How we set up contest environments

Kentaro Imajo (M2, Kyoto University)

@imos
http://imoz.jp/

Self-introduction

- SuperCon 2006 1st, IOI 2006 Bronze, ICPC World Finals 2012
- JOI tutor from 2007 to present
  - Built a judging system
- We established AtCoder

Outline

- Onsite Contest: JOI
- Online Contest: AtCoder
- Wireless networks on events
- Conclusions

Chapter 1
Onsite Contest: JOI

What is JOI

JOI (Japanese Olympiad in Informatics) holds contests to send delegates to IOI (International Olympiad in Informatics).

Financially, it stopped between 1998 and 2004, but resumed in 2005.

Contributions to ICPC

Most of participants took part in ICPC, and they achieved good results.

5 of 12 alumni participated the ICPC World Finals.

Elimination Process

First Round
- Online, 1 day
- 729 contestants (Dec., 2011)

Second Round
- Onsite, 1 day
- 61 contestants (Feb., 2012)

Final Round
- Onsite, 4 days
- 22 contestants (Mar., 2012)

Onsite Contest

Each of 61 contestants uses a computer in the last second round contest.

Problems

- # of contestants is over 60.
- Network prep is costly & troublesome.
- Computer environments are also.

Solution

- Wireless networks by AirPort Extreme,
  - it is inexpensive, 15,400 yen,
  - it can hold up to 50 users officially.
- Virtual machines by VMware player,
  - it is free and stable,
  - it can behave similarly.

Chapter 1
Online Contest: AtCoder

What is AtCoder

A new company to hold contests.

Contests
- AtCoder Regular Contest #001〜#009
- 天下一プログラマーコンテスト 2012
- Asia Pacific Olympiad in Informatics
- UTPC, KUPC, WUPC, IJPC, …

Problems

- # of contestants is about 400
- Rush in the beginning
  - Long connection from foreigners
- # of submissions is about 3000
  - It takes over 10 hour CPU time.

Solutions

- Nginx, Varnish
- Short-time cache
- Distributed judge servers
  - Amazon EC2

Chapter 3
Wireless Network

Case: MLSS

In Machine Learning Summer School there are 300+ participants.

2 AirPort Extreme served 140 people. Backbone was WiMAX and e-mobile LTE.

Case: ICPC-JAG Osaka

There are 7 teams.

It was also held in Tokyo simultaneously.

Contest system was AtCoder.

Backbone was WiMAX.

Final Chapter
Conclusions

Conclusions

We can hold onsite contests:

- with 200+ contestants,

- without wired network,

- without Broadband Internet access
  - with broadband mobile.

We can hold online contests:

- with 1000+ contestants.