheelSpeed	Signal
000032/A-FRWheelSpeed	Signal
000048/A-RLWheelSpeed	Frame
000049/A-RRWheelSpeed	Frame
000042/A-CAN-ConnectionBundle	Item



Questions?





- ▶ Product Management
 - ▶ Carl Megelich
 - ▶ Tel: 508.801.4504
 - ▶ Email: megelich@ugs.com



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- Thank you