



SIMULATING THE FUTURE

**SIMULACIÓN COMPUTACIONAL
APLICADA A LA INGENIERÍA**

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✓ **18 YEARS OF EXPERIENCE**

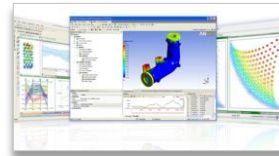
Since 1995 providing the most comprehensive simulation solutions to the market

✓ **LOCATIONS**



✓ **WHAT WE DO?**

- Reduce product development time
- Optimize processes
- Improve product performance



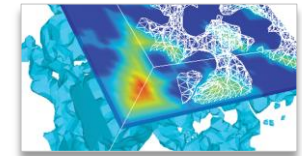
SOFTWARE

- ANSYS
- modeFRONTIER
- EnSight
- VCollab
- KRAKEN
- Chimera



CONSULTING SERVICES

- Modeling activities (R&D)
- Troubleshooting
- Integration of technologies
- Value-added services



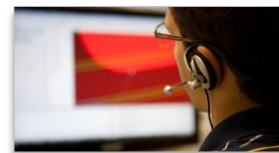
CUSTOM DEVELOPMENT

- Design of new applications
- Multiplatform GUI
- Numerical methods
- Parallel processing
- Scientific visualization



TRAINING

- 60+ training courses
- Postgraduate courses
- Online courses
- 900+ attendees per year



