

# 그리드 서비스

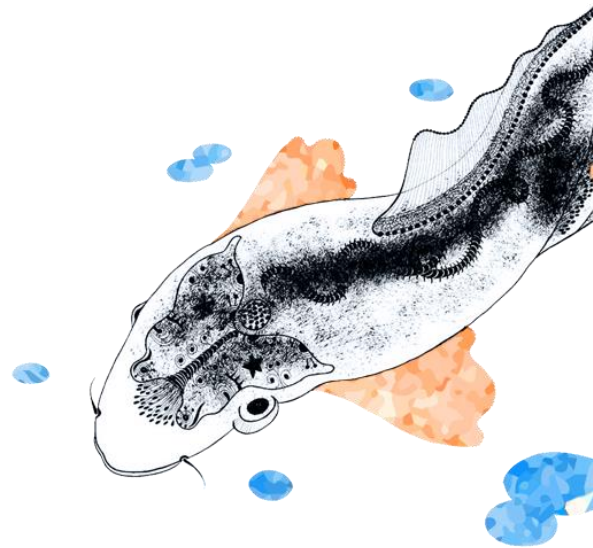
글로벌 분산 컴퓨팅

안상언

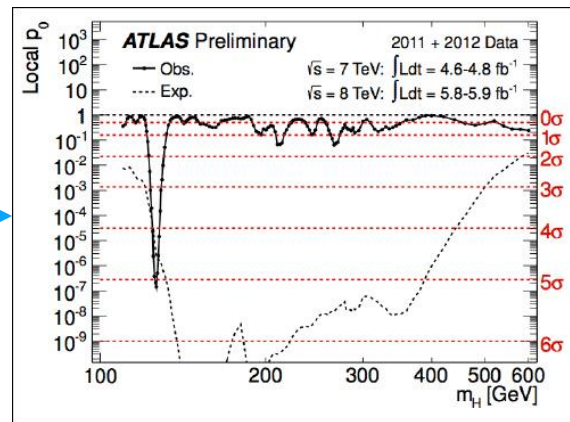
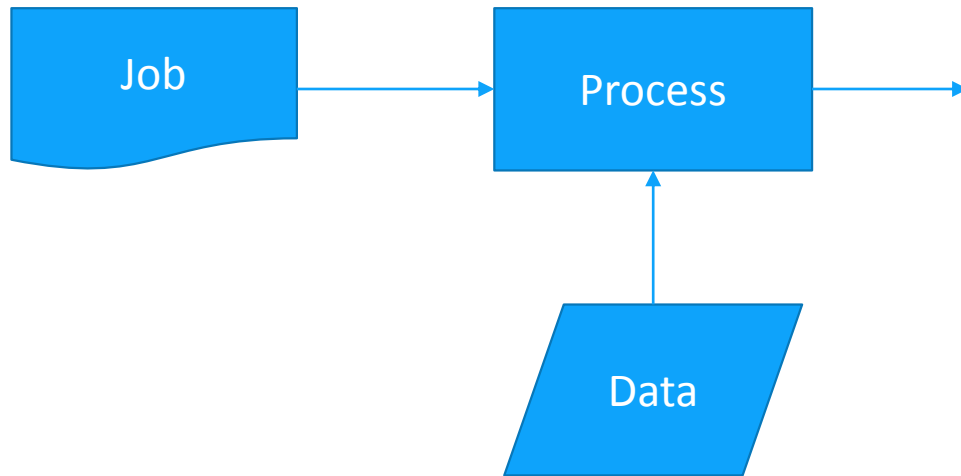
GSDC

GSDC2016, KIRD

2016.12.29

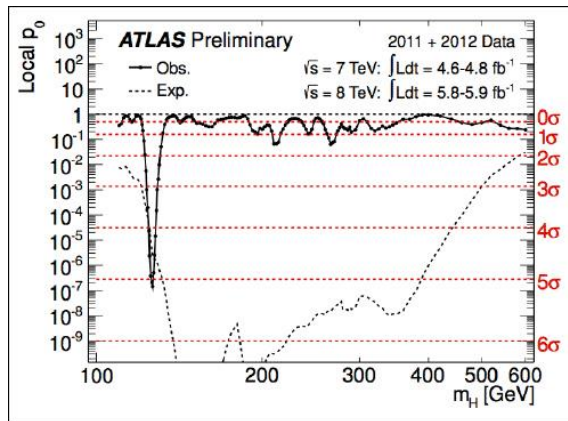


- 글로벌 분산 컴퓨팅
  - ‘WLCG 소개’, ‘그리드 서비스’
- 왜 그리드가 LHC 데이터 처리에 필요한가?
- LHC 컴퓨팅 그리드는 실제로 어떻게 구성되어 있는가?

