

# Self adjusted auto provision system at resource level

Weekly report 15<sup>th</sup> April

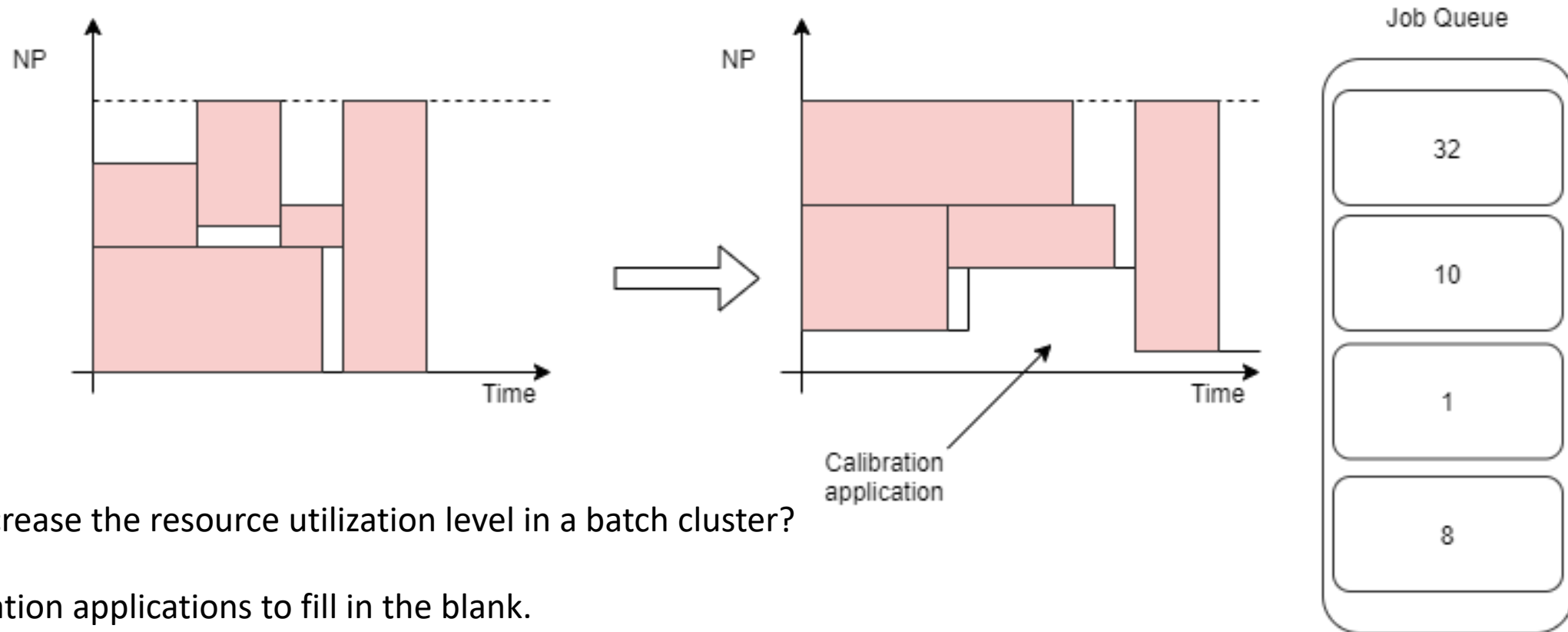
You Hu

# Recap – Background & Requirements

Cloud provider	LOFAR
large scale of resources resource utilization pricing promised availability	
resource allocation resource provision resource adoption	cloud provider(CEP3/4) cloud consumer multiple sites computation&data intensive deadline non sensitive batch jobs
cloud consumer	
price QoS	
price-QoS trade off auto scaling mechanism assume unlimited resource	schedule algorithms parallel computing data storage

