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PTC Product Focus

Expert Framework Extension Lite in Wildfire 5.0

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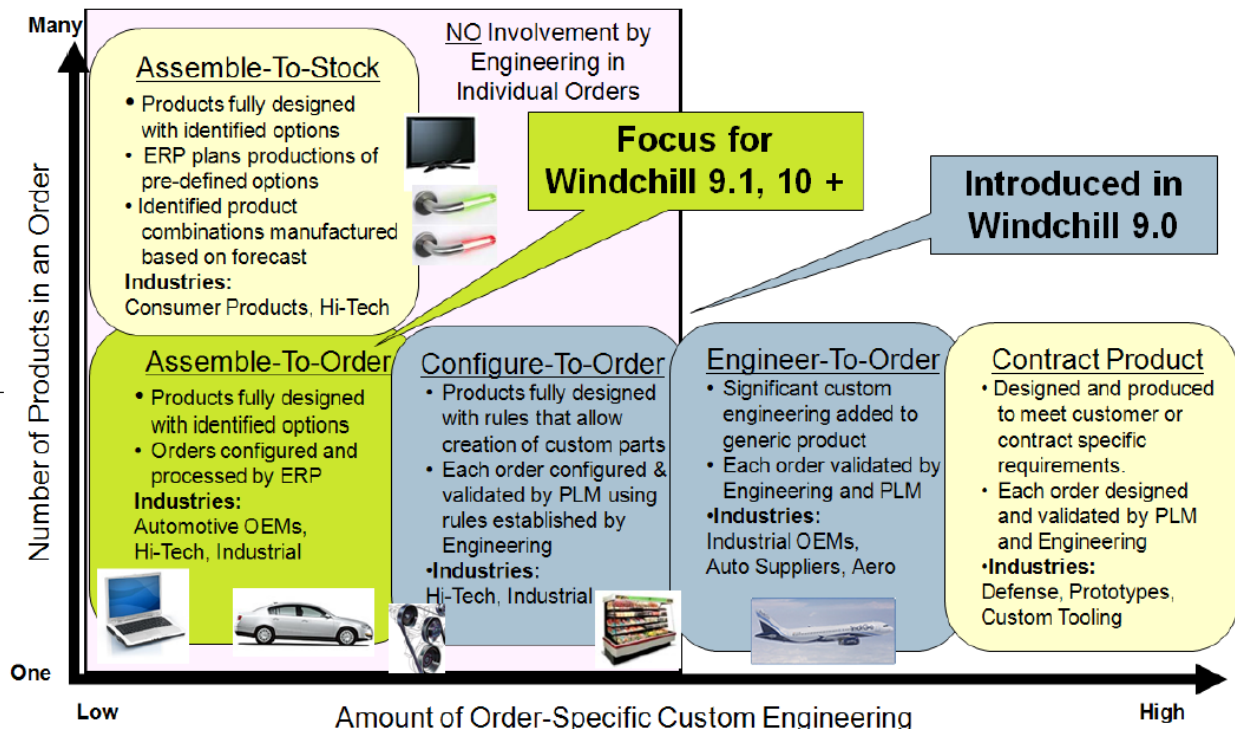
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PTC Product Focus

PDMLink 9.1 Options and Variants - 2 Different Approaches

Customers expect "personalized" products, and they'll give their loyalty to the manufacturers who provide product variety and respond fastest. Defining and managing multiple design variants to satisfy customer, regional and market-specific needs and accommodate design alternatives and improvements is becoming the industry trend. Successfully leveraging flexible platform designs and managing the complexity of multiple variant configurations is the key to competitive differentiation.

Companies use various techniques for developing their products that contain optionality. Product development techniques can range from the Assemble to Order, common for automotive and some high tech companies, through Configure and Engineer to Order, for some industrial and aeronautical products, to complete custom or Contract products.



Assemble-to-Order (ATO)

Assemble-to-Order (ATO) is an approach to design products with a finite list of discrete option choices for key product features. Once the product design has been completed, the processes of customer ordering and manufacturing of the product are executed without involvement from the product development team. This approach is commonly used in many industries such as passenger vehicles, large and heavy equipment, computers, as well as other products manufactured in large volumes.

