MONARC Simulation Single Day Activities Model

Revised values of parameters

(event object sizes and event filter rate)

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MONARC 1999 simulation

Configuration:

- **one TIER0 - CERN**
  600 nodes, 500 SI95 CPU each
- **four TIER1**
  200 nodes, 500 SI95 CPU each
- **one TIER2**
  20 nodes, 500 SI95 CPU each
- **Internet connection - 30 MB/sec**

Changes:

- More events to process, bigger events

Changes from 1999

Item	1999	2000
RAW size	1 MB	2 MB
ESD size	0.1 MB	0.5 MB
AOD size	0.01 MB	0.01 MB
TAG size	0.001 MB	0.002 MB
# of RAW	1×10^9	2.7×10^9
# of ESD	1×10^9	1.55×10^9
# of AOD	1×10^9	1.55×10^9
# of TAG	1×10^9	1.55×10^9
Proc. time RAW	250 SI95*ms	640 SI95*ms
Proc. Time ESD	25 SI95*ms	25 SI95*ms
Proc. Time AOD	2.5 SI95*ms	2.5 SI95*ms
Analyze TAG	0.25 SI95*ms	0.25 SI95*ms

Need to scale up the system:

CPU and internet bandwidth

MONARC 2001

Configuration:

- **one TIER0 - CERN**

  900 nodes, 500 SI95 CPU each
- **four TIER1**

  300 nodes, 500 SI95 CPU each
- **one TIER2**

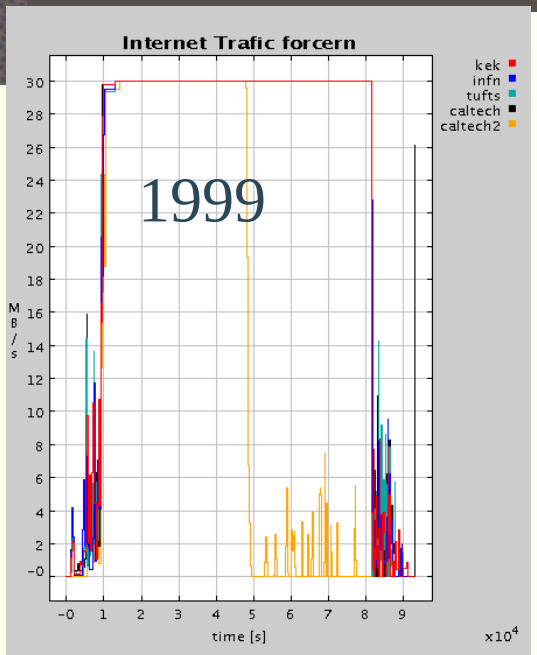
  30 nodes, 500 SI95 CPU each

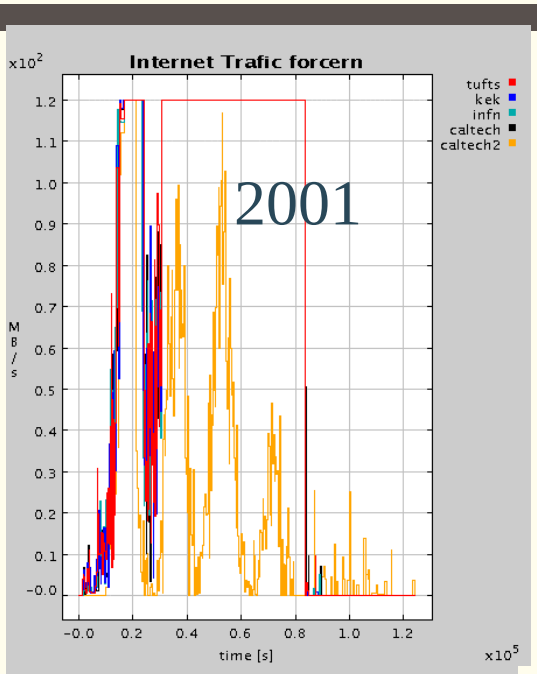
- **Internet connection - 120 MB/sec**

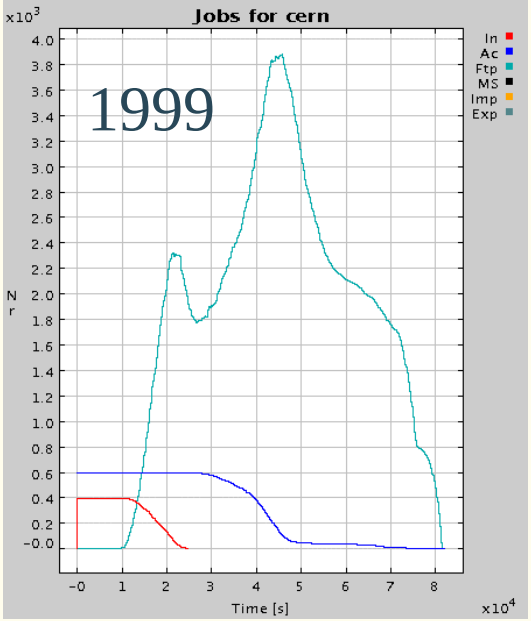
- Very fast access Data Base (no limitation)

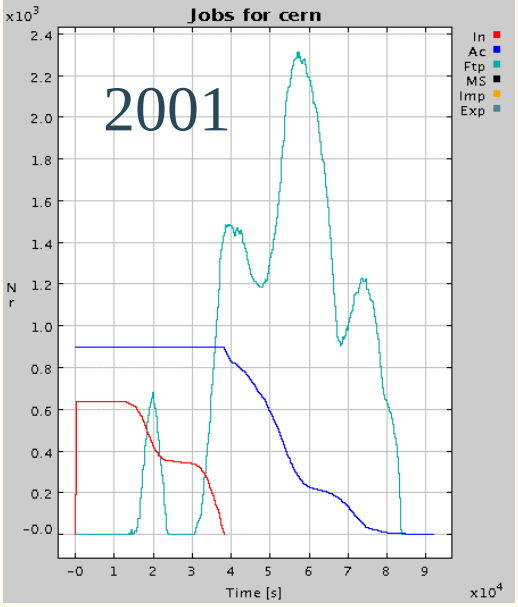
Significant increase of a disk space and internet bandwidth.

