



Arbiter: the Evaluation Tool in Contests of China NOI

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Outline

- Introduction
- Arbiter for Camp Contests (ACC)
- Arbiter for Online Contests (AOC)
- Arbiter for Large Scale Contests (ALS)
- Conclusion

Introduction

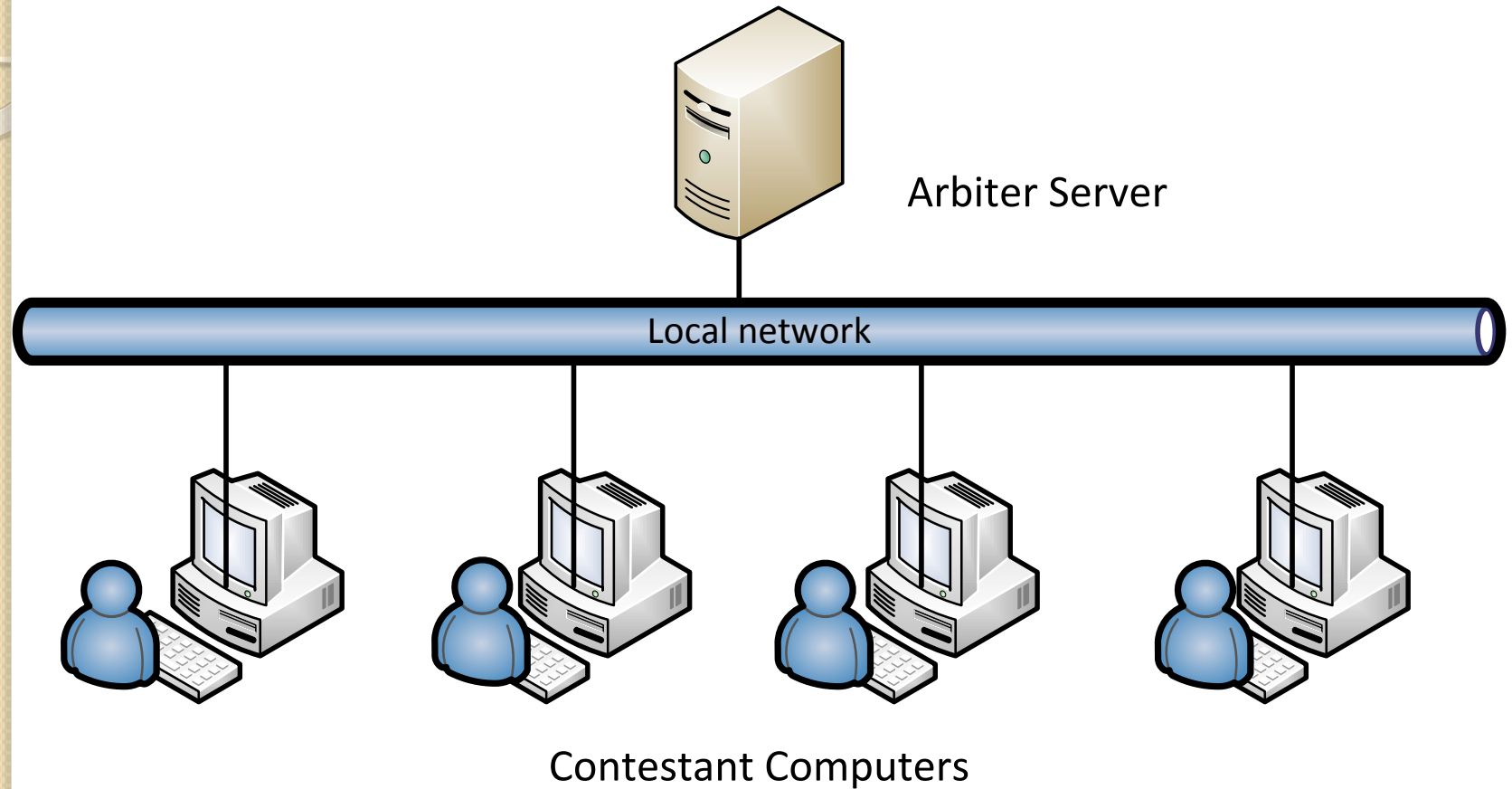
- The contests of China National Olympiad in Informatics
 - NOIP
 - NOI Camps
 - NOI online contests
- Arbiter family: a group of program grading and evaluation tools
 - fit the different contest environments
 - run on most popular Linux OSs, such as *Ubuntu*, *Redhat*, *Debian*, etc.