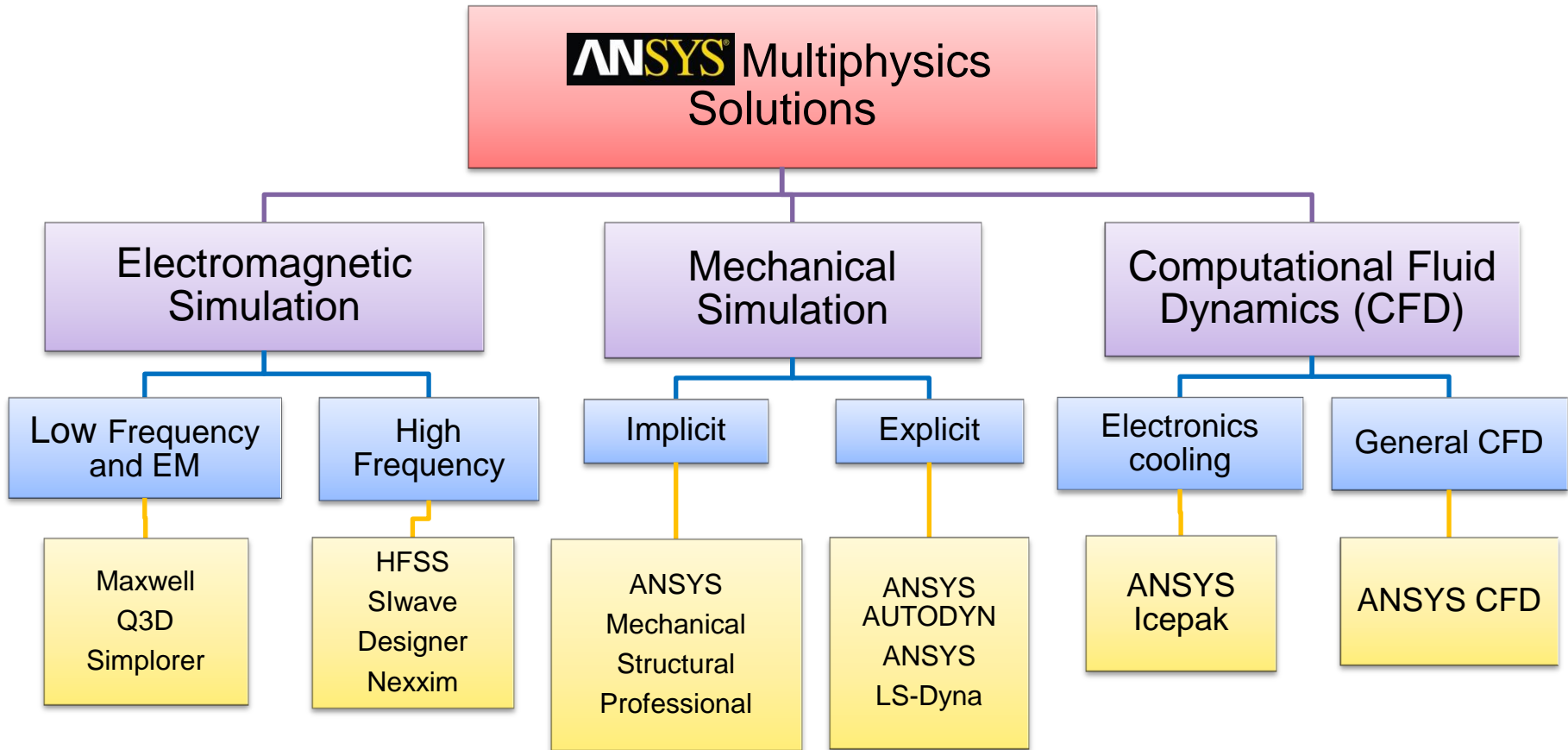
TECHNICAL SUPPORT

- Phone
- E-mail
- Online
- On-site



ACADEMIC PROGRAM

- Student / Academic & Research
- Affordable prices
- Great flexibility
- Partnership program



Caso: Vaciado de tanque

Descripción del problema:

- Tiempo de vaciado de un tanque.

Objetivos:

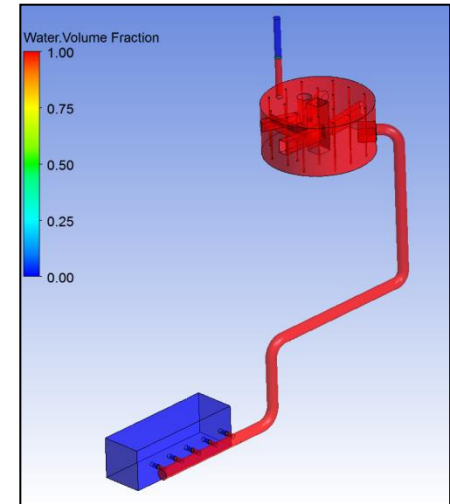
- Estudio transiente del flujo agua dentro de un tanque. Cálculo de curva de caudal de vaciado del tanque.

MESH INFORMATION

- Element type: Polyhedral
- Nodes: 3.9 millions
- Elements: 680 mil

SIMULATION DETAILS

- Analysis Type: Transient
- 2000 Timesteps
- 100 iterations per Timestep (max)
- Around 0,27 seconds of total simulation time



Análisis comparativo de performance de dos clusters trabajando con ANSYS Fluent 14.5

