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PTC Product Focus

Distributed Computing advances with Distributed Pro/BATCH

Leverage hardware and software resources to perform batch jobs over the network.

With the Pro/ENGINEER Wildfire Release, PTC introduces a new suite of applications to enable companies to leverage their hardware and software investment in performing routine, time-consuming, and compute-intensive jobs over their network. The first set of offerings include the following: 1) Distributed Services Manager (DSM): It is a network-based resource management software system to manage remote resources for performing some service over a network. 2) Distributed Pro/BATCH: It is designed to leverage the capability in the DSM for distributing and executing batch jobs on remote sessions of Pro/ENGINEER over the network.

Distributed Computing Technology advances in Pro/E Wildfire

Distributed Computing technology has seen tremendous advances by the proliferation of web protocols such as Simple Object Access Protocol (SOAP), XML and HTTP. Distributed Pro/BATCH and the Distributed Services Manager are built using these latest web standards in keeping with PTC's endeavor to provide customers with quality toolsets built on the latest technologies to optimize their usage of existing resources.

For example, all communication between distributed clients, distributed services, and the DSM are handled using standard SOAP requests/responses over HTTP. All batch-processing instructions are formatted in XML (See Figure 1) for ease of use, visualization, and customization.

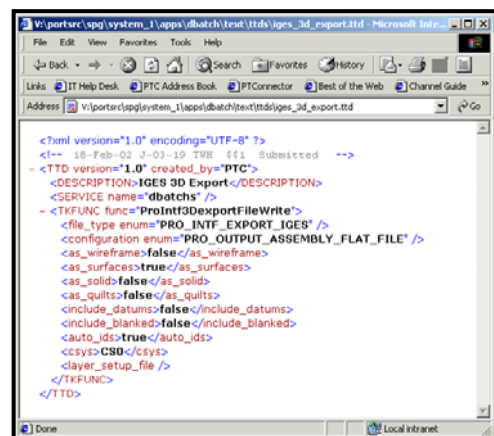


Figure 1: XML-based batch processing instructions

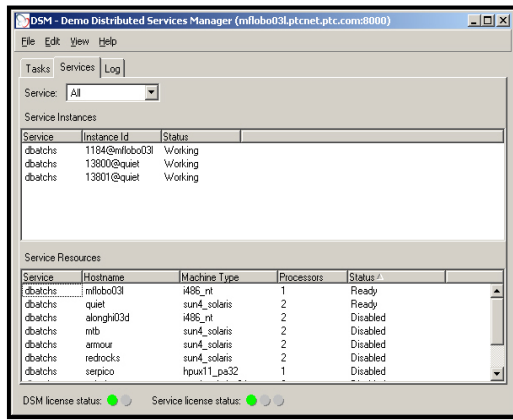


Figure 2: DSM showing Service Resources

Distributed Resource Management with DSM

Distributed Services Manager (DSM) is a network-based application to be released with Pro/ENGINEER Wildfire. The DSM will allow the engineers or CAD administrators to setup and manage a “server farm” of network resources, also referred to as *service resources* that will be used to perform client requested tasks. One or more clients send their tasks to the DSM, which will assign them to available service resources (See Figure 2), or queue the tasks if necessary.

Companies will leverage this technology in scheduling when service resources will be “available” to process these types of requests from remote clients. A web-portal provides users with online access to monitor the progress of their jobs from any location. Distributed Pro/BATCH will be the first distributed service developed by PTC to leverage this distributed resource management capability.

Distributed Pro/BATCH

Distributed Pro/BATCH provides some exciting new features in addition to the ability to distribute batch jobs over the network using the DSM. Distributed Pro/BATCH addresses key inadequacies with the existing Pro/BATCH tool available with Pro/ENGINEER as well as enhance the breadth of functionality. Distributed Pro/BATCH will perform the following batch jobs:

- *Exporting and importing* from 2D interfaces (e.g. DXF, CADAM, etc.)
- *Exporting and importing* from 3D interfaces (e.g. STEP, CATIA, etc.)
- *Exporting* to visualization formats (e.g. ProductView, VRML, etc.)
- Batch execution of *ModelCHECK*
- *Plotting and Printing*

The new Distributed Pro/BATCH will run in 2 modes -- *Standalone* and *Distributed*.

