

AUTOMATING HEALTHCARE CLAIM PROCESSING

How Splunk Software Helps to Manage and Control Both Processes and Costs

Use Cases

- Troubleshooting Services Delivery
- Streamlining Internal Processes

Executive Summary

As the pressure on healthcare practitioners and insurers to streamline their operations rises, many are strategically deploying Electronic Data Interchange (EDI) claim submission solutions to automate and accelerate claims processing. With an EDI solution, healthcare insurance companies spend less time figuring out what is covered and what is not, providers get paid faster and the cost of claims processing decreases for insurers.

But what if the automated claims process is not up to speed? What if it is failing?

One major US healthcare insurer confronted this exact problem. The company's EDI solution had a very high error rate, forcing the insurer to spend more time and money each quarter to manually re-process claims. IT staff also suffered from limited visibility into the insurer's infrastructure, causing the enterprise to spend even more time and money to troubleshoot the system's

performance problems. This scenario stood in stark contrast to the cost-saving efficiencies promised by EDI automation.

To rectify this situation, the insurer turned to Splunk® Enterprise. Using the solution, the insurer gained an end-to-end view of its entire EDI claims processing chain, enabling its IT staff to quickly pinpoint and remediate system errors and bottlenecks. The company is gaining the visibility to identify improperly submitted claims by partners and other providers, reducing error rates further. As an added benefit, Splunk software is streamlining system reporting, web analytics and regulatory compliance, presenting an opportunity to retire costly third-party reporting tools.

With the Splunk platform capturing, indexing and displaying data on its claims processing infrastructure, the insurer will finally realize the cost-efficiencies and elevated service levels promised by EDI.

Business Benefits at a Glance

| Challenges | How Value Is Measured | Business Impact |
|---|--|--|
| Needed insight into issues in the automated claim review process | <ul style="list-style-type: none"> • Number of claims correctly processed per day/month/year • Greatly reduced costs for manual re-processing | <ul style="list-style-type: none"> • 29% potential reduction in failed claims • Expected to eliminate 200K hours of manual review, the equivalent of over 100 full-time employees • Estimated \$14 million of savings in a single year |
| Wanted easy correlation and real-time monitoring of events across all layers and components of the claim processing chain | <ul style="list-style-type: none"> • Reduced hours spent identifying and addressing performance issues • Adherence to uptime and performance service levels | <ul style="list-style-type: none"> • Over \$650,000 per year expected savings through improved troubleshooting • "First pass" performance objectives will be quickly met |
| Required rapid and automated production of regulatory compliance verification reports | <ul style="list-style-type: none"> • Reduction in hours spent manually generating reports • Improved accuracy of reports • Decreased spending on unsatisfactory analytics tools | <ul style="list-style-type: none"> • Eliminating 17-plus hours per day generating reports, leading to more than \$300,000 in savings • Reports are timely and more precise • Projected savings of thousands of dollars per year in licensing fees for analytics tools |

- **Reduced submission error rates.** Automated claims processing routinely failed to meet the insurer's "first pass" quality goals, requiring expensive and laborious re-processing. Using Splunk Enterprise, the company captured and indexed the logs for all systems involved in claims processing. This allowed IT staff to correlate data across various applications with requisite information, such as sessionID and userID, providing granular optics into the infrastructure. The IT team is now able to rapidly identify and correct the source of errors and reduce the rate of improperly processed claims, saving the insurer substantial costs.
- **Realized cost savings and efficiencies.** The insurer previously relied on a hodgepodge of costly reporting tools that offered limited insight into its EDI environment. Performance and processing issues persisted and the company's IT teams spent 17-plus hours per day troubleshooting and producing mandatory reports. With the introduction of the Splunk platform, the teams created dashboards to continuously monitor the operations of all systems. For the first time, they can measure performance levels, expedite claims processing and reduce manual re-processing costs.

- **Verify compliance reporting.** With sparse views into its application and network components, the insurer found that the creation of regulatory compliance reports was incredibly time consuming. Capitalizing on Splunk software, the IT team is building dashboards and alerts to enable real-time compliance verification and reporting across disparate enterprise platforms and applications. They can even automatically generate and deliver reports as PDFs.

The Mystery of Failed Claims Processing

Like many healthcare companies, this large insurance company invested substantial time and money to automate claim processing in order to make its operations faster and more efficient. It built a complex chain of components capable of evaluating claims, processing their data and accurately making accept/decline decisions. The system accepts submissions from healthcare providers via the web and other sources (fax, email), and sends them through the various claims review and approval applications based on their content. It then returns the approval/denial of coverage information back to the providers or aggregators as quickly as possible.

