

U.S. UCAN Community Anchor Institution FAQ

What is the BTOP program?

BTOP is the Broadband Technology Opportunities Program administered by the National Telecommunications and Information Administration (NTIA) in the U.S. Department of Commerce. The program was funded in February 2009 with \$4.7 Billion by the American Reinvestment and Recovery Act (ARRA) to enhance broadband connectivity to underserved areas and community anchor institutions such as colleges and universities, K-12 schools, libraries, hospitals and other health care providers, local governments, and public safety organizations.

What is U.S. UCAN?

Funded by the National Telecommunications and Information Administration (NTIA) Broadband Technology Opportunities Program, the United States Unified Community Anchor Network (U.S. UCAN) will be a nationwide, coast-to-coast advanced network infrastructure that, together with state and regional network partners, will enable the connection of America's community anchor institutions—schools, libraries, community colleges, health centers and public safety organizations—to support advanced applications not possible with today's typical Internet service. U.S. UCAN will fill a critical gap linking community anchor institutions together into a national, open network with next-generation capabilities, operated with end-to-end transparency and the highest levels of performance uniquely suited to the needs of these communities.

U.S. UCAN will provide a network environment capable of supporting life-changing applications such as telemedicine and distance learning for all community anchor institutions, including those in areas previously considered too remote or economically depressed to support advanced network services. Led by the same advanced networking community that has already connected 66,000 community anchors through partnerships across public and private sectors, U.S. UCAN will prepare Americans—now and in the future—to compete successfully in an increasingly competitive global economy.

The network will offer its services to community anchors nationwide through a new not-for-profit organization (also called U.S. UCAN), which will be directed and governed by a partnership of the research and education networking community and representatives of community anchor institutions. In essence, the network will be owned and directed by its stakeholders. As a first priority, U.S. UCAN will make sure that it meets the needs established by its governing body of community anchors

What are Internet2, National LambdaRail, Northern Tier Network Consortium and Indiana University Global Research Network Operations Center?

- **Internet2** is an advanced networking consortium led by the research and education community. An exceptional partnership spanning U.S. and

international institutions who are leaders in the worlds of research, academia, industry and government, the Internet2 community is developing breakthrough Internet technologies to support innovations across academic and research disciplines. Internet2 operates a nationwide high-capacity advanced network that connects research and education institutions across the U.S. including major research universities and colleges, government research facilities, community colleges, libraries, medical facilities, k-12 schools, museums, performing arts centers. Together this community is pioneering the Internet of the future. Internet2 - also known as University Corporation for Advanced Internet Development (UCAID) - is the lead applicant on the US-UCAN BTOP Proposal

- **National LambdaRail (NLR)** - Owned and operated by the U.S. research and education community, NLR is one of the world's most advanced networks: 12,000 miles of high-performance optical fiber coast to coast, capable of speeds up to 100 Gigabits per second. Over 280 universities and federal labs use NLR as their testbed network for leading-edge research. With no restrictions on usage or bandwidth, very high availability, a choice of next-generation network services and applications, and customized support for individual researchers and projects, NLR creates unprecedented opportunities for collaboration, innovation and commercialization among the global research community and between private and public partners. For more information, please visit www.nlr.net.
- **The Northern Tier Network Consortium (NTNC)** seeks to develop and sustain advanced networking capabilities in order to support the educational, research, and economic vitality of the Northern Tier region. Members of NTNC include research and education organizations from across Alaska, Colorado, Washington, Montana, Idaho, North Dakota, South Dakota, Wisconsin, Minnesota, Michigan, Iowa, Wyoming, and Nebraska.
- **The Global Research Network Operations Center (GRNOC) at Indiana University** is a premier provider of highly responsive network coordination, engineering, and installation services that support the advancement of R&E networking. From its support of Internet2, National LambdaRail and other major research networks, the Global NOC has become an unrivaled provider of 24x7x365 expert support for the most advanced research networks in the country.

What qualifies these partners to build U.S. UCAN?

Internet2, NLR, NTNC and IU GRNOC together with their over 30 regional and state networking collaborators have a strong history of providing advanced networking to anchor institutions. Individuals associated with these organizations played key roles in developing NSFNet in the 1980's, and in the 1990's transforming NSFNet into what we today know as the commercial Internet. For nearly 15 years, Internet2 and NLR networks have interconnected regional networks across the US. These regional networks, in turn, connect community anchors seeking advanced broadband

capabilities. Today, this member-led collaboration provides cutting-edge networking for the research community, and has expanded its reach to over 66,000 K12 schools, community colleges, libraries, museums, science centers, performing arts centers, hospitals, and other health clinics. These organizations know the needs of community anchor institutions, the technology and applications, and how to ensure sustainable business models to support them.

In its recently released National Broadband Plan (NBP), the Federal Communications Commission (FCC) further validated the credibility of Internet2, NLR and regional research networks. The plan highlights a past failure to address the needs of community anchor institutions in the U.S. The plan suggests that the best path forward is to develop a “Unified Community Anchor Network” (UCAN) that should be built leveraging the extensive investment the research and education community has already made in national network infrastructure via Internet2 and NLR, as well as utilizing the human expertise and collaborations that have been developed by this community to greatly accelerate the delivery of broadband to all of the nation’s community anchor institutions. This BTOP grant provides a jumpstart on delivering on the FCC’s National Broadband Plan vision.

