

**REQUIREMENT  
SPECIFICATIONS**

**For**

**A\*CRC Website**

**Migration**

# 1 INTRODUCTION

The A\*STAR Computational Resource Centre (henceforth referred to as "ACRC") aims to migrate its existing Website, <https://www.acrc.a-star.edu.sg>, to the A\*STAR HQ Website as a child site as the main website link: <https://www.a-star.edu.sg/acrc>

## 1.1 Objective of the Project

1.1.1 The main objectives of migrating the ACRC Website (henceforth referred to as the "System") are as follows:

(a) To align to the A\*STAR Website Security Strategy as soon as possible by standardizing the underlying technology platform of the A\*STAR RI Corporate Websites;

(b) To tackle security vulnerabilities by adopting a centralized technology platform for a quicker response and centralized management;

(c) To enable a uniform content management tool across A\*STAR for codes / modules sharing and resource pooling;

# 2 PURPOSE OF INVITATION TO QUOTE

2.1 The purpose of this Invitation To Quote ("ITQ") is to establish a contract for the analysis, design, development, migration, implementation, installation, testing, commissioning, end-user training and warranty support of the new ACRC Corporate Website.

# 3 SCOPE OF INVITATION TO QUOTE

3.1 Vendors are invited to submit a complete proposal for analysis, design, development, migration, implementation, installation, testing, commissioning and end-user training of the new ACRC Corporate Website (hereinafter referred to as "System") with 12 months warranty.

3.2 The Vendor shall propose and quote, as an OPTION, for the Service Request man-day rate for implementation of change requests based on per man-day rate of up to a maximum of 30 man-days, which is chargeable only upon utilisation.

3.3 The Vendor shall ensure that a complete proposal is submitted to meet the requirements specified in this ITQ. Where the Vendor wishes to propose alternative offers, each offer shall be presented as a separate, independent and complete proposal with separate costing and total costs. Any incomplete proposal or offer submitted will not be considered. The different items

proposed in each offer shall be highlighted.

## **4 SCOPE OF WORK**

### **4.1 Functional Requirements**

4.2 The Vendor shall leverage on the existing IT environment where the necessary hardware, system software and network components have already been setup for the current HQ Corporate Website (<https://www.a-star.edu.sg>). These can be found in Annex A.

4.2.1 The System should be browser and platform independent so that the website integrity is retained when viewed on different browsers. The System shall be accessed without problems or errors through the web browsers specified in Annex A.

4.2.2 The Vendor may propose the use or development of third party applications, modules to augment the features and functions within the ACRC Corporate website. In cases where modules proposed to be added are of similar functionality to existing modules already present within the A\*STAR HQ Corporate Website, these may be re-used for the ACRC Corporate Website to minimise the cost incurred by developing or purchasing new modules.

4.2.3 The design of the System should minimise client-sided scripting to reduce the hassle of having the users to download plug-ins, software set-ups in order to access the System. If plug-in is required, online help should be provided to guide user on how to download, install and use of the plug-in.

4.2.4 The Vendor shall provide web analytics, consisting of web statistics and reports. This is to allow the organisation to assess the effectiveness of the website on capturing their attention, the volume of visitors who may be interested in our activities, as well as the profile of these visitors, etc.

4.2.5 The Vendor shall ensure all third party applications and modules installed are updated to the latest and most secured version.

4.2.6 The Vendor needs to embed, code or program using A\*STAR internal library codes whenever applicable such as:

- a) Google Analytics codes for web analytics
- b) Password/Verification link for New User account application
- c) Any other innovative codes that improve the User Experience

4.2.7 The Vendor shall ensure that the design of the application shall not be affected by at least the following vulnerabilities during the period of the warranty:

- (i) Parameters not validated e.g. SQL injection and parameter manipulation;

- (ii) Broken access controls;
- (iii) Broken accounts and session management;
- (iv) Cross-site scripting;
- (v) Buffer overflows;
- (vi) Command injection; and
- (vii) Error handling.
- (viii) Any other known and current vulnerability that are in public domain.
- (ix) Any other new vulnerability that is discovered and reported during the warranty period.