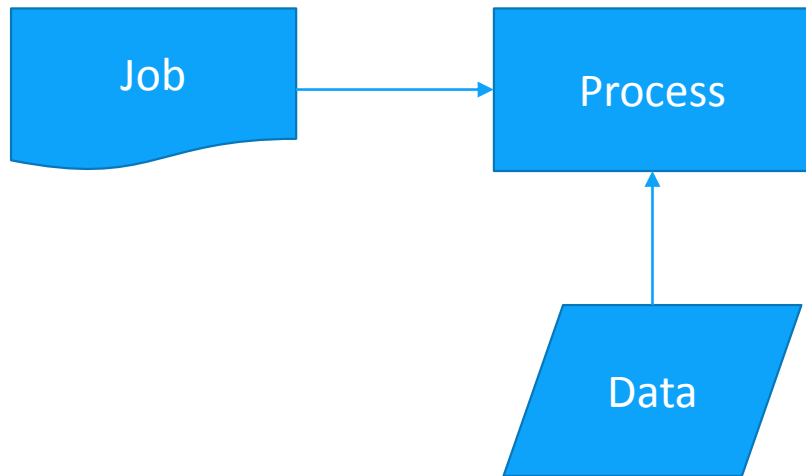




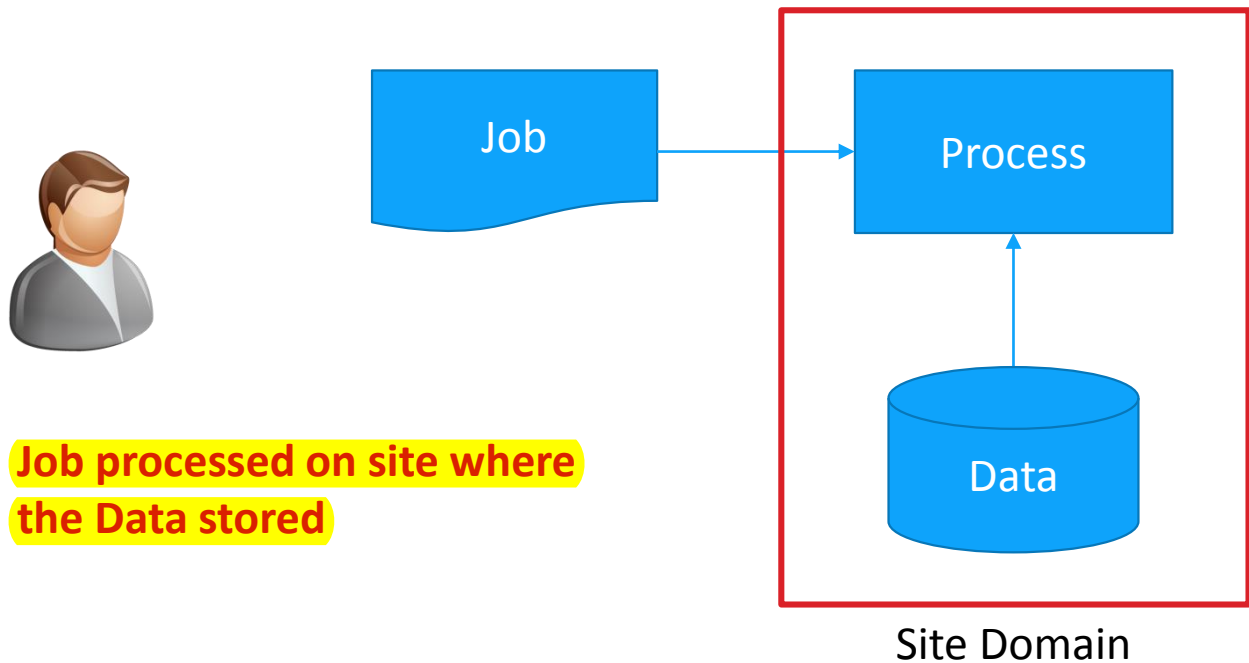
Job



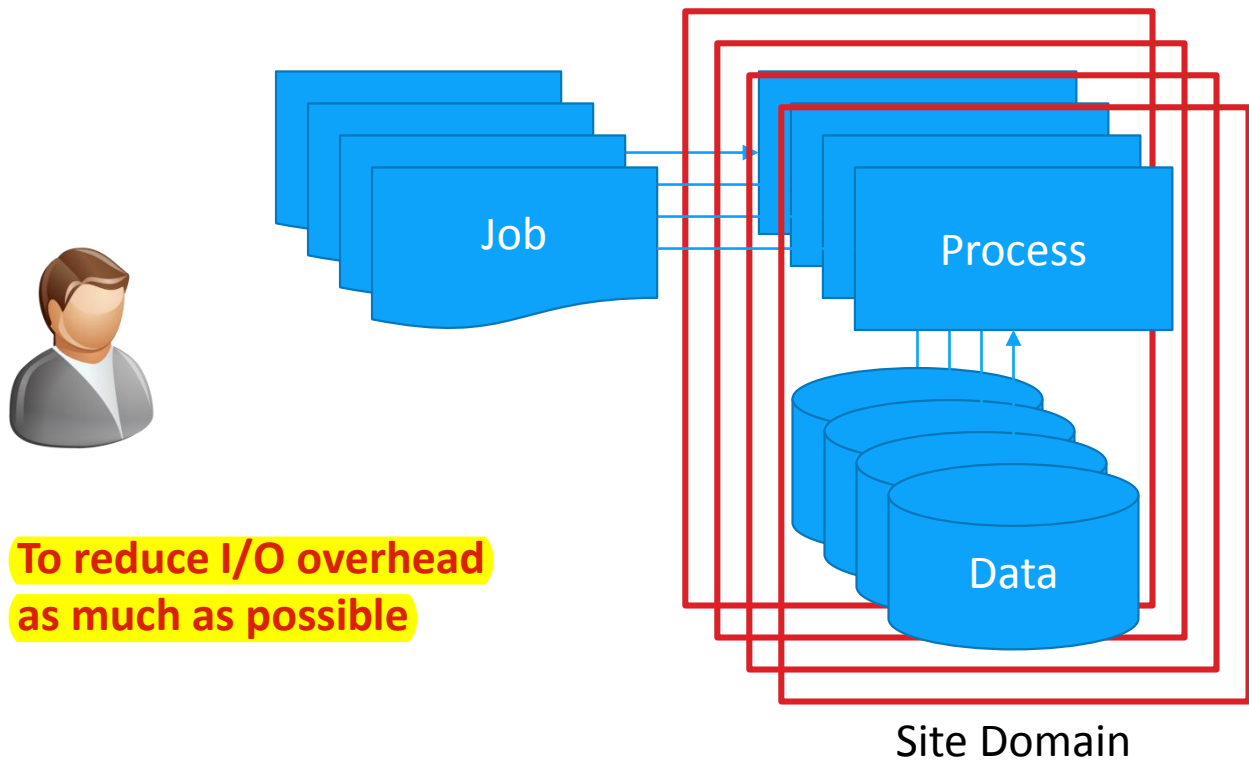
