Fall, 2007

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DEFORM™ News

Events:

- October 23 & 24: The Fall DEFORM User Group Meeting in North America will held in Columbus, Ohio. Information has been mailed to our Users and is posted to the User Area of the web site. We look forward to seeing you in Columbus.

Training:

- October 24 & 25, 2007: Advanced training will be conducted in conjunction with the Fall Users Group Meeting in Columbus.
- SFTC and Aerospace Manufacturing Technology Centre of the National Research Council of Canada are jointly hosting the First International Conference on Sustainable Manufacturing. The topic is Finite Element Modeling and Simulation for Sustainable Machining, Forming and Joining of Metallic Products. The conference will be in Montreal October 17 and 18, 2007. See our web site for more information.
- December 4 & 5, 2007: DEFORM-2D training (includes DEFORM-F2) will be conducted at SFTC in Columbus, Ohio.
- December 6 & 7, 2007: DEFORM-3D training (includes DEFORM-F3) will be conducted at the SFTC office.

New SFTC Office

SFTC has moved to our new office. Our new address is:

2545 Farmers Drive
Suite 200
Columbus, Ohio 43235

The telephone number, fax, email and web site have not changed. The new office is in a business park in Northwest Columbus. It is 5 miles NNW of our previous location on Reed Road. Please update your records.

Parallel Computing

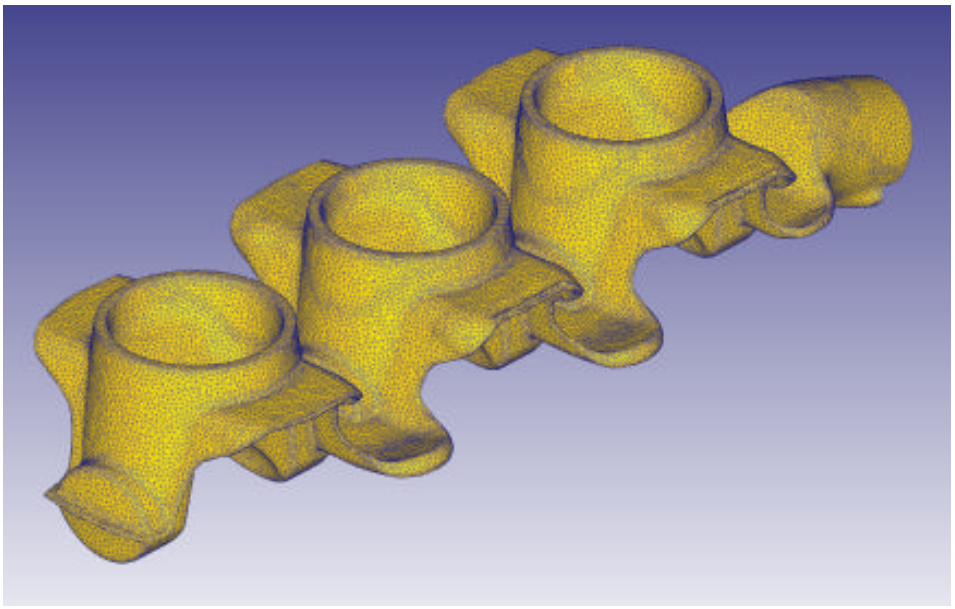
We are continuously enhancing DEFORM-3D to increase simulation speed and maximum model size. These improvements involve both hardware and software. Parallel computing allows a simulation to be shared by multiple processors, resulting in a larger practical model size and reduced solution time.

In a recent test on our 8 processor HP XC Linux cluster, a weld yoke simulation was run with over **one half million elements in about a day!** The simulation started with a round billet defined by 224,000 elements. As the part filled the die cavity, with features being defined, the final model size was 578,000 elements. A successful application using eight hundred thousand elements was recently reported from Japan.

The price of performance is a trade-off that must be considered when buying computer hardware.