Key characteristics of ATO products are:

- products are fully designed with identified options
- orders are configured and processed by ERP
- option sets for each product are managed - manage option codes and applicability and create and share common option combinations

Configure-to-Order (CTO)

Configure-to-Order (CTO) is an approach to design flexible products which can be configured or customized to fit unique needs of each customer order. Typically, a CTO product order is created with some configurator that applies rules and variable customer requirements to create a unique version of the product. The product development team defines the general product and often maintains the configurator logic for creating orders. The product development team typically has no involvement in processing or approving each specific customer order. This technique is common in industries such as industrial products as well as automotive and aerospace suppliers.

Key characteristics of CTO products are:

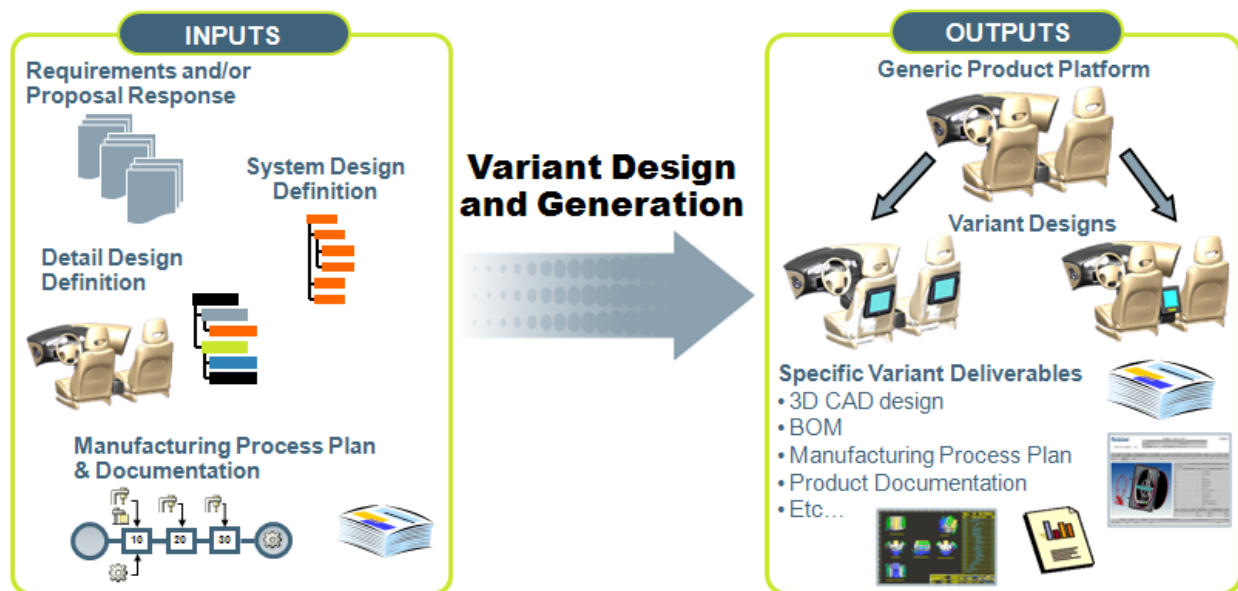
- Products fully designed with rules that allow creation of custom parts
- Each order configured & validated by PLM using rules established by Engineering

Engineer-to-Order (ETO)

Engineer-to-Order (ETO) is an approach similar to Configure-to-Order which involves fitting a general product to unique customer requirements with the extension that an ETO process requires some involvement from the product development team before the product design is complete. Typically, an ETO process involves the product development team to define, and validate each product configuration before manufacturing. As with the CTO process, the ETO approach is also common in industries such as industrial products as well as automotive and aerospace suppliers.

Key characteristics of ETO products are:

- Significant custom engineering added to generic product
- Each order validated by Engineering and PLM



ATO versus ETO/CTO in PDMLink 9.1

PDMLink 9.1 has two different approaches to address optionality. There are Configurable Parts that focus on Assemble to Order and Advanced Configurable Parts that focus on Engineer to Order / Configure to Order. In PDMLink 9.1, functionality that supports ATO and ETO/CTO scenarios is different and does not work in combination. Future capabilities (planned for the next major release) will allow the different approaches to be used simultaneously for one product.