# WLCG 그리드 작업 처리 기본 정책



# WLCG 그리드 작업 처리 기본 정책



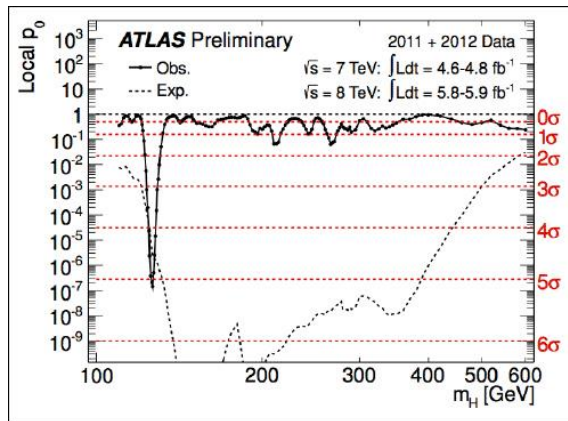
# WLCG 그리드 작업 처리 기본 정책



# 그렇다면 사용자 관점에서는?



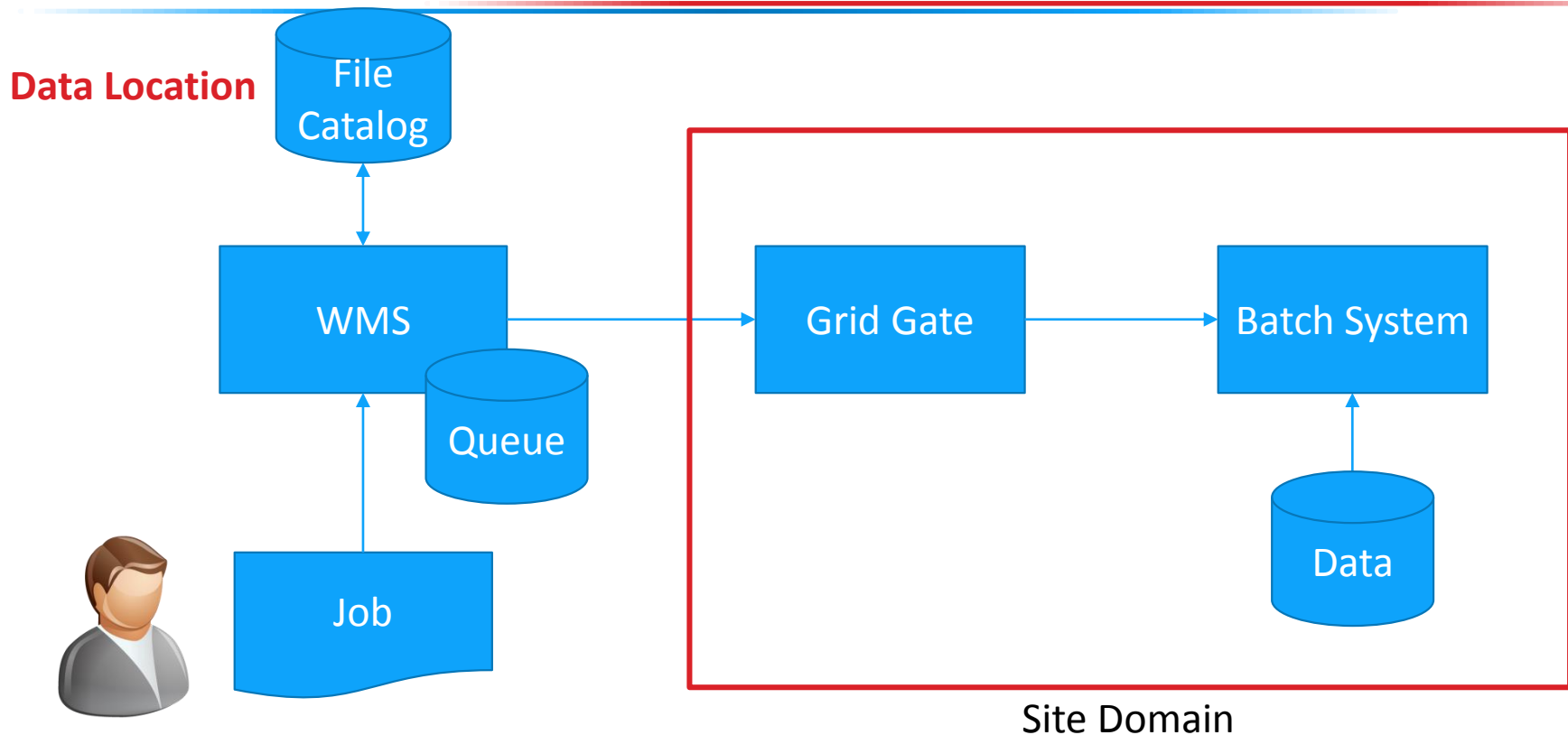