#### **4.3 Content Management Tool (DNN 7)**

- 4.3.1 The Vendor shall design, develop and implement the system as a child site (<https://www.a-star.edu.sg/acrc>) on DotNetNuke 7 and allow ACRC staff to easily manage all the contents of the System without having the knowledge of HTML, metadata standard, web designing or technical knowledge.
- 4.3.2 Designated staff (content owners) will be able to publish content via the developed publishing templates. The Vendor will create and design DotNetNuke skin or templates for the use of ACRC. The templates shall provide a framework for consistency in presenting web pages to the public.
- 4.3.3 The Vendor shall base on the approved designs, develop skins / templates for at least, but not restricted to the information categories provided/existing in Annex C, and other categories that may arise during the requirements study phase. The content owners should retain the ability to add, remove and modify the basic information categories without impacting the generic layout and configuration of the overall website.
- 4.3.4 The Vendor shall ensure that existing content identified by the content managers are successfully and accurately migrated without further action or data entry by ACRC staff. The vendor will also work with the content managers to add new and/or updated content into the new system prior to the migration period.

#### **4.4 Business Requirements**

- 4.4.1 The Vendor shall propose a new layout, design, and font scheme for the ACRC Corporate website. The design must reflect a professional corporate image with an emphasis on the compute resources capabilities of ACRC in the areas of computational science and engineering.
- 4.3.2 The non-exhaustive list of distinct target audience expected to visit the website include:-
  - (a) External research groups interested to learn more about the scientific works of ACRC and who are interested to enter into research collaborations with us.

(b) Private companies and public sector organizations who may be interested to utilise various capabilities that reside in ACRC so as to attract them to enter into collaborative talks and possibly start a research project.

(c) Potential talents (both local and overseas) who may like to explore joining ACRC as a career.

(d) Interested students who would like to:

- (i) learn more about ACRC's compute resources,
- (ii) to participate in our outreach activities

(e) Public who have a deep interest in High Performance Computing and will like to learn more about it.

4.3.3 The proposed colour scheme of the ACRC webpage should be in-line with the corporate colour schemes of A\*STAR. This should be maintained throughout the entire ACRC website to ensure a professional look and feel.

4.3.4 The Vendor shall work with the content managers and propose and develop professional hi-resolution graphical elements to enhance the look and feel of the various webpage found within the ACRC website.

4.3.5 The System shall adopt a User Experience design and layout for ease of use to easily locate the information that they are looking for. Some features that may be incorporated into the design of the website include:

- (a) Breadcrumb design
- (b) Modular based layout
- (c) Easily accessible sitemap.
- (d) Quick links targeting the different target audiences listed in section 4.3.2
- (e) Search function that provides information that is available within the website at first instance.
- (f) Any other new methodologies that are state-of-the-art and relevant to the User Experience.

4.3.6 The vendor shall implement as an option, a suitable approval workflow that will be used by the content managers to update the main content areas as well as to allow individual staff to update their respective profile.

4.3.7 The vendor should also ensure that ACRC administrators are given full capability to assign and remove various staff for both content management and workflow approval roles for different sections of the website.

#### 4.4 **Unit Testing and User Acceptance Testing**

4.4.1 The Vendor shall perform the following testing:

- (a) Unit tests shall be conducted by the Vendor prior to user acceptance to ensure that the System performs as specified in the ITQ;

(b) After successful completion of the Unit Tests, the Vendor shall proceed to configure the system to ACRC's UAT environment for User Acceptance Testing;

(c) Upon completion of the development and Unit test phase, the System shall be handed over to ACRC for user acceptance tests;

(d) Prior to the start of the tests, the Vendor shall prepare a User Acceptance Test Plan and obtain endorsement from ACRC, this is so as to ensure that all the relevant functions are systematically tested; and

(e) The User Acceptance Test Plan shall form the basis of testing. The test would be considered successful when all the test cases produce the expected results according to that specified in the plan. Should there be any errors detected during the testing, the Vendor shall rectify the errors immediately.