It is close to the case of private cloud

# Recap – issue and research question

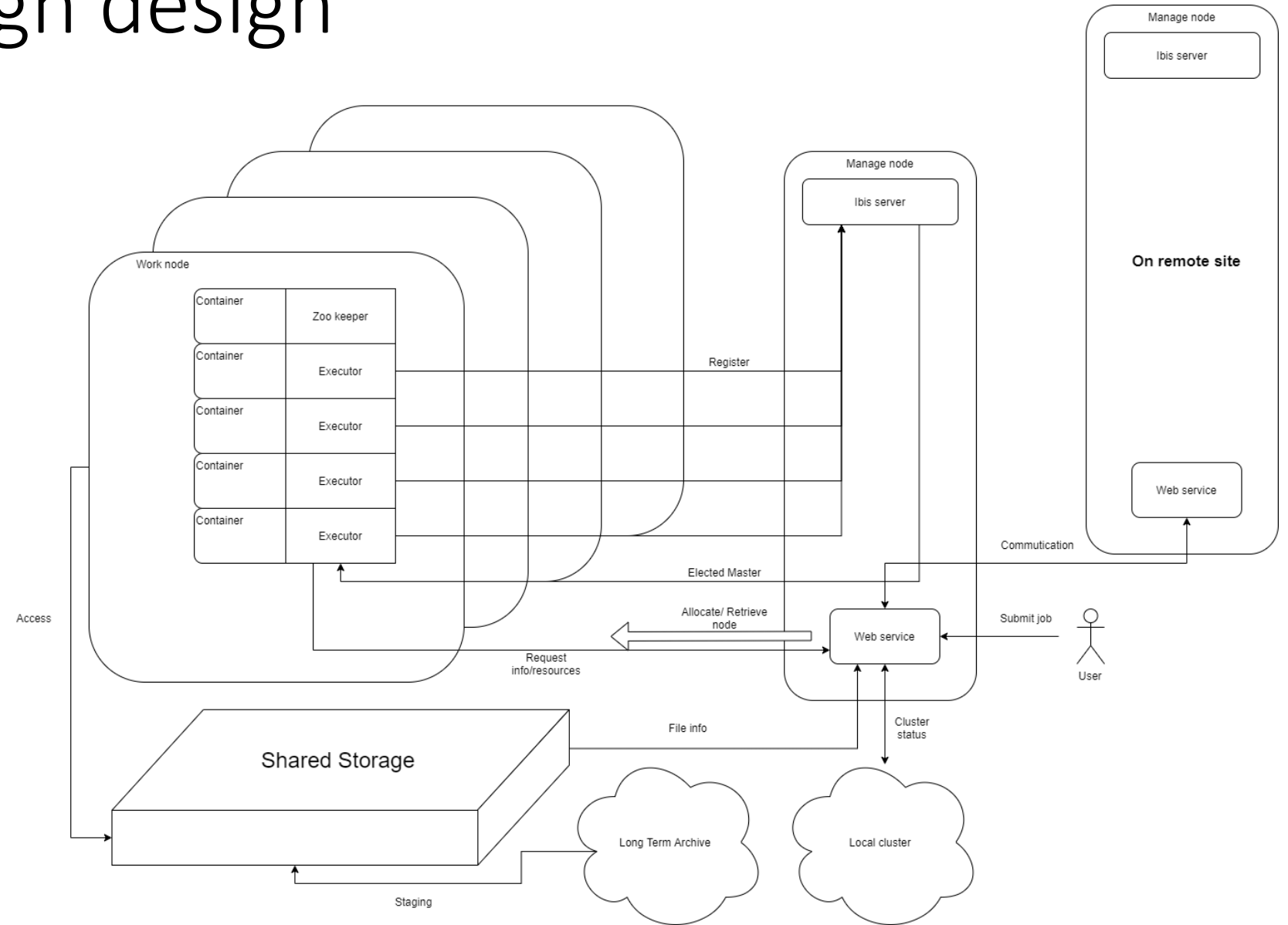


How to increase the resource utilization level in a batch cluster?