Job



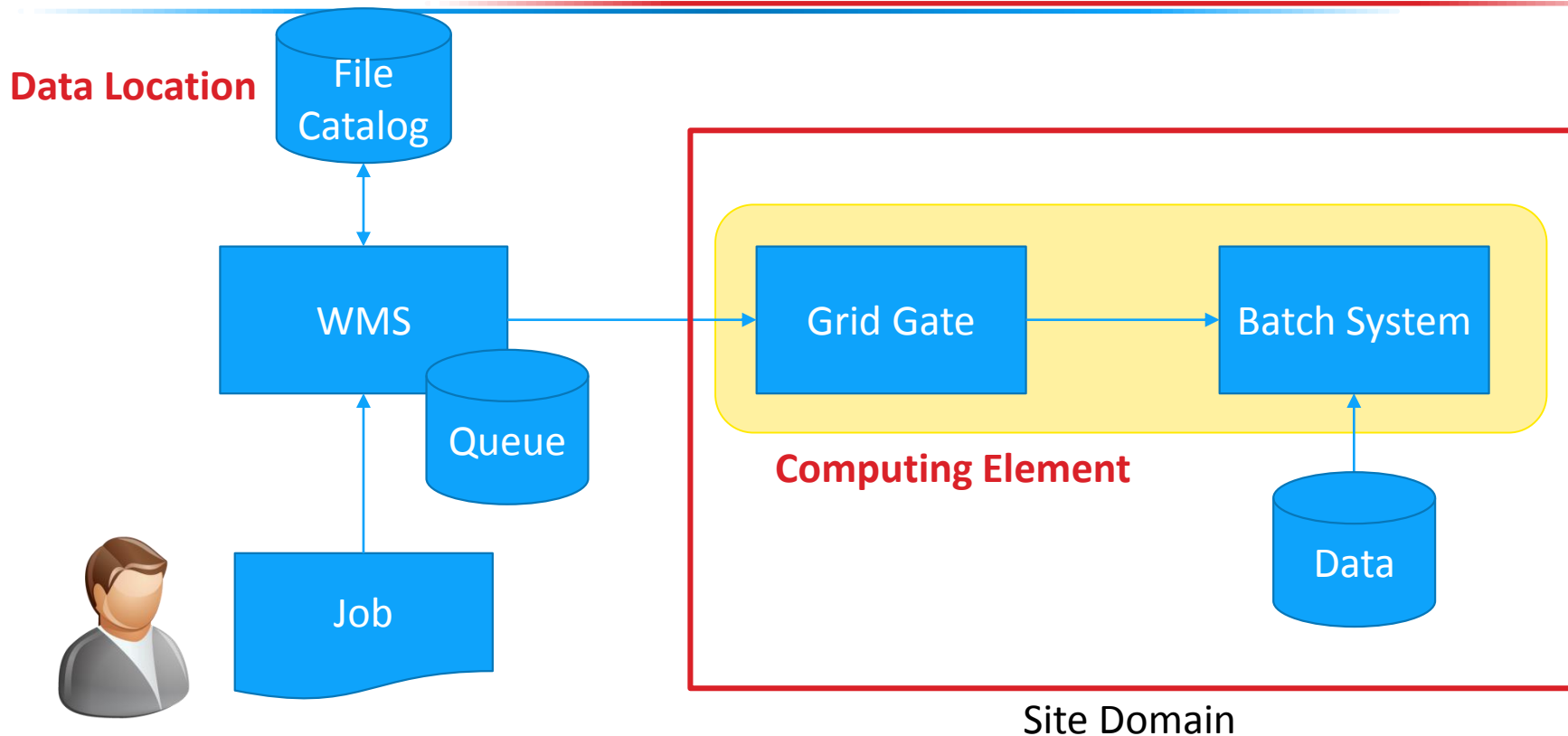
Don't care!



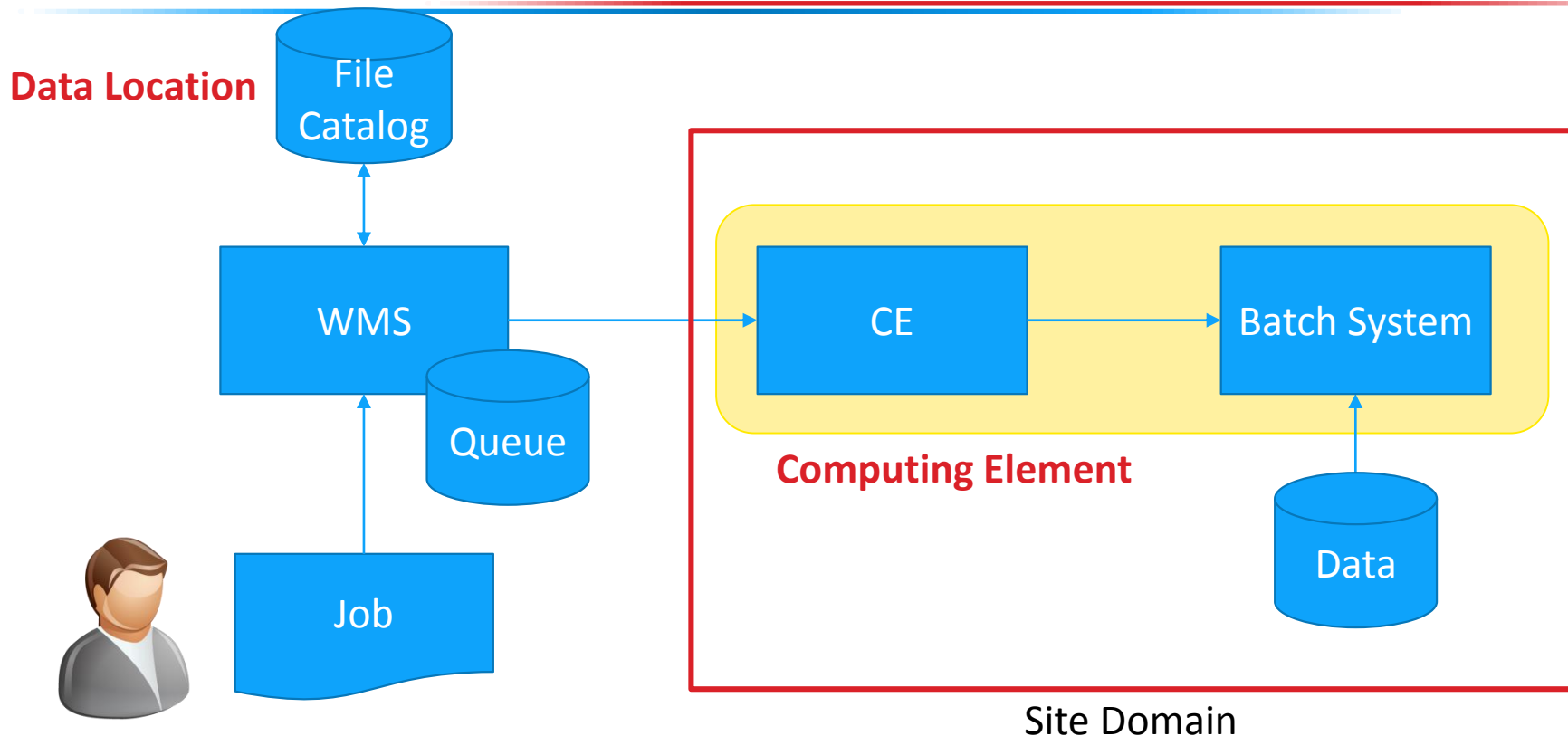
# 실제로 어떤 일이 벌어질까?



