

# LS-DYNA Submission Tool



# Why do you need this tool?

- This tool allows you to easily submit a model into LS-DYNA directly from PRIMER. The model can be submitted locally or onto a remote machine/cluster
- As well as speeding up the submission process, the functionality allows easy initialisation and model checking with a few clicks
- To aid the above, this functionality has been integrated with PRIMER's LS-DYNA output checking tool to speed up the process of initialisation when checking models and visualising decomposition/load profiles
- This tool uses functionality that exists within SHELL – the Oasys LS-DYNA Environment's submission tool



# Purpose of the LS-DYNA Submission Tool

This tool can be accessed by clicking the **Model->Submit** button to perform LS-DYNA runs directly from PRIMER:

- **Local** machine : The same Windows or the Linux machine from where the PRIMER session is launched
- **Remote** machine: Linux machine on a network where LS-DYNA is configured to run

You can also monitor the progress of **ONLINE** (real time) LS-DYNA runs on a **Local** machine

You can perform LS-DYNA initialisation of the model in a PRIMER session and view LS-DYNA results relating to errors/warnings/load profile and decomposition via the **LS-DYNA Output Reader** tool in PRIMER

The screenshot shows the 'LS-DYNA Submission' dialog box with the 'Machine and Model Options' tab selected. The 'Machine Type' is set to 'Local'. The 'Model Number' is '1 (Vehicle)'. The 'Submit Directory' is 'C:\Test-Models'. The 'Submission Options' section shows 'Submission Bookmark' as 'MPP-SINGLE', 'Precision Type' as 'SINGLE', 'Code Type' as 'MPP', and 'MPI Type' as 'IMPI'. The 'LS-DYNA Executable' is 'LS 64 SP MPP (PLATFORM IMPI)'. The 'LS-DYNA Path' is 'C:\Program Files\LS-DC\LS-DYNA\R11...p\_s\_R101\_winx64\_ifort131\_imp\_i.exe'. The 'MPI Executable Path' is 'C:\Program Files (x86)\Intel\MPI-RT4.0.3.010\em64t\bin\mpiexec.exe'. The 'Submission Type' is 'ONLINE' and 'NCPUs' is '4'.

The screenshot shows the 'LS-DYNA Submission' dialog box with the 'Machine and Model Options' tab selected. The 'Machine Type' is set to 'Remote'. The 'Remote Machine' is 'REMOTE-CONNECTION'. The 'Model Number' is '1 (Vehicle)'. The 'Submit Directory' is '/data/test\_models'. The 'Submission Options' section shows 'Submission Bookmark' as 'MPP\_SINGLE-REMOTE', 'Precision Type' as 'SINGLE', 'Code Type' as 'MPP', and 'MPI Type' as 'IMPI'. The 'LS-DYNA Executable' is 'R11.0.0 Intel MPI (AVX2)'. The 'LS-DYNA Path' is '/prg/LINUX/DYNA\_EXECUTABLES/R11.0...65\_ifort160\_avx2\_intelmpi-413.exe'. The 'MPI Executable Path' is '/opt/intel/mpi/5.1.3.223/intel64/bin/mpirun'. The 'Submission Type' is 'QUEUE' and 'NCPUs' is '4'.

# How to configure the LS-DYNA Submission tool?

- To run LS-DYNA from within PRIMER:
  - LS-DYNA executables must be available from (“Local”/ “Remote”) machine:
    - The LS-DYNA executables can be downloaded from the link below:  
<https://www.oasys-software.com/dyna/downloads/ls-dyna-executables/>
  - For MPP LS-DYNA, MPI installation must be present on (“Local”/ “Remote”) machine:
    - **Intel MPI** installation can be downloaded from the link below:  
<https://www.oasys-software.com/dyna/downloads/ls-dyna-mpi-library/>
- A valid LS-DYNA license is required to perform LS-DYNA runs on (“Local”/ “Remote”) machine
- There is no requirement for Oasys software to be installed on the “Remote” machine to run LS-DYNA on that machine. It is however recommended to install Oasys on the machine on which LS-DYNA is to be run. This is to allow access to the advanced LS-DYNA submission facilities available in SHELL



# How to configure the LS-DYNA Submission tool?

- The default settings for this tool are taken from the preferences specified for SHELL
  - For an LS-DYNA run on the “Remote” machine:
    - If the Oasys LS-DYNA Environment is installed on the “Remote” machine, then the SHELL preferences are retrieved from that machine,
    - Otherwise the default settings are applied
- The LS-DYNA related options specified in this tool can be saved by pressing the **Save Settings** button under the **Submission Bookmark** name
  - These settings are saved in a PRIMER “settings file” and these settings can be re-loaded in a subsequent PRIMER sessions for easy tool setup



# Configuration files used for LS-DYNA Submission

- **Preference files (oa\_pref):**

- Default values for many of the LS-DYNA related options are taken from the SHELL preferences specified in the file **oa\_pref**
- This file can be kept at one or all these locations:
  - Folder path specified by OA\_ADMIN Environment Variable
  - Folder path specified by OA\_INSTALL Environment Variable
  - The User's login path (USER HOME)
  - Current working folder
- SHELL Manual references:
  - <OA\_INSTALL>/manuals/shell/shell\_manual/sect\_2/sect\_2.htm #xshell customising
  - <OA\_INSTALL>/manuals/shell /shell\_manual/sect\_4/sect\_4.htm



# Configuration files used for LS-DYNA Submission

- **JSON Settings Files:**

- PRIMER saves the data entered in the LS-DYNA submission tool in a JSON settings file under given bookmark label names. This includes:
  - Remote machine connection options
  - LS-DYNA submission options
- PRIMER can read/write up to four different JSON files - the path to these files is taken from the preference value for **primer\*json\_bookmarks\_file** that is specified in the 'oa\_pref' files kept at these locations:
  - Folder path specified by OA\_ADMIN Environment Variable
  - Folder path specified by OA\_INSTALL Environment Variable
  - The User's login path (USER HOME)
  - Current working folder



# Configuration files used for LS-DYNA Submission

- **JSON Settings Files (cont.):**

- The default name of the saved file is: **pr\_bookmarks.json**
- A newly created bookmark label for remote-machine or submission-options can be saved in a file chosen from the **New Settings** menu and then by pressing the appropriate **Save Settings** button
- PRIMER also saves the details of LS-DYNA jobs that are run via this tool in the HOME folder JSON file.
  - The LS-DYNA job details can be saved just by pressing the appropriate **Save Settings** button
- The list of all entries that are saved under different categories of bookmarks is detailed in “Appendix-I” at the end of this tutorial





# Configuration files used for LS-DYNA Submission

- These additional (but **optional**) files can also be used to configure and enhance the LS-DYNA Submission capabilities.
  - These files are taken only from the **OA\_INSTALL** folder path
  - These files have been traditionally used for LS-DYNA submission in **SHELL**

## 1. **dyna\_versions:**

- The list of LS-DYNA executables can be accessed via this file
- This file can be edited via the LS-DYNA Submission tool and the **LS-DYNA Executable Path** used for LS-DYNA run can be added to this file by pressing the **Add Version** button available in the panel
- SHELL Manual reference:
  - **<OA\_INSTALL>/manuals/shell/shell\_manual/sect 2/sect 2.htm#dyna\_version**



