

CenturyLink Modernizes Dams With Fiber

The telco is upgrading key Army Corps of Engineers dam sites to enhance reliability and provide access to high-speed cloud services.

By Sean Buckley / *Broadband Communities*

CenturyLink is giving the Army Corps of Engineers new service life by winning contracts to build fiber to five river dam sites in Oregon and Washington.

By extending fiber connectivity to these locations, the telco will have a foundation to provide high-speed wide area network (WAN) services to the Ice Harbor Lock and Dam, Little Goose Lock and Dam, and Lower Granite Lake Dam along the lower Snake River in Washington, and the Foster Dam and Green Peter Dam along the Columbia River in Oregon.

These contracts were awarded over the past year by the U.S. General Services Administration's (GSA) IT Schedule 70 contract. The upgrade is part of a Corps program to ensure greater safety and efficiency at these sites that could not be achieved with an aging copper-based infrastructure.

Scott Barnett, vice president and general manager of CenturyLink's Department of Defense (DoD) business, says the company's

work with the Corps is part of a broader effort to upgrade critical sites.

"The Army Corps of Engineers, which is not a new customer, is modernizing," he says. "In this case, modernizing means moving from traditional copper plant to fiber."

DRIVING NETWORK EFFICIENCY

By switching its network infrastructure from copper to fiber, the Corps will avoid environmental issues that plagued the copper network. CenturyLink's fiber-based Ethernet solution eliminates the need for specialized, high-voltage safety protection equipment and the use of existing copper cable that was old, buried and, in many areas, chewed up by gophers.

"Some of the cladding that goes around some of these copper cables smells like peanut butter," Barnett says. "[The Corps] found out it was attracting rodents such as gophers and had to change the cladding so it would not smell."

For CenturyLink to bring its fiber to these facilities, it had to meet several strict DoD power-system regulations and ratings.

Although neither copper nor fiber require a lot of power, Barnett says "it all got roped in together, so it caused CenturyLink and the Corps to jump through some pretty big hoops."

Prior to making the upgrades, these facilities could support only traditional analog POTS voice service or traditional alarm systems

With the fiber network in place, CenturyLink enables the Corps to conduct remote monitoring of sites via live video feeds.



CenturyLink is modernizing Washington's Lower Granite Dam with fiber.

that connect to the public switched telephone network. By migrating from copper to fiber, the service provider can offer the DoD a wider range of services. For example, with the fiber network in place, the service provider enables the Corps to conduct remote monitoring of sites via live video feeds.

“Now that we have fiber deployed, you’re talking not just about services for voice but also for video and data,” Barnett says. “What’s happening now with protecting critical infrastructure and remote management of facilities is that the workers don’t have to be present at these dams all the time. These sites can be remotely monitored now with video surveillance, perimeter security, or any of the advanced technologies you can put over a fiber or a broadband service.”

BUILDING NETWORK DIVERSITY

Given the issues the Corps had with the copper network, ensuring network diversity was a key factor. Network route diversity is important to maintain uptime in the event of a fiber cut due to a construction mistake or an accident, such as a car hitting a pole.

“Diversity is important to this customer because the copper is collapsed or singularly threaded to the dam’s site,” Barnett says. “If there’s a flood or a backhoe, and that copper plant goes down, the dam is isolated.”

The way the Corps wants CenturyLink to develop diverse paths often varies. CenturyLink may set a buildout plan to approach the dam from one side of the river and the other side of the river and then tie it together diversely. Sometimes, however, the Corps may want CenturyLink to come in from one side and connect fiber to the dam on one side. The Corps will also maintain the existing copper, which will

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depart the other side of the dam, as a backup circuit.

CenturyLink, the incumbent LEC in the areas where the dams are located, won't take out copper. The telco sometimes leaves it in place and deploys the fiber.

"These dams happen to be located in the Pacific Northwest region of our network footprint, which CenturyLink's predecessor company, US West, previously built, so there's a lot of copper plant there," Barnett says. "We will place the fiber conduit underground or aerially, depending on

the cost complexion, because putting it in the ground is more expensive than putting it on the pole."

However, the decision regarding whether to install the fiber aerially on existing utility poles or underground depends on the mandate the DoD has for each dam site.

"We work with the government, we understand its budget and we understand its protection schemes," Barnett says. "Sometimes it's mandated by the government that we put the fiber in the ground, and, in some cases, I may even bury the fiber conduit in concrete."

A big factor influencing how CenturyLink constructs fiber to a dam site is related network construction costs. "It depends on what the budget is, and it also depends on the terrain we have to navigate to get to the dam location," Barnett says.

ACHIEVING ECONOMIES OF SCALE

As an incumbent provider that has continually expanded the reach of its metro and last-mile fiber network to more locations, CenturyLink always looks for ways to maximize these investments.

Consider the fact that the company expanded its addressable market by pushing fiber to an additional 18,000 buildings, bringing its total for 2019 to around 170,000 fiber-fed, on-net locations during the fourth quarter.

As the provider touches new buildings in various metro areas with fiber, it can address other opportunities along the same route, such as last-mile residential, carrier wholesale and wireless backhaul opportunities. CenturyLink takes a similar approach in building fiber to the dam sites.

"We try to find economies of scale as we construct to dam sites," Barnett says. "If I can pass other government customers or other businesses on the way and break out my fiber into rural areas, then I am serving several masters and improving service to customers."

One core challenge for CenturyLink in bringing fiber to these dams is their locations. They are often in remote areas far away from key network access points.

"We don't want the government to bear 100 percent of the build costs, so we will look to see if we can diversify along the way," Barnett says. "That's been the chief roadblock because a lot of these dams are way off from telecom networks, and the construction costs have been at times insurmountable. We like to work with state, local and federal government to help take care of the costs for them."