# Computing Element



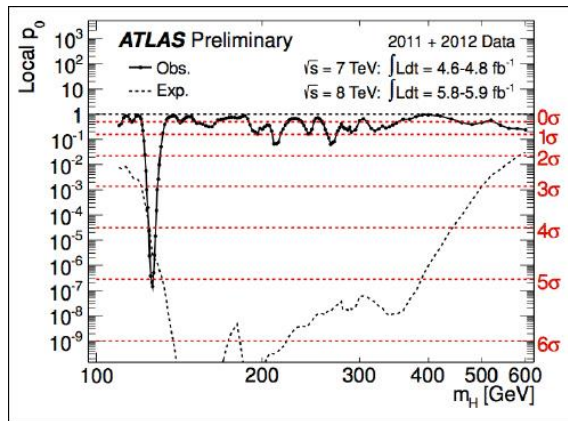
# Computing Element



# 다시 한번 사용자 관점에서는?

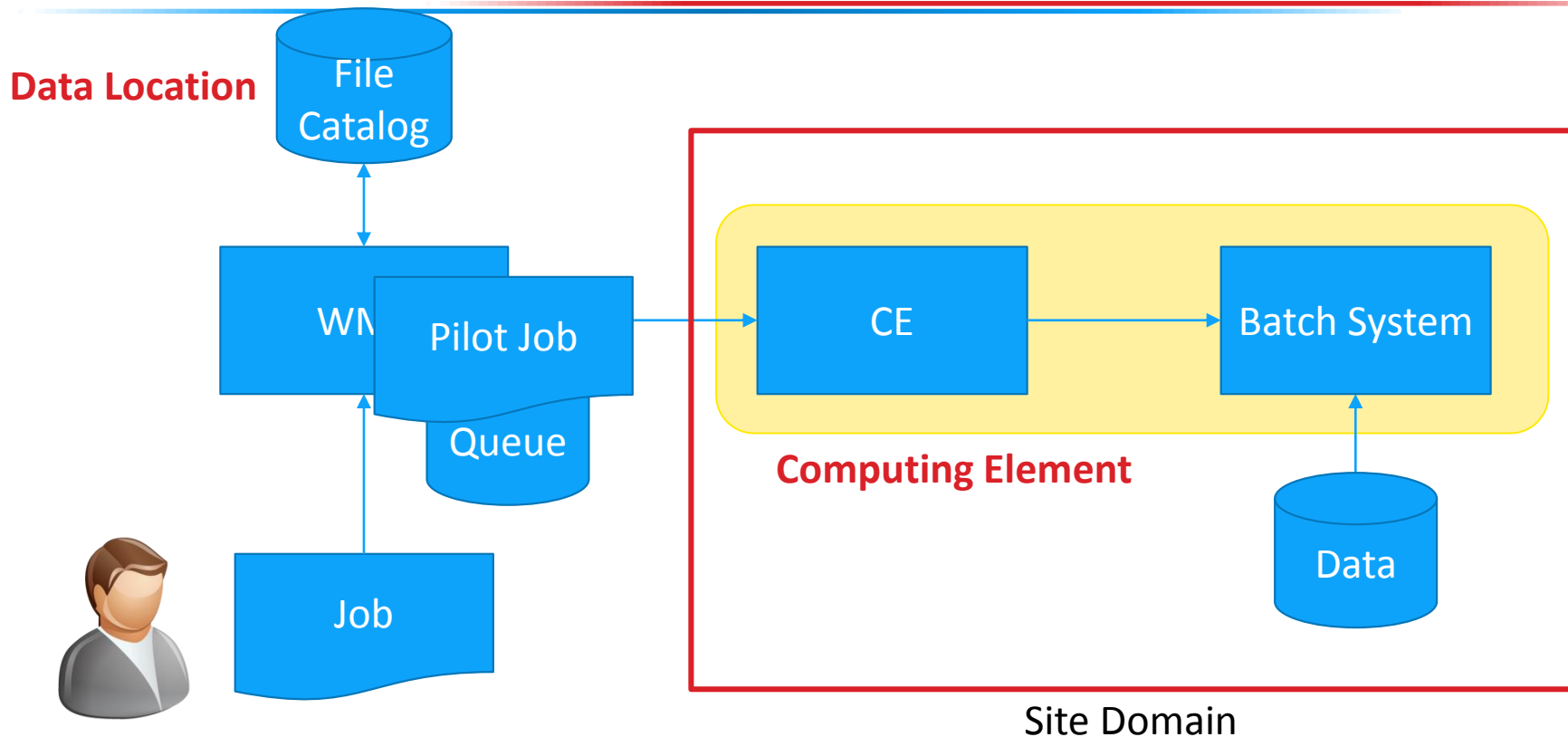


Job

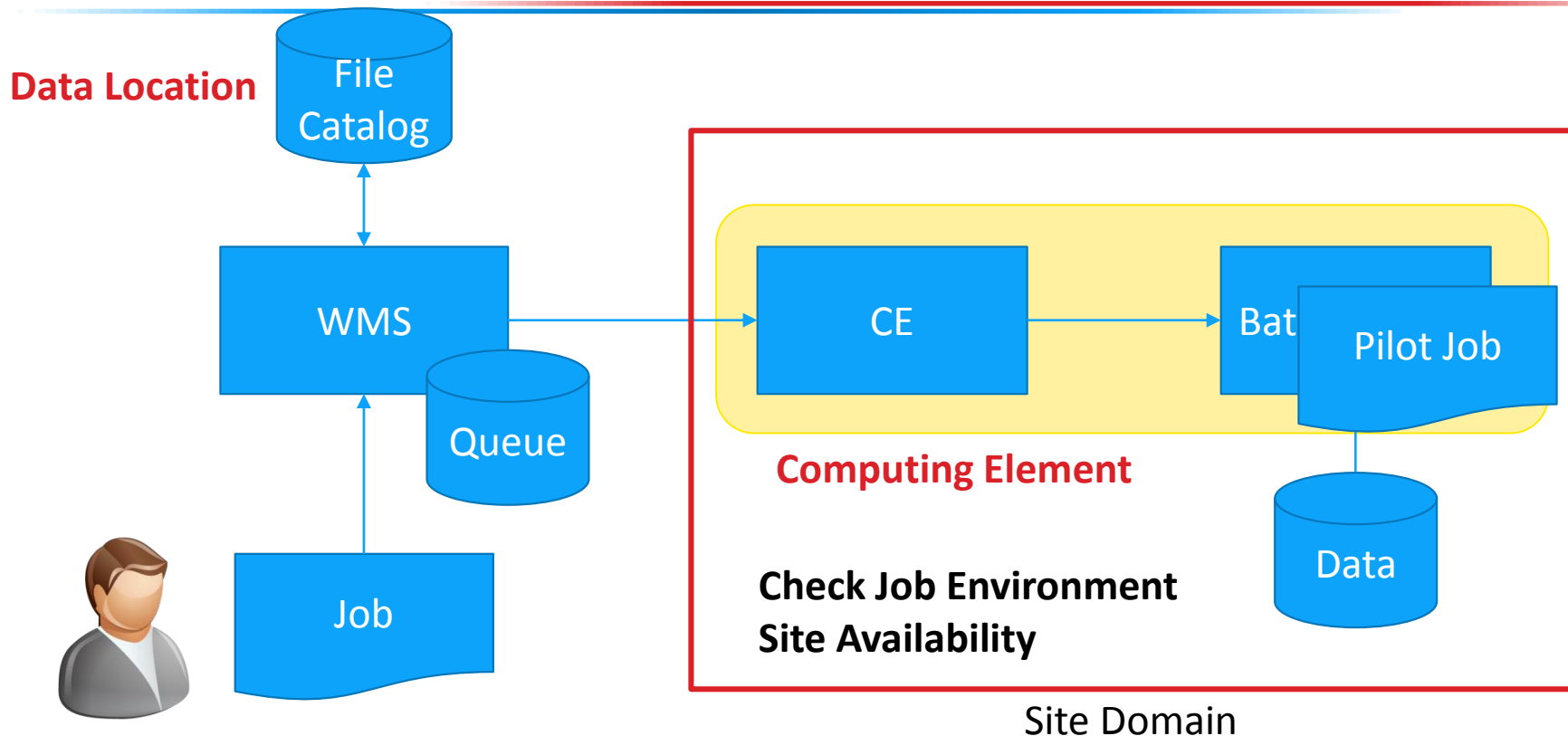


**Don't care!  
BUT  
Result must be  
returned fast  
AND must not  
DIE!!**

# Pilot Job



# Pilot Job



[Latest Results](#)[Historical View](#)[Generate Report](#)[Help](#)

## Site-Groups

All Sites

## Profiles

ALICE\_CE\_CRITICAL

Algorithm:  
ARC-CE+CREAM-CE

## Metric Exit Status

All Exit Status  
OK  
WARNING  
CRITICAL  
UNKNOWN  
MISSING

## Sites

ISS\_LCG  
ITEP  
JINR  
KFKI  
KISTI\_GSDC

## Service Flavours

All Service Flavours  
CREAM-CE

## Metrics

All Metrics  
emi.cream.CREAMCE-DirectJobSubmit (alice)[Show Results](#)☐ Show site metrics

## Algorithm for calculating the Site and Service Availability

## Legends for Metric Result Status

Status:	OK	WARNING	CRITICAL	UNKNOWN	MAINTENANCE
Legend:	OK	W	C	U	MT

Note: darkest colors: test is 0 - 12 hours old, ... lightest colors: test is more that 12 hours old

Found a bug?

## Legend

## Metric Name

1

emi.cream.CREAMCE-DirectJobSubmit (alice)

[Link to data](#)

