whenever the designers updated a design, there would be a few days' worth of DVDs in the pipeline made with the old version of the design. Sometimes it would come out OK, and sometimes it wouldn't.

Under the new system, designs never have to be registered. Whatever comes through in the XML is what gets produced, which frees the designers to make much more frequent changes and roll them out however they want. New revisions of designs don't affect orders in the pipeline, because each order is self-contained. Once the new revision gets out to the studios, then it starts showing up in the order stream.

The only parts that weren't copied were the image files themselves. They're too large to copy, and so instead we assign every image—whether part of a design or taken in the studio—its own GUID. As a rule, once something gets a GUID, it is officially immutable. When it's getting ready to burn orders to DVD, the StudioServer walks through the orders collecting GUIDs (using the controversial Visitor pattern). It adds every image it finds to the DVD, including both the customers' photographs and the design backgrounds.

Render Farm

The StudioClient helps associates create enhanced portraits from the basic images. Those enhanced portraits can be as simple as a sepia or black and white effect to make the portrait look more dramatic, or they can be as complex as a multilayered structure with alpha-composited backgrounds, text, and soft focus. Whatever the effect, the workstations in the studio do not produce the final rendered image. The printing facility has a variety of printers, supporting different sizes and resolutions. They're free to change printers or move jobs between printers at any time. The studios just don't know enough to produce the print-ready images.

When those daily DVDs arrive, they get loaded into the production control system (PCS). PCS makes all the decisions about when to render the images for an order, when to print them, and what printers to send them to. A separate team, in a separate location and in a separate time zone, develops PCS. Previous projects had run into tremendous friction when trying to integrate too closely with PCS. All parties worked with good intentions, but the communication difficulty slowed both teams down. We needed to avoid that friction, and so we decided to apply Conway's Law (defined in the next section) proactively, by explicitly creating an interface in the software where we knew the team boundary would be.

Conway's Law, applied

Conway's Law is often invoked after the fact, to explain what might otherwise appear to be arbitrary divisions within a product. It speaks to a fundamental truth about development teams: anywhere there is a team boundary, you will find a software boundary. This emerges from the need to communicate about interfaces.

We felt it was important enough to keep the DVD format and layout under complete control of Creation Center that we added a program to our own scope: the DvdLoader. DvdLoader