A configurable part is similar to a standard part, except it can be used as a point of configuration (facilitating selection of options) within a product structure. This means that parts below a

configurable part in a structure can be assigned as an option and filtered in or out of the structure, as needed. Configurable parts are used within assemble-to-order (ATO) scenarios.

An advanced configurable part is similar to a standard part, except it can be used as a point of configuration (facilitating selection of options) within a product structure. This means that parts below an advanced configurable part in a structure can be assigned configurable options which are used to filter parts in or out of the structure and also to specify attributes or parameters on the parts themselves, as needed. Advanced configurable parts are used within configure-to-order and engineer-to-order (CTO / ETO) scenarios.

There is a common process to develop the Generic Platform using either methodology. The Generic platform is also referred to as the SuperBOM, an overloaded BOM, or 150% BOM.

Four steps are typically executed during the generic platform design:

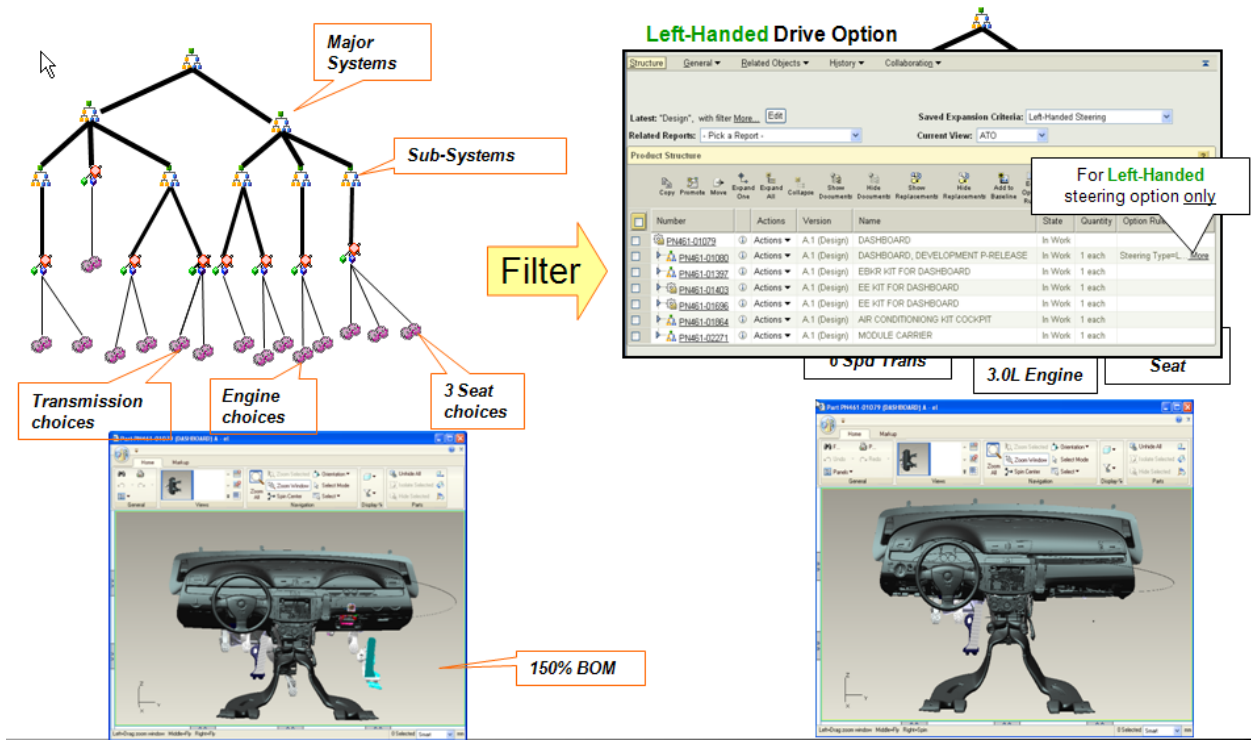
1. Analyze platform optionality needs --The first step during the generic platform design is to analyze and fully understand requirements of the new product and to plan the different options.
2. Assess Current Products for Reuse – The second step is to investigate existing designs for reuse.
3. Create Generic Product Definition - During this step, the product design is structured in such a way to support product optionality. Existing data, parts, and components are reused, or new ones are developed. The rules and logic needed to select the product options are defined.
4. Release and Maintain Platform - Upon successful design and validation of the generic platform, it is released to manufacturing.

