

Collaborating LS-DYNA Simulations

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d3VIEW™

Collaboration Software for Virtual Product Development

<http://www.d3view.com>

Suri Bala
Founder

What is **d3VIEW™** ?

Web software that provides **unparalleled** user experience in managing and collaborating virtual product development data including LS-DYNA simulations, experimental data, material library and documents.

Watch a Screencast at <http://vimeo.com/13870099>

d3VIEW™ History

- Founded in early 2003 to improve data management, mining and collaboration of simulation
- Over 6 years in research and development
- Patents Pending

Current State of Simulations

- 1–5 Gigabytes / Full Vehicle Simulation
- HPC systems returns data with limited knowledge of its content
- Analysts are burdened with handling such large amounts of data
- Collaboration is primitive
- Non-existent Mining

Analyst Repeated Activities

- Estimate Simulation Quality
- Evaluate Product Performance
- Comparison with previous designs
- Collaborate the results

HPC Data Flow

LS-DYNA Input



LS-DYNA Output

With simple connection settings, after every simulation is completed, d3VIEW uses advance technology to auto process the results and stores them in concise format.



With no user input

10000+ responses

Analysis

Relational DB

< 50Mb

Web Browser





d3VIEW™ Out-Of-Box Features

Search
Notifications
Charts
Customization

PROJECT

Audit Trail
Roles
Comments
Analytics

Task, Milestones,
Discussions

Experiments

Simulations

Materials

People

Documents

Project Management




The screenshot shows a web application interface for project management. At the top, there is a dark navigation bar with 'DASHBOARD > PACE' on the left and 'New File Task Simulation' on the right. Below this is a secondary navigation bar with tabs for 'Overview', 'Simulations', 'Tasks', 'Messages', 'Milestones', 'Test Data', 'Material DB', 'Files', 'People', and 'Settings'. The main content area is divided into two sections: 'Recent Activities' on the left and 'Members' on the right. The 'Recent Activities' section has a 'Filter' button and lists three activities: 1. A milestone update by Suri Bala 6 days ago. 2. An attachment creation by Rob Moncur 1 month ago. 3. A solver result set deletion by Suri Bala 1 month ago. The 'Members' section lists four team members with their last login times.

DASHBOARD > PACE New File Task Simulation

Overview Simulations Tasks Messages Milestones Test Data Material DB Files People Settings

Recent Activities

Filter

-  **MILESTONE** updated Milestone First LS-DYNA Crash Simulation status was changed from open to closed
6 days ago
Suri Bala
-  **ATTACHMENT** created PACE_LSDYNA_FINALREPORT.docx
1 month ago
Rob Moncur
Found 1 comments
-  **SOLVERRESULTSET** deleted increased monocoque thickness
1 month ago
Suri Bala

Members

- Suri Bala**
last login 7 minutes ago
- Rob Moncur**
last login 18 hours ago
- Satyan Chandra**
last login 1 month ago
- Greg Jensen**
last login never

Activity Stream

Global Search

Team Members

Statistics

Customization

Notifications

People Management

Xfinity,Inc + Add User

Address
Website
Phone #
Fax #

Clients + Add Client

My Company
Honda Americas
Boeing
Chrysler LLC

Add People To The Project + Add a new Person Done

Xfinity,Inc (Your Organization)

- Anatoliy Chickalenko
- Suganya Chellam
- Mike Saxon
- Shan Bala
- Qui Qui
- Girish Sheshadri

Honda Americas

- Emily Nutwell

Boeing

Name	Email	Last Login	Role
Anatoliy Chickalenko	achikhale...@gmail.com	never	ProjectAnalyst
Qui Qui	lsdyna.exam...es@gmail.com	2010-05-02 06:37:01	ProjectAnalyst
Mike Saxon	saxonm@cyberst.com	never	ProjectAnalyst

- Powerful User management
- Supports several authentication types
- Roles
- Teams