#### **4.5 Commissioning**

4.5.1 The system shall go through a penetration test provided by A\*STAR and the vendor shall resolve all findings resolved before the system can be commissioned.

4.5.2 Upon successful completion and sign-off of the User Acceptance Test, the System can then be installed in the Production environment. At this point it shall be fully commissioned and ready for 'Live' run.

#### **4.6 User Training, User Guide and Maintenance**

4.6.1 At the end of commissioning, the vendor shall also conduct user training to ensure that administrators and content managers in ACRC are educated on how to maintain, update and modify the system as needed.

4.6.2 To assist to educate new staff that will join ACRC in the future, the vendor shall also create a user guide based on the training materials.

#### **4.7 System Warranty**

4.7.1 The Vendor shall provide a 12-month warranty for the System from the Acceptance Date of the System.

4.7.2 The Vendor shall at his or her own costs restore the System to an operable state when the system downtime is attributable to errors or faults in the Vendor's customisation/development effort for the System.

4.7.3 The Vendor shall be required to provide services at no additional cost to the System during the System Warranty Period to ensure the System performs as expected.

4.7.4 During the System Warranty Period, the Vendor may be required to perform Service Requests that cannot be delayed during this period.

#### **4.8 Documentation**

4.8.1 The Vendor shall produce adequate and suitable supporting documentations, which shall include:-

- a. Project Plan & Schedule;
- b. Design Specification including Data Model;
- c. User Acceptance Test Plan, Test Cases & Test Report; and
- d. Any other documents as required by ACRC.

#### **4.9 Ownership of Intellectual Property Rights**

4.9.1 Nothing in the Purchase Order shall affect any person's right to own or license Background IP.

4.9.2 ACRC agrees that all rights, title to or interest in, all Foreground IP created by the Vendor shall be owned by ACRC.

4.9.3 The Vendor shall deliver the source codes to all Foreground IP to ACRC within 1 month of the Acceptance Date in the following manner:-

- (a) 1 soft copy of the source codes in CD; and
- (b) 1 hard copy of the source codes to be signed-off by both Parties unless otherwise agreed.

4.9.4 The Vendor shall obtain for and grant to ACRC and its agent, free of any additional charge, a worldwide, perpetual, non-exclusive license, to use all Background IP owned by or licensed to the Vendor, its sub-contractor.

4.9.5 The title to all IP in any such results, report, data or information generated or produced by ACRC or another person on behalf of ACRC as a result of this Purchase Order shall be owned by ACRC.

4.9.6 If the Vendor, its sub-contractor or Vendor intends to sell or transfer their Background IP, the Vendor shall ensure that the purchaser of the Background IP and every successor in title to the interest in the Background IP has prior written notice of the license that the Vendor, its sub-contractor or Vendor has granted to ACRC.

4.9.7 If any license granted or obtained for Background IP under Clauses (d) can be registered under any IP registration system in Singapore, the Vendor shall:

- (a) register the licence under the IP registration system in Singapore; and
- (b) Deliver copies of documentary proof of such licence registration to ACRC as soon as possible.

## **5 PRESENTATION AND DEMONSTRATIONS**

- 5.1 The Vendor may be required to make presentations/demonstrations on the proposed System, which may include the following:
- (a) Understanding of the main requirements of the project.
  - (b) Demonstration of high-level designs of the proposed System.
- 5.2 The Vendor shall ensure that the materials used in their presentations are not proprietary unless explicitly stated.
- 5.3 The Vendor shall bear all costs incurred in conjunction with the ITQ submission, including the aforesaid presentation and prototype development where necessary. ACRC shall not be required to reimburse the Vendor for all such costs.

## **6. PROGRESS REPORTING**

- 6.1. The Vendor shall submit weekly progress report for the duration of the Contract. The format of the progress report shall be submitted by the Vendor for approval by ACRC.
- 6.2. The report shall cover:
- (a) all tasks which are in progress or which were scheduled to begin or end that week;
  - (b) status of problems reported by types of services; and
  - (c) Progress on services requested, or is scheduled to begin and end that week.
- 6.3. The Vendor may be required to produce ad-hoc progress reports requested by ACRC. The submission and acceptance of progress reports shall not in any way prejudice the rights of ACRC to make any claims against the Vendor.
- 6.4. The Vendor shall be responsible for informing the ACRC, as early as possible, of any impending slippage in the delivery dates and any matters likely to impede the progress of the project. Recommendations shall be put forth on the alternatives available.

