



# ATCF7 Summary Report

7th meeting @ Jeju-do, South Korea  
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# ATCF7

- The 7th series of Asia Tier Center Forum
- Co-located with KREONet Workshop 2023
- Sponsors: KREONet, SUT, CU, PMUB
- 37 registered participants (+3 remote)
- 13 institutes from 7 countries



- SUT(TH), Chulalongkorn U.(TH), Rajamangala University of Technology Isan (TH), \*BRIN(ID, former LIPI), VECC(IN), TIFR(IN), IHEP(CN), Hiroshima U.(JP), ICEPP(JP), KEK(JP), CERN(CH), KISTI(KR)


























\* Remote





# List of Asian sites

- 20 sites from 9 nations
- Mostly LHC sites
  - 2 T1s : ALICE (KISTI), LHCb (IHEP)
- Non-LHC sites
  - 2 T0s : Belle II (KEK), JUNO (IHEP)
  - 2 T2s : LIGO (KISTI, IUCAA)

	Site Name	Nationality	City	VO
1	CUHK	China	Hong Kong	
2	IHEP		Beijing	   
3	Lanzhou		Lanzhou	
4	Wuhan		Wuhan	
5	Kolkata	India	Kolkata	
6	TIFR		Mumbai	
7	IUCAA		Pune	
8	Cibinong	Indonesia	Cibinong	
9	KEK	Japan	Tsukuba	
10	Hiroshima		Hiroshima	
11	ICEPP		Tokyo	
12	Tsukuba		Tsukuba	
13	KISTI	South Korea	Daejeon	  
14	UPM	Malaysia	Seri Kembangan	
15	COMSATS	Pakistan	Islamabad	
16	NCP		Islamabad	
17	ASGC	Taiwan	Taipei	
18	NCHC		Hsinchu	
19	CUNSTDA	Thailand	Bangkok	
20	SUT		Nakhon Ratchasima	



# ATCF WG

- A dedicated group formed to discuss practical challenges and required actions for LHC/non-LHC sites in the region
  - WG members: Andria Arisal and Syam Budi Iryanto (BRIN), Masahiko Saito (ICEPP), Brij Jashal Kishor and Puneet Kumar Patel (TIFR), Vikas Singhal (VECC) and Sang-Un Ahn (KISTI)
- Outlined strategies to build a sustainable support model:
  - Continued support to ATCF related activity: information exchange, sharing knowledge, inviting experts
    - Drafting a new site guideline based on site operation experiences
  - Pursuit and development of common technologies
    - A common repository for sharing common tools and useful tips via CERN GitLab
  - Trying inter-country S&T cooperation programs for funds
  - Active engagement in communication with WLCG or similar scientific computing collaboration



# Experiments

- Belle II
  - Long-shutdown since July 2022, plan to restart in Jan 2024
  - Asian contributions to compute & storage resources
    - CPU: JP 16.3%, CN 2.1%, KR 0.7%, TW 0.4%, IN 0.2%
    - DISK: JP 14.8%, CN 1.5%, KR 0.5%, TW 1.0%
  - 5 sites on LHCOPN, 30% of sites on LHCONE covering 80% of Belle II CEs and SEs
  - Smooth integration and operation of RUCIO
- ALICE
  - 43 PB of Pb-Pb data taken in 2023 (4 PB of Pb-Pb @ RUN1+2)
  - Asian contribution to CPU: 6% (KR 2.74%, JP 1.5%, IN 1.45%, TH 0.18%)
  - Moved to multicore processing, whole-node queue preferred



# WLCG DC24

- Shared the status of DC24 preparation, requirement and schedule (just a week before DC24 workshop happened)
- No active involvement in DC24 identified among ATCF7 participants
  - Inputs to them (mostly T2s) need to be defined



# Site Report (1/4)

- TH - SUT
  - Actively involved in ALICE physics program (post-doc, phd students)
  - A small site but steady one
  - In discussion with CERN server/storage donation program
- ID - BRIN
  - Newly formed national research agency including LIPI
  - Lots of effort done to integrating compute resources owned by different institutes
  - Re-enabling a grid site for ALICE and planning to deploy EOS as a disk storage



