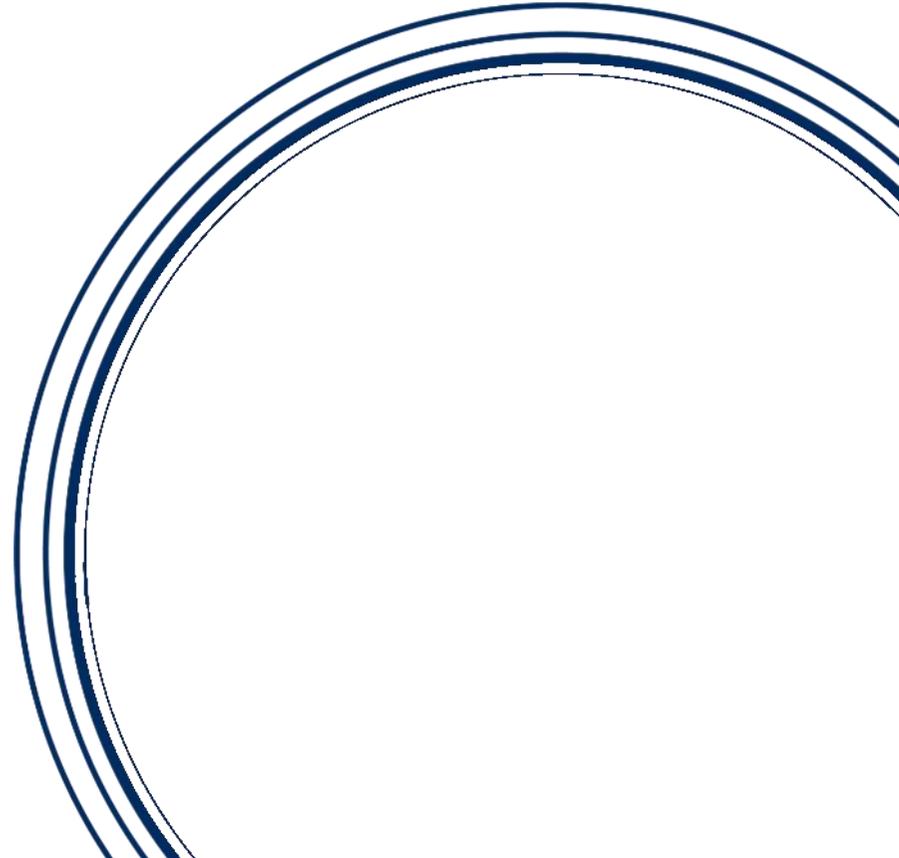


# ANSYS Distributed Compute Services

**Ansys** / DYNARDO

presented at the 17th Weimar Optimization and Stochastic Days 2020 |  
Source: [www.dynardo.de/en/library](http://www.dynardo.de/en/library)



**CADFEM**<sup>®</sup>



**ANSYS**

1. Introduction & highlights
2. Flow
3. Homework
4. Operation
  1. Starting processes
  2. Set up the Evaluators
  3. Connect the Workbench Project to the DCS
  4. Watch the DPS at work
  5. Spaceclaim and Linux
  6. Debugging of solution

# Why we need Distributed Compute Services ?

After we manage to build up the a FE-model with parameters we have solve a lot of design points.

How can we solve it in a short time and use all type of resource?

We have computers with different

- OS (Window/Linux)
- Hardware (Number of CPUs/RAM)
- Software (CAD)
- Type (Workstations/Cluster/AWS)

We do not have administration right's!

How can we get an overview about the status of the design points (pending/running/failed)?

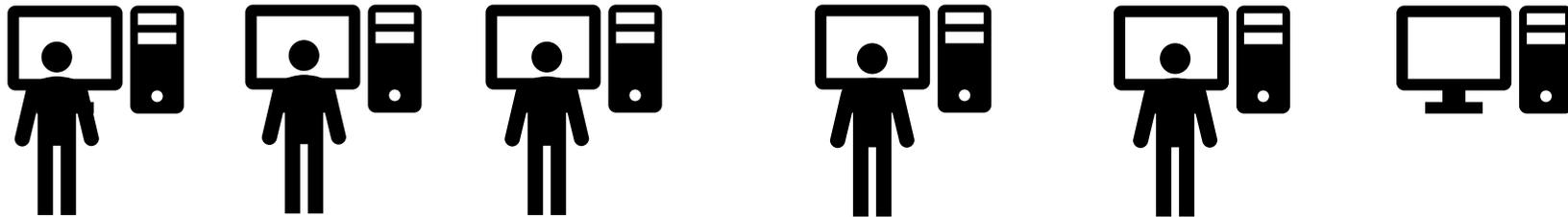
How to keep the size of data small?

How to keep data traffic small?

# Why we need Distributed Compute Services ?

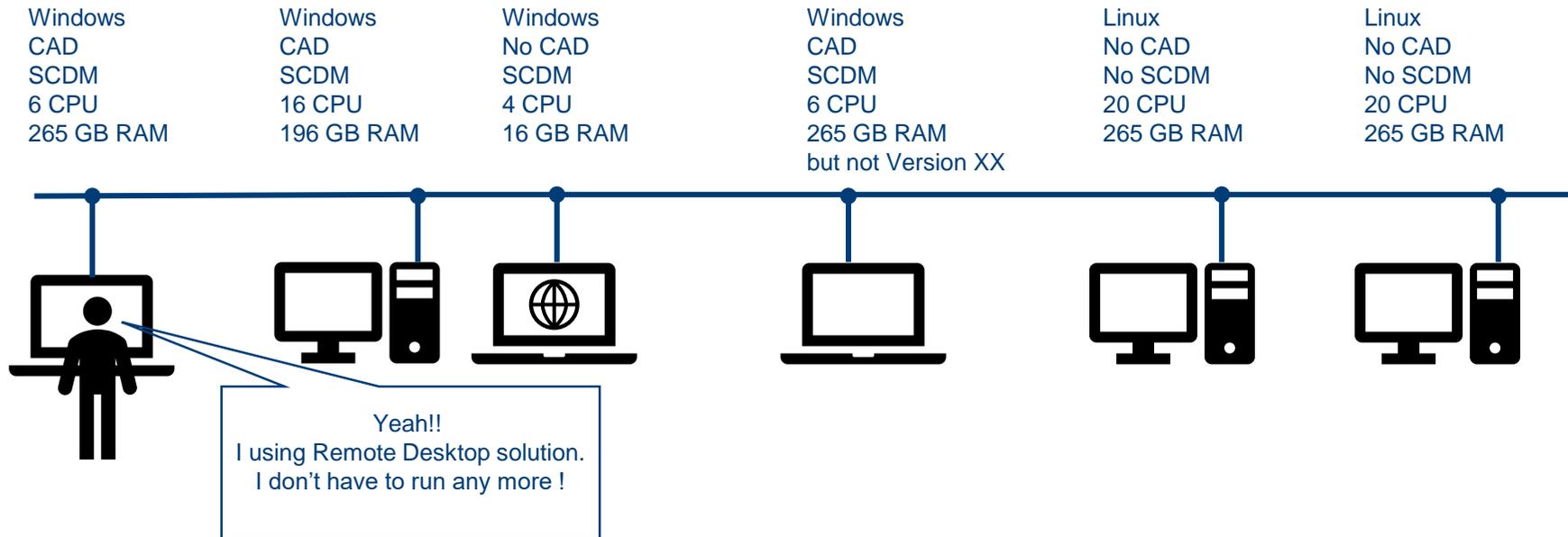
Old School solution:

We are the Job distributor!



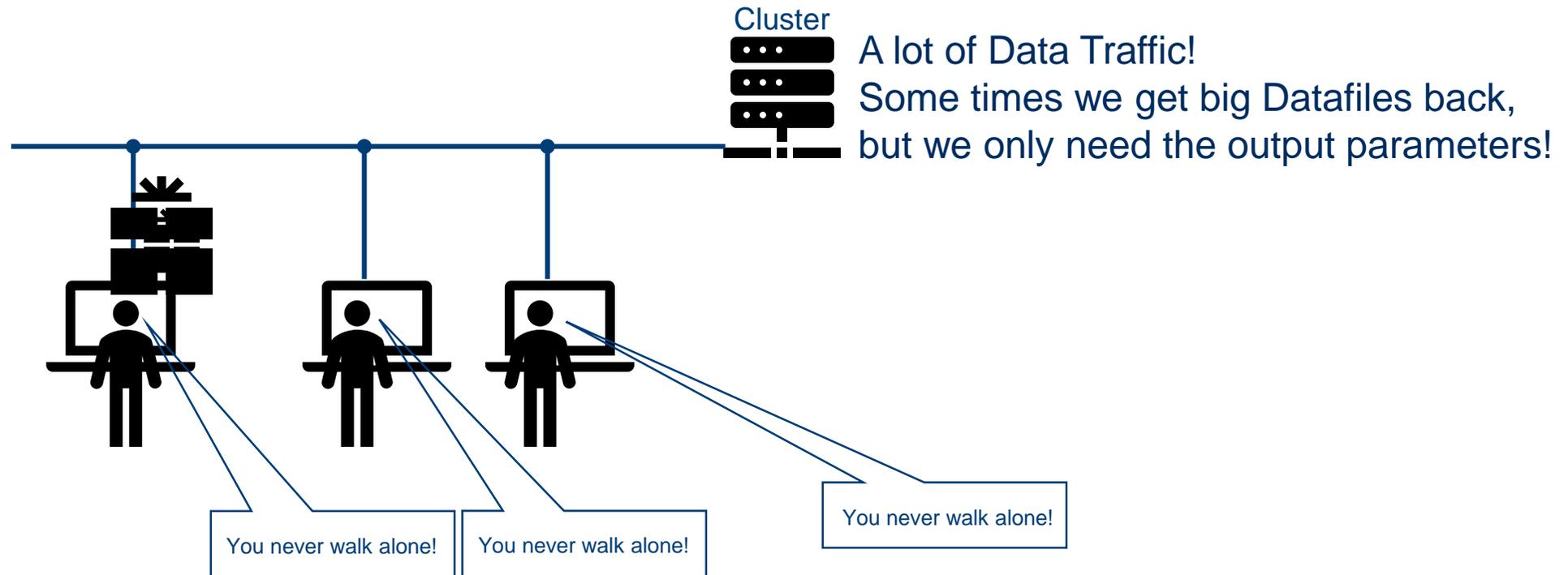
# Why we need Distributed Compute Services ?

