The Alliance Cloud Connect Pilot

Call for Participation for Platform Developers

Digital Research Alliance of Canada | Alliance de recherche numérique du Canada

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1. Introduction

The Digital Research Alliance of Canada (the “Alliance”) is excited to announce *The Alliance Cloud Connect Pilot (*“ACCP”*),* a unique opportunity for vendors, institutions, and individuals (associated with institutions) to participate in the development of a cutting-edge initiative that will transform how Canadian researchers access community cloud and key commercial cloud services.

As part of our commitment to fostering innovation and facilitating seamless cloud services to Canadian researchers, we invite you/your organization to submit a response for consideration to this Call for Participation (“CfP”).

2. Disclaimer

This CfP is not a formal bid process and is not legally binding. The Alliance is not obligated to enter into any contract and reserves the right, but has no obligation, to modify this timeline and in its sole discretion, withdraw this CfP at any time without prior notice.

3. Objectives

The vision of the ACCP is to: leverage an enhanced and rich suite of cloud services, provide an on-demand approach to accessing cloud resources and develop a long-term strategy for using cloud computing to benefit all Canadian researchers. The ACCP aims to build national cloud research capacity and deliver on the Alliance’s mandate to meet the increasing digital research infrastructure (DRI) resource demand from the Canadian research community.

The ACCP will consist of three (3) separate calls for participation (CfP) that will target:

1. Commercial cloud providers
2. Platform developers (this Call)
3. Canadian researchers

This CfP aims to engage platform developers with the goal of developing a unified pilot platform (“platform”) for accessing commercial cloud service providers (“CSP”) in Canada’s research environment and allow researchers to optimize where they put their applications and workloads.

In this CfP, the Alliance is inviting participants from diverse sectors to work together, as partners, in an open and collaborative context that builds on existing efforts and identifies ways to facilitate researchers' use of cloud frameworks. Whether commercial vendors, open-source developers, or members of the Canadian DRI ecosystem, participants will work with community stakeholders to develop a single "pane of glass" or portal for seamless access to community cloud and key CSPs by Canadian researchers.

3.1 Process

The ACCP is made up of multiple stages, with this CfP being the first stage:

Stage 1: Identify possible participants (*This* CfP)

A. Using this CfP, potential participants will be identified from the CfP respondents. **NB: This CfP is neither a procurement call nor is it a funding call. The funding discussion for the pilot occurs in Stage 2 (below).**
B. The eligibility to respond is unrestricted: respondents can be from private industry, academia, non-profits, individuals, etc.
C. Respondents of the CfP will indicate which components they are interested in contributing to, and how they feel they can contribute (expertise, development, operations, security, project management, etc).
D. Respondents of the CfP will communicate why they should be considered (capacity, ARC/HPC experience, engagement with the ACP community, etc).
E. Respondents will indicate at a high level what they see as required remuneration, as well as potential forms of match.

Evaluation: A letter of intent (LOI) containing responses to sections C, D and E above will be required. The CfP evaluation committee will evaluate all responses based on the LOIs. All accepted respondents ("Participants") will have shared with them the submissions of all other Participants.

Stage 2: Kick-off meeting/workshop (1/2 to 1 day)

A kick-off meeting will be held for all Participants (accepted respondents).

1. The overall vision and goals of the project will be communicated, and all parties will be introduced.
2. Each Participant will (briefly) introduce themselves and describe where they see themselves in the project (components of interest, etc).
3. The vision for each component will be presented/described by the Alliance, with Q&A from Participants.
4. The Alliance will work with the Participants to form teams around each component, with some Participants possibly being in more than one team. It is expected that each team will be made up of no more than three or four Participants. One of the Participants will lead the team, chosen by the Alliance in discussion with the team, with the Alliance in co-lead. The Alliance will provide project management support to all teams.
5. The Alliance will articulate in detail the financial aspects of the project, describing the various funding instruments available to Participants. The Q&A is expected so that Participants can understand the funding models.

Stage 3: Component proposals
Each team (one per component) are tasked to propose one (or more) viable solution, made up of:

1. A proposed architecture and technology stack.
2. A draft timeline, including the contributions of each Participant.
3. A draft budget, including the contributions and costs for each Participant, as well as the cost of any additional software or services needed.

