

LSTC and DYNAmore Cloud Services

www.ls-dynacloud.com

Overview

- **Current Situation**
- Product offering on LS-DYNAcloud
- Accessing the LS-DYNAcloud platform
- Advantages
- Plans for future services in LS-DYNAcloud
- Summary

Current Situation

1. Most Customers use their own hardware:
 - Workstation
 - Server-Cluster
 - Usage of MPP-version is standard even on Workstations
2. Intracloud
 - shared resources in the company-internal network
3. Usage of external hardware:
 - external hardware is used to account for peak loads
 - Most cases a mixture of internal+external resources is used

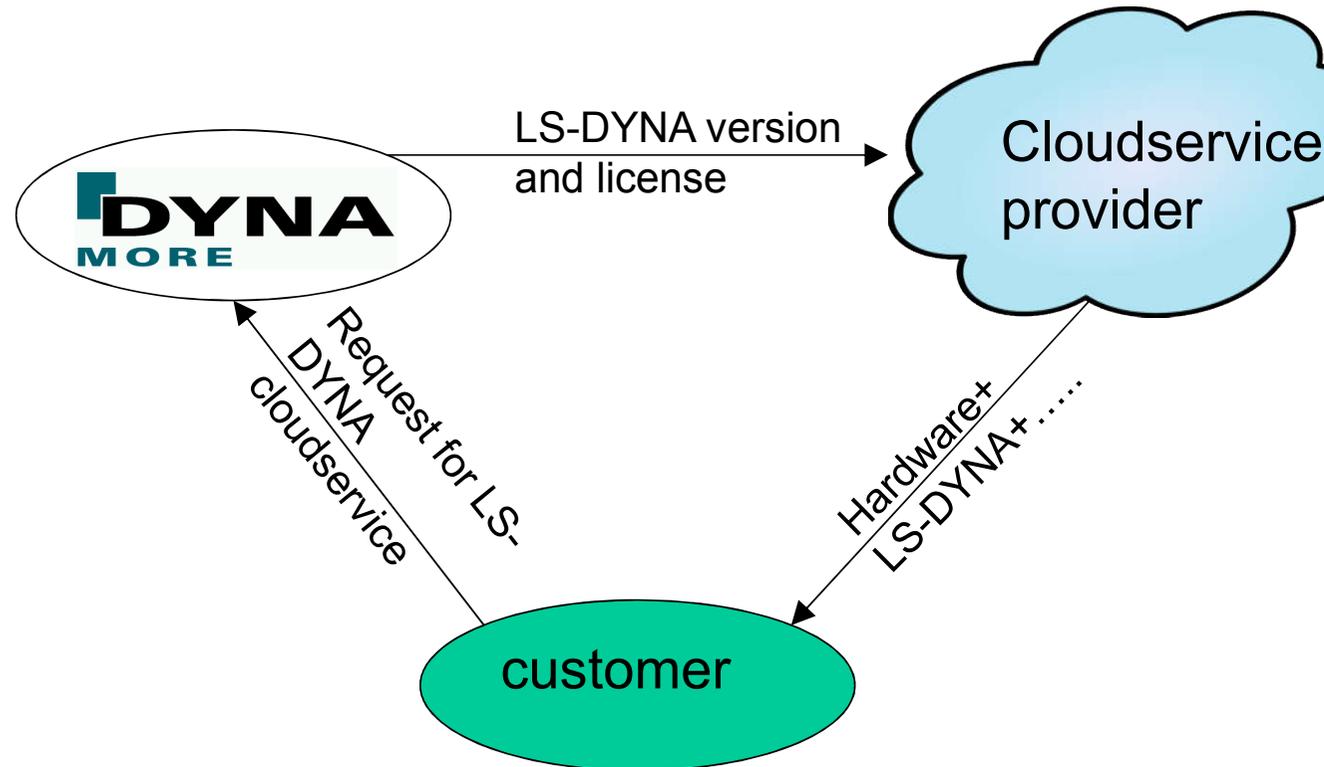
Current Situation

4. Requests for additional licenses to be used in own compute centre
 - Flexibility to exchange resources
 - On Premise hardware is used by different departments or for different solvers
 - Can also be addressed by Cloud-solutions

Current Situation

Cloud-services used by LS-DYNA customers:

