Hello folks

Thanks for joining me today; my name is Scott Claes. In our session today we will discuss the changes/improvements in the ECAD data model and show how we can implement ECAD data storage in PDMLink.

Before we start – a little bit on my background

I'm an EE and I have worked in the industry for 20 years doing board design and obtaining my EE degree.

@ Chrysler for 14 years doing design, project management, etc.

Involved with changes to ECAD tools; selection.

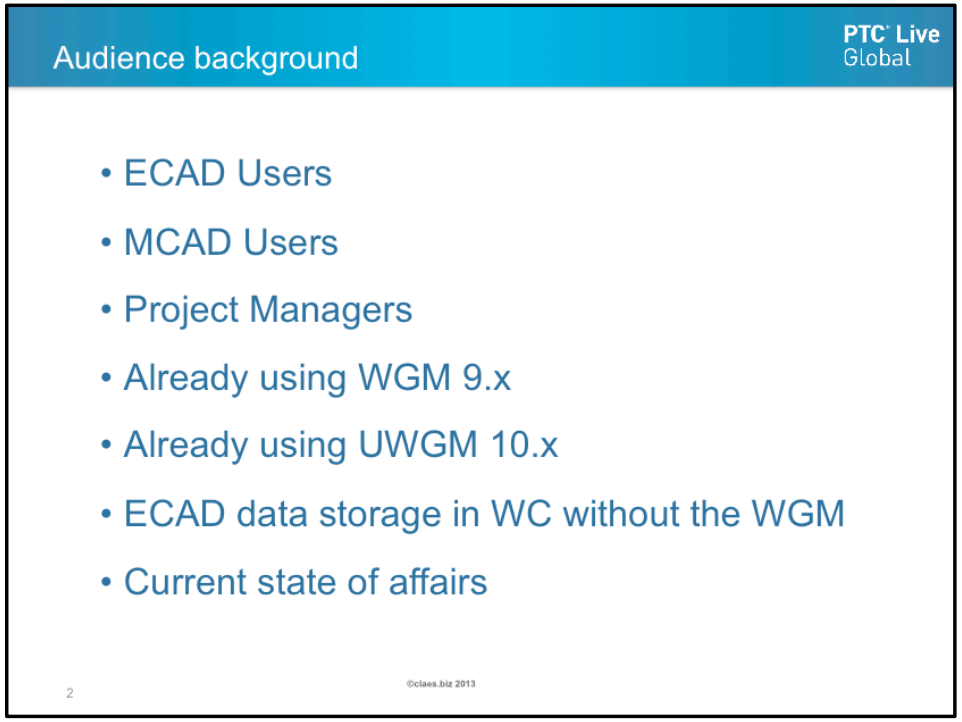
Built designs from test equipment to engine and transmission controller designs built in Huntsville AL. Their production lines produced 62K units/day.

4 years @ PTC

3 years as an independent services consultant configuring ECAD data to be used in PDMLink.

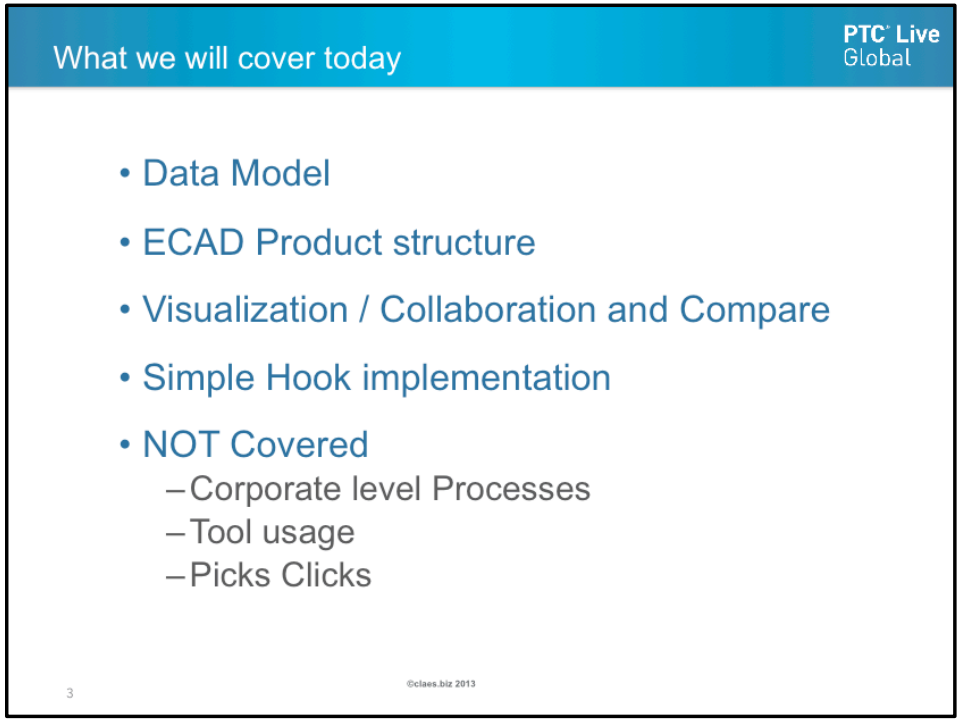
Currently I'm engaged with several US customers and I have experience in in many aspects of PLM implementation including business requirements capture, implementation, configuration, and training.

You can see my history on my linked in page: www.linkedin.com/pub/scott-claes/1/207/738/



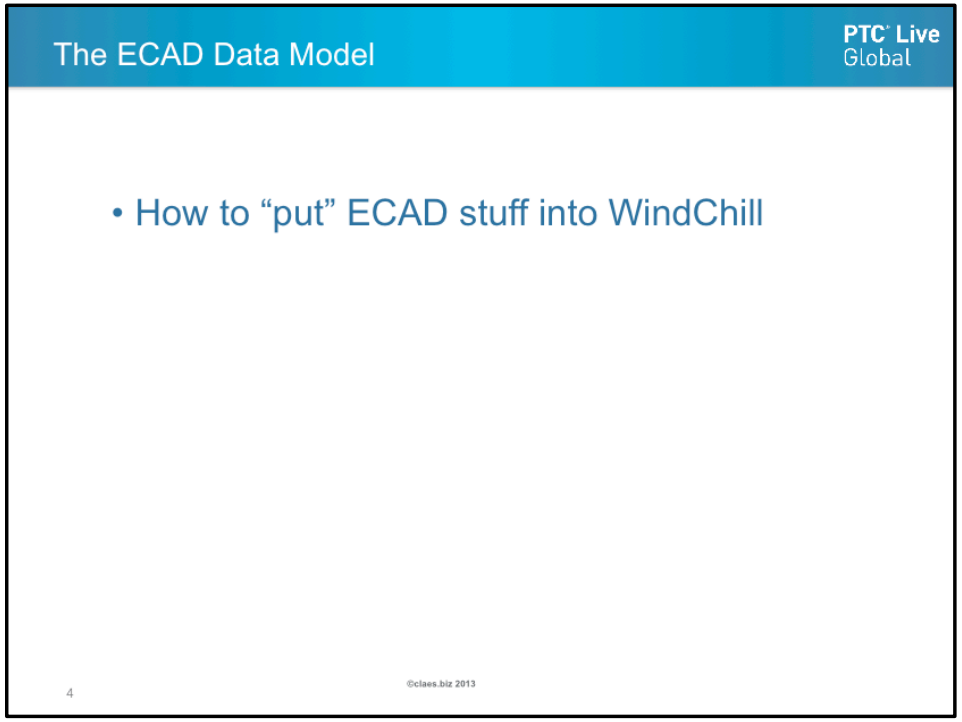
Ask – How many of each
Can we do a survey of the room? Hands for # of ECAD users

How many others are already using the WGM?
Anyone storing data without the WGM?



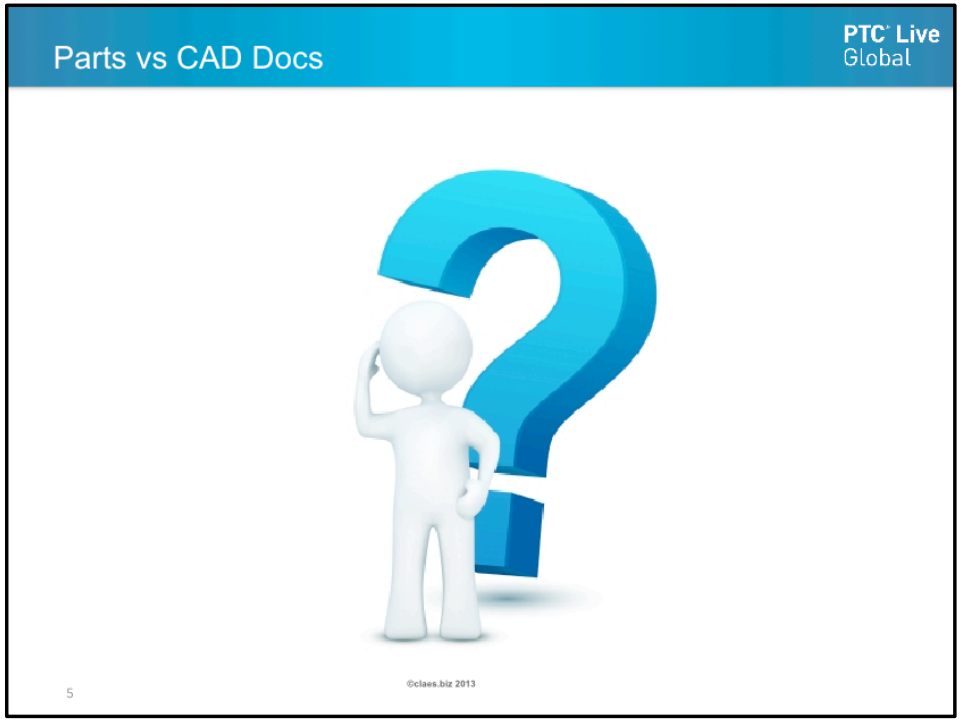
Several other aspects of WGM usage could be discussed here
Today we will focus on the data model created when checking data in with the WGM
Applicable to all V10 implementations

By the end of my presentation you will know
The capabilities that ECAD data in WindChill brings to us

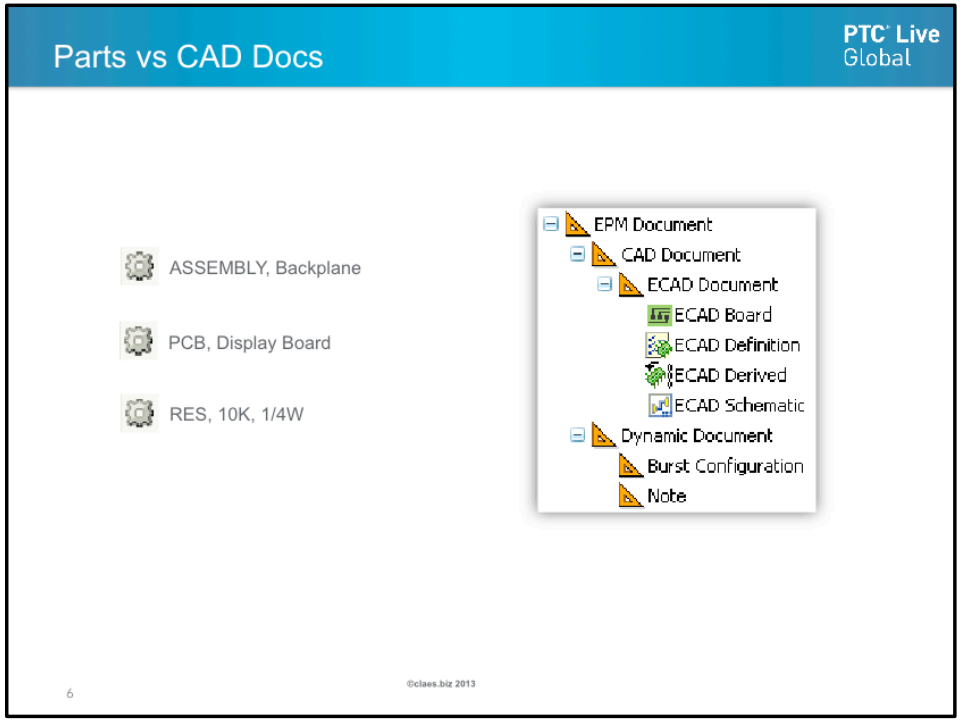


In our presentation today, I’m assuming you are here to gain an understanding of “how to put stuff in WC”
In many cases I’ve seen this occur as a result of MCAD / Wchill relation ship becoming mature and the organization is looking to become more efficient in other design areas.
I’m assuming we are at the point where we need to at least store data in Wchill.
So lets cover a bit of background
One great advantage of storing CAD data in the PLM system is to attain
Holy grail; “ product structure” from the schematic

