Proposal for TRIUMF Commitment (5YP 2015-2020)

Date:
September 20, 2012

PROJECT/COMMITMENT TITLE: TRIUMF/Computing Essential Infrastructure

PROPONENT: Steven McDonald **TRIUMF CONTACT:** Steven McDonald

PRINCIPAL COLLABORATORS: TRIUMF Computing CCN, MIS, DAQ

PROJECT DESCRIPTION:

It is critical to maintain essential infrastructure. Aging infrastructure while it may continue to function and provide service, inevitably becomes more expensive in the long-term to maintain and repair. For TRIUMF to be the most effective with it resources (time & manpower) it is important that basic infrastructure services are kept current, relevant and maintainable.

With this consideration the following should be considered as priorities for basic infrastructure upgrades in the TRIUMF 2015-20 fiscal plan

1. Communications System: The present telephone communication system is approximately 20yrs old. Feature upgrades have occurred over the years, but the basic infrastructure and technology has not changed. An overhaul of the system will be required in the next 5YP. Without a comprehensive review it is not possible to determine if it is viable to continue to upgrade the existing equipment or whether a full replacement is more economical. Either path is likely to be costly. **A ballpark estimate is $500k.**

2. Wireless network: the present wireless network throughout TRIUMF is based on 2002 technology. By 2015 the existing wireless infrastructure at TRIUMF will be 15 years old. The demand and expectation for wireless connectivity from staff for mobile technologies has increased significantly. A complete review and deployment of a new mobile wireless network at TRIUMF is required. **Estimated cost $70k**

3. 10Gigabit Ethernet expansion. In 2012 TRIUMF will deploy a new 10Giagbit network core. The number of 10GbE ports purchased in the 2011/12 RFP was conservative for budgetary reasons. By 2015 it is anticipate additional 10GbE ports will be required to meet the demands for network bandwidth. **Estimated cost $75k**. Furthermore, 100GbE may be required to support the demands of the LHC ATLAS upgrade. The newly purchased network equipment will support **100GbE, however no pricing is available at the time of this submission**.

4. Secondary IT Datacenter for High Availability of Services: Computing and networking services have grown from something used by a few for specific functions to everyone for every aspect of their work at TRIUMF. Many of these services are essential to the operation of TRIUMF. The smallest outage of a critical service has significant impact. To mitigate these occurrences a plan has been underway to build a highly redundant, scalable and reliable computing environment through virtualization and redundant systems. For this to be effective a small secondary server room located in another building is imperative. Room 25a in the Main Office building has sufficed for this purpose until now.

   However, it lacks proper cooling and space. The proposal is to use the new upstairs telecom room and some portion of the librarian's office to construct a small server room for highly critical IT services. This should be co-ordinated with the request to review the

telecommunications equipment, which would be located in the same room. **The estimated cost to renovate the Telecom room to service as a secondary datacenter is $60-100k.**

5. MIS resourcing. How can computing be more effective at TRIUMF in 2015-2020? Historically the MIS computing group provided IT services for the administrative requirements of TRIUMF's Finance, Supply Chain Management and Human Resource groups, approximately 20 people. As computing has evolved at TRIUMF the demands on the group have grown to include application support in other areas across the entire site. Web Services, Work Request System, and Scientific Administration Applications for beam requests and scheduling and Conference registrations are examples. Demand for computing support has exceeded the capacity of the computing groups. This has created a number of undesirable consequences. Insufficient resourcing to adequately support and maintaining existing critical services. Secondly, staff not proficient in computing spend unnecessary amounts of time on computing related tasks, that otherwise are not their primary responsibility. Computing is ubiquitous across the laboratory. When resources are limited, it is desirable to place those resources in positions that will have the greatest benefit. **This is the justification for the request to add a fourth member to the MIS Computing group**.

6. Computing resourcing in general
    a. If additional expertise or services is expected to be provided as a result of requests from other TRIUMF groups, additional FTE resourcing should be reviewed.
    b. If additional hardware is requested to be located in the datacenter additional electrical and cooling capacity will be required. The cost will be dependant on the request.

7. Collaborating Software Services: Email & Calendaring. Email has become a critical service. For many Calendaring has become equally importance. Currently they are not well integrated at TRIUMF and not all staff have access to the Google Enterprise Calendar service. The demand for email and calendaring support on mobile devices such as smart phones and tablets is anticipated to rise significantly by 2015. If this is a service TRIUMF considers important enough to improve and support then an investment will be required. TRIUMF Computing does not have the resources to build and support such a modern system. **The estimated cost to out-source an email/calendaring service for staff-only is approximately $50k/year.**

SCIENTIFIC JUSTIFICATION:

TRIUMF information and Technology Infrastructure is a site wide necessity for all scientific and administrative staff.

RELATIONSHIP TO BROADER CANADIAN RESEARCH COMMUNITY:

N/A

BROADER IMPACTS:

If aging infrastructure is not renewed periodically it inevitably becomes more expensive in the long-term to maintain and repair. For TRIUMF to be the most effective with it resources (time & manpower) it is important that basic infrastructure that provides critical services are kept current, relevant and maintainable.

MAJOR MILESTONES:

Description	Date

RESOURCE REQUIRMENTS:

CASH FLOW REQUIREMENTS						
\YEAR SOURCE \	ONE	TWO	THREE	FOUR	FIVE	TOTAL
TRIUMF						
EXTERNAL						
TOTAL						
TRIUMF NON-CASH RESOURCES						
\YEAR RESOURCE\	ONE	TWO	THREE	FOUR	FIVE	TOTAL

EXTERNAL FUNDING INFORMATION: N/A

N/A

ONGOING OPERATIONAL REQUIREMENTS:

This is critical infrastructure TRIUMF staff and research personnel rely upon to perform the daily scientific and administrative operations the laboratory.

DECOMMISSIONING REQUIREMENT: N/A

N/A