Document Management

The screenshot displays the d3VIEW web application interface. At the top, the logo 'd3VIEW' is visible with the tagline 'Manage YOUR Predictions'. The user is logged in as 'Suri Bala' and has access to 'My Account' and 'HELP' links. The main navigation bar includes 'DASHBOARD > PACE' and an 'Add Stats' button. Below this, a series of tabs are shown: Overview, Simulations, Tasks, Notes, Milestones, Test Data, Material DB, Files (selected), People, and Settings. The 'Files' section shows a list of documents, with the first one being 'PACE_LSDYNA_FINALREPORT.docx (Rev 7)'. This document has no description, is 4.13 MB, and was added by Rob Moncur 3 months ago. It has 7 revisions. A 'New File' modal window is open in the foreground, providing options to upload a file from a local device, from a URL, or import it. It also allows selecting an attachment set from available collections. There are checkboxes for 'Make File Private (Visible Only To Your Company)' and 'Notify Team Members' with a list of users: Jacob Krebs, Satyan Chandra, Rob Moncur, and Greg Jensen. An orange 'NEW' badge is positioned next to the 'Approval' feature in the list on the right.

- Amazing Interface
- Auto processing
- Collaborate
- Approval **NEW**
- Revision Control
- Security

Task Management

All Tasks

Model Development

Open Tasks

- [Suri Bala] Add new team members. 2010-07-10 late by 1 month ago
- [Satyan Chandra] Analyze and access wheel structure for appropriate meshing
- [Satyan Chandra] Tasks: LS Prepost/ Wing Meshing (Mid-surface) and Model modifications/ Wheel disc and rim meshing/

New Task

Task Name

This Is A Multiple List
Check this option if each line is a task

Due Date Assign This Task To Associate This Task With A Milestone (Optional)

Suri Bala Choose Milestone (Optional)

YEAR/MM/DD

- Create, Assign and Track
- Discuss
- Relate to Milestones
- Tasks Lists

Physical Test

DASHBOARD > Debugging Project + Add Stats


Overview Simulations Tasks Notes Milestones **Test Data** Material DB Files People Settings