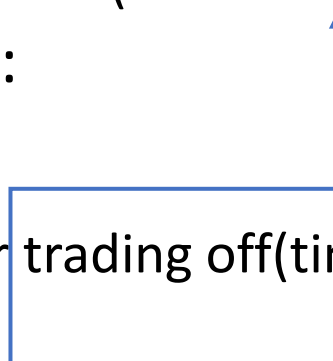
Use calibration applications to fill in the blank.

It requires: auto scaling/provisioning;

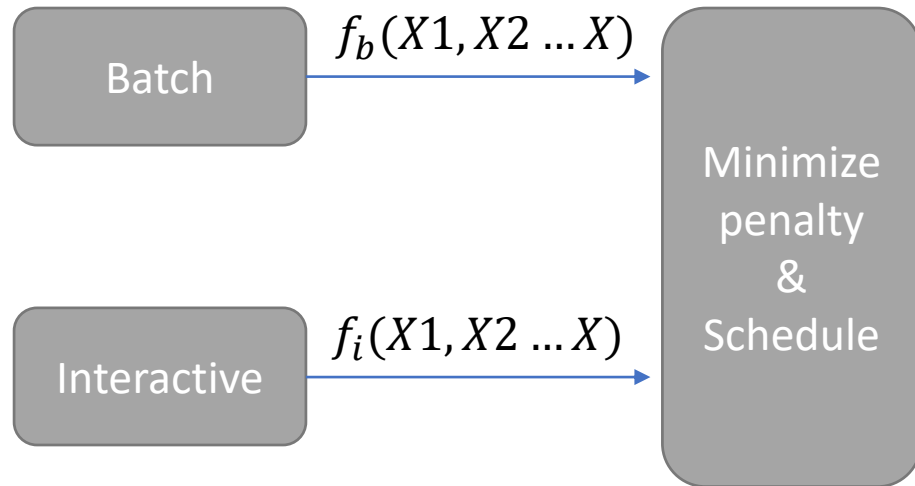
# Recap – Rough design



# Questions statement

- Distributed algorithm/architecture: Master – worker
    - Communication: IPL -> Ibis server(s-for backup)
  - Resource management algo:
    - Estimate job execution time
    - Schedule->SLURM+Xenon
    - Dynamic adjust: a metrics for trading off(time to start and shut down nodes)
  - Fault tolerance
    - Node manage: master->re-election; worker->task persistence
    - Tasks(NO snapshot): Zookeeper/Redis/any lightweight distributed database
  - Data locality: move comp rather than move data
    - Remote sites
    - Shared storage
    - Data aware(?)
- 