## **7. PROBLEM RESOLUTION**

- 7.1. The following table identifies the service response time and defect resolution time that the Vendor shall comply for the various severity type of problems reported.



Severity Type	Description	Response Time	Resolution / Bypass Time
1	<p>1. Problem affects systems such that all or 50% or more users in a business function that is unable to perform their business function.</p> <p>or</p> <p>2. Problem affects mission critical systems or security breach or virus outbreak.</p> <p>or</p> <p>3. Problem affects key appointment holders.</p>	Within 0.5 hour	<p>Resolved within <b>TWO (2)</b> hours. If the incident cannot be rectified, a bypass solution should be implemented within <b>FOUR (4)</b> hours of the Occurrence of the incident.</p> <p>Permanent solution shall be implemented within <b>ONE (1)</b> working day.</p>
2	Problem affects a particular system for which there are alternatives for by- passing the problem.	Within 0.5 hour	<p>Resolved within <b>FOUR (4)</b> hours. If the incident cannot be rectified, a bypass solution should be implemented within <b>EIGHT (8)</b> hours of the occurrence of the incident.</p> <p>Permanent solution shall be implemented within <b>TWO (2)</b> working days.</p>
3	Problem has minimum or no impact on the users' ability to perform their business function.	Within 24 hours	<p><u>On a Monthly Basis:</u></p> <p>75 % of incidents shall be resolved within ONE (1) working day.</p> <p>95% of incidents shall be resolved within TWO (2) working days.</p> <p>100% of incidents shall be resolved within <b>THREE (3)</b> working days.</p>

## 8. SERVICE REQUEST

8.1. For each Service Request, the Vendor shall advise ACRC on the cost and impact of changes that affect the system performance. The implementation of the Service Request(s) shall be subjected to ACRC approval.

8.2. The Vendor shall provide the Service Level as follows:

Severity Level	Response Time	Status Reporting	Resolution Time
1	Within 4 working hours	Every hour	Within 1 working day
2	Within 4 working hours	Every 4 hours	Within 5 working days
3	Within 4 working hours	Daily	Within 10 working days

8.3. The Vendor shall submit the Service Request proposals to ACRC based on the following.

	Classification	Description	Assessment Period
(a)	Minor Request	SRs that require less than or equal to three (3) man- days to complete	Within one (1) working day
(b)	Major Request	SRs that require more than three (3) man-days to complete	Within three (3) working days
(c)	Urgent Request	SRs that are urgently required	Within half (1/2) a working day

**Note:** The "Assessment Period" shall be the time taken by the Supplier to perform the impact analysis and resource estimation for the SR.

8.4. The Vendor shall ensure that all approved SRs by ACRC are completed and implemented based on the following.

	<b>Estimated SR Man-days Effort</b>	<b>Elapsed Completion Time</b>
(a)	Less than or equal to three (3) man-days	Within seven (7) working days or based on mutual agreement between the Vendor and ACRC
(b)	More than three (3) man-days and less than ten (10) man-days	Within fourteen (14) working days or based on mutual agreement between the Vendor and ACRC
(c)	Greater than or equal to ten (10) man-days	Based on mutual agreement between the Vendor and ACRC
(d)	Urgent Request	Based on mutual agreement between the Vendor and ACRC

**Note:** The "Elapsed Completion Time" shall begin upon approval of the SR and end upon raising of the request to implement the SR.

8.5. The implemented SR shall have the following system warranty periods.

<b>Classification</b>	<b>Warranty Period</b>
SRs that require more than twenty (20) man-days to complete	Three (3) calendar months from Implementation Date of the SR concerned

## **9. PROJECT IMPLEMENTATION SCHEDULE**

9.1. The Vendor shall propose a Project Plan to commission the System within four (4) weeks from the issuance of the Purchase Order.

