Case Study

Cunningham Telephone and Cable suspected hit-and-run-ingress was causing multiple problems

Our tools showed them the source & results.

Intermittent Ingress was Frustrating Cunningham's Techs. Finding the Source of the Ingress was Already a Challenge, and as they closed in on the Problem the Ingress Would Often Disappear, Only to Reappear Later.

THE INTRODUCTION

Founded by Dean and Hazel Cunningham in 1944, Cunningham Telephone and Cable has been serving areas of North Central Kansas for over 65 years and is still run by the Cunningham family. They've always been dedicated to providing high quality service to their customers and they continue to focus on customer service and advanced technology products to keep their customers up and running and happy.

THE CHALLENGE

Working with a set of goals for integrating proactive maintenance into their daily operations, Cunningham knew that a major concern was ingress and how to address it more effectively. To their exasperation, they were finding that there wasn't an easy solution to the ingress question. Just as with anything, there has to be an opening somewhere for something to get in or out and those openings can happen quite frequently. Whenever there's a breach in the cable system, you get cable signal leaks and wherever cable signals leak out, noise can get in. These leaks can be caused by loose connectors, damaged and cracked cables, even unterminated connections left over from a former subscriber. One piece of bad cable or one poor connection can wipe out an entire node for upstream services.

From experience, Cunningham knew that troubleshooting for ingress sources is time consuming and frustrating. Finding a single ingress source can take anywhere from two hours to two days or more, and finding all the sources within a block of homes can take weeks. Checking for leakage with a leakage meter was one way to find sources of ingress, but in the case of very small leaks or ingress points, a lower level signal may not leak out and show on the meter. An external signal source, however, like a nearby CB or ham radio or electric heater, may produce a strong enough signal that gets into the upstream. So in some cases, a leakage meter alone may not find all the ingress points, resulting in another wasted truck roll with nothing resolved.

THE RESULTS

The realization that they could instantly see the return path spectrum data live from the CMTS from any location whether in the office or in the field—on any device like a PC, laptop, or smartphone, was a moment of insight for Cunningham. They realized that not only could they verify that noise was present without any additional equipment, they knew it would be easy to see in real time if changes the technician or subscriber made had any impact on the ingress.

Over the next few months Cunningham's proactive maintenance program had success after success with ZCorum's tools. They were also able to analyze and repair several prior occurrences of problems where they couldn't find the noise source before.

> *"Since deploying TruVizion I would estimate that we've reduced our truck rolls by 50%, which is huge!"*

"Usually we would take a meter out and find the problem but we didn't always know exactly which modem was causing problems unless we checked each one individually," said Doyle Nelson, Cable TV and Internet Technician for Cunningham Telephone and Cable. "That's obviously not very efficient." In the meantime subscribers could have poor TV reception, slow internet or have their phone calls drop off in the middle of a conversation. This was not acceptable to Cunningham and they wanted a better way to troubleshoot ingress other than lugging around heavy, expensive equipment and unproductive truck rolls.

Upstream ANALYZER
REMOTE SPECTRUM ANALYSIS

Cunningham had recently deployed ZCorum's Proactive Network Maintenance (PNM) tool, PreEqualization Analyzer, to find hidden impairments out in the plant and was having great success with the software-based tool. They had also had licensed ZCorum's Upstream Analyzer, a return-path spectrum analyzer that is accessed through the same interface.

THE SOLUTION

Nelson began using the two tools together in order to find sources of ingress in the plant. With Upstream Analyzer they could now view spectrum from anywhere without needing expensive monitoring equipment in the headend to capture the return path spectrum. They could also leave behind the proprietary equipment they had been using. Nelson, and Cunningham's other technicians, could now see the data on a PC, laptop or their Android phones.

Now that they could conveniently get a picture of the spectrum from any location, the next challenge was how to determine where the noise was coming in. "Sometimes we wouldn't even know there was necessarily noise present at all unless we checked everything," said Nelson. "The usual procedure was to roll a truck and start disconnecting segments of the cable plant to find sources of ingress."

Instead, Doyle started making use of the Intermittent Modem Report in PreEqualization Analyzer. This report identifies modems with large variations in their upstream transmit power. It also looks for correlations between changes in a modem's transmit power and the pre-equalization data from the CMTS, which means the device is probably compensating for a lot of ingress. With this data in hand, Cunningham technicians could see which subscriber modems were most likely leaking in large amounts of noise, giving them a specific list of in-home issues to target. Plus, they could immediately verify on Upstream Analyzer if the noise level had dropped after a repair was made. "I saw one modem that clearly had some ingress issues," said Nelson. "I called the customer and asked him to check the connector on his modem. He said it was loose, so he tightened it two turns. I watched on the Analyzer as the green Min Hold line dropped to the noise floor."

THE BOTTOM LINE

In order to streamline their ingress troubleshooting, Cunningham added Upstream Analyzer alongside their deployment of PreEqualization Analyzer and put the return path tool to a test. The results were successful right from the start. They've been able to find and correct several sources of ingress in the plant and in subscriber homes, often without rolling a truck. Their maintenance program is running exactly like they planned and is helping them keep their goals for proactive maintenance on track.

ZCorum™

About ZCorum

ZCorum is the leading provider of innovative diagnostics and managed broadband solutions to telecommunications companies, helping them reduce costs, increase operational efficiency and improve the subscriber experience. For more information, visit ZCorum.com.

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