

ROADEF/EURO Challenge

Final results

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Thanks

- ▶ Thanks to all the teams for their great work

- ▶ Thanks to the co-organizers from ROADEF:
 - Christian ARTIGUES
 - Eric BOUREAU
 - Murat AFSAR

- ▶ And from EURO:
 - Ender Ozcan

Future papers

- ▶ Obviously, you are authorize and even encourage to publish on the subject.
- ▶ Keep us informed of your papers.

Web site

- ▶ The results will be published very soon.
- ▶ We will add a page with the current best solutions and actualize it as soon as someone improve it.

The challenge: an international contest

- ▶ Registrations: 44 teams, 25 countries, 5 continents
- ▶ Program submitted for qualification phase: 27 teams
- ▶ Finalists: 21 teams, 13 countries, 3 continents
- ▶ Program submitted for final phase: 16 teams, 11 countries
- ▶ 5 prizes, ? countries

Why EDF has proposed a subject?

- ▶ To identify some researchers to work with
- ▶ To improve the resolution of a real problem
- ▶ To encourage the links between industrial and academic researchers

Why this problem of outages scheduling?

- ▶ A very difficult problem that evolve
 - The possibility to optimize the reloaded quantity is very new
- ▶ We work on this problem for more than 10 years and we are not completely satisfy with the current method we used
- ▶ Lot of ideas without the time to test it all:
 - Constraint programming
 - Linear Programming
 - Column generation
 - ...
- ▶ A imagination with limitation
 - Other people could have other ideas to solve this problem

How the teams are ranked?

- ▶ The score will be computed as announced in the subject:

$$scoreFinalPhase = \sum_{i \in B \cup X} \frac{objective(i) - objective^*(i)}{objective^*(i)}$$

- ▶ Base B: 5 sets, available at the beginning of final phase
- ▶ Base X: 5 sets (same size of those of base B), unknown by participants, will be available after the announcements of final results
- ▶ If an executable fails to find a feasible solution, its score on this instance will be double the score obtained by the worst feasible solution found by a team.

Data sets B and X

- ▶ 5 data sets B: B6, B7, B8, B9, B10
- ▶ 5 data sets X: X11, X12, X13, X14, X15
- ▶ All data sets are from real data sets that have been filtrated and masked.
- ▶ All the real data sets have the same characteristics.
- ▶ The same treatments have been done on 2 different real data sets to obtain B6 and X11, another treatment for B7 and X12 and so on.

3 categories

- ▶ Senior : no restriction on team but single-thread
- ▶ Junior : only students (no PhD), single-thread
- ▶ Multi-Thread : no restriction on team, multi-thread allowed

Rankings

- ▶ **The official ranking is the one done on data sets B and X.**
- ▶ 1/ Nevertheless, we will start with a ranking on data sets B by using the announcements of candidates.
- ▶ 2/ Then, we will give a ranking done by testing on data sets B.
- ▶ 3/ On this ranking, we will add the number of data sets X solved by each team.
- ▶ 4/ Finally, we will give the **official ranking** on data sets B and X.
- ▶ Each step can contain some surprises.

Ranked by the announcements of candidates on base B

ranking	id	score	score/5
1	Team S24 Johan Peekst	0.043%	0.009%
2	Team S22MT Frédéric Gard	1.808%	0.362%
3	Team S22 Frédéric Gard	2.084%	0.417%
4	Team S23MT Laurent Alfanc	8.075%	1.615%
5	Team S23 Laurent Alfanc	8.077%	1.615%
6	Team J06 Niels Kjeldser	11.324%	2.265%
7	Team S21 Christoph Dür	24.371%	4.874%
8	Team J08 Roman Steine	53.240%	10.648%
9	Team S04 Mauro Dell'An	67.911%	13.582%
10	Team S14 Valentin Web	73.558%	14.712%
11	Team S17 François Sour	176.612%	35.322%
12	Team S08 Cor Hurkens	186.149%	37.230%
13	Team S16 Hadrien Camt	635.227%	127.045%
14	Team J05 Lauri Ahlroth,	903.696%	180.739%
15	Team S11 Wi Davide Anghir	1422.529%	284.506%
16	Team J16 Stefan Heinz1	3875.450%	775.090%
17	Team S10 Bjørn Peterse	8597.411%	1719.482%
18	Team S10MT Bjørn Peterse	8597.419%	1719.484%
19	Team S25 Haris Gavranc	17218.932%	3443.786%