The execution of these steps are different depending on which approach is chosen.

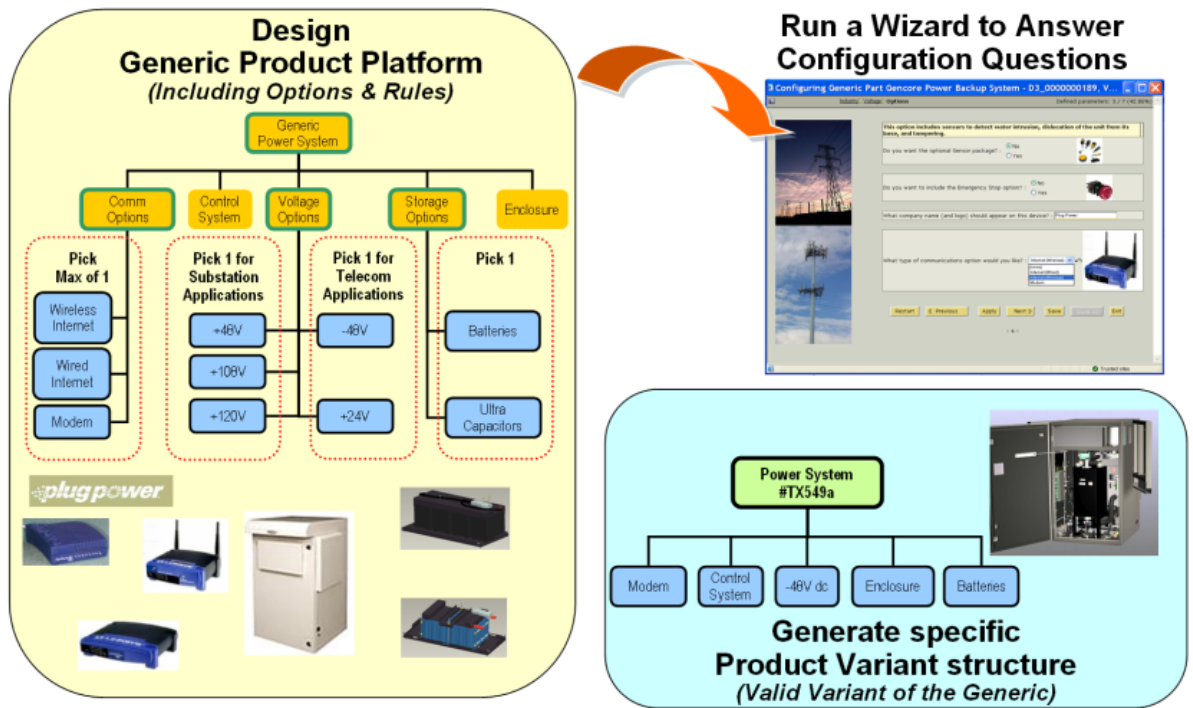
- For ATO, the option rules are created by choosing an object and specifying option choice(s) that make that object a valid option to include in the product structure. This sets values on the usage link for an object. These options are managed in option sets that capture the option, option codes, and valid choices.
- For CTO/ETO, the option rules are created as logic in the Advanced configurable part. These are created by using the Product Structure Explorer where parameters and constraints are specified. These are applied to the objects within the structure to determine when an object is valid (turned on/off or selected). For detailed info on creating rules for the CTO/ETO process, access the **Best Practices for Options and Variants White Paper**.

The two approaches also differ in the creation of a specific configuration.

- For Assemble-to-Order, a specific configuration is accessed by selecting choices for options and filtering the product structure based on those choices and option rules.



- For CTO/ETO, a new variant is created by running a wizard that asks a series of questions based on the configuration logic. Based on the inputs and logic, PDMLink creates a new variant by reusing as many sub-components as possible and creating new parts in the structure, as necessary.



Both of these sets of functionality are available with the base PDMLink package. For more details, please visit the Product area of ptc.com or contact your PTC Account Manager.

