



SUPERCOMPUTINGASIA

Gathering the best of HPC in Asia

Co-organised by HPC centres from Australia, Japan, Singapore and Thailand, SupercomputingAsia (SCA) is an annual conference that encompasses an umbrella of notable supercomputing and allied events in Asia.

The key objective of the SupercomputingAsia conference is to promote a vibrant and relevant HPC ecosystem in Asia. Delegates will be able to gain access to visionary insights from thought leaders in academia and industry, optimum networking opportunities and the Supercomputing community in Asia.

The programme highlights of the conference include seminars and sessions covering current and future trends in high performance computing (HPC) technology worldwide. These topics include AI, Quantum Computing, Exa and Hyperscale Infrastructure, HPC security, and HPC-enabled industry applications.

The conference has become a key networking and decision-making platform for regional and global supercomputing partners and collaborators. SCA has hosted or co-located key events and meetings that strengthened local, regional and global cooperation in supercomputing technology.

These include strategic meetings with regional and global HPC centre partners, workshops on HPC cloud and security, HPC in healthcare & genetics, Supercomputing Frontiers Asia, the Asia-Pacific Research Platform (APRP) and the EU-ASEAN-Japan Symposium.



Industry
HPC technology updates & case studies

Scientific
Academic and research paper presentations

Strategic Showcase
Strategic verticals on the use of HPC

Co-located HPC Events
Integrating the entire HPC ecosystem

Tutorials & Exhibitions
Learn from the best in HPC



www.sc-asia.org

Co-organised by:



PARTNER WITH US

and redefine Research and Development with HPC

To create a rich and diverse ecosystem of skills and infrastructure, NSCC customises HPC collaboration models to cater to the diverse research and development needs of businesses, government agencies, researchers and educators.

Break New Grounds in Scientific Research
Harness the power of HPC capabilities and achieve scientific breakthroughs.

Accelerated Speed
Accelerate R&D processes and achieve scientific breakthroughs faster with HPC.

Achieve Scalability
Be equipped to take on bigger challenges with scaled up compute resources.

Create Competitive Edge
Create an edge through innovating at scale by leveraging on HPC ecosystem.

Transforming Singapore's research landscapes

NSCC aims to deliver HPC capabilities to accelerate R&D for Singapore government agencies and research institutes. With NSCC's state-of-the-art HPC capabilities-powered and integrated solutions, organisations are able to scale up their research and increase the speed and efficiency in their research areas such as weather monitoring, digital twin modeling, big data analytics, healthcare AI, precision medicine, transport, advanced manufacturing and quantum computing technology. We continuously engage and explore collaborations with government agencies, research institutes, industries and Institutes of Higher Learning (IHLs) to discover new HPC use cases.

Accelerating innovation across industries

Explore a Proof-of-Concept trial period with NSCC; a negotiated period of complimentary familiarising, testing and proof-of-value as a starter kit. If you would like to continue using HPC to fuel innovation after the starter period and enjoy industry-competitive rates on HPC resources such as the latest CPU, GPU and/or high performance storage resources, talk to us.

Powering up your research

Major users or organisations affiliated to existing founding stakeholders (eg. A*STAR, NUS, NTU, SUTD) ride on the packages already provided to our key fee-paying stakeholders and users. These users enjoy access to large allocations of dedicated HPC resources and can leverage the existing high-speed, high-bandwidth secured connectivity via their parent organisations or partner nodes found across Singapore. For those interested in securing large amounts of HPC resources for your particular needs, you may consider joining NSCC as a unique major fee-paying user.

CONNECT WITH US

For more information on our collaboration models and ways to accelerate your research, reach out to us at bizdev@nsc.sg.

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National
Supercomputing
Centre

SUPERCOMPUTING FOR ALL

POWERING INNOVATION

About NSCC

The National Supercomputing Centre (NSCC) Singapore was established in 2015 to manage Singapore's national petascale facilities and high-performance computing (HPC) resources. As a National Research Infrastructure funded by the National Research Foundation (NRF), the HPC resources that we provide helps support the research needs of the public and private sectors, including research institutes, institutes of higher learning, education institutions, government agencies and companies.