9.2. The Project Plan shall include a project schedule that show in detail, to the task level, how each of the milestones could be achieved. The project schedule shall be able to reflect the possible overlaps between key activities and their interdependencies.

## **10. PAYMENT SCHEDULE**

10.1. The payment schedule shall be as followed:

Stage	% of Purchase Order Price	Cumulative Total
Upon submission of the Project Plan	35	35
Upon release of the website to the public	45	80
3 months after release of the website to the public	10	90
Upon from expiry of System Warranty Period.	10	100

## 11. SUBMISSION OF PROPOSAL

11.1. The Vendor shall include in the ITQ proposal a paragraph-by-paragraph statement according to the section and paragraph reference of the ITQ and state whether the specified requirements can be complied in the format attached in **Annex B**.

- a) Compliance to functions and features specified in the ITQ;
- b) Itemised costs for application development and implementation of the System as follows:

S/N	ITEM DESCRIPTION	QUANTITY	COST (\$\$)
<b>MANDATORY ITEMS</b>			
1	Proposal for new layout and design to improve the look and feel of the ACRC website		
2	Extension/replication of existing modules, features and capabilities on DNN7.		
3	Migration of existing corporate website onto DNN7 as a child site of A*STAR HQ website		
4	Entry of newly developed content into the new website		
5	Conduct user training and authoring a user guide for both administrators and general users		
6	Any other associative work to ensure the completeness of the project		
	<b>TOTAL MANDATORY COST (W/O GST)</b>		
	<b>TOTAL MANDATORY COST (W GST)</b>		
<b>OPTIONAL ITEMS</b>			
6	Professional Services for Service Request as per Rate of man-day		
7	Design, development and implementation of a customizable interactive sub-website page		
	<b>TOTAL OPTIONAL COST (W/O GST)</b>		
	<b>TOTAL OPTIONAL COST (W GST)</b>		

**Note:**

- Development work is done at Vendor's site and the Vendor should setup their development environment.
- All prices are to be quoted in Singapore dollars.
  - All cost shall exclude GST.
  - All costs shall be itemized.
  - All costs stated are all inclusive (i.e. Application development, manpower, setup or installation, etc).
  - All volume discounts (if any) must be clearly stated. All costs shall be itemized.

c) Compliance to the specified timeline.

11.2. ACRC reserves the right to award the contract in parts and not full. This shall mean ACRC may choose to award Mandatory Item Part (1) or Part (2) or both as shown in Table 1.

11.3. The Vendor shall possess the relevant experience and track record and shall have done at least 3 projects of similar technology, complexity and scale within the last 2 years.

- 11.4. The Vendor shall cite at least 3 customer references.
- 11.5. The prices quoted in the submission shall be valid for thirty (30) days.
- 11.6. In the proposal, the Vendor shall include their past work with various A\*STAR Research Institute to substantiate their support and capabilities as described in the quotation.

## **12. STANDARDS**

- 13.1 The Vendor shall also comply with the latest version of the following policies, standards and guidelines:
  - (a) Government IM8 on Information and Communication Technology
  - (b) Any other security policies, standards and guidelines that may be issued by A\*STAR from time to time.

## **13 SUB-CONTRACTING AND ASSIGNING**

- 13.1 The Vendor shall not sub-contract or assign the Contract without the written consent from ACRC.

## **14. SYSTEM PERFORMANCE AND AVAILABILITY**

- 14.1 The System shall be proven in design and operation and shall meet the Standard of Performance with a System Availability Level of not less than ninety-nine point five per cent (99.5%) for each calendar month or part thereof, except during the time when the System is shut down for Scheduled System maintenance.
- 14.2 The System is required to run continuously for twenty-four (24) hours daily, seven days a week including public holidays and Sundays, except during the time when the System is shut down for Scheduled System maintenance.
- 14.3 The response time for the various types of transactions performed shall be as follows:

S/No	Type of Transaction	Response Time
(a)	Display of web pages	Shall not exceed 3 seconds for 95% of the time and shall be within 5 seconds for the remaining 5%
(b)	Navigation between pages and different levels of details	Shall not exceed 3 seconds for 95% of the time and shall be within 5 seconds for the remaining 5%

The response time is defined as the time taken from the moment the <Enter> key or the mouse button is depressed by the user to the time the reasonable response is displayed on the screen of the user, excluding the Wide Area Network (WAN) latency.