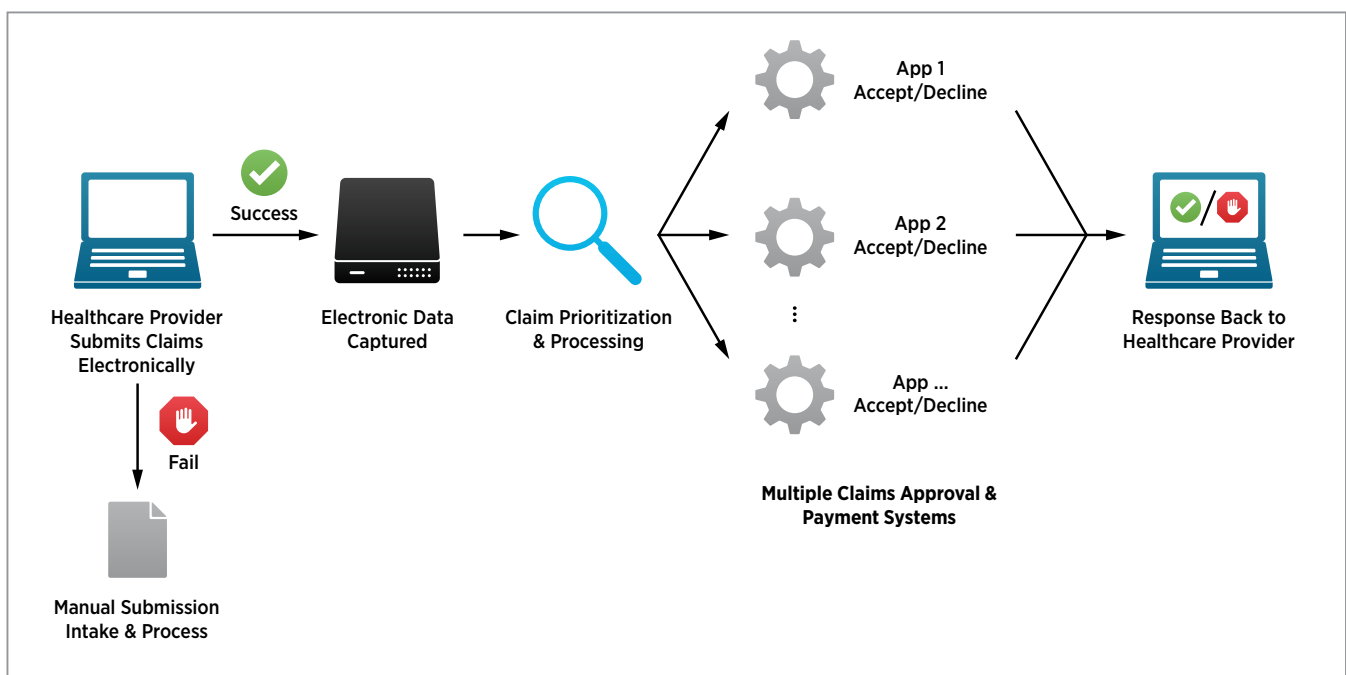


Figure 1. The flow of claims processing, including manual re-processing of failed submissions.