What role will each of the industry partners (Ciena, Cisco, Infinera, and Juniper) play in operating U.S. UCAN?

U.S. UCAN industry partners – who have been longtime partners in the research and education networking community - will play a critical role in making this effort a success. These partners have made substantial contributions including state of the art networking equipment and financial support to assure U.S. UCAN has leading edge capabilities to support the most advanced needs of the community anchors.

What are the benefits of participating in U.S. UCAN?

Community anchor institutions need very high-capacity bandwidth to provide essential services to their communities. The broadband needs of community anchor institutions are very different from the needs of residential or business consumers. Anchor institutions often serve thousands of people every day and need “future-proof” broadband capacity that will be capable of handling their growing broadband needs for decades. U.S. UCAN provides myriad benefits that specifically meet the needs of community anchors. Some of these include:

- **A NETWORK ENVIRONMENT TAILORED TO SERVE COMMUNITY ANCHOR NEEDS**
Under current commercial network paradigms, packet-loss, low performance and operational opacity continue to limit network performance, adoption of new Internet-based applications, and support for national programs like healthcare, education, science and research. U.S. UCAN will provide a robust, resilient national advanced network infrastructure that assures performance, models operational transparency, and will provide a full set of advanced capabilities to all community anchor institutions essential to the economic recovery and growth

of the U.S.

- **OPERATIONAL TRANSPARENCY**

Given the critical nature and time-sensitivity of many advanced broadband applications used by community anchors, network transparency is a necessity. A typical physical network path connecting one doctor to a remote colleague requires crossing several so called “administrative network domains,” meaning the connection could include any number of network providers. Since a problem can occur on any one of these network links without transparency on the entire “end-to-end” path, it is very difficult to troubleshoot and fix any application problems.

The national, regional and local advanced networks that will make up the U.S. UCAN ecosystem operate open networks in a collaborative fashion. These networks have also developed and deployed a suite of open-source network performance tools that optimize applications and trouble-shoot problems, especially across networks boundaries. The U.S. UCAN commits to operating under these same principles and will publish network statistics in near real time on publicly available websites. Problem resolution and problem avoidance will be far more easily managed because the root of the problems can be immediately pinpointed by interested parties. Network problems will be commonly prevented and quickly resolved when they do occur.

- **ADVANCED CAPABILITIES**

Anchor institutions need Internet Protocol version 6 (IPv6) and multicast capabilities. These technologies make more efficient use of networks, enable more efficient video broadcasting and file transfer, and are essential to the growth and expansion of the Internet. U.S. UCAN will deploy IPv6 and multicast. For example, during the early part of the BP oil spill, the organization that produce the PBS-aired NewsHour converted the live video of the leaking oil rig into a video format that more Internet users could access. There was overwhelming demand for this live video, and the conventional method for distributing the video to many thousands of users became a significant strain on the NewsHour's Internet connection and financial resources. If the NewsHour had been able to use IP multicast, a single live feed of the gulf oil spill could have been viewed by an unlimited number of users without affecting the NewsHour's Internet connection or financial resources. In short, multicast allows an individual or small organization to send a live video feed to unlimited number of viewers for very little expense. The national non-profit networks that will underpin U.S. UCAN are IPv6-ready and, as a community, its members can provide the technical support and knowledge required for the widespread adoption and deployment of IPv6 during this major transition in Internet technology.

- **A THRIVING COMMUNITY**
Community anchors need more than just infrastructure to support their advanced broadband applications. Significant work must be done at the applications and services levels to make the deployment of advanced broadband to community anchor institutions meaningful. For instance, at the applications level, anchors often require expertise, demonstrations, help centers and engineers who can “tune” applications, sometimes with the intent of increasing the bandwidth available to an application to better serve the user, while not constraining it. The research and education community has many thriving collaboration opportunities including many working groups, community forums, and other information-sharing mechanisms that enable individuals to share best practices and solve common problems all with the goal of enabling institutions to better leverage their network resources and take advantage of new and innovative applications. This can be considered a social network for broadband innovation in some respects.

What are the high level basics of the grant? What will it accomplish?

- U.S. UCAN will develop a 100-Gigabit per second national backbone infrastructure—dedicated to supporting all 200,000 community anchor institutions across the U.S. through its regional partners. This network would catalyze the adoption of next-generation Internet applications - most importantly in life-changing fields such as telemedicine, public safety, and distance education. The network would be configured to easily grow to multiples of 100-Gigabit in advance of demand to assure there is always excess capacity for innovative applications;
- U.S. UCAN’s infrastructure would leverage the non-profit model, existing assets and proven expertise of the research and education network community to serve community anchor institutions with next-generation networking and collaboration support to fulfill their needs;
- U.S. UCAN would ensure that the tens of thousands of new community anchor institutions connected via existing regional networks or new separately funded BTOP proposals have the bandwidth and capabilities they need on the national level to collaborate not just across state but around the world;
- U.S. UCAN is more desirable than alternative networks for these applications because it will enable next generation services like IPv6 and multicasting; will be built with abundant capacity headroom to support high-bandwidth applications and users; will be operated transparently including its finances; and would provide unique support for end-to-end network performance;
- It is estimated that U.S. UCAN would initially be able to connect over 100,000 anchor institutions, serving over 35 million individuals and will be capable of serving the remaining U.S. anchors;
- The grant includes a resilient set of fiber paths through the middle of the country where there is the highest demand with new capabilities also added across the Northern Tier and through the south and east.

