

Activity at KIAF

KoALICE National Workshop 2021 @ High1 Resort
2022-01-04

Byungyun KONG



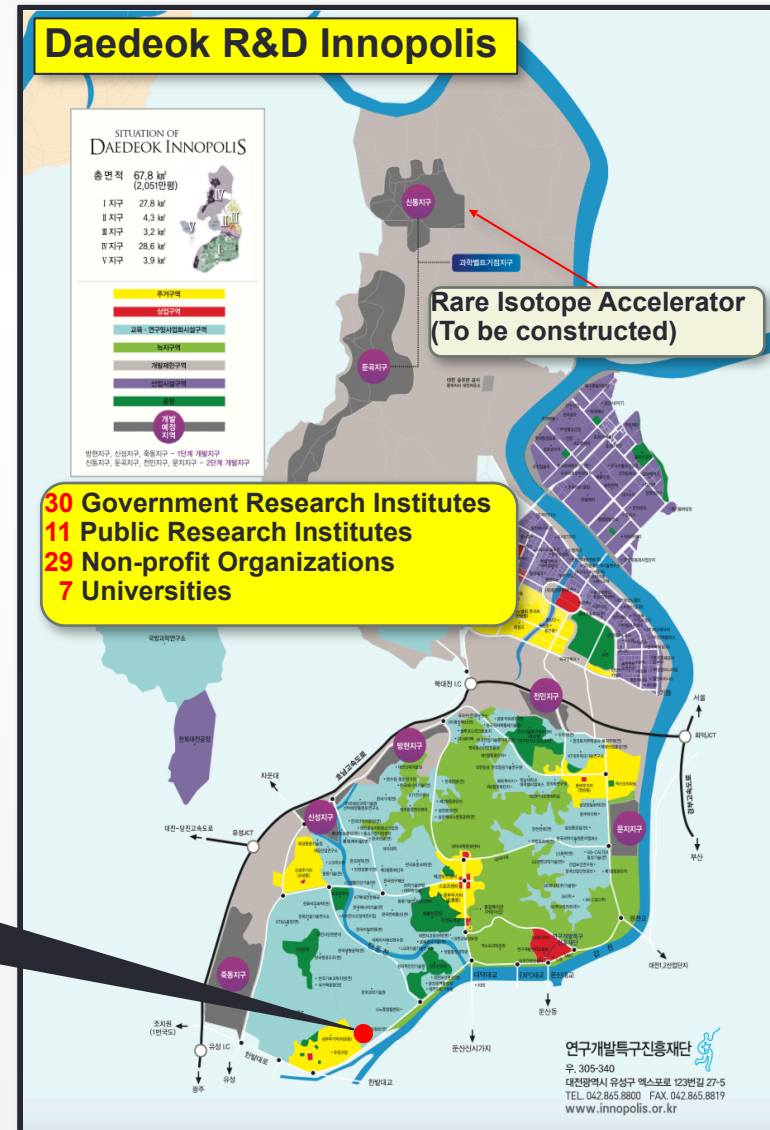
Content

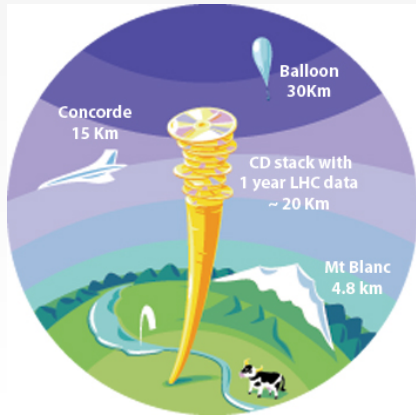
- **GSDC Introduction**
- **ALICE Analysis Farm**
- **HTcondor Integrated Pool**
- **Operation Status**

GSDC Introduction

Korea Institute Science and Technology Information

- Government-funded research institute founded in 1962 for National Information Service and Supercomputing
- National Supercomputing Center
 - Nurion System (~25.7 PFlops at Peak), ranked 11th of Top 500(2018)
 - KREONet National R&E Network





Large-scale Scientific Data:
20Km CD stack with data
produced per year in CERN

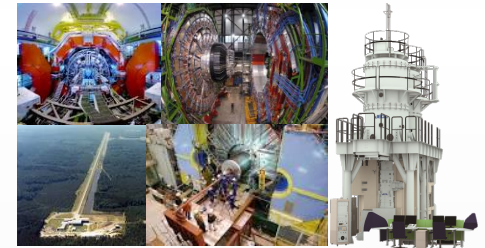
Global Science

experimental Data

hub Center



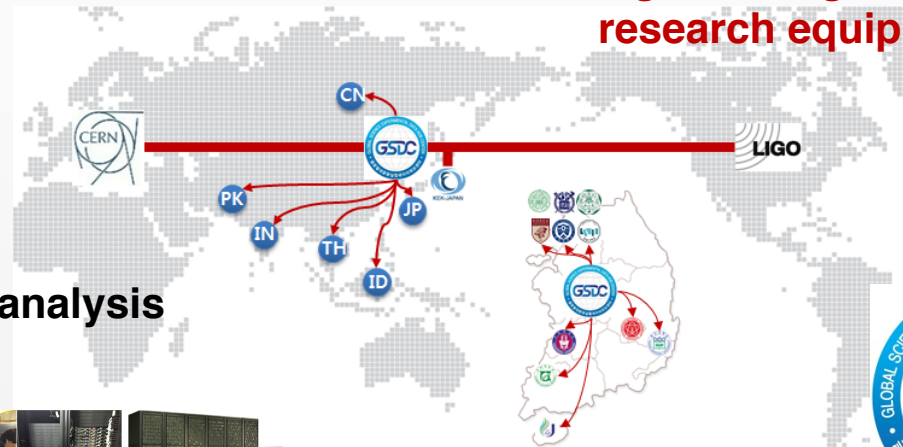
Collaboration with global laboratories



Data from large and high-valued research equipment

➤ **(Global)**
Asia representative **Data Hub**

➤ **(Domestic)**
Scientific data management and analysis platform service



Experimental Support



3-4 more domestic experiments under preparation
e.g. volcanic hazard mitigation, brain research, disease control, etc.

ALICE Analysis Farm

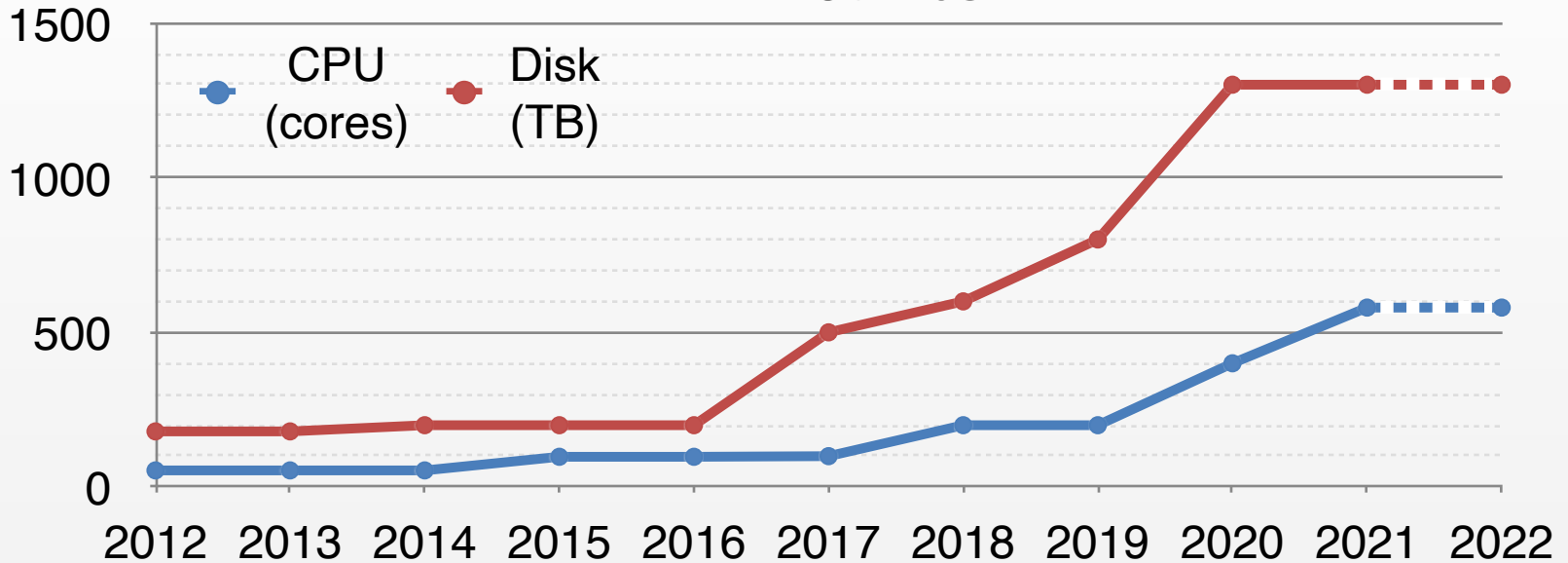
KIAF System

- **Dedicated Computing farm for KoALICE**
But share worker node with KCMS & BIO community
- **Basic configuration**
 - HTCondor batch system
 - XRootD data management system
(coupled with AliEn for ALICE dataset transfer)
 - Scientific Linux 7.9
- **Additional software**
 - XRootD Filesystem for local file access
 - PROOF on Demand enabled
 - **Docker & Singularity Image support**
 - Ganglia for monitoring (Admin only)