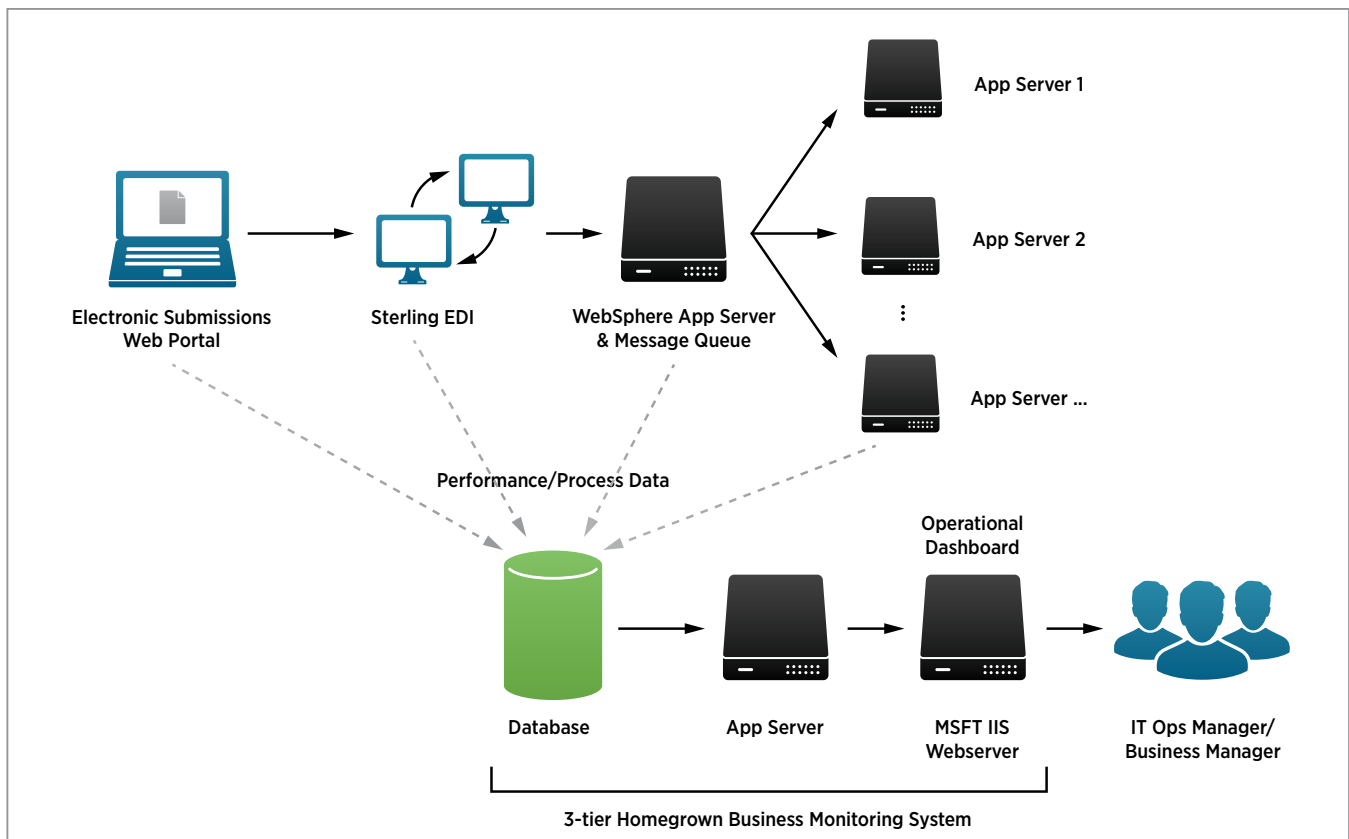


Figure 2. The complex monitoring and reporting system.

If something is wrong with the submission, the initial processing of the claim fails, which requires an analyst to review the claim and determine whether it should be accepted or rejected. Unfortunately, due to the intricacies of the system's many interlocking components (see *Figure 1*), the rate of electronically submitted claims that failed on the first pass was 14 percent or almost 1.5 million failures a year. Each failed claim demanded a half hour to manually re-process, which totaled over 730,000 hours of manual labor each year spent on investigation and resolution—and that was just for the initial claims submission acceptance.

In a complex environment, IT/Operations staff and system analysts can spend as much time trying to determine the cause of performance and quality problems as it took to deploy the systems. *Figure 2* illustrates the complexity of the insurer's monitoring architecture. Its application integration, web platform, WebSphere MQ/Message Broker and EDI processing support personnel each had areas of responsibility, but with no end-to-end visibility into the claims processing

workflow and a cumbersome reporting infrastructure, they lacked the ability to assess the root cause of the performance issues. Troubleshooting problems took too long, resulting in failures to meet targeted services levels. As a result, resources continued to be squandered on manually assessing failed claims.

Evaluating the performance of the business-critical TriZetto Facets application, for example, was impossible with the company's existing tools. Because the application traverses many layers of infrastructure and the network, support staff were unable to determine the cause of claims processing problems. Without this knowledge, senior management could not understand key issues and, therefore, could not improve overall claims throughput.

Moreover, existing reporting systems were unwieldy and fragile. Analysts spent far too much time gathering and manipulating data by hand. Reports took too long to generate and were of limited value because the tools were unable to fully correlate customer experience

and other metrics. The bottom line was the company's business model was compromised. The situation looked bleak.

Enter Splunk

The Splunk team approached the insurer to demonstrate the ability of Splunk Enterprise to capture, index, collate, and visualize logs and data generated by the many components of the EDI claims processing chain. The engineers set up the Splunk software in a test environment and within just one week, simply used WebEx meetings to show each developer and IT staff member how to query the solution to obtain precisely the data they needed. The IT staff was particularly impressed by Splunk's ability to access WebSphere MQ data and how the Splunk DB Connect application riding on top of the platform can retrieve and integrate structured data from databases.