ECAD users should leverage MCAD existing processes, knowledge, and workflows where ever possible
Typically MCAD processes and workflows can be used
Since ECAD isn’t usually too familiar with what’s needed to attain this goal.
Lets cover a bit of TERMINOLOGY

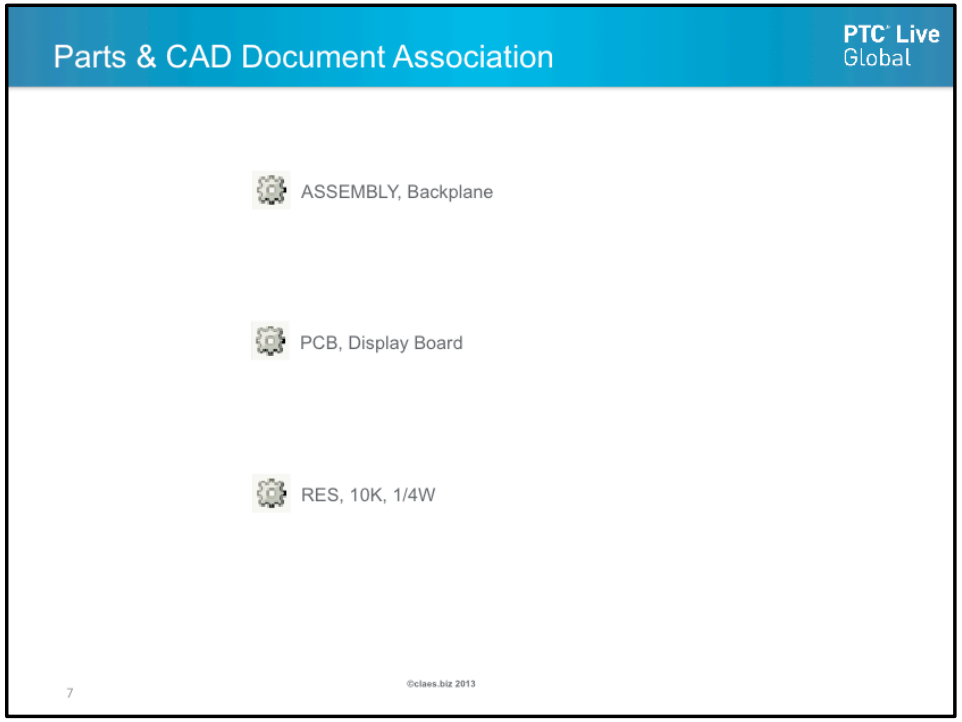


What is a WTPart?

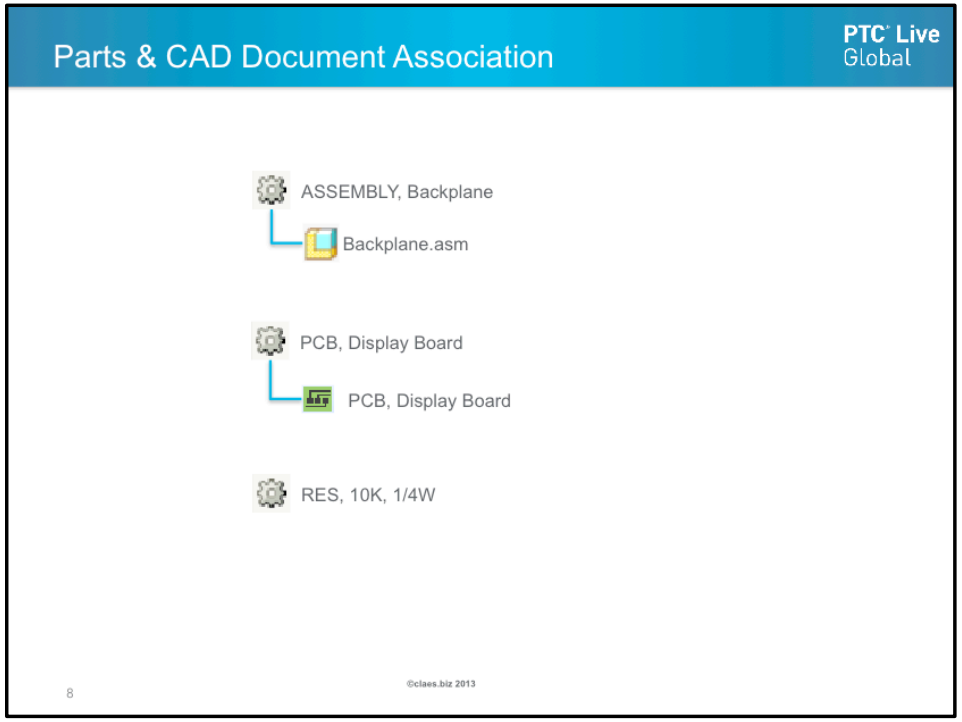


WTParts are objects to build product structures. They are associated with any object type in Windchill and do not contain CAD Documents objects, but reference the CAD documents. WTParts can also reference each other in a hierarchy called the product structure. They are symbolized in Windchill by a gear icon.
CAD documents contain CAD data; In the MCAD space we see CUBE icon. For ECAD we have a few special Icons to help us identify them.

The WTPART is the record master



The MCAD case is usually pretty simple.
The ECAD case has a few variations that we will discuss more as we go on.
For now, note that there is the possibility of multiple objects driving the information contained in the WTpart.



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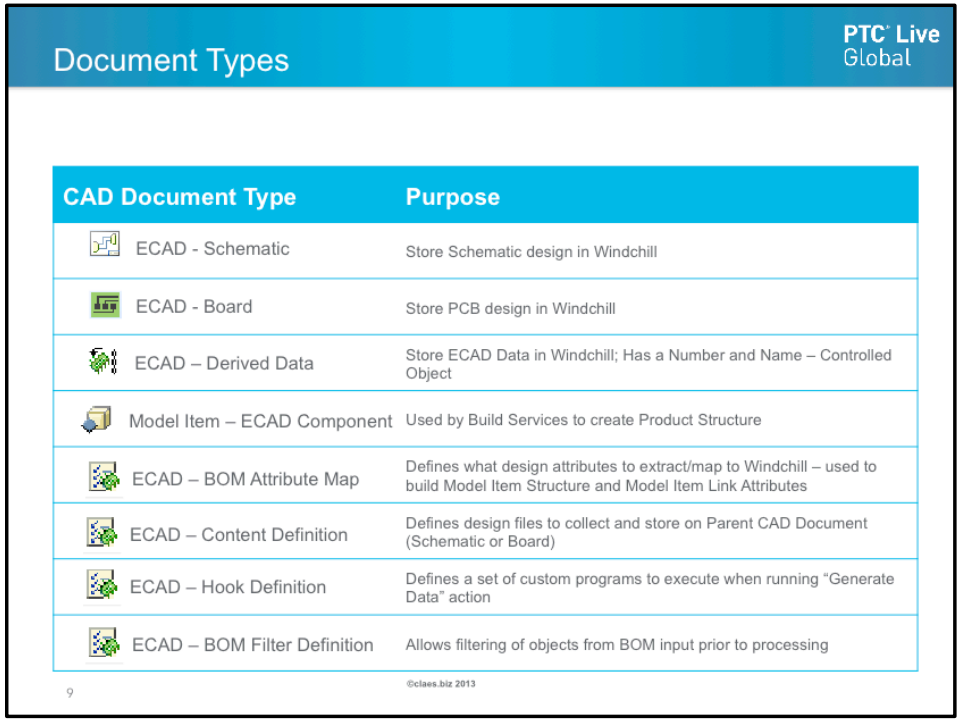
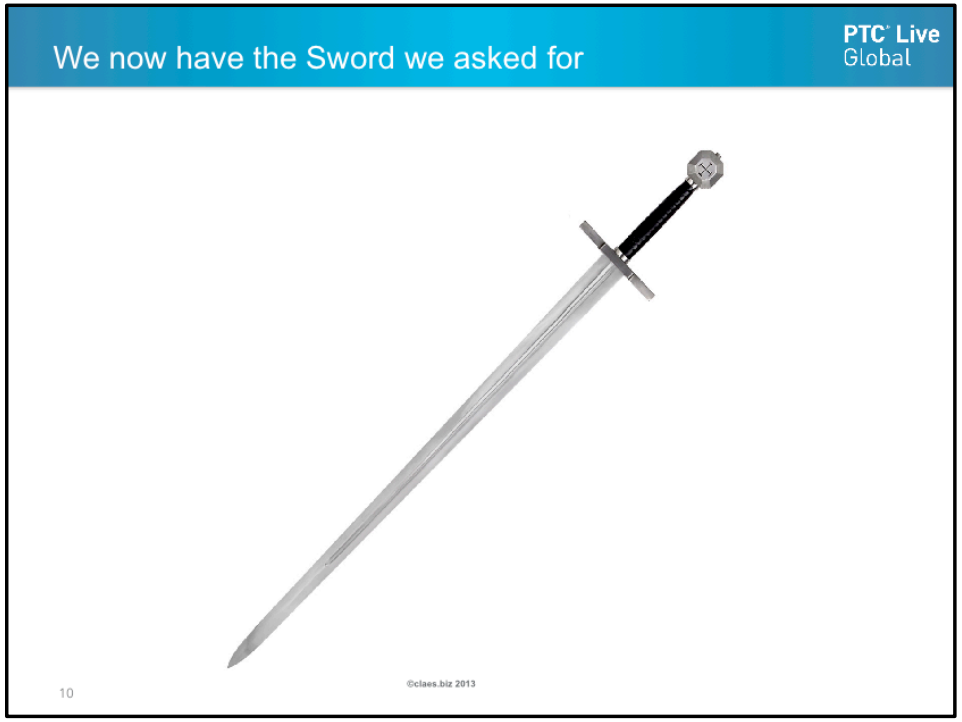


This is the important part; here are the new cad document types known and understood by PDMLink that apply to our ECAD data

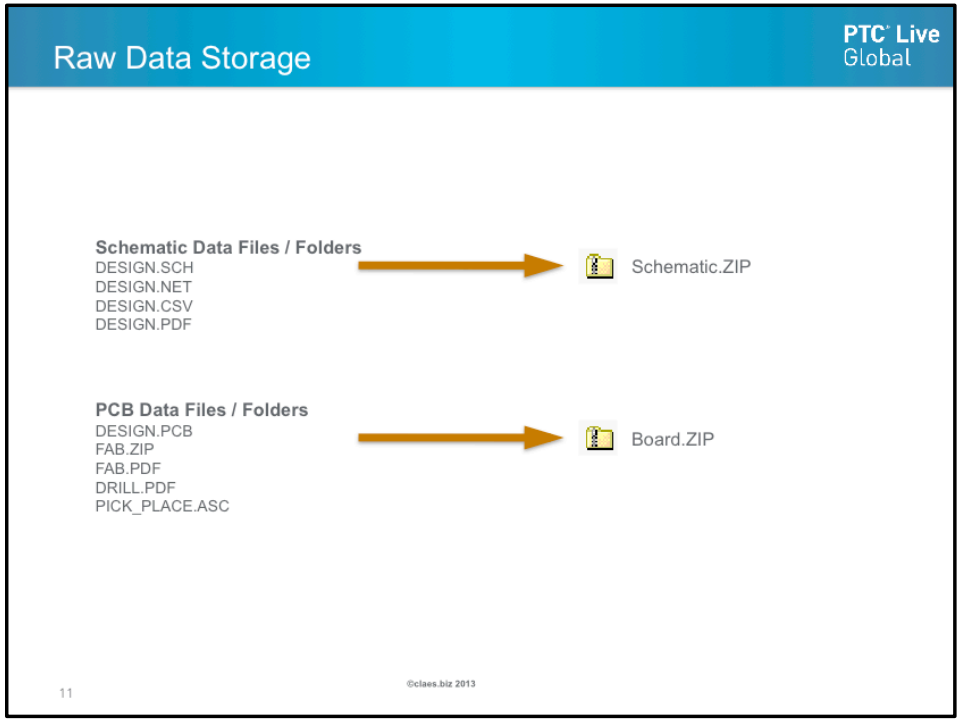
All of these objects are created and managed with the Unified Workgroup Manager