# Configuration files used for LS-DYNA Submission

## 2. **oasys\_queue:**

- This file lists alternative batch queues and queue directives. It only needs to be created for systems on which jobs can be submitted to a NQS style queue
- This file can only be created/edited manually
- SHELL Manual reference:
  - [<OA\\_INSTALL>/manuals/shell/shell\\_manual/sect 2/sect 2.htm#oasys\\_queue](#)

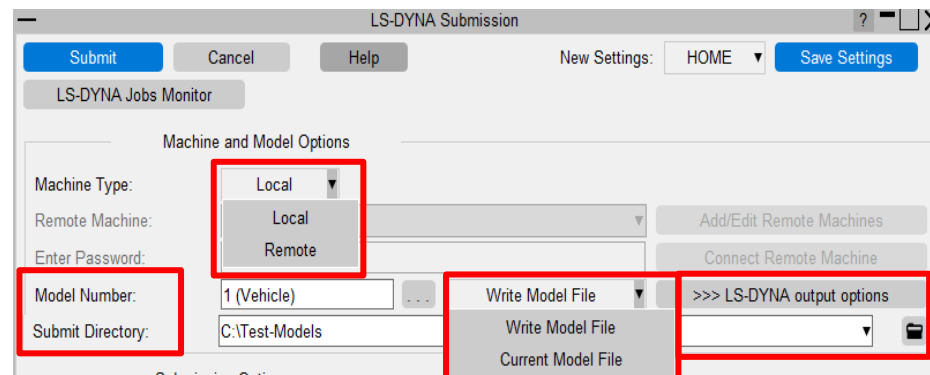
## 3. **oasys.submit:**

- The commands to run LS-DYNA can be included from this user configurable file
- This file can only be created/edited manually
- SHELL Manual reference:
  - [<OA\\_INSTALL>/manuals/shell/shell\\_manual/sect 2/sect 2.htm#oasys\\_submit](#)



# Machine and Model Options (Local LS-DYNA run)

- To carry out local submission, select **Local** from the **Machine Type** menu
- The model file that will be submitted to LS-DYNA can be chosen from the menu next to the model selector button
  - **Write Model File** – Re-writes the model files (master and includes) to the **Submit Directory** and runs LS-DYNA on this file
    - The model output options can be changed by pressing the **>>> LS-DYNA output options** button
  - **Current Model File** – runs LS-DYNA on the original model file that is currently loaded as a PRIMER model
    - If the current model file is a binary or the compressed file (optional PRIMER format), then PRIMER will always re-write the file
- The **Submit Directory** is the path where the LS-DYNA output is generated
  - If the selection is “Current Model File”, this is fixed as the path of current master file



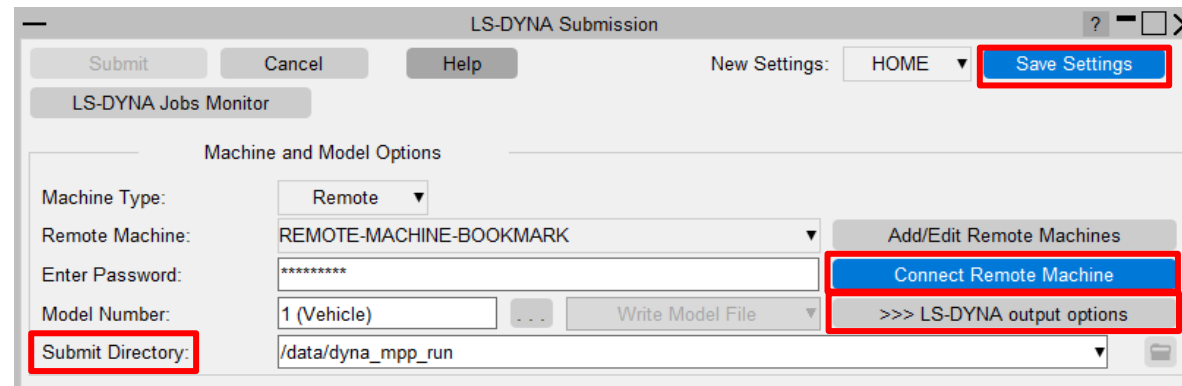
# Machine and Model Options (Remote LS-DYNA run)

- To carry out remote submission, select **Remote** from the **Machine Type** menu
- The **Remote Machine** connection settings are retrieved from the PRIMER settings file, if one exists:
  - These settings are created via the panel launched by pressing the button **Add/Edit Remote Machines**
  - The settings can be saved into PRIMER settings file by pressing the **Save Settings** button
- The Remote machine connection can only be completed by entering the **Password**
  - PRIMER never saves this password, and the user must manually enter the Password every time a remote connection is needed

The screenshot shows the 'LS-DYNA Submission' dialog box. At the top, there are buttons for 'Submit', 'Cancel', and 'Help'. To the right, there is a 'New Settings:' dropdown set to 'HOME' and a 'Save Settings' button. Below these is a 'LS-DYNA Jobs Monitor' button. The main section is titled 'Machine and Model Options'. It contains several fields and buttons: 'Machine Type:' is a dropdown menu set to 'Remote'; 'Remote Machine:' is a dropdown menu set to 'REMOTE-MACHINE-BOOKMARK'; 'Enter Password:' is a text field with asterisks; 'Model Number:' is a text field set to '1 (Vehicle)'; 'Submit Directory:' is a text field set to '/data/dyna\_mpp\_run'. There are also buttons for 'Add/Edit Remote Machines', 'Connect Remote Machine', and 'Write Model File'. A button labeled '>>> LS-DYNA output options' is at the bottom right.

# Machine and Model Options (Remote LS-DYNA run)

- For an individual PRIMER session, a first-time connection check to the **Remote** machine is required via **Connect Remote Machine**
- PRIMER always Re-writes the model file for the Remote LS-DYNA submission:
  - To save time and increase the performance of the submission process, the model file is written in the “compressed” format locally and then the compressed file is transferred to the remote machine path specified in Submit Directory
  - The model output options can be changed by pressing the **>>> LS-DYNA output options** button
- The **Submit Directory** is the path where the LS-DYNA outputs are generated on the Remote machine:
  - For each Remote LS-DYNA submission, the submission paths can be saved in the settings file using **Save Settings**



# Remote Machine Connection Options

- This panel is launched by pressing the **Add/Edit Remote Machines** button on the main panel and is used to Add/Edit/Remove connection settings for a remote machine
  - **Remote Connection:** List of the Remote connections retrieved from the PRIMER settings file
  - **Connection Name:** Connection identifier in the main panel menu
  - **Machine Name:** The user can also provide the IP address to the machine
  - **User Name:** Username to connect to the Remote machine
  - **Oasys Directory:** The path to the Oasys installation on the remote machine
    - This is **optional** and can be left empty
  - **Buffer Size:** While connecting and transferring files to/from a remote machine a small 'buffer' is required to transfer the data
    - If the connection speed for data transfer is slow, the size of this buffer can be increased using this option for faster speed - **Default is 64 KB.**