The solutions would be crafted through interactions with, and feedback from, the Alliance and the community. Once the proposed solutions are approved by the Alliance, they will be formalized and treated as sub-projects of the overall project. Where appropriate, formal contracts with Participants to provide the services needed to build the solution will be put in place.

Stage 4: Component sub-project implementation (agile/iterative)
TBD

Stage 5: Deployment and testing (*pre-researcher*) (agile/iterative)
TBD

Stage 6: Pilot operations and researcher evaluation
TBD

4. Background

4.1. The Alliance

The Alliance is funded by the Government of Canada through Innovation, Science and Economic Development Canada (ISED) via the Digital Research Infrastructure Strategy. The Government of Canada is promoting the broader adoption of cloud computing to leverage the benefits in delivering faster, more adaptable and scalable solutions to meet the growing demand for digital resources in the Canadian research community[1].

In 2022, ISED gave the green light to the Alliance's 2023-25 Multi-Year Funding Proposal and National Cloud Strategy, endorsing a unified vision, strategy, and action plan in Canada's DRI ecosystem.

The Alliance Researcher Council's updated cloud priorities for 2023[2]:

1. Provide a flexible model for commercial cloud computing that facilitates transparent access or by providing in-kind credits to researcher groups to

[1] Government of Canada's Cloud Adoption Strategy: 2023 Update, https://www.canada.ca/en/government/system/digital-government/digital-government-innovations/cloud-services/cloud-adoption-strategy-2023-update.html.
[2] Alliance Researcher Council: Meeting the Digital Research Infrastructure Needs of the Canadian Research Community - Update on Cloud Computing, https://zenodo.org/doi/10.5281/zenodo.7974805

directly purchase cloud compute, storage or services from a vendor of their choice.

2. Ensure that Alliance-managed access to commercial clouds is done so that compute, storage and services are provided in a manner that is vendor-agnostic.

3. Consider commercial clouds for opportunistic computing when Alliance resources are oversubscribed or offline.

ISED has made available $5M to the Alliance for the ACCP project, which if leveraged fully, would require a match of approximately $2M. This amount is for the entire project, including the CSP CfP.

4.2. Current State

The “cloud,” defined as those services provided via the major CSPs and 2nd tier providers, have created a mature Infrastructure as a Service (IaaS), Platform as a Service (PaaS), and Software as a Service (SaaS) ecosystem over the last two decades. This ecosystem has been growing at approximately 15% year over year since 2006, and now serves all levels of business, enterprise, and government. Higher education in Canada and the United States have lagged in this area, although interest is accelerating as pricing becomes more competitive, along with specialized programs, and economies of scale.

The Alliance is one of the key providers of DRI services in Canada. It is a member-based organization of post-secondary institutions, research hospitals, colleges, and related organizations, with 45 primary members and 88 associated members spanning the country. Computational services include both traditional high-performance computing (HPC) as well as community cloud on-premises infrastructure, with over 21,000 active research users and 5,600 active principal investigators. The demand for the Alliance DRI computational services is continually increasing, with the Alliance only able to meet a fraction of the demand from current researchers due to limits in capacity. For example, in 2023 the Alliance resource allocation process[3] was only able to meet 46% of the requested computation for HPC (216K core years allocated out of a requested 468K) and 76% of requested cloud resources (27K virtual CPU years allocated out of a requested 35K). The ability to meet the needs of Canadian researchers in terms of specialized hardware is even more challenging, with only 20% of requested GPU resources allocated (2K GPU years allocated out of 10K requested). In some cases, Canadian researchers are directly utilizing commercial cloud to meet their research needs. The Alliance envisions hybrid commercial and community cloud as a mechanism to help meet the

[3] Alliance 2022-2023 Annual Report, https://www.alliancecan.ca/sites/default/files/2023-08/annual_report_2022-2023.pdf, Page 13

needs of Canadian researchers, including but not limited to (from Alliance National Cloud Strategy[4]):