ECAD Derived object has it's own unique name and number; and is also version controlled and contains a workflow

The bottom group of four objects are content definition objects – used to create and define configurations of the ECAD data

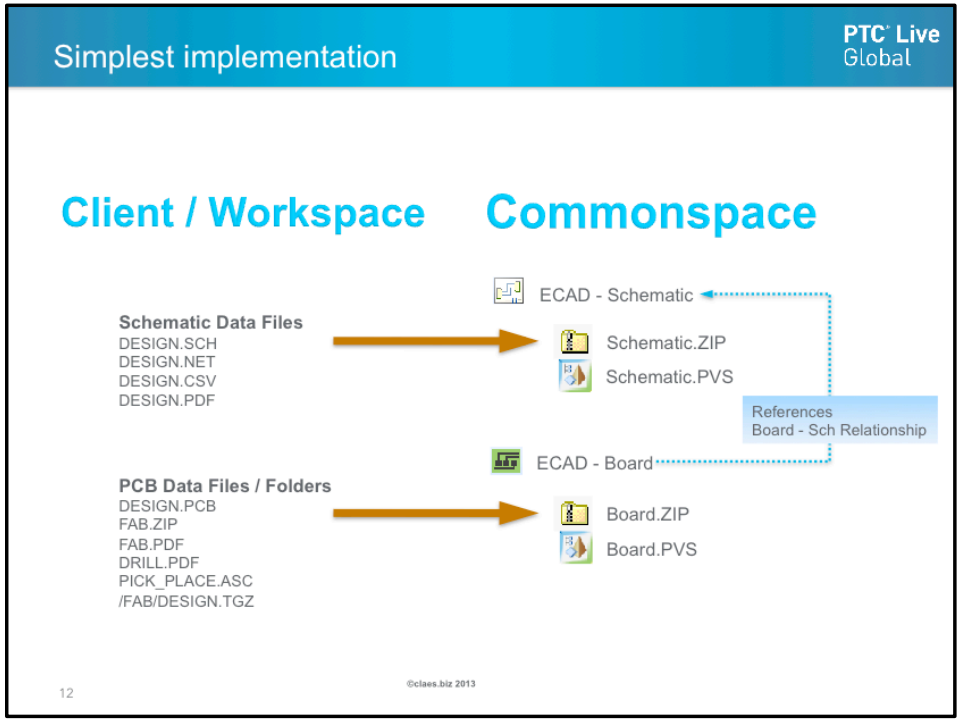


It’s big and shiny and can do lots of damage since it’s double edged.
Good because we can discretely manage and change all of the elements that we want.
For example independently revise the board, without revising the schematic.
Bad because there are a lot of things we can configure.



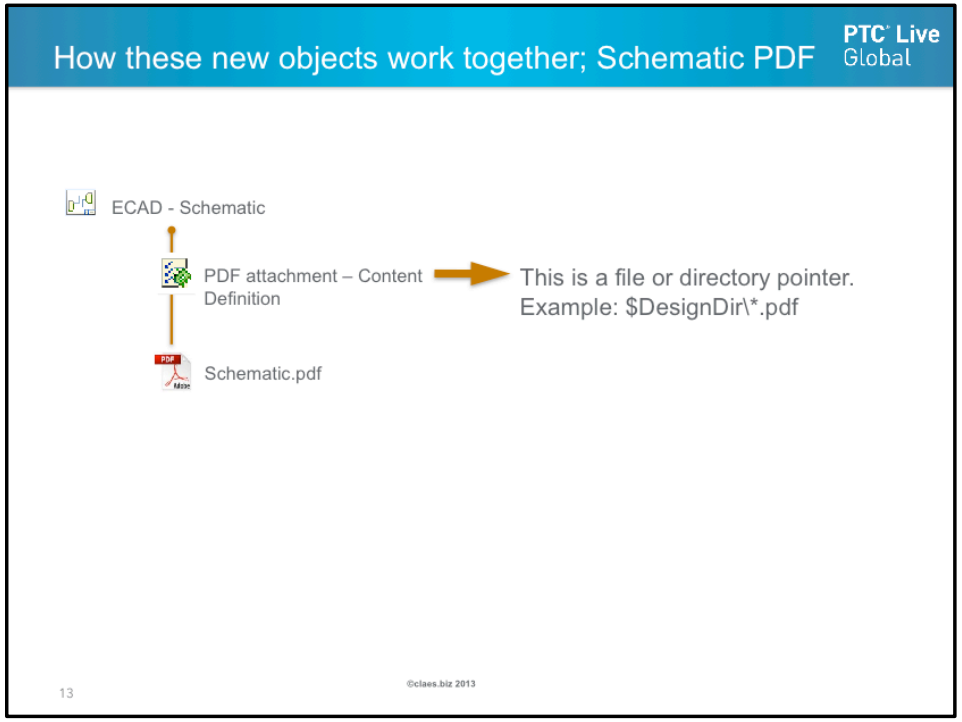
Raw data storage is conceptually unchanged; we are zipping two directories of data into separate schematic and board content.

Auto created on checkin process



1st implementation = simplest

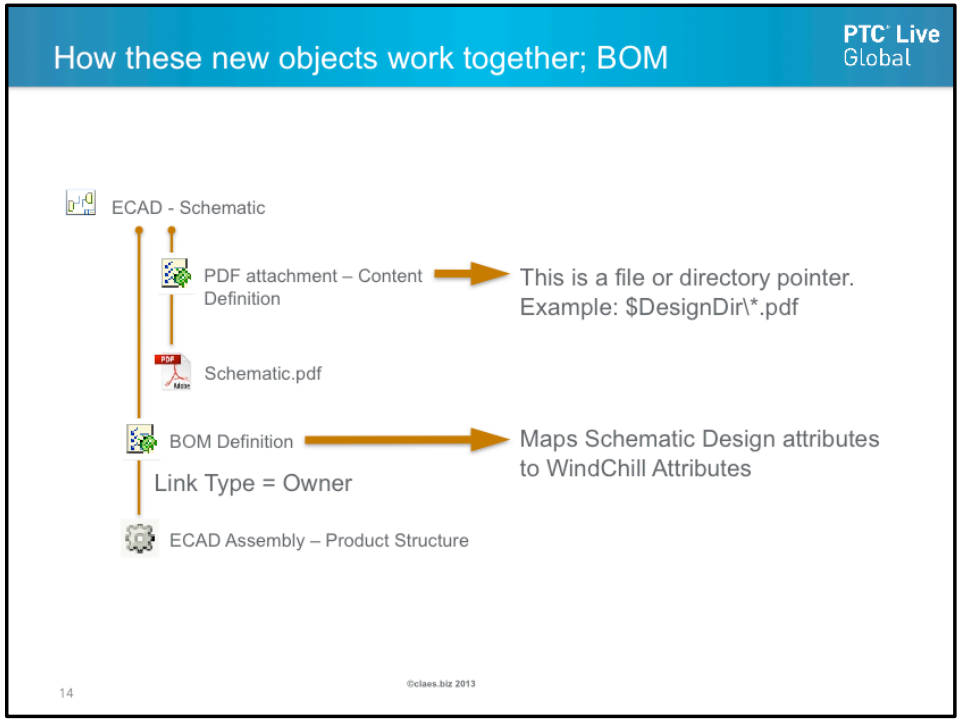
In the simplest implementation with no configuration, we see these relationships created.
The Board references the Schematic
All of this replaces the “shared” drive – but is really the same concept
Beyond what we see here; EVERYTHING is a configuration



Schematic Definitions

We have decided we need a PDF file attached to the schematic – reason irrelevant; this is just an example of a file attachment. Though, it is a realistic / common event.

Content definition holds a pointer to the data; it is attached to the schematic. On data import or generate the file is loaded; then it is put in the common space when checkin occurs.

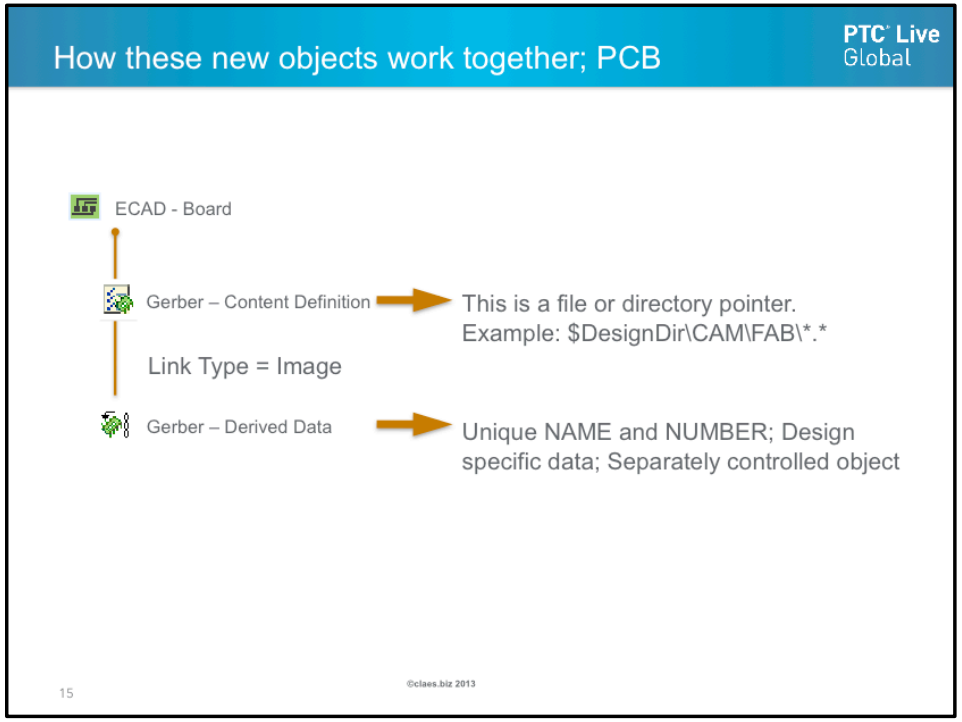


BOM definitions

Here we have defined the schematic attributes to be used to populate the BOM or Product structure

Part Number; Description; Reference Designation are minimally required – additional attributes can be configured.

