



NSTC 國家科學及技術委員會
National Science and Technology Council



SCALE & NSTCCore 核心設施 User Committee Meeting

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Computing Core Facility Is an Integral Part of the Research Infrastructure

- **Core facility for the scientific computing and big data analysis, funded by AS from Jan 2023 (2nd 2-year term)**
 - 4M/yr, hardware and travel could be applied separately
- **NSTCCore is funded by NSTC for the R&E communities of Taiwan from June 2023 (3-year term project)**
 - ~27M/yr including 70% hardware (CPU & storage mainly) fund.
- **Vision: accelerating scientific discovery with growing scientific computing capacity**
 - **User-oriented, service-based approach**
 - **Flexible collaboration models and customized services are strategic focus**
 - **Reliability and efficiency are primary objectives**
 - **Integrated platform of data, algorithm and computing**
 - **Besides hardware, service and HR are of the equal importance**

Services and Resources

16K CPUCores, 213 GPU, 27 PB Disk, 500+ Host, 5PB Transferred/Yr

ASGC (4,352 -> 6,272 Cores) Collocated Resource

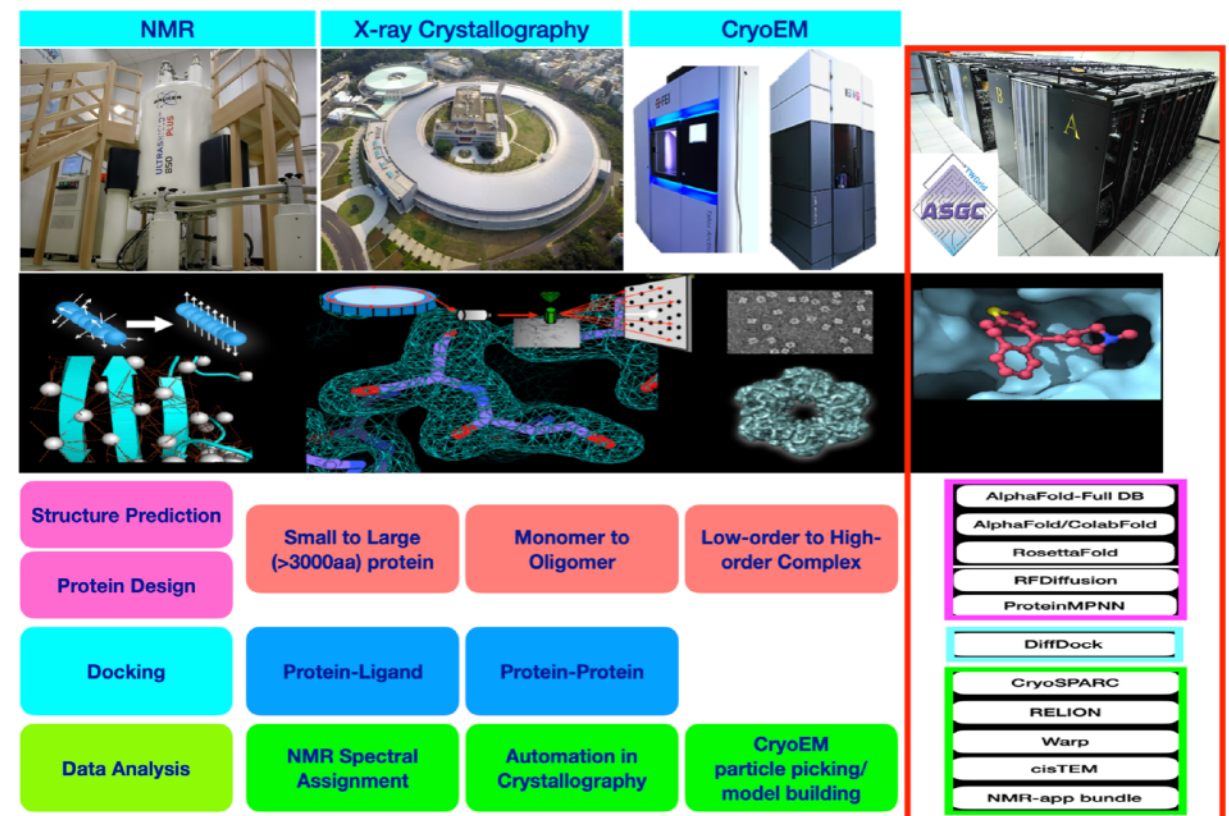
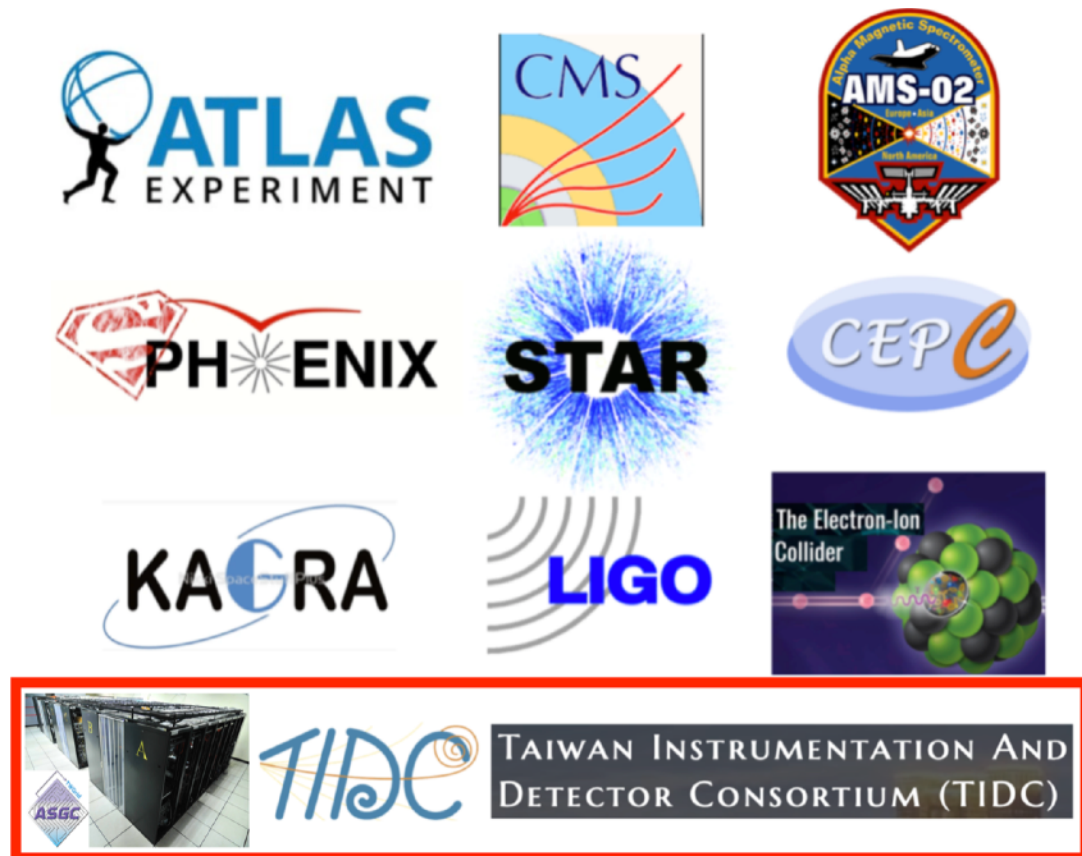
	Cluster	Spec	CPUCore/ GPUBoard	CPUCore/ GPUBoard	Total	
CPU	EDR1	AMD Genoa 9654	3,840	8,532	12,884	Supporting batch, DiCOSApp (SaaS) service CPU usage: >50% growth; GPU Usage: 30% growth
	Intel-G4	Intel Xeon 6448H	512			
GPU	A100	8 GPU/Server, 80GB	24	28	52	
	L40S	4 GPU/Server, 48GB	4	1	5	
	4090	8 GPU/Server, 24GB	16		16	
	3090	4 or 8 GPU/Server, 24GB	56		56	
	V100	8 GPU/Server, 32GB	48		48	
	P100	4 GPU/Server, 32GB	16		16	
Storage	Disk (PB)	CephFS	12.0	8.7	21	
	Tape (PB)	LTO9 (18TB/tape)	10	0	10	
WLCG	CPU		648		648	Incl. SaaS, PaaS, UI and VM/K8S Services
	Disk (PB)	3x EOS Servers	5		5	
Core Services	CPU		1,048		1,048	Cost \$/kWh 2025 is ~20% higher than 2024
	Storage		4.3		4	
Power Usage 2025 (Sep)		kWh (monthly average)			236,172	
		Cost (monthly average)			NTD\$ 966,602	
		%	59.5%	40.5%		