- Enabling access to cloud-based, container-orchestration workflow systems
- Supporting shared scheduling of HPC-like workloads
- Enabling interactive and collaborative workloads
- Providing alternative open-source tools
- Supporting rapid access to virtual HPC
- Offering collaborative portals and publishing
- Accessing innovative AI tools and algorithms

5. Project Overview

The goal of this project is to create and operate a unified platform that streamlines and enhances the process of accessing and administering community and commercial cloud providers operating in Canada. This platform aims to provide better access to compute, software and data through a centralized and user-friendly interface, ensuring efficiency, security, and compliance for the Canadian research community seeking cloud services. The plan is to complete the development of the pilot by March 2025 (Stages #1-4), followed by the pilot testing (Stage #5) during which the platform will be evaluated by a group of selected researchers (identified through the "Canadian Researcher CfP").

The objective of this CfP is to identify potential participants (Stage #1) for the design, implementation, testing and evaluation of the platform described in the MVP.

Pursuant to the 2021 Researcher Needs Assessment and the Researcher Council Priorities Report, five (5) Use Cases were developed. The Use Cases provide examples that detail the specific functional and technical requirements of the platform and can be found here.

5.1. Key Features

- **Seamless Integration:** The platform should support easy integration with leading commercial and community cloud providers, allowing users to manage and deploy resources effortlessly.
- **Security and Compliance**: Robust security measures and compliance features must be implemented to meet industry standards and regulatory requirements in Canada.
- **User-Friendly Interface**: The platform should have an intuitive and user-friendly interface, enabling both technical and non-technical users to navigate and utilize its features effectively.

[4] Alliance National Cloud Strategy 2023, https://zenodo.org/doi/10.5281/zenodo.10214474

- **Scalability**: Allow researchers to combine the power of an agile, elastic, and pay-per-use cloud experience that can accommodate the evolving needs of the researchers and adapt to changing requirements.

5.2. General Principles

Figure 1 captures both the provider (separate CfP) and the platform (this CfP) which together implement the Minimum Viable Product (MVP) for this pilot. Identity management (IdM) is external to the MVP, with the Platform IAM component - which is primarily access management - needing to interact with the external authoritative IdM. The Platform is divided into three categories, each containing one or more components, indicated in red borders in the diagram. The MVP document describes the requirements for each of these components.

5.3. Minimum Viable Product (MVP)

The MVP document provides a description of the features required for the development of the Cloud Connect Platform MVP, as well as a list of desirable features. The MVP document was used to inform the development of this CfP.

The Alliance will explore all options, including leveraging an existing commercial platform, adapting open-source options, or supporting the co-development of an in-house solution.

The Platform components are expected to run on one or more of the cloud service providers. Deployment of the platform components onto the CSPs is required to use Infrastructure-as-Code (IaC). The MVP document contains details regarding the IaC requirements.

The Platform is made up of six components, in four categories.

1. **'Single Pane of Glass' Portal (*Component #1*):** A web interface (portal) providing researchers a single integrated view across all of the platform services (2,3,4 below), and pass-through links to the CSPs' web consoles. The development of this component will require integration with the below components and links to the CSPs' web consoles. The portal will also provide Alliance and community admins with integrated administration views of all the components.

2. **Researcher-Facing Managed Services:** A set of Alliance and/or community managed, CSP-hosted, researcher-facing specialized compute services, which will allow researchers to deploy their own instances of these services. These services (components), for the purposes of the pilot, are: Jupyter **(*Component #2*)**, Galaxy **(*Component #3*)**, Magic Castle **(*Component #4*)**. The user interfaces for the deployment of these services by researchers will be integrated into the portal. Additional services (Others - ***Component #5***) will be considered where relevance, cost and community support justifies their

inclusion in the pilot.

