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## Proposed Montana Project – US UCAN Pilot Affiliate Program

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### OVERVIEW

Although Montana's two research universities, The University of Montana (UM) and Montana State University (MSU), are long time active members of Internet2, Montana's involvement beyond that has been limited. For example, Montana is one of the few US states/territories without an Internet2 Sponsored Educational Group Participation (SEGP) program, and hence has been without national research and education connectivity for its broader K-20 community. That said, in recent years UM, MSU, and others have helped dramatically improve the networking infrastructure within Montana, so that the time is now right to undertake a concerted effort to enhance networking for K-20 and other "public serving" institutions. UCAN and the UCAN Pilot Affiliate Program will allow Montana to implement an organizational framework -- a UCAN Affiliate -- and use that organization to begin systematically connecting a wide range of community anchor institutions (CAIs), from a wide range of CAI types. Participants in Montana's proposed pilot project include The University of Montana, the Montana University System (representing UM and MSU, but also Montana's community colleges), Montana State IT (representing state government, including its public safety entities), and the Health Information Exchange of Montana (representing health care, and in particular FCC RHC PP award winners). With this core group we hope to build a solid organizational base and the core of a state-wide UCAN aggregation network, which will allow us to move on to address connectivity for K-12; other higher education sites; libraries, museums, and performing arts sites; local and regional government; and additional health care entities.

Montana recently has implemented several relevant networking projects on which its pilot project will be based. The MT Pilot Project will leverage both the network infrastructure and the partnerships which helped create the infrastructure, recognizing that both are critical to long term success. Key elements are as follows.

(a) **Organizational Framework** Creating an appropriate MT-based Affiliate to coordinate state activity, and to work with a MT-based Internet2 Connector which serves as the point of contact with the national UCAN Program office.

(b) **Network Connection Framework** Building an appropriate network physically connected through the Connector to Internet2/UCAN infrastructure, and reaching out to facilitate CAI connections through infrastructure connected to aggregation points located across the state.

The key in a pilot is to achieve short term (demonstration) results that then feed into long term (sustainability) plans for serving a diverse set of MT CAIs by building and maintaining these two frameworks. The Plan to be followed in the MT Pilot is explained in more detail below.

### ORGANIZATIONAL FRAMEWORK

The first specific challenge is to create an appropriate MT-based Affiliate organization to coordinate UCAN connectivity within the state, and to link that entity through a Connector to the national UCAN Program Office. MT has no existing SEGP and thus no organization or partnership that it can simply extend from SEGP to UCAN coordination. That said, it does have a number of existing partnerships that can and will be used as the basis for creating a Montana Affiliate, and it does now have a Connector that can link the Affiliate to "UCAN central". The partners in this activity are explained briefly below.

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-The Montana University System (MUS) and Montana State IT (MT-ITSD) – long term partnership to create and manage state wide networking with connectivity to MUS and State sites, including public safety.

-Montana's University System, three private colleges, three community colleges, seven tribal colleges, and the state-wide K-12 coordinating entity (Office of Public Instruction) – cooperation on a state-wide education programs and K-12 to higher education transition, and partnership to extend NTN connectivity to non-MUS higher education entities via an initial set of MUS network aggregation points.

-UM and the Health Information Exchange of Montana (HIEM) – cooperation on implementing HIEM's FCC RHC PP funded network and making excess bandwidth available to the MUS for compatible R&E uses.

-UM, MSU, the MUS, and comparable entities in Washington, North Dakota, Minnesota, Wisconsin, and Iowa – partnership to implement and manage the Northern Tier Network (NTN).

-UM and the University of Utah-Utah Education Network (UU-UEN) – partnership to create and manage an Internet2 Connector with presence in Montana, using the NTN and other infrastructure to reach Internet2 infrastructure in Seattle, Salt Lake City, and Chicago.

The specific plan is to form a Montana Affiliate by drawing initial representatives from the already connected MUS, community/tribal colleges, MT-IT, and HIEM. These groups are all now committed to cooperate on network management and in-state use, so extending this cooperation to also look at national connectivity is a natural next step. In addition to basic formation and operation issues, the primary short and long term challenges that Montana's new Affiliate will need to address include: (a) funding the UCAN (SEGP) membership fee; (b) funding base service for Affiliate members on the national network; (c) expanding existing MUS, State, and HIEM networking into a regional UCAN aggregation framework; and (d) expanding this framework to add, connect, and serve other CAIs.

As for the Connector requirement, UM will fill this role. Through its existing UT-MT Connector status and organizational connections it will provide liaison with the UCAN Program Office. Through its existing physical connections to Internet2 infrastructure in Seattle, Salt Lake City, and Minneapolis/Chicago, it will provide Internet2 connection service for Montana's connected CAIs.

### **NETWORK CONNECTION FRAMEWORK**

The goal for the MT Project is to create an effective framework for the connection of a wide number and type of CAIs, with the following elements (building outside in).

*-A Connector with Montana point of presence, linked to Internet2 infrastructure* As noted above UM and its existing connections will fill this role.

*-An in-state very high speed core network connecting aggregation points to the Connector* We start with (i) the NTN with drop/add points in Missoula, Bozeman, Billings, and Miles City; (ii) State Network, HIEM-based, and other connections that reach all eight MUS campuses, three community colleges, and one tribal college; (iii) State Network connections to essentially all MT-IT sites; and (iv) HIEM-based connections to twelve health care sites. It is hoped that this can be expanded in two ways. First, funding will be secured to allow additional HIEM

infrastructure to be added, extending the base MT UCAN aggregation network with Missoula/Kalispell, Kalispell/Libby, and Kalispell/Shelby segments, and comparable Kalispell, Libby, and Sheby aggregation points. Second, MT-IT will secure funding to allow the addition of a NT drop/add in Helena, enhanced integration of NTN and State Network facilities, and enhancement of State links to other parts of the state to serve both MT-IT needs and act as connections to UCAN aggregation points.