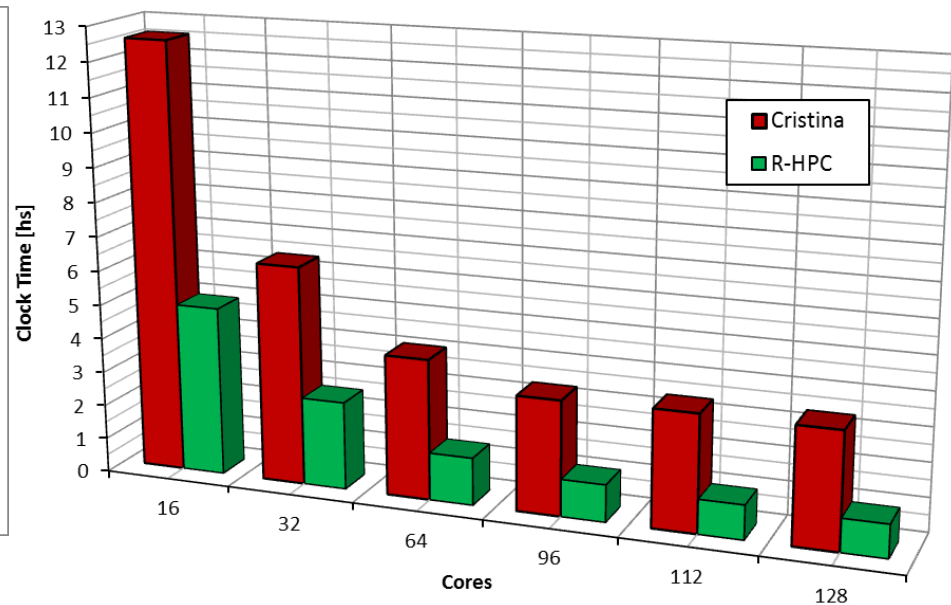
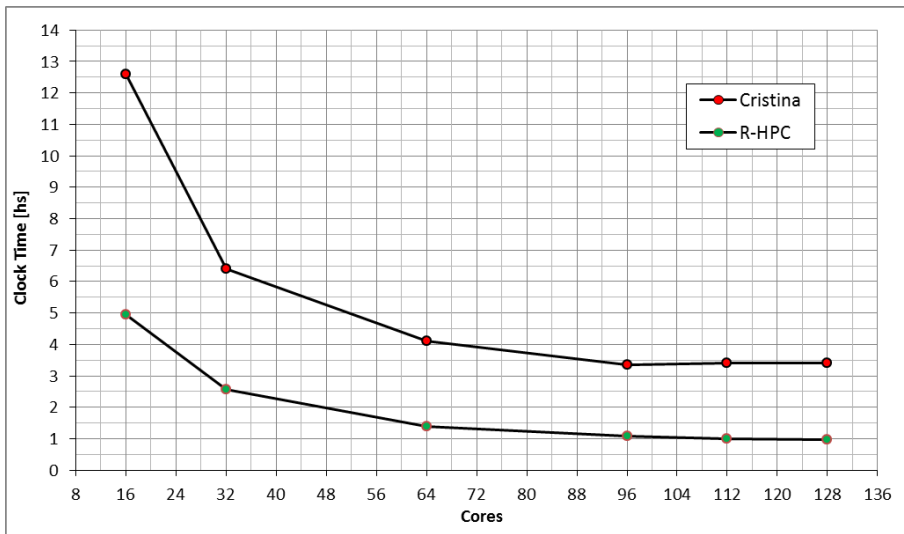
HPC CLUSTER CRISTINA

- OS: Linux CentOS 5
- 70 nodes (in this test will only be used up to 16 nodes)
- 2 Intel® Xeon® Processor E5420 per node
 - 4 cores per processor
 - 2,50 GHz Clock Speed
 - 12 MB Cache
 - Launch Date: Q4 2007
- 8 cores per node
- 16Gb RAM per node (2Gb RAM per core)
- Infiniband (40Gbps)

HPC CLUSTER R-HPC SYSTEMS

- OS: Linux Red Hat Enterprise 6.4
- 32 nodes
- 1 Intel® Xeon® Processor E3-1270 per node
 - 4 cores per processor
 - 3,4 GHz Clock Speed
 - 8 MB Cache
 - Launch Date: Q2 2011
- 4 cores per node
- 16Gb RAM per node (4Gb RAM per core)
- Infiniband (40Gbps)

ESSS Scalability Test Comparison



Cores	Cristina		R-HPC		Speed Comparison
	Clock Time [hs]	Simulation Speed [s/day]	Clock Time [hs]	Simulation Speed [s/day]	
16	12,58	0,510	4,95	1,404	2,5x faster
32	6,40	1,003	2,57	2,707	2,5x faster
64	4,10	1,565	1,38	5,023	3,0x faster
96	3,35	1,916	1,08	6,414	3,1x faster
112	3,42	1,878	1,00	6,949	3,4x faster
128	3,40	1,888	0,97	7,189	3,5x faster