We are Job distributor!

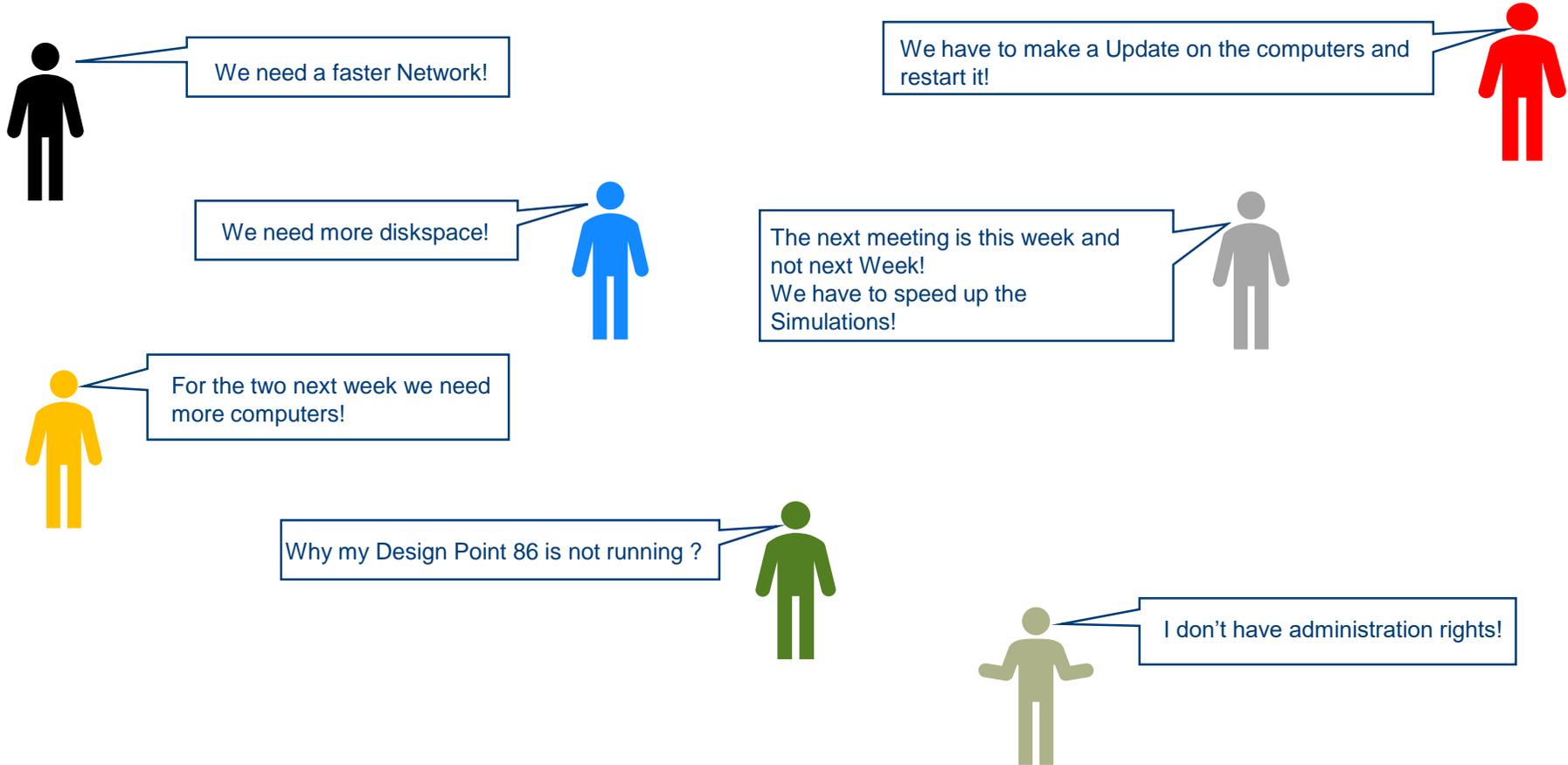


# Why we need Distributed Compute Services ?

Using RSM:

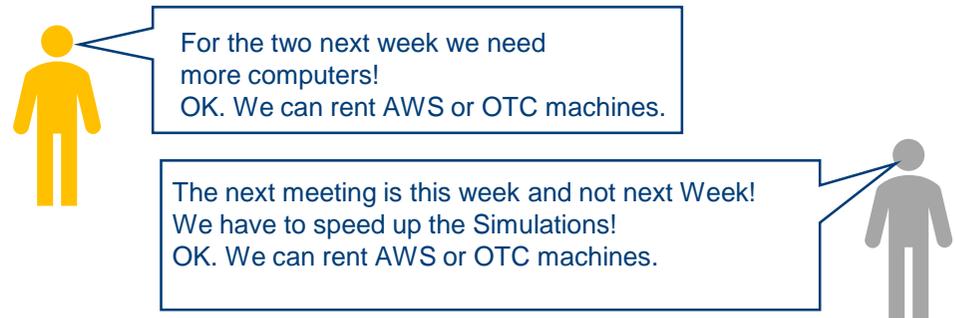


# Why we need Distributed Compute Services ?



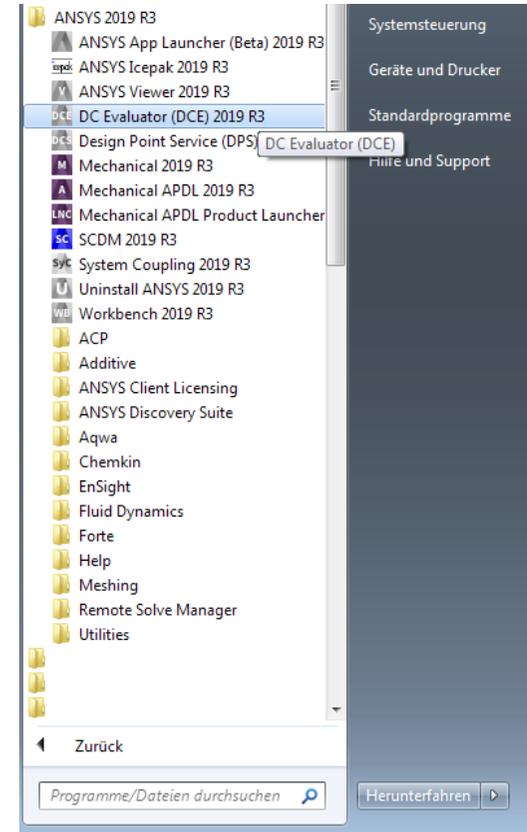
- **Data integrity**
  - Robust (no single point of failure)
  - large number of Design Points (up to 10000, also less)
- **Distributed**
- Supports a wide range of infrastructures
  - desktop machines
  - multiple desktop machines
  - Cluster with queueing system
  - Private/public cloud
  - Windows/Linux mixture with heterogenous software installation
  - pause update (release license for a while)

- **extendable**
  - Connects to Design Point creating tools like (DX, optislang, ...)
  - Python-Customizing (ANSYS 2020 R1)
- **small network requirements (only output parameters, no rst file transferred)**
- **Configuration**
  - Web-based (**Firefox/Chrome**)
  - no administrative privileges required



# What is DCS/DPS/DCE?

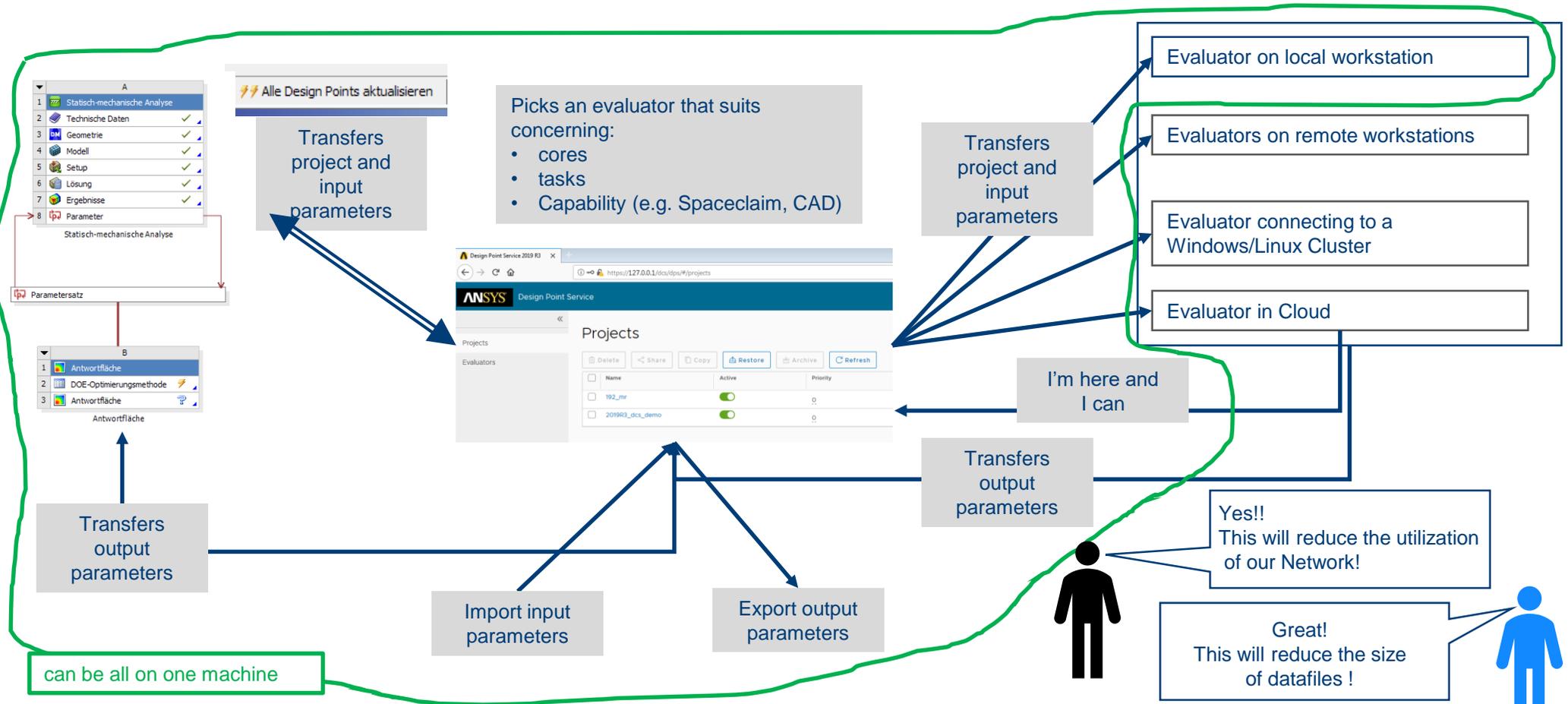
- **DCS** (Distribute Compute Services) is a new family of services for evaluation and management of simulations.
- **DPS** (Design Point Service) is a subsystem to handle and solve hundreds to thousands of Design Points.
- **DCE** (Distribute Compute Evaluator) is the executing component.