With the support of key partners and stakeholders from the Singapore HPC community such as the Agency for Science Technology and Research (A*STAR), Nanyang Technological University (NTU), National University of Singapore (NUS), Singapore University of Technology and Design (SUTD), National Environment Agency (NEA) and Technology Centre for Offshore and Marine, Singapore (TCOMS), NSCC catalyses national research and development initiatives, attracts industrial research collaborations and enhances Singapore's research capabilities. For more information about our key stakeholders, partners and collaborators, please visit www.nsc.sg.

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WHAT CAN NSCC'S SUPERCOMPUTERS DO FOR YOU?

01 SUPERSIZE YOUR RESEARCH

Bigger aspirations and more rewarding challenges

Most modern world-changing projects require vast amounts of computational power to succeed. NSCC offers unique petascale supercomputing resources, structured planned queues, and dedicated support to give your extremely data-intensive, complex research projects that competitive edge to fly higher and reach further.

02 ACCELERATE YOUR RESEARCH

Faster processing and greater connectivity

When you need to crunch massive amounts of data requiring millions of compute hours, NSCC's petascale resources are able to provide. This raw compute power is coupled with 100G Infiniband high-performance links across Singapore and globally, so you can work faster, bigger, and more collaboratively.

03 ACCESSIBLE AND FLEXIBLE

Supercomputing to suit your needs

NSCC supports you now, and in the future. Our infrastructure is available to all local public and private researchers wanting to tap on the power of supercomputers. We welcome conversations with researchers, entrepreneurs and educators to help co-create and build flexible collaboration models and initiatives to unleash the maximum benefits of supercomputing.

04 TRANSFORMATIVE

The possibilities are endless

Supercomputing is a vital aspect of Singapore's digital transformation and a key scientific resource. NSCC supports this transformation in research and business, with a strong track record of powering high-resolution virtual modelling and simulation solutions, enabling digital twin technology, and supporting a rapidly increasing number of innovations in data-driven AI as well as quantum technology initiatives across various sectors and industries.

SINGAPORE'S SUPERCOMPUTING JOURNEY

1980s

Government identifies supercomputing as an important resource.

1987

National Computer Board proposes government-funded facility to provide shared computing resources.

1988

Advanced Computation Centre (ACC) installs first NEC SX-1A supercomputer.

1993

National Supercomputing Research Centre (NSRC) is formed.

1996

NSRC installs Singapore's most powerful supercomputer then, the Cray Research T94.

1998

NSRC and NUS' Centre for Computational Mechanics form the Institute of High Performance Computing (IHPC).

2007

A*STAR Computational Resource Centre (A*CRC) inherits 10 HPC clusters totaling 10 TFlops.

2014

A*CRC's 100Gbps InfiniCortex (IC) is demonstrated at Supercomputing 2014 (SC14) in New Orleans.

2015

National Supercomputing Centre (NSCC) Singapore, the nation's first national petascale facility, is established with the support of A*STAR, NUS, NTU and SUTD as founding stakeholders.

2016

Singapore's 1 PF supercomputer, ASPIRE 1, comes online as the region's most powerful supercomputer and ranked 115th in the TOP500 supercomputer list (Nov 2016 ed.).

2017

New AI.Platform@NSCC with NVIDIA bolsters AI capabilities for academic, research and industry and supports AI Singapore (AISG) efforts.

2018

The inaugural SupercomputingAsia 2018 (SCA18) conference is held.

April 2018

Six NVIDIA DGX-1 servers of the new AI.Platform@NSCC for large, batch AI workloads are integrated with the ASPIRE 1 supercomputer system.

2019

Finance Minister and Chairman of the National Research Foundation (NRF), Mr. Heng Swee Keat announced a grant of S\$200 million to upgrade the nation's supercomputing capability at Supercomputing Asia 2019 (SCA19).

2020

NSCC's new Köppen system, an add-on to ASPIRE 1, is commissioned to support the research needs of the climate research community.

2021

NSCC awards the tender for the development of the next generation national supercomputer system.

2022

Singapore commissions next generation supercomputer, ASPIRE 2A, with up to 10 PF of computing capacity and is eight times more powerful than ASPIRE 1.