- Hardware is provided by Cloud service providers (CPU24/7, Gompute, Rescale)
 - LS-DYNA licenses are provided by DYNAmore:
 - Pay per use – basis
 - Lease – base
 - Only few customers
- (->easier access and information necessary)



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„New“ Product: LS-DYNAcloud

- HW+SW-ressources are bundled
- Unique point of contact: DYNAmore
- Pay for a predefined volume to be used within a dedicated time period
- No Computing Centre build and maintained by LSTC/DYNAmore
- Latest hardware available through the following global providers:
 - Gompute (local computing centres available)
 - CPU24/7 (Germany only)
 - Microsoft Azure (local computing centres available e.g. in Europe)
 - Amazon AWS (local computing centres available)
 - ...

„New“ Product: LS-DYNAcloud

- Actual Information about Hardware performance is being given for standard benchmarks
- Additional customer-specific benchmark examples can be done
- Pricing examples are shown

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Accessing the LS-DYNAcloud Platform

- LS-DYNAcloud offering includes standard GUI for job administration
- D3View can be provided through LSTC.
- Integration of Hardware in the standard IT-environment of the customer's on-premise hardware is possible.
- All LS-DYNA related software and tools from LSTC and DYNAmore can be used:
 - d3View
 - LSOpt, LSTasc,
 - Dummy and Barrier models
 - Plotcompress, Femzip
 - Tools for Simulation data management, e.g. Loco

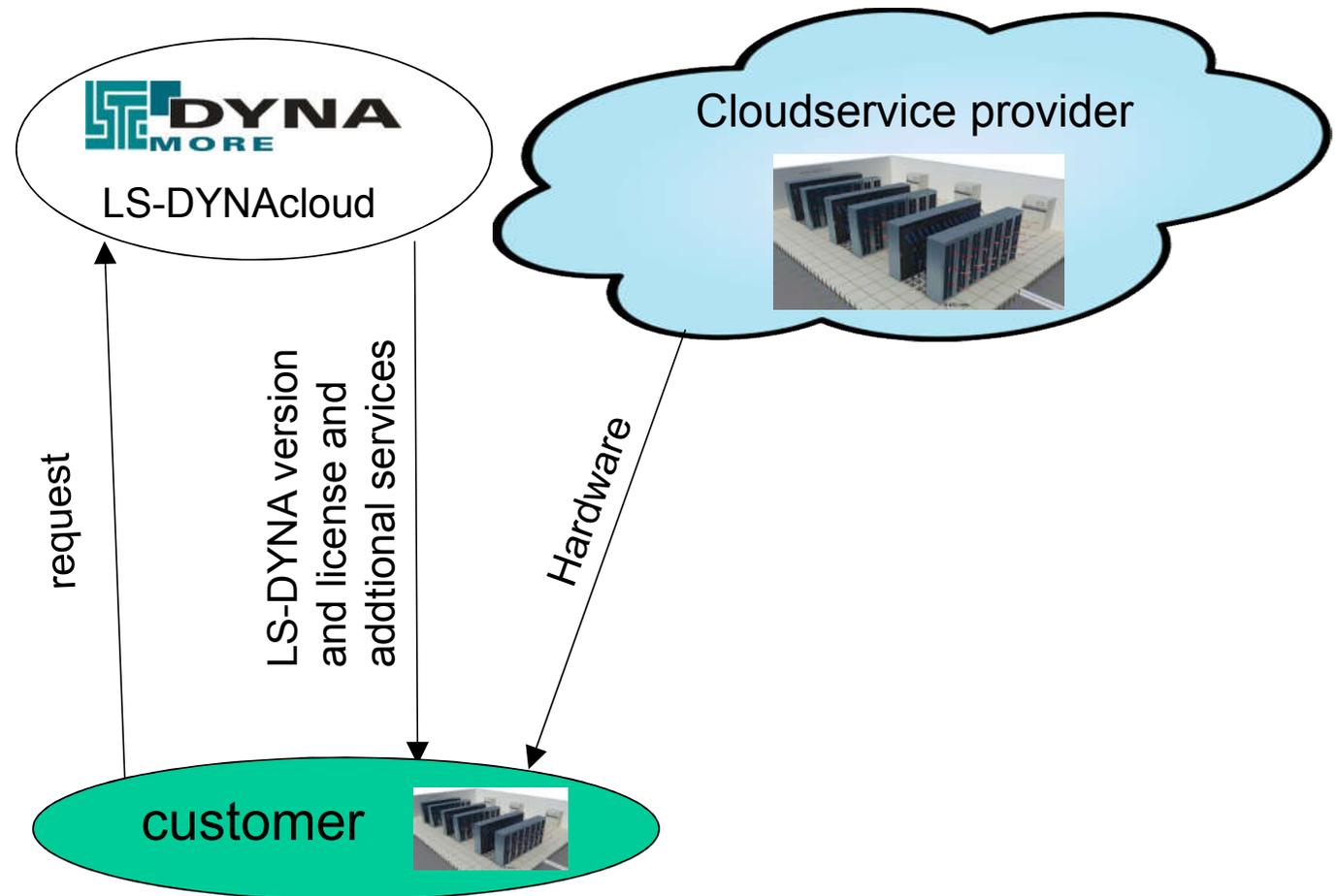
The screenshot displays the 'Core Types' section of the LS-DYNAcloud platform. It features a table of primary core types with columns for Type, Memory, Compute, Interconnect, Storage, and Price. The 'Standard' type is selected. To the right, a 'Hardware Summary' panel shows a grid of nodes and a table with columns for Compute, Memory, and Storage. Below the table, there are options for 'Low Priority' and 'Immediate'.

