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Programming Contest

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# Preparing A Successful First Regional Contest

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(Louisiana, Oklahoma, Texas)

**Previous Author: Tom CaPaul, RCD Pacific NW  
Region** (British Columbia, Washington, Oregon,  
North Idaho, Northern California, Hawaii)

**Previous Author: Kris Rudin**

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# Background

- **Isaac & Kathy Traxler**
  - [traxler@lsu.edu](mailto:traxler@lsu.edu), [ktraxler@lsu.edu](mailto:ktraxler@lsu.edu)
  - RCD South Central USA Region 2000-Present
  - ACM-ICPC coach since 1990 (and before)
  - Previous Competitors
  - Beta site for ICPC transition to Linux
  - Experience with central and distributed contests
  - Hosted local collegiate and high school contests
  - PC^2 user for 15+ years



# Who's Who

- **Bill Poucher** – ICPC Executive Director, aka, “Head Honcho”
- **Marsha Poucher** – Contest Manager, helps with almost everything
- **James Comer** – Director-Regional Contests, deals with all problems
- **John Clevenger** – Director-Contest Systems (also head of PC<sup>2</sup> Contest Software Team)
- **Debbie Kilbride** – IBM liaison – provides funding for the contests (prizes, software, etc.)
- **Super Regional Director** — get to know your boss



# Types of Contests

- **Single site** – all teams come to one site on the same day
- **Multi-site/Single-day** – several contests within one region happening at the same time. Scores are merged and listed as one site. (we do this)
- **Multi-site/Multi-day/Unified** – contest All sites use same schedule and problems, practice one day and contest next day
- **Multi-site/Multi-day** – several sites hold the contest on different dates with different problems. Scores are merged at the end, just like multi-site/single day sites.
- **Tiered** – preliminary contest(s) followed by final contest, with only selected teams moving on to the next tier. Each Tier could be single site or multi-site.



# Types of Judging

- **Single site** – the only decision is to use automated judging or humans.
- **Multi-site** – three choices:
  - *Automated*: computer does judging
  - *Human centralized*: judges are physically at one site, problems submitted via internet
  - *Human localized*: judges may be at multiple sites
    - A difficulty here is to make sure all judges are returning the same judgments – requires lots of phone/IM



# Which Contest Model?

- Which contest model is right for your region?
- Many factors:
  - History – how has it been done in the past?
  - Geographic distribution of teams – are most of your teams within 2-3 hour drive?
  - Volunteer sites – multi-site contests need multiple host schools (it can be **challenging** to get schools to host)
- Single site regionals are the easiest to manage.
- Multi-site contests add a **huge** amount of overhead. Instead of managing one contest, you are managing a contest at each distributed site.
- Multi-day and tiered contests also require more management.



# First Decisions

## *Select contest date(s)*

- All regionals must be completed by mid-November (date is provided in RCD notebook and can vary based on ICPC date)
- Try to avoid holidays
- If held at a university avoid sporting events which may cause traffic/parking/hotel problems
- Local events, Fall Break, testing periods
- Other student events



# First Decisions

## *How many teams will you allow?*

- Allow as many *universities* as you possibly can
- Allow as many *teams* as you possibly can
  - Space limitations may require a limit, e.g. allow  $n$  teams from each school, and if space allows, start adding the  $n+1$  teams (in order of application)
- Important Note: Schools/Teams may only compete in ONE region
- If a school/team has a conflict it can appeal to compete in another region (case by case basis)





# First Decisions

## *Multi-site Contests: How many sites?*

- Each site should have a relatively large number of teams (at least 20 teams) or you do not need that site
- Exceptions:
  - Travel difficulties – e.g. time of year, weather, distance (Hawaii is one the locations in a region)
  - Visa problems – if contest crosses international boundaries (this is the case in some regions)
  - Add significant new universities/teams



# First Decisions

## *Hardware / Software Selection*

- What hardware/OS will each site have (consistency is very important – teams will want to know these details)?
- What languages will you allow? World Finals supports C, C++, and Java. You must decide if it makes sense for your region to allow languages other than those. You should use all languages World Finals does.
- What software will you use for running the contest?
  - PC<sup>2</sup> / Kattis / Mooshak / home grown



# Key People

## *Regional Director (YOU)*

- **Responsible for**
  - Selection of contest date (other factors)
  - Selection of software and system
  - Recruiting volunteer sites
  - Budget
  - Registration
  - Ordering plaques, prizes (if you do this), gifts, *t-shirts?*
  - Make schedule for contest day
  - Overall success of the contest
  - DELEGATE where possible!