1999 vs 2001 - TIER0



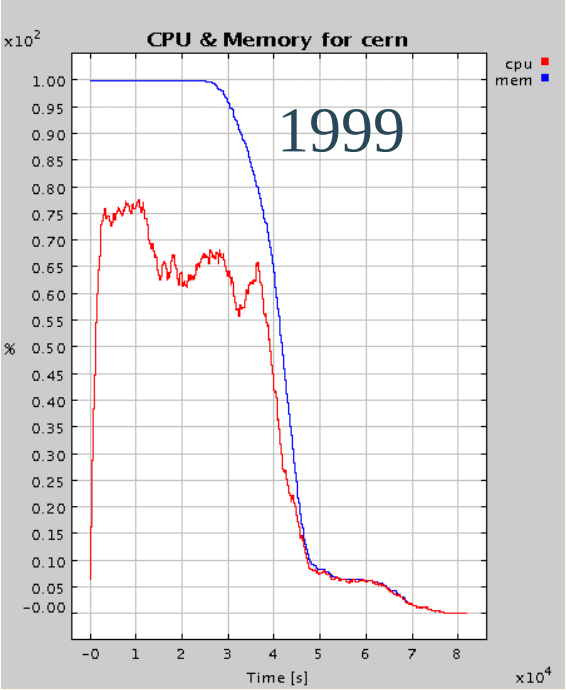


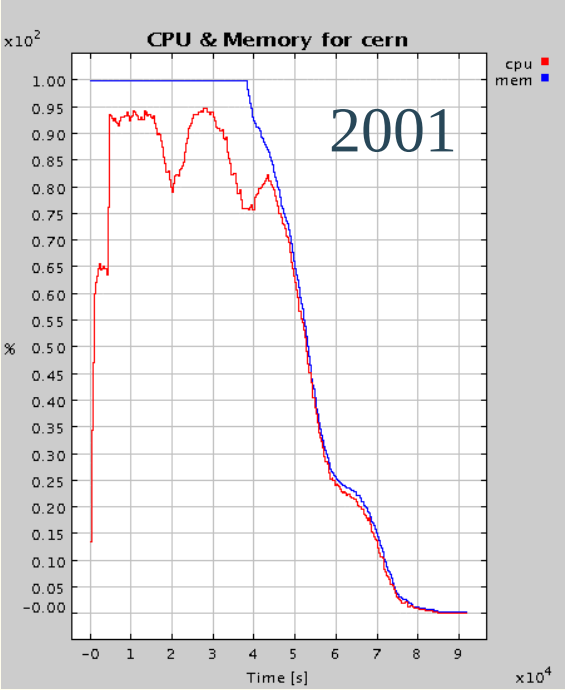




- Time – about 24 h
- Limited by internet connection

1999 vs 2001 - TIER0

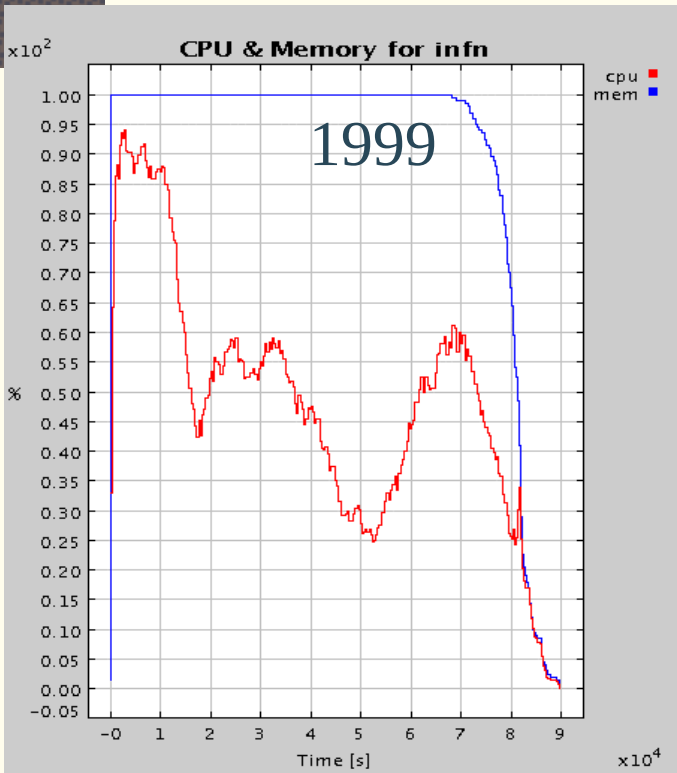


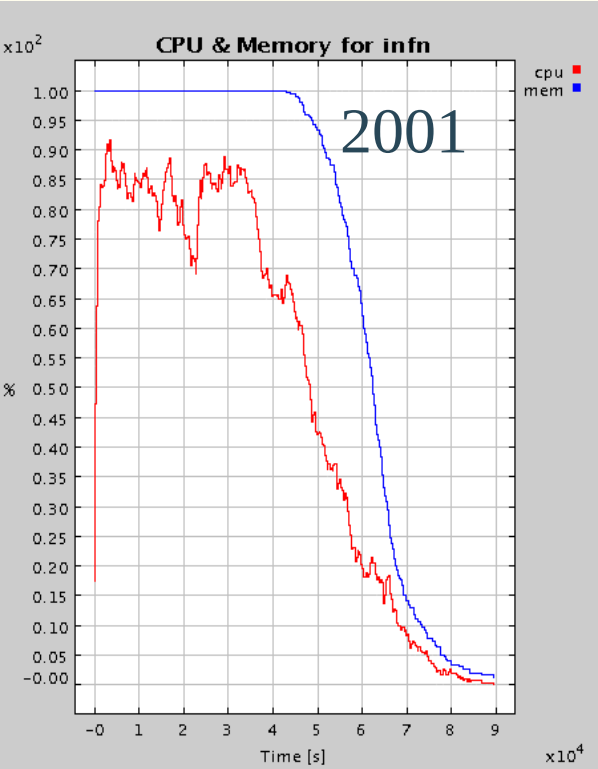


TIER0

- CPU not used in 100%. Limits due to:
  - Data Base access
  - Internet bandwidth