The screenshot shows the 'Add/Edit Remote Connection' dialog box. The 'Add' button is highlighted with a red box. The dialog contains the following fields:

- Remote Connection: New Connection (dropdown menu)
- Connection Name: NEW-REMOTE-CONNECTION
- Machine Name: 10.10.10.10
- User Name: dynauser
- Oasys Directory: (empty field)
- Buffer Size (KB): 64

At the bottom, there is a table for Environment Variables:

Environment Variable	Environment Value	
		+
		x
		x
		x
		x
		x

# Remote Machine Connection Options

- **Environment Variables:** The environment variables defined here will override the remote machine environment values
  - This list can be left empty since while connecting to the remote machine, PRIMER can automatically inquire important LS-DYNA or Oasys (if present on remote machine) related environment variables from the remote machine
- All the entries related to a certain remote connection can be saved in a PRIMER JSON settings file under the bookmark label name given in the **Connection Name** input textbox.
  - The settings are saved into the PRIMER settings file by pressing the **Save Settings** button on the main panel
  - These settings can be loaded and edited/removed in subsequent PRIMER sessions

Add/Edit Remote Connection

Remote Connection: REMOTE-MACHINE-BOOKMARK

Connection Name: REMOTE-MACHINE-BOOKMARK

Machine Name: remote\_machine

User Name: dynauser

Oasys Directory: /prg/oa\_18

Buffer Size (KB): 512

Environment Variable	Environment Value	
ARUP_LICENSE_PATH	6300@oasys_server	+
LSTC_LICENSE_SERVER	dynaserver	x
LSTC_LICENSE	network	x
		x
		x

# Submission Options

- **Submission Options** define the LS-DYNA settings required to run the model on the specified machine
- All the specified values in this section can be saved under a given **Submission Bookmark** name
  - The user can add/edit/remove a submission bookmark by pressing relevant buttons
  - These submission bookmarks are saved in the PRIMER settings file by pressing the **Save Settings** button at the top of the panel
- Advanced LS-DYNA input/output and command line options can be controlled via option panels launched by pressing the **More Options** and **Optional Files** buttons

Submission Options

Submission Bookmark:	MPP-SINGLE-ONLINE	Add/Edit	Remove
Precision Type:	SINGLE	Code Type:	MPP
LS-DYNA Executable:	Local LS-DYNA Executable	MPI Type:	IMPI
LS-DYNA Path:	C:\Program Files\LSTC\LS-DYNA\R11.1\ls-dyna_mpp_s_R101_winx64_ifort131_impj.exe	Add Version	
MPI Executable Path:	C:\Program Files (x86)\Intel\MPI-RT\4.0.3.010\em64t\bin\mpiexec.exe		
Submission Type:	ONLINE	NCPU:	4
		More Options	Optional Files



# Setting LS-DYNA with "Submission Options"

- The following options specify the type of the LS-DYNA executable to be run:
  - Precision Type:** SINGLE or DOUBLE
  - Code Type:** SMP (Shared memory parallel), MPP (Distributed memory parallel), HYBRID
  - MPI Type**
    - Type of platform to run MPP/HYBRID LS-DYNA
    - By default, PRIMER supports only these MPI types:
      - Windows:** HPMPI, IMPI (Intel MPI), MSMPI (Microsoft MPI), MPICH2
      - Linux:** HPMPI, IMPI (Intel MPI), PMPI (Platform MPI), OPENMPI
    - To submit LS-DYNA with other MPI types, the tool can be configured in the [oasys.submit](#) file
      - <OA\_INSTALL>/manuals/shell/shell\_manual/sect 2/sect 2.htm#oasys\_submit

The screenshot shows the 'Submission Options' dialog box with the following settings:

- Submission Bookmark:** MPP-SINGLE-BOOKMARK
- Precision Type:** SINGLE (dropdown menu is open showing SINGLE and DOUBLE)
- Code Type:** MPP (dropdown menu is open showing SMP, MPP, and HYBRID)
- MPI Type:** IMPI
- LS-DYNA Executable:** Local LS-DYNA
- LS-DYNA Path:** C:\LS-DYNA\11.1\ls
- MPI Executable Path:** C:\Program Files\Microsoft MPI\Bin\mpiexec.exe
- Submission Type:** ONLINE
- NCPUs:** 4

Buttons visible include 'Add/Edit', 'Remove', 'Add Version', 'More Options', and 'Optional Files'.

# Setting LS-DYNA with "Submission Options" (cont.)

- The following options specify the type of the LS-DYNA executable to be run:
  - LS-DYNA Executable/Path:**
    - The LS-DYNA executable must match to the selected Precision/Code/MPI types
    - The LS-DYNA executable can be chosen from the list contained in the optional **dyna\_versions** file:
      - If no 'valid' LS-DYNA executables are found, the user needs to select a **Local LS-DYNA Executable**
      - Add Version** button adds the selected Local LS-DYNA executable into the **dyna\_versions** file for future use
  - MPI Executable Path:**
    - The path to the MPI executable to run the LS-DYNA MPP program
    - The path to the different MPI executables can also be specified in the **oasys.submit** file

Submission Options

Submission Bookmark: MPP-SINGLE-BOOKMARK [Add/Edit] [Remove]

Precision Type: SINGLE [SINGLE] [DOUBLE] Code Type: MPP [SMP] [MPP] [HYBRID] MPI Type: IMPI

LS-DYNA Executable: [Local LS-DYNA] [Add Version]

LS-DYNA Path: [C:\LS-DYNA\R11.1\ls...\_winx64\_ifort160\_imp.exe]

MPI Executable Path: [C:\Program Files\Microsoft MPI\Bin\mpiexec.exe]

Submission Type: ONLINE [More Options] [Optional Files]

NCPU: 4

# Setting LS-DYNA with "Submission Options" (cont.)

- The following options are the important settings needed to run an LS-DYNA submission:
  - **Submission Type:** LS-DYNA jobs may be submitted using 4 different submission methods.
    - **ONLINE:** Submit jobs interactively
    - **QUEUE:** Submit jobs to NQE batch queues using **qsub** or equivalent commands
      - The option is available 'only if' the **oasys\_queue** file is available
      - The Queue Options are available in the "**More Submission Options**" panel
    - **BACKGROUND** (LINUX Only) : Submit jobs in background.
    - **BATCH** (LINUX Only): Submit jobs into a batch queue using the LINUX 'batch' command

Submission Options

Submission Bookmark: MPP-SINGLE-BOOKMARK Add/Edit Remove

Precision Type: SINGLE Code Type: MPP MPI Type: MSMPI

LS-DYNA Executable: Local LS-DYNA Executable Add Version

LS-DYNA Path: S-DYNA\R11.1\ls-dyna\_mpp\_s\_R11.1\_winx64\_ifort160\_msmpi.exe

MPI Executable Path: C:\Program Files\Intel\Compiler\MPI\Bin\mpiexec.exe

**Submission Type:** ONLINE BATCH BACKGROUND

NCPU: 4 More Options Optional Files

# Setting LS-DYNA with "Submission Options" (cont.)

- The following options are the important settings needed to run an LS-DYNA submission:
  - **NCPU:** Specifies the maximum number of processors that you want to run LS-DYNA on
    - This option will be of significance only if your system supports parallel versions of LS-DYNA
    - The value selected will override the number of processors specified on any **\*CONTROL\_PARALLEL** card in the input deck