ASGC 2025 procurement plan: 1,920 CPUCores (AMD 9645), 3PB disk, and 1x RTX Pro 6000(8) 3

Flexible Collaboration Model: User-Driven, Service Oriented

707 User Accounts in 203 PI Groups, from 30 Institutes

- Pay-as-you-go
- Resource Integration:
 - Collocation: ASIAA, IOC, IOP
 - Buy-In: IOP, TIDC/NTU, IBC
- Service Hosting
- Reservation
- Experiment & Collaboration support
- Advanced Service: Web Application and portal, efficiency tuning, workflow optimization, customization, hands-on training
- User Engagement : weekly User Meeting, User Committee, dissemination & outreach



Capacity Building

- User community engagement with flexible collaboration model
 - Understanding user requirements and supporting workflow integration
 - (Cross) domain activities: TPS, Chem, TWSIAM, hands-on in workshop, etc.
- Supporting user access to ASGC services easier and enhance application efficiency
- Training and workshop/conference: 300+ participants in 2025
- Core technology and international collaboration: ISGC

Work Shops



ISGC 2025 (Mar 16-21)

Basic

- 30min – full day
- Get access, details of using compute, data and SaaS services, w/o hands-on, User Forum

Thematic

- 1 hrs – full day
- Discipline-based Data analysis
- ICT topics: GPU Computing, AI, CPU Trends

Domain-Specific Workshop

- 30min – 3hrs
- Supporting hands-on, w/o ASGC service introduction

Conference

- ISGC (International Symposium on Grids & Clouds, since 2002)
- HEPiX, CHEP (Computing in High Energy Physics)
- APAN (Asia Pacific Advanced Network) 5



New Services

- **2-factor authentication: from Jan 2025**
- **Supporting user to make a local copy: rsync, SCP**
- **Tape system data backup and archive**
- **Cloud Storage: sync & share**
- **FileSender: secure & trustworthy web services for file sharing**
- **eduGAIN through Taiwan Access Federation (TWAF)**
- **NCHC collaboration is strengthening**
 - **After the meeting in June 2025, we will enhance the support to scientific computing requirements of Taiwan together**
 - **e.g., migration of large jobs, resource federation, user community support, etc.**