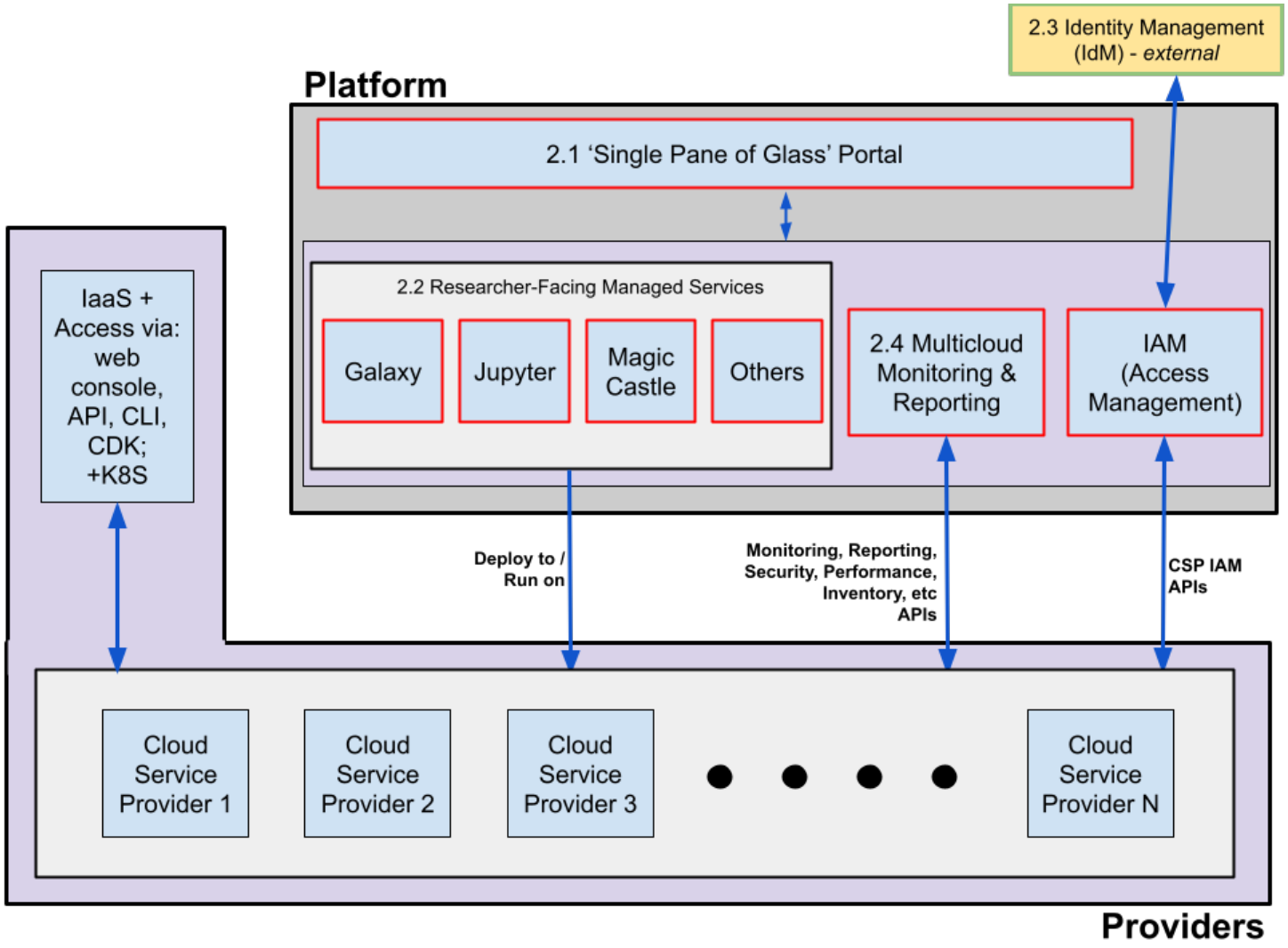
3. **Identity and Access Management (IAM) (*Component #6*):**
   a) Delegates identity management to a federated authority; and
   b) Is the authority for access management and propagates access management policy to the cloud providers.

   Access management in this context is primarily the ability to invoke, manage, view, etc CSPs' services/infrastructure. Researchers will be able to sign on with their existing credentials and access cloud resources as per their role in their projects. An administrative view will allow Alliance and community admins to manage accounts, CSP access, etc.