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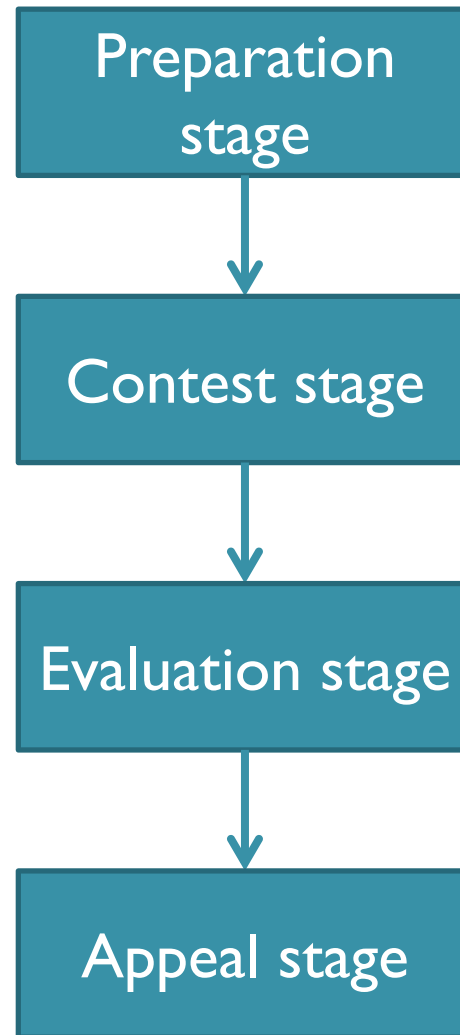
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Arbiter for Camp Contests(ACC)



Arbiter for Camp Contests(2)

- Four stages



Arbiter for Camp Contests(3)

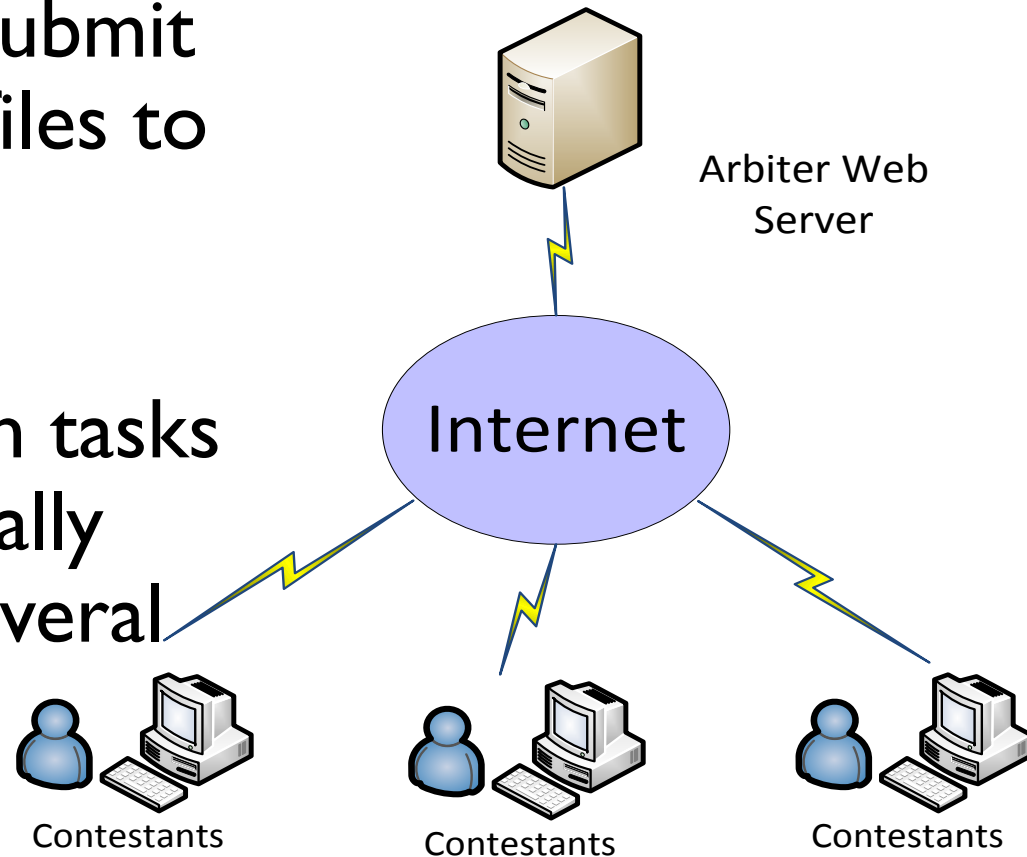
- A client-server system
 - A control server
 - Directs and monitors the contest machines in all stages
 - all the machines the contestants use in the competition
 - All arbiter clients work on contestants' machine in the daemon mode
 - Receive and execute commands from the server
 - Evaluate the contests' answer independently
 - filtering all suspicious network packages sent to/from host machines
 - The server and clients communicate by UDP and TCP

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Arbiter for Online Contests(AOC)

- Web-server mode
- Contestants submit their answer files to the server
- The evaluation tasks are automatically assigned to several evaluating computers



Arbiter for Online Contests(2)

