NSF/IUCRC CAC PROJECT

MONITORING, VISUALIZING, AND PREDICTING HEALTH STATUS OF HPC CENTERS

Jie Li
Doctoral Student, TTU
01/31/2020

Advisors:
Mr. Jon Hass, SW Architect, Dell Inc.
Dr. Alan Sill, Managing Director, HPCC, TTU
Dr. Yong Chen, Associate Professor, CS Dept, TTU
Dr. Tommy Dang, Assistant Professor, CS Dept, TTU

PROFILING WITH INFLUXDB

Cluster Hardware

Client | Controller | Database | Computing Nodes | Computing Nodes | … | Computing Nodes

Daemons

slurmctld | slurmdbd | slurmd | slurmd | … | slurmd

Commands & Processes

srun, salloc, sbatch | sstat, scontrol, sacct | slurmstepd | slurmstepd | … | slurmstepd

Jobacct_gather Threads

jobacct | jobacct | … | jobacct

Acct_gather_Energy IPMI Threads

ipmi | ipmi | … | ipmi

Acct_gather_Profile Threads

profile | profile | … | profile

Buffer | Buffer | … | Buffer

Influx DB

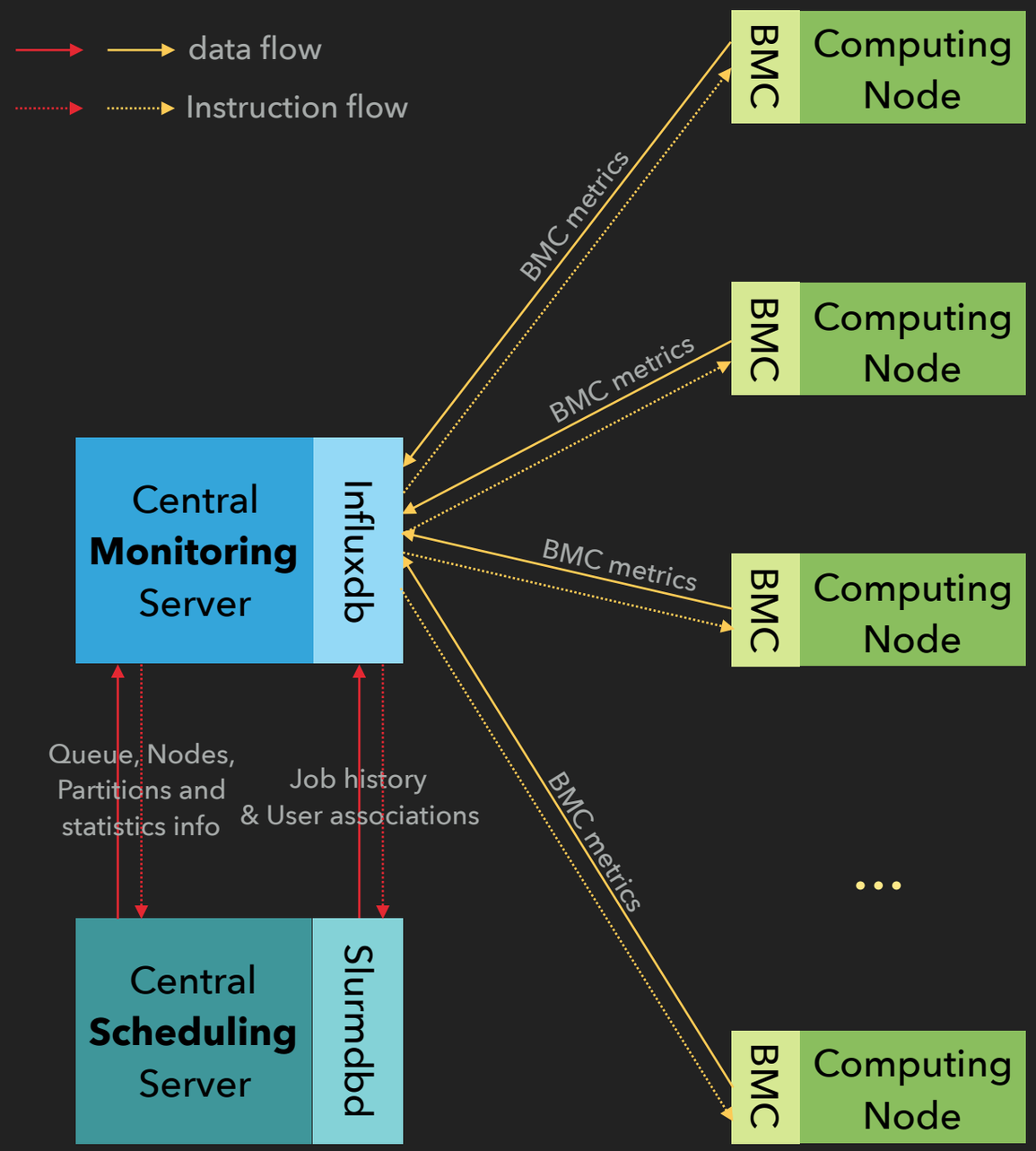
Ref:https://slurm.schedmd.com/acct_gather.conf.html