4. **A Multi-Cloud Reporting and Management Dashboard (*Component #7*):**
   A component allowing researchers and Alliance and community administrators to monitor, control and optimize cloud costs, infrastructure and services. The dashboard will offer a unified view across the cloud providers, supporting roll ups by researcher, project, cloud provider, etc. The dashboard will support reporting and alerting for cost management, intrusion and anomaly detection, compliance, security policy, network issues, performance issues and access policy issues.

In Appendix A, respondents are required to select the components to which they wish to contribute to the pilot. Furthermore, respondents are required to substantiate their selection by detailing their relevant experience, merits, and qualifications in a LOI.

Figure 1: ACCP MVP



6. Scope of Participation

6.1. Participant Eligibility

The ACCP initiative provides a unique opportunity for collaboration and partnership between the Alliance, academia, healthcare, private industry and other partners to accelerate cloud computing across the Canadian DRI ecosystem. This typically includes for-profit businesses, not-for-profit organizations, academic institutions and other legally constituted entities. Individuals may also qualify based on their contributions, provided they are associated with and apply through a qualified organization (Figure 2).

This CfP welcomes service and platform providers, developers, engineers, and specialists from various sectors with the capacity and capability to deliver results by having the necessary expertise, resources, infrastructure and support systems in place to contribute to the success of this project.

6.2. Matching Contributions and Funding

NB: The information provided in this section does not apply to this CfP (Stage 1 of the ACCP). It is intended to inform respondents on the financial details relevant to subsequent stages of the project (Stages 2 and 3). See section 3.1 for more details.

The Alliance has a requirement to leverage the federal contribution it receives with matching contributions from partners. Initiatives like the ACCP must achieve match targets in order to proceed. As such, matching contributions from partners are essential to the success of this project and will determine the Alliance's funding contribution to this initiative.

Matching contributions may be either monetary (direct support of costs) or non-monetary ("in-kind"). To be considered eligible, matching contributions should meet both the following criteria:

- be used to pay for eligible costs
- be provided by eligible partners

For more information on the eligibility of costs, contributions and partners, please refer to the Alliance Financial Management Guidelines (AFMG).

Figure 2: SCOPE OF PARTICIPATION

Sector	Affiliate	Deliverable(s)	Matching Contributions	Agreement
Industry	Commercial Entities For-profit business	Off the shelf commercial products -software solutions -applications - support services	-Discounts* on list-price -non-monetary contribution in the form of in-kind access to professional services -Scientific - Engineering - Technical staff	Purchase Agreements/Orders Entered into with the entity. -SLA -Subscriptions -EULA, etc.
Academia	Canadian research institutions Universities Colleges	Design, development, integration and support	Budget, including salary and eligible expenses, paid for by the institution	Funding Agreements/MOU Entered into with the institution
Healthcare	Hospitals Research centres	Design, development, integration and support	Discount* on fees A non-monetary contribution in the form of professional services or access to IP	Service Agreements Entered into with the health centre
Other	Firms Sole proprietors (Consultants/ contractors/freelancers) Open source	Strategic and technical advice and direction, design, development, and support.	Discount* on fees A non-monetary contribution in the form of professional services or access to IP	Service Agreements Entered into with the legal entity

*** Beyond the normal academic discount**

7. Response Submission

7.1. Submission Guidelines

Responses to this Call for Participation will consist of two (2) parts:

1. **Appendix A - Submission Form**

    - Respondents will find the application form on the Alliance website at the following link: www.alliancecan.ca/en/ACCP

- Respondents will provide all required participant information, as requested.
- Respondents must clearly specify the component(s) to which they intend to contribute in this project.

2. **Letter of Intent (LOI)**

   The LOI is designed for respondents to express their interest and commitment to the ACCP and to provide an overview of how their contribution will add to the success of the project. The LOI should address the following key points:

- **Description:**
  a. Please provide a description of the proposed contribution.
  b. Your response should clearly tie into the component(s) as selected in Appendix A.
  c. Your response should align specifically with the MVP.
- **Relevance to Project Goals:**
  a. Explain how your proposed participation aligns with the objectives and needs of the project.
  b. Explain how your expertise, past experience and accomplishments will bring value to this project.
- **Benefits and Impact:**
  a. Describe the anticipated benefits and impact of your contribution on the project and its stakeholders.
- **Additional Information:**
  a. A high level of what they see as required remuneration, as well as potential forms of match.
  b. Include any additional information or considerations relevant to your response.