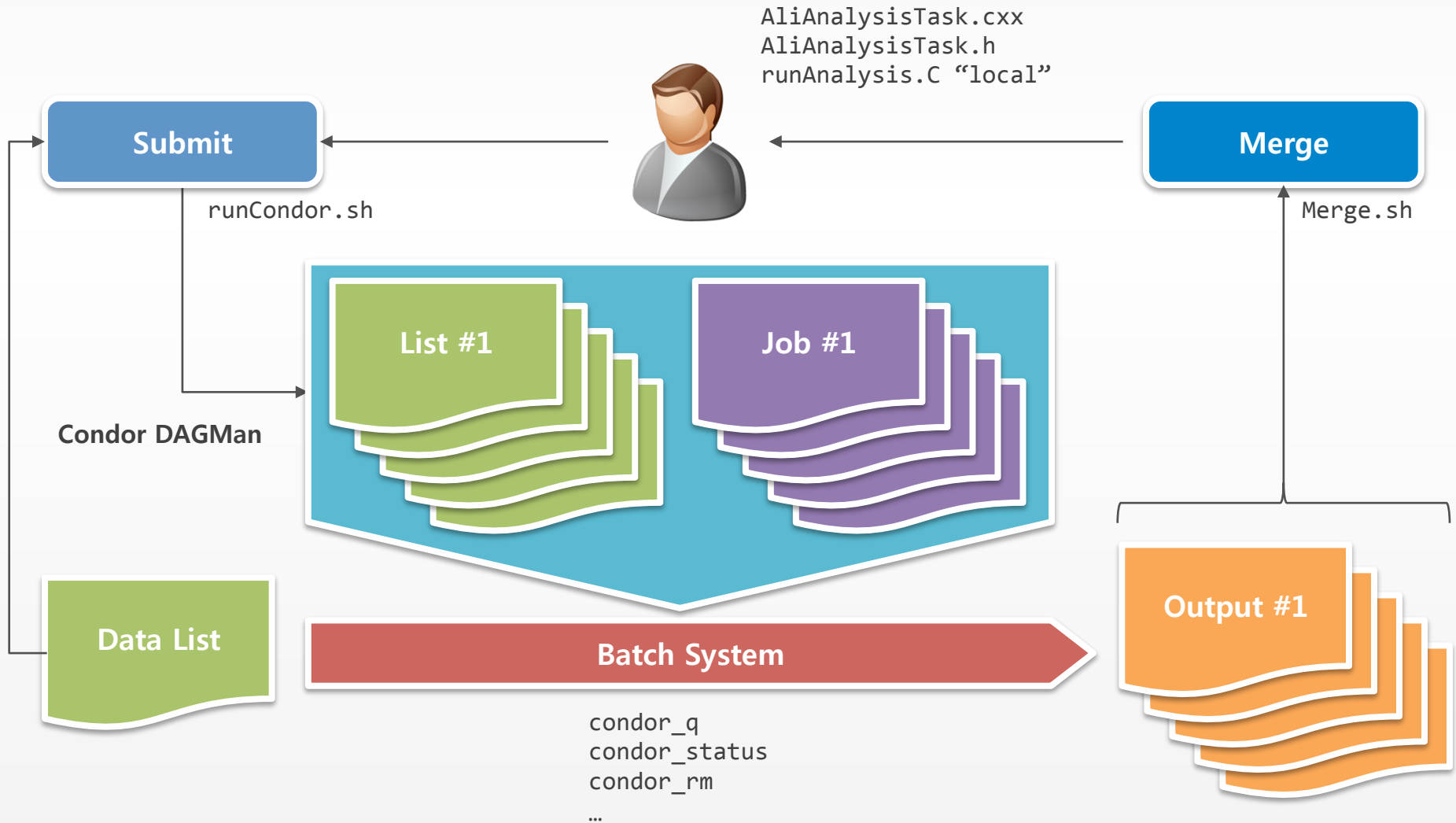
Hardware History

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2021
CPU	54	54	54	98	98	100	200	200	400	580	580
Disk (TB)	180	180	200	200	200	500	600 (700)	800	1,300	1,300	1,300
Network (Gbps)	1	2	2	10	10	10	10	10	10	10	10

KIAF Curves



User Analysis Workflow



User Analysis Workflow

AliAnalysisTask.cxx
AliAnalysisTask.h
runAnalysis.C "local"



Submit

Merge

runCondor.sh

Merge.sh

Condor D

Data

```
#!/bin/bash
condor_slot=40
nfile=2
merge=1 #0=nomerge, 1=merge

work_dir=`date +%y%m%d%H%M%S`
run_macro="runAnalysis.C"
data_file="sim_LHC13d3_195675_A0D159.txt"
input_files="AddMyTask.C,AliAnalysisTaskMyTask.cxx,AliAnalysisTaskMyTask.h"
out_file="AnalysisResults.root"
request_RAM="4GB"
USER_MAIL=""

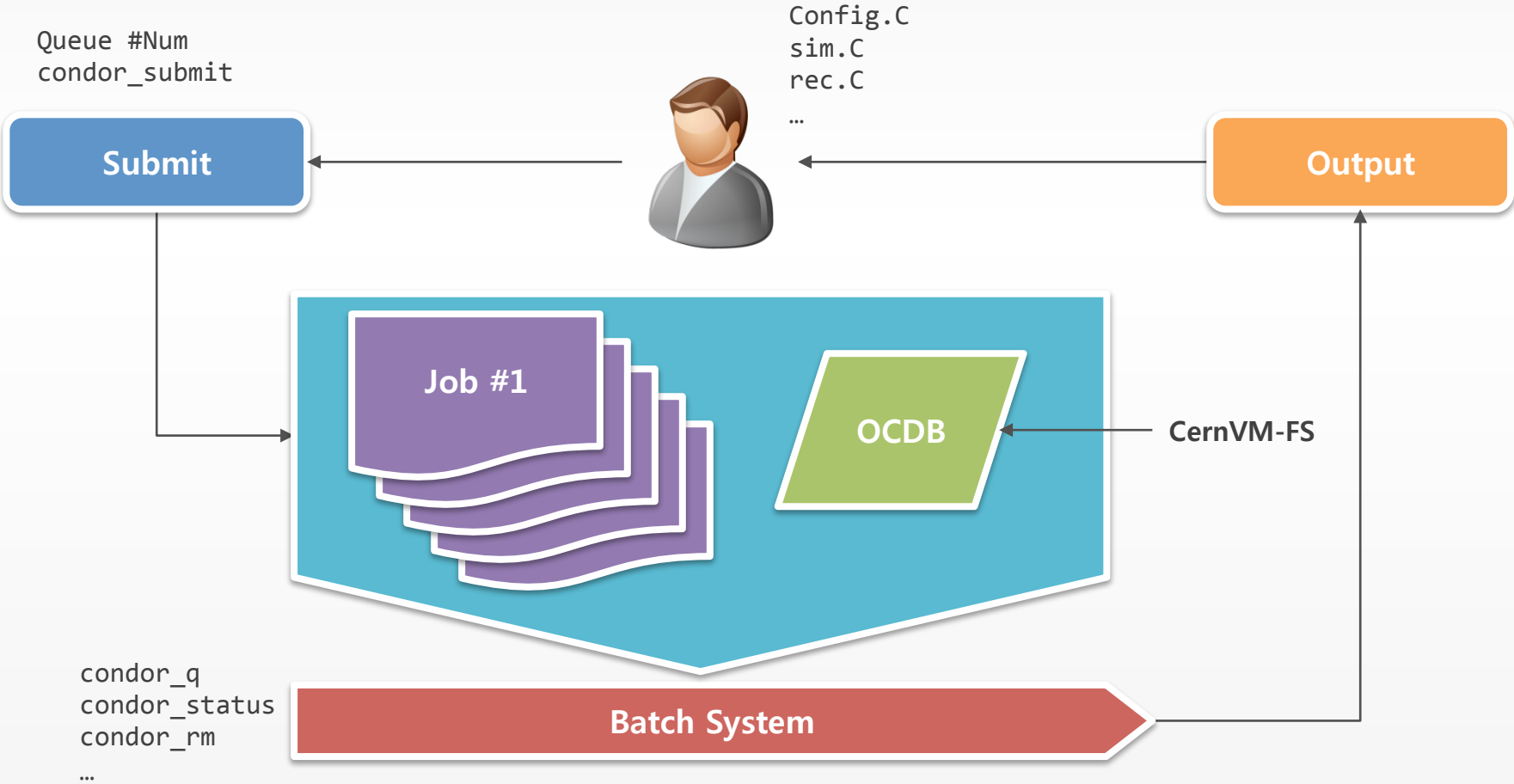
main_dir=`pwd`

source /pool/macro/runScript.sh
```