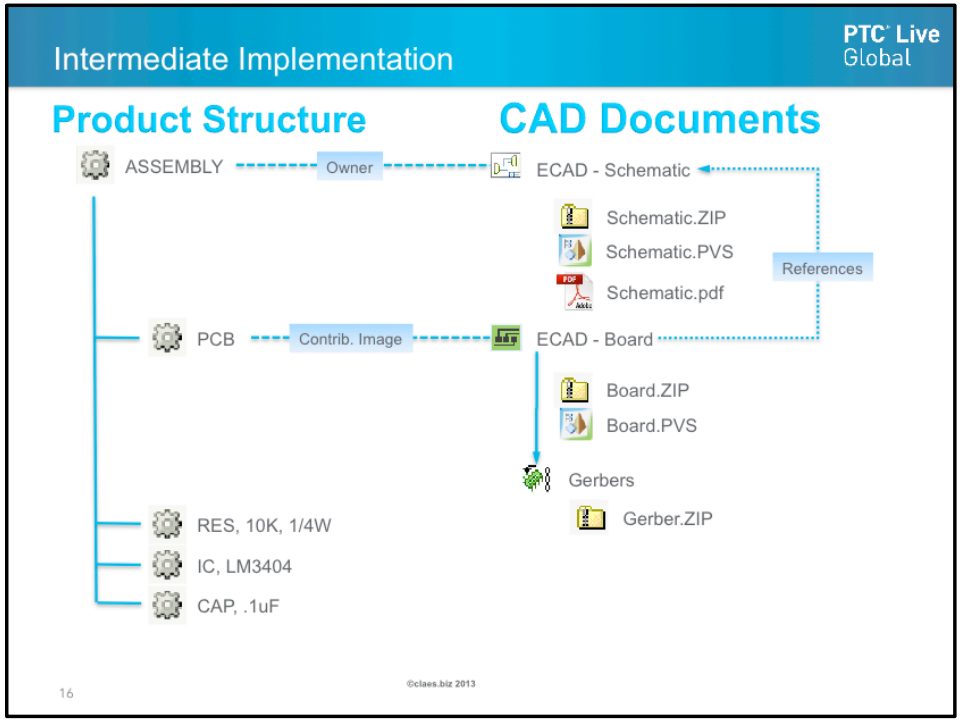
Note that we store these definition objects in a Library for reuse.



OR content definitions

We would like Gerber data created each time on checkin

This form of content definition attached to a derived data object, makes us aware that upon a change to the primary data, the derived data should be updated.



2nd implementation; intermediate.

If we added in the configurations just discussed, we would have an intermediate level of configuration and implementation.

Back to our discussion of the double edged sword;

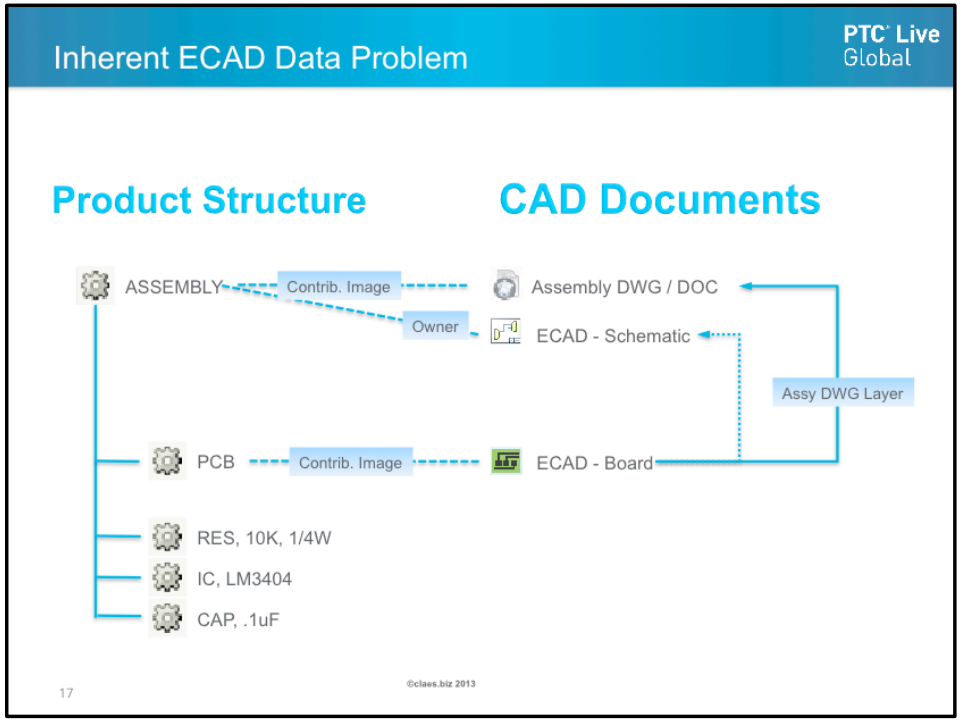
This configuration requires decisions on how off the shelf ECAD parts will be created and maintained in the system.

How New parts (NPI) will be done etc

If these processes require changes, redefinition, or even new creation from scratch ….

You begin to see why business scoping discussions are important prior to the development of your approach to data storage implementation.

And, also why it is very difficult for me to answer the question, as an experienced implementer, as to “how long will this take?”

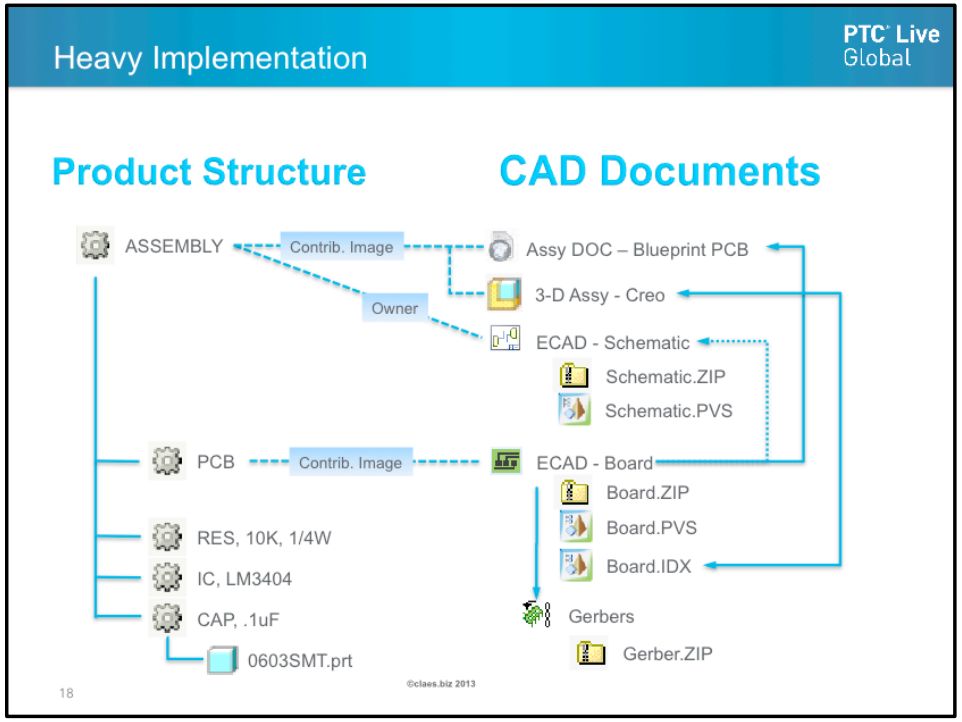


In order to discuss a complete implementation we need to discuss the inherent problem that exists in most all ECAD datasets.

Essentially ECAD software vendors don't structure their datasets in a way that readily accommodates PLM needs.

We would like to have a product structure – so we extract that data from the schematic.

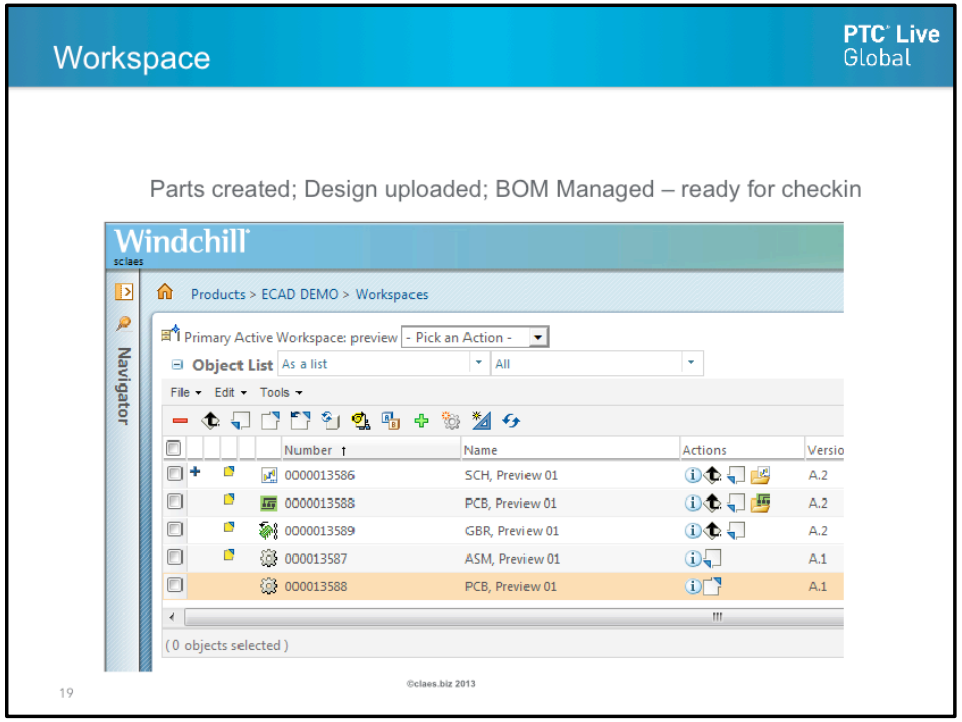
But – the board dataset holds the assembly data in one of the layers.



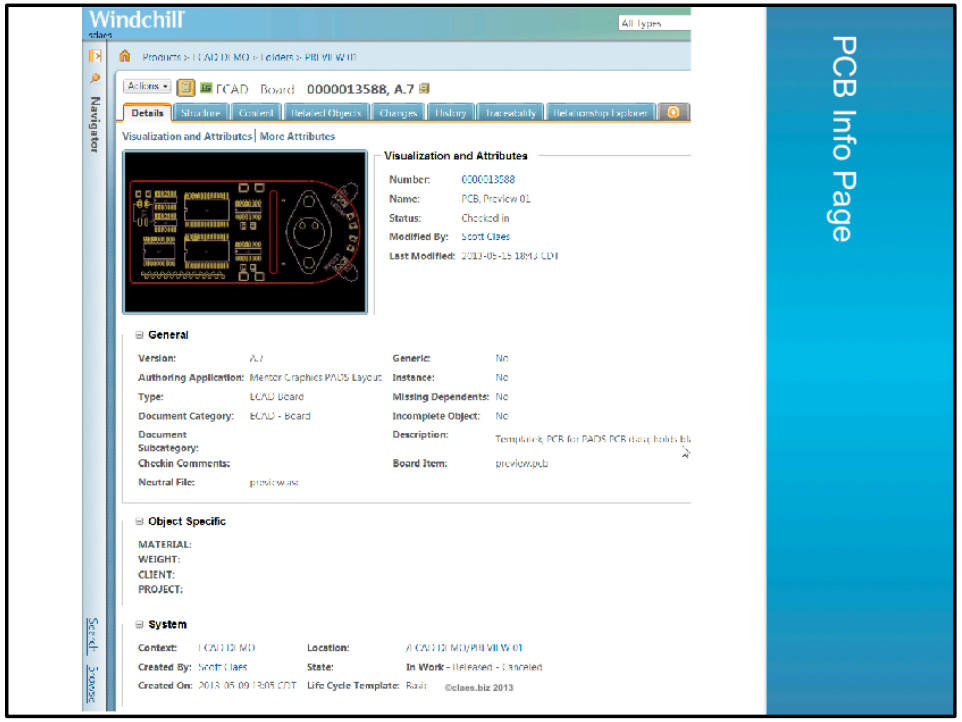
3rd solution

The PTC solution for this is to allow the optional use of Blueprint PCB data files to be the primary cad objects associated with the Assembly WTPart.
The WGM will also manage CAM350 data as a CAD document if needed.

