



ADC Professional Services—Helping MSOs Deliver on the Promise of Broadband

CASE STUDY

As practically every TV watcher and Internet user knows, the cable TV industry and the nation's telephone companies are locked in a fierce battle to capture the lion's share of the broadband-services market. Advancing technology is fueling customer demand for high-bandwidth services, especially high-definition TV (HDTV), video on demand (VoD) and, of course, ever-faster Internet access. With millions—perhaps billions—of dollars in potential revenues at stake, both types of service provider are scrambling to build next-generation networks capable of delivering on the promise of broadband.

Many telephone companies, from small independents to large global carriers, have been building fiber-to-the-home (FTTH) networks that currently give their subscribers connection speeds of up to 50 Mbps. In 2006, the cable industry adopted the latest version of the Data Over Cable Service Interface Specification (DOCSIS), the international standard which defines the communications and operation support interface requirements for a data-over-cable system. DOCSIS 3.0, in addition to supporting Internet Protocol Version 6 (IPv6), significantly boosts the upstream and downstream transmission speeds of data-over-cable signals. The standard specifies the bonding of multiple 6-MHz channels to deliver, theoretically, shared downstream data rates of 160 Mbps or higher per virtual channel and upstream data rates of 120 Mbps or higher. As vendors roll out "wideband" cable-modem technology that complies with DOCSIS 3.0, leading MSOs are deploying that equipment as fast as possible in their networks.



Where to Find the Time and Expertise?

When it comes to getting their wideband networks up and running, MSOs realize they have no time to lose if they expect to compete effectively with telephone companies. Yet upgrading their networks presents an enormous challenge in terms of the time required and the availability of necessary skills. One major MSO, in planning to upgrade one of its metropolitan networks to wideband, decided on a very aggressive schedule of three to six months to complete the work. That network comprises 36 sites, including one headend, one superhub and 34 hubs. The objective was to deploy all the necessary equipment, including a DOCSIS 3.0 cable modem termination system (CMTS) and all the associated cabling and powering, to provide high-speed data, switched digital video and VoD services.

However, while the MSO had in-house technical expertise, it simply did not have enough skilled people to work on the upgrade and simultaneously handle the ongoing day-to-day operations involved in delivering existing services to customers. The MSO's executives, realizing they would need outside help, brought in ADC Professional Services (APS) to handle the project. Based on the two companies' long-term relationship, the executives knew that APS, with its multivendor/multiservice/multitechnology capabilities, had the overall expertise to handle the job, as well as the requisite number of skilled engineers and technicians. They also knew that APS is a preferred partner of many of the network-equipment vendors selected by the MSO, which means that ADC works not only with its own products but also those of other vendors. APS employs a fully trained, professional staff, with extensive experience working in MSO environments that can deliver a full turn-key solution from design to implementation.

Expertise for Each Part of the Job

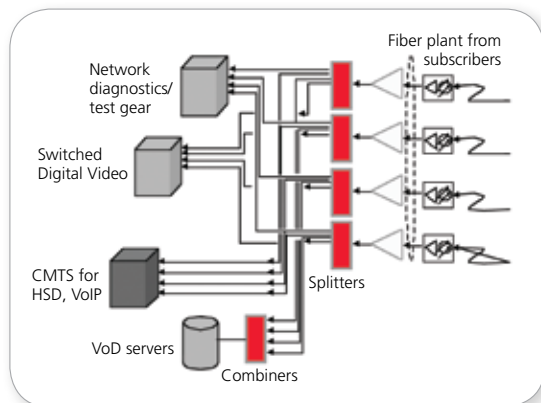
In tackling the huge and complex project for the MSO, APS brought to bear experts from various functional teams: three people from Project Management; six people from Detail Engineering; and 25 people from Field Resources. Working closely with the MSO's representatives, the Project Management team managed the complete life cycle of the project. Specifically, the ADC project managers:

- Provided complete material management: ordered and ensured delivery of all equipment and materials to each of the sites prior to installation
- Managed the field resources needed to meet and exceed the milestones established by the clients' deployment schedule: scheduled the Field Resources team to install that equipment and associated cabling, migrated each hub to the new gear and then decommissioned and removed the old CMTS; and
- Provided continuous project updates: provided daily status reports which included site specific details on material status, percentage site completion and overall project schedule milestones to the MSO.