- Four stage
 - Registration
 - Contesting
 - According to the configuration, the contestants may run their answers on the sample data
 - Evaluation
 - The server assigns contestants' answers to the evaluating machines and gets the evaluation results from them.
 - Appealing



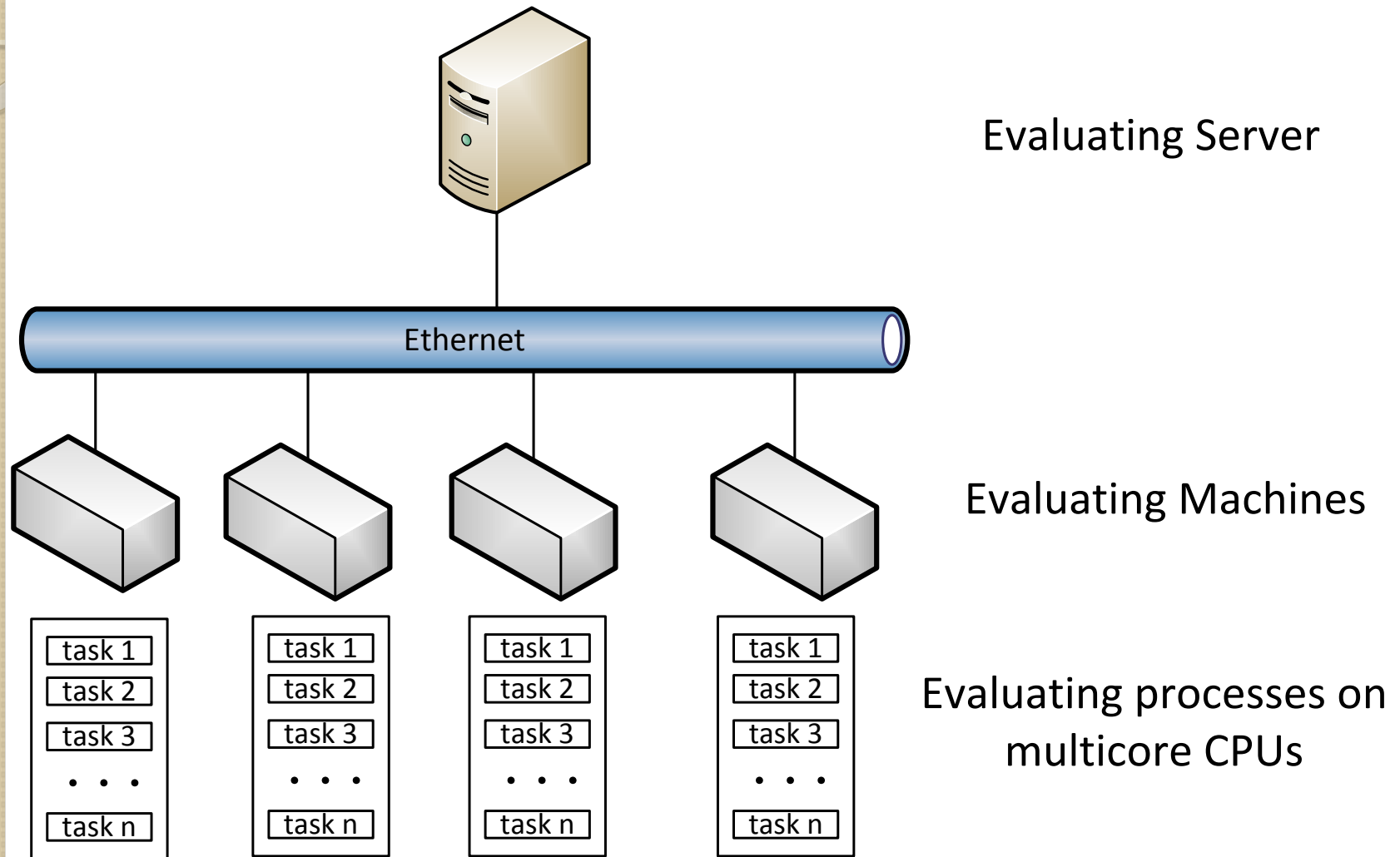
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Arbiter for Large Scale Contests (ALS)

- Used in NOIP
 - The NOIP contests are held simultaneously in 31 provinces for about 100,000 contestants.
 - In order to keep the unique standard of evaluation over the provinces, the answers of all contestants are gathered together via email and evaluated in an off-line mode by the ALS system

Arbiter for Large Scale Contests (ALS)





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Conclusions

- Features of the Arbiter family
 - Flexibility in usage
 - Stability and efficiency in evaluation
 - Easy to migrate
 - Standard interfaces for data exchange
 - Secrecy in data storage
- Work stably and efficiently
 - Became official evaluating system since 2002
 - The Arbiter tools have evaluated about 700,000 contestants, 5,000,000 problem answers, on about 60,000,000 test cases.

Thanks!