Physical Tests + New Test

NHTSA 2008 Chrysler Sebring Convertible Files Responses edit delete

All New File

v06621P008.jpg

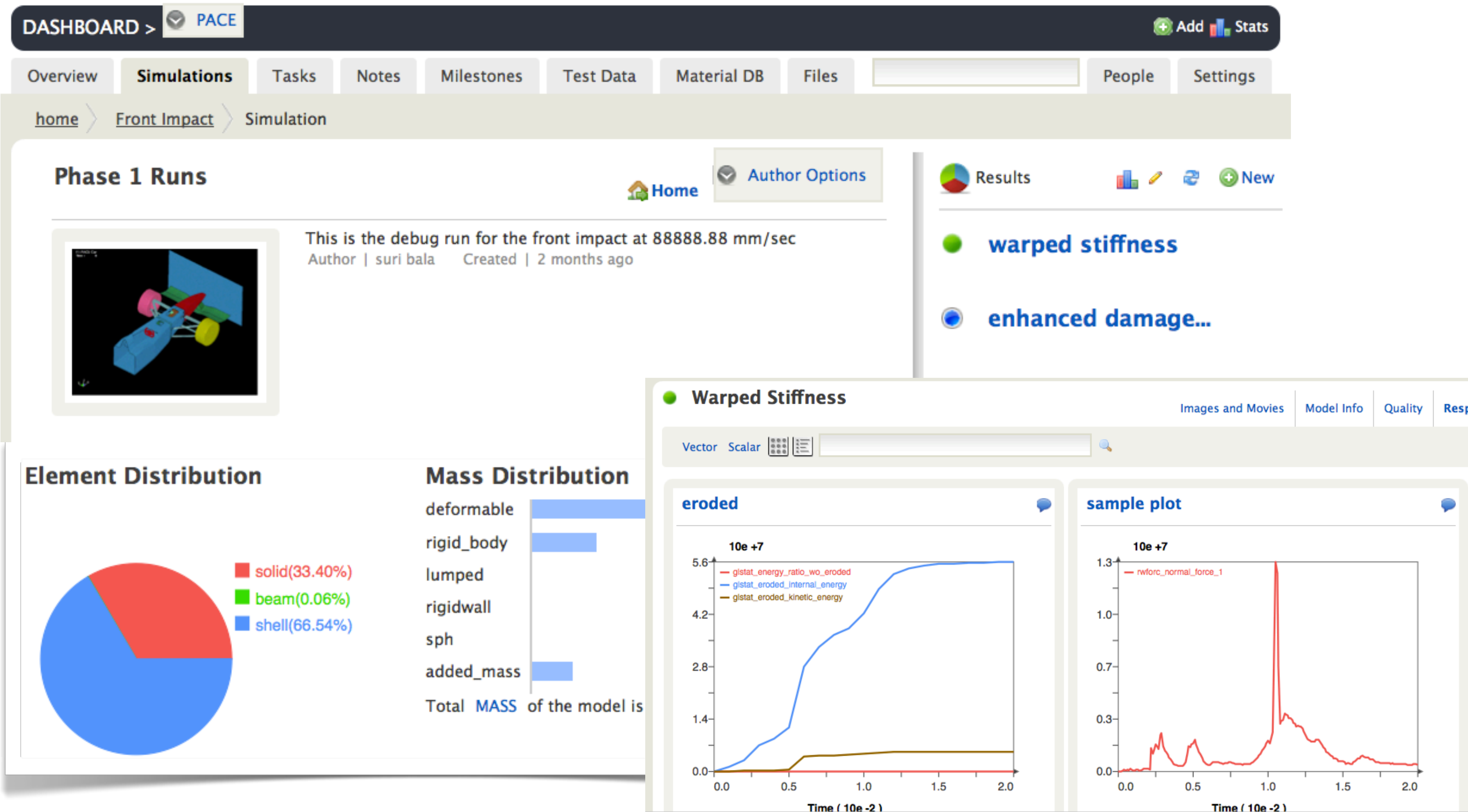


No description available
659.24 KB
added by **Suri Bala** 32 minutes ago

v06621P007.jpg

- Single place to store all experimental data
- Images, Videos
- Timehistories
- Clean up
- Unit-Aware

Simulations



- Generic framework to extract solution results
- Incredible comparison functionalities
- HPC connector
- Template driven post-processing
- 10000+ response extraction
- Bill Of Analysis

Discussions & Knowledge Database

The screenshot displays a web dashboard with a dark header containing 'DASHBOARD > PACE' and '+ Add Stats'. A navigation bar below the header includes tabs for 'Overview', 'Simulations', 'Tasks', 'Notes', 'Milestones', 'Test Data', 'Material DB', 'Files', 'People', and 'Settings'. The main content area is titled 'All Notes' and features a note titled 'Rear Car Inertial And Mass Info' posted by 'Suri Bala' on '2010-06-06 09:22:28'. A 'New Message' modal window is open in the foreground, containing a 'Title' field, a 'Message Body' text area, a 'Choose category' dropdown menu, and an option to 'OR Create A New Category' with an associated input field. Below the message body, there is a 'Notify Team Members' section with checkboxes for 'Jacob Krebs', 'Satyan Chandra', 'Rob Moncur', and 'Greg Jensen'. A 'Create Message' button is located at the bottom of the modal.

