

# NETWORKWORLD

EnerNOC powers up BPM to automate a core business process

*Bonitasoft business process management tool reduces errors, ensures process scalability*

By John Dix  
March 17, 2015

*Companies that want to get a better handle on energy usage turn to EnerNOC, a Boston-based firm that developed what it calls energy intelligence software. While EnerNOC sells EIS for corporate internal use, it also uses the software to drive a service called demand response which enables companies to curtail usage for rewards from energy suppliers. Network World Editor in Chief John Dix recently visited Chief Architect Per Gyllstrom to 1) find out more about EnerNOC's energy management tools, and 2) how it is using business process management (BPM) to orchestrate its complex demand response business.*



*EnerNOC Chief Architect Per Gyllstrom*

## **How about we start with an explanation of how your demand response business works.**

With demand response, utilities are our customers. So on a hot summer day when everybody is going to crank their air conditioners, utilities will expect high energy use and contact us and say, "At 11:00 AM we want you to start giving us back a gigawatt of savings and keep doing that until 4:00 PM."

So we turn to companies we have relationships with [more than 6,000] that you can think of as "providers", say a grocery store or a big sawmill. We have meters on their buildings and have created a baseline of their energy usage, so we can ask them to curtail usage compared to those baselines. Curtailing might mean shutting off every other light or adjusting the temperature in a store up or down. There are lots of techniques you can use.

We can invoke thousands of providers to help us curtail usage and we aggregate all of the savings to get to the gigawatt. If we're successful with this, the utility pays us money for the gigawatt and we turn around and pay the providers. The company was founded around the idea of demand response here in New England, but we're doing it everywhere in the world now.

### **How is the curtailment request handled?**

We figure out with providers how much energy they can drop without feeling pain. Our experts put together a full plan, and for some it will be a manual thing where you get notified that you need to start curtailing in an hour, and in some cases it's automatic, so switches will be thrown.

### **Is one approach more prevalent than the other?**

To be clear, there's automation throughout the entire demand response dispatch process – from the time utilities initiate an event, to the automated communications that go out to our end users, right up until the demand response dispatch is over, but if you're talking specifically about turning things off, the percentage of manual vs. automatic depends largely on what kind of facility is participating. In industrial and manufacturing settings, which typically are the largest energy users, curtailment is almost always manual. There are safety concerns there: both from the staff and equipment perspective. In conditioned spaces, however, like commercial real estate or grocery stores, for example, a greater percentage of curtailment is automated. In those cases we're usually talking about temperature set points or lighting schedules.

We put Bonitasoft tools into production about two years ago. But let's first talk about the problem we were trying to solve.

For example, PJM is one of our biggest customers, a utility grid operator for all of the eastern seaboard, and when they notify us asking us to do something, what we call a dispatch, it sets off a multistep process. They'll give us a time window and, when the gun goes off, we'll typically only have two hours until we need everybody to start saving energy.

The first thing we have to do is notify everyone involved, so that might be 1,000 providers for a given program. So we have to notify them and get verification back saying, "Yes, I heard you. I'm going to do this." If we don't hear back we need to recheck in case they missed it.

Once the notifications have gone out and we have the validations back, we go into the next phase which is curtailment. Now we're in action so all of the meters are reporting in and people in our network operations center here are monitoring everything that's going on and ensuring people are staying with it. If people are not following exactly or they're not meeting the needs -- say maybe they didn't shut off everything expected -- we have to tune the process.

Then after curtailment more notifications go out saying, "Hey, at 3:00 PM you're good to come off this." All together there are seven major steps in the process from start to finish.

### **How long do these events typically last?**

Typically about four hours, but it varies. Each program involves all these steps, and each provider is participating in their own unique way, and we run as many as 40 programs simultaneously, so it is quite complex. We orchestrate and manage all of this with a Bonitasoft process.

Why? Because when I first came here the network operations center was doing a lot of this manually, and visually you couldn't understand what was going on. People were having difficulty managing this by hand and mistakes were creeping in. It was clear to me we should look at a technology to do this, so we evaluated a number of vendors.

### **Energy measured in dollars**

Demand response still represents 70% of EnerNOC's revenue, but EIS is the fastest growing business. Gyllstrom explains: "In the nonretail space, peak usage in a month is a multiplier for your monthly bill, so if you hit a new peak your whole monthly bill just went up by quite a bit. We are able to predict and tell you in dollars what you could avoid if you don't go over peak. The focus is on how much you're spending instead of how much energy you're using because money talks." The company tracks all types of energy, from electricity and gas to steam and more.

### **What attracted you to Bonitasoft?**

One of the reasons is I'm a stickler for standards, so I want something that can support the BPMN 2.0 standard, which stands for Business Process Management Notation; it's a drawing tool and it's the only standard in business process. All our process drawings are in BPMN, but the beauty of Bonitasoft is, when the drawing is done, I can push a button and it generates code that actually runs. And since it is in BPMN, if I want to I can pick this up using a different tool and it will run. So it's a portable, visual, executable standard. It's really powerful.

Most process folks draw stuff, put it on a piece of paper, tape it to the wall and say, "Let's follow that." What we're doing is using a tool that executes each of these steps.

The default is to step through the process automatically, which is 90% of the time, but someone can interject, and say, "No, I'm going to stop it here." And if a human interaction is expected and it doesn't happen at a certain point, a timer times out and takes it to the next step.

### **So the tool keeps track of the steps for the NOC operators, and I presume actually kicks off various processes automatically, like sending email notifications?**

Yes, there are connectors to capabilities being orchestrated. Like you said, one is a connector that starts sending out notifications via email or what have you, and the process waits for that to take place before going on to the next state. The tool comes with a set of connectors for everything from web services to Salesforce. It's a fairly rich set and you can build your own connector if you need to.

### **How do you measure success?**

With our old human-intensive operation errors were creeping in because people were relying on private timers, clicking on the wrong button, dispatching the wrong company, etc. If we ask a company to curtail and they're the wrong company and yet they do their job, we owe them money. In a worst case, if we dispatched falsely – say there wasn't a dispatch and we dispatched 800 providers for two hours – we would probably be out millions of dollars.

### **Has that ever happened?**

That has not happened, but I'm just showing you how serious it can be. There's a lot of money riding on this, and BPM is helping to keep everything in synch.

**Bonitasoft says its tool is easy to use. Is that what you found?**

Yes, it is very easy to use. It's like you're doing a drawing and then all of a sudden you can run it, which is really cool. You can put an application together very, very quickly. However, as easy as that is, it's part of our development tool suite so the output has to be fully tested.

**And it scales well?**

We've tested about 1,000 simultaneous workflows, where each one is an individually created workflow instance and we have some very significant performance needs for each step, and it's done very well.

**I would imagine that before you brought this in there was a temptation to build some kind of homegrown approach?**

Yes. In fact, we started with a bit of a home-grown piece. In a fast-growing young company you end up building your own because you can't afford to get anything else. But we can now afford to do better. We shouldn't be in the business of building a business process modeling tool.

**Does EnerNOC use other BPM tools for other needs?**

We had something called jBPM, which is part of the JBoss stack. It was used slightly in the previous incarnation of this, but jBPM was a dead-end standard so it was going away. One of the reasons I pushed for Bonitasoft is we haven't automated a lot of processes within the company so I wanted to bring in a tool that was very capable. We're at the point now where I'm talking to some senior operations folks that are interested in seeing how we can automate some other processes.



**John Dix** — *Editor in Chief*

Dix helped launch *Network World* in 1986 after chronicling developments in networking and distributed processing first at IDC (1980-1984), then at *Computerworld* (1985-1986).