The screenshot shows the 'Submission Options' dialog box. The 'Submission Bookmark' is set to 'MPP-SINGLE-BOOKMARK'. The 'Precision Type' is set to 'SINGLE', and a dropdown menu is open showing options: 'ONLINE', 'QUEUE', 'BATCH', and 'BACKGROUND'. The 'Code Type' is set to 'MPP'. The 'MPI Type' is set to 'MSMPI'. The 'LS-DYNA Executable' is set to 'Local LS-DYNA Executable'. The 'LS-DYNA Path' is set to 'S-DYNA\R11.1\ls-dyna\_mpp\_s\_R11.1\_winx64\_ifort160\_msmapi.exe'. The 'MPI Executable Path' is set to 'C:\Program Files\Intel\Compiler\MPI\Bin\impiexec.exe'. The 'Submission Type' is set to 'ONLINE'. The 'NCPU' field is highlighted with a red box and contains the value '4'. There are buttons for 'Add/Edit', 'Remove', 'Add Version', 'More Options', and 'Optional Files'.

# More Submission Options

This panel is launched by pressing the **More Option** button on the main panel

## Job Options:

- **Memory:**

- The value entered is the size of the main array declared internally within LS-DYNA that is used to store data in
- The units used to define the Memory Limit can be switched between Words and Megawords

- **Memory2:**

- This option is only available for the MPP/HYBRID version of LS-DYNA
- With the MPP/HYBRID versions of LS-DYNA more memory is required for the first CPU that initialises the model than for the other processors
- The units used for MEMORY and MEMORY2 are the same

More Submission Options

Close

Job Options

Memory: 40 ☒ Auto Memory

☒ Memory2 ? 10 MegaWords

CPU LIMIT: 0 Seconds

Output Files: ARUP \*.ptf ...

☒ CPU Consistency? ARUP \*.ptf ...  
LSTC 'd3plot ...'

Hybrid Options

MPP threads: 2

SMP threads: 2

Parallel Options

Local Host

File:

Submission Type Options

Start Time: 00 : 00

Start Day: Now

Queue Name: dyna

Queue Memory: 15000000 Words

Queue Options: 4 CPU x 1 Node

Queue CPU: 0 Seconds

CPU Limit : NONE

# More Submission Options

## Job Options (cont.):

### • CPU LIMIT:

- The value entered is the actual amount of CPU time that LS-DYNA will use for the analysis
- When this limit is reached LS-DYNA will terminate the job
- The units used to define the CPU limit can be switched between Seconds, Minutes and Hours
- A value of "0" means that no limit has been set and the job will run to termination

### • Output Files:

- This option controls the names of the output files generated by LS-DYNA, either ARUP or LSTC can be selected

### • CPU Consistency:

- This option controls whether parallel analyses are run with the accuracy option in LS-DYNA turned ON or OFF

More Submission Options

Close

Job Options

Memory: 40 ☒ Auto Memory

☒ Memory2 ? 10 MegaWords

CPU LIMIT: 0 Seconds

Output Files: ARUP \*.ptf ...

☒ CPU Consistency? ARUP \*.ptf ...  
LSTC 'd3plot ...'

Hybrid Options

MPP threads: 2

SMP threads: 2

Parallel Options

Local Host

File:

Submission Type Options

Start Time: 00 : 00

Start Day: Now

Queue Name: dyna

Queue Memory: 15000000 Words

Queue Options: 4 CPU x 1 Node

Queue CPU: 0 Seconds

CPU Limit : NONE

# More Submission Options (cont.)

The panel is launched by pressing the **More Options** button on the main panel

**Hybrid Options:** Available only for HYBRID LS-DYNA runs on a LINUX machine

- **MPP/SMP threads:** The number of MPP threads that can be selected for HYBRID jobs

**Parallel Options:** These options will only be available when submitting MPP jobs

- **Local Host:**

- When selected, the MPP jobs will be submitted using only the machine that the shell is being run on

The screenshot shows the 'More Submission Options' dialog box with the following settings:

- Job Options:**
  - Memory: 40
  - Memory2: 10
  - CPU LIMIT: 0
  - Output Files: ARUP \*.ptf ...
  - CPU Consistency: ☒
  - Auto Memory: ☒
  - MegaWords:
  - Seconds:
- Hybrid Options:**
  - MPP threads: 2
  - SMP threads: 2
- Parallel Options:**
  - Local Host:
  - File:
- Submission Type Options:**
  - Start Time: 00 : 00
  - Start Day: Now
  - Queue Name: dyna
  - Queue Memory: 15000000
  - Queue Options: 4 CPU x 1 Node
  - Queue CPU: 0
  - CPU Limit : NONE

# More Submission Options (cont.)

**Parallel Options (cont.):** These options will only be available when submitting MPP jobs

- **Node File:**

- This option can be used to select a file containing a list of Nodes and CPUs to use when submitting an MPP job
- The format of this file is given in the SHELL manual:
  - `<OA_INSTALL>/manuals/shell/shell_manual/sect_1/sect_1.htm#nodefile`

- **Node List:**

- This option can be used to specify a string containing the list of Nodes and CPUs to use when submitting an MPP job
- The format of this list is given in the SHELL manual:
  - `<OA_INSTALL>/manuals/shell/shell_manual/sect_1/sect_1.htm#nodelist`

More Submission Options

Close

Job Options

Memory: 40 ☒ Auto Memory

☒ Memory2 ? 10 MegaWords

CPU LIMIT: 0 Seconds

Output Files: ARUP '.ptf ...'

☒ CPU Consistency? ARUP '.ptf ...'

LSTC 'd3plot ...'

Hybrid Options

MPP threads: 2

SMP threads: 2

Parallel Options

Local Host

File:

Submission Type Options

Start Time: 00 : 00

Start Day: Now

Queue Name: dyna

Queue Memory: 15000000 Words

Queue Options: 4 CPU x 1 Node

Queue CPU: 0 Seconds

CPU Limit : NONE



# More Submission Options (cont.)

**Submission Type Options:** The parameters that can be specified under each submission option are different and those available under the Queue option will vary from system to system

- **Start Time:** Specify a time at which the LS-DYNA job will execute:
  - Available for QUEUE or BACKGROUND submissions
  - The required time should be entered in the form HH:MM using a 24-hour clock
  - If no time is specified, then the job will be executed as soon as possible
- **Start Day:** Specify the day on which the job will be executed:
  - Available for QUEUE or BACKGROUND submissions
  - If a day is specified and no analysis start time has been set, the job will be submitted with a start time of 00:01 on the required day

More Submission Options

Close

Job Options

Memory: 40 ☒ Auto Memory

☒ Memory2 ? 10 MegaWords

CPU LIMIT: 0 Seconds

Output Files: ARUP \*.ptf ...