How can my institution become connected to U.S. UCAN?

The announcement of the grant from the NTIA is an exciting first step to bringing U.S. UCAN to fruition. Now that the BTOP funding is committed, leaders from the anchor institution community must now come together to create the U.S. UCAN organization. If you would like to join a mailing list to be kept aware of U.S. UCAN developments, please visit www.usucan.org to provide your contact information.

What services would be available via U.S. UCAN?

The network will provide advanced Internet connections among community anchors, a “peering service” connecting anchors to key content providers and general access to the commercial internet. Other specific services will be determined as leaders of the community anchor community determine requirements in their leadership roles with US-UCAN. It is envisioned that services will be designed to ensure the use of the most advanced applications needed by community anchor institutions including telepresence, telemedicine, distance learning and beyond.

What if my institution is already connected to Internet2?

As U.S. UCAN develops, your institution will have access to a greater set of resources including an increased number of collaborators that you can connect with as well as new types of applications. The support of the BTOP dollars will not only provide the capacity to support the new anchor institutions, but also to accelerate Internet2’s support for leading edge research with new 100G backbone capabilities.

Will our connection to U.S. UCAN give us access to the entire Internet?

Depending on the needs of the community anchor institution, U.S. UCAN will have capability to connect it to the Internet, to a portion of the Internet or just to other similar communities.

How much will participation in U.S. UCAN cost?

Determining the fees for U.S. UCAN will require discussion within the community that will lead the US UCAN organization. It will be a goal of U.S. UCAN to ensure that access to this advanced infrastructure will be affordable to all institutions that qualify to connect, while also allowing the necessary continuous investment to sustain and advance the shared asset of its users.

Do we need any special expertise to connect to U.S. UCAN?

It is expected that community anchors and networks that support them should be able to use common off the shelf equipment to connect to U.S. UCAN. It is expected that the U.S. UCAN community will form advisory groups and other supporting structures which may leverage existing knowledge from the research and education community to provide a supporting community to build shared expertise.

How can I get involved in the planning of U.S. UCAN?

The startup partners of U.S. UCAN will be convening many discussions among the community anchors to be served by the infrastructure. There will be many mechanisms through which to provide feedback and to become involved. As a first step, a mailing list will be developed to keep those interested up to date on the progress of U.S. UCAN. Please [visit www.usucan.org](http://www.usucan.org) to provide your contact information.

We are a high school (library, etc.). Can we use e-rate to connect to U.S. UCAN? Are there other subsidy programs we can use to connect?

The partners involved in U.S. UCAN are advocating that the FCC clarify its rules to make connecting to U.S. UCAN an eligible expense under E-rate, the new Connect America Fund, and the Rural Health Care Program. The FCC is currently considering revisions to all of these Universal Service Fund programs.

We have a consumer connection to the Internet now. Can we ask them to connect us to U.S. UCAN?

U.S. UCAN will be a high performance advanced network that will have special design standards to assure its advanced capabilities are delivered on an end-to-end basis. Over the coming weeks, the U.S. UCAN website will list approved methods and partners authorized to connect anchors to the network throughout the country.

Will U.S. UCAN cost my organization more for Internet than we are paying now?

While specific fees have not been determined, connections to U.S. UCAN will be affordable and provide more advanced capabilities than traditional Internet connections. U.S. UCAN will be built to provide the capabilities necessary to enable connected organizations the ability to use very advanced Internet applications such as telepresence, telemedicine, and distance learning. U.S. UCAN and its principal partners are all non-profit and are seeking to develop a sustainable fee and business model while keeping fees to the connecting organizations affordable.

What will be the economic benefits?

U.S. UCAN will provide myriad economic development opportunities from new job training opportunities, to increased demand for home broadband, to creating new incentives for investments in regional and local networks. For example:

- Next generation applications like telepresence, telemedicine, Internet voice communications, large data transfer and other advanced collaboration tools hold immediate promise of opening up new job opportunities and new job training opportunities. For example, community colleges with specialty training programs can offer classes to a nationwide audience, improving job skills and employment prospects for thousands.
- As U.S. UCAN reaches over 50 million Americans through community anchor organizations, users will be exposed to these new advanced Internet applications and demand and investment for broadband at home will increase.
- The R&E community's existing investments in advanced networks over the past decade has stimulated over \$1 billion in local investments to acquire nearly

25,000 miles of local fiber in over 30 states. It is anticipated that U.S UCAN will help to spur yet another round of similar, perhaps even larger investment.