Cloud Computing Service Setup, Data Storage and Cost Management for Water Resources Modeling Studies

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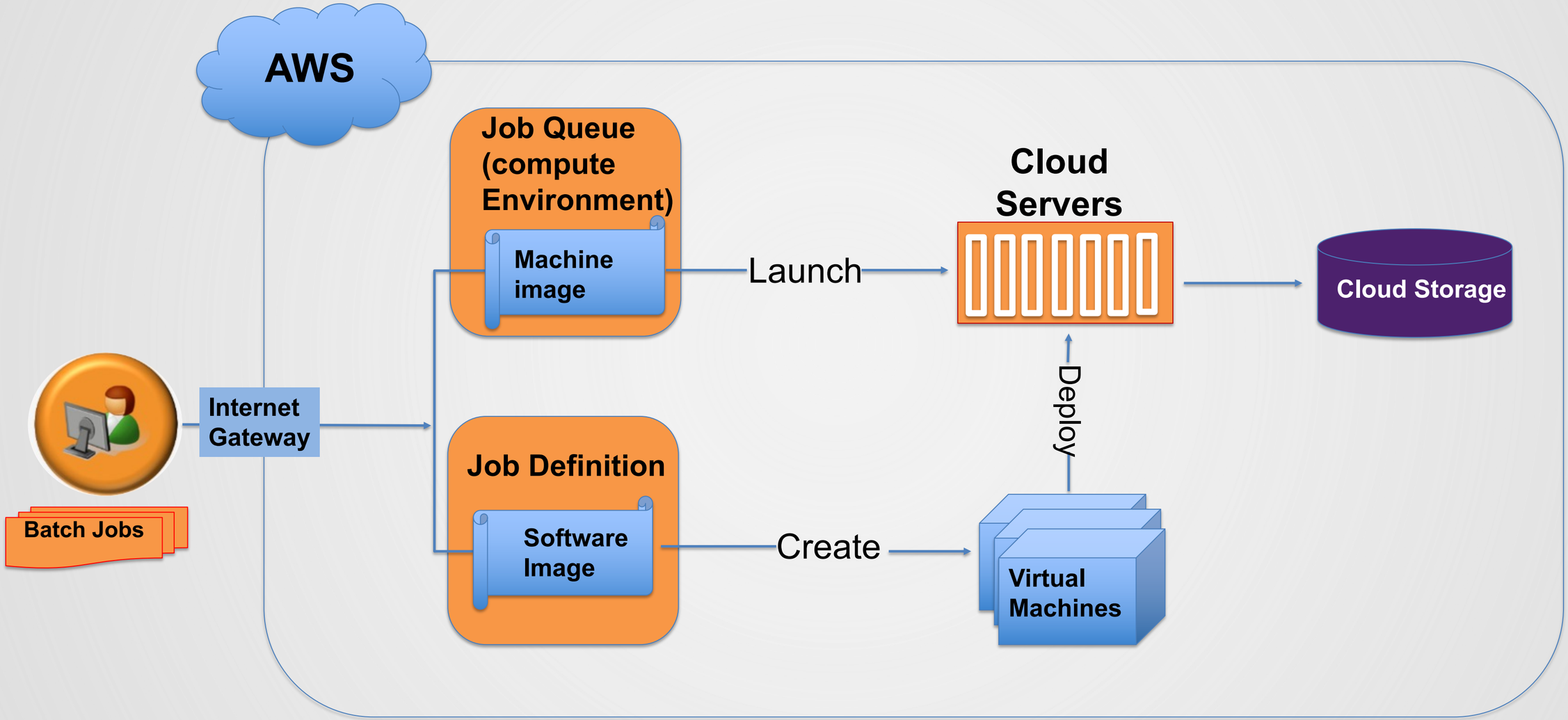
Why Cloud Computing

- ✓ Flexible and scalable
- ✓ Reliable
- ✓ Efficient
- ✓ Easy to use
- ✓ Cost effective