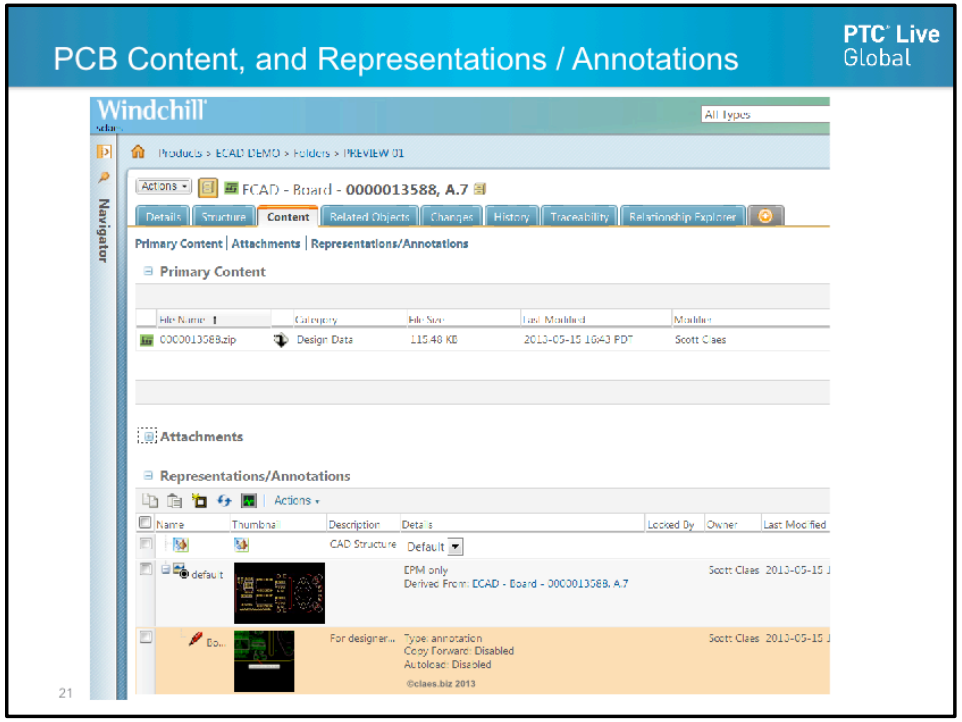
I am also showing here the IDX file and it's association to the 3-D assembly



Now let's look at some actual design data in the Windchill and WGM environment
More edges to the sword
Workspace usage is implemented with the use of the Unified Workgroup Manager

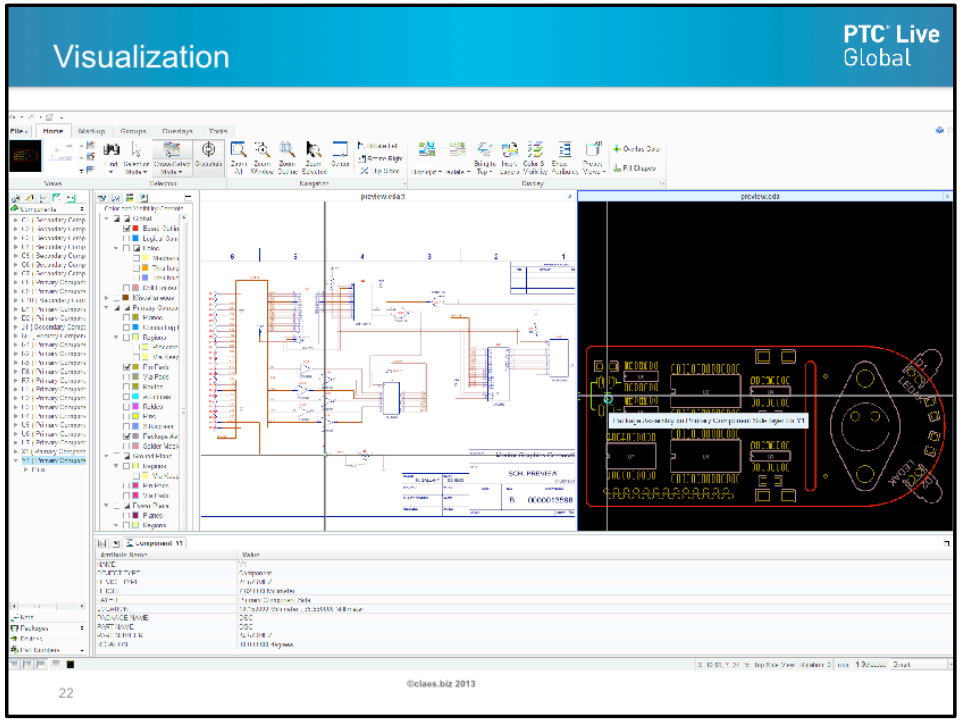


Here we observe the ECAD Board design data details page
The thumbnail of the visualization is apparent along with the detailed design information



Viewing the content tab

We see the design data zip file as well as the visualization representation and any annotations or markups associated to it.



The Creo ECAD view is a great visualization tool; assisting in collaboration and comparisons of ECAD data without the consumption of an ECAD tool license.

PCB Related objects

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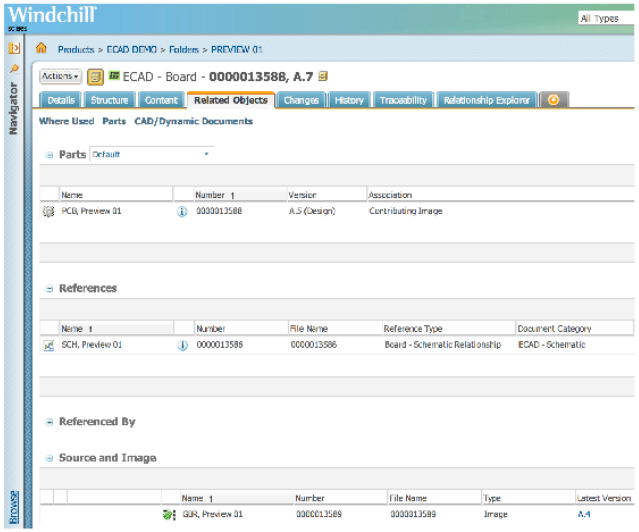
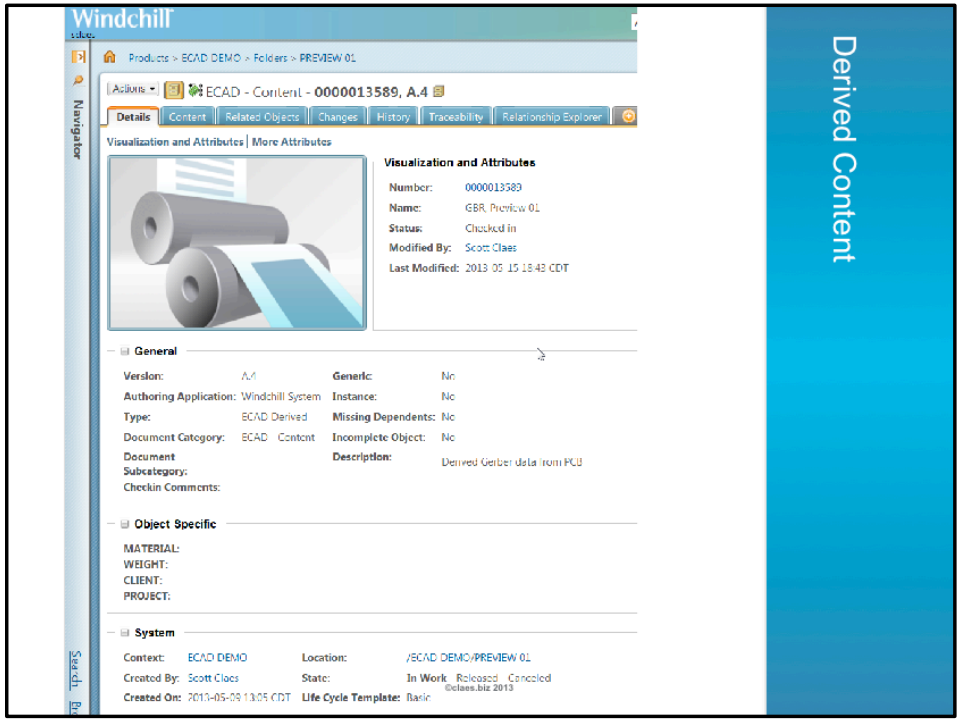
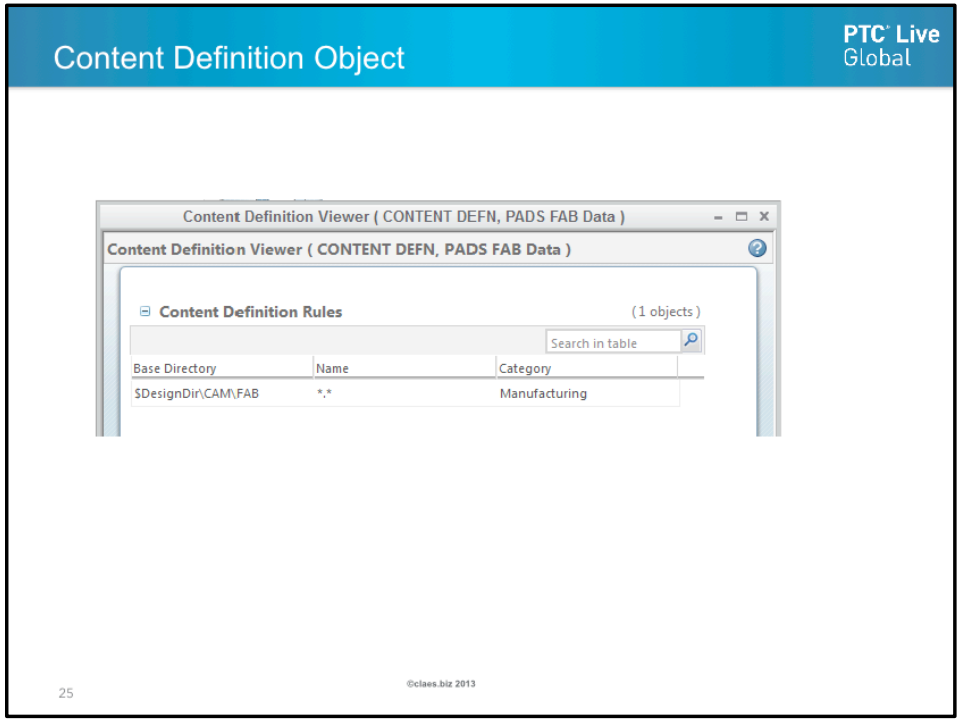


Note that the related objects to the board are of course the WTPart and the board REFERENCES the Schematic. The board is also the source of the GBR Derived object.