PROFILING WITH INFLUXDB

- 3 new parameters added to the acct_gather.conf file
  - ProfileInfluxDBHost: the host where to send the data to
  - ProfileInfluxDBDatabase: the database in influx where to store the data
  - ProfileInfluxDBDefault: Default profiling level
- A small 16KB buffer is used to aggregate some data before sending
- The influx line protocol is used to send the data
  - Metric,(TAGS) value=VALUE (TIMESTAMP)
  - CPUTime job=24,step=1,task=2,host=node001 value=99 1460713153
- Information is sent through curl to the Influxdb server

Ref:https://slurm.schedmd.com/acct_gather.conf.html; https://slurm.schedmd.com/SLUG16/monitoring_influxdb_slug.pdf

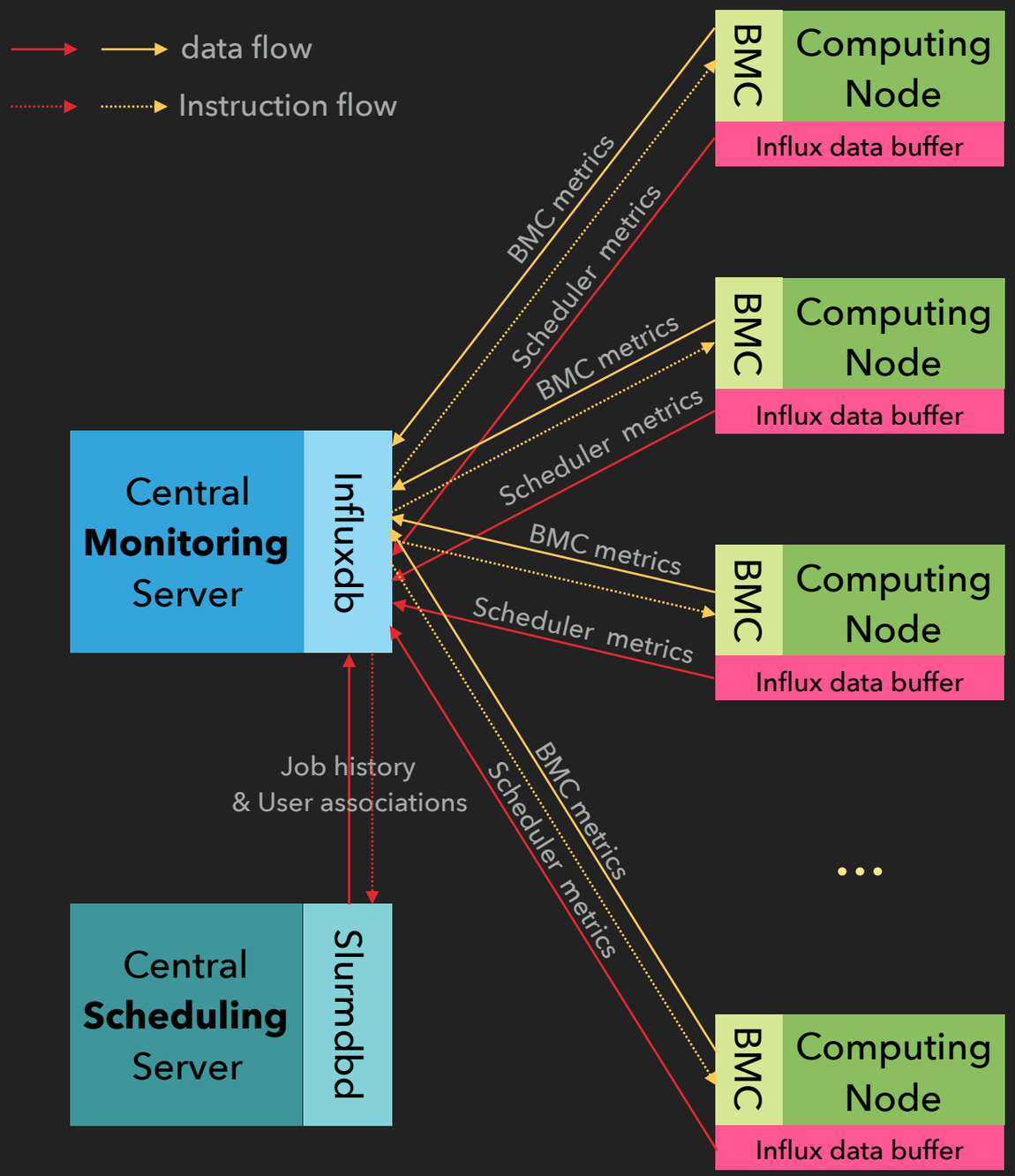
MONITORING MODEL



Pull+Pull model

- Pulling BMC metrics through Redfish API
- Pulling Job history & User associations through queuing Slurm accounting database
- Pulling Queue, Nodes, Partitions and Status info through Slurm CLI

MONITORING MODEL



Pull+Push model

- Pulling BMC metrics through Redfish API
- Pulling Job history & User associations through queuing Slurm accounting database
- Queue, Nodes, Partitions and Status info are pushed periodically to Influxdb

QUESTIONS?/COMMENTS?