„Im Rahmen meines Projekts mussten viele Varianten berechnet werden. DCS hat mir die Arbeit deutlich erleichtert. Die Konfiguration bleibt einfach, Varianten können dank der Evaluators auf mehrere Rechner verteilt werden. Die Design point Statistics geben eine klare Übersicht des Berechnungsverlaufs. Im Vergleich zum bisherigen Variantenberechnungsverfahren ist DCS stabil und erlaubte eine große Zeitersparnis. Diese Software habe ich in meiner Abteilung sofort empfohlen.“

Hr. Nicolas Kieffer – Schaeffler Automotive Buehl GmbH & Co. KG, Buehl

# Flow



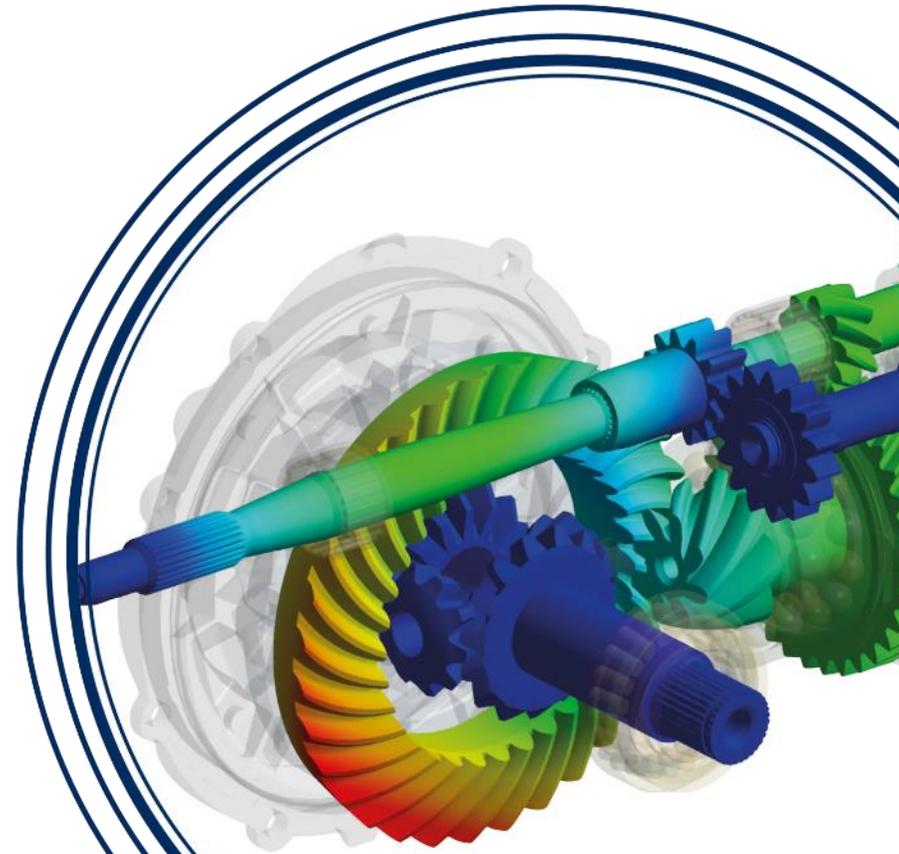
# Homework

- Collect some information
  - Which and how many licenses are available?
  - Which machines are available?
  - How many cores per machine?
  - What is the size of the model?
  - Average solution time?
  - Operating systems?
  - Is solving quite robust?

	A	B	C	D	E	F
1	Name	P1 - DS_Length	P2 - DS_Radius	P3 - DS_Height	P4 - DS_Depth	P5 - Equivalent Stress Maximum
2	Units	mm	mm	mm	mm	MPa
3	DP 0 (Current)	90	5	20	8	291.7
4	DP 1	90	6	20	8	291.7
5	DP 2	90			8	291.7
6	DP 3	90			8	291.7
7	DP 4	90			8	291.7
*						

# ANSYS Distributed Compute Services

## Starting processes



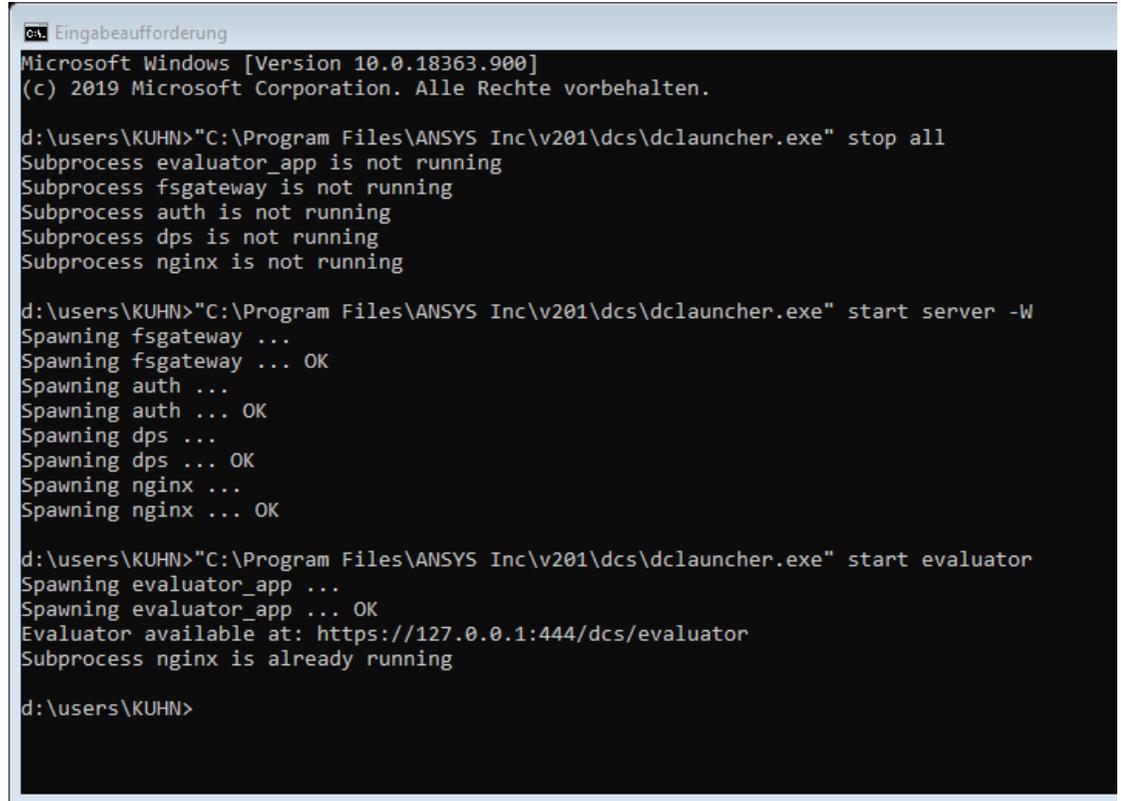
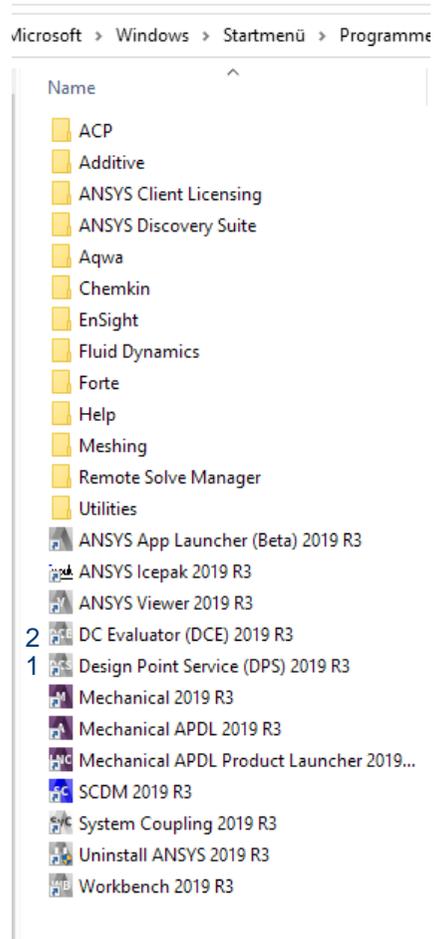
**CADFEM**<sup>®</sup>