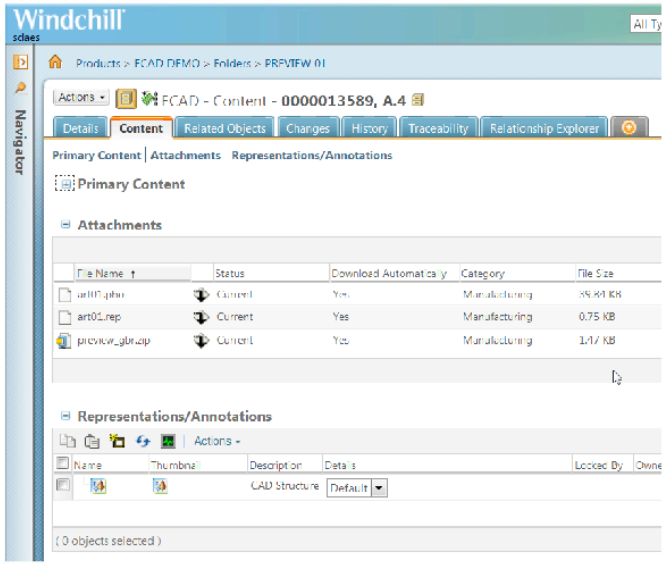
Looking at the GBR derived object, we see the details of it's information



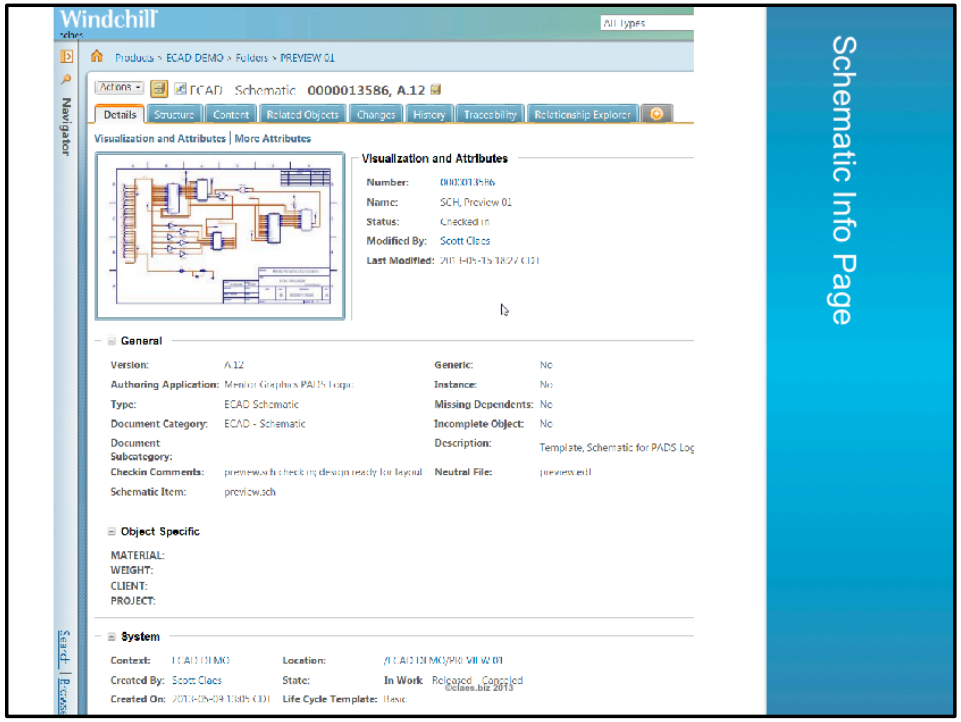
Here we see the actual content definition that was used to attach these files to the Derived Gerber object

Derived Content - displayed

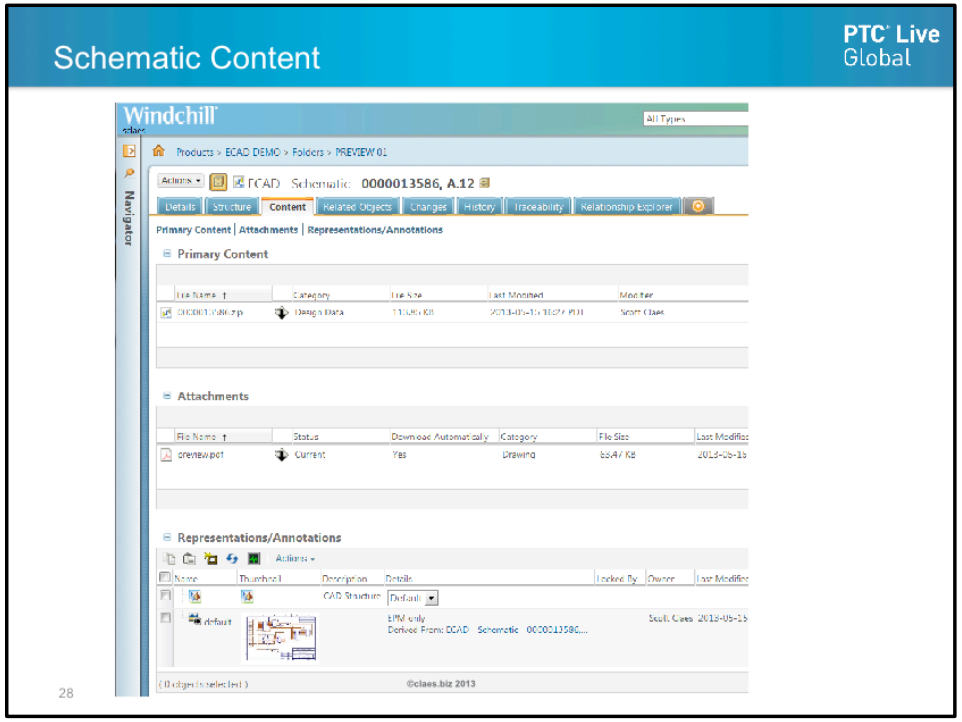
PTC Live Global



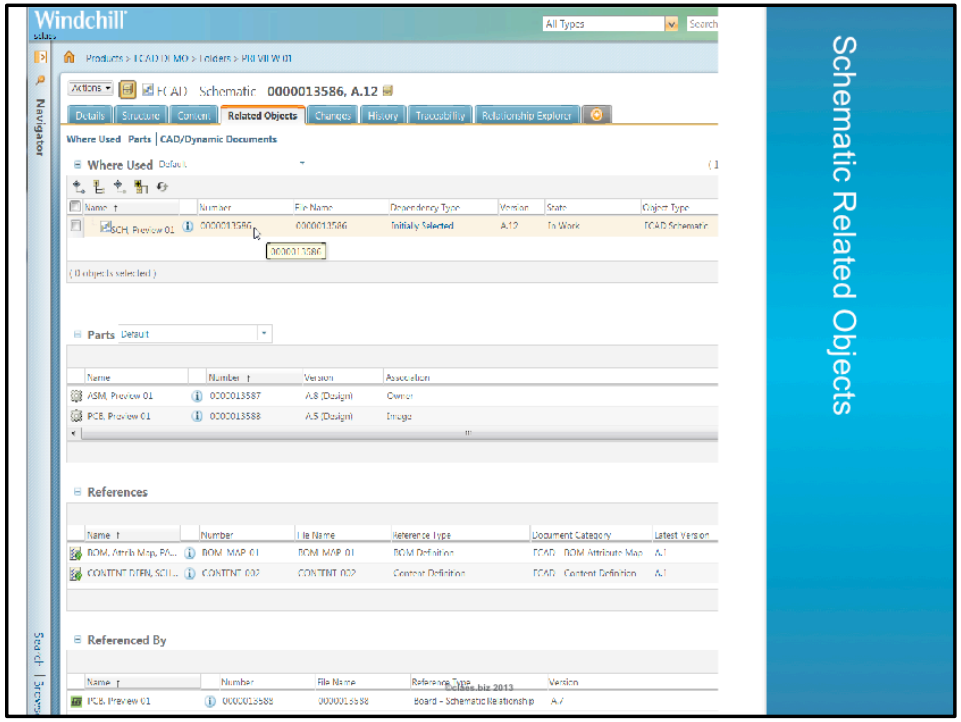
As well as the attached contents



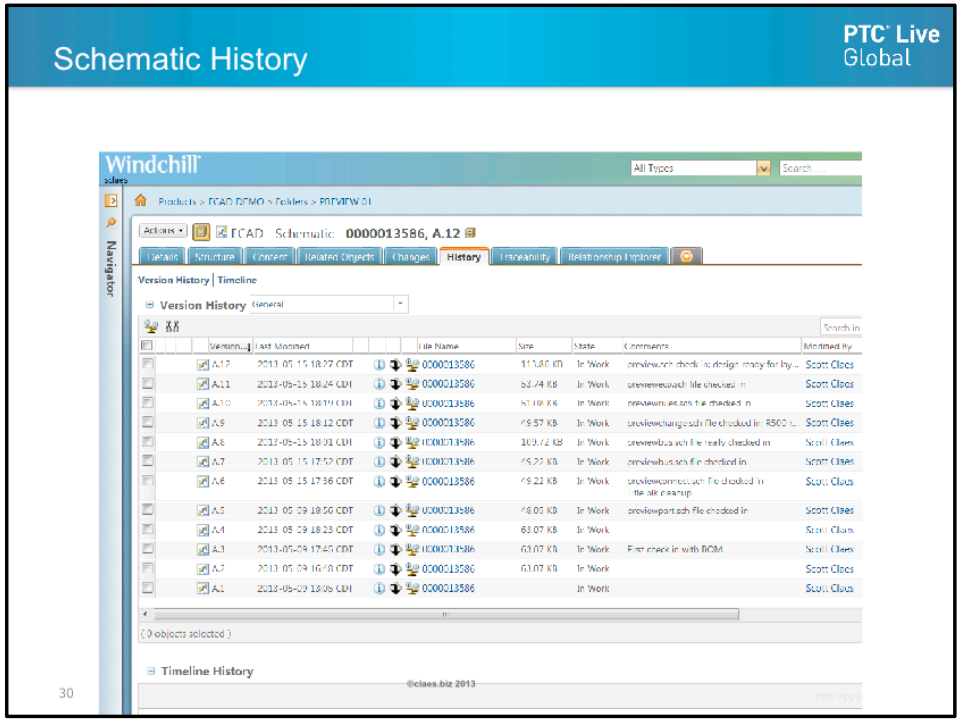
Next
Looking at the schematic info page
We see the visualization thumbnail and associated details



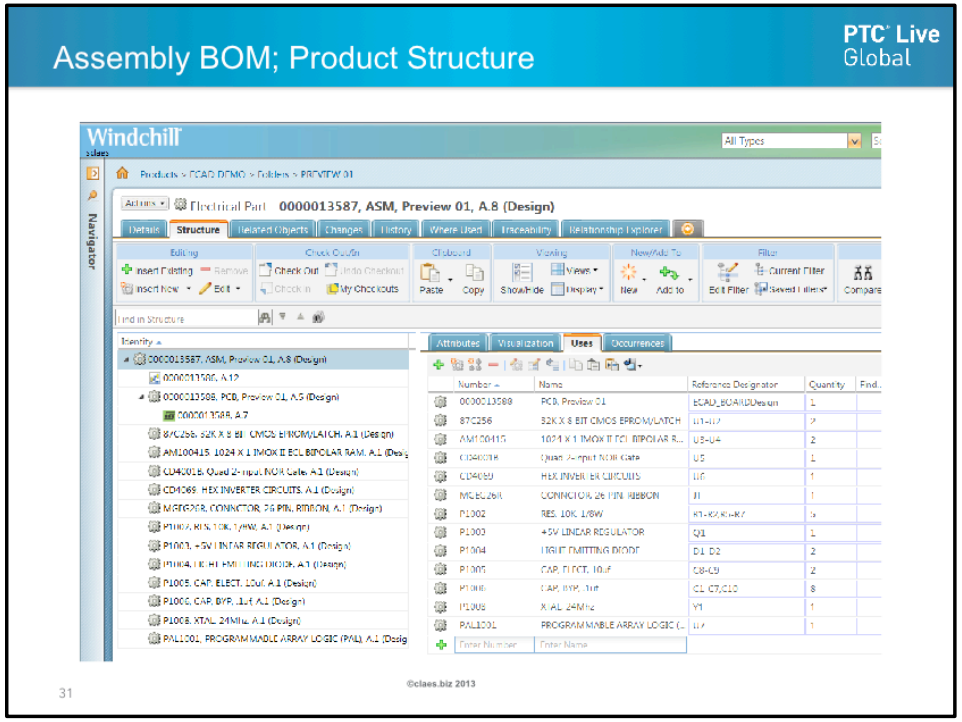
And again under content
The zipped design data
The PDF file we specified in the PDF content definition
And the visualization file



Objects related to the schematic are the parts in the BOM
The definition items
and the Schematic is REFERENCED BY the PCB.