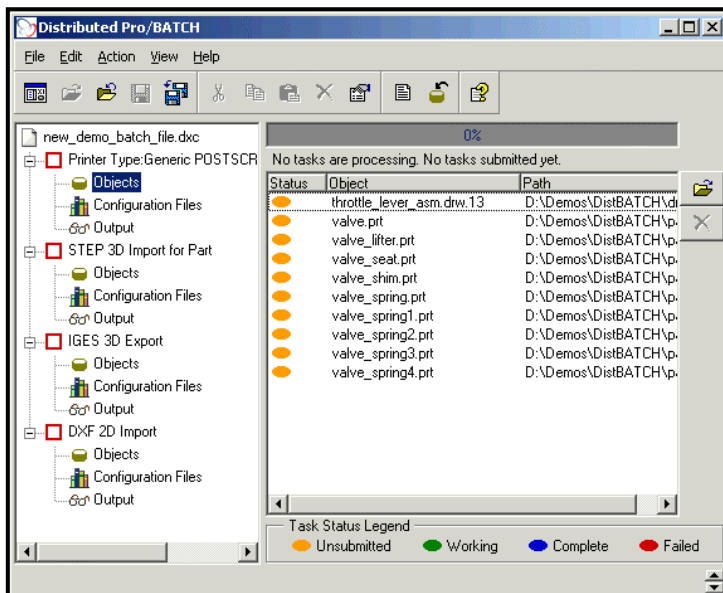


Figure 3: New Distributed Pro/BATCH Client User Interface

In *standalone* mode, a local session of Pro/ENGINEER on the user’s machine is used to process batch jobs. This is similar to the way Pro/BATCH works today.

In *distributed* mode, one or more remote sessions of Pro/ENGINEER on the network will process the batch jobs. One or more distributed Pro/BATCH clients on the network may submit batch jobs to be processed. A centralized DSM manages all batch requests.

Distributed Pro/BATCH features a new client graphical user interface (See Figure 3) to compose, send and monitor batch jobs. The client can be installed and run independent of

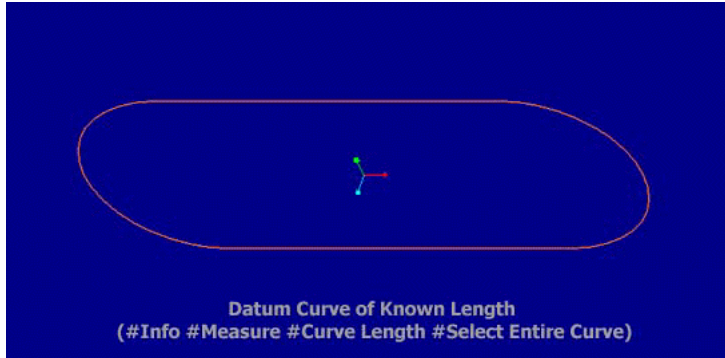
Pro/ENGINEER. The client also features a scheduling capability. This is extremely useful for the *standalone* mode, since the user can schedule when the local session of Pro/ENGINEER Wildfire starts processing batch jobs. In addition to the GUI, the client can also be run from the command line.

Summary

Distributed Pro/BATCH offers exciting new capabilities in the area of batch processing of common Pro/ENGINEER related tasks, such as executing ModelCHECK in batch mode or exporting ProductView viewables. Distributed computing technology in Pro/ENGINEER leverages the latest open web standards, namely SOAP, XML, and HTTP. *Distributed Pro/BATCH* in conjunction with the *Distributed Services Manager* for network-based distributed resources management heralds a new paradigm of batch processing with Pro/ENGINEER.