**ANSYS**

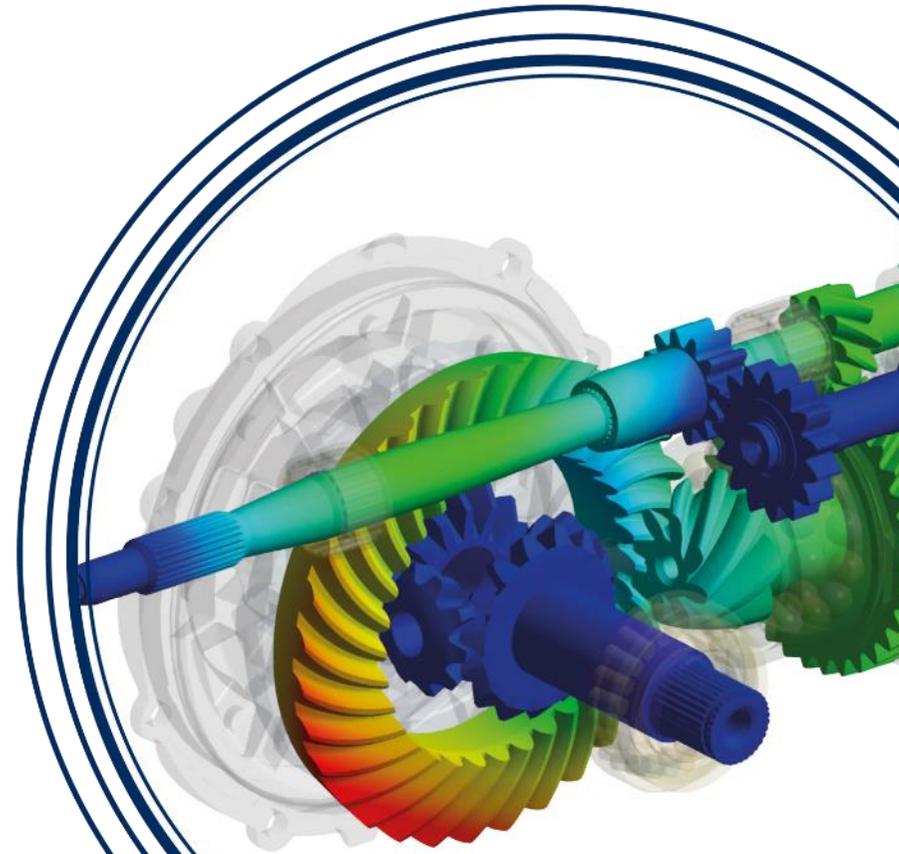
# Starting processes

1. Start the **DPS**
2. Start the **DPE**



# ANSYS Distributed Compute Services

## Setup



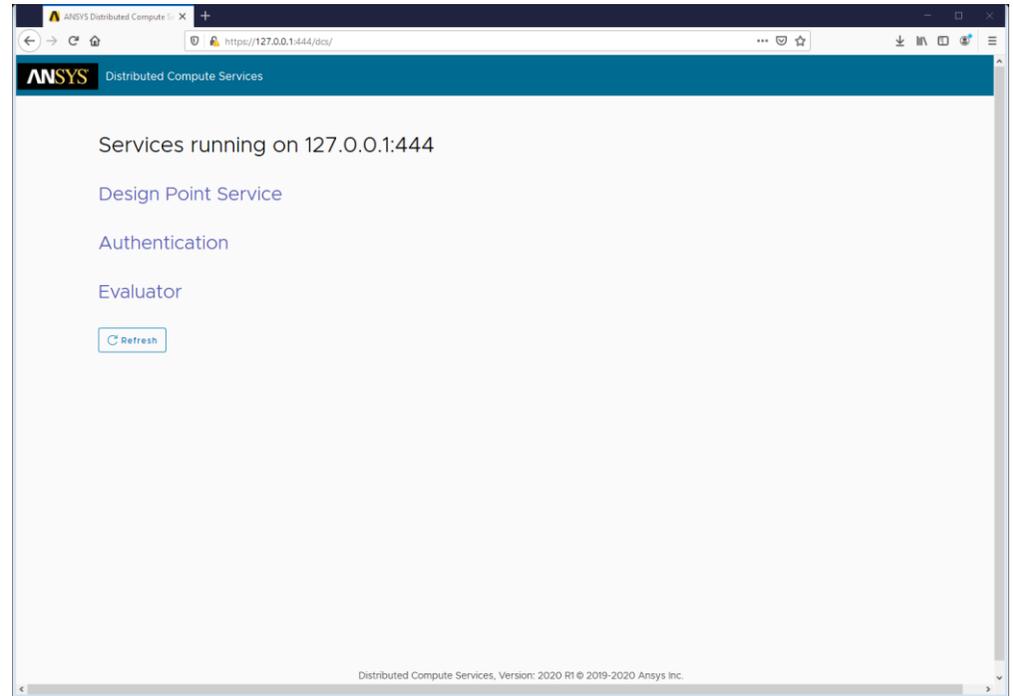
**CADFEM**<sup>®</sup>



**ANSYS**

# Setup

- After the services are running you can setup the Design Point Services by a web browser (Chrome/Firefox)
- <https://127.0.0.1:444/dcs/>



# Setup Evaluator at local workstation

The image displays two screenshots of the ANSYS DC Evaluator web interface. The left screenshot shows the 'Configure' page, and the right screenshot shows the 'Configuration' page.

**Configure Page (Left Screenshot):**

- Buttons: Start, Stop, Hard, Shutdown, Cleanup
- Evaluator: running
- DCS Server: Connected dcadmin@https://localhost:444/dcs/
- DCS Server Url: https://localhost:444/dcs/ **Url of the DCS Server.**
- User Name: dcadmin
- Password: **Password: dcadmin**
- Project Assignment: On Design Point Service
- Logging: debug, info, warning, error (selected), Follow Tail
- Log output:

```
2020-06-16 18:02:51,799, WARNING: No project URL provided
2020-06-16 18:02:56,642, INFO: Active connection : dcadmin@https://localhost:444/dcs/dps/api
2020-06-16 18:02:56,903, INFO: Sorted project list, 0 item(s):
2020-06-16 18:02:56,904, INFO: Assigned project : None
2020-06-16 18:02:56,955, WARNING: No project URL provided
2020-06-16 18:03:01,695, INFO: Active connection : dcadmin@https://localhost:444/dcs/dps/api
2020-06-16 18:03:01,861, INFO: Sorted project list, 0 item(s):
2020-06-16 18:03:01,861, INFO: Assigned project : None
2020-06-16 18:03:01,913, WARNING: No project URL provided
2020-06-16 18:03:06,747, INFO: Active connection : dcadmin@https://localhost:444/dcs/dps/api
2020-06-16 18:03:06,885, INFO: Sorted project list, 0 item(s):
```
- Footer: © 2019-2020 ANSYS Inc. Version: 2020.01 Build: 2019-11-08 07:44:21

**Configuration Page (Right Screenshot):**

- Buttons: Save, Reset
- General:
  - Name: STU-AK-18
  - Platform: Windows
  - Loop Interval [s]: 5
  - Auto Start:  Whether to run evaluator automatically on startup
- Task Manager:
  - Active Task Manager:  Direct  RSM
  - Queue: Local
- File Management:
  - Working Directory: D:\DCI\_Workdir
  - Use Local File Cache:
  - Max Cache Size (MB): 93275
  - Task Directory Cleanup:  always  on\_success  never
- Compute Resources (highlighted):
  - Max Num Parallel Tasks: 6
  - Num Cores: 6
  - Memory (MB): 15321
  - Disk Space (MB): 21989
- Applications:

Name	Version	Executable	Install Path	Capabilities	Remove
ANSYS Workbench	20.1	C:\Program Files\ANSYS Inc\v201	C:\Program Files\ANSYS Inc\v201	SCDM	Remove
- Footer: © 2019-2020 ANSYS Inc. Version: 2020.01 Build: 2019-11-08 07:44:21

# Setup Evaluator at remote workstation

Just start the DCE on a other Computer and connect it to the DCS



Cool! I don't need to be Admin.



DC Evaluator 2020 R1

Run: Start Stop Hard Shutdown Cleanup

Configure

DC Evaluator <https://stu-fk-19/dcs/evaluator/api/>

Evaluator: running

DCS Server: Connected dcadmin@https://stu-nk-18:444...

DCS Server Url: <https://stu-nk-18:444/dcs/> **Url of the DCS Server.**

User Name: dcadmin

Password: **Password: dcadmin**

Project Assignment: On Design Point Service **Edit**

Logging: debug info warning error  Follow Tail

```
2020-06-16 20:40:05,757, WARNING: No project URL provided
2020-06-16 20:40:10,472, INFO: Active connection : dcadmin@https://stu-nk-1
2020-06-16 20:40:11,044, INFO: Sorted project list, 0 item(s):
2020-06-16 20:40:11,045, INFO: Assigned project : None
2020-06-16 20:40:11,096, WARNING: No project URL provided
```

© 2019-2020 ANSYS Inc. Version: 2020 R1 Build: 2019-11-08 07:44:21

DC Evaluator 2020 R1

Run: Save Reset

Configure

DC Evaluator <https://stu-fk-19/dcs/evaluator/api/>

**If the evaluator is connected to the DCS I can define the Evaluator from my local Computer.**

General

Name: STU-FK-19

Platform: Windows

Loop Interval [s]: 5 Interval for main evaluator loop

Auto Start:  Whether to run evaluator automatically on startup

Task Manager

Active Task Manager:  Direct  RSM Task manager to use to execute or submit compute tasks

Queue: Local Name of queue to submit tasks to

File Management

Working Directory: C:\Users\kumala\AppData\Local\Temp\Ansysv20 Basic working directory to store temporary file data of task computations

Use Local File Cache:  Whether to use a local file cache in working directory

Max Cache Size [MB]: 60320 Maximum size the local file cache is allowed to consume in MB

Task Directory Cleanup:  always  on\_success  never Cleanup policy for task working directories

Compute Resources

Max Num Parallel Tasks: 3 Maximum number of tasks that the evaluator runs in parallel

Num Cores: 3 Total number of cores available for computations in this evaluator

Memory [MB]: 15317 Total amount of memory available for computations in this evaluator

Disk Space [MB]: 137091 Total amount of disk space available for computations in this evaluator

Applications

© 2019-2020 ANSYS Inc. Version: 2020 R1 Build: 2019-11-08 07:44:21

# Setup

## Available Evaluators for the DPS

- Manage the Evaluators from your Computer (number of CPUs, number of Tasks,...)
- Which Evaluator should be used for a Project or witch should not be used at all.
- You can do it at any time !!