## Sitename

## Flavour

## Host status in profile

## Hosts

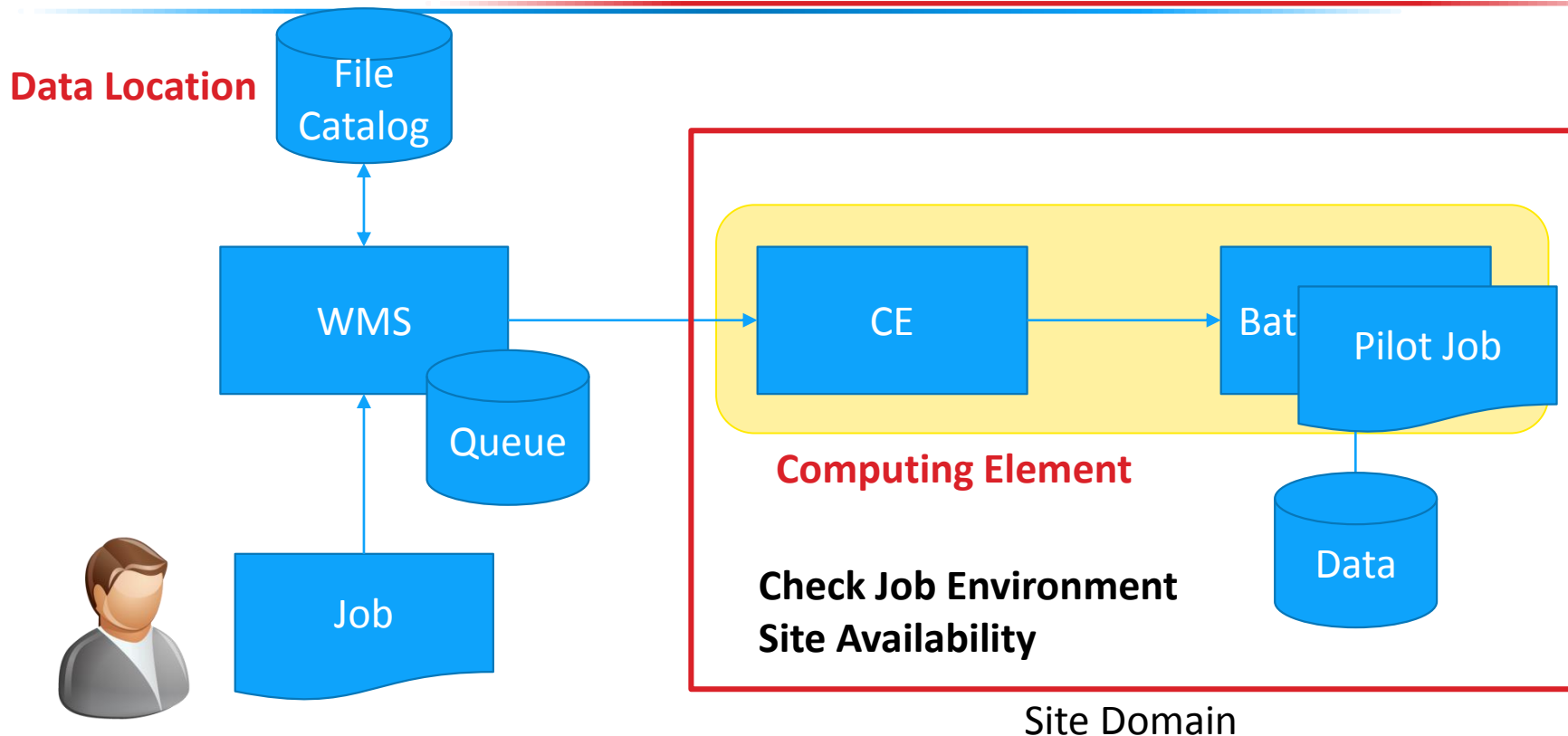
1

KISTI\_GSDC

CREAM-CE

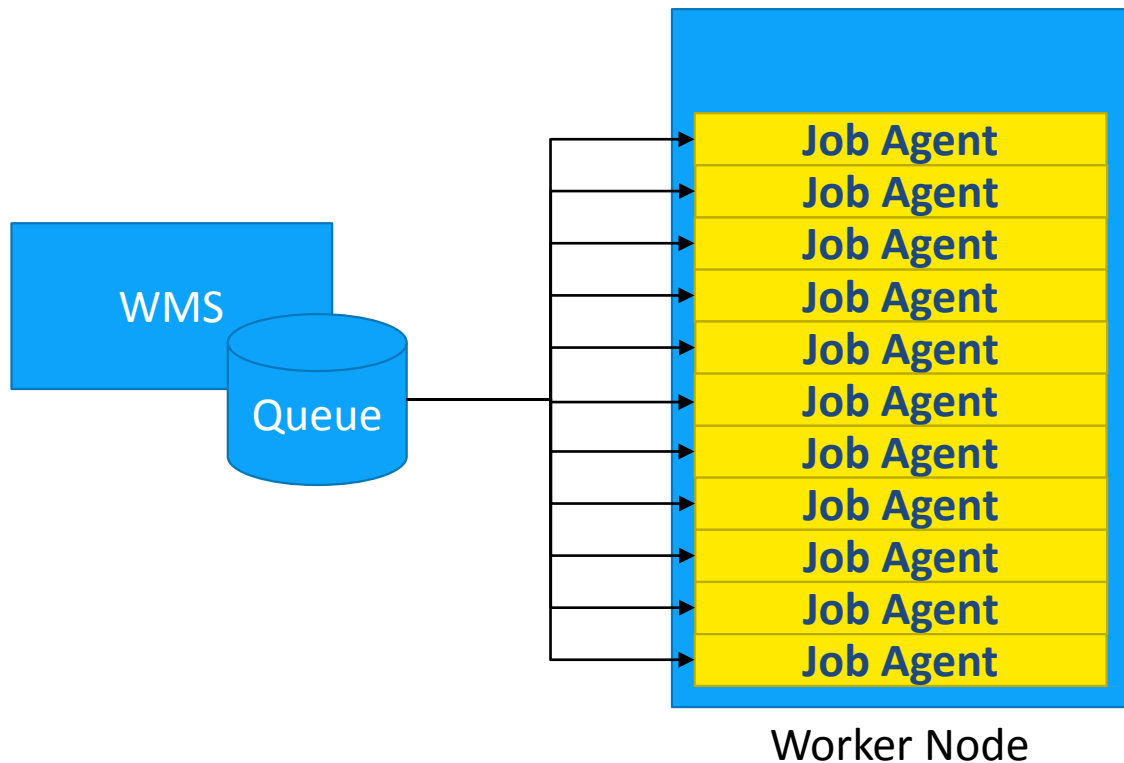
OK  
OK  
OKalice-t1-ce01.sdfarm.kr  
alice-t1-ce02.sdfarm.kr  
alice-t1-ce03.sdfarm.krOK  
OK  
OK

# Pilot Job

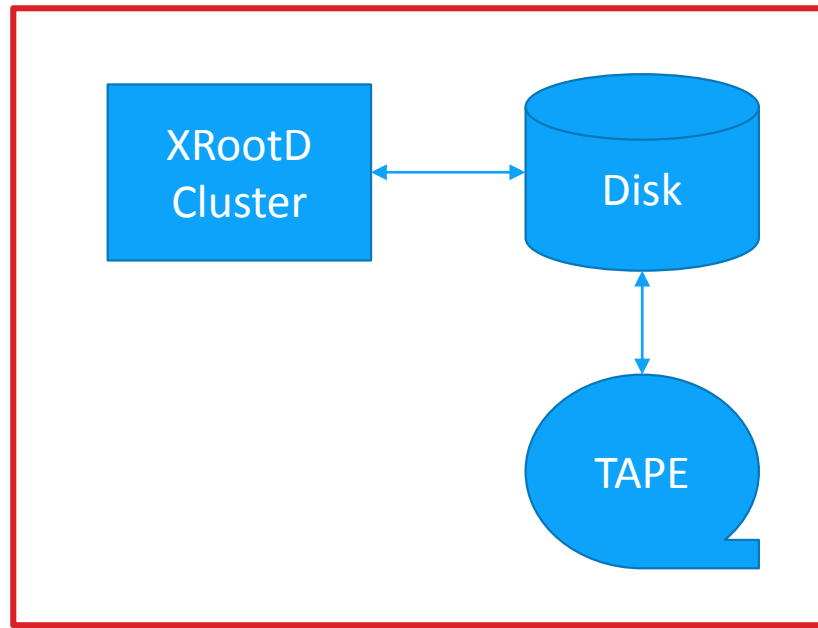
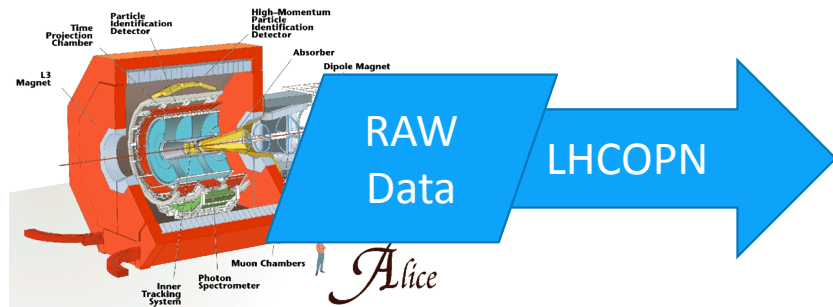




# 그래서 실제로는

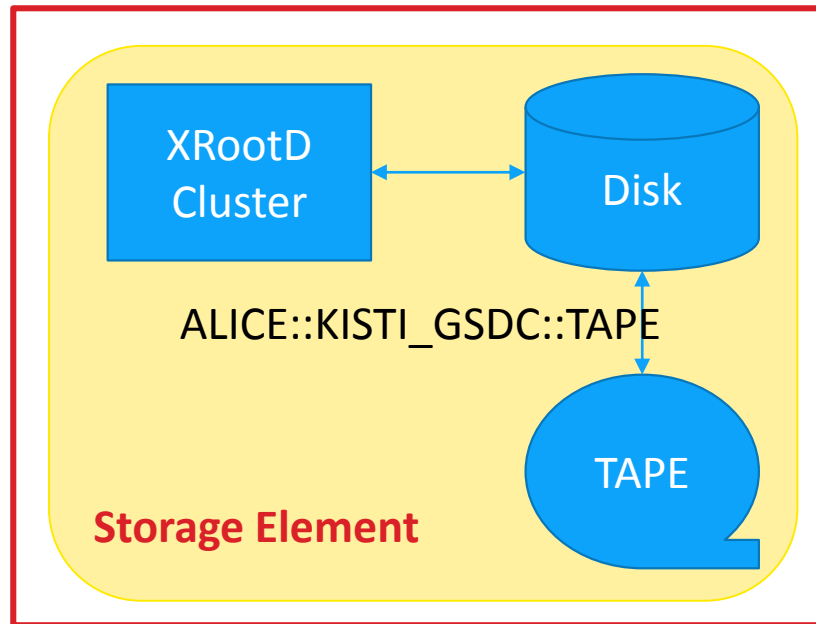
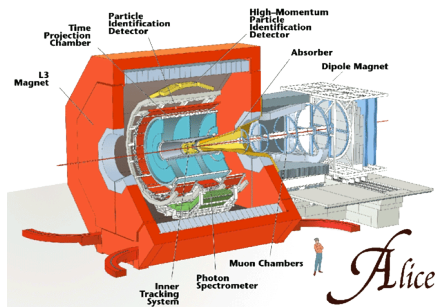