# Existed research



The penalty calculation is based on SLA

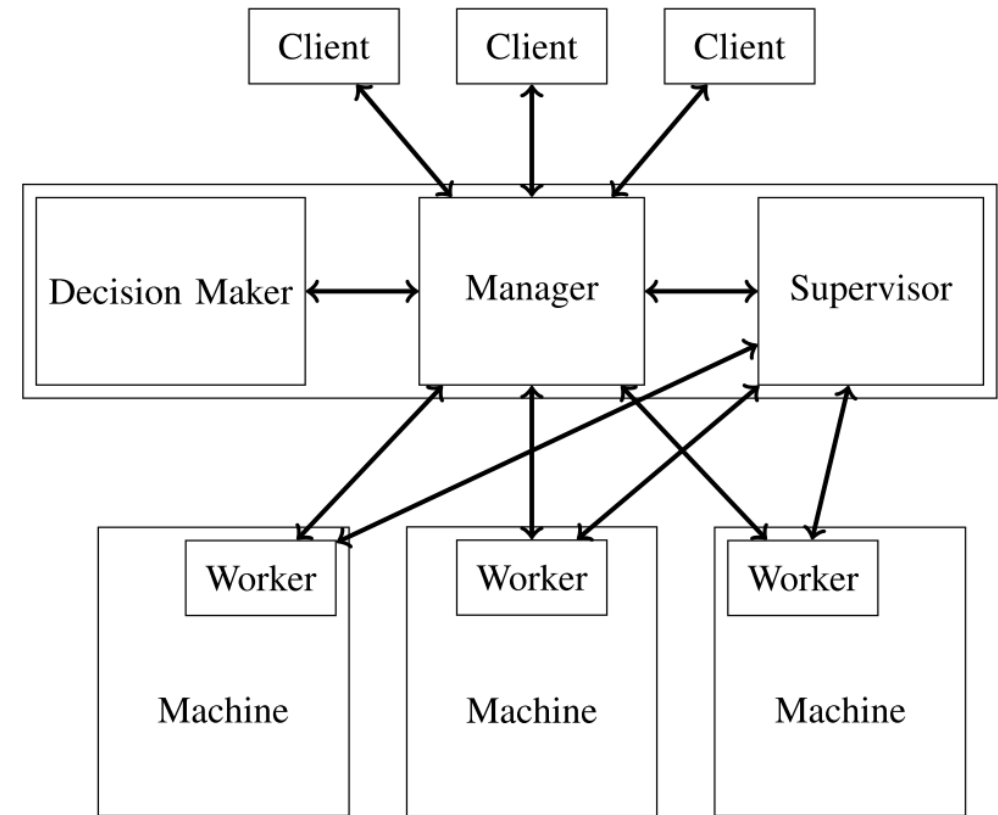
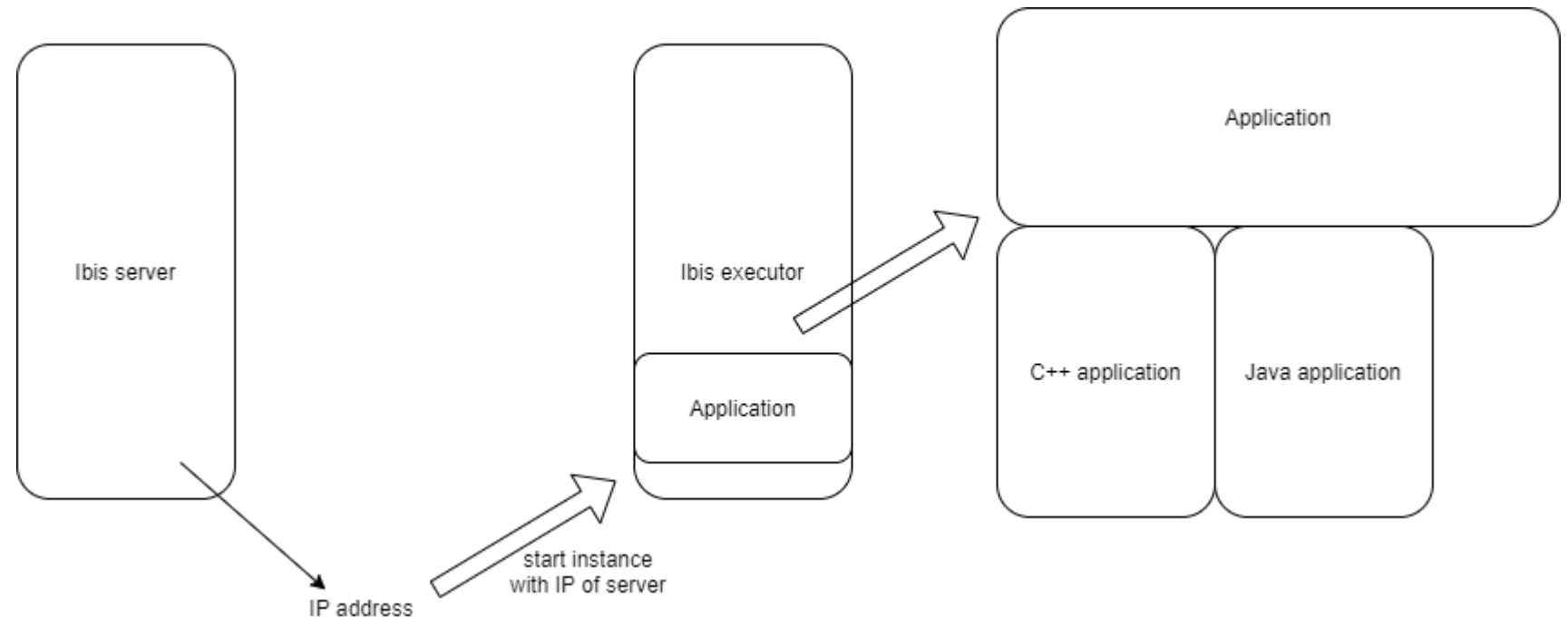