☒ CPU Consistency? ARUP \*.ptf ...  
LSTC 'd3plot ...'

Hybrid Options

MPP threads: 2

SMP threads: 2

Parallel Options

Local Host

File:

Submission Type Options

Start Time: 00 : 00

Start Day: Now

Queue Name: dyna

Queue Memory: 15000000 Words

Queue Options: 4 CPU x 1 Node

Queue CPU: 0 Seconds

CPU Limit : NONE

# More Submission Options (cont.)

**Submission Type Options:** The parameters that can be specified under each submission option are different and those available under the Queue option will vary from system to system

## • Options for QUEUE Submission:

- These options are available only for the QUEUE submission type
- The options in the menus are prepared from the 'oasys\_queue' file kept at OA\_INSTALL folder
- The format of this file is shared here:
  - [<OA\\_INSTALL>/manuals/shell/shell\\_manual/sect\\_2/sect\\_2.htm#oasys\\_queue](mailto:OA_INSTALL/manuals/shell/shell_manual/sect_2/sect_2.htm#oasys_queue)
- **Queue Name:** NQS style queue list mentioned in 'oasys\_queue'
- **Queue Options:** The options available will depend on:
  - Selected Queue
  - NCPU value
  - Contents of the 'oasys\_queue' file

More Submission Options

Close

Job Options

Memory: 40 ☒ Auto Memory

☒ Memory2 ? 10 MegaWords

CPU LIMIT: 0 Seconds

Output Files: ARUP \*.ptf ...

☒ CPU Consistency? ARUP \*.ptf ...  
LSTC 'd3plot ...'

Hybrid Options

MPP threads: 2

SMP threads: 2

Parallel Options

Local Host

File:

Submission Type Options

Start Time: 00 : 00

Start Day: Now

Queue Name: dyna

Queue Memory: 15000000 Words

Queue Options: 4 CPU x 1 Node

Queue CPU: 0 Seconds

CPU Limit : NONE

# More Submission Options (cont.)

**Submission Type Options:** The parameters that can be specified under each submission option are different and those available under the Queue option will vary from system to system

- **Queue Memory:** The value entered defines the total amount of memory that the job will request from the system
- **Queue CPU:** The value entered is the total Queue CPU Limit that includes the time taken to run the LS-DYNA analysis and any system time required
- **CPU Limit:** When a queue is selected the CPU limit for that queue will be displayed:
  - If the queue is a pipe queue the word PIPE will be displayed
  - If the queue has no CPU limit, then the word NONE will be displayed

More Submission Options

Close

Job Options

Memory: 40 ☒ Auto Memory

☒ Memory2 ? 10 MegaWords

CPU LIMIT: 0 Seconds

Output Files: ARUP \*.ptf ...

☒ CPU Consistency? ARUP \*.ptf ...  
LSTC 'd3plot ...'

Hybrid Options

MPP threads: 2

SMP threads: 2

Parallel Options

Local Host

File:

Submission Type Options

Start Time: 00 : 00

Start Day: Now

Queue Name: dyna

Queue Memory: 15000000 Words

Queue Options: 4 CPU x 1 Node

Queue CPU: 0 Seconds

CPU Limit : NONE

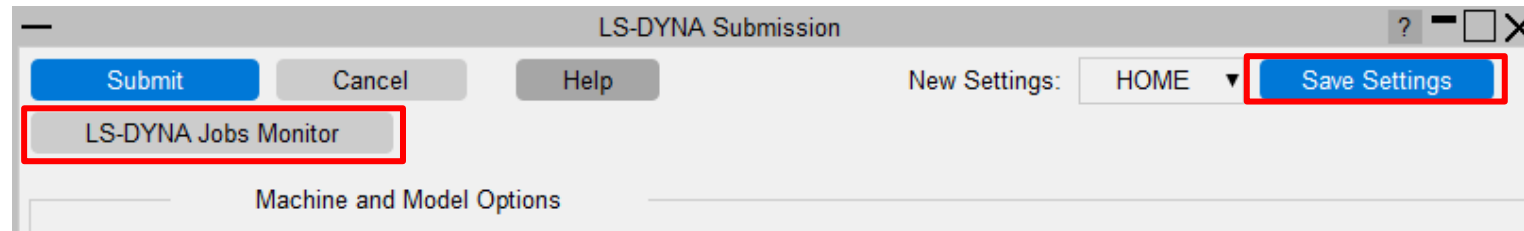
# Optional Files

- This panel is launched by pressing the **Optional Files** button on the main panel
- For more details on these options see the LS-DYNA User's manual

The screenshot shows the 'ADDITIONAL FILES' dialog box. It has a title bar with a minus, maximize, and close button. The dialog is divided into several sections: 'Input Files' with checkboxes for Stress Initialization (.sif), Interface Segment (.isf2), VDA Geometry (.vda), CAL3D Input (.c3d), TOPAZ3D Temperature file (.htf), MADYMO Input File, REMAP option, MPP pfile (with a text field containing 'pfile'), and GMINP (.gm); 'Input Options' with text fields for ENDTIM (0.000000), ENDCYC (0), and PARA (0), and checkboxes for CASE, MCHECK, PGPKEY, INIT, D3PROP, LONG, BIGID, and JOBID; 'Output Files' with checkboxes for Contact Force File (.ctf), Interface Segment (.isf1), Static Database File (.ztf) (which is checked), Winfrith Crack file (.crf), FSIFOR file (.fff), GMOUT (.gm), CPM Interface Force (.cpm), DEM Interface Force (.dem), FSILNK file (.fsl), PBM Interface Force (.pbm), D3PART file (.d3part), BEM file (.bem), and General Print file (.root); and a bottom section with checkboxes for Module DLL, map =, and map1 =, each followed by a text field and a folder icon. At the bottom, there is a 'Binary File Size' field with '1024' and '(max 8192)', and a 'CLOSE' button.