**Job Agent activated by  
pilot job PULLS user Job  
(The Real Job)**



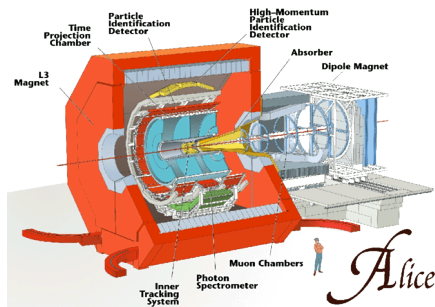
Site Domain

# Storage Element

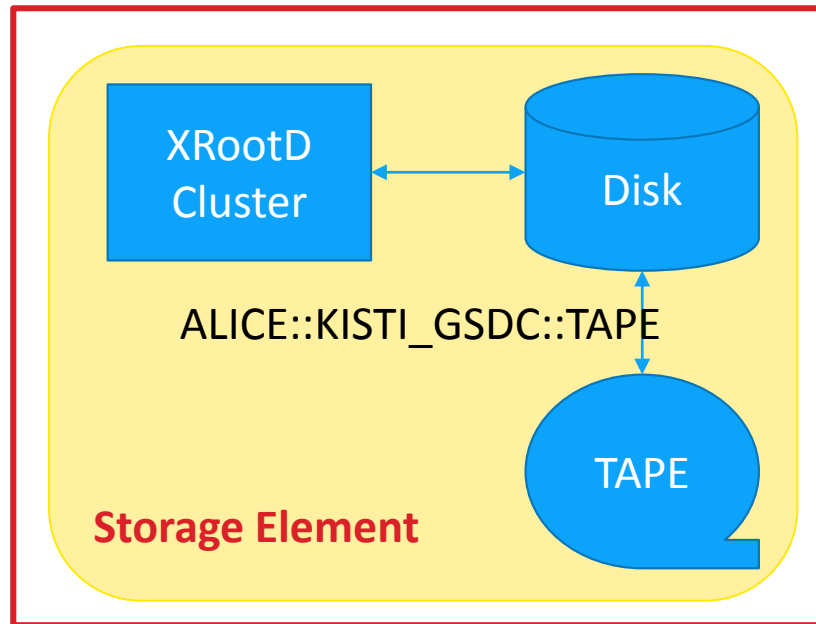
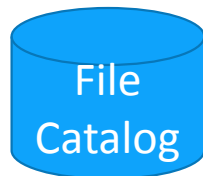


Site Domain

# File Catalog



**Data Location**



Site Domain

# LFN vs PFN

Logical  
Filename

/alice/data/2016/LHC16e/123456/ESD/001/root\_archive.zip

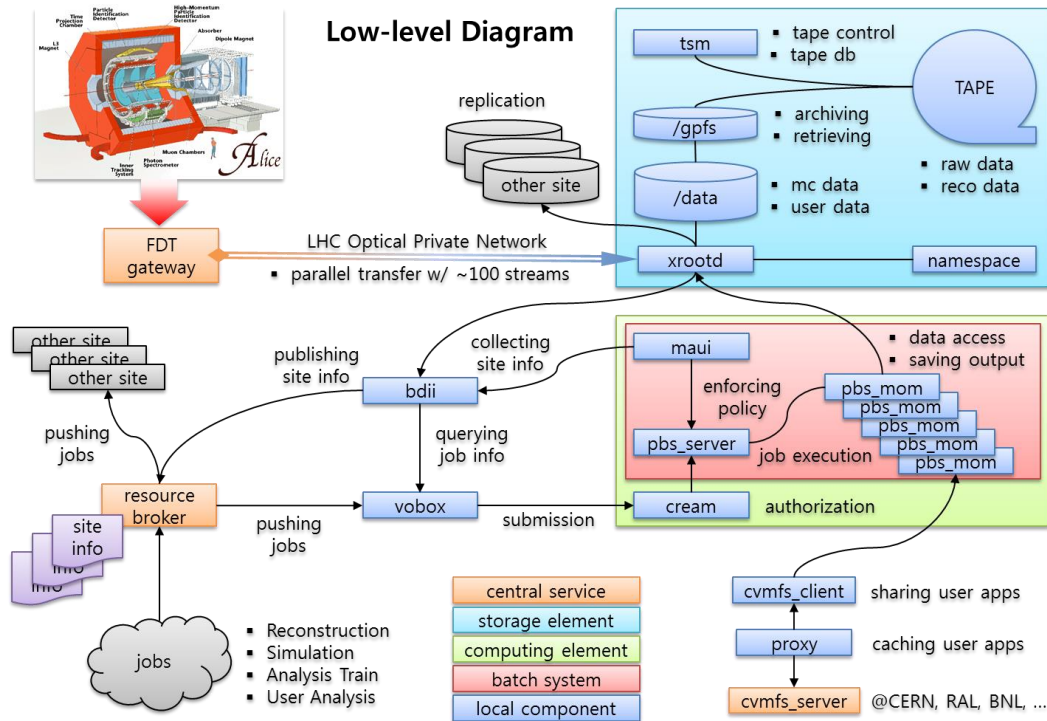


Physical  
Filename

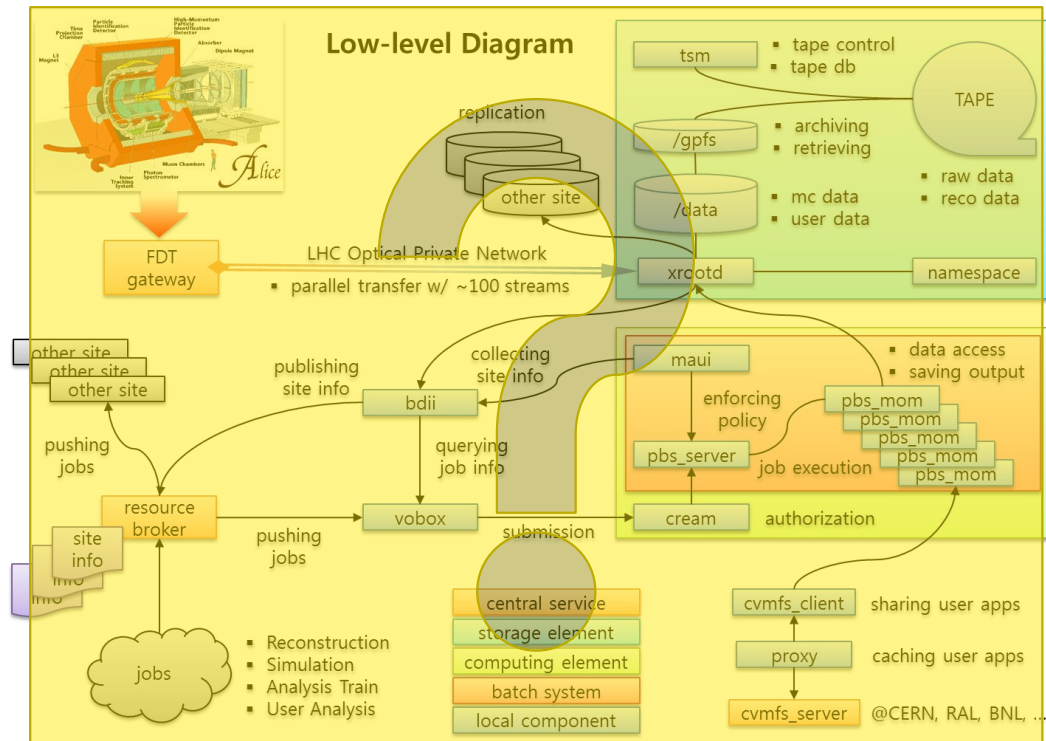
xroot://alice-t1-xrdr01.sdfarm.kr:1094//01/39482/.../root\_archive.zip