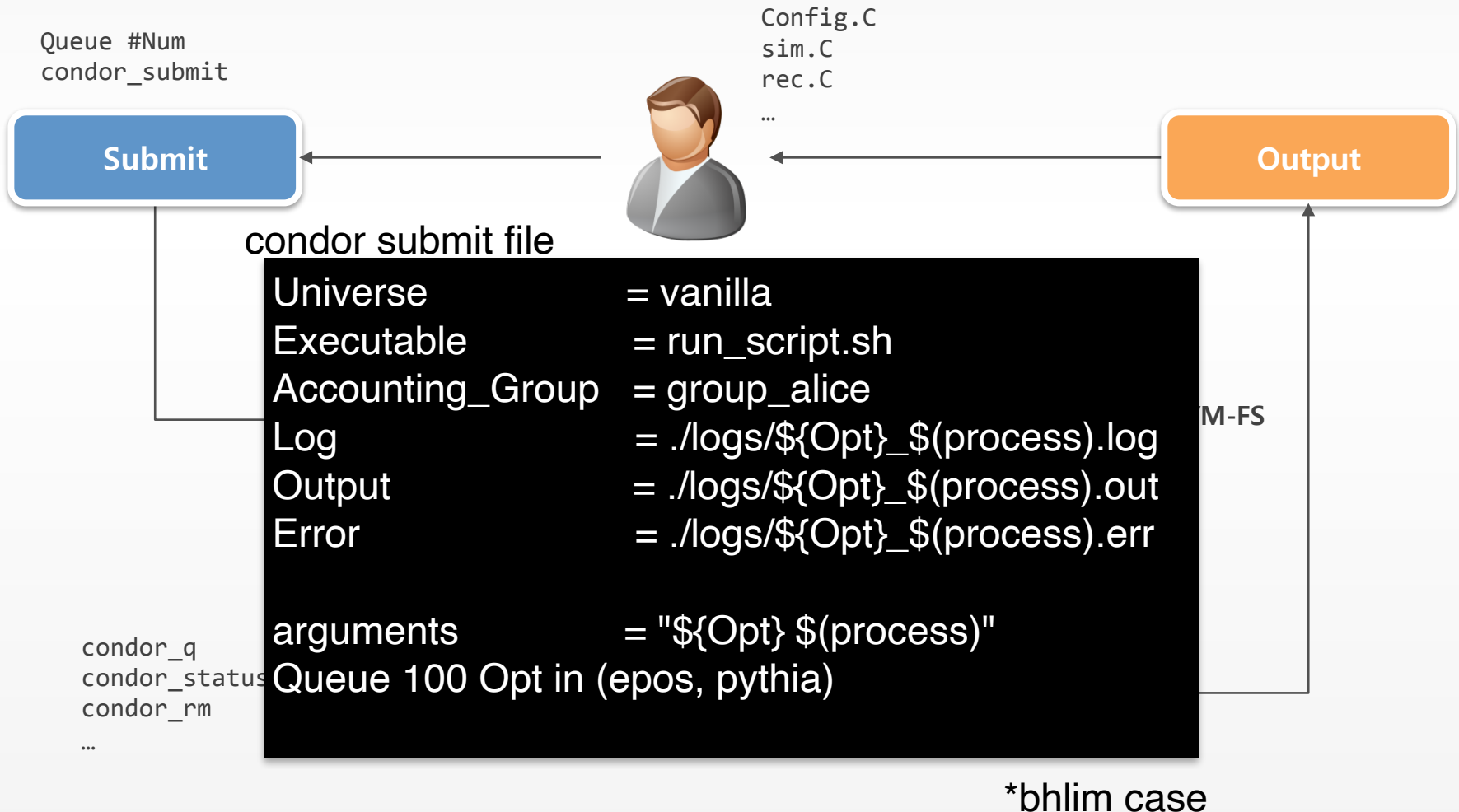
... /pool/macro/runCondor.sh



MC Workflow



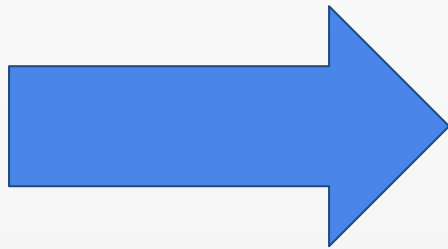
MC Workflow



HTCondor Integrated Pool

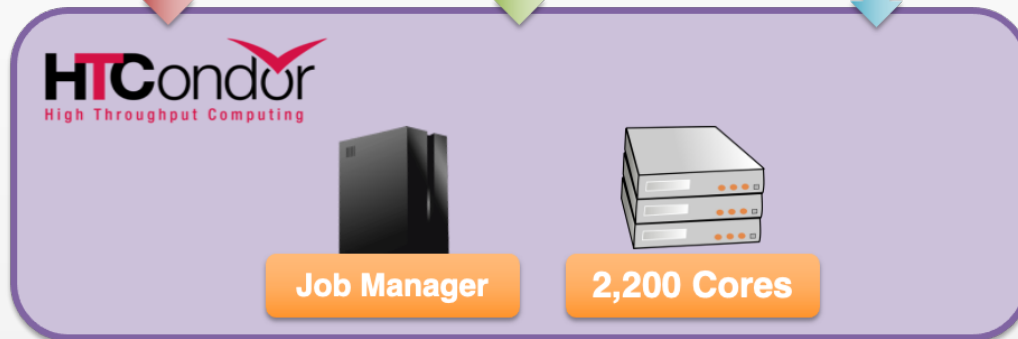
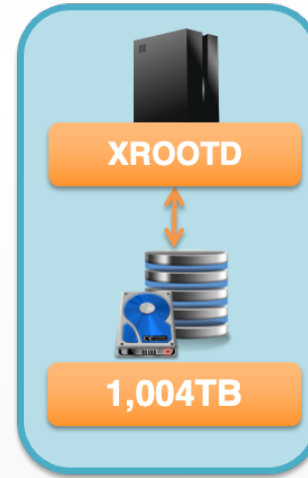
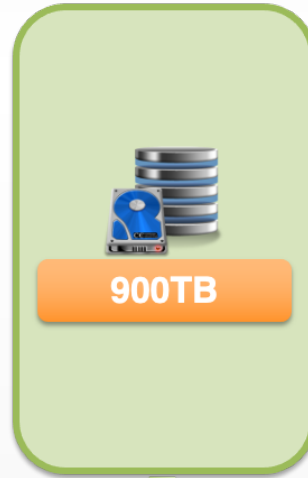
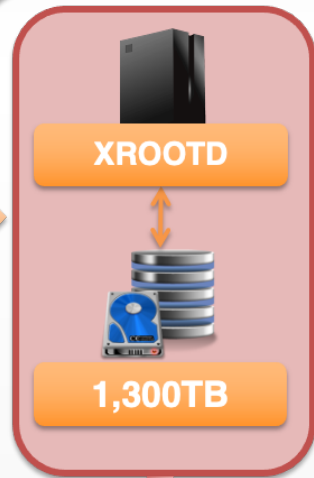
Introduction of Integrated System

- **Temporary idle resource generation due to system crowded according to the research schedule in the community**
 - Example) Workshop, Conference, Presentation
- **As the resource demand of the community continues to grow, a method for efficiently utilizing limited resources is required.**