- Replacement to Email
- Gather team's input on a idea
- Comment threads
- Search
- Archive for reference

Material Library

DASHBOARD > PACE

Overview Simulations Tasks Notes Milestones Test Data **Material DB** Files

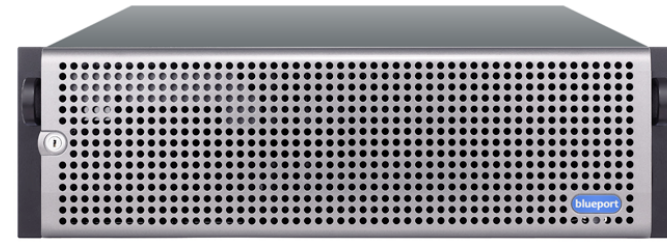
Materials

all compare export

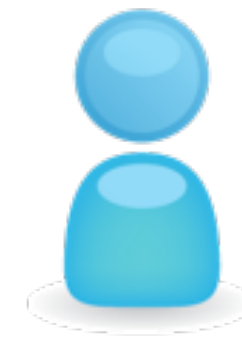
Name	Description	Family	Elastic Modulus	Bulk Modulus	Flexural Modulus	Shear Modulus	Density	Specific Weight	Poisso Ratio
			Mega Pascals	Mega Pascals	Mega Pascals	Mega Pascals	megagram/millimeter ³		
<input type="checkbox"/> Aluminum	This is a generic aluminum property	MT	70000	0	0	0	2.2e-09	0	0.33
<input type="checkbox"/> Steel	This is the generic grade steel	MT	210000	0	0	0	7.89e-09	0	0.3
<input type="checkbox"/> Alumold 500	This goes to the large curved	MT	72000	0	0		2.82e-09	0	0.33
<input type="checkbox"/> Alumold 200	curved								
<input type="checkbox"/> Alumold 100	this goes to	MT	110000	0	0		5.85e-09	0	0.33

- Store corporate material database
- Compare materials
- Internal characterization support
- Export to Solver specific
- Unit-Aware

Under the Hood



d3VIEW Software



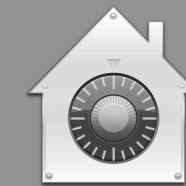
HTML

D3VIEW Business Logic

BluePort



Database



File Vault

d3VIEW Software

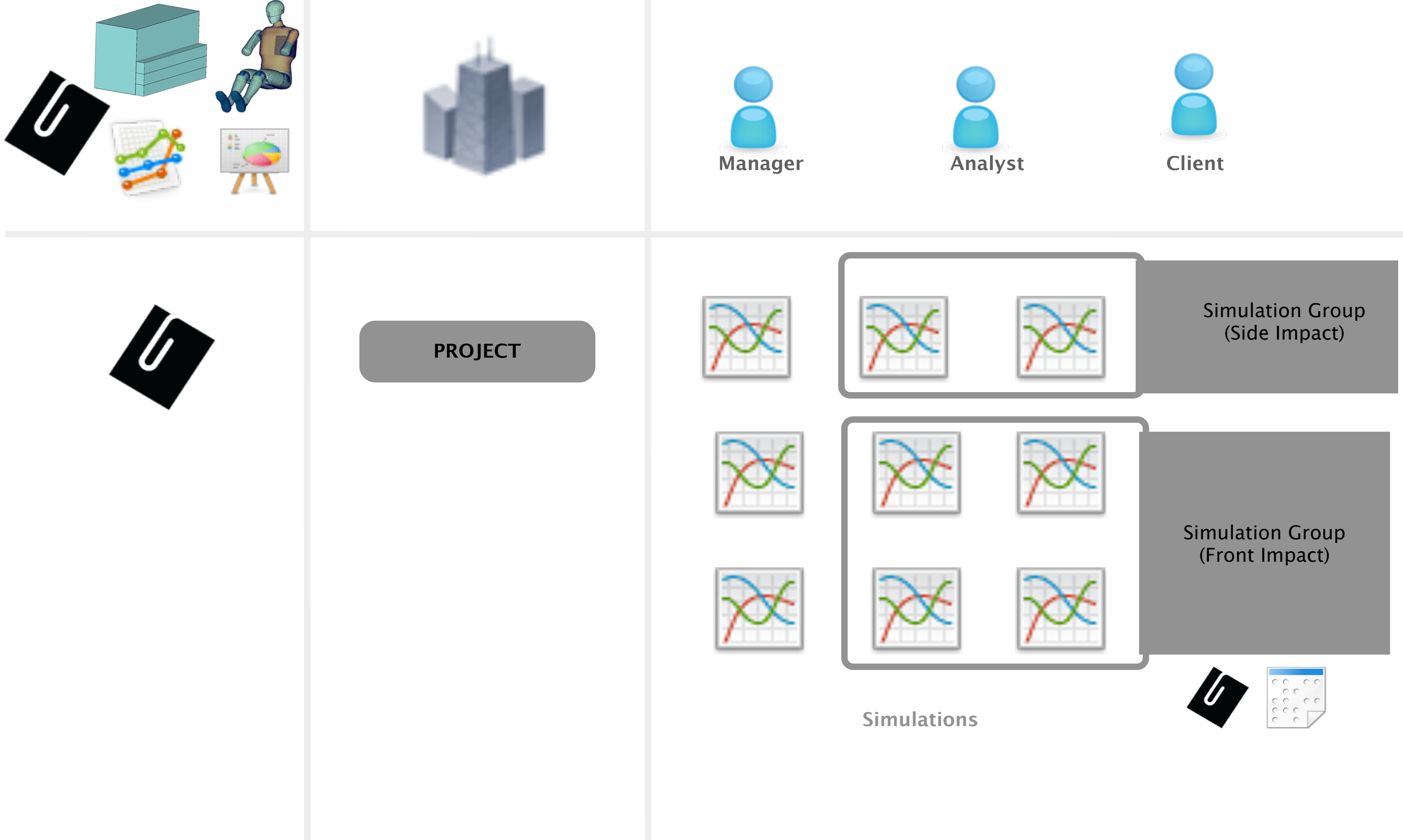
- PHP, Python, C++, Java,...
- MySQL/Oracle/PostgreSQL Database
- Runs on all operating systems