Tip of the Week

Modeling a Chain Assembly

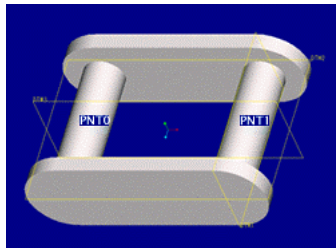


1. Create a new assembly and default assembly datum planes. In this document, all references to datum planes follow the assumption that default datums are being used.

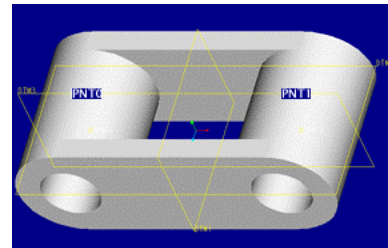
Create a datum curve of the path that the chain should follow. Make sure that the length of the curve is a value that can be evenly divided by the

length of each link. Select Datum, Curve, from the Insert pulldown menu then Sketch, Done, (Pick the sketch plane ADTM3), Okay for the direction, Top, (Select the horizontal reference plane ADTM2). Sketch two horizontal lines of length 5 each and two Tangent End arcs of radius 1.59155 each. To determine the length of the curve, select Measure from the Analysis dropdown menu, select Curve Length from the Type list and select Chain from the Curve/Edge list, then select the curve and make sure that the entire curve is highlighted as red. The curve length will be shown in the Results field. In this example, the curve length is 20.

2. Create two link parts with the distance between the pins/holes specified. In this example, the distance is 0.5 between the pins/holes of each link. One link has the shafts; the other link has the

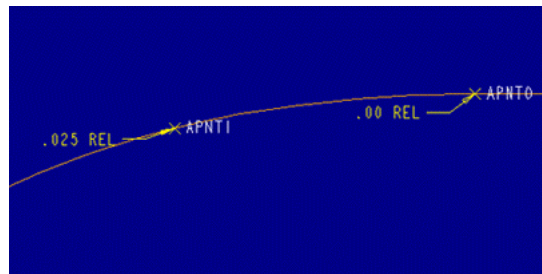


holes. First create a new part called "link_seg1". Create default datum planes and create two round protrusions on Both Sides of DTM3 with the distance between the center of each protrusion equal to 0.5. Create two more protrusions for the side plates.



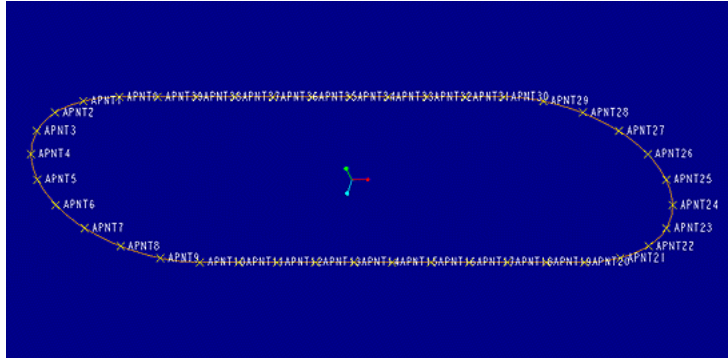
Create two datum points that lie on DTM3 and the axis of each round protrusion. Repeat this to create a part named "link_seg2" but create the protrusions with holes in them that are also a distance of 0.5 apart. Make sure that the overall width of link_seg2 will fit inside of the side plate protrusions of link_seg1. Create two datum points on DTM3 and the axis of each hole in link_seg2.