# Site Report (2/4)

- JP - KEK
  - Providing compute and storage resources for experimental particle physics experiments conducted in Japan
  - Current system procured in 2020 - 4/5-year of all hardware replacement cycle
    - ~50% of total resource capacity increase from 2016; 20~30% of capacity improvement foreseen at the next term in 2024
  - Recent shift to WebDAV for data transfer, performance degradation observed
    - Some issues on switch redundancy configuration identified and resolved
- JP - ICEPP
  - One of the biggest T2 for ATLAS: contributing 4% of CPU, 3% of DISK
  - Migration from DPM to dCache (15 PB) completed in Mar 2023
  - Upgrade HTCondor from 8.8.x to 10.0.x
  - Well established monitoring and alerting framework
  - Positive to publish their automation code based on Ansible



# Site Report (3/4)

- IN - TIFR
  - One of the largest T2 for CMS: contributing about 10% of CPU & DISK
  - Requested and expected upgrade of network from Mumbai to Geneva for Hi-lumi LHC up to 40G
    - To be shared by other Indian institutes including VECC T2 for ALICE
  - Successful migration from DPM to dCache
  - Published working configurations of HTCondor/HTCondor-CE in the context of ATCF WG
- IN - Kolkata
  - One of the oldest T2 for ALICE operated for 15 years: contributed software development and technical site supports
  - Early adapter of EOS RAIN configuration on disk storage
  - Acting as a main role in Grid India Project



# Site Report (4/4)

- CN - IHEP
  - Host institute of various fundamental research activities in China
  - A newly proposed T1 for LHCb
  - Large scale of EOS deployment for disk storage ~ 62 PB
  - Migration from DPM to EOS completed in May 2023
- KR - KISTI
  - Smooth operation of T1 for ALICE including disk-based archival storage powered by EOS
    - Upgrade of EOS v4 to v5 completed in June 2023
  - Plan to migrate Grid services onto container based orchestration framework
  - HPC integration for ALICE experiment in progress

# Networking

- CERN
  - T0 status: PDC site, hundreds of Gbps LHC DAQ links, QC initiatives
  - LHCOPN: 3 New T1s - IHEP (CN), NCBJ (PL) and LHEP (CH)
  - LHCONE: DUNE joins, updates on VPN peering in AP region, R&D projects for DC24
- KREONet
  - Expanding to CERN and Singapore with 100G for LHCONE
    - Upgrade of LHCOPN to 100G before start of Hi-lumi LHC Runs
- TEIN - Excuses



# Special session - HPC/QC

- ICEPP
  - Experiences on using HPCs in University of Tokyo (operated by ITC) as ATLAS T2 Grid resources
    - Oakbridge-CX - using fat singularity container to deploy ATLAS application (no external connection from HPC workers) via shared FS
    - Wisteria/BDEC-01 - ARM architecture CPU manufactured by FUJITSU needing to optimize HEP applications, e.g. GEANT4
  - QC testbed in Quantum Hardware Test Center in UTokyo, joined worldwide QC initiatives
    - Various QC researches being conducted such as parton shower simulation, QED simulation, Quantum neural network, Quantum circuit optimization, Qutrit, Annealing, Qubit sensor (HW development)
- KISTI
  - R&D effort and SW development on classical simulation of quantum circuits using HPC
  - National project for 50-qubit quantum computer (circuit-based) launched in 2022
    - Consortium: KRISS (hosting the quantum computer), UNIST, SKKU and KISTI
    - KISTI R&R: Quantum Circuit SDK & MPI-backend for classical simulator, Cloud service framework, Algorithm/theory R&D using HPC

# Conclusion

- Continued support and participation from Asian sites
  - Sites' operations in good shape and individual efforts on the prep for RUN4 and beyond in line with experiments' requirements
- Slow start of making progress in support model
  - Drafting a new site guideline
  - Publishing automation tools and working configurations
  - Communication via Mattermost channel, mailing, ATCF WG meetings
- To be discussed how well integrated with DC24 and any other activities within WLCG



**Thank you**