- 14.4 The Vendor shall establish a mechanism to collect, analyse and report the above service levels specified by ACRC.

## 15 ENQUIRIES

- 15.1 All enquiries shall be entertained till the day before close of the ITQ.

- 15.2 No oral representation shall be:

- a) accepted or construed as modifying or varying any of the provisions, terms or conditions in this ITQ; or
- b) binding on ACRC.

## **ANNEX A: HARDWARE AND SYSTEM SPECIFICATION**

- 1.** The new system shall be built on DotNetNuke 7.0 Enterprise version and implemented as a child site at <http://www.a-star.edu.sg/acrc>.
- 2.** The System must be hosted internally using the following platform
  - Windows Server Enterprise 2008 R2
  - IIS Web Server Version 7.5
  - ASP. Net 4.0
  - MSSQL 2008 R2
- 3.** The developed System shall minimally support the following browsers:
  - a) Internet Explorer 7 and later
  - b) Microsoft Edge
  - c) Firefox 2.0 and later
  - d) Google Chrome
  - e) Safari 3.0 Web Browser and later
  - f) Opera Web Browser
  - g) Browsers in Android and iOS platform
- 4.** The developed System shall minimally support the following portable devices:
  - a) iOS
  - b) Android
  - c) All Mobile devices and Tablets



## ANNEX B: COMPLIANCE TO THE REQUIREMENTS SPECIFICATION

1. Please state clearly the compliance to each clause including sub-clauses specified in this ITQ in the format provided below.
2. Quote the lowest paragraph or sub-paragraph number. Any declaration made to the stated paragraph shall also apply to all the lower level paragraphs, unless otherwise specified by the Vendor. All paragraphs in this ITQ must be referenced.
3. The Vendor shall take note that the response shall take into consideration all annexes referenced. Where there is a failure to indicate any compliance against any clause, it shall be deemed that the Vendor has indicated "Compliance" and the offer shall be evaluated accordingly.
4. Only the following responses are acceptable:

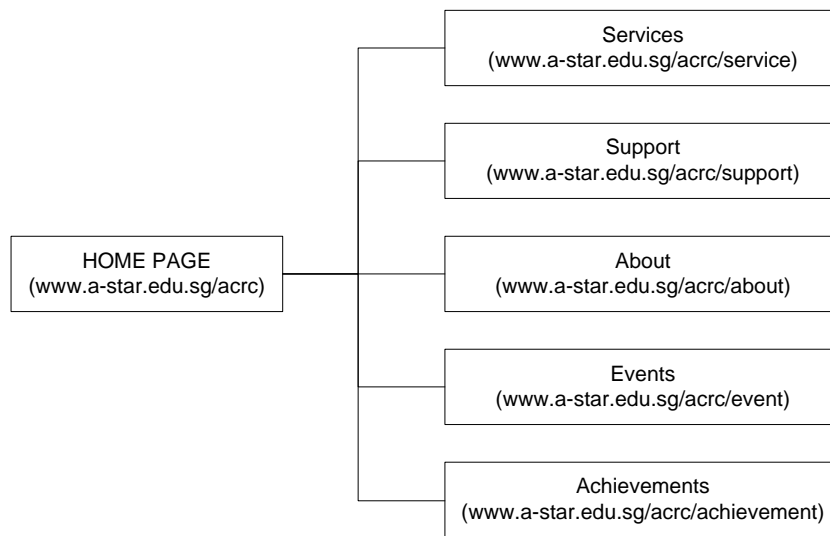
C : When the System meets all requirements without any comments. The Vendor shall not add comments against the clause that vary the meaning of full compliance to the clause. However, comments indicating references to literature to substantiate the response is permissible. Any other comments which will vary the meaning of full compliance will be ignored.

NC : When the proposed System or Services does not comply with the requirements at all.