Running ECO-PTM on Office PCs

- **Hardware**:
- **Software**: install special software on every PC
- **Cost**:
  - IT staff to maintain the software used to connect computers
  - Need engineers to take care of failed runs
- **Computing power**: difficult to run too many simulations

How Cloud Computing Work



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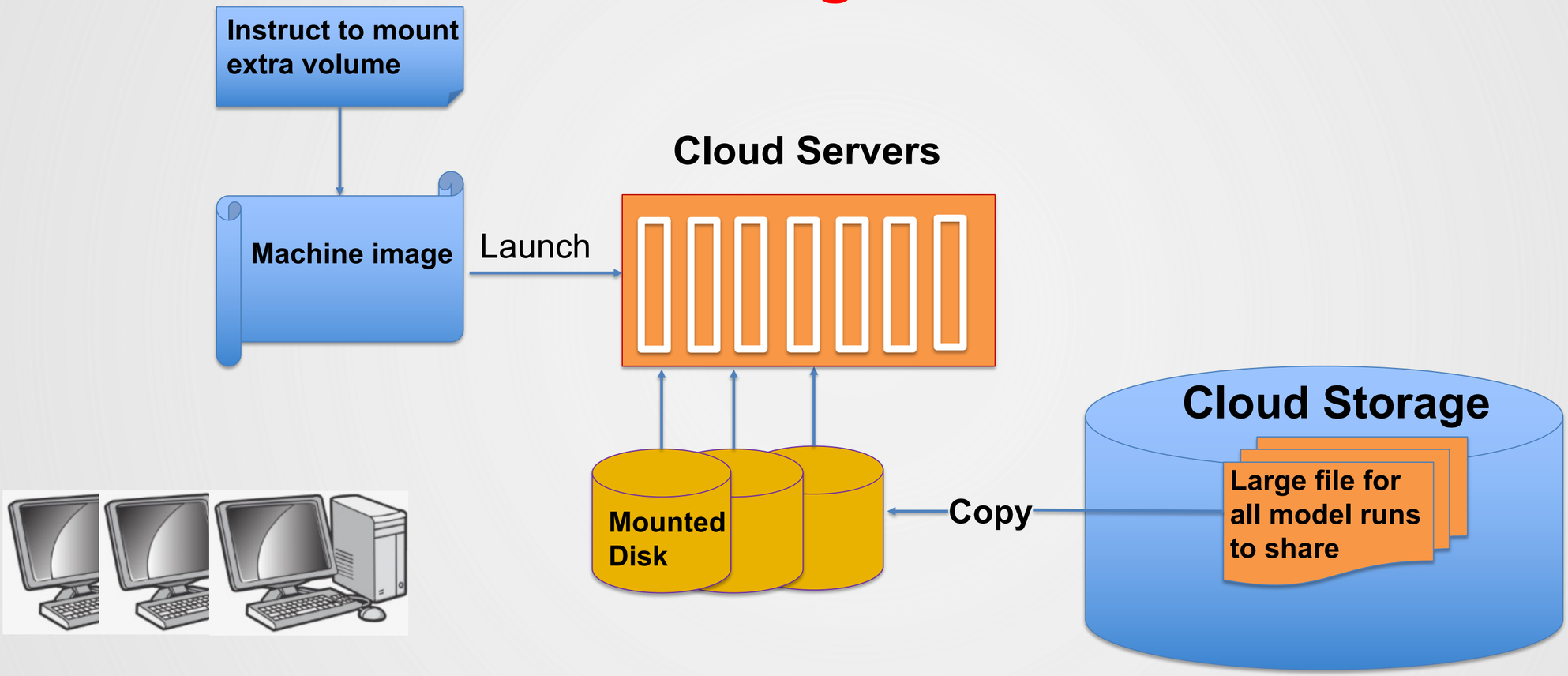
Hardware: Customize Machine Image

Can configure hardware - Flexible!