# Key People

## *Site Director(s)*

- The person who will handle local set-up at each site
- Successful coaches often make good site directors
  - Provide a guide book for them
  - Must be someone willing to commit to “doing a good job”
- Responsibilities may include
  - Selection of local judge(s)
  - Selection of local system person(s)
  - Local arrangements (contest room, meeting hall, catering, t-shirts, balloons and helium, print materials, etc.)
  - Recruitment of volunteers (balloon runners, registrar, etc.)
  - Web site for his/her contest site (should contain itinerary, map, parking information, etc.)



# Key People

## *Head Judge*

- Person who understands the contest
- Person who can commit to the time required
- Best if this person accepts multi-year commitment: consistency is key
- Can use someone from industry or academia
  - Some regions prefer not to use current coaches to avoid conflict of interest
  - However, many regions do and have had no issues
- Responsible (with other judges) for:
  - Writing the problem specification (clear)
  - Writing the test data (clean and robust)
  - Writing the solutions (in all languages your contest will support)
  - Final authority on judging decisions during the contest
- Must be on site for the actual contest



# Key People

## *Problem Writers/Judges*

- These people assist the head judge in preparing the problem set:
  - Writing problem statements
  - Solving problems
  - Verifying I/O
- It helps if the judge staff do the problem writing, so they are familiar with each problem when judging
- The more folks involved the better the problem set can be and the better the continuity over the years



# Key People

## *Regional Systems Administrator*

- Especially critical for multi-site contests
- Responsibilities may include
  - Setting up PC<sup>2</sup> (or whatever contest software you are using)
  - Configuring team and judge computers
  - Performing a test contest
  - Preferably 2 weeks prior to contest date
  - Tests connectivity and software
  - Must be available for the actual contest
  - Overseeing system preparations at all contest sites. Don't forget that networking between sites can be a problem (firewalls, security, ...)



# Key People At Each Site

## *On-site Registrar*

- Often ACM club volunteer or faculty member
- Registers teams on site on contest day:
  - Prints and gives certificates, badges, t-shirts and information packets to each team
  - May or may not take fees – this is up to you as to when/if you require fees
  - Answers questions about schedule and locations