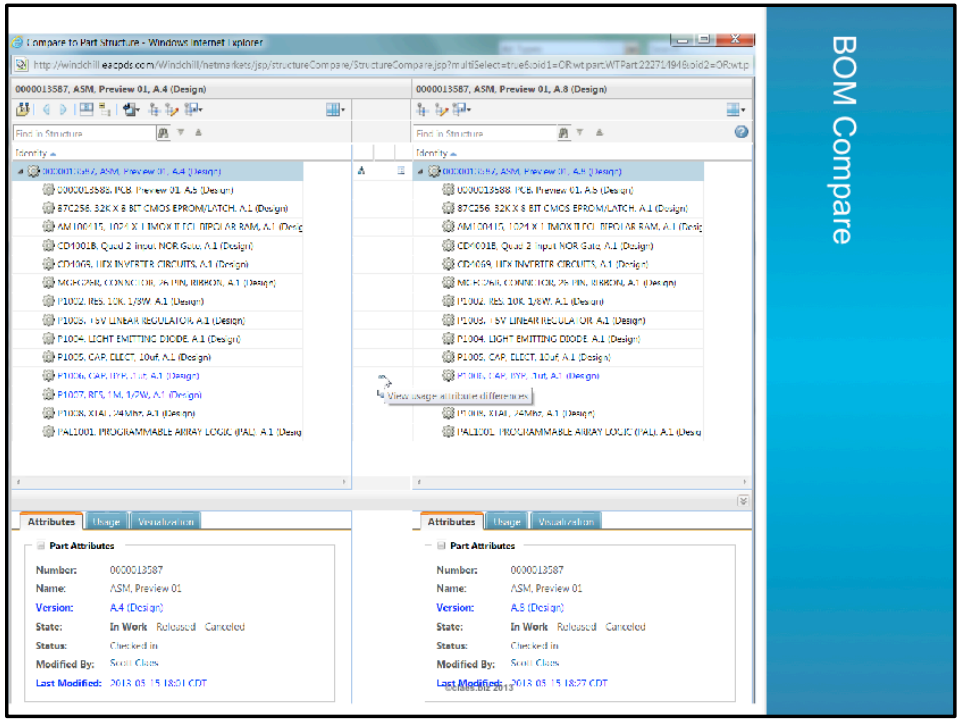


While the history tab obviously provides a history of creation of versions and iterations,

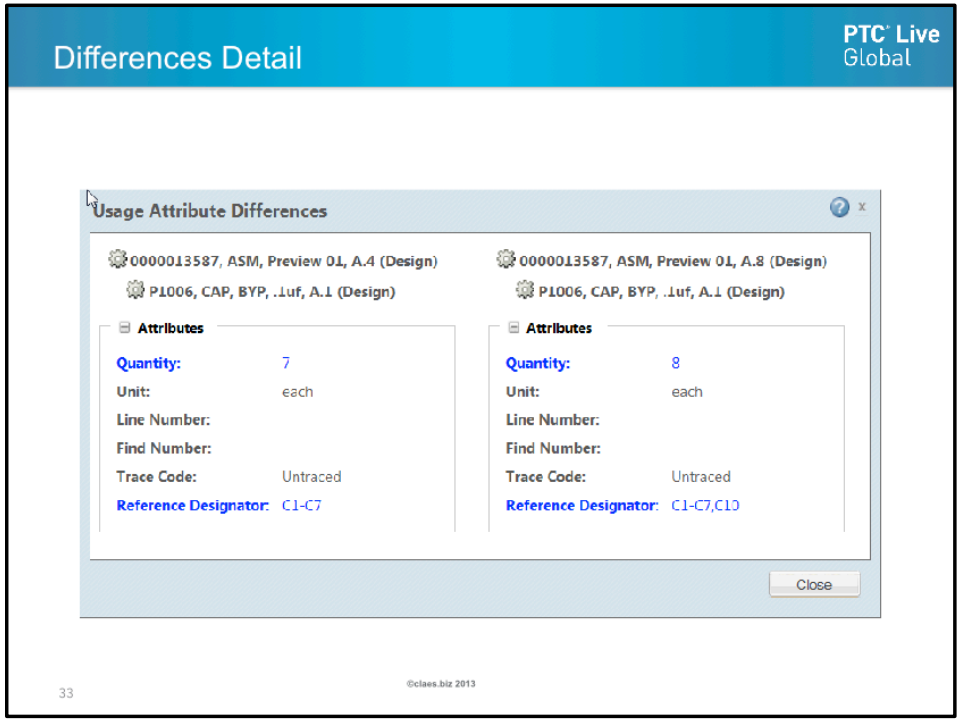


Finally
Choosing to view the information page of the Assembly
And examining the structure;
We see the product structure and the BILL of MATERIALS
There are multiple views available

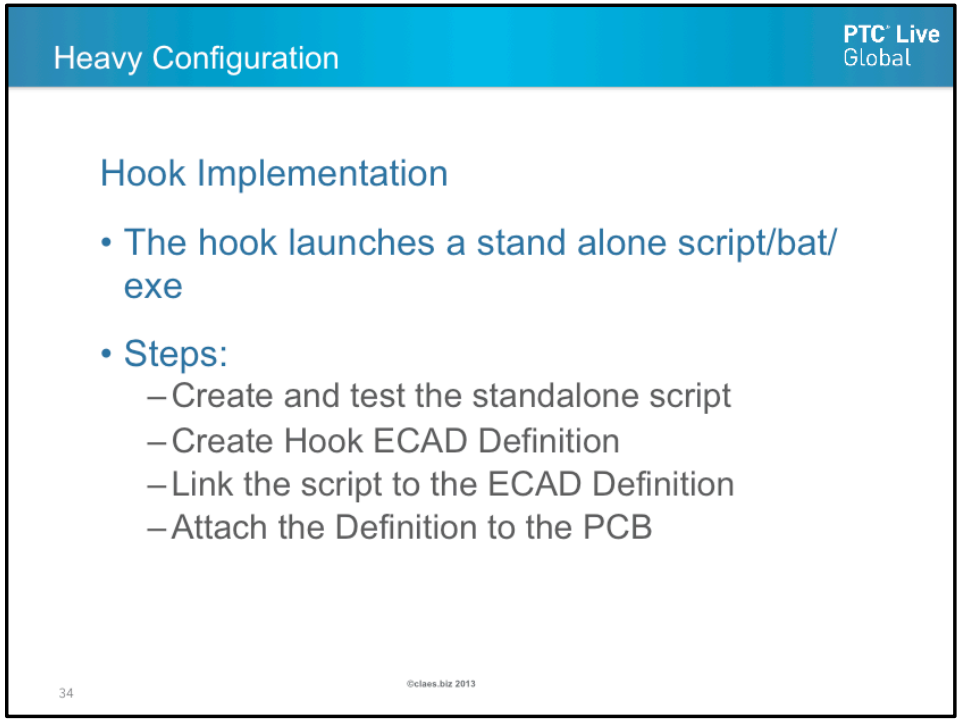
If we choose the compare button all the way to the right …



Where we see different icons and line coloration that depicts changes that have occurred.

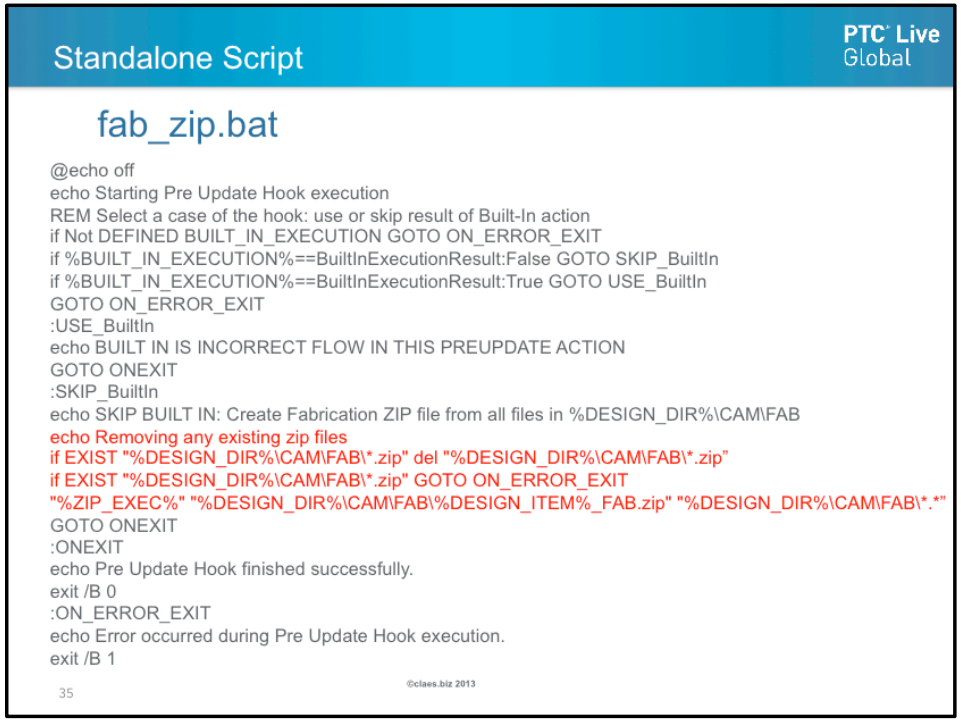


I would also point out that there are tools in Creo View for performing more detailed difference analysis



Make sure the example BAT file is open in TXT editor to show
Also have WWGM PDF open on desktop to show the examples in the documentation.

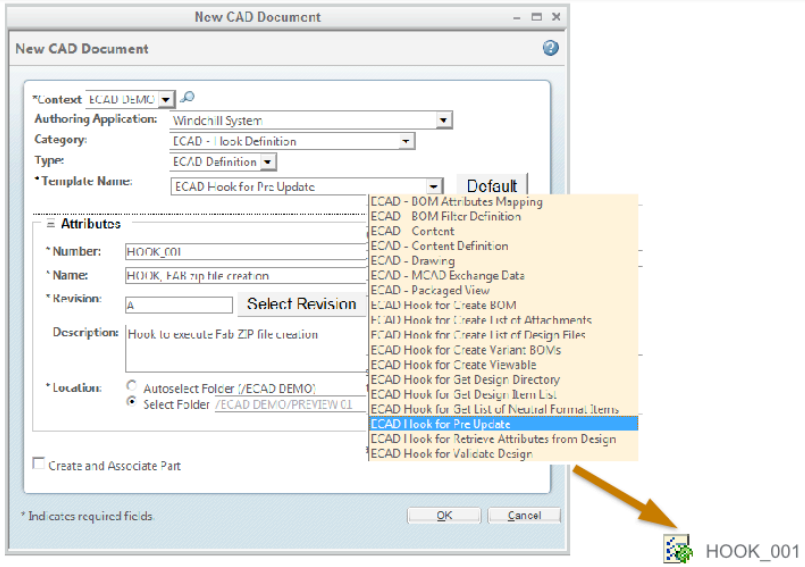
A hook launches a stand alone script
Runs in an environment that runs on the ECAD client