# LS-DYNA Jobs Monitor

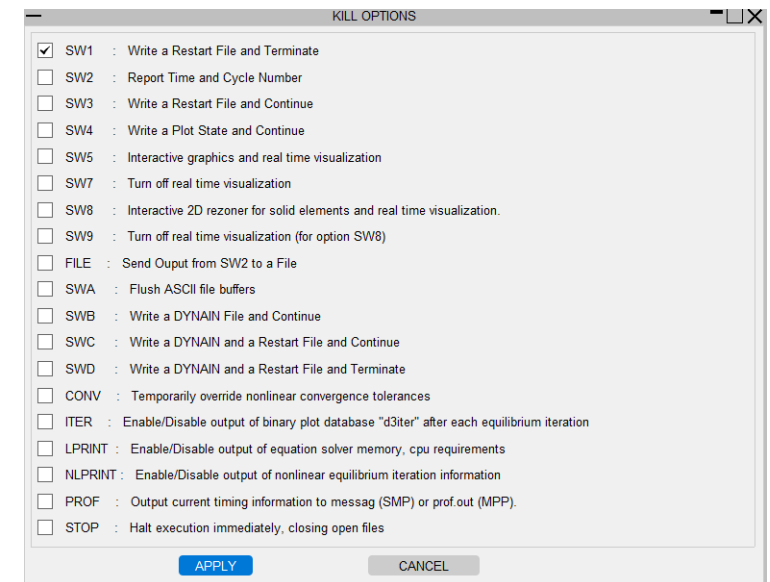
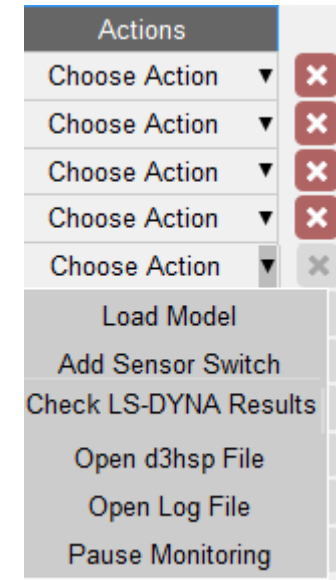
- PRIMER monitors the progress of the ONLINE LS-DYNA runs on a Local machine
- The progress of such jobs can be viewed in the 'LS-DYNA Jobs Monitor' panel
- The user can also save the details of such an LS-DYNA run inside the HOME area settings file by pressing the **Save Settings** button
- Later sessions of PRIMER will automatically pick up these jobs from the settings file and the user can monitor these jobs by pressing the **LS-DYNA Jobs Monitor** button



Job Id	Job File Name	Job Type	Job Status	Actions
2	Vehicle.key	Single-MPP-IMPI	ERROR: Cannot find d3hsp...	Choose Action
3	Vehicle.key	Single-MPP-IMPI	Terminated: Normally	Choose Action
4	Vehicle.key	Single-SMP	Terminated: Sensor switch	Choose Action
5	Vehicle.key	Double-MPP-HPMPI	Terminated: LS-DYNA program crash	Choose Action
6	Engine.key	Double-SMP	Terminated: LS-DYNA Error	Choose Action
7	D:\test_model\Engine.key	Single-SMP	Terminated: License problem	Choose Action
8	Vehicle.key	Single-SMP	Running, 18.98% completed	Choose Action
9	Vehicle.key	Single-SMP	Initialised, termination time=3.000e+01	Choose Action
10	Vehicle.key	Single-SMP	d3hsp not generated yet...	Choose Action
11	Test-model.key	Single-SMP	Started Monitoring...	Choose Action

# LS-DYNA Jobs Monitor Actions

- The user can perform these actions on the running/completed jobs listed in the monitor:
- Load Model:**
  - Load the model file in PRIMER on which the LS-DYNA was run
- Add Sensor Switch:**
  - Assign KILL switches on the currently running job
  - Please refer to the LS-DYNA manual for the description of the kill switches listed in the “KILL OPTIONS” panel
- Check LS-DYNA Results:**
  - LS-DYNA results for the ‘Terminated’ jobs can be loaded in the “Read DYNA” panel in PRIMER
- Open d3hsp/Log Files:**
  - Open the files in a text editor
- Pause/Resume Monitoring:**
  - Pause or Resume the job monitoring in PRIMER



# Step by step guide



# Simple steps to run LS-DYNA on a "Local Machine"

The image shows two screenshots from the LS-DYNA software interface, illustrating the steps to run a simulation on a local machine.

**Left Screenshot: LS-DYNA Submission Dialog**

This dialog box is titled "LS-DYNA Submission" and contains two main sections: "Machine and Model Options" and "Submission Options".

**Machine and Model Options:**

- Machine Type:** Set to "Local" (Step 3).
- Remote Machine:** Empty field.
- Enter Password:** Empty field.
- Model Number:** Set to "1 (Vehicle)" (Step 4).
- Submit Directory:** Set to "C:\Test-Models\" (Step 4).

**Submission Options:**

- Submission Bookmark:** Set to "MPP-SINGLE-BOOKMARK" (Step 6).
- Precision Type:** Set to "SINGLE" (Step 5).
- Code Type:** Set to "MPP" (Step 5).
- MPI Type:** Set to "IMPI" (Step 7).
- LS-DYNA Executable:** Set to "Local LS-DYNA Executable" (Step 8).
- LS-DYNA Path:** Set to "C:\Program Files\LS-TC\LS-DYNA\R11.1\ls-dyna\_mpp\_s\_R101\_winx64\_ifort131\_impi.exe".
- MPI Executable Path:** Set to "C:\Program Files (x86)\Intel\MPI-RTV4.0.3.010\em64t\bin\mpiexec.exe".
- Submission Type:** Set to "ONLINE".
- NCPU:** Set to "4".

**Right Screenshot: Model functions menu**

This screenshot shows the "Model functions" menu, which is used to manage the simulation model.

- Model functions:** A list of actions including Create, Copy, Delete, List, Modified?, Read, Merge, Build, Compare, Renummer, Write, Submit, Contents, and Utilities.
- Submit:** The "Submit" button is highlighted with a red box (Step 2).
- Model No:** Set to "M1".
- Title:** Set to "Vehicle".



# Simple steps to run LS-DYNA on a “Local Machine”

1. Read a LS-DYNA ready Model into PRIMER
2. Press **Submit** on the **Model functions** panel
3. Select **Machine Type** as **Local**
4. Select **Current Model File** – runs LS-DYNA in the same directory as model file
5. Select **Precision** Type (SINGLE or DOUBLE) and **Code** Type (SMP or MPP or HYBRID)
6. Select LS-DYNA Executable as **Local LS-DYNA Executable**
7. Enter the **MPI Type** (needed for MPP or HYBRID run only)
  - For example, MPI type values are: **IMPI** or **MSMPI** or **HPMPI**
8. Select the **LS-DYNA Executable Path**
  - Make sure that the LS-DYNA exe confirms the Precision/Code/MPI types selected above
  - For example, for LSDYNA version 10.1, the Windows MPP executable name to work with Intel MPI is going to be this filename:
    - **ls-dyna\_mpp\_s\_R101\_winx64\_ifort160\_imp\_i.exe**



# Simple steps to run LS-DYNA on a “Local Machine”



12

Submit

Cancel

Help

New Settings: HOME

Save Settings

13c

13d

LS-DYNA Submission

LS-DYNA Jobs Monitor

Machine and Model Options

Machine Type: Local

Remote Machine:

Enter Password:

Model Number: 1 (Vehicle)

Submit Directory: C:\Test-Models\

Current Model File

Add/Edit Remote Machines

Connect Remote Machine

>>> LS-DYNA output options

Submission Options

Submission Bookmark: MPP-SINGLE-BOOKMARK

13a

Add/Edit

Remove

Precision Type: SINGLE

Code Type: MPP

MPI Type: IMPI

13b

LS-DYNA Executable: Local LS-DYNA Executable

Add Version

LS-DYNA Path: C:\Program Files\LSTC\LS-DYNA\R11.1\ls-dyna\_mpp\_s\_R101\_winx64\_ifort131\_impi.exe

MPI Executable Path: C:\Program Files (x86)\Intel\MPI-RTV4.0.3.010\em64t\bin\mpiexec.exe

9

Submission Type: 10

ONLINE

NCPU: 4

11

More Options

Optional Files

Model

Part tree

M1:Main file

Model functions

Create

Copy

Delete

List

Modified?