N : Noted, for statements which does not call for the Vendor to meet a specific requirement but merely informs the Vendor of a fact. Where "N" is used against clauses requiring response other than "Noted", the Vendor's response will be classified as full compliance.

Paragraph Reference	Compliance	Explanatory Notes
Section 3		
3.1		
.... (filled up where necessary)		
Section 4		
4.1.1		
4.1.2 ... (filled up where necessary)		

# ANNEX C: DRAFT FIRST LEVEL SITEMAP FOR ACRC CORPORATE WEBSITE



## **ANNEX D – Current A\*CRG Website for revamp**

**Revamp of website - Main focus is on user experience, one stop information. More information will be confirmed during the planning stage.**

5 Basic Categories on Webpage with side option of Help desk / VPN login (include guide) and Search Box

- Home - Announcement on upcoming maintenance or workshop
- Services - (Basic description on what services we provide and account creation)
- Support - (All details on system, software, storage, network)
- Events - Current / historical events and workshops. Calendar, Registration
- Achievement - Publication, awards , collaboration , projects etc
- About - Mission statement, Overview , Org Chart, Contact us , Staff Directory

### **Links or contents to be removed to due redundancy or not supported.**

#### Operation

[https://www.acrc.a-star.edu.sg/34/a\\*crc\\_user\\_tools.html](https://www.acrc.a-star.edu.sg/34/a*crc_user_tools.html)

[https://www.acrc.a-star.edu.sg/14/documentation\\_and\\_training.html](https://www.acrc.a-star.edu.sg/14/documentation_and_training.html)

#### System

[https://www.acrc.a-star.edu.sg/48/account\\_request\\_\(existing\\_users\).html](https://www.acrc.a-star.edu.sg/48/account_request_(existing_users).html)

<https://www.acrc.a-star.edu.sg/account/statLogin.php> (discuss to make cluster q and ganglia available for public)

<https://vpn.acrc.a-star.edu.sg/,DanaInfo=www.acrc.a-star.edu.sg+iframe.php?url=chromium.acrc.a-star.edu.sg/joblogs/>

<https://vpn.acrc.a-star.edu.sg/,DanaInfo=www.acrc.a-star.edu.sg+iframe.php?url=chromium.acrc.a-star.edu.sg>

#### Storage

[https://www.acrc.a-star.edu.sg/23/storage,\\_file\\_systems\\_and\\_file\\_management.html#shs](https://www.acrc.a-star.edu.sg/23/storage,_file_systems_and_file_management.html#shs)

[https://www.acrc.a-star.edu.sg/23/storage,\\_file\\_systems\\_and\\_file\\_management.html#db](https://www.acrc.a-star.edu.sg/23/storage,_file_systems_and_file_management.html#db)

[https://www.acrc.a-star.edu.sg/23/storage,\\_file\\_systems\\_and\\_file\\_management.html#backup](https://www.acrc.a-star.edu.sg/23/storage,_file_systems_and_file_management.html#backup)

[https://www.acrc.a-star.edu.sg/23/storage,\\_file\\_systems\\_and\\_file\\_management.html#virtual\\_infra](https://www.acrc.a-star.edu.sg/23/storage,_file_systems_and_file_management.html#virtual_infra)

[https://www.acrc.a-star.edu.sg/23/storage,\\_file\\_systems\\_and\\_file\\_management.html#archive](https://www.acrc.a-star.edu.sg/23/storage,_file_systems_and_file_management.html#archive)

[https://www.acrc.a-star.edu.sg/23/storage,\\_file\\_systems\\_and\\_file\\_management.html#security](https://www.acrc.a-star.edu.sg/23/storage,_file_systems_and_file_management.html#security)

#### Software

<https://www.acrc.a-star.edu.sg/35/mpi.html#MPI>

<https://www.acrc.a-star.edu.sg/35/mpi.html#OpenMP>

<https://www.acrc.a-star.edu.sg/35/mpi.html#Shmem>

Network

## **Current static link that will sorted into these main categories.**

HELPDESK

<https://support.acrc.a-star.edu.sg/otrs/customer.pl>

VPN

[https://vpn.acrc.a-star.edu.sg/dana-na/auth/url\\_default/welcome.cgi](https://vpn.acrc.a-star.edu.sg/dana-na/auth/url_default/welcome.cgi)

