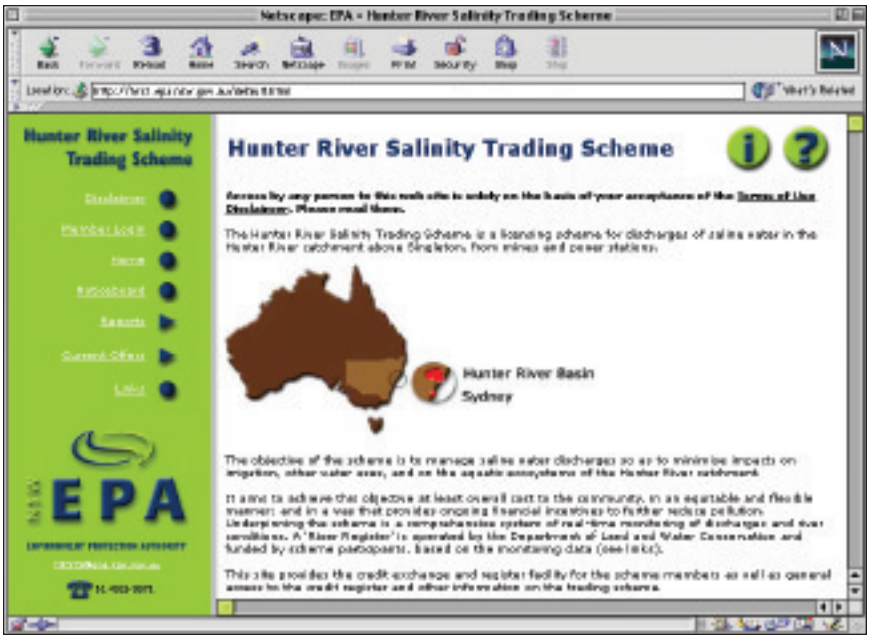
EPA's Web exchange keeps emission credits flowing, so river runs clean.

Overview

- ***Challenge***
  Enable power plant and coal mine operators to exchange saline emission credits 24 hours a day
- ***Solution***
  Online credit exchange based on the IBM WebSphere® platform for e-business
- ***Why IBM***
  IBM WebSphere Application Server was seen as a scalable, secure enterprise-level platform capable of supporting current and future applications
- ***Key Business Benefits***
  For coal mine and power plant operators: improved service and significant cost avoidance
  For EPA: 66% savings in development time; extended hours of service at same internal cost
- ***Business Partner***
  Multitask Consulting



Just as the EPA's programs take future environmental needs into account, its Web-based emissions credit exchange infrastructure can scale to support emerging applications, such as credit auctions.

The Hunter River in New South Wales, Australia, winds through a landscape filled with vineyards and flourishing farms, all sustained by the river's benevolent, but variable, flow. Nearby, coal mines and power plants hum, fueling the region's growing economy. As they do, they discharge saline (salt) water—one byproduct of their operations—into the Hunter River.

Yet, no one complains. That's because agriculture and industry have learned to co-exist in the region, thanks to the Hunter River Salinity Trading Scheme (HRSTS),

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>
> *–Simon Smith, Director, Economics and Environmental Reporting, EPA*

e business

Key Components

Software

- IBM WebSphere Application Server, Advanced Edition, Version 3.3
- IBM WebSphere Studio
- IBM DB2® Universal Database™ for Windows®
- IBM VisualAge® for Java™

which provides a carefully controlled method of discharge that balances the needs of all the users of the river while accommodating the intermittent nature of the river itself. At present, 20 coal mines and 2 power plants along the Hunter River participate in the scheme.

Since it was established in 1995, the HRSTS has been managed by the New South Wales Environment Protection Authority (EPA), the state's leading public-sector organization responsible for environmental protection. Simon Smith, the EPA's director of economics and environmental reporting, explains how it works: "During high flows, each participant is entitled to a share of the total allowable discharge, according to the number of salt credits the participant holds. Since what matters from an environmental perspective is the total amount of emissions into the river, the EPA provides the means for participants to redistribute the credits among themselves as needed. If, on a particular day, one company needs to discharge more salt water than it has credits for, it can request to buy credits from another company that doesn't need them. Likewise, companies that have a credit surplus can offer their credits for sale."