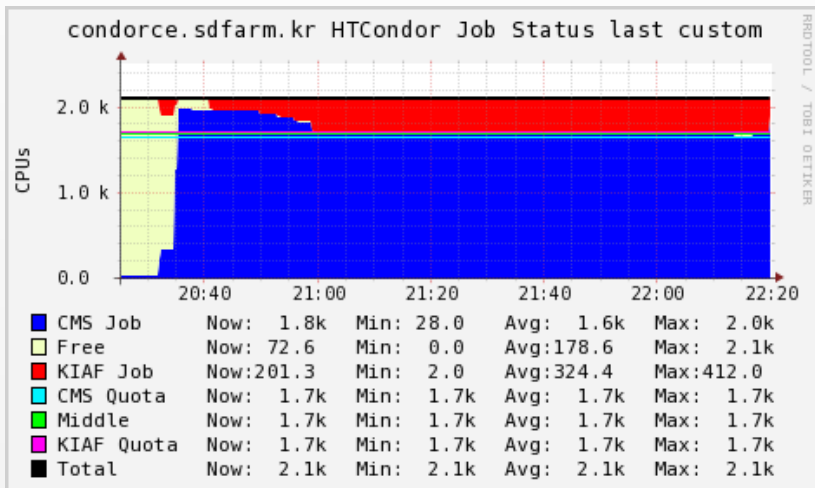
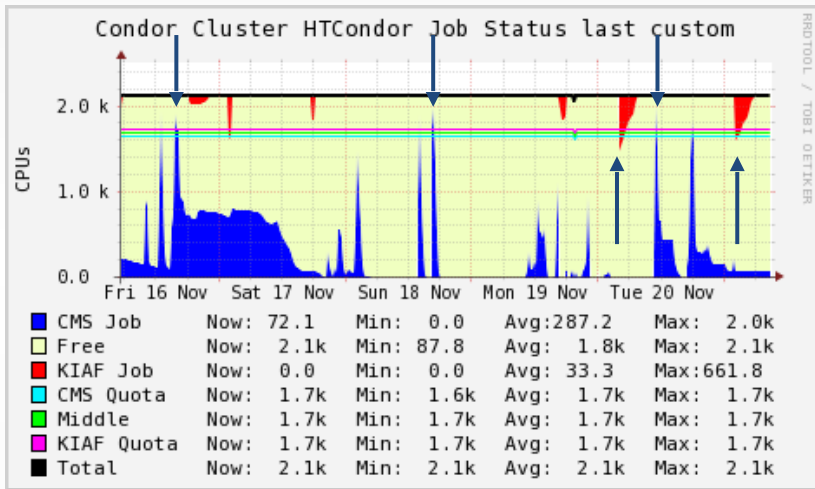


Solution :
Increase resource utilization efficiency by integrating resources between communities

Integrated Pool Structure



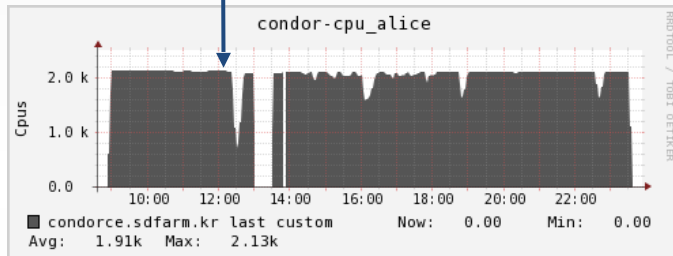
Job Processing Policy



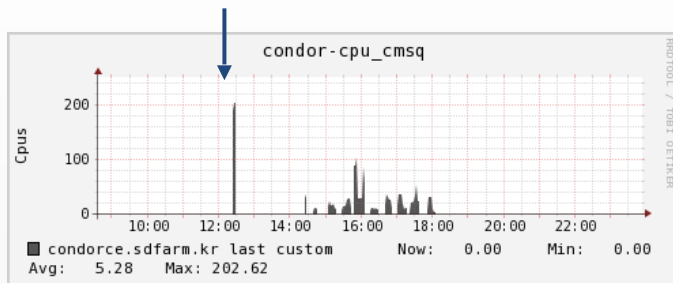
- **Unused resources can be used without restriction of any group**
 - Increase temporary idle resource efficiency
- **Ensuring the use of existing allocated resources among the consolidated resources**
 - Re-assigning by canceling the most recent operation among other use addition activities
- **Assign allocation priority according to slot memory size**
 - Increase dynamic allocation machine efficiency

Job Processing Scenario

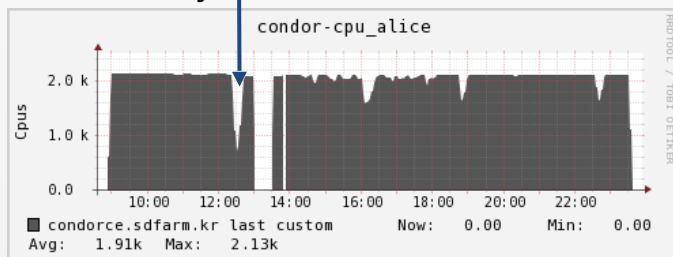
0. Run ALICE job



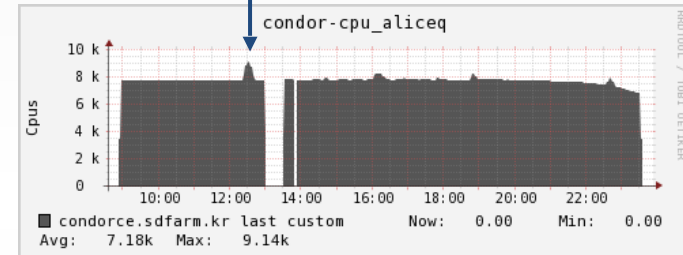
1. Submit a new CMS job



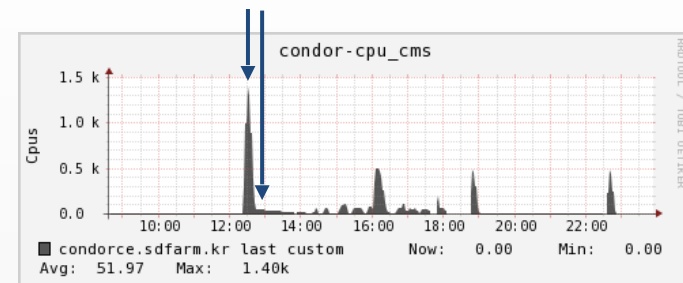
2. Canceling an existing ALICE job



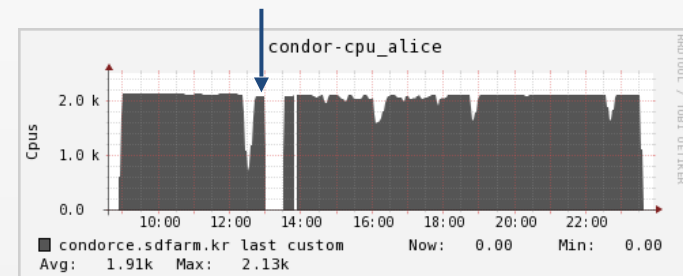
3. Canceled ALICE jobs are queued



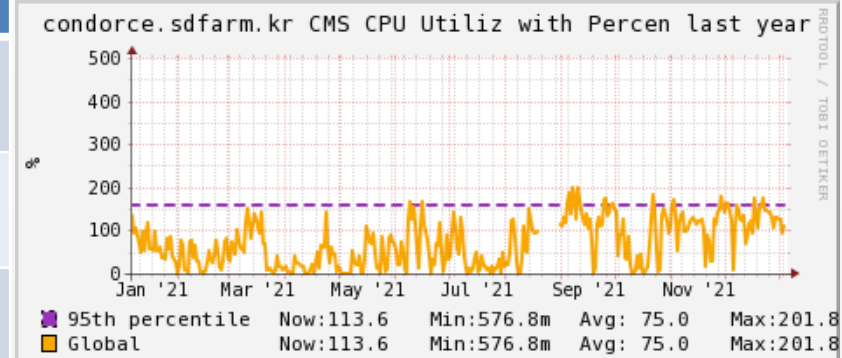
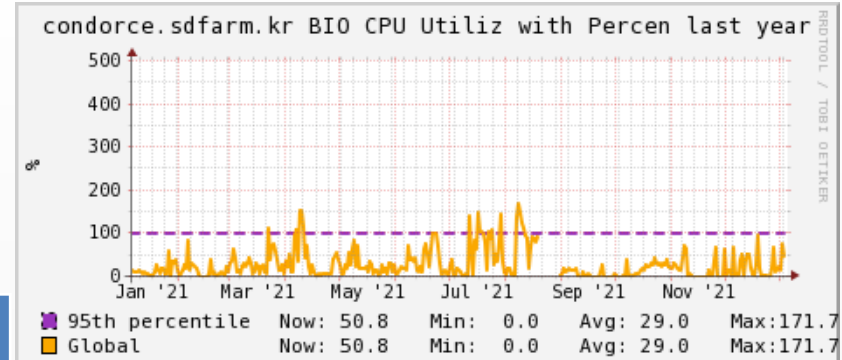
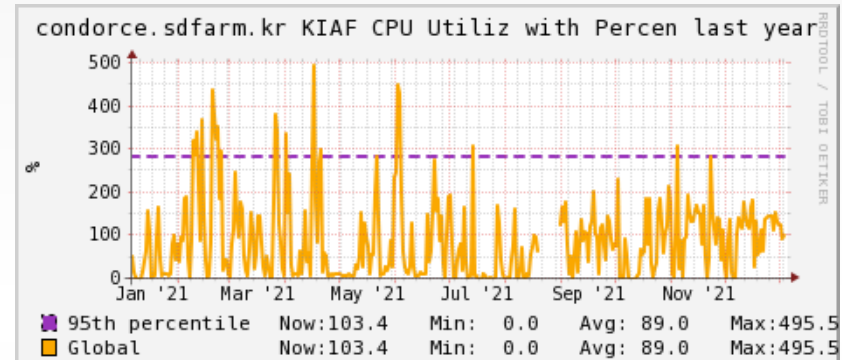
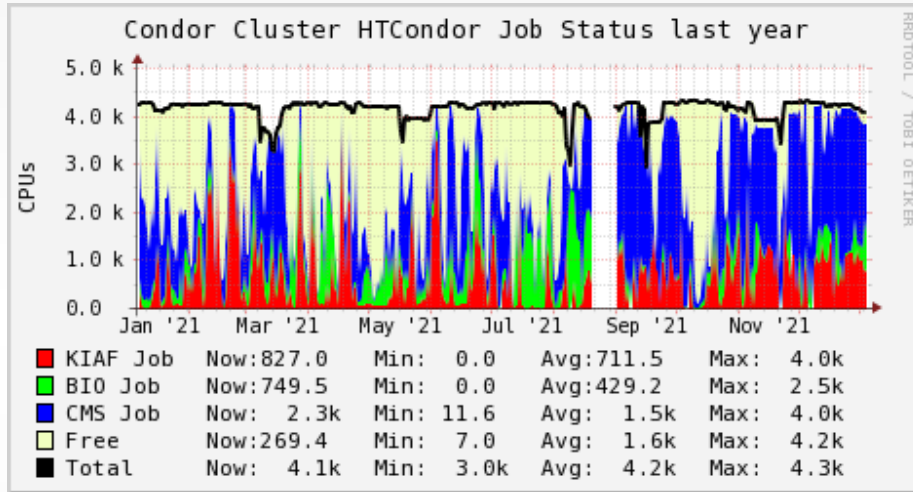
4. Execute and terminate the CMS job