*-Support for UCAN aggregation points* As noted above, the MUS/MT-IT already support a set of aggregation points which can be generalized as UCAN aggregation points in Missoula, Bozeman, Billings, and Miles City, with the plan being to expand this set to include Helena, Kalispell, Libby, and Shelby. The plan is also to look at current State Network facilities and see if they can be expanded/broadened in a similar way, with specific focus on setting up connections and aggregation sites in other parts of Montana. This will include looking at existing State Network links to other MUS sites and key Montana population centers – Havre/MSU-Northern, Great Falls/MSU-Great Falls, Butte/UM-MTech, and Dillon/UM-Western. It will also include looking for a way to set up aggregation points in other central and north eastern parts of Montana (e.g. Lewistown, Glasgow/Wolf Point, Plentywood, and others).

*-Support for CAI local loop connections* The Plan focuses short term activity on what amounts to “harvesting low hanging fruit” represented by CAIs that would be relatively easy to connect – e.g. those CAIs that are nearby existing aggregation points (e.g. K-20 sites in Missoula, Bozeman, Billings, and Miles City) and those already connected to other private networks which could be “bridged” to the UCAN network (e.g. K-20 sites on “video conferencing networks” maintained by private providers). Longer term the idea is to use the pilot project’s organizational and network frameworks to support individual CAIs and groups of CAIs in their own efforts to secure funding for UCAN connection. A prime example here is a group of 40-plus public library sites which have received both Gates Foundation and BTOP/PCC funding for local networking enhancements, and might now seek additional funding for UCAN connectivity.

As noted above, with current activity MT is *a priori* guaranteed that it will be able, network transport wise, to connect the eight campuses of the MUS, the three community colleges, one tribal college, 12 health care delivery sites from HIEM, and appropriate State sites. Because we plan to “appropriately logically interconnect” rather than “physically rewire” the State, MUS, and HIEM networks, we will have to carefully address various security and performance concerns in blending these networks. Thus the extent of what we can achieve with the aggregation framework during the short pilot itself is unknown. But the MUS, MT-IT, and HIEM are committed to participate to the extent possible. We anticipate that many other new CAIs around the state will also want to participate, but given that their participation depends on the creation of appropriate transport (aggregation network and local loop connection), again the number of full connected new participants achieved during the pilot is unpredictable.

## SUMMARY

In summary, the proposed MT Pilot Project offers the following potentially unique elements.

- Building a MT-based UCAN Affiliate from the ground up
- Coordinating activities for two states through a single Internet2 Connector (assuming that both MT and UT Pilots proceed)
- Demonstrating full involvement and participation by the state IT organization (MT-IT), including its public safety elements
- Demonstrating the full involvement and participation by a major FCC RHC PP award winner, including both participation of the health care sites but also the processes

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involved in utilizing FCC RHC PP funded infrastructure for this compatible but not health care specific use

The Project also would combine a number of interesting networking developments – traditional vendor based state networking, the NTN, the proposed Internet2/NTN 100Gb upgrade, FCC RHC PP funded efforts, and related NTIA/BTOP funded efforts. Because the bulk of these networking elements are or will soon be in place, successful connection of an initial, diverse collection of CAIs is largely dependent on organizational development, rather than network development. And because the new CAIs that are targeted come from the least understood (from the Internet2 perspective) CAI types of health care, community/tribal colleges, state/local government, and public safety (in MT largely part of state/local government), working through these organizational issues in MT could be potentially very useful to the national UCAN Office. The bottom line is that in MT we think the time is right for us to move forward, we think our project has a lot to offer, and we look forward to working with Internet2 and the national UCAN Office to launch and implement our project.

#### **SUMMARY - PROJECT PARTICIPATION AND COMMITMENTS**

Participation Representatives from UM (in the “convener” role), MUS, MT-IT, and HIEM, possibly others as the project evolves.

Tentative Project Timetable Start immediately. Continue through roughly June 30, 2012 for the creation of the Affiliate organization and network planning. Continue through roughly December 31, 2012 for execution of networking upgrades, initial operation of the Affiliate, and preparation of funding requests for the 2013 Legislature. Continue operational and legislative activity through June 30, 2013. Begin steady state operation in July 2013.

#### Project Resource Requirements/Commitments

*Step 1 – Affiliate Creation* UM, MT-IT, and MUS commit personnel time to lead the creation of the Affiliate organization. UM commits personnel time for Connector issues.

*Step 2 – Network Design* UM, MUS, MT-IT, and HIEM commit personnel time (network expertise) on an “as needed” basis to address technical issues.

*Step 3 – Resource Issues* UM, MUS, MT-IT, and HIEM commit personnel time to seek funding to address on-going resource issues.

#### Major Hurdles/Milestones

-Obtaining pilot funding for UCAN/SEGP member fee, integration of State Network with NTN-based MUS network, and broadening of MUS/State aggregation points to serve as UCAN aggregation points

-Obtaining in-principle buy-in from other key stakeholders, notably K-12, public library groups, various elements of state/local government, and other health care delivery groups

#### Anticipated Outcomes (Assuming the Hurdles are cleared)

-A viable, sustainable UCAN Affiliate to coordinate a MT UCAN connection program

-A viable UCAN core and aggregation network, serving a substantial portion of Montana, and connected to the national Internet2/UCAN infrastructure

-Connection of a diverse and significant collection of CAIs, drawn from various CAI types