Challenges: Sustainability

- **Target: growing Users x Service x Resource, with reliability and efficiency**
- **Demands of Funding agencies: clearly division of the two core facilities**
 - AS: 補貼非中研院經費之使用費收入
 - NSTCCore: 使用費收入需繳庫
- **Short of advanced GPU resource: budget, scientific computing support are key issues**
- **Pricing strategy**
 - Baseline: covering power consumption (including data center operation)
 - Will rely mainly on data services and advanced services
- **Data Center reliability: 20 years old**
 - Power system upgrade
 - Energy efficiency
 - Upgrade for higher power consumption & liquid-cooling computing hardware in the near future
 - Deployment & R/D on Intelligent monitoring & control
- **High-price electricity cost**
- **Improving system efficiency**
 - Intelligent monitoring & control
 - Improving users' experience, and reducing the waiting time
- **HR & Capacity building: enhancing professional skills according to user needs and ICT progress**
 - Have to catch up/support evolving needs of scientific computing and AI applications
 - Hard to have backup HR for key technologies
 - User support needs more investment
 - Uncompetitive ecosystem

Future Events

- Inauguration of CECAM-TW (30-31 Oct. 2025)
 - ASGC/IOP is one of the initiator
 - CECAM-TW: Centre Européen de Calcul Atomique et Moléculaire
- 自然科學簡訊採訪: mid-Nov 2025
 - Welcome users sharing their research outcomes
- Delivery of new hardware: by end of 2025
 - 1,920 CPUCores, 3PB disk storage, 8x or 16x RTX Pro 6000 GPU
- Proposal for the next term NSTCCore fund
 - Call for pre-proposal will be announced in Nov. 2025
- Proposal for the next term SCALE fund
 - Have to be submitted by mid-March 2026
- Workshop at CHiP+TIDC NMNS: 5-7 Jan, 2026
- Taiwan Physics Society 2026: 13-15 Jan, 2026
- ISGC 2026: 15-20 March, 2026
- Expecting more domain/society-specific events

Welcome to ISGC2026 in Taipei

- 15 - 20 March 2026
- Theme: Trustworthy Infrastructures and AI for Global Open Science
- Keynote speech, Asia Partner Updates, and workshop/session are major components
 - Security workshop, sessions of HEP, Grid & Clouds, Networking, infrastructure and AI, Hybrid Quantum Computing are typical arrangements. Domain-specific workshop or sessions are also welcomed
 - Environmental Computing Workshop, etc.
- Call for sessions and abstract are open until 17 Nov. 2025
- <https://indico4.twgrid.org/event/64/>
- Contact: ISGC Secretariat
 - vhuang@as.edu.tw



INTERNATIONAL SYMPOSIUM ON GRIDS & CLOUDS (ISGC) 2026

15-20 March 2026

Academia Sinica, Taipei, Taiwan

*Trustworthy Infrastructures and AI for Global Open Science
– Enabling Data Sovereignty and Secure Research Collaboration*

可信賴的基礎設施與人工智慧，推動全球開放科學 — 實現資料主權與安全的研究合作

CALL FOR ABSTRACTS

<https://indico4.twgrid.org/event/64/abstracts/>

Deadline (截止日期) : 17 November 2025 (2025 年 11 月 17 日)