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Tips of the Month

Using Mechanica for Early Structural Analysis of Frameworks

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Tips of the Month

PDMLink – Multi-Level Bill of Material Compare Report

PDMLink has many out-of-the-box reports. One of these is the Multi-Level BOM Compare report. This report can show you differences between different versions, configurations, and even unrelated product structures.

The Multi-Level BOM Compare report can be accessed from the Structure page of any object.

The screenshot shows the PDMLink interface for a product structure. At the top, there are buttons for 'Latest: "Default" More... Edit' and a 'Sourcing Context' dropdown set to 'Default'. Below this is the 'Product Structure' section with a toolbar containing icons for Copy, Add to Project, Save As, Promote, Move, Expand One, Expand All, Collapse, Show Documents, and Hide Documents. A table lists the product structure items:

Name	
<input type="checkbox"/> 844J CAB	
<input type="checkbox"/> AUDIO	
<input type="checkbox"/> LABELS	
<input type="checkbox"/> SUSPENSION SEAT STD LTH HEAT	
<input type="checkbox"/> SUSPENSION SEAT STD CL	

To the right, the 'Related Reports' dropdown menu is open, showing a list of report types. 'Multi-Level BOM Compare' is highlighted in blue. Other options include: Multi-Level Components List, Single-Level Consolidated BOM, Single-Level BOM with Notes, Single-Level BOM, Multi-Level BOM, Multi-Level BOM with Replacements, Multi-Level Where Used, Multi-Level BOM with AML/AVL, Multi-Level BOM with AML, Single Source OEM Parts, and Unique Manufacturer Parts. Below the dropdown, there are 'Actions' dropdowns and version numbers: 0000012014 and 0000012015.

By selecting this report type, a source and a target Bill of Material are required for the comparison. By default, the product structure that the report was initiated from is automatically selected as the source for the report. The target Bill of Material must be specified. The choices are to search for and select an entirely new Bill of Material, select a specific configuration specification, or select a saved expansion criteria.

Multi-Level Bill of Materials Compare Query

Source

Part: 0000011994

Latest: "Default" [More...](#)

Target

Part:

Latest: "Default" [More...](#)

Saved Expansion Criteria:

JAP Base Model - No Seat

US Base Model - STD

XL US DELUXE CAB

[Clear Filter](#)

The generated report will look similar to the image below. In this case, the Bill of Material comparison was done on an overloaded BOM and a BOM filtered on specific option choices. The information on the left pertains to the source Bill of Material and on the right, the target Bill of Material. In the tabulated area, the information is showing that there are several components in the source BOM that are not in the target BOM. This type of report is valuable for BOM configuration and interrogation and change audits.

Multi-Level Bill of Materials Compare Results

Source Part

Number 0000011994
Version A.8 (Design)
Name 844J CAB

Expansion Criteria

Name Default
Configuration Specification
Latest:
View = Design
Working = True
Applied to Top = True
Use Default = False

Target Part

Number 0000011994
Version A.8 (Design)
Name 844J CAB

Expansion Criteria

Name XL US DELUXE CAB
Configuration Specification
Latest:
View = Design
Working = True
Applied to Top = True
Use Default = False

Options Filter:

Cab Accessories = ASH, CTHK, MAT, SNV
Cab Color = YLW
Cab Lights = YLW
Cab Size = XL
Location = US
Mirrors = OLT, ORT, RVLT, RVRT
Seat = LTHH
Wipers = FRT, REAR

[Reset Target](#)

