Control-theory based Cluster Optimization
(Modeling and Control)

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May 20, 2020

Introduction

Background

- Objectives:
  - maximize the utilization of idle cluster resources by *best-effort* jobs
  - Avoid overloading the cluster
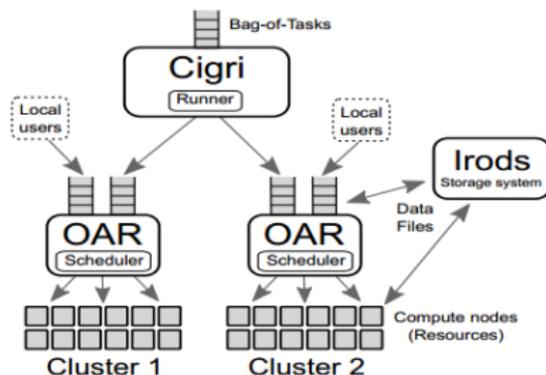- Strategy:
  - control-theory based automation

Figure: 1. System global architecture.

Activities

Series of control laws used in our experiments have proved to be significant in increasing cluster utilization while avoid overloading the file server due to **best-effort** *writing* activity

- Previous work:
  - uses *PI* controller to maximising utilization
  - uses *MPC* controller to achieve optimal trade-off between maximising utilization and preventing file server overload.
- Current work:
  - model refinement
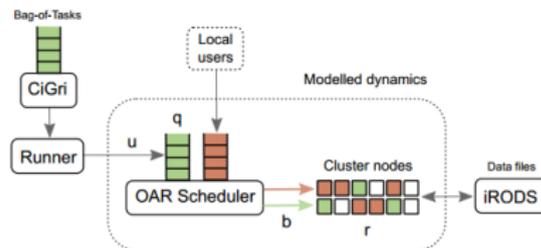 - dynamic multi-cluster overload control

Figure: 2. Sigle cluster.

THANK YOU