Read

Merge

Build

Compare

Renumber

Write

Submit

Check

Contents

Utilities

Model No:

Title

M1

Vehicle

<spare>

<spare>

<spare>

<spare>

<spare>

<spare>

<spare>

<spare>

<spare>

<spare>

<spare>

# Simple steps to run LS-DYNA on a “Local Machine”

9. Select **MPI Executable Path** (needed for MPP or HYBRID run only)

- Make sure that the MPI path confirms to the MPI type
- For example on Windows the path to MPI executable for Intel MPI (**IMPI**) could be something like this:
  - **C:\Program Files (x86)\Intel\MPI-RT\4.0.3.010\em64t\bin\mpiexec.exe**

10. Select Submission type as **ONLINE**

11. Enter the NCPU value

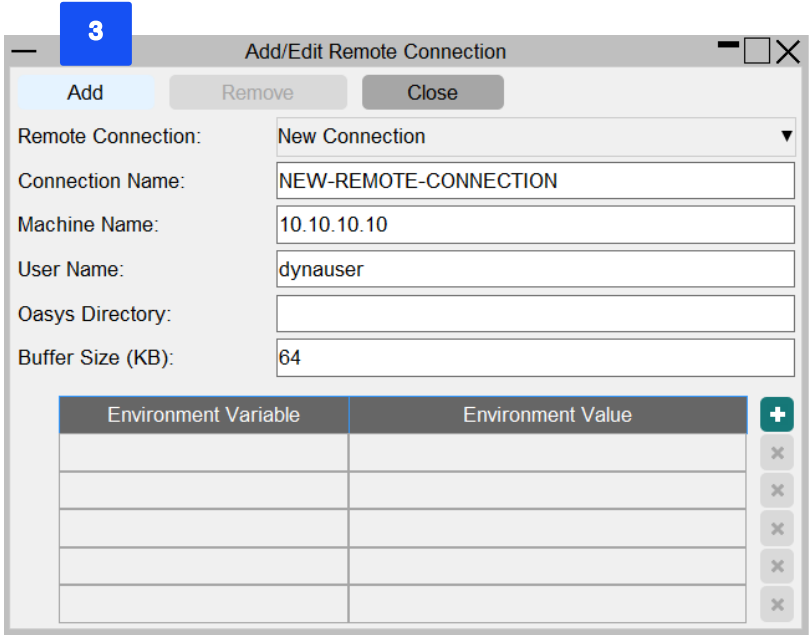
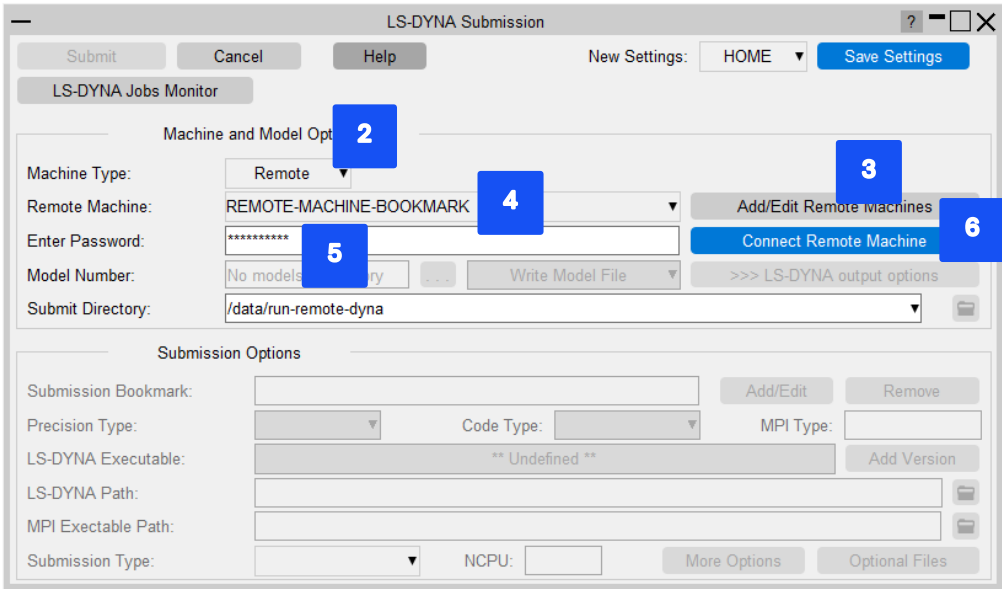
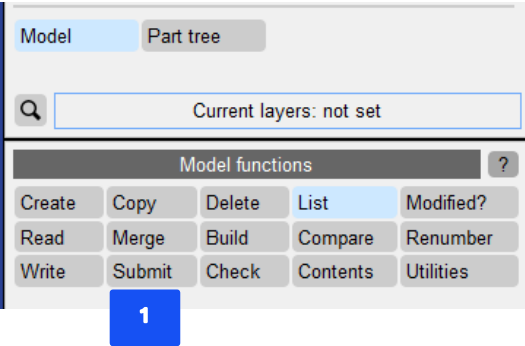
12. Press **Submit** to run LS-DYNA

13. Save LS-DYNA options as a Submission Bookmark:

- a) Enter appropriate name to the **Submission Bookmark**
- b) Press **Add/Edit** to record the Bookmark into PRIMER session
- c) Select **New Settings** file from the drop down
- d) Press **Save Settings** to save the bookmark into the JSON file



# Configure and Connect a "Remote Machine"



# Configure and Connect a "Remote Machine"

1. Press **Submit** on the **Model functions** panel
2. Select **Machine Type** as **Remote**
3. Create a Remote machine bookmark from **Add/Edit Remote Machines** panel
  - Press **Add** button on this panel to save the remote machine settings in PRIMER
4. Select a **Remote Machine** bookmark created above
5. Enter the appropriate **Password**
6. Press **Connect Remote Machine** button to perform the one-time connection configuration:
  - If Oasys is installed on the remote machine, the relevant "LS-DYNA configuration files" will be retrieved from the remote machine
  - While working with the remote machine, if you feel that the data transfer speed is slow, you can try increasing the **Buffer Size (KB)** to higher value - the default value here is **64 KB**
8. Save remote machine settings:
  - a) Select **New Settings** file from the drop down
  - b) Press **Save Settings** to save the bookmark into the JSON file



# Configure and run LS-DYNA on "Remote Machine"

LS-DYNA Submission

Submit Cancel Help New Settings: HOME Save Settings

LS-DYNA Jobs Monitor

Machine and Model Options

Machine Type: Remote 1

Remote Machine: REMOTE-MACHINE-BOOKMARK 1 Add/Edit Remote Machines

Enter Password: \*\*\*\*\* Re-connect Remote Machine

Model Number: 1 (Vehicle) Write Model File >>> LS-DYNA output options

Submit Directory: /data/run-remote-dyna 1

Submission Options

Submission Bookmark: REMOTE-MPP-SINGLE Add/Edit Remove

Precision Type: 2 SINGLE 2 Code Type: MPP 2 MPI Type: HP-MPI 4

LS-DYNA Executable: 3 Local LS-DYNA Executable Add Version

LS-DYNA Path: /prg/LINUX/DYNA\_EXECUTABLES/R11.0.0/lis-dyna\_mpp\_s\_r11\_0\_0\_x64\_centos65\_ifort160\_av 5