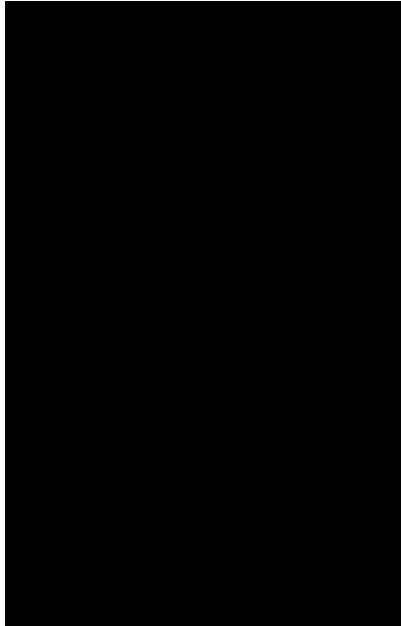
▶ no check have been done on these values

Ranked done by the organizers on base B (1/2)

rang	id	score	score/5	B sets solved	
1	Team S22	Frédéric Gard	1.160%	0.232%	5
2	Team S24	Johan Peekst	1.200%	0.240%	5
3	Team S23MT	Laurent Alfanc	7.170%	1.434%	5
4	Team S23	Laurent Alfanc	7.273%	1.455%	5
5	Team J06	Niels Kjeldser	10.633%	2.127%	5
6	Team S21	Christoph Dür	23.523%	4.705%	5
7	Team J08	Roman Steine	59.942%	11.988%	5
8	Team S04	Mauro Dell'An	65.103%	13.021%	5
9	Team S14	Valentin Webt	72.634%	14.527%	5
10	Team S08	Cor Hurkens	145.811%	29.162%	4
11	Team S17	François Sour	175.470%	35.094%	5
12	Team S16	Hadrien Camt	277.804%	55.561%	4
13	Team J05	Lauri Ahlroth,	531.785%	106.357%	5
14	Team S10	Bjørn Peterse	8633.089%	1726.618%	5
15	Team S10MT	Bjørn Peterse	8633.189%	1726.638%	5
16	Team J16	Stefan Heinz1	9253.559%	1850.712%	4
17	Team S11 Wii	Davide Anghir	11664.910%	2332.982%	3
18	Team S22MT	Frédéric Gard	17119.158%	3423.832%	2
19	Team S25	Haris Gavranc	17290.279%	3458.056%	0

► Small variations of the scores announced

Number of data sets solved and Penalties



number of data sets solved (on 10)	number of teams
10	4
9	3
8	3
7	1
6	2
5	2

- ▶ All the data sets have been solved by at least 7 teams.
- ▶ Only 4 teams have solved the 10 data sets.

Ranked done by the organizers on base B (2/2)

rang	id	score	score/5	B sets solved	X sets solved	
1	Team S22	Frédéric Gard	1.160%	0.232%	5	1
2	Team S24	Johan Peekst	1.200%	0.240%	5	4
3	Team S23MT	Laurent Alfanc	7.170%	1.434%	5	2
4	Team S23	Laurent Alfanc	7.273%	1.455%	5	0
5	Team J06	Niels Kjeldser	10.633%	2.127%	5	3
6	Team S21	Christoph Dür	23.523%	4.705%	5	5
7	Team J08	Roman Steine	59.942%	11.988%	5	5
8	Team S04	Mauro Dell'An	65.103%	13.021%	5	2
9	Team S14	Valentin Web	72.634%	14.527%	5	5
10	Team S08	Cor Hurkens	145.811%	29.162%	4	4
11	Team S17	François Sour	175.470%	35.094%	5	4
12	Team S16	Hadrien Camt	277.804%	55.561%	4	1
13	Team J05	Lauri Ahlroth,	531.785%	106.357%	5	5
14	Team S10	Bjørn Peterse	8633.089%	1726.618%	5	4
15	Team S10MT	Bjørn Peterse	8633.189%	1726.638%	5	4
16	Team J16	Stefan Heinz1	9253.559%	1850.712%	4	4
17	Team S11 Wi	Davide Anghir	11664.910%	2332.982%	3	3
18	Team S22MT	Frédéric Gard	17119.158%	3423.832%	2	1
19	Team S25	Haris Gavranc	17290.279%	3458.056%	0	0