Home



Call for Abstract



Scientific Topics

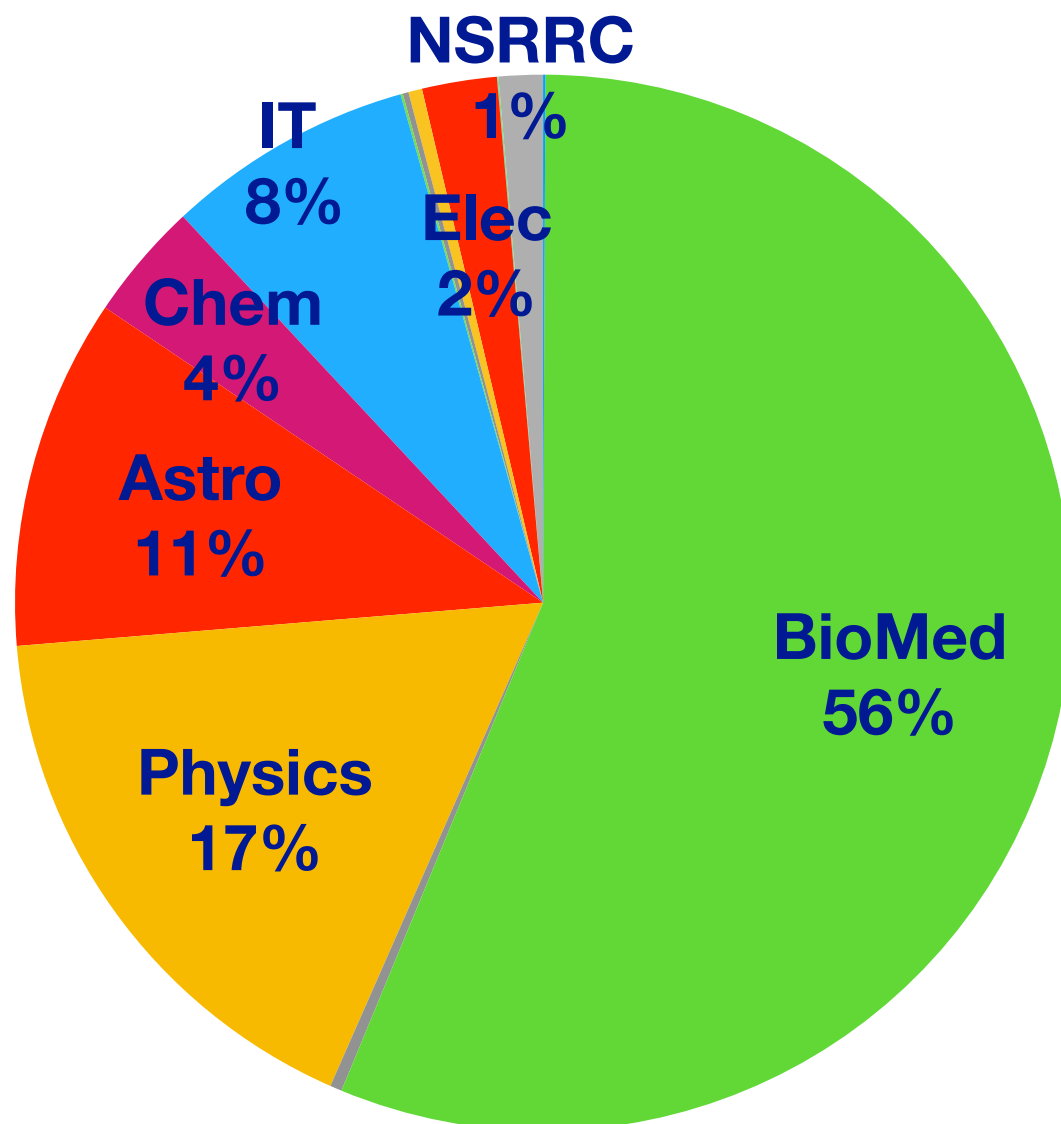


References

CPU/GPU Usage in 2025 (till end of Oct 2025)