Ok. Now we can deactivate the Evaluator and make the update and restart the computer !



ANSYS Design Point Service dcadmin@https://127.0.0.1:444/dcs/dps/api/

### ← Evaluators

Projects

Evaluators reloaded. ×

Evaluators

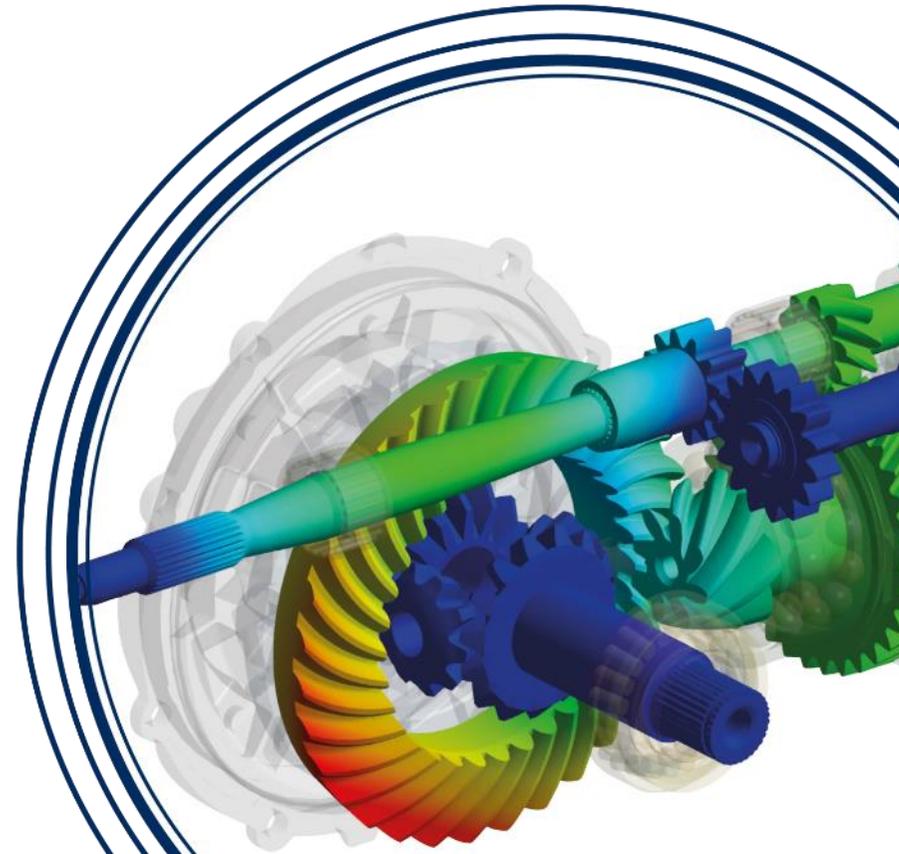
Project Assignment

<input type="checkbox"/>	Name	Hostname	Assignable on Server	Assigned Projects	Platform	Task Manager	Last Seen
<input type="checkbox"/>	STU-NK-18	STU-NK-18	Yes	All Active Projects	Windows	Direct	0 seconds
<input type="checkbox"/>	STU-FK-19	STU-FK-19	Yes	All Active Projects	Windows	Direct	0 seconds

Selected evaluators:

# ANSYS Distributed Compute Services

Connect the Workbench Project to  
the DCS



**CADFEM**<sup>®</sup>



**ANSYS**

# Connect the Workbench Project to the DCS

## Parameter Set

- Change to Submit to DPS
- Enter the URL of the DCS
- Enter a Name of the Project.
- Set the execution Time Limit
- Set up how many CPUs should be use by one Job.

## DOE

- Define how many Design Points should be send to the DCS

The image shows two screenshots of ANSYS Workbench dialog boxes. The top one is 'Properties of Schematic: Parameter Set' and the bottom one is 'Properties of Schematic C2: DOE'. Both are presented as tables with columns A (Property) and B (Value).

	A	B
1	Property	Value
2	Solution Process	
3	Update Option	Submit to Design Point Service (DPS)
4	Server URL	https://localhost:444/dcs
5	Database Name	Hook
6	Auto-Start Local Evaluator	<input checked="" type="checkbox"/>
7	Execution Time Limit (seconds)	3600
8	Update Design Points in Steps	<input type="checkbox"/>
9	Design Point Update Process	
10	Component Execution Mode	Parallel
11	Number of Processes	2

	A	B
1	Property	Value
2	General	
3	Component ID	SensitivityTask
4	Directory Name	Sensitivity
5	Notes	
6	Notes	
7	Design Points	
8	Preserve Design Points After optiSLang Run	<input checked="" type="checkbox"/>
9	Retain Data for Each Preserved Design Point	<input type="checkbox"/>
10	Update Settings	
11	Use Simultaneous Execution Mode	<input checked="" type="checkbox"/>
12	Number of Design Points Sent to Parameter Set	100

# Connect the Workbench Project to the DCS

- After press the update project Icon the project will be visible in the DPS

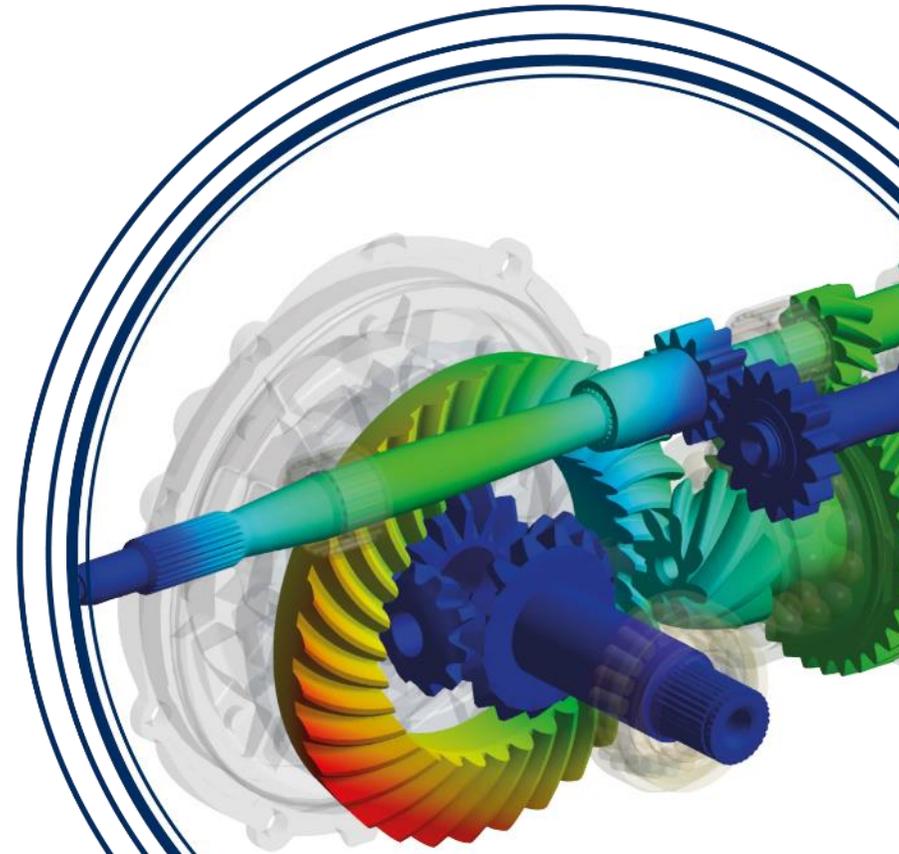
The screenshot shows the ANSYS Design Point Service web interface. The browser address bar displays `https://localhost:444/dcs/dps/#/projects`. The page title is "Projects" and the user is logged in as `dcadmin@https://localhost:444/dcs/dps/api/`. Below the header, there are action buttons: Delete, Share, Copy, Restore, Archive, and Refresh. A table lists the projects:

<input type="checkbox"/>	Name	Active	Priority	Created	Last Modified	Number of Design Points	Evaluated Design Points	Running Design Points
<input type="checkbox"/>	Hook	<input checked="" type="checkbox"/>	0	Jun 16, 2020, 10:21:01 PM			0	

© 2019-2020 ANSYS Inc.  
Version: 2020 R1  
Build: 2019-11-08 07:51:34

# ANSYS Distributed Compute Services

Watch the DPS at work



**CADFEM**<sup>®</sup>



**ANSYS**

# Watch the DPS at work

## Take a look to the Overview

The screenshot shows the ANSYS Design Point Service (DPS) web interface. The browser address bar indicates the URL is `https://localhost:444/dcs/dps/#/projects/Hook`. The page title is "Design Point Service" and the project name is "Hook".

The interface includes a navigation menu with "Overview", "Configuration", and "Design Points". The "Overview" tab is active, displaying the following details:

- Priority: 0
- ID: Hook
- Created: Jun 16, 2020, 10:21:01 PM
- Last Modified: Jun 16, 2020, 10:21:44 PM

The "Design Point Statistics" section features a table and a pie chart:

Category	Count
Total	100
evaluated	0
running	2
prolog	2
pending	96
failed	0
timeout	0
aborted	0
inactive	0

The pie chart visualizes these statistics, with a large blue slice representing the 96 pending design points, and very small slices for the 2 running and 2 prolog design points.

The "File Storage" section shows the following configuration:

- RestGateway: `dc_fs_gateway`
- FileSystemStorage: `file_system_storage`

At the bottom left, the copyright information reads: © 2019-2020 ANSYS Inc. Version: 2020 R1. Build: 2019-11-08 07:51:34.