3. Create two length ratio (LR) datum points on curve, with the first point LR = 0.0 and the second point LR = 0.025. The length ratio can be computed by dividing the link length by the overall length of the chain. In this example, $LR = 0.5 / 20 = 0.025$. Select **Datum, Point** from the **Insert** pulldown menu then **On Curve, Length Ratio**, (Pick the datum curve),



Done Sel, enter 0.00 for the first datum point. Before selecting **Done**, again select **On Curve**, **Length Ratio**, (pick the datum curve), **Done Sel**, and enter 0.025 for the length ratio. Finally, select **Done** to end the datum point creation. This creates the datum points together as a single feature to facilitate the points being patterned together.

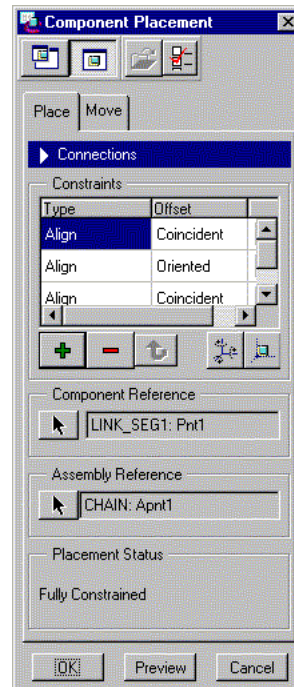
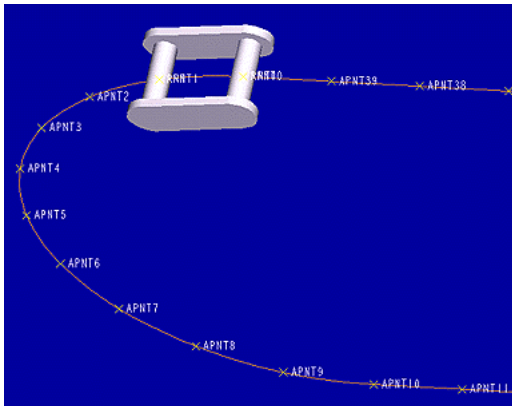
4. Pattern these two points around the curve by selecting **Pattern**, (pick one of the datum points), (pick the 0.00 dimension), and enter the curve length ratio increment of 0.05. The curve length ratio increment is equal to the length ratio multiplied by 2. When prompted to "Select another dimension for FIRST direction..."



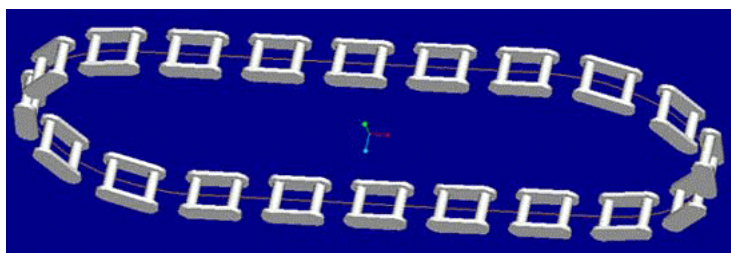
(pick the 0.025 dimension), and enter 0.05 again for the curve length ratio increment. Select **Done** and enter 20 for the total number of instances. The total number of instances should be half of the total number of links because these points will represent the "link_seg1" part. The number of links is equal to the datum curve length

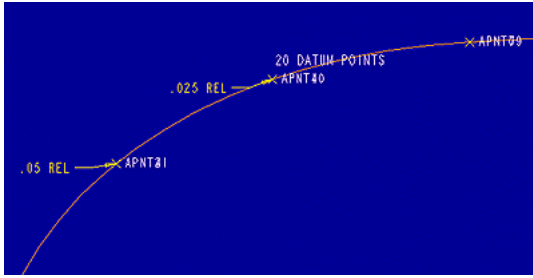
divided by the link length, or in this example 40 links. Therefore, the total number of instances for this first pattern should be $40 / 2 = 20$. When prompted to "Select pattern dimension for SECOND direction..." hit **Done** to create the pattern. This will create 40 total points around the datum curve.

5. Assemble "link_seg1.prt" and align PNT0 and PNT1 to APNT0 and APNT1, respectively. Also, align DTM3 to ADTM3 to fully constrain the component.