MPI Executable Path: /opt/intel/impi/5.1.3.223/intel64/bin/mpirun 6

Submission Type: ONLINE NCPU: 4 More Options Optional Files

# Configure and run LS-DYNA on “Remote Machine”

1. Select **Remote Machine** bookmark and enter **Submit Directory** to run an LS-DYNA job on that machine
  - This directory path must have appropriate read/write/execute permissions
2. Select **Precision** Type (SINGLE or DOUBLE) and **Code Type** (SMP or MPP or HYBRID)
3. Select LS-DYNA Executable as **Local LS-DYNA Executable**
4. Enter the **MPI Type** (needed for MPP or HYBRID run only)
  - For example, MPI type values are: **IMPI** or **PMPI** or **HPMPI** or **OPENMPI**
5. Enter the **LS-DYNA Executable Path**. Make sure that the LS-DYNA exe confirms the Precision/Code/MPI types selected above
  - For example, on Linux, LS-DYNA version 11, MPP executable name to work with Intel MPI on 64-bit CENTOS 6:
    - **ls-dyna\_mpp\_s\_r11\_0\_0\_x64\_centos65\_ifort160\_avx2\_intelmpi-413.exe**
6. Enter the **MPI Executable Path** (needed for MPP or HYBRID run only)
  - Make sure that the MPI path confirms to the MPI type
  - On Linux the path to 64-bit MPI executable for Intel MPI (**IMPI**) could be:
    - **/intel64/bin/mpirun**



# Configure and run LS-DYNA on "Remote Machine"

**10**

LS-DYNA Submission

Submit Cancel Help New Settings: HOME Save Settings

LS-DYNA Jobs Monitor **11c** **11d**

Machine and Model Options

Machine Type: Remote

Remote Machine: REMOTE-MACHINE-BOOKMARK Add/Edit Remote Machines

Enter Password: **9** \*\*\*\*\* Re-connect Remote Machine

Model Number: 1 (Vehicle) ... Write Model File >>> LS-DYNA output options

Submit Directory: /data/run-remote-dyna **10**

Submission Options

Submission Bookmark: REMOTE-MPP-SINGLE **11a** Add/Edit **11b** Save

Precision Type: SINGLE Code Type: MPP MPI Type: HP-MPI

LS-DYNA Executable: Local LS-DYNA Executable Add Version

LS-DYNA Path: /prg/LINUX/DYNA\_EXECUTABLES/R11.0.0/lis-dyna\_mpp\_s\_r11\_0\_0\_x64\_centos65\_ifort160\_av

MPI Executable Path: /opt/intel/impi/5.1.3.223/intel64/bin/mpirun

Submission Type: **7** ONLINE NCPU: 4 **8** More Options Optional Files



# Configure and run LS-DYNA on “Remote Machine”

7. Select Submission type as **ONLINE**
8. Enter the NCPU value
9. Enter the **Password** again to connect to the remote machine
10. Press **Submit**. The following happens:
  - PRIMER connects to remote machine
  - Transfers zipped model to **Submit Directory** and unzips the file in the folder
  - Runs LS-DYNA on remote machine
11. Save LS-DYNA options as a Submission Bookmark:
  - a) Enter appropriate name to the **Submission Bookmark**
  - b) Press **Add/Edit** to record the Bookmark into PRIMER session
  - c) Select **New Settings** file from the drop down
  - d) Press **Save Settings** to save the bookmark into the JSON file



# FAQs

- What is the minimum requirement to run LS-DYNA on a model in PRIMER session ?
  - You only need these items to run LS-DYNA via the PRIMER:
    - LS-DYNA Executable
    - Valid LS-DYNA License
    - MPI Installation (only for MPP/HYBRID runs – not required for SMP runs)
- How do I configure MPP LS-DYNA run?
  - You can directly use these MPI types in PRIMER by just specifying the MPI type and MPI executable path
    - **Windows:** HPMPI, IMPI (Intel MPI), MSMPI, MPICH2
    - **Linux:** HPMPI, IMPI (Intel MPI), PMPI (Platform MPI), OPENMPI

For the rest, you will have to configure the **oasys.submit** file in the OA\_INSTALL area

- <OA\_INSTALL>/manuals/shell/shell\_manual/sect 2/sect 2.htm#oasys\_submit



# FAQs

- How do I configure the LS-DYNA license related Environment variables?
  - LS-DYNA can use either a **nodelocked** license or a **floating/server** license system.
  - If you are using a nodelocked license, then:
    - **LSTC\_FILE** should be set to the full pathname of the license file.
      - By default, this file should be called 'LSTC\_FILE'
    - The variable **LSTC\_LICENSE** should also be set to **local**
      - **setenv LSTC\_FILE** **\$OA\_INSTALL/LSTC\_FILE**
      - **setenv LSTC\_LICENSE** **local**
  - If you are using the floating/server license system, then:
    - **LSTC\_LICENSE\_SERVER** should be set to the hostname where the LSTC license server is running,
    - **LSTC\_LICENSE** should be set to **network**
      - **setenv LSTC\_LICENSE\_SERVER** **hostname**
      - **setenv LSTC\_LICENSE** **network**
  - More information is given in the Installation manuals:
    - **<OA\_INSTALL>/manuals/install/oasys18 <windows/linux> installation\_guide.pdf**



# Appendix-I : List of entries in a JSON settings file

- PRIMER saves the entries in the LS-DYNA submission panel under various bookmark headers in settings files at these locations:
  - Folder path specified by OA\_ADMIN Environment Variable
  - Folder path specified by OA\_INSTALL Environment Variable
  - The User's login path (USER HOME)
  - Current working folder
- The default name of the settings file is **pr\_bookmarks.json**
  - The path to settings files can be changed via a preference in the **oa\_pref** file kept at the above locations
    - **primer\*json\_bookmarks\_file**



# Appendix-I : List of entries in a JSON settings file

- The following settings are saved in the settings files:
  - **Remote Connection Bookmarks**
    - Bookmark Name
    - Machine Name
    - User Name
    - Oasys Path
    - Buffer Size
    - List of environment variables
    - List of submit directories on remote machine in which the LS-DYNA run was done recently
  - **LS-DYNA Jobs List**
    - Master Mode file path
    - Submit directory path
    - LS-DYNA type (Precision/Code/MPI)
    - File path for d3hsp and logs



# Appendix-I : List of entries in a JSON settings file

- The following settings are saved in the settings files (cont.):
  - **Submission Options Bookmarks**
    - Bookmark Name
    - Precision Type
    - Code Type
    - MPI Type
    - Submission Type
    - NCPU Value
    - LS-DYNA Executable Path
    - MPI Executable Path



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