5. Restart the ALICE job



Integrated Pool Operating Result



CPU 최대 활용률

	2019	2020	2021
KoALICE	527.0%	637.9%	495.5%
BIO	-	124.4%	171.7%
KCMS	127.4%	208.3%	201.8%

Operation Status

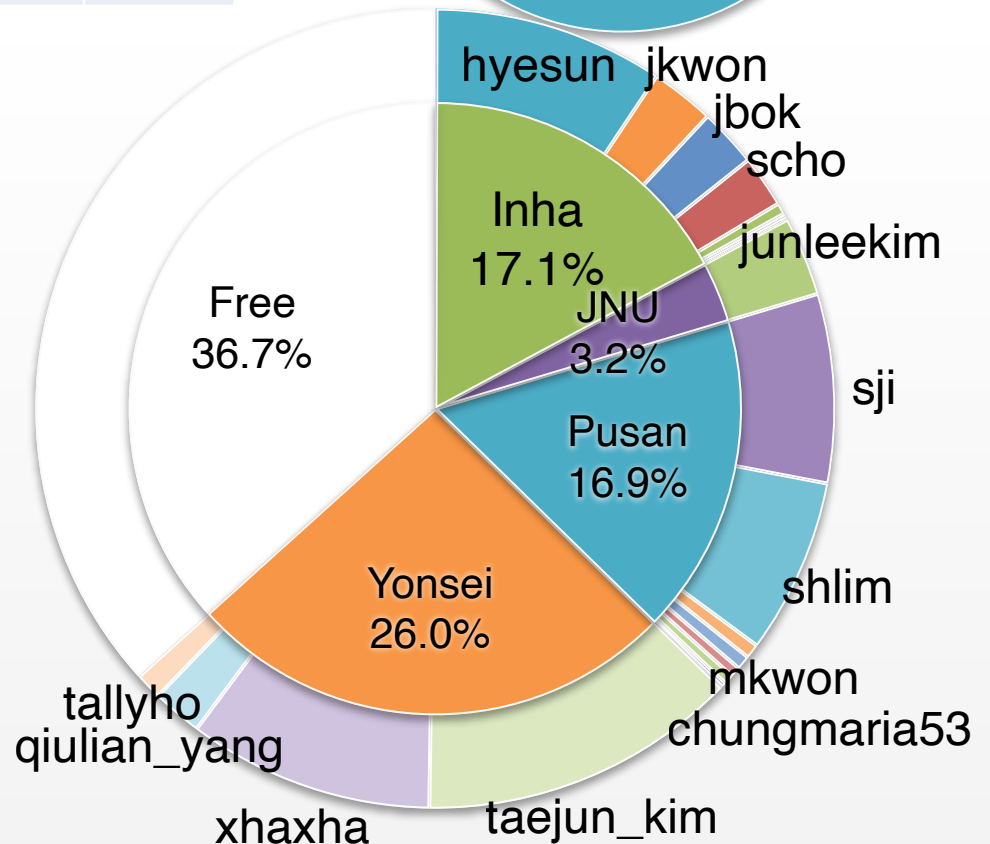
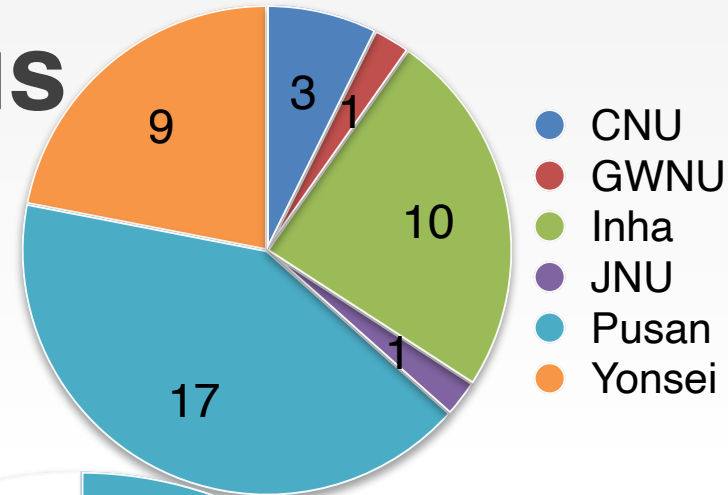
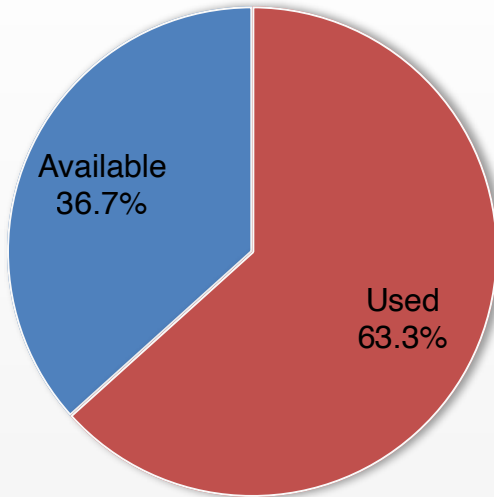
User Status

- User Accounts**

CNU	GWNU	Inha	JNU	Pusan	Yonsei	Total
3	1	10	1	17	9	41

- User Home Directory**

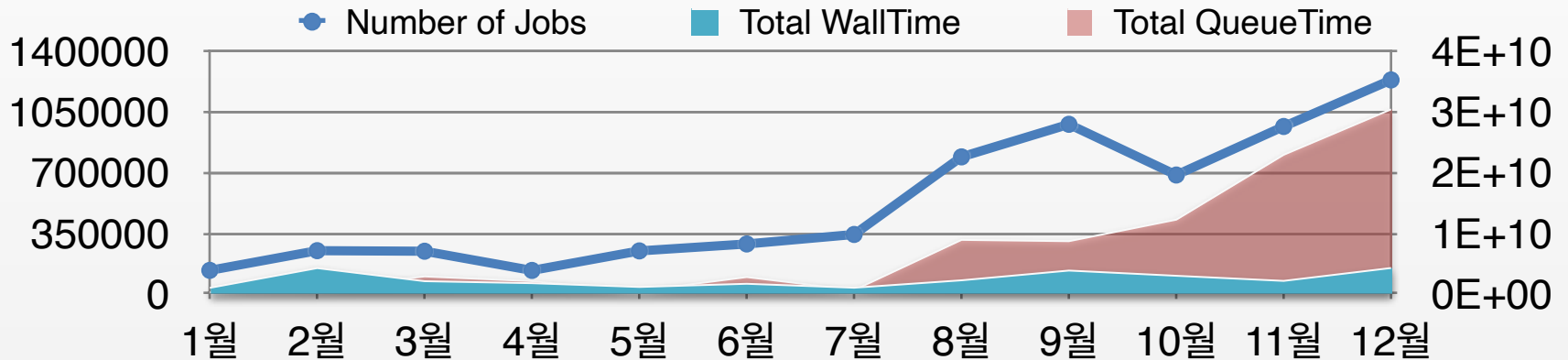
– 12.7TB / 20TB (63.6%)