Fig. 1: System Architecture

Chang, T. W., Lin, C. C., Liu, P., Wu, J. J., Shih, C. C., & Huang, C. W. (2016). Resource provision for batch and interactive workloads in data centers.

# Current experiment – Ibis + JNI + container

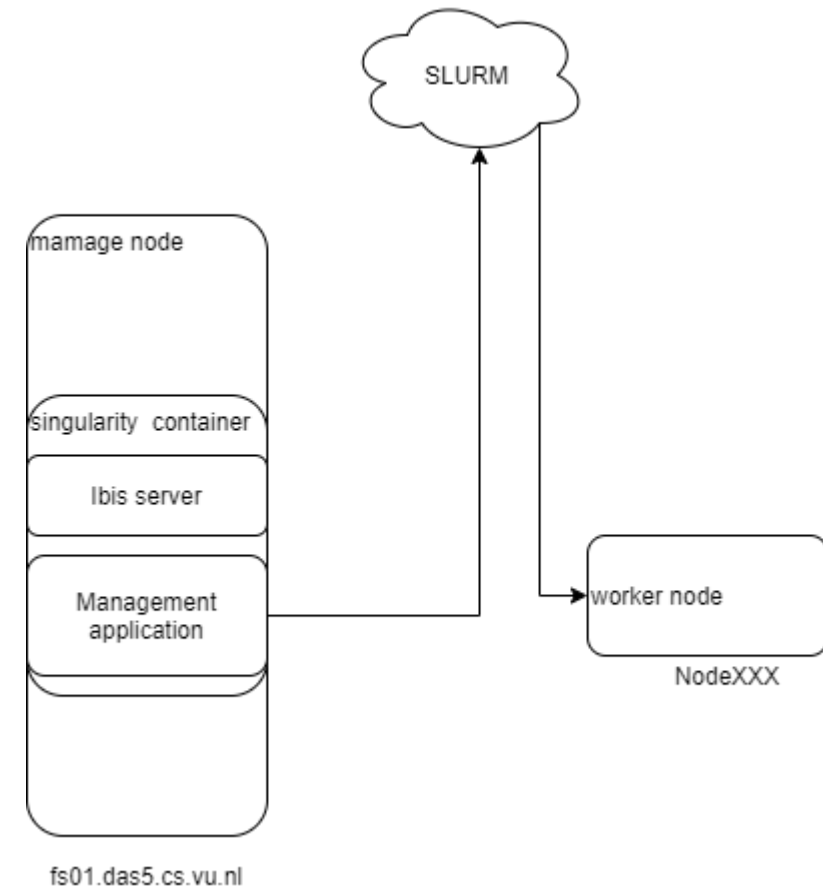


The JAVA and C++ applications have been compiled when the images of executor built(by Gradle)

# Current experiment – Xenon + SLURM

Problems:

- No container now: port mapping(where is ibis server?)
- Can not connect head node: × location = "ssh://localhost"





# Other topics

- Remarks on the design
- Ibis and Xenon, how to excavate the potential of them on this application
- Schedule management of SLURM
- Next phases
  - Literature study
  - Experiments