HOME

Getting started

[https://www.acrc.a-star.edu.sg/9/access\\_information.html](https://www.acrc.a-star.edu.sg/9/access_information.html)

[https://www.acrc.a-star.edu.sg/25/expert\\_knowledge\\_and\\_user\\_support.html](https://www.acrc.a-star.edu.sg/25/expert_knowledge_and_user_support.html)

[https://www.acrc.a-star.edu.sg/13/running\\_jobs.html](https://www.acrc.a-star.edu.sg/13/running_jobs.html)

Compute resources

<https://www.acrc.a-star.edu.sg/32/policies.html>

[https://www.acrc.a-star.edu.sg/19/file\\_systems\\_and\\_file\\_management.html](https://www.acrc.a-star.edu.sg/19/file_systems_and_file_management.html)

[https://www.acrc.a-star.edu.sg/20/feedback\\_and\\_enquiry\\_form.html](https://www.acrc.a-star.edu.sg/20/feedback_and_enquiry_form.html)

[https://www.acrc.a-star.edu.sg/10/code\\_development.html](https://www.acrc.a-star.edu.sg/10/code_development.html)

[https://www.acrc.a-star.edu.sg/12/computing\\_resources.html](https://www.acrc.a-star.edu.sg/12/computing_resources.html)

<https://www.acrc.a-star.edu.sg/21/hardware.html>

<https://www.acrc.a-star.edu.sg/142/cirrus.html>

<https://www.acrc.a-star.edu.sg/143/aurora.html>

<https://www.acrc.a-star.edu.sg/149/cumulus.html>

<https://www.acrc.a-star.edu.sg/144/fuji.html>

<https://www.acrc.a-star.edu.sg/22/software.html>

[https://www.acrc.a-star.edu.sg/23/storage,\\_file\\_systems\\_and\\_file\\_management.html](https://www.acrc.a-star.edu.sg/23/storage,_file_systems_and_file_management.html)

<https://www.acrc.a-star.edu.sg/24/visualisation.html>

Events

<https://www.acrc.a-star.edu.sg/132/events.html>

[https://www.acrc.a-star.edu.sg/140/past\\_events.html](https://www.acrc.a-star.edu.sg/140/past_events.html)

[https://www.acrc.a-star.edu.sg/146/powering\\_discoveries.html](https://www.acrc.a-star.edu.sg/146/powering_discoveries.html)

Awards and Achievement

About

[https://www.acrc.a-star.edu.sg/47/careers\\_at\\_a\\*crc.html](https://www.acrc.a-star.edu.sg/47/careers_at_a*crc.html)

Naming convention of URL

Should be similar to the major naming convention as possible, for example:

- Home – [www.a-star.edu.sg/acrc](http://www.a-star.edu.sg/acrc)
- Services - [www.a-star.edu.sg/acrc/services](http://www.a-star.edu.sg/acrc/services)

- Support - [www.a-star.edu.sg/acrc/support](http://www.a-star.edu.sg/acrc/support)
- Events - [www.a-star.edu.sg/acrc/events](http://www.a-star.edu.sg/acrc/events)
- Achievement - [www.a-star.edu.sg/acrc/achievement](http://www.a-star.edu.sg/acrc/achievement)
- About - [www.a-star.edu.sg/acrc/about](http://www.a-star.edu.sg/acrc/about)

## **ANNEX E – Some Reference External Websites that is relevant to ACRC**

<https://www.top500.org/lists/2016/11/>

<https://computing.llnl.gov/>

<https://www.nersc.gov/>

<https://www.olcf.ornl.gov/>

<http://www.ccs.tsukuba.ac.jp/eng/>

<http://www.itc.u-tokyo.ac.jp/en/>

<http://www.aics.riken.jp/en/>

<http://www.cscs.ch/index.html>

<http://www.anl.gov/>

<http://www.lanl.gov/>