Engineering the Details

As a part of the design phase of the project, ADC engineers performed a thorough evaluation of each site to determine the detailed requirements for upstream/downstream cabling and node combining/segmentation. As part of those evaluations, technicians surveyed each hub to determine what was needed in terms of infrastructure, power, connectivity, and the appropriate layout of all equipment. They then turned that information over to ADC's drafting experts, who entered the data into AutoCAD software to produce rack elevations and floor plans. Together, engineers from ADC and the MSO reviewed and, when necessary, revised the diagrams to ensure that each component of the network satisfied the MSO's operational requirements.

ADC engineers also created installation and MOP documents, cross-referenced with the node-combining plan, to ensure everything in the hub worked according to the plan's specifications. Following any necessary revisions to those documents, the ADC engineers then drew up wiring lists for each site.



Broadband Network Upstream Systems

Now Comes the Deployment of Equipment

The APS Field Resources team then began their work at the 36 hub sites. The installers first prepped each site for infrastructure, ensuring that each one was ready to receive the new equipment and that there was adequate physical space in the event that racks and/or powering equipment were required. Then, using the wiring lists created by the ADC engineers, the crews pulled in the coaxial cable, terminated and labeled it and tied in the forward/return paths to the shelves of the new equipment.

In 10 of the hub sites, the field technicians upgraded the universal routers with new cards and power supplies. The crew also installed the ADC-manufactured pass-through equipment, that is, the splitters/combiners, in accordance with the MSO's node-combining plan. Where necessary, the ADC crews also installed additional transmitters.

ADC Commissioning and Integration (C&I) engineers, part of the Field Resources team, then pre-provisioned the new CMTSs. The C&I engineers made sure that all the correct software revisions were loaded on the equipment and then baseline-configured the CMTSs. At that point, the MSO's technicians tested the equipment and secured it with passwords.

ADC-Manufactured Products for MSO Networks



- SignalOn® RF Signal Management System
- Custom Patch Panels, including BNC and F type, and connectors
- CMTS RF Cable Assemblies
- Fiber Guide® Fiber Management System
- PowerWorx® Fuse Panels

Migrating from the Old to the New

Once the installation team finished its work, ADC's Engineering team prepared for the migration from the old cables to the new ones. At each of the 36 sites the cables were tested and labeled prior to the start of the migration.

The ADC engineers, working closely with the MSO's engineers and under the direction and coordination of the MSO's Network Operations Center technicians, then supported the migration process. During the maintenance window, the new cables were swung onto the new equipment from the old CMTSs. APS remained on site until the NOC reported that the modems were up and running. Some of the larger hub sites required that two CMTSs be migrated in a single maintenance window. Regardless of the size of any given site, however, they successfully completed the migration process at each location within a six-hour maintenance window.

Decommissioning and Cable Mining

Once the engineers and technicians finished the migration process and made sure the equipment was operational for a safe period of time, the APS decommissioning and cable-mining team came in to do the heavy lifting—removing all the old equipment and cable. The cable-mining task at some of the sites—particularly the smaller ones—went pretty quickly. However, larger sites, which house two new CMTSs, typically have at least 400 feeder cables; in these cases, the APS crew needed anywhere from one to several days to complete the task. Obviously, the crew members were working around live equipment and thus had to proceed cautiously, ensuring at every step that they did not cut live circuits. When the decommissioning and cable-mining team completed its work, project managers from APS turned over the final documentation to the MSO.

Bringing in Professional Services Brings in Multiple Benefits

The MSO executives realized that if they attempted to undertake this massive network-upgrade project by using internal resources and skills, they would risk stretching those resources to the breaking point and thereby risk degrading service to existing customers. By bringing in ADC Professional Services, the MSO leaders freed up their own engineers and technicians to focus on day-to-day operations and the continued delivery of high-quality service to customers. They also obtained a wideband network that can deliver the faster connections and new, high-bandwidth services that customers want. As a result, the MSO significantly strengthened its ability to retain existing customers and attract new ones in the ultra competitive market for broadband services.



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