# Watch the DPS at work

The screenshot shows the ANSYS Design Point Service (DPS) interface. The top navigation bar includes the ANSYS logo, the text 'Design Point Service', and the user email 'dcadmin@https://localhost:444/dcs/dps/api/'. The main header shows the project name 'Hook' and navigation tabs for 'Overview', 'Configuration', and 'Design Points'. Below the tabs, there are status filters: 'evaluated (30)', 'running (4)', 'prolog', 'pending (66)', 'failed', 'timeout', 'aborted', and 'inactive'. There are also 'Refresh' and 'Reset' buttons. A table below displays the evaluation results with columns for ID, Name, Eval Status, Priority, Last Modified, Evaluation Time, Evaluators, Geometry Mass, and Equivalent Stress Maximum. The table contains 20 rows of data. At the bottom left, there is a copyright notice: '© 2019-2020 ANSYS Inc. Version: 2020 R1 Build: 2019-11-08 07:51:34'. At the bottom right, there is a pagination control showing '1-20 of 100' and 'Page Size 20'.

<input type="checkbox"/>	☆ ID	Name	Eval Status	Priority	Last Modified	Evaluation Time	Evaluators	↳ Geometry Mass	↳ Equivalent Stress Maximum
<input type="checkbox"/>	☆ 1	1	evaluated	0	Jun 16, 2020, 10:23:07 PM	84	STU-NK-18	0.679801671169	364193602.179
<input type="checkbox"/>	☆ 2	2	evaluated	0	Jun 16, 2020, 10:23:07 PM	83	STU-NK-18	0.718785388756	380650108.763
<input type="checkbox"/>	☆ 3	3	evaluated	0	Jun 16, 2020, 10:23:05 PM	66	STU-FK-19	0.966408361318	204122035.713
<input type="checkbox"/>	☆ 4	4	evaluated	0	Jun 16, 2020, 10:23:05 PM	67	STU-FK-19	0.963415402024	297980162.414
<input type="checkbox"/>	☆ 5	5	evaluated	0	Jun 16, 2020, 10:24:21 PM	66	STU-FK-19	1.17383171187	181492311.831
<input type="checkbox"/>	☆ 6	6	evaluated	0	Jun 16, 2020, 10:24:21 PM	66	STU-FK-19	0.93466446923	332526866.079
<input type="checkbox"/>	☆ 7	7	evaluated	0	Jun 16, 2020, 10:24:29 PM	79	STU-NK-18	0.820691129956	317283235.727
<input type="checkbox"/>	☆ 8	8	evaluated	0	Jun 16, 2020, 10:24:36 PM	82	STU-NK-18	1.17511503819	133747294.438
<input type="checkbox"/>	☆ 9	9	evaluated	0	Jun 16, 2020, 10:25:35 PM	65	STU-FK-19	0.921287659688	274068110.476
<input type="checkbox"/>	☆ 10	10	evaluated	0	Jun 16, 2020, 10:25:35 PM	66	STU-FK-19	0.932849282627	417673510.74
<input type="checkbox"/>	☆ 11	11	evaluated	0	Jun 16, 2020, 10:25:46 PM	74	STU-NK-18	0.648004679992	324571975.533
<input type="checkbox"/>	☆ 12	12	evaluated	0	Jun 16, 2020, 10:25:56 PM	77	STU-NK-18	0.629756324335	350888248.586
<input type="checkbox"/>	☆ 13	13	evaluated	0	Jun 16, 2020, 10:26:50 PM	65	STU-FK-19	0.93716683506	323879648.218
<input type="checkbox"/>	☆ 14	14	evaluated	0	Jun 16, 2020, 10:26:50 PM	66	STU-FK-19	0.928582290946	322530129.626
<input type="checkbox"/>	☆ 15	15	running	0	Jun 16, 2020, 10:25:47 PM	74	STU-NK-18		
<input type="checkbox"/>	☆ 16	16	running	0	Jun 16, 2020, 10:25:57 PM	63	STU-NK-18		
<input type="checkbox"/>	☆ 17	17	running	0	Jun 16, 2020, 10:26:51 PM	10	STU-FK-19		
<input type="checkbox"/>	☆ 18	18	running	0	Jun 16, 2020, 10:26:54 PM	7	STU-FK-19		
<input type="checkbox"/>	☆ 19	19	pending	0	Jun 16, 2020, 10:21:33 PM	0			
<input type="checkbox"/>	☆ 20	20	pending	0	Jun 16, 2020, 10:21:33 PM	0			

# Watch the DPS at work

## Change the Status of a DP

- In this case the maximum execution Time was too short -> timeout
- Change the maximum execution Time and save the settings
- Select the DPs with the status timeout and change the Status to pending

ANSYS Design Point Service

Hook2

Overview Configuration **Design Points**

evaluated (78) running (3) prolog (1) pending (90) failed timeout (1)

Refresh Reset

ID	Name	Eval Status	Priority	Last Modified	Evaluation Time	Eval
1	1	timeout	0	Jun 17, 2020, 8:09:42 PM	34	STU NK-'
2	2	timeout	0	Jun 17, 2020, 8:09:42 PM	33	STU NK-'
3	3	running	0	Jun 17, 2020, 8:09:15 PM	30	STU
4	4	running	0	Jun 17, 2020, 8:09:18 PM	28	STU
5	5	running	0	Jun 17, 2020, 8:09:44 PM	4	STU NK-'
6	6	running	0	Jun 17, 2020, 8:09:46 PM	2	STU NK-'

© 2019-2020 ANSYS Inc. Version: 2020 R1 Build: 2019-11-08 07:51:34

ANSYS Design Point Service

Hook2

Overview **Configuration** Design Points

Configuration.1 Save

- Process Step: Workbench\_Project
- Application
- Requirements
  - CPU: 2 Minimum number of processor cores needed to execute this process step. Floating point number, half a process is written as 0.5
  - Memory: 0 Minimum amount of memory needed to execute this process step in MB
  - Disk Space: 0 Minimum amount of free disk space needed to execute this process step in MB
  - Maximum Execution Time: 3600 Maximum execution time for this process step in seconds
  - Execution Level: 0 Defines when this process step is executed if a sequence with multiple process steps is defined
  - Number of Attempts: 1 Maximum number of attempts to execute this process step
- Files
- Success Criteria

Hook2

Overview Configuration **Design Points**

evaluated (78) running (2) prolog (2) pending (90) failed (1)

Fields Filters

Status Pending ☆ Delete Compare

Name	Eval Status	Priority
Inactive	1	timeout
Aborted	2	timeout
3	3	timeout
4	4	timeout
5	5	timeout
6	6	timeout
7	7	timeout
8	8	timeout
9	9	timeout
10	10	timeout
11	11	timeout
12	12	timeout
13	13	timeout
14	14	timeout
15	15	timeout
16	16	timeout
17	17	running
18	18	running
19	19	running
20	20	running

1-20 of 100 Page Size 20

# Watch the DPS at work

## Compare DPs

ANSYS Design Point Service

Hook

Overview Configuration **Design Points**

evaluated (57) running (4) prolog pending (39) failed timeout aborted inactive

Fields Filters

Status Delete **Compare** Import Export

<input type="checkbox"/>	☆	ID	Name	Eval Status	Priority	Last Modified	Evaluat
<input type="checkbox"/>	☆	1	1	evaluated	0	Jun 16, 2020, 10:23:07 PM	84
<input type="checkbox"/>	☆	2	2	evaluated	0	Jun 16, 2020, 10:23:07 PM	83
<input type="checkbox"/>	☆	3	3	evaluated	0	Jun 16, 2020, 10:23:05 PM	66
<input type="checkbox"/>	☆	4	4	evaluated	0	Jun 16, 2020, 10:23:05 PM	67
<input type="checkbox"/>	☆	5	5	evaluated	0	Jun 16, 2020, 10:24:21 PM	66
<input type="checkbox"/>	☆	6	6	evaluated	0	Jun 16, 2020, 10:24:21 PM	66
<input checked="" type="checkbox"/>	☆	7	7	evaluated	0	Jun 16, 2020, 10:24:29 PM	79
<input checked="" type="checkbox"/>	☆	8	8	evaluated	0	Jun 16, 2020, 10:24:36 PM	82
<input checked="" type="checkbox"/>	☆	9	9	evaluated	0	Jun 16, 2020, 10:25:35 PM	65
<input checked="" type="checkbox"/>	☆	10	10	evaluated	0	Jun 16, 2020, 10:25:35 PM	66
<input type="checkbox"/>	☆	11	11	evaluated	0	Jun 16, 2020, 10:25:46 PM	74

