The United Network for Organ Sharing (UNOS) is the private, non-profit organization that manages the nation’s organ transplant system under contract with the federal government. In doing so, UNOS brings together hundreds of transplant and organ procurement professionals and thousands of volunteers. This unique collaboration helps make life-saving organ transplants possible each day. The UNOS system serves as the model for transplant systems around the world, and UNOS maintains registries for other organ transplant organizations, such as the International Society for Heart & Lung Transplantation (ISHLT).

UNOS does not do surgery or transplants; rather, it matches deceased donor organs with transplant candidates according to allocation policy and maintains information about every transplant performed in the United States since 1988. “At a high level, what we do is put together available organs and potential recipients in an algorithm and match them up.”

Integrating systems to create organ offer reports
UNOS databases currently contain approximately three terabytes of data. Talend processes the data within Hadoop, and outputs the results to a source system where Tableau data visualization software can read them. Tableau then serves up the Organ of all transplantation activity at their hospital for a given month.

“When we first brought Hadoop onboard, we were hand-coding it,” says Sutphin, “but we recognized we needed an enterprise tool that could integrate all our different technologies into one pipeline and eliminate the hand-coding. That’s what Talend does for us.”

“Talend makes the Organ Offer Report available sooner by allowing us to rapidly ingest and process data from several systems. It was the launching pad for the big data development we had to do to integrate them.”

UNOS is using Talend to integrate both structured data from Microsoft and Oracle databases with JSON data from the Web. UNOS is using Talend’s ability to generate Spark code to accelerate integration jobs, with Talend data pipelines feeding three separate Hadoop clusters.

“Using Talend has enabled us to automate the process of integrating systems and processing data as well as reduce the time required for this essential task from 18 hours down to three or four hours,” says Sutphin.

Transplant centers accessing the report can now see bio statistics about a specific organ, such as blood type and antigens, and the history of what they’ve transplanted over the last three months. “Transplant centers can now see the potential outcome of the organs they did not accept so they can analyze...”

CAStudy

UNOS™
UNITED NETWORK FOR ORGAN SHARING

INDUSTRY
• Non-profit

INFORMATION
• HQ: USA
• 201-500 employees

USE CASE
• Donation Management

CHALLENGE
• On average 22 people die each day while waiting for a transplant. There is a lack of donors. Making better use of organs is a challenge

TALEND PRODUCT USED
• Talend Big Data

RESULTS
• 85 lives saved or enhanced every day in the United States through organ transplants
• From 18 hours to 3 to process and share new data

With Talend, we are making organ data available faster, so hospitals can transplant more patients and save more lives.

Jamie Sutphin, Big Data Services Architect, UNOS
why they turned them down, why they were successfully used by other centers, and whether or not they should consider using them in the future.

"In the big picture," says Sutphin, "what we're doing is making data available to transplant centers so they can find ways to use organs that may not have been used before, transplant more patients and save more lives through transplantation."

Talend is also an integral part of the UNOS project to build a data warehouse within Hadoop in order to do historical and predictive analysis on data sets.

**Delivering results faster**

As to why Talend is faster, Sutphin says, "Talend provides almost a thousand prebuilt components that are easy to drag and drop and then hook up. That replaces all the hand-coding. It's a lot faster than coding it all in Linux or Java. We can also extend Talend by adding our own custom Java code if we need to, which is extremely powerful."

"That means we can build things in blocks," he says. "Talend helps us build something and then reuse it over and over, which we did a lot. We'd build one template, thoroughly unit-test it, then duplicate it in many locations. That ability to re-use components not only allows us to avoid writing something over and over, it also increases the consistency and quality of the software."

All this has dramatically shortened the time needed to develop and unit-test components for specific tasks, as this graph shows.

**Why Talend?**

In evaluating Talend, Sutphin says UNOS had a set of requirements and did a proof of concept. "We like the fact that it's in Java and very extensible," he says.

“We also like that it's part of a new generation of tools that have been built natively to work with Hadoop platforms. And Talend talks to so many different systems—it's obvious it grew up in the big data age. The results of the proof of concept gave us confidence that Talend could do the job."

After the successful proof of concept, UNOS decided on Talend Big Data that includes Big Data Integration and Data Quality.

It took UNOS only two and a half months to go live with the Organ Offer Report functionality. "It was a big piece to rewrite," says Sutphin. "It included 45 or 50 different jobs and thousands of lines of Java code and a process that crosses several different platforms and technologies."

The UNOS Data Services development team consists of an architect/developer and another developer. The company also has researchers who help load data and use Tableau to validate it by providing unit-test cases to make sure that computed results look correct. "We can be very productive with a small development team and be very efficient in terms of organizing and building code," says Sutphin.

Summing up the experience UNOS has had with Talend, Sutphin says, "We are very satisfied with Talend—it's doing exactly what we want. Talend is solving problems we couldn't solve before deploying it, and integrating systems we couldn't beforehand. In fact, we have difficulty seeing where we couldn't apply Talend to a use case because it's so versatile."