Job History

2021	January	February	March	April	May	June
Number of Jobs	134,615	248,225	245,023	134,338	246,886	286,825
Total Wall time (s)	968,420,856	4,219,252,954	2,064,688,694	1,736,984,123	1,114,124,147	1,638,129,933
Mean Queue time (s)	1,683	3,122	11,615	15,345	1,827	9,561

2021	July	August	September	October	November	December
Number of Jobs	341,687	788,994	976,805	684,386	964,204	1,232,518
Total Wall time (s)	988,966,980	2,211,787,833	3,815,757,595	2,956,370,255	2,115,678,473	4,237,747,644
Mean Queue time (s)	1,740	11,239	8,858	17,826	23,734	24,637



User Usage (Total)

	JobCount	Total Wall time (yy:ddd:hh:mm:ss)	Total CPU time (yy:ddd:hh:mm:ss)	Total Queue time (yy:ddd:hh:mm:ss)
Inha	149,138	153y:299d:14h:38m:53s	82y:81d:14h:03m:04s	114y:242d:13h:47m:37s
jkwon	30,281	0y:306d:18h:21m:45s	0y:229d:23h:32m:05s	0y:27d:8h:43m:32s
jonghan	118,857	152y:357d:20h:17m:08s	81y:216d:14h:30m:59s	114y:215d:5h:04m:05s
JNU	47,878	18y:146d:23h:33m:32s	14y:284d:17h:44m:13s	8y:196d:11h:10m:11s
junleekim	47,878	18y:146d:23h:33m:32s	14y:284d:17h:44m:13s	8y:196d:11h:10m:11s
Pusan	1,253,208	239y:158d:17h:49m:15s	147y:73d:10h:20m:24s	205y:294d:17h:52m:20s
blim	271,961	42y:124d:17h:23m:35s	25y:311d:7h:08m:52s	81y:301d:14h:08m:17s
chungmaria53	19	0y:0d:1h:30m:31s	0y:0d:0h:00m:00s	0y:0d:0h:02m:39s
fbwogur0203	84	0y:4d:22h:48m:29s	0y:3d:23h:41m:01s	0y:1d:16h:10m:38s
mkwon	151,076	20y:315d:16h:34m:56s	4y:214d:16h:24m:53s	19y:259d:9h:42m:28s
shlim	600,058	160y:207d:18h:24m:07s	105y:337d:20h:32m:10s	63y:170d:23h:25m:59s
sjj	230,010	15y:235d:13h:07m:37s	10y:300d:14h:33m:28s	40y:291d:2h:22m:19s
Yonsei	4,834,272	250y:108d:4h:05m:38s	138y:81d:9h:19m:56s	2609y:189d:5h:20m:55s
taejun_kim	4,833,808	248y:116d:18h:07m:24s	136y:86d:15h:11m:13s	2609y:188d:13h:48m:21s
xhaxha	464	1y:356d:9h:58m:14s	1y:359d:18h:08m:43s	0y:0d:15h:32m:34s
Total	6,284,496	661y:348d:12h:07m:18s	382y:156d:3h:27m:37s	2938y:193d:0h:11m:03s

User Usage (Mean)

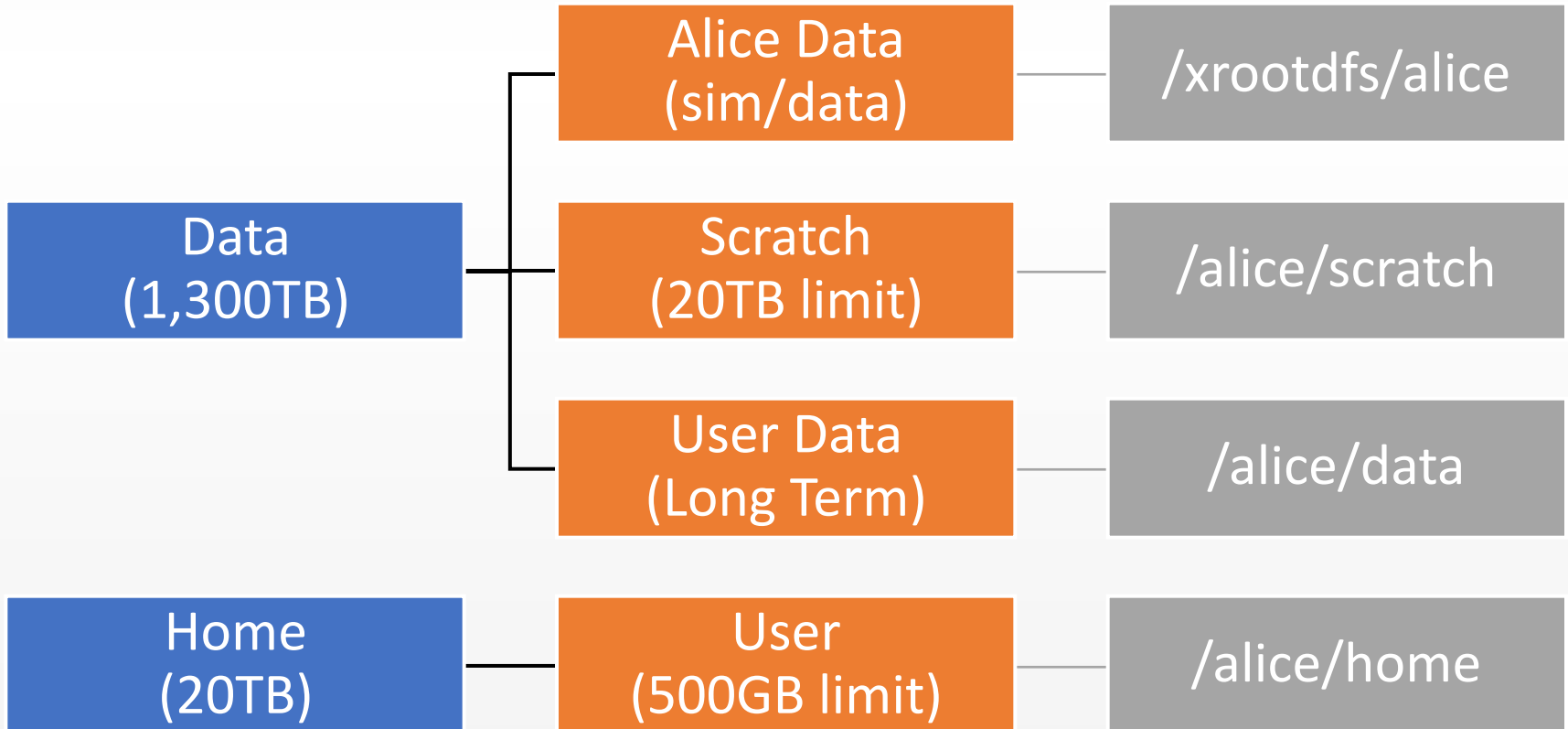
	JobCount	Mean Wall time (yy:ddd:hh:mm:ss)	Mean CPU time (yy:ddd:hh:mm:ss)	Mean Queue time (hh:mm:ss)
Inha	149,138	0y:0d:9h:02m:06s	0y:0d:4h:49m:47s	0y:0d:6h:44m:06s
jkwon	30,281	0y:0d:0h:14m:35s	0y:0d:0h:10m:56s	0y:0d:0h:01m:18s
jonghan	118,857	0y:0d:11h:16m:30s	0y:0d:6h:00m:49s	0y:0d:8h:26m:44s
JNU	47,878	0y:0d:3h:22m:01s	0y:0d:2h:42m:15s	0y:0d:1h:33m:44s
junleekim	47,878	0y:0d:3h:22m:01s	0y:0d:2h:42m:15s	0y:0d:1h:33m:44s
Pusan	1,253,208	0y:0d:1h:40m:25s	0y:0d:1h:01m:44s	0y:0d:1h:26m:19s
blim	271,961	0y:0d:1h:21m:50s	0y:0d:0h:49m:58s	0y:0d:2h:38m:08s
chungmaria53	19	0y:0d:0h:04m:46s	0y:0d:0h:00m:00s	0y:0d:0h:00m:08s
fbwogur0203	84	0y:0d:1h:24m:52s	0y:0d:1h:08m:21s	0y:0d:0h:28m:42s
mkwon	151,076	0y:0d:1h:12m:35s	0y:0d:0h:15m:58s	0y:0d:1h:08m:34s
shlim	600,058	0y:0d:2h:20m:39s	0y:0d:1h:32m:47s	0y:0d:0h:55m:36s
sji	230,010	0y:0d:0h:35m:45s	0y:0d:0h:24m:44s	0y:0d:1h:33m:14s
Yonsei	4,834,272	0y:0d:0h:27m:13s	0y:0d:0h:15m:02s	0y:0d:4h:43m:43s
taejun_kim	4,833,808	0y:0d:0h:27m:00s	0y:0d:0h:14m:49s	0y:0d:4h:43m:45s
xhaxha	464	0y:1d:13h:18m:53s	0y:1d:13h:29m:15s	0y:0d:0h:02m:01s
Total	6,284,496	0y:0d:0h:55m:22s	0y:0d:0h:31m:59s	0y:0d:4h:05m:46s