ANSYS Design Point Service

Hook

Overview Configuration **Design Points**

Evaluators

Compare Design Points

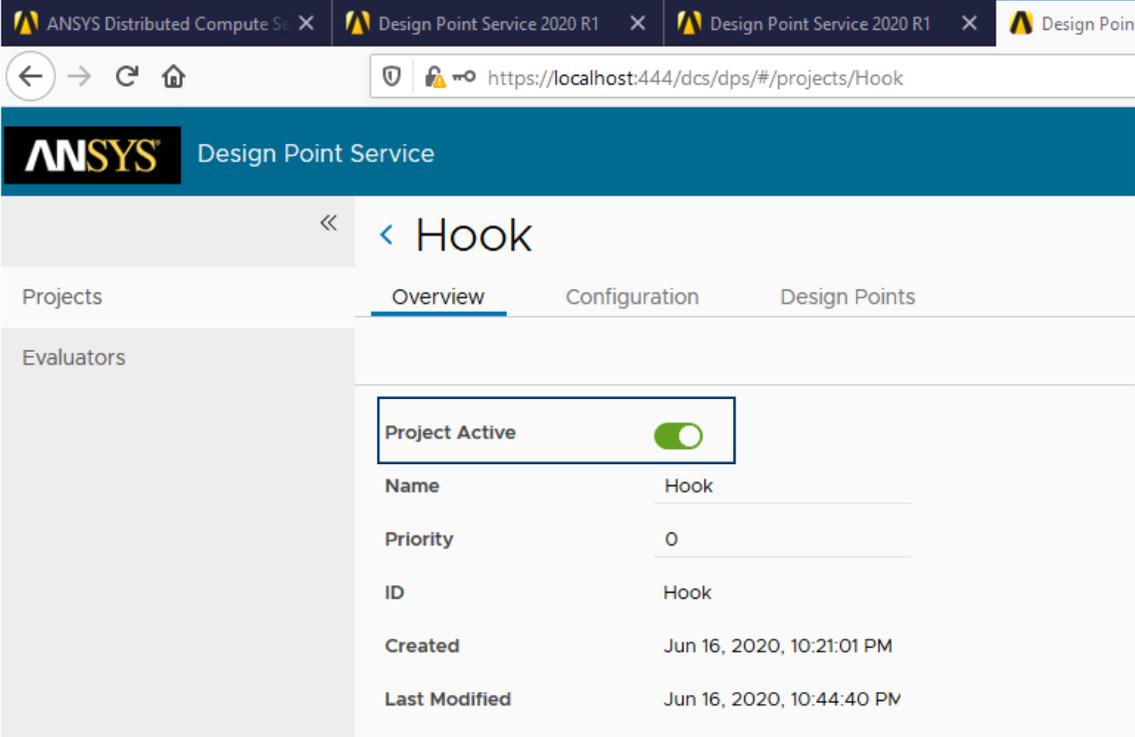
Maximum Significant Digits: 8

	10	9	8	7
<b>Properties</b>				
ID	10	9	8	7
Name	10	9	8	7
Eval Status	evaluated	evaluated	evaluated	evaluated
Priority	0	0	0	0
Created	Jun 16, 2020, 10:21:33 PM			
Last Modified	Jun 16, 2020, 10:25:35 PM	Jun 16, 2020, 10:25:35 PM	Jun 16, 2020, 10:24:36 PM	Jun 16, 2020, 10:24:29 PM
Evaluation Time	66	65	82	79
Evaluators	STU-FK-19	STU-FK-19	STU-NK-18	STU-NK-18
Creator	Workbench	Workbench	Workbench	Workbench
<b>Note</b>				
- Output Parameters (2)				
Geometry Mass	0,31284928	0,32128766 (-1,2%)	1,171115 (26,0%)	0,82069113 (-12,0%)
Equivalent Stress Maximum	417673310	274068310 (-34,4%)	133747290 (-68,0%)	117283240 (-24,0%)
- Input Parameters (4)				
DS_Thickness	15,55	19,95 (28,3%)	24,15 (55,3%)	19,85 (27,7%)
DS_Depth	21,85	19,45 (-11,0%)	24,55 (12,4%)	17,15 (-20,6%)
DS_LowerRadius	54,05	51,55 (-4,6%)	45,65 (-15,5%)	52,05 (-3,7%)
DS_Angle	145,35	142,95 (-1,7%)	141,15 (-2,9%)	142,65 (-1,9%)

# Watch the DPS at work

## Start / Stop Project

- You can pause the Project and start it again at any time

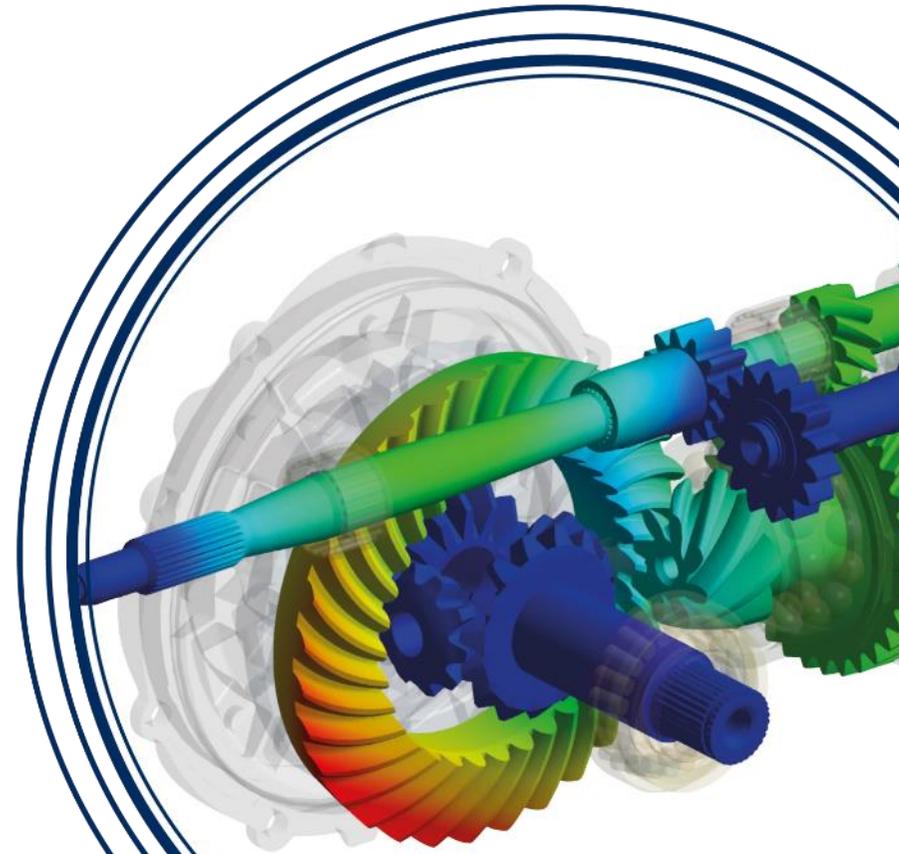


The screenshot shows the ANSYS Design Point Service web interface. The browser address bar indicates the URL is <https://localhost:444/dcs/dps/#/projects/Hook>. The page title is "ANSYS Design Point Service". The main content area shows the project "Hook" with tabs for "Overview", "Configuration", and "Design Points". The "Overview" tab is selected. A "Project Active" toggle switch is shown in the "On" position (green). Below the toggle, the project details are listed:

Name	Hook
Priority	0
ID	Hook
Created	Jun 16, 2020, 10:21:01 PM
Last Modified	Jun 16, 2020, 10:44:40 PM

# ANSYS Distributed Compute Services

## Spaceclaim and Linux



**CADFEM**<sup>®</sup>



**ANSYS**

# Design Points with Spaceclaim and Linux

The Update of the DP will be split in two steps.

- Workbench Geometry
- Workbench Solution

Properties of Schematic: Parameter Set		
A	B	
1	Property	Value
2	Solution Process	
3	Update Option	Submit to Design Point Service (DPS)
4	Server URL	https://localhost:444/dcs
5	Database Name	hook_Steps
6	Auto-Start Local Evaluator	<input checked="" type="checkbox"/>
7	Execution Time Limit (seconds)	300
8	Update Design Points in Steps	<input checked="" type="checkbox"/>
9	Design Point Update Process	
10	Component Execution Mode	Parallel
11	Number of Processes	2

The screenshot shows the 'hook\_Steps' configuration page in the Design Point Service web interface. The 'Configuration' tab is active, showing 'Configuration.1' with a green 'Configuration Active' toggle. The 'Workflow' section is expanded to show two process steps: 'Workbench\_Geometry' and 'Workbench\_Solution'. The 'Workbench\_Solution' step is further expanded to show its application details, including the name 'ANSYS Workbench', version '20.1', and a command line for executing the solution process.

This screenshot is identical to the previous one, showing the 'hook\_Steps' configuration page. It highlights the 'Workbench\_Geometry' process step, which is expanded to show its application details: 'ANSYS Workbench', version '20.1', and a command line: `%executable% -B -R %file:wbin_Workbench_G %file:log_Workbench_Geometry%`.

This screenshot is identical to the previous ones, showing the 'hook\_Steps' configuration page. It highlights the 'Workbench\_Solution' process step, which is expanded to show its application details: 'ANSYS Workbench', version '20.1', and a command line: `%executable% -B -R %file:wbin_Workbench_S %file:log_Workbench_Solution%`.

# Design Points with Spaceclaim and Linux

hook\_Steps

Overview Configuration **Design Points**

evaluated (3) running prolog pending failed timeout aborted inactive

Fields Filters

Status ☆ Delete Compare Import Export

ID	Name	Eval Status	Priority	Last Modified	Evaluation Time	Evaluators	Geometry Mass	Equivalent Stress Maximum
1	1	evaluated	0	Jun 22, 2020, 5:06:59 PM	149	STU-NK-18 otc-ws-0036	0.993245968273	167115730.089
2	2	evaluated	0	Jun 22, 2020, 5:06:23 PM	110	STU-NK-18 otc-ws-0036	0.752436703248	460276043.619
3	3	evaluated	0	Jun 22, 2020, 5:07:24 PM	147	STU-NK-18 otc-ws-0036	0.696608609848	416537054.706

