

# Access to High Performance AI Computing (HPAIC)

Benefits for Participants of  
Open-Source GenAI Grand Challenge

In Partnership with C-DAC

Oct 2024



nasscom





nasscom



# C-DAC Partnership: An Overview

In April 2023, the Telangana Government and Centre for Development of Advanced Computing (C-DAC), facilitated by Telangana AI Mission (T-AIM), launched a partnership to offer AI startups unparalleled access to advanced AI computational resources. This initiative supports startups linked with T-AIM, powered by nasscom, to nurture a dynamic AI startup ecosystem in Telangana.

Startups will leverage C-DAC's cutting-edge supercomputing facilities, bridging the gap between innovative AI concepts and their practical application, empowering groundbreaking exploration and innovation.



nasscom



# The Benefits

AI Startups participating in this grand challenge will gain exclusive access to:

- High-performance computing facilities of C-DAC equipped with the latest AI-specific hardware.
- The opportunity to refine their AI models on an advanced computational platform.
- A rich resource of data management and analytics tools to accelerate research and development.
- There would be **no charges levied for the first 500 GPU Hours**. These **GPU Hours are valid for six (6) months**.
  - The period of six months, for any startup, will commence from the date when they receive access to the National AI Facilities (AIRAWAT-PSAI System).
  - **After the expiry of 500 GPU Hours of credit OR expiry of the 6-month period, further usage will be charged as per the charging model.**



nasscom

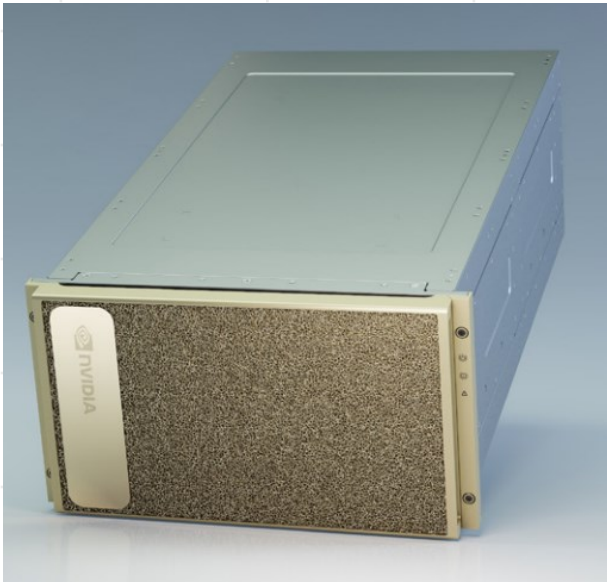


# About AIRAWAT-PSAI System

- AIRAWAT-PSAI is an **82-node cluster of NVIDIA DGX-A100** systems with HDR200 Gbps InfiniBand Interconnect and with peak computing power of **410 PF(AI)** and peak computing capacity of 13.77 PF (DP), and sustained computing power of **8.5 PF (DP)**.
- NVIDIA DGX-A100 systems are the compute nodes, allocated through the SLURM HPC scheduler, and 10.5 PiB Lustre PFS-based high-performance storage has been made available as shared storage on all the nodes.
- Each node has **8 NVIDIA A100** Tensor Core GPUs, Dual socket AMD EPYC 7742 64C 2.25GHz CPU, **320 GB GPU memory**, and **1 TB system memory**.



# Hardware Specs



[Refer datasheet for details](#)