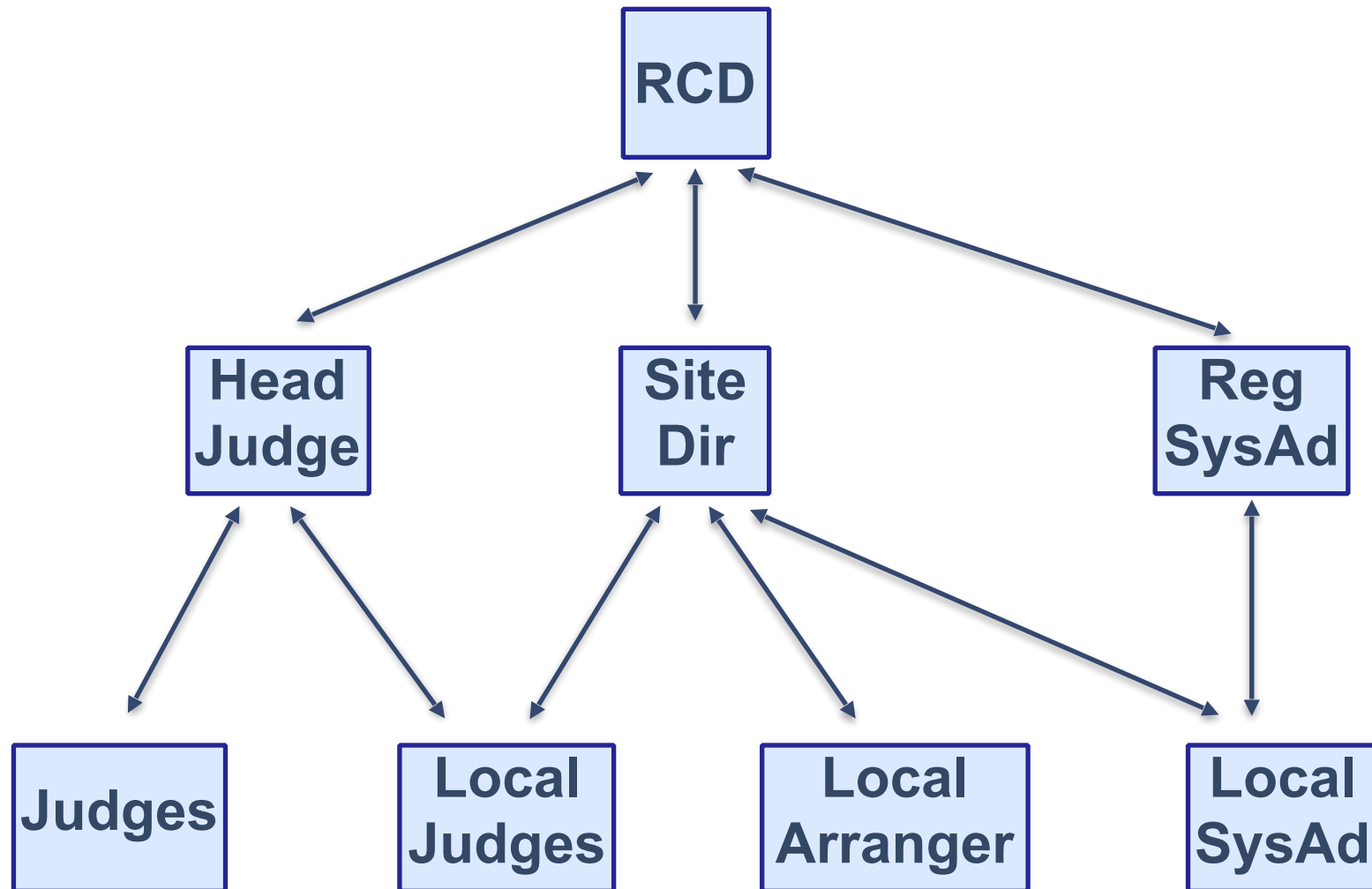
# Key People At Each Site

## *Local System Administrator*

- Communicates with Regional Systems Person
- Responsibilities include
  - Setting up contest system at the site
  - Being present for **test contest**
  - Being present at site on contest date (to help with any systems problems)
  - This person plays a key role as s/he may need interact with IT department at that site to get ports opened for testing and the day of the contest



# Communication Lines



# Other RCD Duties

## *Contest Registration*

- Coaches register teams on acm-icpc web site
- You (or someone) mark teams as approved/paid
- You determine registration costs and payment methods
  - You can require pre-pay, or accept payment on the day of the contest (this may be harder for multi-site contests)
  - You **must** provide receipts for payment
  - You may want to recruit a central registrar to handle all of the registration duties (marking teams approved, writing up receipts, mailing receipts, doing bank deposits, etc) – This should be someone you **trust!!**
  - You may need/want PayPal and/or credit card support so schools can pay online



# Other RCD Duties

## *Problem Set*

- **Goals** for the problem set:
  - 6-10+ problems
  - Every team should solve at least one problem\*
  - No team should solve all problems
  - Each problem should be solved by a team
- Each problem should have been solved by the problem writers in every language your contest allows (preferably by different people)
- The judge data and solution for each problem should be verified by more than one person
- ICPC wants your problems, I/O, and solutions after your contest is done, so be prepared to send those items their way (they post the problems online and students can solve those problems via the online judge)

***\*harder than you think!***



# Other RCD Duties

## *Test Contest*

- Used to find any problems: firewalls, software versions, etc. so you have time to correct them before the actual contest
- About 2-4 weeks before the contest
- “Mock contest”: submit problems, clarifications, judgments (you can use another regions problem set/data from a previous year)
- Each site should have at least 2 team machines (central judging site needs at least 2 judge machines)



# Other Issues

## *Fairness*

- Make sure all computers at all sites (including judges) have equivalent hardware (judge hardware can be better)
- For multi-site contests, if one site doesn't have room for all 3 team members at a machine, then you must decide whether all sites must limit access, as well.
- Equally unfair: It is often impossible to be fair. It is often possible to be equally unfair. Example: printing fails at one site, have all sites disable printing.



# Other Issues

## *Security*

- Physical security for problem set – both electronic and print (requires thought for distributed contest)
- Physically separate rooms for judges, systems, teams, coaches – no mingling!
- No electronics allowed (cell phones, scientific calculators, tablets, etc.)
- Staff Required: print runners, bathroom escorts/monitors, balloon runners (if used)
- Only balloon runners, print runners and systems personnel are allowed in contest room
- T-shirts or Badges – separate colors to identify, e.g.:
  - White – teams
  - Purple – coaches
  - Orange – staff
  - Blue – “special people”
- Personal rule: Do not do anything that can be perceived as cheating