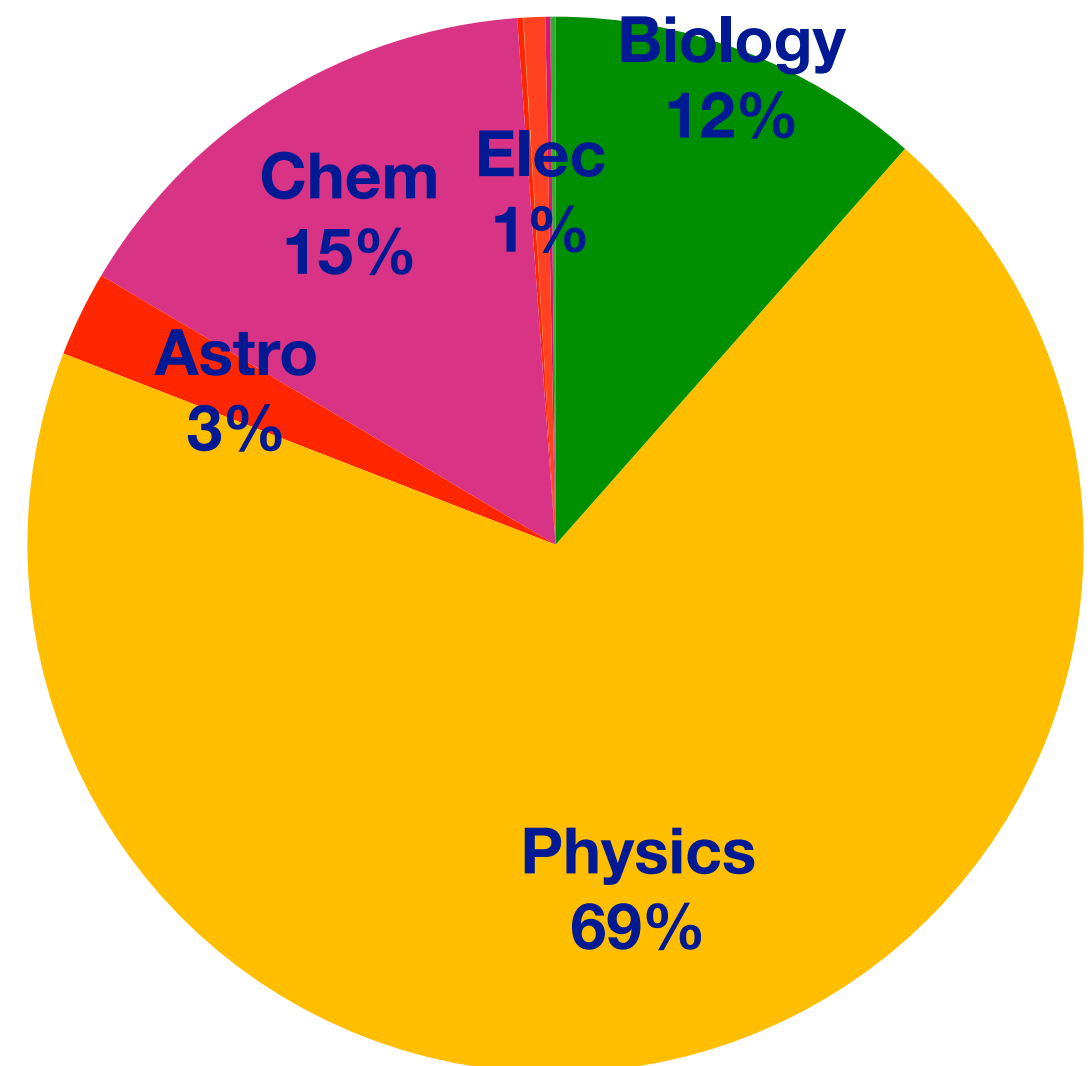
- **GPU Usage Distribution**

- 1.92M SRU in total



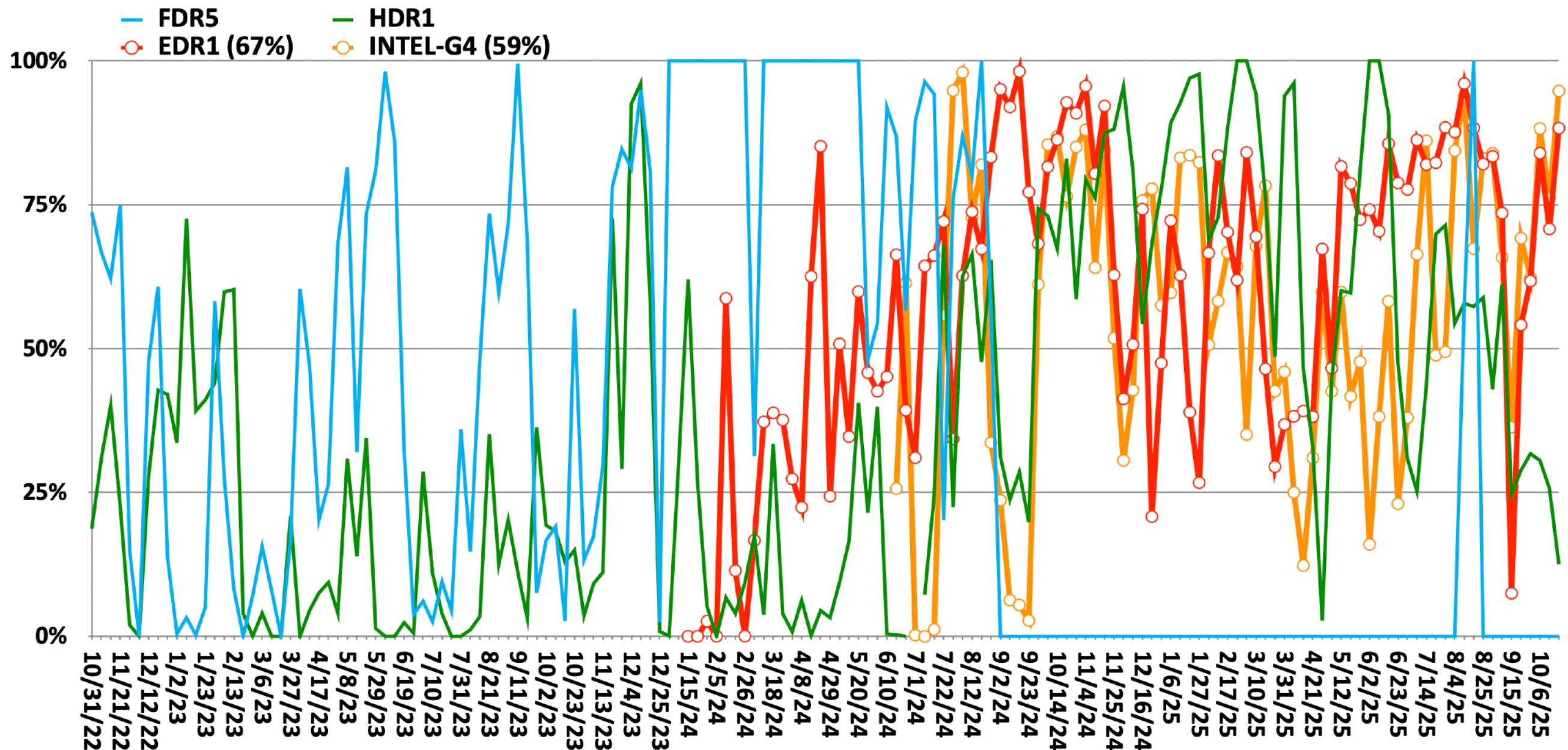
- **CPU Usage Distribution**

- 1.15M SRU in total



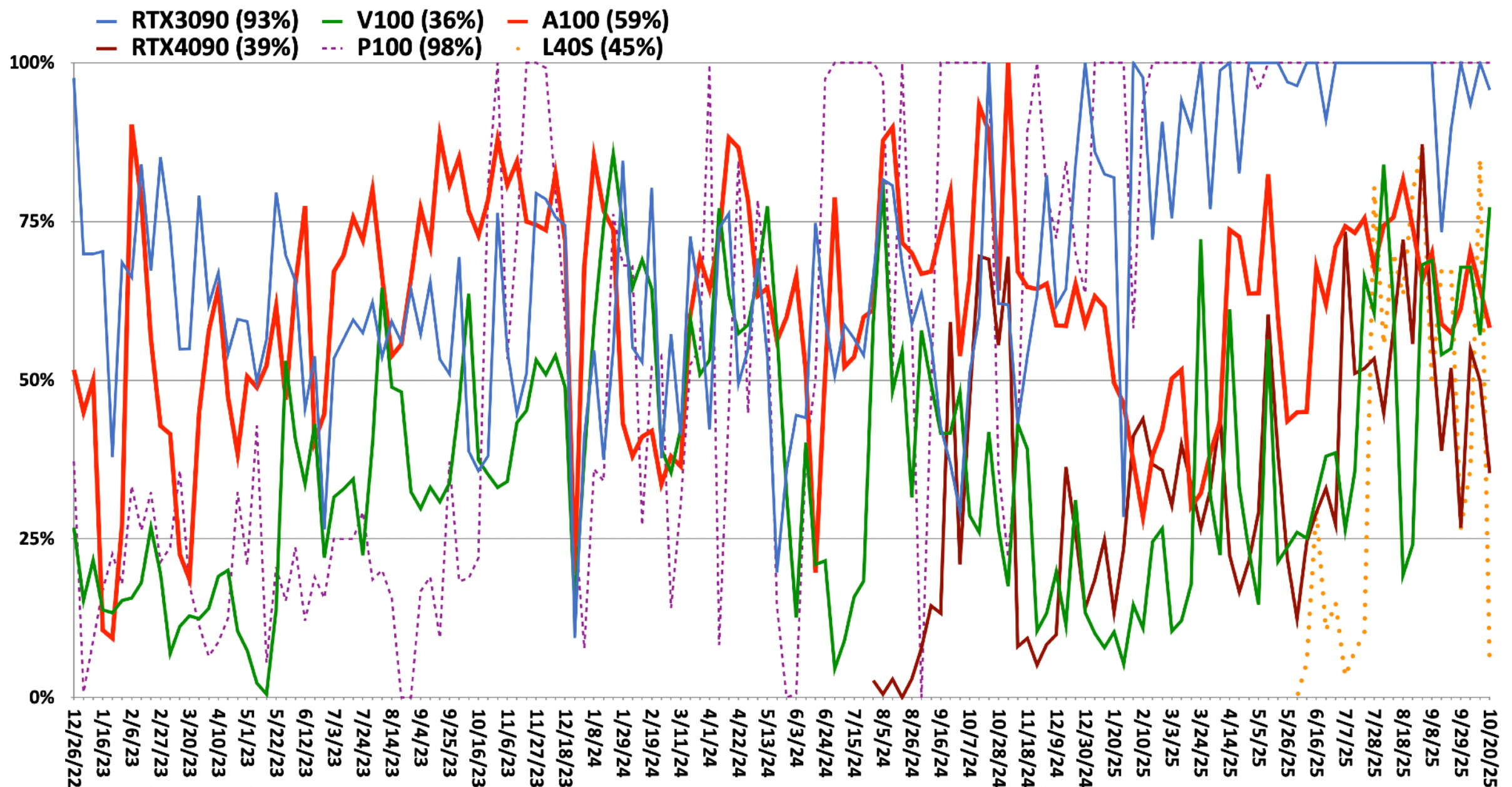
CPU Resource

- >1.5x growth (CPUCore-days), comparing the usage in 2025 with 2024
- Usually, queueing time is < 1hr, unless
 - 3.75M jobs running in 6 months, average job CPU time is (1.3, 52.5)min, by 1 user/team
 - Multiple teams are running O(1000) 192Core-jobs