Type	Memory	Compute	Interconnect	Storage	Price
Marble Standard	3.8 GB	3.00	Standard	40.0 GB	\$ 0.10
Nickel HPC+	3.8 GB	6.75	10 GB/s	40.0 GB	\$ 0.15
Dryx HPC++	3.8 GB	7.33	10 GB/s	36.0 GB	\$ 0.20
Iron HPC Infraband	7.0 GB	5.50	40 GB/s	125.0 GB	\$ 0.30

Compute	Memory	Storage
54 CPU	30.0 GB	320.0 GB
Nodes	Memory / node	Storage / node
1	30.0 GB	320.0 GB



Accessing the LSDYNAcloud Platform





LSTC
Livermore Software
Technology Corp.

DYNA
MORE

LS-DYNAcloud

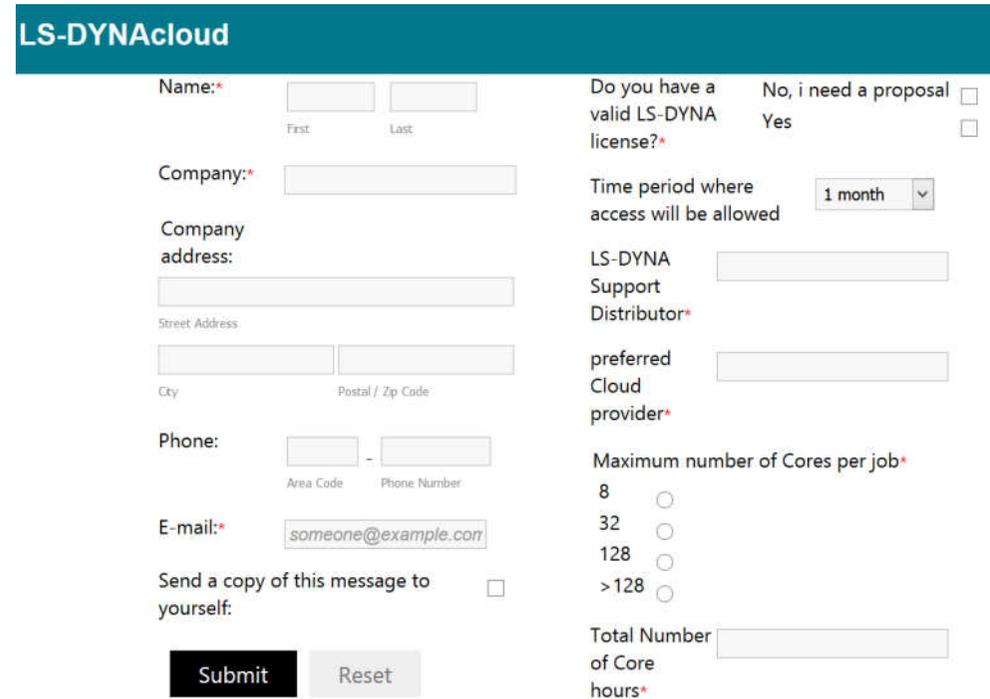
Is an integrated simulation platform offered by LSTC and DYNAmore. The simulation software LS-DYNA is provided on a High Performance Computing platform. Hardware is provided in cooperation with experienced hardware service providers. It can easily be accessed in a fast and cost-efficient manner.