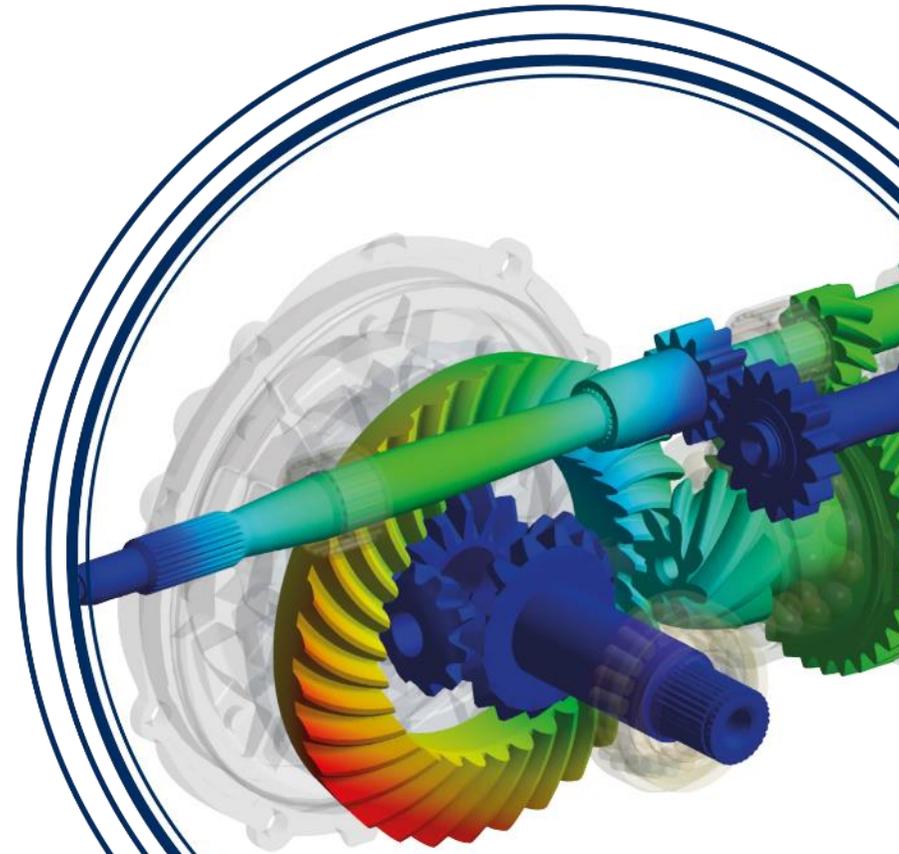
1-3 of 3 Page Size 20

Geometry update

Solving

# ANSYS Distributed Compute Services

## Debugging of solution



**CADFEM**<sup>®</sup>



**ANSYS**

# Debugging of solution

For each DP there is a LOG file of the Workbench Project available.

In the File you can get information why the DP failed. (Geometry update / Meshing or solving)

× log\_Workbench\_Project\_dp1 - hook3\_V2OR1\_Workbench\_Project\_log.txt

```
22.06.2020 15:15:50: [INFO] Set parameter units
22.06.2020 15:15:50: [INFO] Set input parameters
22.06.2020 15:15:50: [INFO] ProjectStepEvaluate
22.06.2020 15:15:55: [INFO] Initialize optiSLang Extension Version 8.0.0
22.06.2020 15:15:55: [INFO] Initialize optiSLang Extension Done
22.06.2020 15:15:55: [INFO] The project has been opened from D:\user\kuhn\DCE_Workdir\tasks\Hook\task_1\2jtslvcn.rue\hook3_V2O
22.06.2020 15:15:56: [INFO] Updating components in design point 0
22.06.2020 15:15:57: [INFO] Updating the Geometry component in Geometry
22.06.2020 15:16:08: [INFO] Updated the Geometry component in Geometry
22.06.2020 15:16:09: [INFO] Updating the Model component in Static Structural
22.06.2020 15:16:23: [INFO] Updated the Model component in Static Structural
22.06.2020 15:16:23: [INFO] The Model component in Static Structural requires user input before it can be updated. For instru
22.06.2020 15:16:23: [INFO] Updating components in design point 0
22.06.2020 15:16:23: [INFO] Updating components in design point 0
22.06.2020 15:16:23: [INFO] Updating components in design point 0
22.06.2020 15:16:23: [INFO] Updating components in design point 0
```

The Model component in Static Structural requires user input before it can be updated.  
For instructions on how to address the cell in its current state, click the blue triangle in the lower right corner of the cell in the Project Schematic.

Process Step	Application	Evaluator	Eval Status	Evaluation Time	Attempt
Workbench_Project	ANSYS Workbench 20.1	otc-ws-0010	failed	31	1 of 1
Overall			failed	31	

ID	Path	Mode
input_parameters_dp86_replaced	hook4_input_param.wbjn	input
wbjn_Workbench_Project	hook4_Workbench_Project.wbjn	input
wbpz	hook4.wbpz	input
log_Workbench_Project_dp86	hook4_Workbench_Project_log.txt	output
output_parameters_dp86	hook4_output_param.txt	output
workbench_project_output_dp86	workbench_project_output.txt	output

Oh, that is the reason why the Design Point 86 is not running



# Debugging of solution

For each DP there is a LOG file of the Workbench Project available.

In the File you can get information why the DP failed. (Geometry update / Meshing or solving)

× log\_Workbench\_Project\_dp2 - hook3\_V20R1\_Workbench\_Project\_log.txt

```
22.06.2020 15:43:17: [INFO] Updating the Solution component in Static Structural
22.06.2020 15:43:45: [WARN] One or more bodies may be underconstrained and experiencing rigid body motion. Weak springs have been added.
22.06.2020 15:43:45: [ERROR] Element 4029 located in Body "Solid" (and maybe other elements) has become highly distorted. You may select this element in the model tree and click the "Reset" button to reset the element.
22.06.2020 15:43:45: [WARN] The unconverged solution (identified as Substep 999999) is output for analysis debug purposes. Results at this time should not be used for any other purpose.
22.06.2020 15:43:45: [WARN] Although the solution failed to solve completely at all time points, partial results at some points have been saved.
22.06.2020 15:43:45: [WARN] Large deformation effects are active which may have invalidated some of your applied supports such as displacement.
22.06.2020 15:43:45: [WARN] The solution failed to solve completely at all time points. Restart points are available to continue the analysis.
```

Element 4029 located in Body "Solid" (and maybe other elements) has become highly distorted....  
The unconverged solution (identified as Substep 999999) is output for analysis debug purposes. Results at this time should not be used for any other purpose.

### Hook4

Overview Configuration **Design Points**

#### Design Point: 86 1 of 1

Process Step	Application	Evaluator	Eval Status	Evaluation Time	Attempt
Workbench_Project	ANSYS Workbench 20.1	otc-ws-0010	failed	31	1 of 1
Overall			failed	31	

Files All Files Log Files

ID	Path	Mode
input_parameters_dp86_replaced	hook4_input_param.wbjn	input
wbjn_Workbench_Project	hook4_Workbench_Project.wbjn	input
wbpz	hook4.wbpz	input
log_Workbench_Project_dp86	hook4_Workbench_Project_log.txt	output
output_parameters_dp86	hook4_output_param.txt	output
workbench_project_output_dp86	workbench_project_output.txt	output

Parameters

Output Parameters (2)

Geometry Mass



Oh, that is the reason why the Design Point 86 is not running ?  
I just change the status of the DP and try it again.

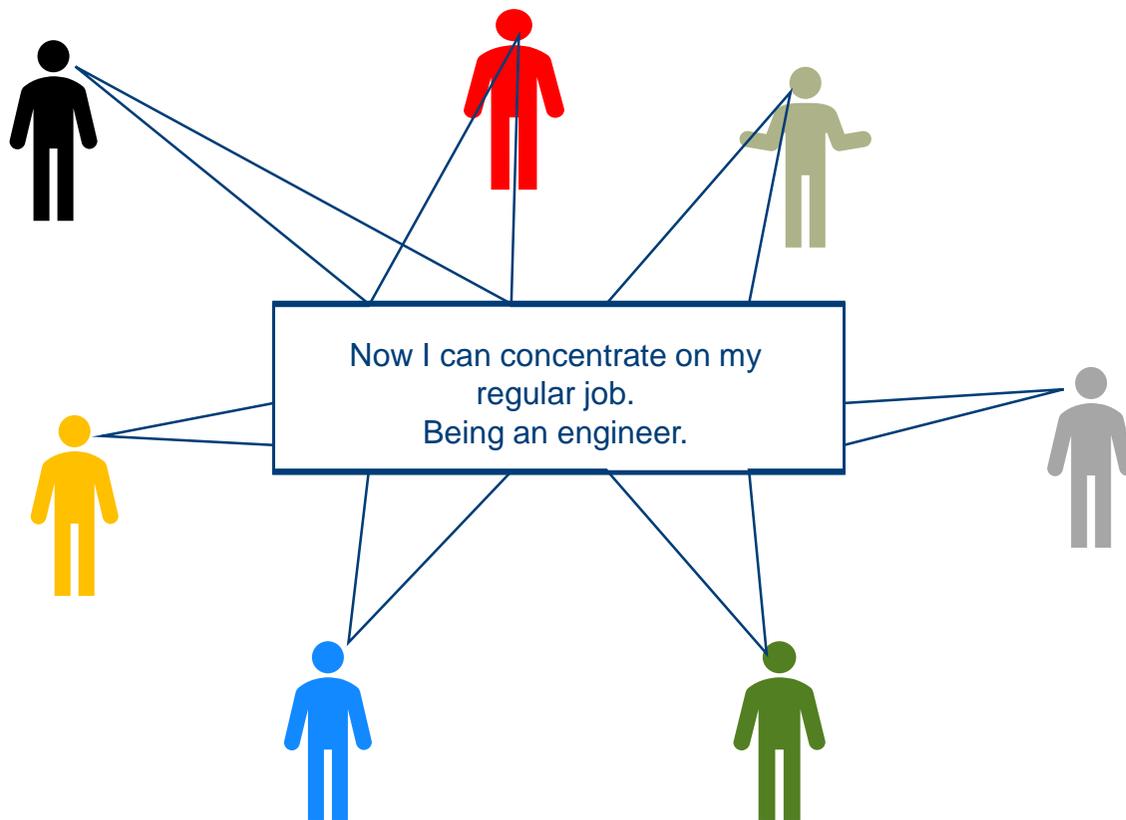


# Debugging of solution



Now I want to see the results of the Failed Design Point!!

Change the Task Directory Cleanup and change the status of the DP.



# More Information



- CADFEM Support
  - [support@cadfem.de](mailto:support@cadfem.de)
  - 08092 7005 55 (8:00 a.m. – 6 p.m)
  
- CADFEM Webinar
  - Please contact Mr. Kellermeyer [mkellermeyer@cadfem.de](mailto:mkellermeyer@cadfem.de) and you get a one Week access to the CADFEM eLearning platform