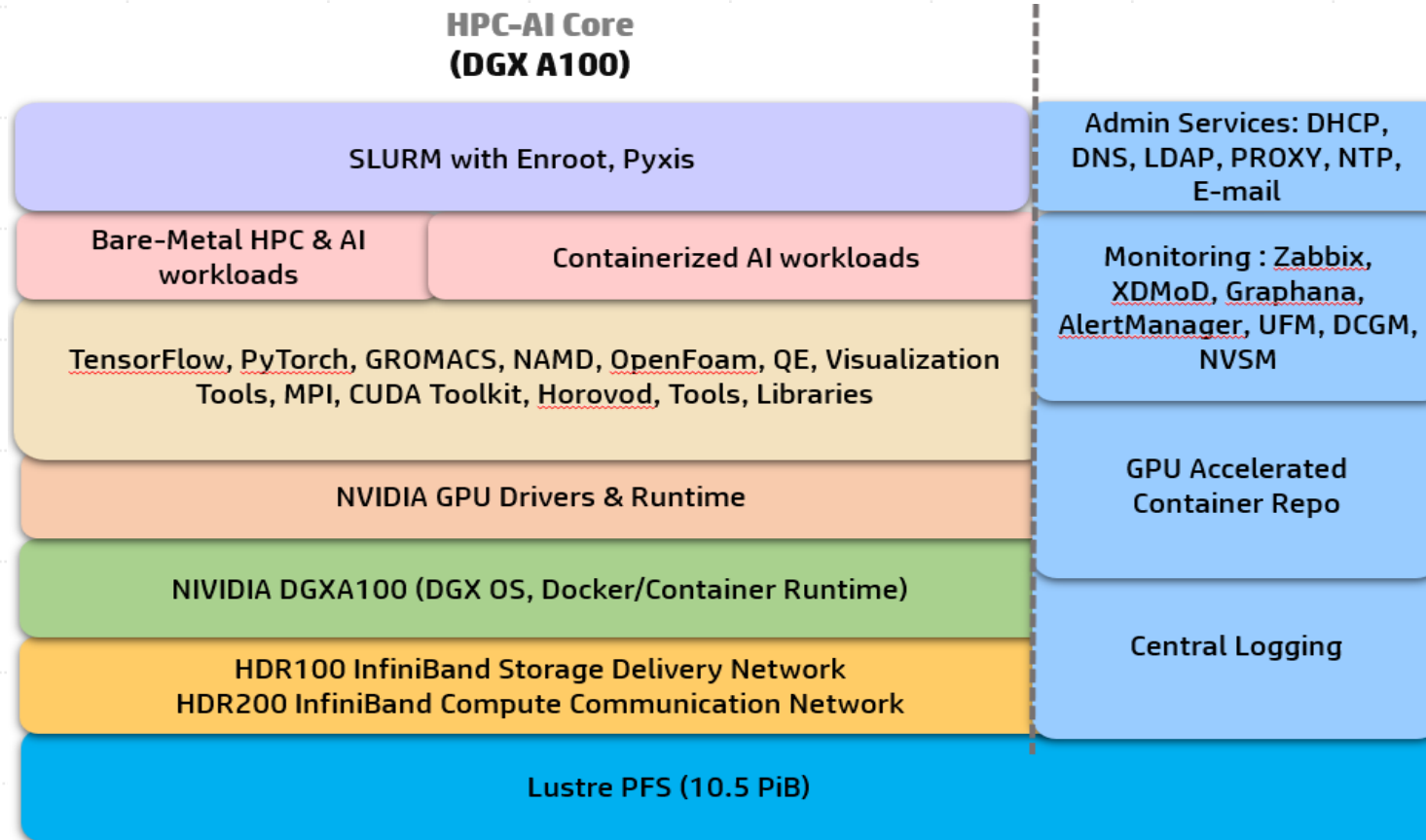
Component	Specifications
CPU	AMD EPYC 7742 64C 2.25GHz
L3 Cache	256 MB
System Memory (RAM)	1 TB
GPU	NVIDIA A100 - SXM4
GPU Memory	40 GB
Total GPUs per node	8
Networking	NVIDIA Connect X-6 VPI (InfiniBand HDR)



nasscom



# AIRAWAT-PSAI Software Stack





nasscom



# Application Frameworks-AI

<b>AI Frameworks</b>	PyTorch , TensorFlow, MxNet, Caffe2, MCTK, Theano, XGBoost
<b>Deep Learning SDK</b>	DeepStream, RAPIDS, TensorRT Inference Engine
<b>Conversational AI(ASR, NLP, TTS)</b>	Kaldi, NeMo
<b>Vision AI (Computer Vision)</b>	DeepVision, DeepCognition, YOLO, OpenCV
<b>Workbook based Editor</b>	Jupyter



nasscom



# Application Frameworks-HPC

<b>Atomic &amp; Molecular Sciences</b>	Quantum Espresso, GROMACS, NAMD, LAMMPS, VMD, QMCPack, VASP *, SIESTA, NWChem, CPMD, Molden, MRCC*, DIRAC*, GAUSSIAN*, ABINIT
<b>Computational Fluid Dynamics</b>	OpenFOAM, STARCCM*
<b>Computational Chemistry</b>	GAMESS
<b>Climate and Environmental Sciences</b>	CESM, WRF*
<b>Electronic Sciences</b>	Ngspice
<b>SDK</b>	NVIDIA HPC-SDK, HPC-X (openMPI), intel oneAPI
<b>Libraries</b>	Math Kernel Library