In the end, the insurer's own IT team, rather than Splunk representatives, presented the Splunk solution to upper management.

The insurer's staff funneled the following data sources into Splunk Enterprise and correlated the data across applications by using fields such as sessionID and userID:

- WebSphere Application Server
- MS Internet Information Server (IIS)
- WebSphere MQ administrative logs
- WebSphere Queue manager analytics
- Sterling File Gateway system logs
- Sybase Facets performance analytics.

Once data collection was set up and the Splunk platform was extracting meaningful data from the EDI systems, the company's various IT teams created a number of dashboards so they and business users could graphically view, in real time, the number and kinds of claims going through the system.

Viewing Every Link in the Chain From Start to Finish

The Splunk Enterprise implementation immediately afforded the insurer visibility into its malfunctioning claims processing, as well as comprehensive views into

its entire infrastructure, allowing IT teams to identify the sources of errors and quickly resolve them. *Figure 3*, for example, shows the traffic of EDI claims into the Sterling File Gateway broken down by provider/aggregator, as well as failures to route claims correctly within the WebSphere application servers by source/provider.

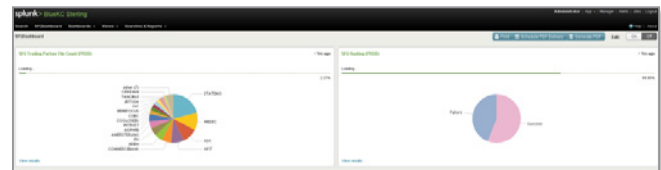


Figure 3. EDI claims and the failure rate of routed claims within WebSphere app servers.

This and other insights allow the company to identify the primary sources of misfiled EDI claims, which in turn enables staff to rapidly address their root causes. Optics into the failures by source also permit the insurer to target partners and other providers with high error rates for additional training on properly submitting claims.

In another example, staff used two types of logs for the WebSphere MQ monitoring and troubleshooting dashboards:

- **Administrative logs:** number of elements in queue, depth of queue, queue performance
- **Manager logs:** connections into the queue, clients connecting to this queue server, errors in connections

The Message Broker dashboard (see *Figure 4*) shows WebSphere MQ performance by queue and broker, with the WebSphere Message Broker error messages, known as BIP errors, representing the brokers' aggregate errors. BIP errors mean that other apps in the workflow cannot get their events into the queues, impacting performance of the overall system. IT investigators and application developers now can drill down into a given failure to quickly identify its cause.



Figure 4. The Message Broker dashboard showing the WebSphere MQ performance by queue and broker.



Figure 5. The performance characteristics of each queue.

The MQ dashboard (see Figure 5) shows the performance characteristics of the queues. Each line is the number of events in each stage of the processing process.

The web analytics dashboard (see Figure 6) shows all employer, broker and provider claims submission activity at a glance, as well as information about how they access the site. This provides awareness of resource usage by submitter and enables staff to prioritize which platforms need improved user interfaces to simplify deployment of their portal and minimize errors.

The WebSphere dashboard (see Figure 7) covers network connectivity and performance. The first panel shows the connection establishment times for providers connecting into the EDI processing queue. The second displays connectivity between all the various Java apps that make up the EDI processing queue. When a queue begins to back up, alerts are issued and the appropriate application support team is notified to address the issue.



Figure 7. The panels of the WebSphere dashboard.

Ensuring Investments in Automation Pay Off

Investing in EDI automation is a wise long-term investment, but it is not enough to build it and hope “they will come.” These processes are complex and require a high level of visibility to troubleshoot and manage their components. As this healthcare insurance company uses Splunk software, the visibility delivered by the platform exposes opportunities that will save millions of dollars a year in personnel-hours spent trying to identify and resolve the root causes of processing errors and freeing those analysts, IT investigators and application developers to develop better functionality for the company’s customers.