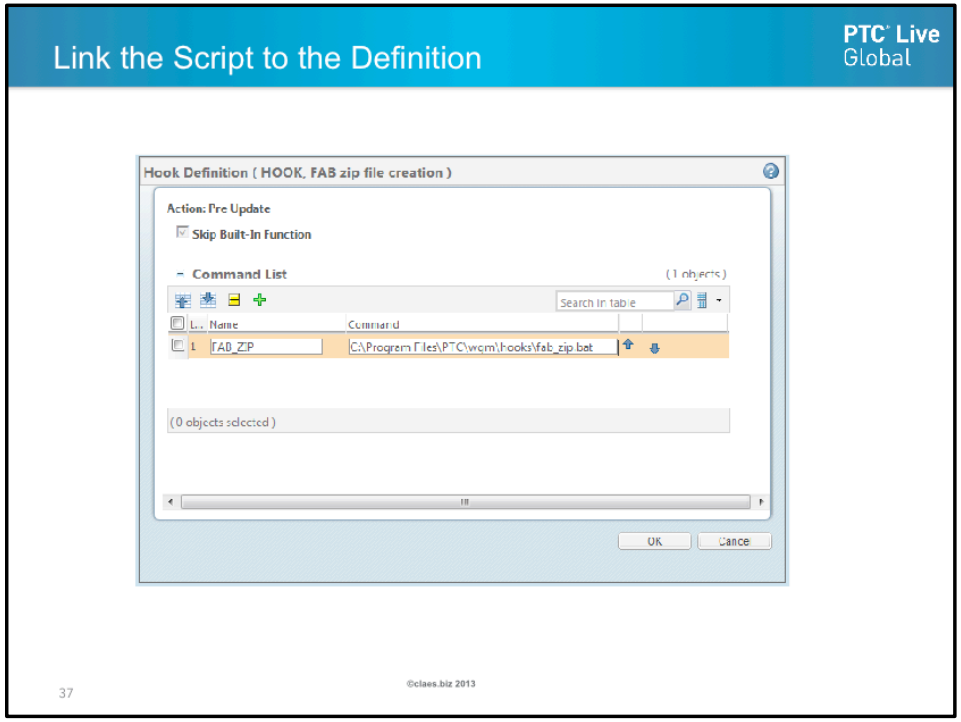


There are examples of script .bat files in the WWGM PDF documentation

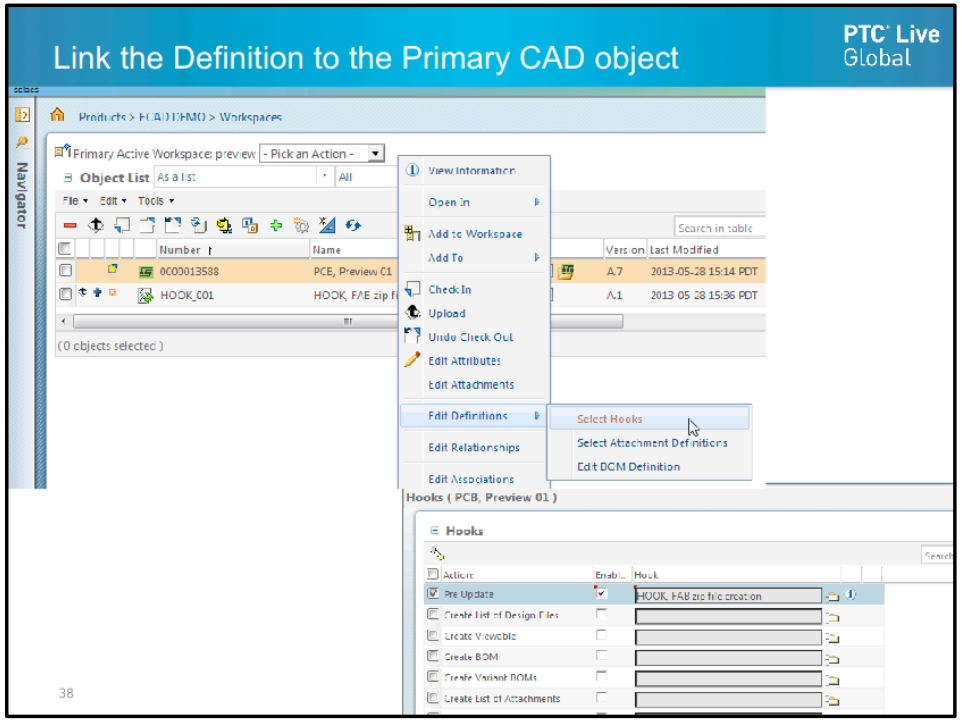
Hook ECAD Definition object

PTC Live Global





Store the definition, as all definitions, in a generic library for reuse by any dataset.
Check it in.



Edit Definitions; Select Hooks on the PCB CAD document.
This is because the data is associated with the PCB.

ZIP file created by the hook

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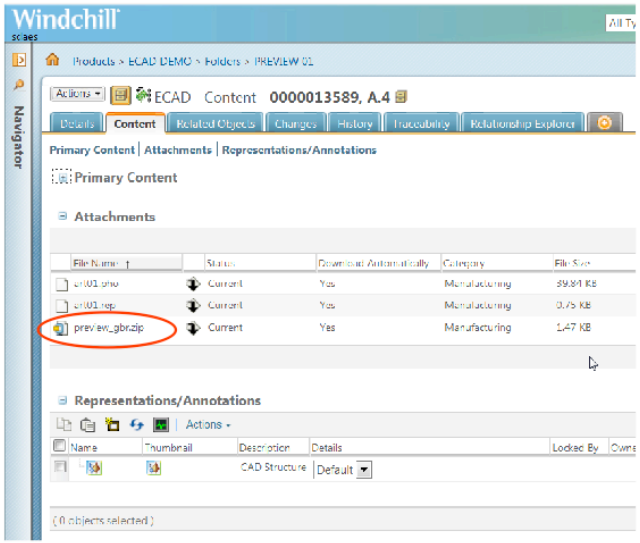
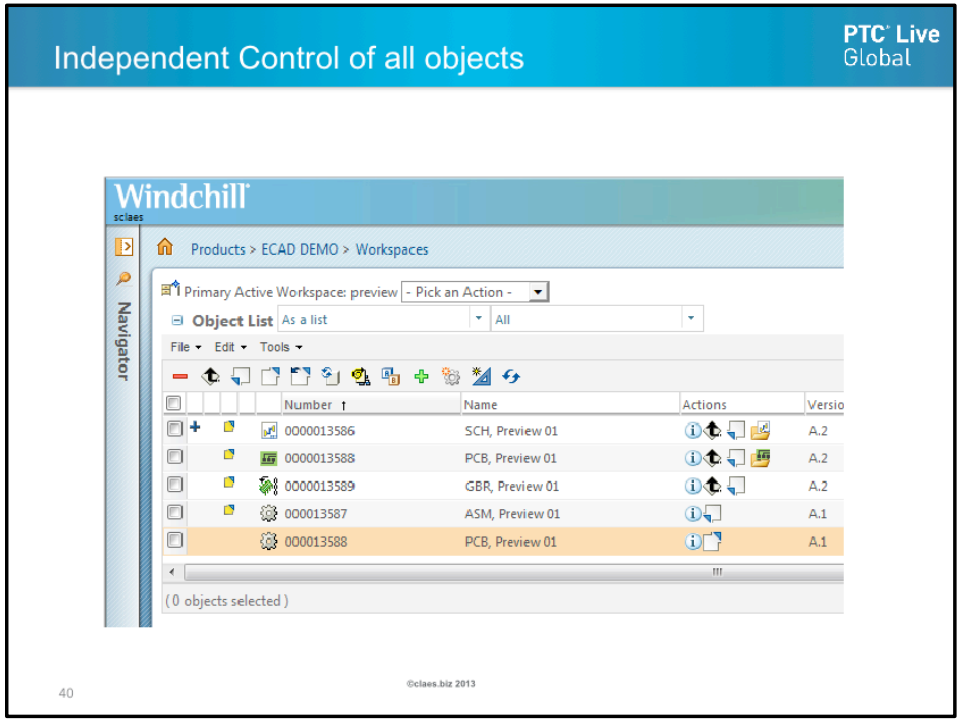
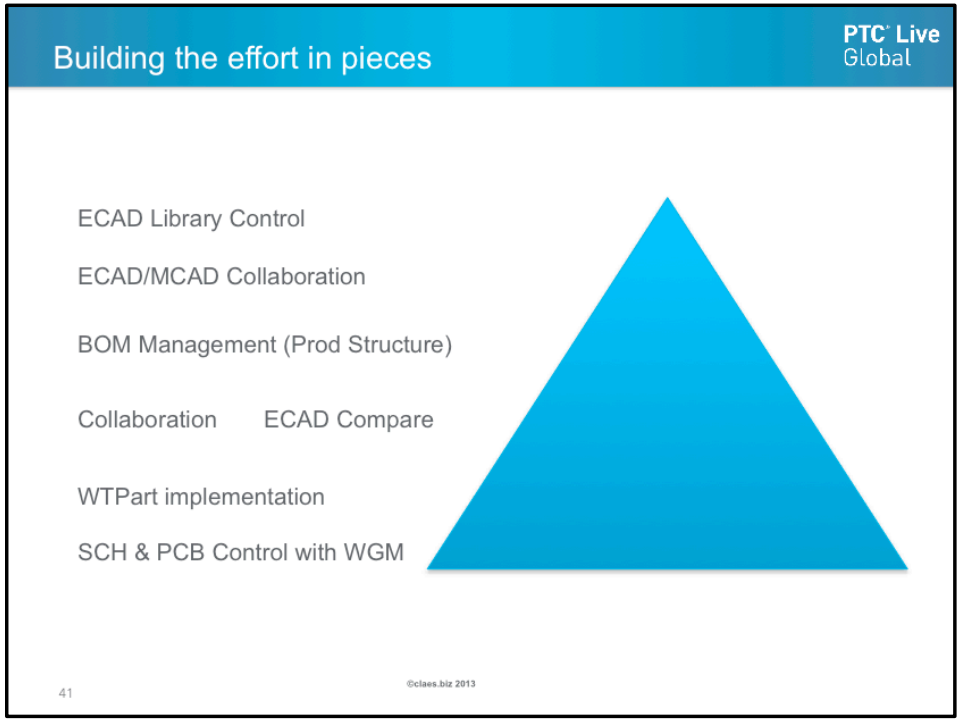


As well as the attached contents

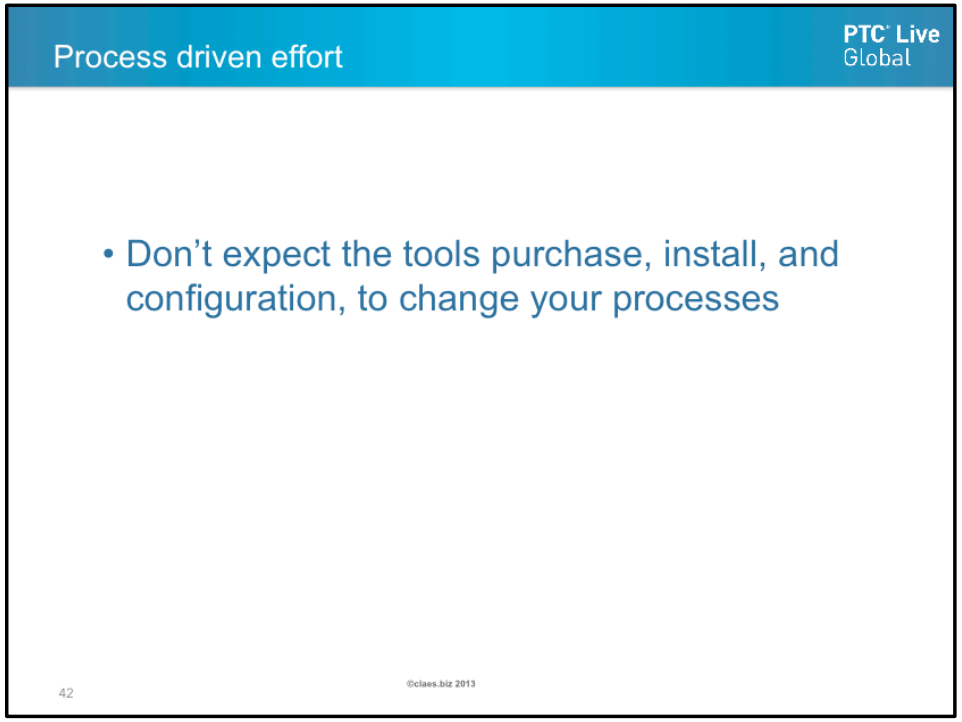


What did we just see?
A complete dataset as shown here, in the workspace created, defined and implemented.
Revise and modify independently



That covers our data implementation discussion
In general I would like to make a few suggestions based on my experience in installing and configuring ECAD data in PDMLink.

Generally there are two " top of the pyramid requirements; Product Structure driven from Bill of Materials – Schematic extraction, and ECAD/MCAD collaboration.
Start with the simple parts that provide value to your business; then add on the more complex after designers and engineers are familiar and comfortable with the processes newly implemented.



Tools don’t change your processes

PTC Live Global; June 10, 2013
ECAD Data Model in Windchill

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CLAESDOTBIZ

integrating ECAD into PLM


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