



CASE STUDY

# Medical Center VoIP Fax QA

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— VoIP Administrator



## The Situation

The Health Insurance Portability and Accountability Act places stringent requirements on the healthcare industry's handling of patient data. A major university medical center in the Midwest uses fax to comply with HIPPA's data security provisions. Over the years, fax has become ingrained in their processes for internal and external communications. When the medical center moved to updated fax terminal systems and Voice over IP (VoIP), they needed the new systems to provide a better – or at least equal – quality of fax transmissions.

When they added a new electronic record system, fax usage was dramatically increased, and the cracks began to show. The IT Communications Group saw a substantial increase in fax call trouble reports – failed connections, corrupted pages, even pages not received at all – in spite of replacing older multifunction peripherals (MFPs). With fax terminal locations spread through multiple buildings across a city-wide campus, the medical center needed a coordinated, approach to control this problem.

VoIP communications companies tend to shy away from dealing with fax issues because it's difficult to untangle the multiple interactions between systems down to the root cause. The medical center's IT manager described it as a "standoff between fax machine support saying 'there is noise on the line' and Telecom testing the line and finding no line problems."

## QualityLogic's Approach

The medical center asked QualityLogic to find the cause and recommend a solution. QualityLogic implemented a two-pronged approach:

### 1. Getting to the root of the problem

#### ***Diagnostics:***

QualityLogic's QA engineers conducted a survey of page transmission issues via direct channel monitoring to assess and profile the issues and their probable causes. A group of five terminal locations was selected

in areas where trouble reports were high. Each fax terminal served two lines, and monitors were set on both to record transmitted and received faxes over a two- to three-day period, depending on the traffic level. QualityLogic engineers analyzed these call trace records to identify the root causes of page transmission errors.

**Tools administered:**

The QA engineers used DataProbe, QualityLogic's call monitoring tool, to record incoming and outgoing fax calls, including over a thousand operational parameters from each call. DataProbe provided modulation symbol quality assessment, call and T.30 message analysis, and pcm data recordings for off-line audio structure analysis.

## 2. Identifying the culprits

**Diagnostics:**

To verify connection performance, QualityLogic QA engineers precisely measured fax transmission quality across four different data paths through the center's IP communication network. This identified network problems rather than fax terminal compatibility failures.

**Tools administered:**

QualityLogic's FaxLab tool provided precise test call transmission and reception control to determine exactly where issues occurred. FaxLab allowed minute analysis of each test call and direct parameter control to vary any value that seemed to cause a problem.

The tools used include hardware data capture and fax send/receive capability that is controlled by QualityLogic's IP-connected analysis software. QualityLogic engineers were able to directly monitor connections and generate or terminate calls remotely, saving the cost of travelling to the university site.

*"Detailed investigation into our fax transmission problems was beyond the desired scope of our IT operations," said the medical center's IT Director. "Being able to bring QualityLogic in as an expert third party service was just what we needed."*

## The Analysis

QualityLogic discovered that data symbol modulation quality loss was the primary cause of page quality degradation. Pages were either corrupted or lost altogether due to this issue, and it also caused call data rates to fall to as little as half of the system design speed. This caused the bulk of the problem reports that complained of lost or misprinted pages.

The other main issue was call completion - connecting the basic telephone call and maintaining the connection until all the pages had been sent. This had its roots in T.30 protocol negotiation at the beginning of the call - the connected fax terminals either couldn't arrive at a satisfactory set of transmission parameters or disconnected over conflicting system configurations.

## The Solution

QualityLogic developed a seven-point policy to bring all of the medical center's fax terminals into an optimal configuration that would ensure interoperation with each other for interdepartmental calls. It also reduces the possibility of conflicts with off-site fax terminals by averting potential T.30 negotiation and page modulation issues before they happen.

The network channel path survey revealed a gateway with a fax modem issue that was causing modulation problems, and it also discovered an equipment configuration that could be emulated on other installations to improve page transmission quality.

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### For More Information

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