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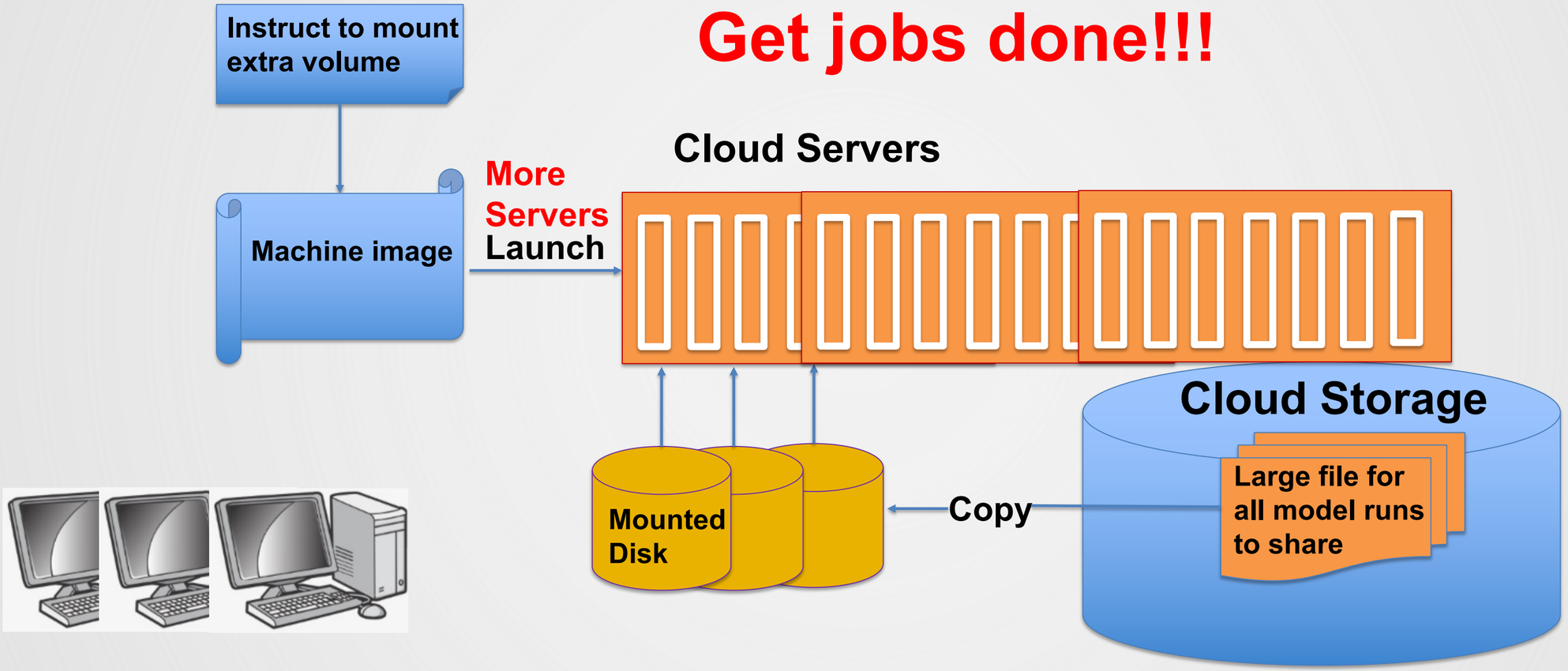
Hardware: Increase Computing Power