 - O(10K) 20cores-jobs, by 1 user/team
 - Insists using >100 (half or the whole CPU Cores in a node) for a job without worrying the waiting time

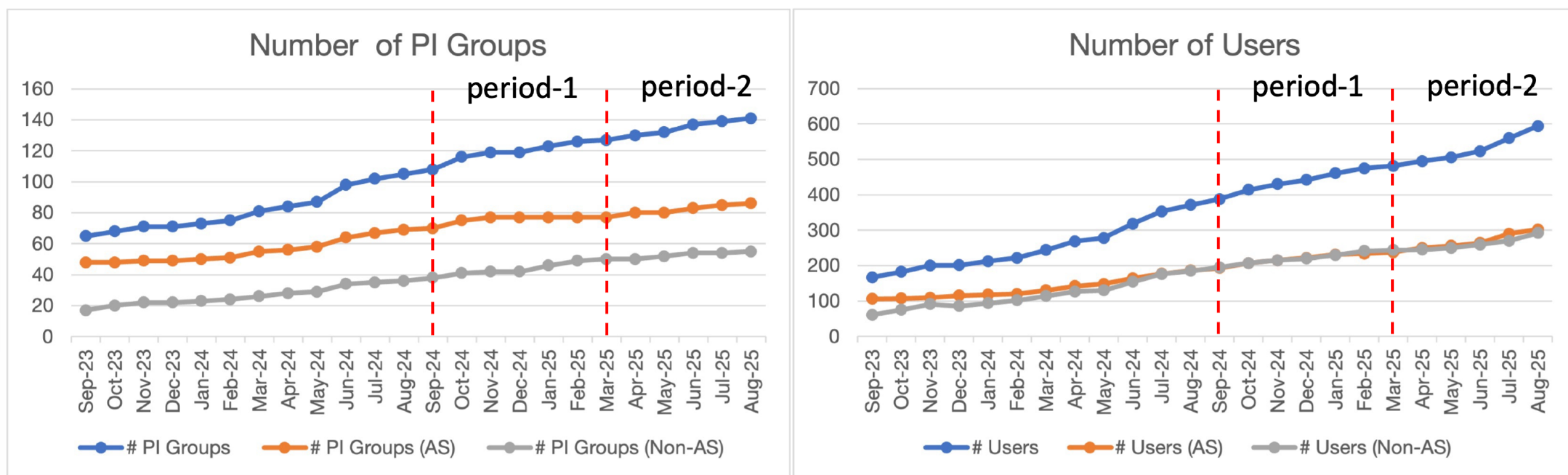


GPU Resource

- ~28% growth (SRU), comparing the usage in 2025 with 2024
- High onboard memory (80GB) and NVLink in A100 are still valuable
- Try to acquire new GPU architecture (Blackwell RTX PRO 6000) for users to test/validate annually
- Migrating to GPU and trade off between double and lower precision are still barriers