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–Simon Smith

The challenge for the EPA has been how to facilitate the exchange of the saline emissions credits in a timely manner. Until recently, participants could buy or sell credits during business hours by phoning or faxing the EPA's Hunter Office in Newcastle, where two staff members kept a manual log of the credit holdings and the exchanges between the participants. "Unfortunately," Smith says, "the Hunter River doesn't keep business hours. Periods of high flow—the only time when discharges may be made—can come at any hour as well as on weekends. If companies can't obtain the credits they need during the high-flow period, they can't discharge, or they risk steep fines if they do. We needed an exchange system that would be available 24 hours a day, every day."

Smith adds that companies can reduce their discharge frequency by building and maintaining larger saline water reservoirs. However, it is an option they would rather avoid, as it would add hundreds of thousands of dollars to their annual operating costs.

IBM offers platform for the future

The EPA turned to IBM Business Partner Multitask Consulting, a Sydney-based provider of e-business consulting, development and support services, to design and build an online credit exchange for the HRSTS. Multitask proposed a component-based Java application, which would run in IBM WebSphere Application Server, Advanced Edition, with IBM DB2 Universal Database for Windows serving as the exchange's data management system.

The EPA quickly accepted the proposal. "We wanted to build an infrastructure that could not only support the online trading exchange, but also integrate with our existing systems to support a wide range of interactions with various industries, environmental advocates and the public at large," says Smith. "Multitask recommended WebSphere software because it offered a scalable, secure enterprise-level platform."

Developed in just three months, the HRSTS online credit exchange has been enthusiastically received by all the participants, who can now take advantage of every discharge opportunity and avoid expanding their reservoirs. The EPA is equally pleased, as it can now better serve HRSTS participants, while making more effective use of the talents of its staff.

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–Dion Gillard, Technical Director, Multitask Consulting

As the river rises, so does Web site activity

To help HRSTS participants pinpoint discharge opportunities, the scheme includes an online river register, accessible from the EPA's Web site, which displays the realtime status of the river flow. If the flow indicates that a discharge opportunity exists, and participants want to buy or sell credits, they can log on to the secure HRSTS Web site—residing on a dedicated server—and complete an online form to post an offer.

The Hunter River sustains one of Australia's most famous wine production areas—as well as its largest coal-fired electricity generators.

Once the sender submits the form, the application generates an e-mail message to the offer recipients. Upon receiving the e-mail, any offer recipient can log on to the Web site to view the offer and either accept or decline it. Recipients can also post their own offers. Whenever an offer is accepted, e-mail confirmations are sent to both the buyer and the seller, and the trade is logged in DB2, which also keeps track of the current credit holdings of each of the participants.

Following the IBM User-to-Business (Self-Service) Pattern for e-business, Multitask used IBM WebSphere Studio to create the JavaServer Pages that display the various forms and confirmation pages. And using IBM VisualAge for Java, it developed the Enterprise JavaBeans (EJB) that extract the data from the forms, load it into the DB2 database and generate the e-mails.

"The EJB architecture supported by WebSphere Application Server allows us to maximize code reuse," explains Dion Gillard, Multitask's technical director. "Such reuse—along with the IBM Patterns for e-business—helps reduce development risk and shorten development time." Smith concurs, noting, "This application was developed in approximately one-third of the time it would have taken us to develop similar functionality using older methods, and we believe it will scale much more easily."

Technology increases awareness, incentives for eco-accountability

Believed to be the world's first 24-hour online credit exchange for a water emissions trading scheme, the HRSTS exchange has attracted interest among emissions management organizations and environmental advocates worldwide. Today, they can all witness the exchange in action and in the future they may even be able to trade credits themselves.

"Multitask has advised us that the scalability of DB2 and the WebSphere software will enable us to handle the increased traffic loads on the site," Smith says. "With the infrastructure now in place, we'll be able to add enhanced services, such as auction capabilities, which will make it even easier for these businesses to do their part to protect the ecosystem we all share."

For more information

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