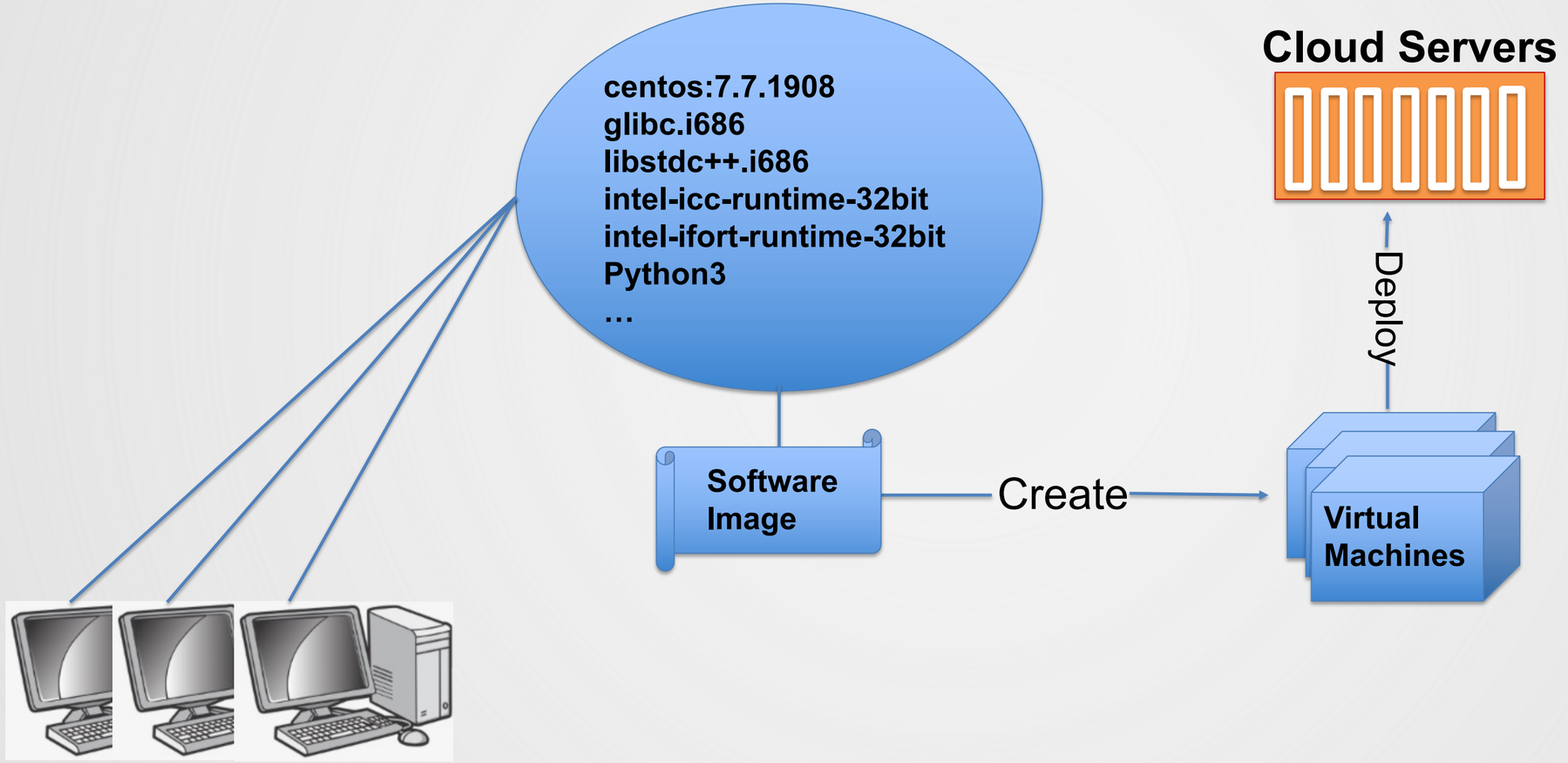
Scalable and efficient

Get jobs done!!!