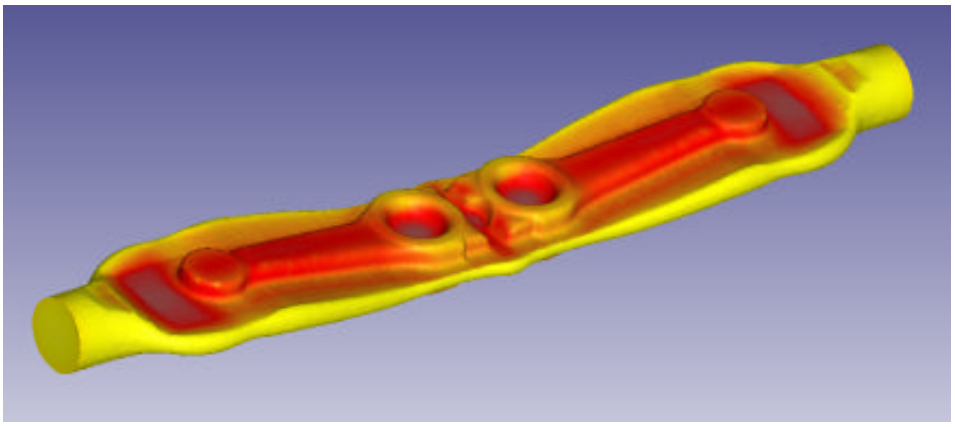
- Single processor workstations have become very affordable. A $500 PC can run a moderate sized 3D simulation at impressive speeds.
- Dual-core workstations provide entry-level parallel computing capability for under $1,000. A significant performance improvement is available for a modest cost.
- Dual processor workstations (with dual core CPU's) with very high performance components are available for under $5,000. This represents an attractive high-performance option for many manufacturers. Most large models can be run within a day or overnight.
- Cluster computing provides the fastest performance available with 4 - 8 (or more) processors, fast components and high-speed interconnects between CPU's.

DEFORM™
Design Environment for FORMing



The yoke simulation was run on a Hewlett Packard XC CP 3000 cluster running Linux. The cluster uses Intel 5160 dual-core CPU's with Infiniband high-speed interconnects for cluster computing tasks. A gigabit interconnect supports high speed IO. The image (above) shows the model at the end of the last step with 578,000 elements. This provides excellent resolution of features in the forging, including flash definintion. The actual run time was 24 hours and 24 minutes on four (4) dual-core processors.

The steering link (below) has been used to test parallel computing performance gains on a moderate sized problem. This model is run with under 100,000 elements. On the HP cluster, the simulation runs for 3:06 (hr:min) on a single processor. When runing on 2 processors, the job is completed in 1:55 - representing a 38% reduction in simulation time. With 4 processors, the turnaround is 1:10 (62% improvement). For 8 processors, the speed is reduced to 0:57. This model is too small to gain significant improvements in performance beyond 8 processors. The benefits realized from parallel computing vary by hardware, operating system, model size, model shape and process. In any case, fast turnaround of DEFORM-3D models is practical.



If you have been considering an upgrade to your computer system, contact your local DEFORM distributor or SFTC technical support for our latest recommendations and the specific details on our hardware performance.

Releases:

DEFORM-3D V6.1 and DEFORM-F3 V6.1 were released on August 22, 2007. See the release notes for details.

Major features released in 6.1 include:

- non-isothermal ring rolling module
- induction heating
- side rolls, tables and gravity in shape rolling module
- new GMRES solver to take advantage of multi CPU environments
- parallel modules for interpolation and volume conpensation
- three new friction models have been implemented in DEFORM-3D
- improved coupled die stress analysis
- shrink fit for non-cylindrical surfaces
- improved measuring functionality
- animation (movie) files can be directly generated for Windows Media player and MS Movie formats
- material library includes filters based on AISI, ISO, JIS, DIN, KS, and BS standards

The following Linux systems are now supported:

- Centos 4.5 (kernel 2.6.9-55),
- Redhat Enterprise Linux 4 (kernel 2.6.9-55) and
- HP XC Linux Cluster version (kernel 2.6.9-42.3).

DEFORM-3D and DEFORM-F3 V6.1 service pack 1 is scheduled for release by mid October.

DEFORM-2D and DEFORM-F2 V9.1 is scheduled for release by the end of 2007.

For a complete list of all the improvements, please refer to the release notes in the DEFORM User Area.

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