Starting with MOSIX

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What is MOSIX?

MOSIX= **M**ulticomputer **OS** for UN**IX**

- software for supporting scalable cluster computing
- processes migrate between nodes
- balance the CPU load
- run a process on a node with more RAM
- fully transparent execution location

Our Cluster Setup

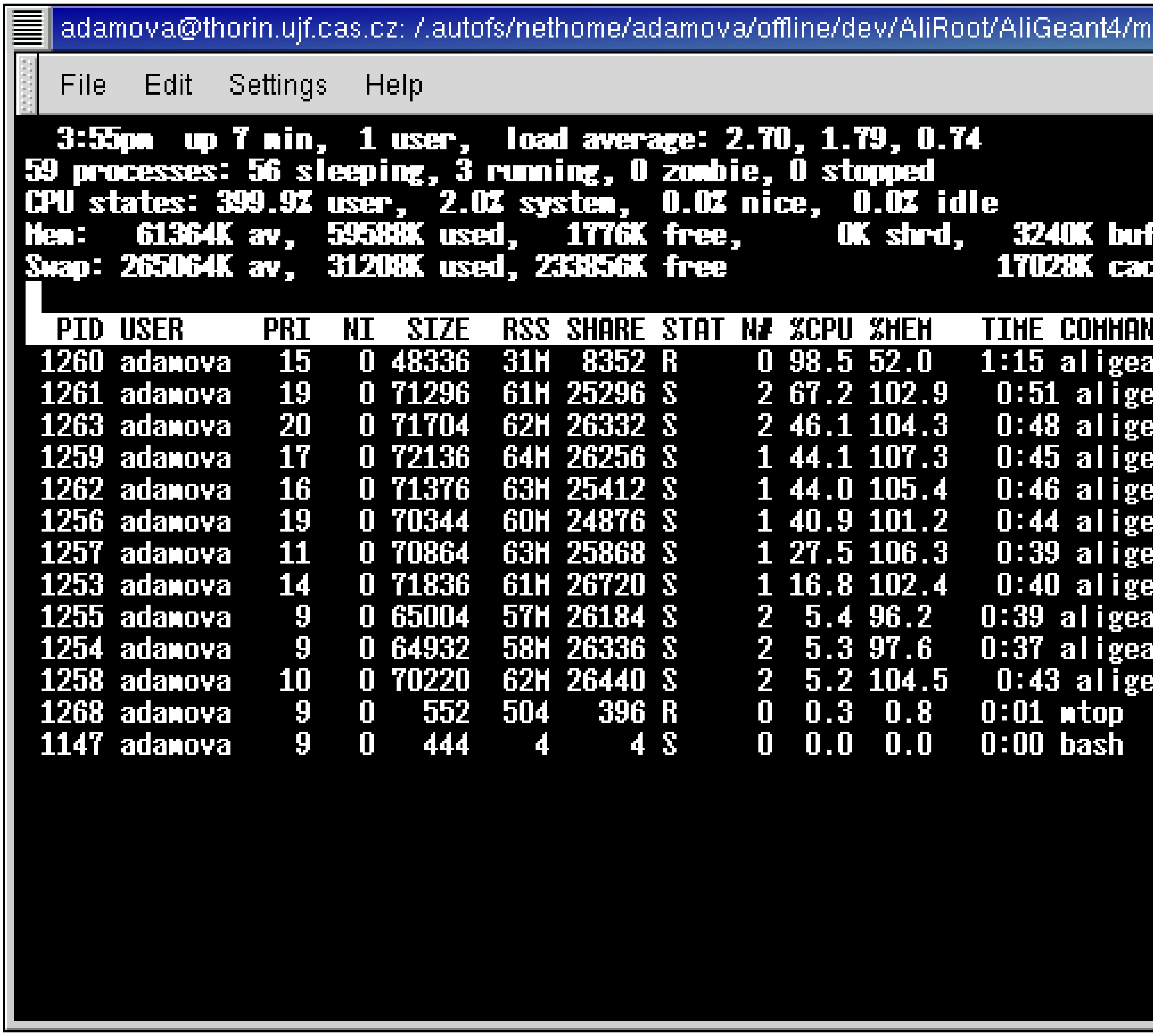
- 10 Linux PC

- 4 with Mosix 130 kernel 2.4.9

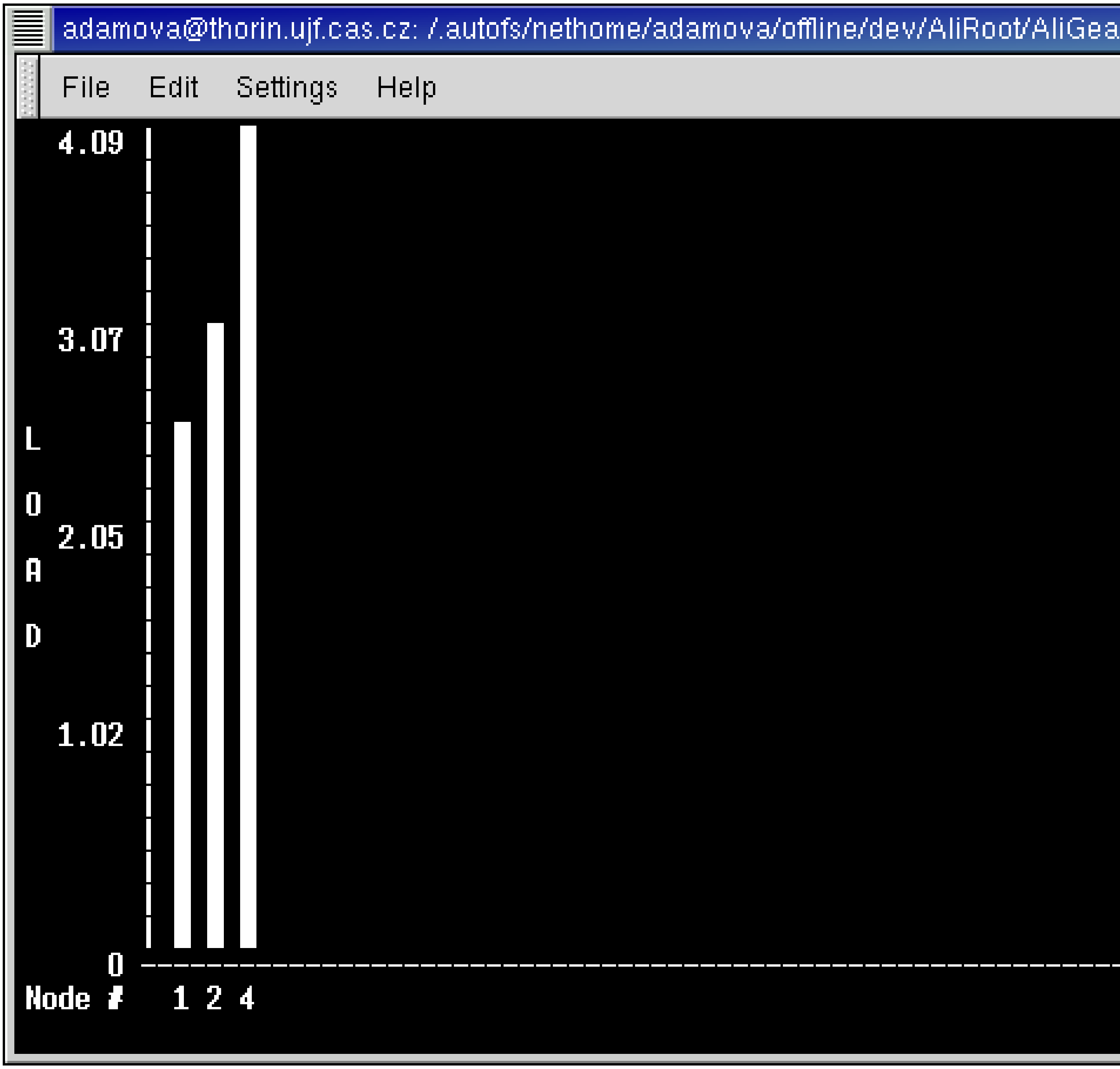
Configuration

node	CPU[MHz]	OS	RAM[MB]	HD[GB]
1	2x PIII 933	RedHat 7.1	512	9+8+82
2	2x PIII 800	RedHat 7.1	512	6+82
3	Celeron 433	RedHat 7.0	128	2+16+1
4	PII 300	RedHat 7.1	64	4+13+1

Screenshot of mtop



Screenshot of MOSIX monitor



Typical test run

11 AliRoot (v3-06-Rev-02) simulations submitted

1. to node 1 without Mosix migration

2. to node 1 with Mosix migration

3. to node 4 with Mosix migration

adamova@li1.ujf.cas.cz: /nethome/adamova/MOSIX_TESTS

File Edit Settings Help

```
[adamova@li1 MOSIX_TESTS]$ more 11PerformanceComparison

*************************************************************************************
                Performance comparison without/with MOSIX
*************************************************************************************

Process #        without M       with M /1       nmigs   with M /4       nmigs
--------------------------------------------------------------------------------------
  1              5:43            3:47            3       4:02            34
--------------------------------------------------------------------------------------
  2              6:02            3:05            1       3:25            4
--------------------------------------------------------------------------------------
  3              6:24            3:54            1       5:22            12
--------------------------------------------------------------------------------------
  4              6:26            3:02            1       3:18            12

--------------------------------------------------------------------------------------
  5              6:38            3:45            3       3:55            10
--------------------------------------------------------------------------------------