1999 vs 2001 TIER1

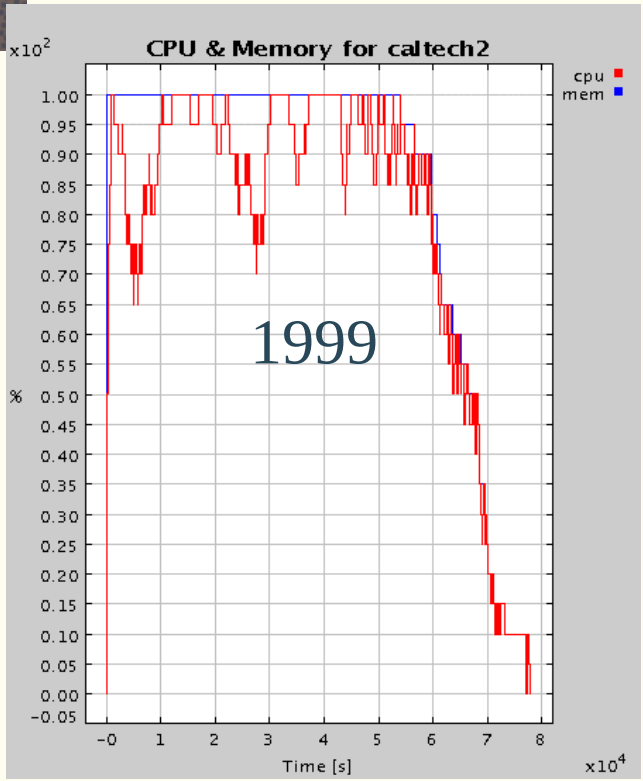


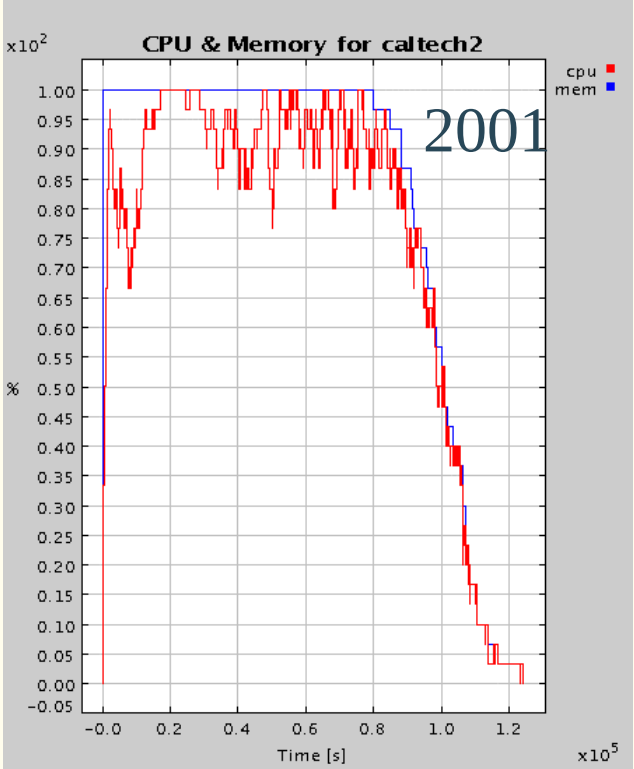


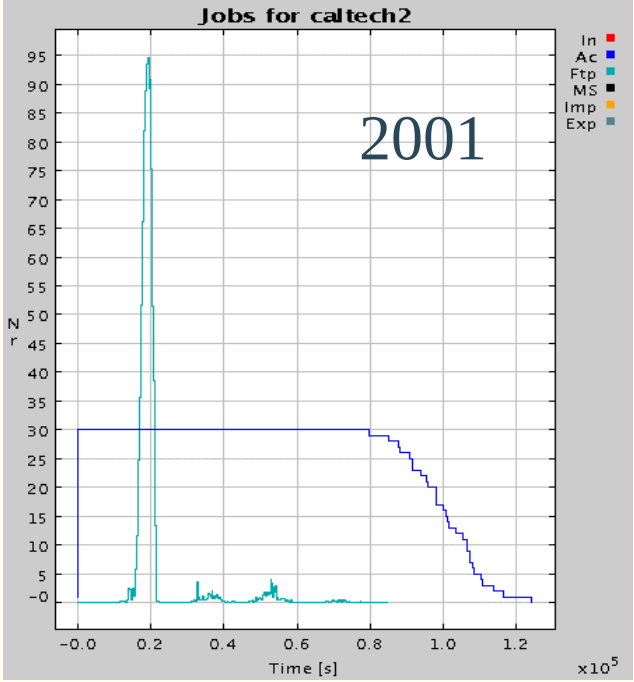
TIER1

- limited by local CPU and internet bandwidth
- 1999 simulation - limited as well by the Data Base access

1999 vs 2001 TIER2







TIER2

- limited by local CPU

Conclusions

- To fulfill 2001 requirements:
  - internet bandwidth increased from 30 MB/sec up to 120 MB/sec
  - CPU and disk space in every center scaled according to the increased number and size of events (1.5 * CPU)

Things to be done

- Test the impact of finite data base access speed on the total processing time

- **Replace the fast disk data base by the one with tapes and a cache disks**