SETTING PRIORITIES

Operating and maintaining about 700 dams nationwide and in Puerto Rico, the Corps has set priorities on which sites to update.

ADAPTIVE NETWORKING OFFERS ENHANCED AGILITY, SECURITY

Software defined networking (SDN) enables service providers to provide adaptive networking for their enterprise customers. Adaptive networking capability allows enterprises to procure bandwidth (across hybrid WAN services) and related network functions in an on-demand manner. Enterprises can also centrally define, configure and manage network policy administration.

A 2019 Frost & Sullivan enterprise WAN survey revealed that 61 percent of IT decision-makers cited ability to make changes quickly to a WAN as a key factor in selecting a WAN provider.

The research firm pointed out that adaptive networking offers three main advantages to an enterprise's WAN:

- **Productivity gains:** By detecting the bandwidth requirements of several enterprise applications, adaptive networking can dynamically scale network resources to support those applications. The research firm said 81 percent of IT decision-makers indicated "improving business productivity" is a key driver for their digital transformation initiatives.
- **Improved operations:** Enterprise IT managers can access a set of enhanced network performance monitoring and access control features to streamline network operations. The software-defined architecture provides IT managers in-depth visibility into application performance, and the ability to make real-time changes.
- **Enhanced security:** Because virtual solutions can be built on virtual machines, which can reside at either the customer location or in the cloud, enterprises can rapidly deploy more security elements.

"Thanks to the emergence of SDN, network function virtualization and SD-WAN technologies, the traditional static WAN is now programmable," writes Roopa Honnachari, industry director for business communication services and cloud services at Frost & Sullivan. "A software-enabled WAN provides an intuitive layer of control that breaks away from the expense and complexity of the traditional WAN and delivers an agile and flexible platform that quickly adapts to the fast-changing enterprise needs of an application age."

CENTURYLINK MAKES PUBLIC SECTOR GAINS

CenturyLink overall has continued to gain ground in the public sector. The service provider ranked No. 29 on Washington Technology's 2019 Top 100 list of federal government IT contractors.

In March 2019, CenturyLink became the first service provider to receive an authority to operate (ATO) under the General Services Administration's (GSA) 15-year, \$50 billion Enterprise Infrastructure Solutions (EIS) program. EIS is an indefinite-delivery, indefinite-quantity program that serves as the follow-on to the GSA's Networx, WITS-3 and regional telecommunications services contracts.

Not long after gaining the EIS ATO, CenturyLink won the first contract under EIS to provide core network services for the National Aeronautics and Space Administration. Additional wins include contracts with the Social Security Administration, the Department of Defense Education Activity Network, the Census Bureau, and the Department of the Interior (with a task order

worth up to \$1.6 billion over an 11-year period).

In the fourth quarter, CenturyLink reported \$1.56 billion in enterprise revenues, a figure that includes its public sector business.

Jeff Storey, CEO and chairman of CenturyLink, told investors during the company's fourth-quarter earnings call that he attributes success in the public sector to combining the assets of CenturyLink and the former Level 3.

"While both companies had a share of the federal business," Storey said, "we are seeing that the combined networks together with our hybrid networking and other capabilities made us more competitive and are enabling us to win more new business than either company was able to do on its own."

He added that although CenturyLink "will continue to pursue growth in the public sector space, I do want to caution that government contracts generally take several years to ramp."

"The Corps has a hit list of dam sites it wants to attack first," Barnett says. "These won't be the first and they won't be the last, as we hope to help with the total portfolio of dams where it makes sense to upgrade to fiber from a cost standpoint."

By offering a fiber connection to each dam location, the Corps can take advantage of new sensor technology. In particular, the agency will be able to more effectively oversee the performance of the electric powering equipment.

"If the operation of the equipment inside is very complicated and technical, the Corps can better monitor that equipment remotely," Barnett says.

Besides benefitting the Corps, these fiber deployments also will provide advantages for a local power provider that might use a dam facility to provide power. The fiber deployments also could benefit a state fish and wildlife organization that facilitates fish breeding or spawning activity – for example, the organization could use a high-capacity network and new sensor applications to measure the water levels or the temperature of the water.

"There are a lot of collateral benefits that come from this – not just for the Corps, but also for the people who enjoy hydroelectric power," Barnett says.

GUARANTEEING SERVICE QUALITY

A key differentiator that CenturyLink brings to the Corps is that every service for each dam runs over its own fiber network. The telco can offer a series of cybersecurity, cloud, managed-hosting and IT services and can ensure the service experience and make upgrades rapidly.

"Once I put services onto our network, customers enter into a very dynamic environment because they are on our network, so we can control the service experience directly," Barnett says. "If they want to add a service or increase bandwidth, I don't have to go through a third party to enable that service."

In addition, the Corps will be able to benefit from CenturyLink's ongoing incorporation of SDN into its network.

SDN is the foundation of CenturyLink's adaptive network feature, which offers enterprises, including its government customers, to

scale bandwidth up as needed. Adaptive networking can allow government agencies to procure bandwidth (across hybrid WAN services) and related network functions on demand. It can also centrally define, configure and manage network policy administration.

"Now that we're pushing into software-defined networking, we can dynamically allocate bandwidth," Barnett says. "Once we put them on our fiber plant, all of that can happen for them."

Although a dam itself might not have very demanding daily bandwidth demands, the fiber connections and the on-demand capabilities mean CenturyLink can communicate with a site if an event occurs.

"A dam probably does not push a lot of bits and bytes during a 24-hour period, but let's say there's a failure that takes place," Barnett says. "If the Corps needs to leverage those broadband applications for a period of time, we'll be able to turn up that bandwidth." ❖

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