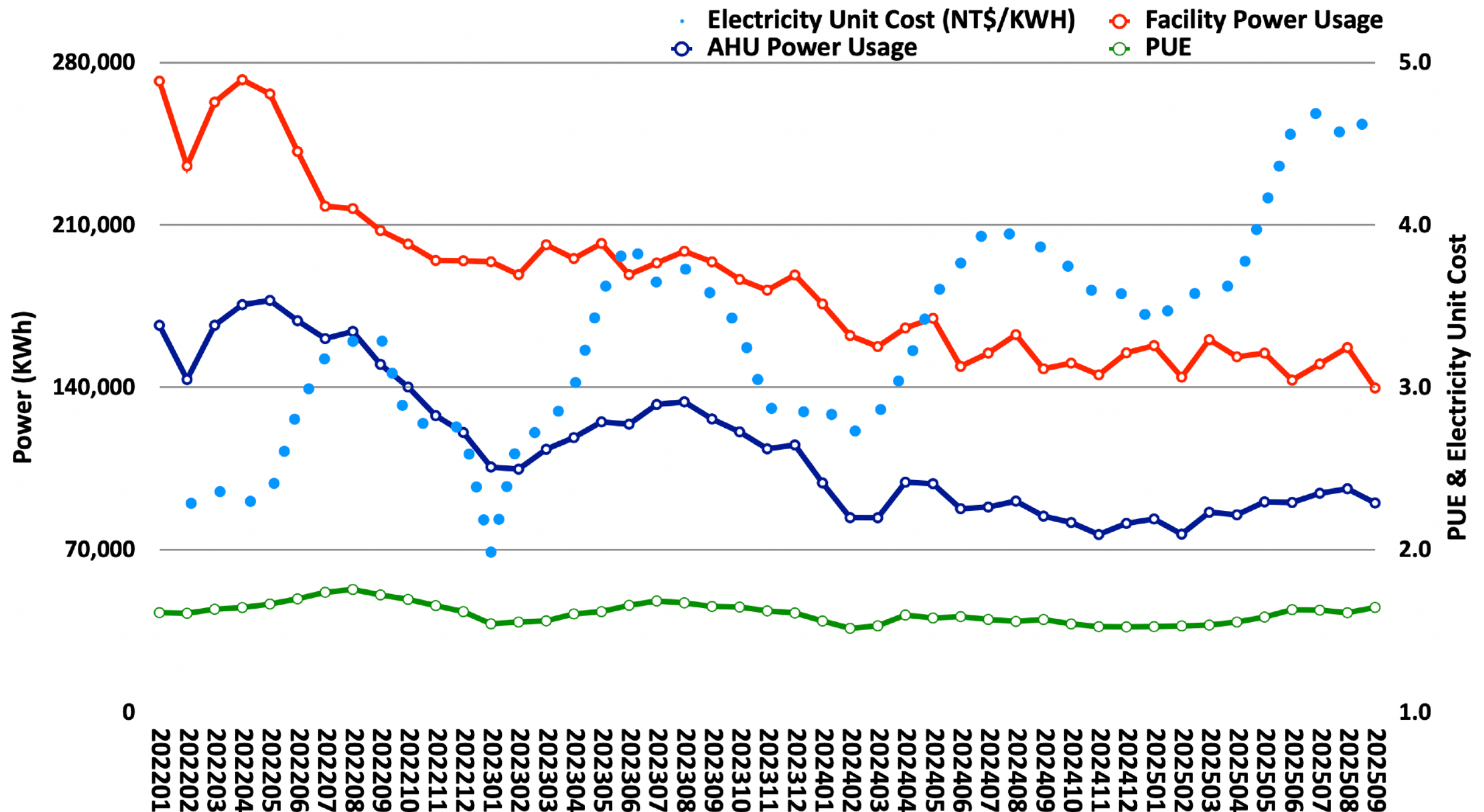
Growth of PI Groups and Users



- There is a steady increase in the number of PI groups and users registered to use the Core Facility
 - 707 User Accounts in 203 PI Groups, from 30 Institutes (till 30 Oct. 2025)

Unit Cost of Electricity Is ~20% Higher in 2025

- Electricity unit cost in 2025 (monthly average, till end of Sep) is 4.09/kWh, which is 51% higher comparing to 2022
- Both facility and cooling power usage decrease by > 20% in 2023 and 2024
- The power usage in 2025 keeps having 5% drop
- PUE (2025) is 1.58, which maintains the same level as in 2024 (1.56)



Promotional and Training Events in 2025

Event	Location	Date	# of Attendance
TPS 2025 (Annual Meeting of Taiwan Physics Society 2025), with training workshop	14-16 January 2025	National Sun Yat-Sen University	~40
TAML (Telescope Array Machine Learning) 2025 Workshop	Academia Sinica	March 25-29 2025	~40
User Training Workshop for NSTCCore Computing Service	National Biotechnology Research Park, Academia Sinica	April 10th, 2025	25
114年化學學門整合型計畫成果發表暨媒合交流研討會 (link)	National Taiwan University	April 26th, 2025	111
TWSIAM Annual Meeting 2025	National Tsing Hua University	7-8 Jun 2025	~30
Genomic Epidemiology Workshop	Academia Sinica	July 21-25 2025	150
Summer Student Program	Institute of Physics, Academia Sinica	August 13, 15, 2025	27
User Training Workshop for NSTCCore Computing Service	National Tsing Hua University	October 15th, 2025	26
Telescope Array Data Analysis & Machine Learning Workshop 2025 (TADAML 2025)	Academia Sinica	15-17 Oct 2025	~30

Resources

CPU Cluster	Spec	Total CPU Cores	GB RAM/ Core	Performance (TFLOP/Server (MPI))	Performance (TFLOP/Core)	Price per Core-Day	Remarks
EDR1	AMD Genoa 9654	3,840	8	6.85	1.1	1.2	1. 20 Nodes now 2. +1,920 cores (AMD 9645) by end of 2025
Intel-G4	Intel Xeon 6448H	512	8	4.3	1	1.4	

GPU Cluster	Spec	Total GPU-Boards	GPU RAM (GB)	Architecture	Performance (TFLOP/GPU)	Price per GPU Day	Proc Date	Remarks
L40S	4 GPU/Server	4	48	Ada Lovelace		70	Dec 2024	Low power use
4090	8 GPU/Server	16	24	Ada Lovelace		60	Jul 2024	
3090	4 or 8 GPU/Server	56	24	Ampere		40	Dec 2020	
A100	8 GPU/Server	24	80	Ampere		120	Jun 2020	Best VRAM, DP
V100	8 GPU/Server	48	32	Volta		35	Dec 2018	
P100	4 GPU/Server	16	32	Pascal		8	Dec 2017	