# Other Issues

## *T-shirts*

- Need *\*at least\** 2 weeks time for t-shirt makers (don't forget about time to ship to location)
- Need shirts for teams, judges, systems team, other staff/volunteers
- Teams fill out sizes at the online site (though many teams don't, which is problematic: decide what the "default" size will be if none is provided)
- For multi-site contests, need to mail out t-shirt at least a week before the contest (OR have each site order own t-shirts, they can get shirt sizes from web site)
- Remember: t-shirts are your advertising, get extra





# Other Issues

## *Contest Web Site*

- Obviously, you should have a regional contest web site
- For multi-site contests, each local site should have a web site or a subsection of your site with information such as:
  - Directions
  - Parking
  - Hotels
  - Contest Day Itinerary
- All sites for the contest should contain an itinerary of events if at all possible



# Other Issues

## *Miscellaneous*

- Parking – should post info on local site web site and post signs for the contest
- Signage to help teams find the building/room where contest is
- Publicity for contest (TV, newspapers)
- Announcements of winners
- For multi-site contests, visit remote sites, if possible
  - Helps to know the people there
  - View contest areas to ensure suitability



# Other Issues

## *Future Attendance*

- Happy coaches and teams come back
- Food helps (if it is good)
- Gifts help
- Organization improves the experience
- Prizes to reward success help
- Having a schedule and sticking to it
- Consistency, make small changes from year to year
- Make the coaches welcome, make the students *believe* you are happy they are there



# Other Issues

## *Communication*

- You must talk with the coaches/teams (welcome, cover rules, problem discussion, awards, ...)
- Single site contests need a big room
- Multi-site contests need an electronic big room (not as easy as it sounds)
- Plan a short session between practice and contest to clarify rules and procedures
- Plan to have the judges discuss the problem set and data at the close of the contest
- Have printed copies of results for teams to leave with



# Other Issues

## *Prizes*

- Obviously the winner gets a prize
- Maybe top 5 or top 10 do
- Certificates only may be adequate for 6-10
- Plaques can be inexpensive and rewarding
- Extra prize(s) for categories
  - Best in state
  - Best without a graduate program
  - First to solve each problem
  - Last to solve problem (promote working to last minute)
  - Site prizes



# Budget

- Start up a checking account
  - Allows you to keep track of paid registrations
  - Allows you to keep track of expenses
  - if you use a school account, you may have trouble/restrictions spending money on some items
- Registration fees are added to the IBM funding to cover entire cost of contest.
  - Keep as low as possible, but make sure you can pay for everything you want at your contest
  - Some regions allow each site to determine the registration fee
- Budget must include travel expenses for attending next year's ICPC (leave some extra to plan for unexpected costs)



# Budget

- For multi-site contests, decide how much to allocate to the sites – based on the number of teams
- Plan on paying for travel (hotel, food) for the head judge and judge team. It is important that they are on site.
- Consider a small reward for head systems
- Rental costs (rooms, tables, chairs, equipment)
- Consider funding a post contest celebration for staff/judges to reward them for their hard work



# Budget

## Other Expenses (they add up!)

- Printing costs
- Shipping costs
- Food/drink
- Balloons/helium/ribbon/scissors
- Rentals
- T-shirts
- Prizes/gifts
- Travel
  - To contest site
  - To next RCD Symposium (If you can not make it to the next RCD Symposium, please send a representative in your place)





# Income

- You will receive a check from IBM. It will be an amount times the number of teams that participated in your regional last year.
- You may charge an admission fee (rather than a late fee, have a discounted early registration fee and a normal fee — some schools cannot pay late fees).
- You may have additional sponsors. Remember IBM is the primary sponsor. Anyone else is a secondary sponsor. Their name and log may not be displayed more prominently (and should be at least slightly less) than IBM's name/logo.



# Sample Schedule (Single Day)

- **8:00 – 9:00** – registration (give out badges, t-shirts, etc.).
- **9:00 – 10:00** – Orientation/rules briefing
- **10:00-11:00** – Practice contest (this is a practice for judges and systems, too!)
- **11:00-12:00** – De-briefing, Q&A, systems-reset (clear all computers)
- **12:00-5:00** – Actual contest (lunch served during contest)
- **6:00** – Awards party (banquet/pizza)



# Sample Schedule (Multi-day)

- **Friday:**

4:30 p.m. – 7:00 p.m. – Registration

7:00 p.m. – 8:30 p.m. – Practice contest

8:30 p.m. – 10:00 p.m. – Pizza Party and Q&A

- **Saturday:**

6:30 a.m. – 9:00 a.m. – Breakfast

9:00 a.m. - 10:00 a.m. – Line-up for contest

10:00 a.m. - 3:00 p.m. – Actual contest (lunch served during contest)

4:00 p.m. – Dinner Banquet and Awards



# Questions