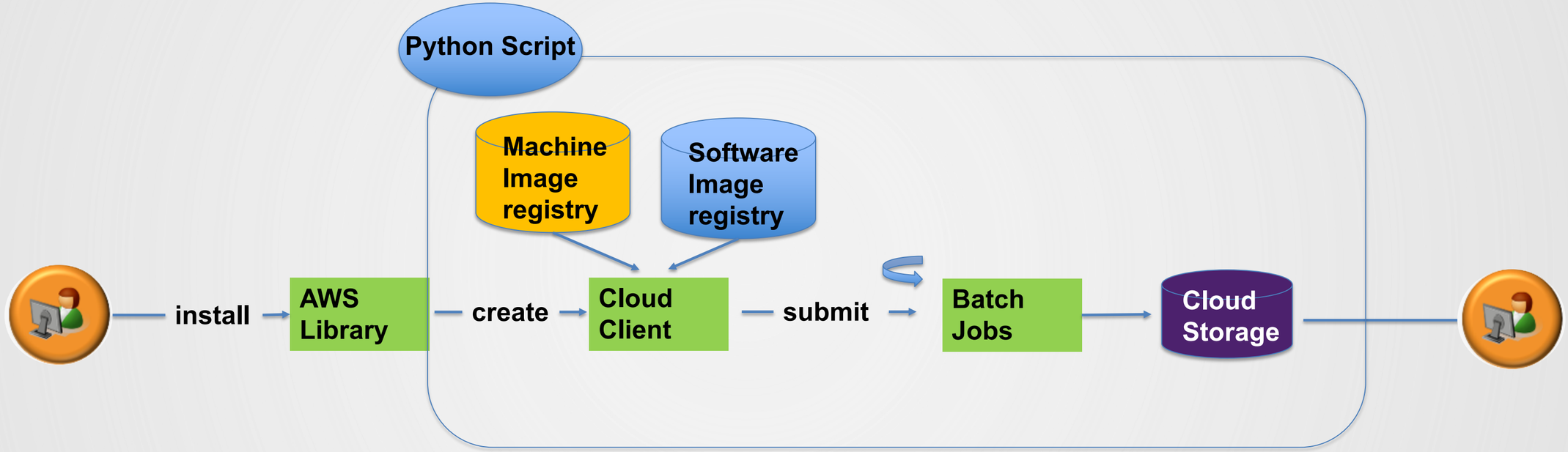
Software: Configure Software(Docker) Image

Pack all software needed - consistent and reliable!