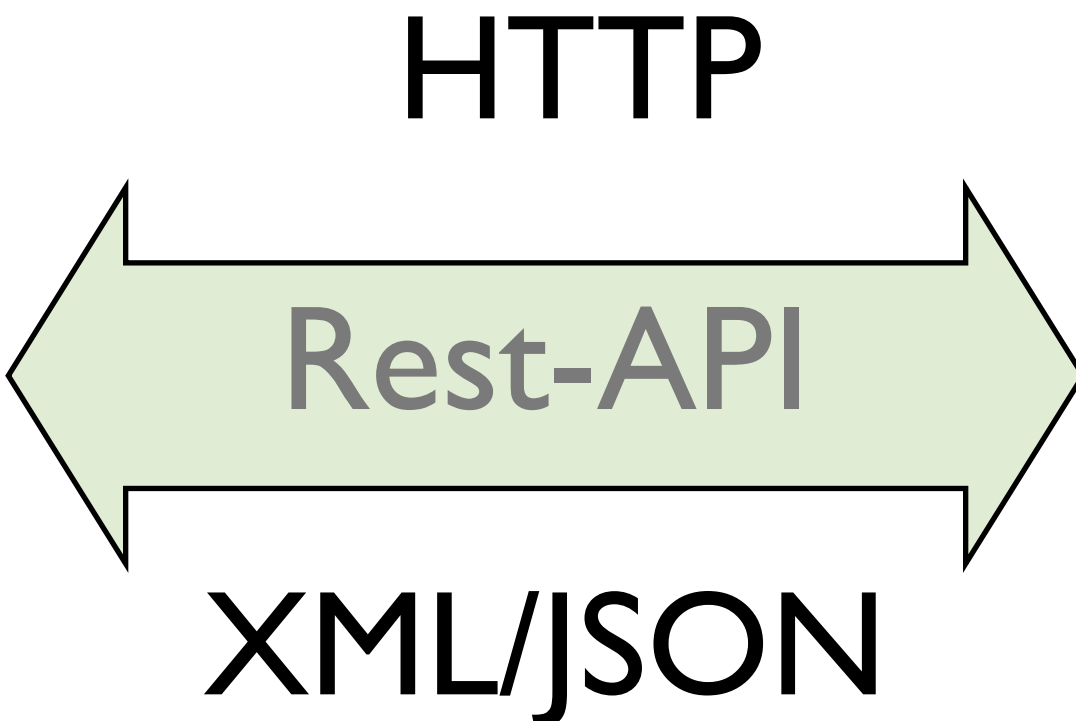
- Viewable in almost all browsers



d3VIEW Model



Third Party



d3VIEW[®]