SINGAPORE'S NEXT GENERATION NATIONAL SUPERCOMPUTER

Advanced Supercomputer for Petascale Innovation Research & Enterprise 2A

>3.5x
more cores

5x
more compact
(1.5x less nodes)

2x
more GPUs

8x
compute power

than ASPIRE 1

Singapore's first national petascale supercomputer

SPECIFICATIONS



105,984 Cores
CPU (AMD EPYC™ 7713)
800 Nodes



1,024 Cores | High Frequency
Nodes (AMD EPYC™ 75F3)
16 Nodes



352 GPUs | Accelerated Nodes
GPU (NVIDIA A100)
82 Nodes



476 TB
Total System Memory



25 PBytes
Storage (Spinning + Nearline)



10 PBytes
Scratch Disk

- Parallel DMF hierarchical storage system with remote backup
- Parallel High i/o (200Mb/sec) storage flash module
- Kubernetes Containerisation for HTC workflows
- Direct-to-Chip aircon-less green cooling
- Rear door heat exchange thermosiphon cooling system
- Quantum Simulator Module
- Visualisation Lab

DATA CENTRE FEATURES

Award-winning green data centre

The new data centre at the NUS innovation 4.0 Building achieved Singapore's Building Construction Authority (BCA) Platinum Green Mark Award certification with an estimated PUE of <1.18. Key features of the data centre include an aircon-less compute area, locally-designed cooling racks and is warm-water cooled.

IoT-enabled & digitally monitored smart data centre

The new data centre is equipped with intelligent monitoring AI-assisted tools, advanced DCIM and leveraging Digital Twin technology with integrated IoT sensors, which enables data analysis with CFD and AI thus facilitating operations and optimising real-time supercomputer and data centre operations.

Linked via 100G network fabric

The new data centre forms part of a high-speed, resilient research network of distributed data centres and systems connected by 100G research links between major research nodes in Singapore such as A*STAR, NUS, NTU and SUTD.



OUR LOCAL & GLOBAL 100GBPS NETWORK FABRIC

LONDON

JAPAN

SEATTLE

LOS ANGELES, USA

HAWAII

SINGAPORE

AUSTRALIA

NEW ZEALAND

ADDING VALUE TO SCIENCE AND BUSINESSES

RESEARCH

Supercomputing helps make your research process quicker and more efficient, by providing and enabling solutions for your increasingly complex and advanced data needs.

BUSINESS

Supercomputing gives your business a competitive edge, reduces your time to market for products and services, and helps lower costs by leveraging supercomputers to experiment in a virtual environment.

PART OF OUR HPC COMMUNITY

NSCC's national supercomputing infrastructure and resources are dedicated to supporting Singapore's research aspirations across key fields identified under the nation's Research, Innovation and Enterprise (RIE) plan.

Manufacturing, Trade and Connectivity

Smart Nation and Digital Economy

Urban Solutions and Sustainability

Human Health and Potential

Supercomputers support R&D in various fields:

- Advanced Manufacturing and Engineering
- Aerospace
- Bioinformatics and Medical Informatics
- Climate Modelling and Weather Forecasting/Prediction
- Computational Finance/Fluid Dynamics/Material Science
- Data Analytics
- Data Centre and Networking
- Deep Learning Machine/Artificial Intelligence
- Geonomics & Precision Medicine
- Immersive Media Production
- Life Sciences
- Offshore & Marine
- Quantum Physics/Chemistry
- Scientific Analysis



LOCAL AND GLOBAL PARTNERSHIPS

Connectivity
Ahead of the curve



NSCC's supercomputing power is augmented by a network of local and global connectivity resources that enable the quick, safe, and efficient transfer of large amounts of data — an essential part of the equation in academia, research, and industry. NSCC collaborates with the Singapore Advanced Research and Education Network (SingAREN) to continually upgrade high-performance local and global network connectivity to anticipate growing needs, and enable our collaborations with international research platforms and partners.

Island network

Encouraging accessibility and collaboration

A high-speed, high-bandwidth network fabric traversing Singapore, the dedicated 100G Infiniband network enables seamless data sharing, and now connects major research institutions like the Agency for Science, Technology and Research (A*STAR), National University of Singapore (NUS), Nanyang Technological University (NTU), Singapore University of Technology & Design (SUTD), and more.

International collaborations

Shared experiences and goals from across the globe

NSCC establishes partnerships with like-minded national HPC infrastructures, centres and HPC research organisations from around the world to drive collaborative activities, joint projects and events that help advance HPC capability & education, develop talent, raise competency and enhance international cooperation.