  6              6:56            3:04            1       3:58            5
--------------------------------------------------------------------------------------
  7              3:17            3:54            5       2:27            1
--------------------------------------------------------------------------------------
  8              7:17            3:03            3       5:16            9
--------------------------------------------------------------------------------------
  9              7:18            3:55            3       3:55            4
--------------------------------------------------------------------------------------
  10             7:20            3:46            3       2:29            6
--------------------------------------------------------------------------------------
  11             7:21            3:53            2       3:27            4
--------------------------------------------------------------------------------------
**********************************************************************
*********************************************************************
[adamova@li1 MOSIX_TESTS]$
```

MOSIX vs CONDOR

- Nodes are their own server/client
- Scalability ... nodes can be added/withdrawn at any time
- Decentralised control makes it more robust against failure
- When migration is carried out :
  Memory to memory process transfer
  (MOSIX)
  instead of complete state of process written
  to disk (CONDOR)

Motivation

- There is a starting project at the Institute Of Physics AS CZ in Prague to build the PC farm of 64 nodes which will be a candidate for Tier2 for D0, ATLAS, ALICE experiments

- With their existing cluster they are already active in testbed for D0 distributed computing model.

- As a part of this project the MOSIX is planned to be installed/tested

Conclusions and Outlook

- First experience (with 4 PC minifarm) good
- Immediate next step: install MOSIX on the other PCs in our cluster
- Get involved in the Tier 2 project of the IOP in Prague : install/test MOSIX at the PC farm
- Grant application to extend our Linux cluster
- Support large scale (Ali)Root simulations/data analysis