

## Certifying IP Network Paths for Visual Communications Insights: The distinction between “technical” and “technologist”

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### Introduction:

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### Background

At Oregon State University, the IT team is both functional, doing what needs to be done, and passionate, immersing ourselves in the challenges and surprises of current technology. I consider this the difference between being “technical” and being a “technologist.” I have found that with visual communications, technical skills can only get you so far before you are faced with the decision to either become further engaged in the science and innovation, or remain stagnant and comfortable with the status quo. This may include the tools you use, the approach you take and the level of collaboration you pursue.

### Business Problem

At Oregon State University we have a strict metric for our Visual Communications over IP Quality (VCQ), as outlined in the [Part 1 of this series](#). We monitor and track the VCQ metric which includes aspects such as connectivity, latency, packet loss and even a calculated Mean Opinion Score (MOS). This metric is part of our Visual Communications Network Path service level quality diagnostic, assessment and certification processes. Many factors contribute to the chances of achieving the VCQ metric, but the biggest one is at Layer 2 (data link) of the OSI Model.

One of the simplest - and I think most misunderstood - settings is the PORT setting on data switches and video endpoints because of the AUTO function. AUTO does not mean AUTOMATIC; it means either:

AUTO-NEGOTIATION (IEEE 802.3u)  
AUTO-SENSING (Manufacture’s Method)

Ethernet interfaces have two settings (Speed & Duplex) and typically two modes for each setting (Speed: 10Mb, 100Mb; Duplex: Full, Half). The IEEE 802.3u specifies how the “negotiation” between interfaces is to occur. The method, however, also creates high risk because the “negotiation” happens independently by each device. The endpoint says, “I do can do this,” and sends its list to the network device. The network device does the

same and sends its list to the endpoint. Then “independently” both devices make a calculated best guess at the negotiation. While this approach is often correct, it certainly is not 100% reliable.

Now, think about how many ports there are in total between the source of the video and the destination endpoint in a visual communications environment. Not knowing, or understanding, if the network element ports are IEEE’s 802.3u (auto-negotiation) or a manufacture’s (auto-sensing) means that the Layer 2 links established (even if using AUTO all the way through) are a gamble. Not even a best effort, it is a best guess.

### Solution

How do we determine if our network paths are using AUTO-SENSING or AUTO-NEGOTIATION? Unfortunately, we can’t - at least not all the way through a cloud that we don’t control, like the external carrier or the Internet (1 or 2).

Oregon State University’s Network Services found a solution for this issue with its Visual Communications: AppNeta’s PathView Cloud (PVC). With PVC’s scientific approach to testing the network paths, we gain greater clarity into the cloud’s configuration, especially when there is a misconfiguration. And duplex mis-match is the most common LAN and endpoint issue; occasionally we find it even in the WAN cloud.

PathView Cloud allows users to more fully understand the AUTO setting and without PVC, we would have an extremely difficult time diagnosing these mismatches. The tool enables end users and network managers to gain a greater understanding of network communications, whether it is within their control or outside of their own networks. PVC dramatically reduces the “finger-pointing,” allowing the professional and insightful “technologist” to resolve problems using their “technical” skills.

Oregon State University’s Visual Communications have become increasingly reliable, greatly due to PathView’s extensive analysis and reporting of likely root causes of problems and recommendations for fixing the problem. For this technologist, it has been one of the most valuable additions to our toolset.

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