xroot://eos-alice.cern.ch:1094//01/39482/.../root\_archive.zip

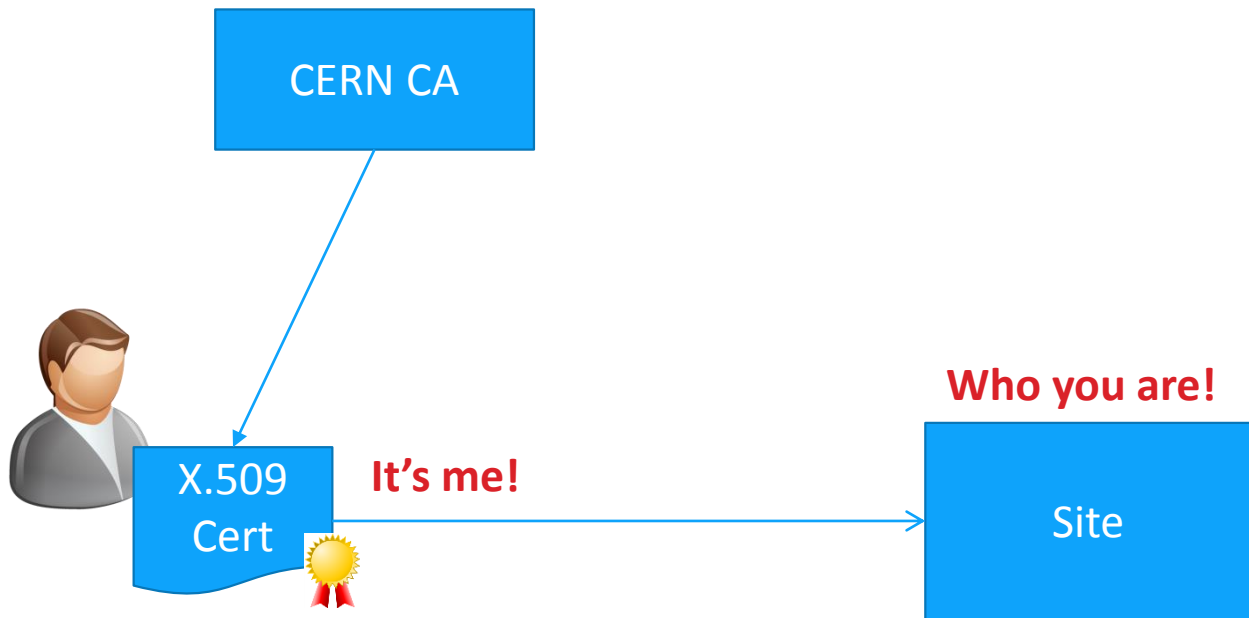
**Replication**



# Data, Job, Trust?



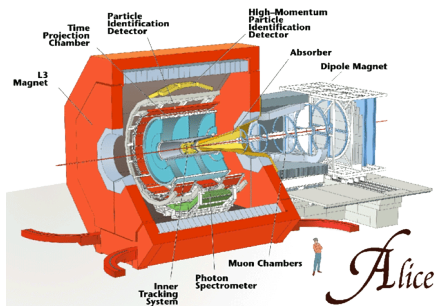
# CA is not enough!





# CA is not enough!

Hmm..



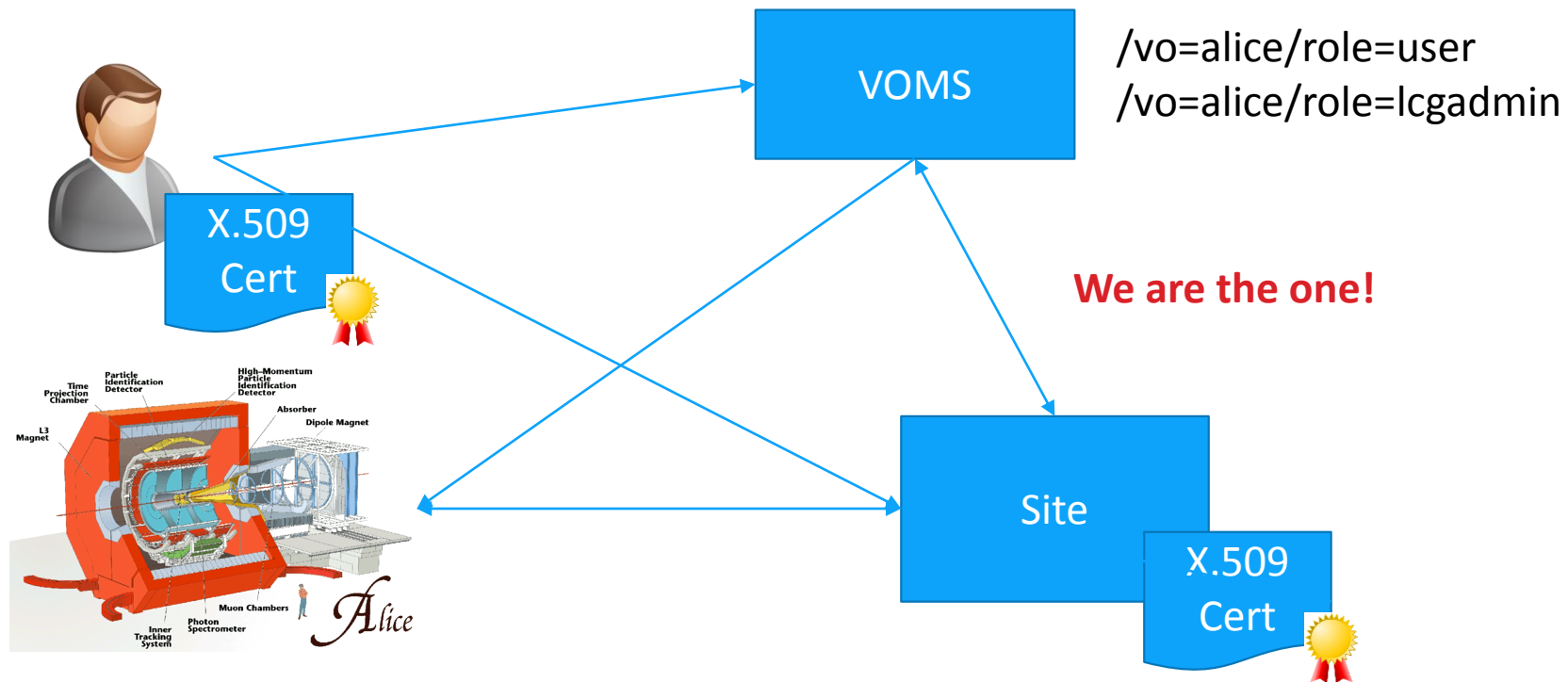
Give me data!

KISTI CA

Site

X.509  
Cert





- Information Service
- Accounting - APEL
- Squid Proxy
- perfSONAR-PS
- ...

- WLCG 구성요소
  - Computing Element
  - Storage Element
  - Information Service
  - VOMS
  - ...