6. Select **Component**, **Pattern**, (pick the "link_seg1" component), **Ref Pattern**, **Done**. This will pattern the "link_seg1" component around the datum curve with a space between each link for the "link_seg2".

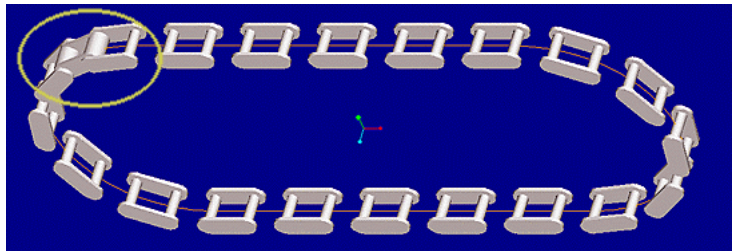




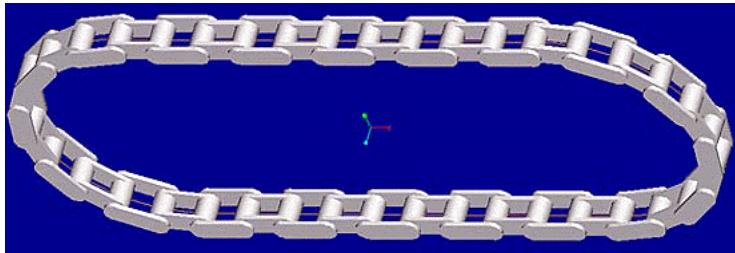
7. Create two more datum points as before in step #3 that are offset by one length ratio, so the first point's length ratio should be 0.025 (rather than 0.0) and second point's length ratio should be 0.05 (rather than 0.025). These points will lie on top of APNT1 and APNT2 from the first pattern of points.

8. Pattern these points (APNT40 and APNT41), the same as in step #4.

9. Assemble "link_seg2.prt" and align PNT0 and PNT1 to APNT40 and APNT41, respectively. Also align DTM3 to ADTM3 to fully constrain the component.



10. Select **Component, Pattern**, (pick the "link_seg2" component), **Ref Pattern, Done**. This will pattern "link_seg2" around the datum curve, completing the chain assembly.



Announcements

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Boston, MA - University of Massachusetts

August 5, 2002

Training Class Schedules

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

Start Date	Course Title	Location	Registration Info
2002 07/15	Designing With Surfaces	Needham (MA)	Request Registration
2002 07/18	Consistent Innovation with Behavioral Modeling	Needham (MA)	Request Registration
2002 07/22	Introduction to Pro/ENGINEER	Needham (MA)	Request Registration
2002 07/24	Administer the Windchill Business Environment	Needham (MA)	Request Registration
2002 07/25	Pro/MECHANICA Advanced Workshop	Needham (MA)	Request Registration
2002 07/29	Fundamentals of Design	Needham (MA)	Request Registration
2002 07/29	Drawing for Designers	Needham (MA)	Request Registration
2002 07/30	Administer Windchill Workflow	Needham (MA)	Request Registration
2002 08/05	Introduction to Pro/ENGINEER	Needham (MA)	Request Registration
2002 08/12	Introduction to Pro/ENGINEER	Needham (MA)	Request Registration
2002 08/12	Complex Milling	Needham (MA)	Request Registration
2002 08/19	Fundamentals of Drawing	Needham (MA)	Request Registration
2002 08/26	Introduction to Pro/ENGINEER	Needham (MA)	Request Registration
2002 08/26	Fundamentals of Design	Needham (MA)	Request Registration
2002 08/26	Mechanism Design & Analysis	Needham (MA)	Request Registration
2002 08/27	Simulating Mechanisms for Dynamic Performance in Pro/E	Needham (MA)	Request Registration
2002 08/28	Designing With Surfaces	Needham (MA)	Request Registration

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