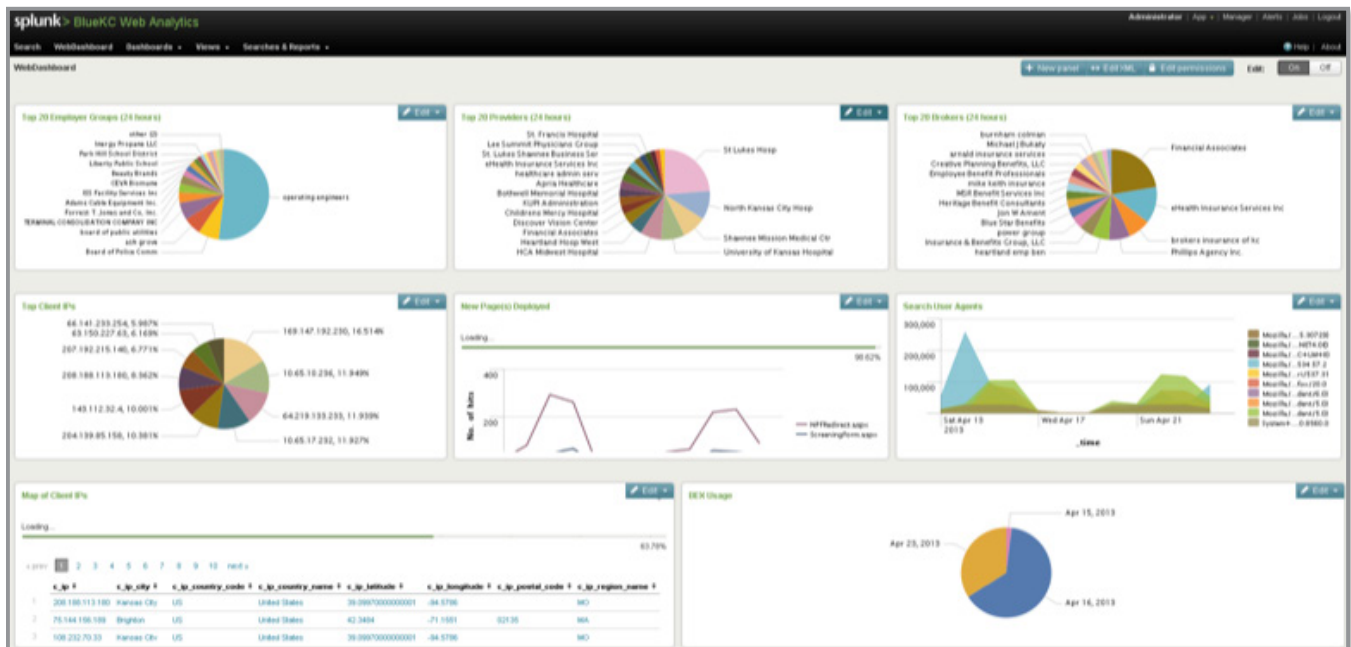


Figure 6. The panels of the web analytics dashboard.

The insurer expects to reduce failed claims by 29 percent and to meet its “first pass” performance objectives. As a result, the company is on its way to saving over 210,000 hours of manual labor and \$14 million in cost annually. Moreover, its newfound ability to quickly identify root causes of errors is projected to save \$650,000 per year in troubleshooting costs.

In addition to the greatly improved submission success rates, the Splunk solution also simplified the company's internal performance and web analytics reporting as well as external compliance reporting, allowing it to begin phasing out third-party reporting tools. This will save thousands of dollars each year in licensing fees.

With Splunk, They Got Up To Speed

This use case illustrates how Splunk software can improve operational efficiencies, particularly in distributed transactional environments that deliver mission-critical business processes. Although the customer had a sophisticated, highly complex infrastructure of interlocking applications and systems, Splunk Enterprise provided the optics to manage and control both processes and costs.

- **Elimination of data silos.** By indexing a wide variety of data, both structured and unstructured, the Splunk platform provides the customer's many IT teams with holistic views across the diverse components and application stacks comprising the environment.
- **Correlations drive analytics.** Splunk software correlates different types of data to enable the insurer to link error messages in one system's logs to useful evidence in other data to resolve issues.
- **Insight into complex business processes.** Splunk software's enterprise-wide visibility offers in-depth reporting and effective compliance verification to meet governance and regulatory demands.
- **Operational intelligence.** Splunk Enterprise delivers insights not only into the performance of business processes, but also into the health and availability of the underlying IT infrastructure supporting them.
- **Knowledge and control.** This use case illustrates how Splunk software can offer knowledge into business operations. With this knowledge comes the control to achieve objectives while ensuring efficiencies and service levels.

About Splunk

Splunk Inc. (NASDAQ: SPLK) is the pioneer in analyzing machine data to deliver Operational Intelligence for security, IT and the business. Splunk provides the enterprise machine data fabric that drives digital transformation. More than 12,000 customers in over 110 countries use Splunk in the cloud and on-premises. Join millions of passionate users by trying a [free trial of Splunk](#).