Disk	Disk Capacity (TB)	System			Price	Remarks
Ceph File System	12,000	Online storage managed by Ceph distributed file system, with (8, 3) erasure coding			1,000 per TB-year	+3PB by end of 2025
Tape Lib System	10,000	LTO9 (18TB/Tape)			300 per TB-year	Service from 2025

Price of Service

CPU計算服務				
機器名稱	機器規格	計費單位(Per Core/Board-Day) 價格(NTD)	國內非學術單位使用者	國外學術單位使用者
intel-g4	Intel(R) Xeon(R) Gold 6448H	1.4	加計 50%	加計 50%
EDR1	AMD Genoa 9654 @2.4GHz	1.2		
HDR1	AMD Rome 7662 @2.0GHz	1		
GPU計算服務				
A100	NVIDIA A100	120	加計 50%	加計 50%
L40S	NVIDIA L40S	70		
RTX4090	NVIDIA RTX-4090	60		
RTX3090	NVIDIA RTX-3090	40		
RTX3090 (Dedicated for ASCEM user)	NVIDIA RTX-3090	40		
V100	NVIDIA V100	35		
P100	NVIDIA P100	8		
1080Ti	NVIDIA GTX-1080Ti	1		
儲存與擷取服務				
--	\$1000 NTD/TB-Year		加計 20%	加計 50%
--	\$3 NTD/TB-Day			
資料傳輸				
--	目前未納入計費			
進階服務				
--	依據所需人時計算。額外需開發之軟體、系統或使用介面等，將另按工時計費(每 168 man-hr 為 NT\$ 120,000)			

<https://nstccore.twgrid.org/access.php#pricing>

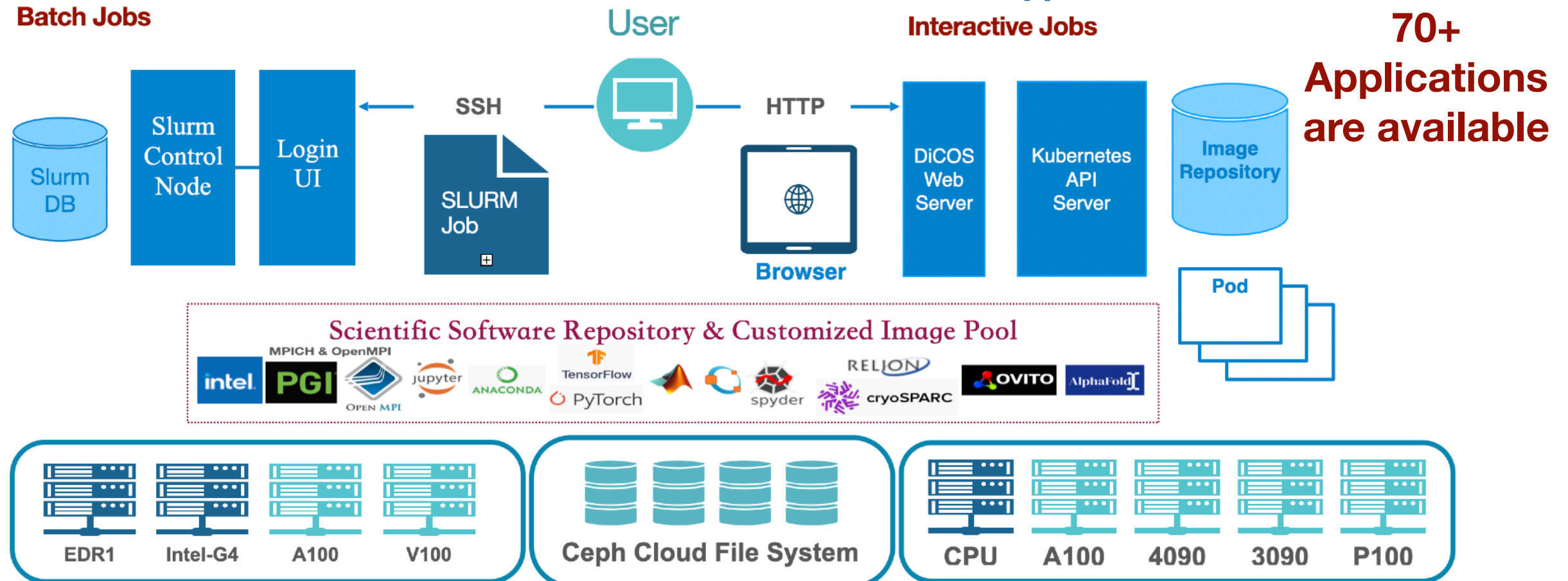
Computing Services:

Optimization of Application and System Efficiency

- HTC/HPC & Cloud Computing Platform
- Integration of computing model and software
- Research data workflow and management
- Information security
- Application efficiency
- Customized IaaS, PaaS, and SaaS

HPC platform
Slurm System Architecture
Batch Jobs

Software-as-a-Service Web-based Cloud Platform
DiCOSApp SaaS Architecture
Interactive Jobs



NSTCCore Services 聯絡資訊

- **Core Facility Services**
 - <https://nstccore.twgrid.org>
 - <https://scale.grid.sinica.edu.tw/index.php>
- **ASGC Web Site: <https://www.twgrid.org>**
- **Access to ASGC Resources**
 - <https://dicos.grid.sinica.edu.tw/>
- **Contact point: DiCOS-Support@twgrid.org**
- **Gentle Reminder**
 - Please include ASGC (Academia Sinica Grid-computing Center) in the acknowledgement when research outcomes that relied on ASGC resources, services or expertise are presented in your research.