Official ranking on data sets B and X

rang	id	score	score/10	B and X sets solved	
1	Team S21	Christoph Dür	39.211%	3.921%	10
2	Team J08	Roman Steine	77.118%	7.712%	10
3	Team S14	Valentin Web	139.891%	13.989%	10
4	Team S23MT	Laurent Alfanc	202.364%	20.236%	7
5	Team S17	François Sour	297.191%	29.719%	9
6	Team S24	Johan Peekst	299.955%	29.996%	9
7	Team J06	Niels Kjeldser	407.501%	40.750%	8
8	Team S04	Mauro Dell'An	486.043%	48.604%	7
9	Team S22	Frédéric Gard	494.288%	49.429%	6
10	Team S08	Cor Hurkens	495.240%	49.524%	8
11	Team J05	Lauri Ahlroth,	574.203%	57.420%	10
12	Team S23	Laurent Alfanc	624.030%	62.403%	5
13	Team S16	Hadrien Camt	773.511%	77.351%	5
14	Team S10	Bjørn Peterse	8801.920%	880.192%	9
15	Team S10MT	Bjørn Peterse	8961.748%	896.175%	9
16	Team J16	Stefan Heinz1	9330.627%	933.063%	8
17	Team S11 Wi	Davide Anghir	12029.319%	1202.932%	6
18	Team S22MT	Frédéric Gard	17612.274%	1761.227%	3
19	Team S25	Haris Gavranc	17907.036%	1790.704%	0

Senior

- ◆ Winner: S21 **David Savourey, Vincent Jost, Christoph Dürr, Nora Touati, Antoine Jeanjean**, *Polytechnique and Bouygues e-lab, France*
- ◆ 2nd: J08 **Roman Steiner, Sandro Pirkwieser, Matthias Prandtstetter**, *Vienna University of Technology, Austria*
- ◆ 3rd: S14 **Julien Darlay, Louis Esperet, Yann Kieffer, Guyslain Naves, Valentin Weber**, *Laboratoire G-SCOP, France and McGill University, Canada*

- ◆ None of these team has had a best solution.
- ◆ But, they have solved the 10 data sets.

Junior

- ◆ Winner: J08 **Roman Steiner, Sandro Pirkwieser, Matthias Prandtstetter**, *Vienna University of Technology, Austria*
- ◆ 2nd: J06 **Steffen Elberg Godskesen, Thomas Sejr Jensen, Niels Kjeldsen, Rune Larsen**, *Dept. of Mathematics and Computer Science, Univ. of Southern Denmark and DONG Energy A/S, Denmark*
- ◆ 3rd: J05 **Lauri Ahlroth, Henri Tokola, Andre Schumacher**, *Aalto Univ., School of Science and Technology, Finland*

Multi-thread category

- ▶ Only 3 teams (S11, S22, S23) have sent a multi-thread executable.
- ▶ If we consider these submissions of multi-thread executable (S11, S22, S23) nothing change.
- ▶ S21 still have the best score.
- ▶ Due to the lack of enthusiasm for the multi-thread category, the jury of this challenge decided to cancel the multi-thread category to create a special prize.
- ▶ This special prize will go to the team with the largest number of best solutions.

Special prize:

- ▶ Team S24 (**Johan Peekstok, Eelco Kuipers**, *BelImproved, Netherlands*) win this prize with 6 best solutions.

To sum up

► Senior:

- Winner (4000€): S21
- 2nd: J08
- 3rd: S14

► Junior:

- Winner (2500€): J08
- 2nd (1000€): J06
- 3rd (500€): J05

► Special prize:

- Winner (2000€): S24

► 5 prizes, 5 countries