nasscom



# Application Framework-Other Tools

<b>Compilers</b>	PGI, GNU, OpenACC , CUDA
<b>Visualization Tools</b>	Paraview , Graphana, MatplotLib,seaborn, cuGraph , wxMacMolPlt
<b>Python Packages</b>	NumPy, Pydicom, skimage, Pandas,Flask, LibROSA, Apache singa, Scikit-learn,Amazon Deep Java Library, Deeplearning4j, deep learning framework, Natural Language, Toolkit (NLTK), Gensim, CoreNLP, spaCy
<b>CUDA toolkit &amp; CUDA SDK</b>	V10, 11, CUDA tuned Neural Network (cuDNN) Primitives, CUDA tuned BLAS, CUDA tuned Sparse, Matrix Operations (cuSPARSE)
<b>Computation Framework</b>	Hypre, Matlab*, Octave



nasscom



# Rates (beyond the free credits)

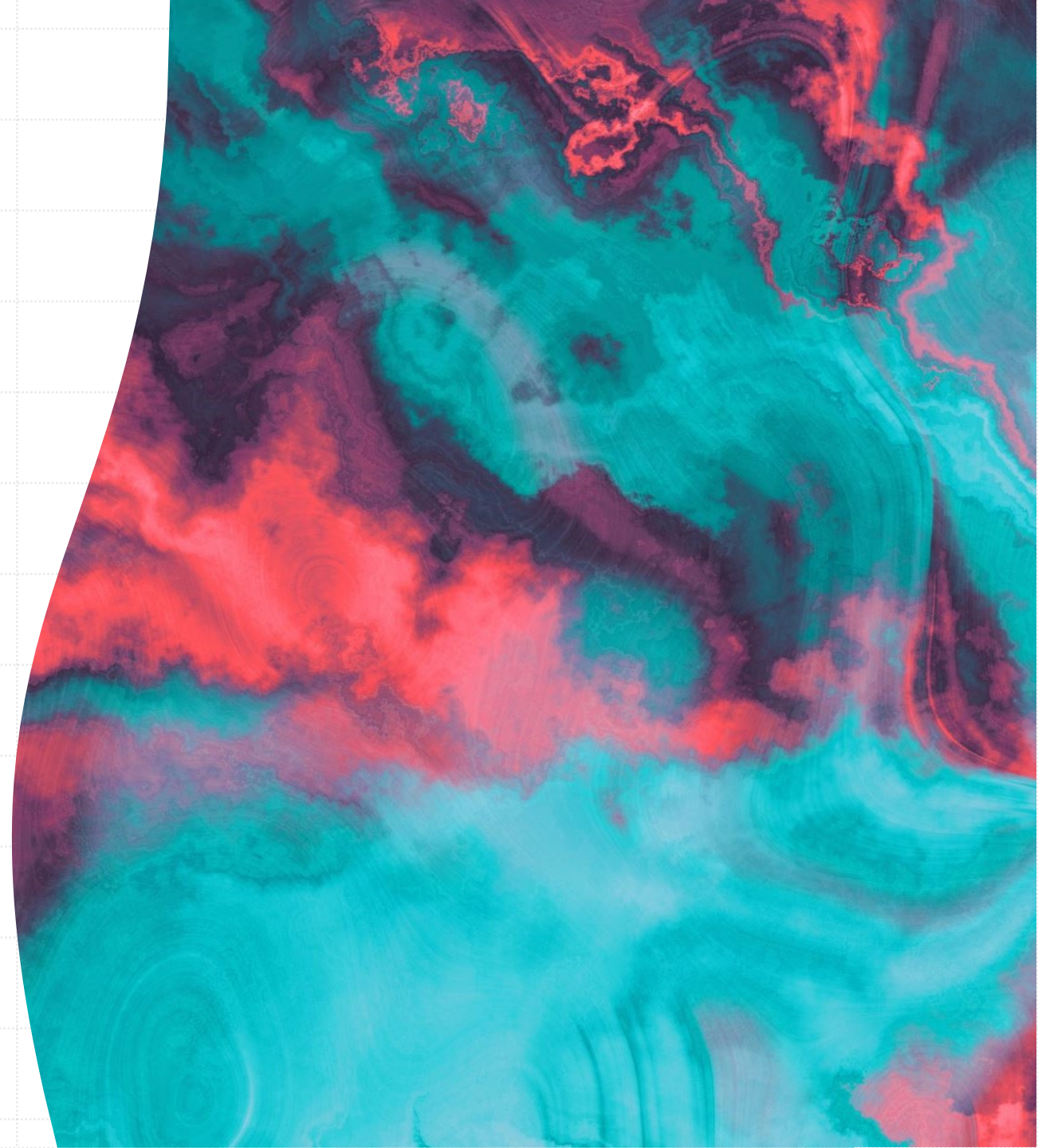
NVIDIA A100							Storage Charges
Org Type	GPU	Hourly Rate (GPU Hour)	1 Month Reserved	3 Month Reserved	6 Month Reserved	12 Month Reserved	One Month
R&D Govt. / Academia / PSU / Startup	1XA100	₹160	₹70,080 ₹96 per hour <b>(40% discount)</b>	₹2,03,232 ₹92.8 per hour <b>(42% discount)</b>	₹3,85,440 ₹88 per hour <b>(45% discount)</b>	₹7,00,800 ₹80 per hour <b>(50% discount)</b>	Allocation of 1 TB @ ₹350 per month