Level	Product Structure Differences		Source		Target	
	Number	Name	Version Used	Quantity	Version Used	Quantity
1	0000012054	CAB LIGHTS	A.3 (Design)	1 each	A.3 (Design)	1 each
2	0000012074	FLOOD LAMP	A.5 (Design)	6 each	A.5 (Design)	6 each
3	0000012076	FLOOD LAMP WHITE	A.2 (Design)	1 each		
3	0000012075	FLOOD LAMP_RED	A.4 (Design)	1 each		
1	0000011995	LABELS	A.3 (Design)	1 each	A.3 (Design)	1 each
2	0000000709	OPERATORS MANUAL EUR	A.1 (Design)	1 each		
2	0000000706	SAFETY MANUAL EUR	A.1 (Design)	1 each		
2	0000000710	OPERATORS MANUAL JAP	A.1 (Design)	1 each		
2	0000000703	TECHNICAL MANUAL EUR	A.1 (Design)	1 each		
2	0000000707	SAFETY MANUAL JAP	A.1 (Design)	1 each		
2	0000000711	OPERATORS MANUAL CHN	A.1 (Design)	1 each		
2	0000000704	TECHNICAL MANUAL JAP	A.1 (Design)	1 each		
2	0000000708	SAFETY MANUAL CHN	A.1 (Design)	1 each		
2	0000000705	TECHNICAL MANUAL CHN	A.1 (Design)	1 each		
1	0000012018	SUSPENSION SEAT XL LTH NH	A.2 (Design)	1 each		
1	0000012014	SUSPENSION SEAT STD LTH HEAT	A.2 (Design)	1 each		
1	0000012035	STEERING COLUMN STD	A.2 (Design)	1 each		
1	0000012017	SUSPENSION SEAT XL CL	A.2 (Design)	1 each		
1	AT202774	SIDE LIGHT	A.1 (Design)	1 each		
1	0000012034	STD CAB	A.2 (Design)	1 each		
1	0000012037	FRONT PEDESTAL STD	A.2 (Design)	1 each		
1	0000012036	STEERING COLUMN COVER STD	A.2 (Design)	1 each		
1	AT225811	SUSPENSION SEAT	A.1 (Design)	1 each		
1	0000012015	SUSPENSION SEAT STD CL	A.2 (Design)	1 each		

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Announcements

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[Tips & Techniques: Work Smarter Not Harder!](#)

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- <http://www.hp.com/go/ptcworkstation>

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- <http://www.ptc.com/company/news/events/index.htm>

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Also visit <http://social-product-development.blogspot.com/>

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Please take a few minutes to check out this new web site. We don't think you will be disappointed.

<http://profilesmagazine.com/>



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Upcoming Events & Training Class Schedules

Upcoming, 2010 Your local Pro/Engineer User Groups
<http://www.ptcuser.org/rugs/>

June 6 – 9, 2010 Orlando, FL USA
PTC/USER World Event
<http://www.ptcuser.org/>

Events

Our seminars and conferences seek to provide you with relevant information regarding product development trends in your industry as well as innovative software learning experiences. Think of them as a constructive day off where you can share experiences and swap ideas with your peers.

If you can't manage to get away, we'll bring it to you. Check back often for regularly scheduled live webcast events.

[You're Invited to Attend...](#)

Please visit the [PTC Education Services](#) website for the latest training information including course descriptions, schedules, locations, and pricing.

- Attend a course at any PTC Center and receive a **free** copy of Pro/ENGINEER Wildfire Student Edition!

<http://www.ptc.com/services/edserv/index.htm>

Live Instructor-Lead Virtual PTC Training Courses

Virtual Classrooms provide interactive learning with a trained PTC instructor in convenient and manageable sessions that last approximately 4 hours over a series of days. It's easy to join a class right from your desk using a phone or voice-over IP technology.

Sessions are performed just like a traditional ILT (including interactive exercises where you and the instructor can work on lab exercises together) and feature some of our most popular ILT courses. These sessions cover the exact same material as the traditional ILT in-center courses. Also look for some of our most frequently requested mini-topics delivered in the same format that are only an hour - two hours in duration.

If you have any questions about these sessions or would like to see getting other courses, not on this list, on the schedule please feel free to contact me for more details. They are a great way to bring training to you without you having to worry about location or being out from work for long stretches.

You can register for these sessions just as you would for any normal ILT class either by:

1. calling order admin at <http://www.ptc.com/services/edserv/training/registra.htm> or
2. you can go to PTC University directly at <http://www.ptc.com/learning> and submit a registration request directly. All you have to do is search the catalog by typing in “virtual” in the search field and you will see a listing.

PTC

Note: This PTC E-Newsletter will continue to be used for the following:

- 1) Inform you on events related to PTC products (user groups, conferences, training schedules, etc.)
- 2) Educate you on solutions that are available at PTC
- 3) Tips & Techniques using PTC Products

Note: These messages are compiled in the local PTC office and will be distributed via e-mail.

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