Storage Policy

KIAF 스토리지

스토리지 내 배분

KIAF 서버 내 경로

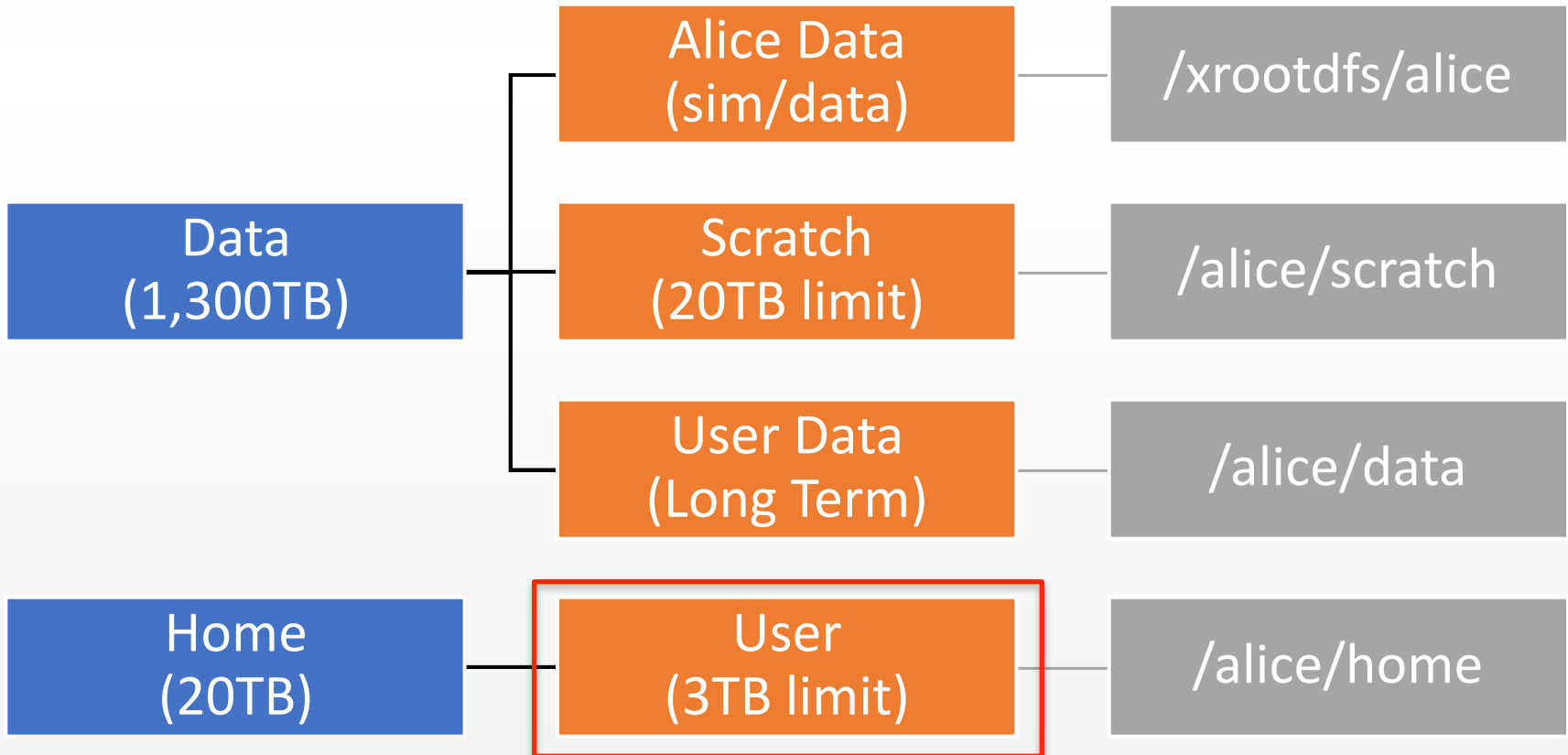


Storage Policy

KIAF 스토리지

스토리지 내 배분

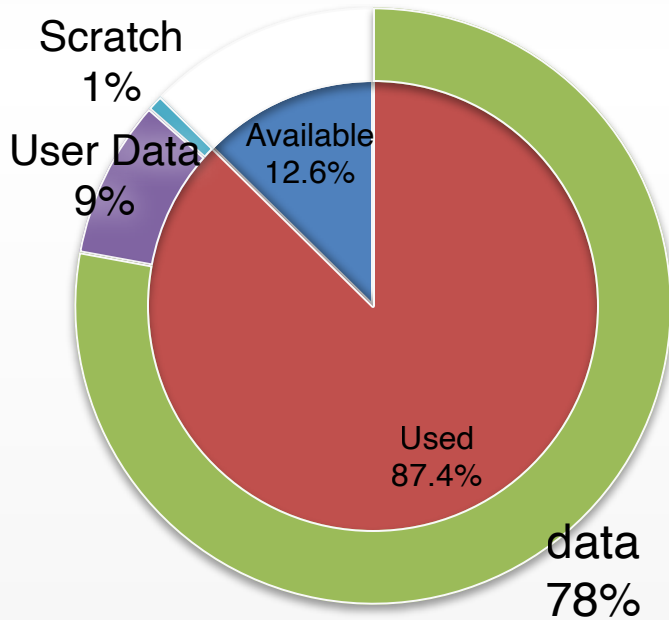
KIAF 서버 내 경로



Storage Usage

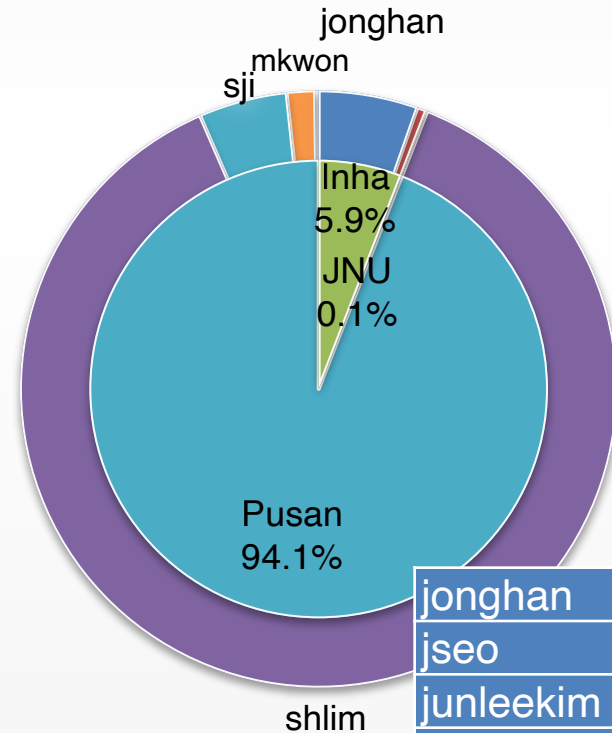
- Data Directory**

- 1,136.3TB / 1,300TB (87.4%)