Accessing the LS-DYNAcloud platform

1. Customer fills request form on www.ls-dynacloud.com

Request form contains:

- Maximum number of cores per job (cores)
- Total number of jobs to be analysed on the platform
- Time period where access is valid
- Hardware vendor and GUI
- LS-DYNA distributor in the area (for telephone support)
- Additional Software for LS-DYNA (e.g. LS-Opt, etc.)



The screenshot shows the LS-DYNAcloud request form. The form is titled "LS-DYNAcloud" and contains the following fields and options:

- Name:** Two input fields for "First" and "Last".
- Company:** One input field.
- Company address:** One input field for "Street Address".
- City:** One input field.
- Postal / Zip Code:** One input field.
- Phone:** Two input fields for "Area Code" and "Phone Number".
- E-mail:** One input field containing "someone@example.com".
- Send a copy of this message to yourself:** A checkbox.
- Do you have a valid LS-DYNA license?*** A checkbox.
- No, i need a proposal Yes:** A checkbox.
- Time period where access will be allowed:** A dropdown menu set to "1 month".
- LS-DYNA Support Distributor*:** One input field.
- preferred Cloud provider*:** One input field.
- Maximum number of Cores per job*:** Radio buttons for 8, 32, 128, and >128.
- Total Number of Core hours*:** One input field.

At the bottom of the form are "Submit" and "Reset" buttons.

Access to LS-DYNAcloud

2. Customer gets a proposal from DYNAmore containing:

- Software costs and conditions
- Hardware costs and conditions (Hardware provider chosen by customer)

3. Customer sends PO to DYNAmore

- Contract for cloud usage will be provided
- Access to resources is allowed

The image displays three pricing packages for LS-DYNAcloud, each with a 'purchase' button. The packages are: Package "Small" (3,000 core hours, 1 month, 8 Cores, 2,200 US\$), Package "Medium" (10,000 core hours, 3 months, 8 Cores, 7,000 US\$), and Package "Large" (60,000 core hours, 3 months, 64 Cores, 19,000 US\$). All packages cover hard- and softwareusage on LS-DYNAcloud.

Package "Small"	Package "Medium"	Package "Large"
3,000 core hours valid for one month, 8 Cores in parallel	10,000 core hours valid for 3 months, 8 Cores in parallel	60,000 core hours valid for 3 months, 64 Cores in parallel
2,200 US\$ Hard- and Softwareusage on LS-DYNAcloud	7,000 US\$ hard- and softwareusage on LS-DYNAcloud	19,000 US\$ hard- and softwareusage on LS-DYNAcloud
purchase	purchase	purchase

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Advantages

1. Seamless access to actual Hardware platforms and appropriate LS-DYNA versions
2. High flexibility – up- downsizing of the platform.
3. Peak loads can easily and fast be adressed
4. Configurations of Hardware+Software fit to each other
5. Single point information and contact:

www.ls-dynacloud.com

cloud@dynamore.com

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Plans for future services in LS-DYNAcloud

1. Integration of dynasupport.com and dynaexamples.com into LS-DYNAcloud
2. Support area
 - support case can be moved to support area
 - > support ticket is generated with link to support case on the Cloud platform
 - > DYNAmore support can work on the case directly on the Cloud platform
 - > when the case is solved, will be put back to user area.
3. Area for evaluation purposes:
 - New hardware provided by Hardware Companies
 - LS-DYNA beta-versions

Plans for future services in LSDYNAcloud

4. LS-DYNA licenses on demand
 - License server will be placed in the cloud and hosted by DYNAmore
 - External (Cloud-)hardware and internal hardware can be used on a pay per use-basis
5. Integration of social networks
 - User groups
6. Offering for Academic use
 - OpenCloud area
 - Attractive pricing
 - Area for exchange of models, materials, etc.

Summary

LS-DYNAcloud – provided by LSTC+DYNAmore

- Easy and fast access to Cloudbased infrastructure
- Good opportunity to account for peak compute loads
- New services will be made available through LS-DYNAcloud