Format: Please upload the LOI in electronic format (PDF or Word/Excel) to the application form found at alliancecan.ca/en/ACCP. Ensure the response is single spaced, four (4) pages max (not including tables/spreadsheets) using Arial (11) font.

8. Master Schedule

This CfP will roll-out according to the following master schedule:

Milestone	Estimated Timeline	Event	Stage
M1	4 Weeks	Issuance of Call for Participation March 27, 2024	1

M2		Deadline to submit questions April 12, 2024	1
M3		Issuance of 'Questions and Answers' document April 19, 2024	1
M4		Close of Call for Participation April 24, 2024	1
M5	2 Weeks	Review and assessment of LOIs	1
M6		Establish a 'short-list' of respondents "Participants"	1
M7	1 Week	Kick-off meeting / workshop with Participants	2
M8	3 Week	Submission of component proposals	3
M9		Review and assessment of component proposals	3
M10		Negotiations with Participants	3
M11	3 Weeks	Finalization of Agreements	3
M12		Announcement of successful Participants to the ACCP	3

***Include actual dates in the Master Schedule**

9. Intellectual Property

It is expected that all code, scripts, templates, etc that are developed during the pilot will be open sourced with an OSI-recognized licence, in a public facing source code repository like GitHub. Background[5] IP developed independently of the ACCP would be an exception. Other exceptions to this will be entertained, with justification due to commercial interests, security concerns, etc.

5 https://en.wikipedia.org/wiki/Background,_foreground,_sideground_and_postground_intellectual_property

10. Submission Deadline

All responses must be submitted by April 24, 2024.

The Alliance will only accept electronic submissions.

Please complete the application form on the Alliance website: www.alliancecan.ca/en/ACCP

11. Criteria for Acceptance

The merit of each submission is evaluated using the following criteria:

- Meets eligibility requirements
- Demonstrates relevant expertise
- Clearly defines role in the pilot
- Demonstrates experience and past performance
- Exhibits leadership and engagement
- Promotes collaboration

A review committee will be convened to conduct a merit assessment for all responses according to their operational and technical adequacy in addressing the specified use cases. Committee members will also consider the feasibility of participant expertise presented in the response, the participant's experience and involvement in similar projects. Shortlisted candidates may be invited for further discussions.

12. Contact Information

For inquiries or additional information, please contact Oludolapo Obaseki, Project Manager at ACCP@alliancecan.ca. We look forward to receiving your innovative responses and working collaboratively to create a state-of-the-art platform that will elevate the cloud computing landscape in Canada.

Thank you for your interest and participation.

APPENDIX A: SUBMISSION FORM

Project Title: ALLIANCE CLOUD CONNECT PILOT - PORTAL

Participant Information:

- Name:
- Address:
- Email:

- Phone Number:

Select all applicable categories and components the respondent will contribute to in the ACCP:

☐ ‘Single Pane of Glass’ Portal

☐ Researcher-Facing Managed Services
  - Galaxy
  - Jupyter Notebooks
  - Magic Castle (Component #4)
  - Other (- Describe and justify proposed additional component(s):

  - Identity and Access Management (IAM)

  - A Multi-Cloud Reporting and Management Dashboard

- Type of participant:
  - ☐ Industry
  - ☐ Academia
  - ☐ Individual Contributor (consultant, contractor or freelancer)
  - ☐ Healthcare
  - ☐ Non-profit

- Home institution/organization:

- Is the requirement for financial support anticipated?
  - Yes
  - No

- Type of Anticipated Matching Contributions: [one or more selection]
  - Monetary donation
  - Non-monetary/in-kind donation
  - Discount offer
  - Credit/service offer
  - None

Provide a brief description of your contribution:

Letter of Intent

The LOI is designed for respondents to express their interest and commitment to the ACCP and to provide an overview of how their contribution will add to the success of the project. Details on what to include in the LOI can be found here in section 7.1 Submission Guidelines.