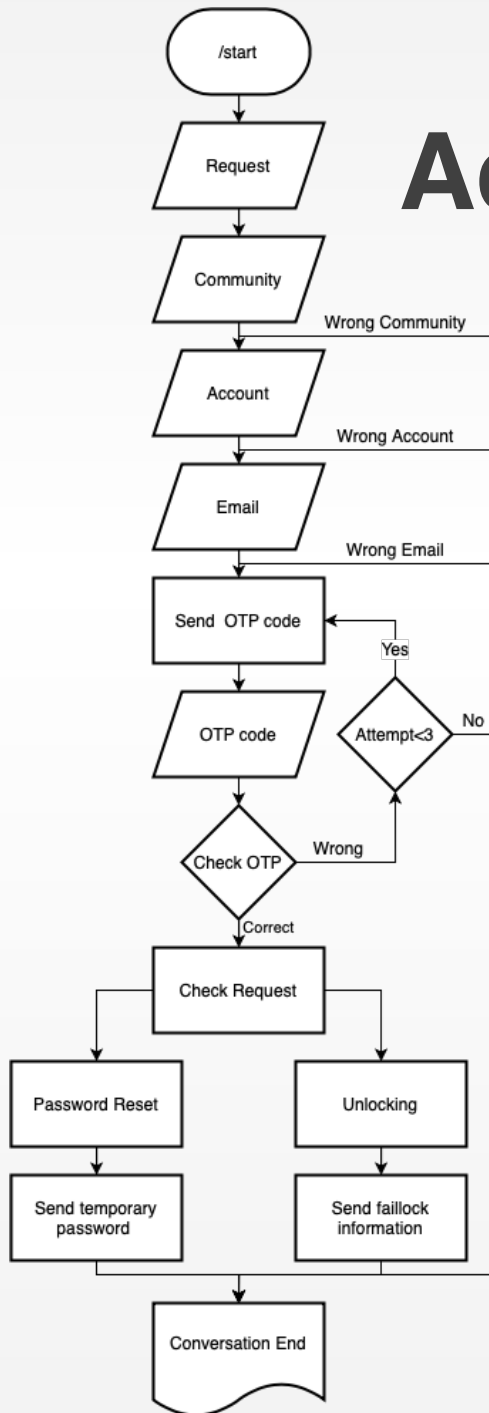
data	1012.89TB
User_data	111.87TB
Scratch	11.52TB

- User Data Directory**



jonghan	6.01TB
jseo	569.51GB
junleekim	72.01GB
shlim	97.94TB
sji	5.37TB
mkwon	1.71TB
fbwogur0203	220.44GB
ckim	1.35GB

Account Manage Bot



■ Telegram @GSDCAccountBot

- Start by /start
- Choose { Reset password | Unlocking account }
 - Reset password
 - Unlocking account
- Check your account information
 - community = ALICE
 - ID = User ID
 - email = Registered Email when creating an account
- Enter the OTP code sent by email
 - *You will be given 3 chances, if wrong, send a new code
- Request processing

/start 3:15 AM ✓

Hello! My name is GSDC Bot. What can I do for you?

Please select your request from the list below.

Send /cancel to stop talking to me. 3:15 AM

Unlocking account 3:15 AM ✓

Ok, I help you to unlocking your account.

First, what is your community name? 3:15 AM

ALICE 3:15 AM ✓

OK, You are a member of ALICE.

Do you remember your ID? Please, enter your ID. 3:15 AM

kong91 3:15 AM ✓

Ok, Confirm your user name.

Please enter your email address that you told me when you signed up. 3:15 AM

kong91@kisti.re.kr 3:15 AM ✓

The email address you entered matches the information we know.

You will receive OTP code on your email to identify.

The OTP code is valid for 5 minutes. 3:15 AM

Please, enter the OTP code to proceed. 3:15 AM

962464 3:15 AM ✓

OTP code is correct. Now, we unlocking your account. 3:15 AM

I quit this conversation. Please, send '/start' if you want to restart. 3:16 AM

Manage Bot Demo

보낸사람

gsdc-support@kisti.re.kr

Unlocking account

2022-01-04 03:19:19



kong91:

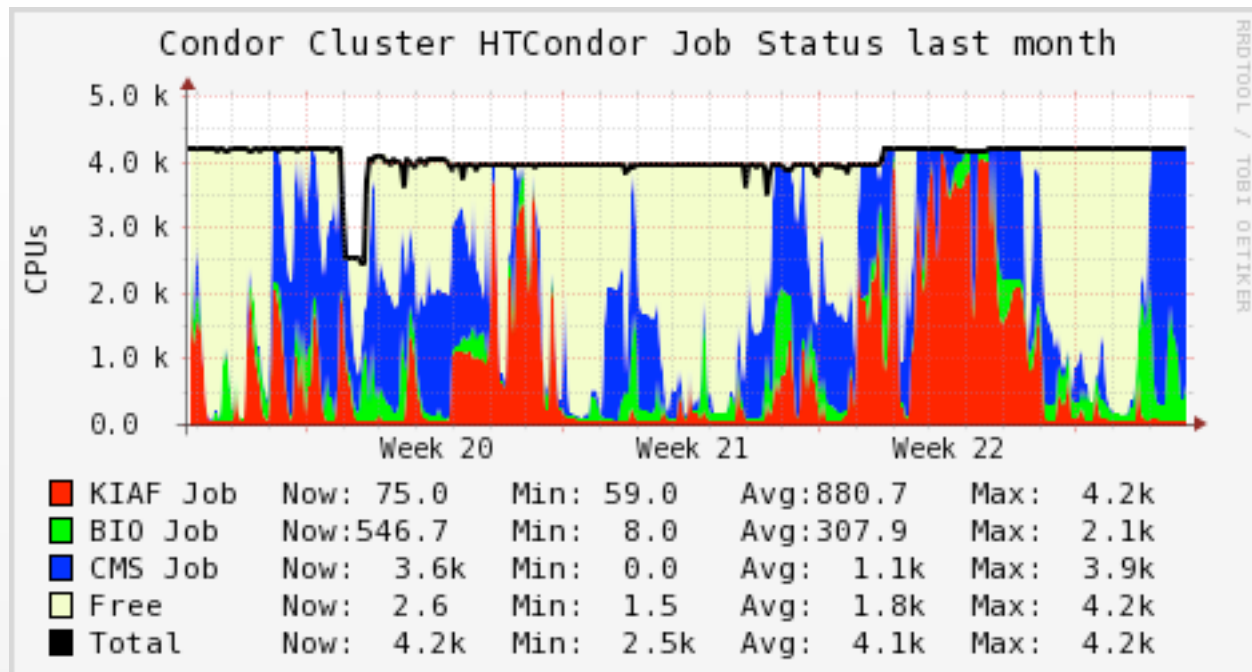
When Type Source Valid

2022-01-04 03:18:25 RHOST 1 [redacted] 1 V

2022-01-04 03:18:27 RHOST 1 [redacted] 1 V

HTCondor Pool Report

- 5 files under /pool/report (jpg)
 - 6month, 3month, month, week, day
 - Hourly update



Alice Environment

- **kiafenv command**
 - `~/alice_env/alice_env.conf`

```
export ALICE_ROOT_VERSION="v5-07-20-4"  
export ALIPHYSICS_VERSION="vAN-20180810-1"  
export CVMFS_PACKAGES_VERSION="O2::nightly-20210813-2"
```

- **Priority**
 1. **CVMFS_PACKAGES_VERSION**
 2. **ALIPHYSICS_VERSION**
 3. **ALICE_ROOT_VERSION**

Data Staging & Staging List

- **DataList**

- **OLD**

- **[simldata]_[period]_[Run_number+pass]_[FileType].txt**
 - ex) **sim_LHC18f4b_259868_AOD.txt**
data_LHC18r_000297132_pass3_AOD252.txt

- **New**

- **Human readable List (AliDPGRunLists + [pass, FileType])**

LHC16d pass2

For definition see AliDPGRunListsDef

Memento of runlist creation [LHC16dpass2runlist.pdf](#)

v1 of pass2 has been done to have all 2016 pp periods reconstructed with the same AliPhysics version. In all CentralBarrelTracking lists 1 run has been removed wrt v0.

Name	Detector Requirement: RCT flag 1	Comment
pass2 processing		18 runs
v0		timestamp 20200701
v1		timestamp 20210901
RunList_LHC16d_pass2_Tracklets.txt	SSD SPD SDD V0	18 runs
RunList_LHC16d_pass2_CentralBarrelTracking.txt	SSD SPD SDD V0 TPC	17 runs
RunList_LHC16d_pass2_CentralBarrelTracking_hadronPID.txt	SSD SPD SDD V0 TPC TOF T0	17 runs
RunList_LHC16d_pass2_CentralBarrelTracking_electronPID.txt	SSD SPD SDD V0 TPC TOF TRD T0	17 runs
RunList_LHC16d_pass2_CentralBarrelTracking_calor.txt	SSD SPD SDD V0 TPC EMC	0 runs

Farm Management

- **Fortnightly KIAF User Meeting @ Zoom**

- Next Meeting January 19th 17:00(KST)

- Link : <https://cern.zoom.us/j/62365377766?pwd=NmZzYIB4T0lteWtMcTNCQThnQk8wdz09>

- Agenda

- KIAF Operation

- User Feedback

- Use policy

- **KIAF User Guide**

- **Contact**

- `kiaf-support@kisti.re.kr`
`dataset-request@kisti.re.kr`

- OR

- `gsdc-support@kisti.re.kr`, but title begin with [ALICE]

THANK YOU