Experiencing D3VIEW

You can experience D3VIEW in three different ways.

Simulation Data Collector

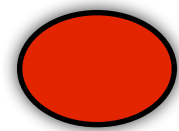
Simulation Data Storage

HPC Front End

d3VIEW Data Collector

This has the least impact to the existing processes but provides a unparalleled alternative to NAS storage

One line to existing LS-DYNA job scripts to perform data extraction



```
330
331 /appl/scripts/stage_out.sh
332
333 if [[ "x${D3VIEW_POST}" = "xyes" ]] ; then
334     echo " d3View post extraction ...";
335     ${RSH} ${D3VIEW_SERVER} "${D3VIEW_POST_SCRIPT} -sim_dir ${FROM_DIR}"
336 fi
337
338 if [[ "x${SOLVER_RUN_TYPE}" = "xbatch" ]] ; then
339     $RCP $SOLVER_START_DIR/"${SOLVER_JOB_NAME}"_LOG_ERR" $FROM_HOST:$FROM_DIR
340 fi
341
342 cd $SOLVER_START_DIR # go back to where this script was called from
343 rm -rf $SOLVER_LOCAL_DIR # remove local dir
344 echo " Finished running $SOLVER_INPUT FILE "
345 echo " Solver details ..."
346 echo "   Type : $SOLVER_TYPE"
```

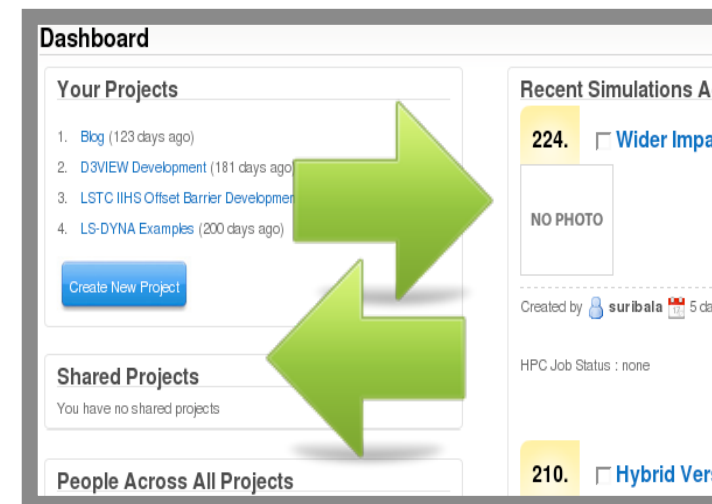
d3VIEW as data storage

This would be manual storage of selective simulations for viewing comparison and quality checks



d3VIEW HPC Gateway

This would be central gateway to interface with HPC systems



“With the complicated and intricate nature of creating a crash-worthy model of the PACE FI race car, d3VIEW was a perfect solution to keep our team organized. With d3VIEW we were easily able to share images, videos, and most importantly the LS-Dyna key files. The simulation features made it very easy to visualize the simulation we had created. Overall d3View is a great collaboration tool saved our team valuable time in the management of our project”

Rob Moncur
BYU

In Summary

- Rapid product development necessitates a collaborative and intelligent systems to improve efficiency
- With strong framework aiding fast development, d3VIEW addresses the challenges faced by simulation and product development engineers
- Its Open-API allows it to seamlessly integrate with any third-party applications
- Out-of-the-Box feature rich software requires minimum customization