**Technical Support Charges:** Waived for L2 or L3 Support calls with C-DAC team until the startup is actively using the C-DAC infrastructure (inclusive of the 6-month period)

# How to access AIRAWAT-PSAI System?



**nasscom**





nasscom



# Accessing AIRAWAT-PSAI System

- Fill the form: <https://npsf.cdac.in/tas/form>. Consider all mentions of the word **Project** in the form as **your Product**.
  - **Section 1:** CI is the main contact person/technical coordinator for the startup. Ideally, this will be the startup's CTO or an appointed technical point of contact.
  - **Section 2:** If any other person other than the CI is going to be accessing AIRAWAT-PSAI, please mention their details in this section. We strongly suggest that startups fill in details seeking at least 2 additional accounts.
  - **Section 3:** Most part of section 3 are self-explanatory. For the part that reads **\*Potential benefits to C-DAC:** startups can mention if any publications, white papers or articles are expected to be published. If published, give due credits to C-DAC AIRAWAT PSAI System,. For **Expected start date of the project on NPSF system:** please specify a date that is +12 days to your Form submission date. For **Project duration** please specify the number of months you need C-DAC's GPU access for.
  - **Section 4: Estimated computing usage requirement:** table to be filled in with estimated compute resources required by the startup post the trial period. **Compute Usage Charges:** all sections of this table to be filled as **NA. Waiver requested for:** All charges. **Reason for waiver request:** Startup.
  - **Section 5:** Self-explanatory
- **After e-signing the form, PDF will be generated. Please send us the PDF to [taim@nasscom.in](mailto:taim@nasscom.in) with a copy to [naigc@nasscom.in](mailto:naigc@nasscom.in)**





nasscom



# What to expect after form is submitted?

- All submitted forms will be scrutinized by nasscom, T-AIM and C-DAC team
- Access to be allotted for startups on a first come, first serve basis
- Expected response time ~7 to 10 days



# Received Access to AIRAWAT-PSAI System?



**nasscom**





nasscom



# Steps to access AIRAWAT-PSAI System

**1. Access Mode:** SSH based access is provided for accessing the AIRAWAT-PSAI System. This involves a two-stage process:

- Step 1: Connect to C-DAC VPN
- Step 2: Log in to AIRAWAT-PSAI System

**2. Connect to C-DAC VPN:** Users need to install a VPN Client (FortiClient) on their local machine. Then:

- Start the FortiClient application.
- Enter “User ID” and “password” provided at account creation.
- Click on Connect button to establish the VPN connection.



nasscom



# Steps to access AIRAWAT-PSAI System

**3. Login to AIRAWAT-PSAI System:** The login node is the primary gateway to the cluster. You can access it from Windows and Linux machines:

- Windows: Use MobaXterm or Putty software tool as an SSH client on a Windows machine.
- Linux: Use the ssh command to log in.

**4. Password Change:** Use the command “passwd” to change your password. Follow the password setting criteria.

**5. Data Transfer between local machine and AIRAWAT-PSAI System:**

- Windows: Use MobaXterm or WinSCP to transfer data.
- Linux: Use scp command to transfer data. If you wish to transfer large files or datasets, upload them on the web (e.g., GitHub) and download directly on the AIRAWAT-PSAI System using wget, git clone, etc.

P.S: A detailed description of the above 5 steps will be provided in a comprehensive user guide to each start-up at the time of sharing log-in credentials to access the AIRAWAT-PSAI System.



nasscom



Need assistance?

Points of contact: For any queries, please write to [naigc@nasscom.in](mailto:naigc@nasscom.in) with cc to [taim@nasscom.in](mailto:taim@nasscom.in)