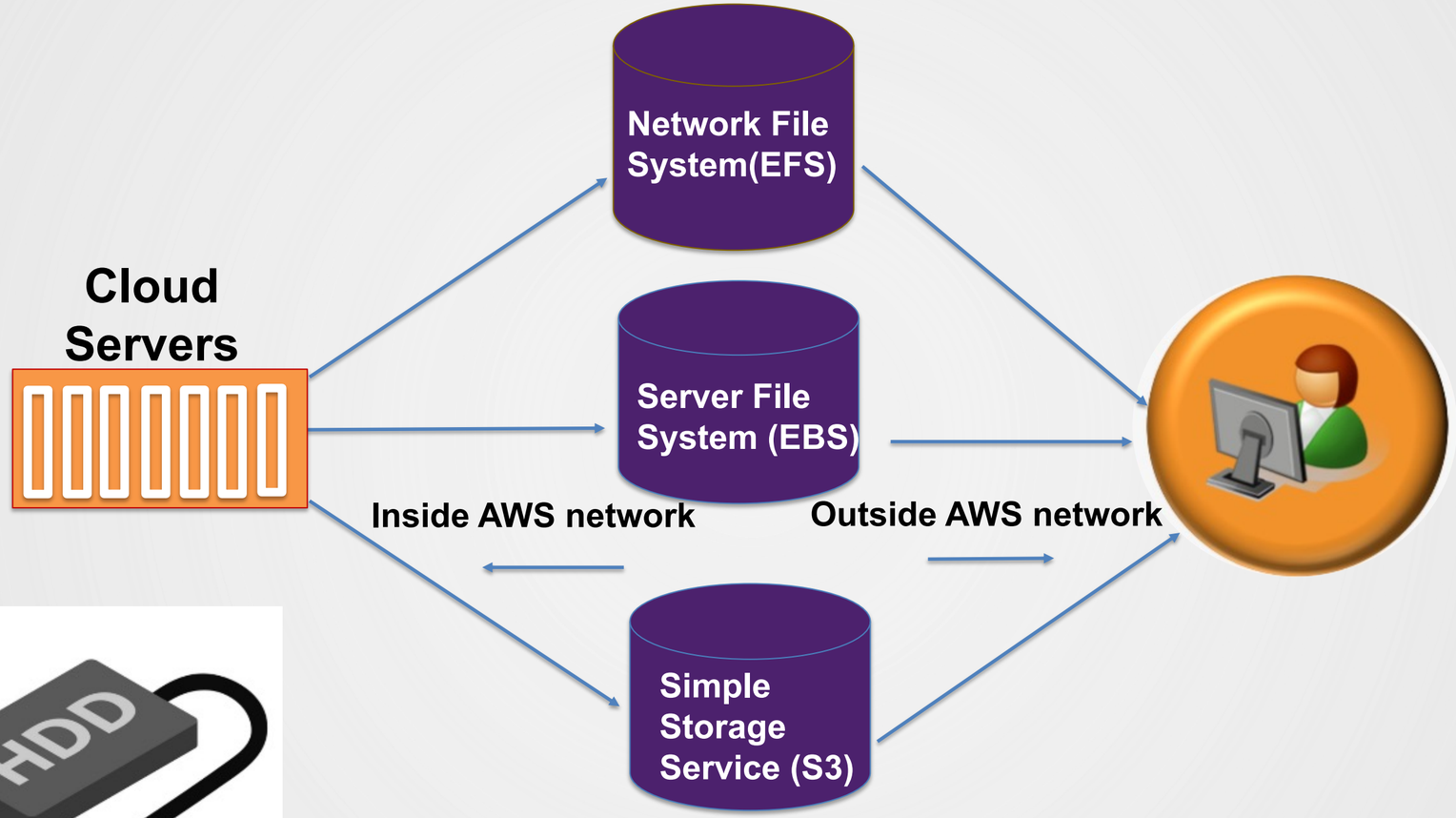


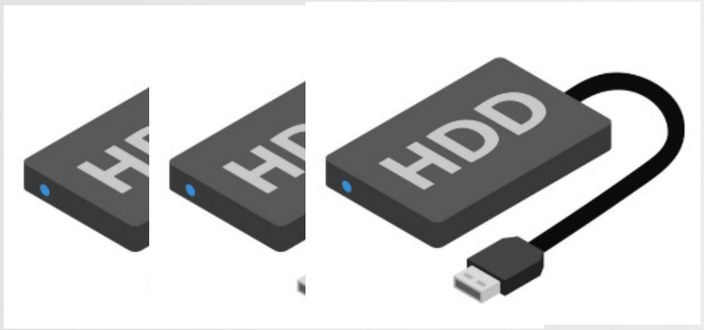
Batch Jobs: Streamline Submission Process

Cumbersome submission process can be streamlined!



Cloud Storages: Optimize Usage





- ✓ Cost of S3 << EFS and EFS
- ✓ Avoid heavy network traffic between AWS and outside locations

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Cost of Cloud Servers

- Regular, on demand pricing:
  - ~1,700 hours of CPU time (20K PTM runs)
  - ~3 hours runtime on AWS
  - Cost ~$50
- Spot:
  - Using server idle time
  - Could save 50% - 90%
  - Jobs could be stopped anytime and resubmitted

Summary

- **Flexible and scalable:** machines are easily configured
- **Efficient:** auto scale computing power up and down
  - Large number of simulations possible!
  - No need to maintain servers!
- **Reliable and consistent:** one software image for all
- **Easy to use:** submission process streamlined
- **Cost effective:** engineer and IT staff hours saved

Thank you!