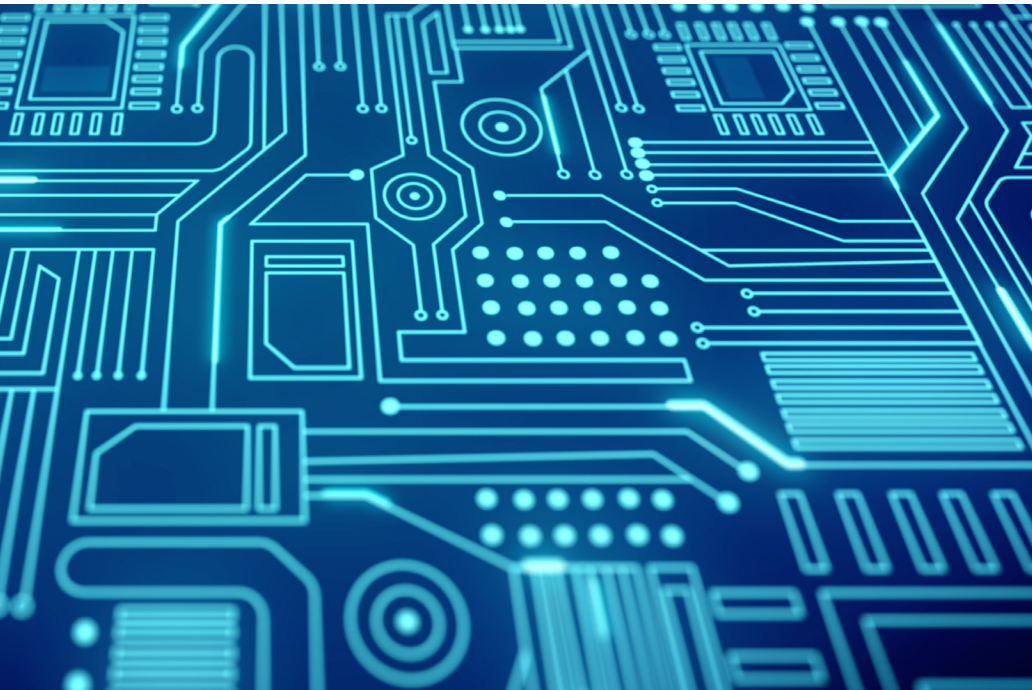




# Database DevOps team automates synchronization across 7,600 schemas

Global paper manufacturer uses Quest® Toad® DevOps Toolkit to automatically synchronize thousands of schemas in databases across dozens of sites.



“Before Toad DevOps Toolkit, we used to have a two- or three-week backlog of requests from developers. Now it's just a few days.”

*Business Consultant, Global Paper Manufacturer*

**Every minute you spend manipulating scripts to keep your database schemas in sync is a minute you don't spend rolling out new features for your developers.**

A small group of database engineers within a global paper manufacturer had seen schema synchronization eat into the time they could spend keeping app

developers productive. The company has dozens of production sites worldwide. The group had spent years trying to improve the process of synchronizing thousands of schemas in databases across those sites, but the process was still labor-intensive and prone to error.

## CUSTOMER PROFILE

|          |                           |
|----------|---------------------------|
| Company  | Global paper manufacturer |
| Industry | Manufacturing             |
| Country  | U.S.A.                    |

## BUSINESS NEED

A small DevOps team at a global paper manufacturer kept thousands of Oracle database schemas synchronized across dozens of sites by writing, maintaining and running PowerShell scripts. The labor-intensive practice led to errors and was not scalable.

## SOLUTION

By integrating Toad DevOps Toolkit with their build automation tools (Microsoft Team Foundation Server and Azure DevOps), the manufacturer automated the process of comparing and synchronizing database schemas. Without the burden of managing home-grown scripts, the database DevOps team can now fulfill its primary mission: working on new features for application developers.

## BENEFITS

- Simplified DevOps workflow from continually maintaining hundreds of scripts to maintaining a single script
- Cut time to respond to developers' requests from weeks to days
- Enabled the customization of scripts to synchronize multiple, differently named schemas per database

## SOLUTIONS AT A GLANCE

- Database DevOps

## PRODUCTS & SERVICES

### SOFTWARE

Toad DevOps Toolkit

“I need to sync schemas in one database to differently named schemas in the other databases. None of the other products I found [except for Toad DevOps Toolkit] offered that level of customization.”

*Release Engineer, Global Paper Manufacturer*

## KEEPING SCHEMAS SYNCHRONIZED IN DOZENS OF DIFFERENT PLACES

The company runs 12 different environments for development/testing and training to support production, inventory and shipping at more than 30 facilities companywide. The dev/test and training environments consist of a single Oracle database with all of the schemas for all facilities. When the database is deployed to a facility, it contains only the schemas for that facility; the other schemas are removed.

A business consultant works with a PL/SQL developer to create and manage the tables and objects in the Oracle database. They then create the views, procedures and functions that developers call from their applications.

“For years we struggled to keep the right objects and the right versions in all of our dev/test, training and production databases,” says the consultant. “Each production database contains 13 schemas, so we were responsible for keeping about 7,600 schemas in sync. In the old days, we created Oracle DDL scripts with CREATE/ALTER commands and ran them everywhere manually whenever we changed schemas.”

There was more to that than simply launching scripts and watching them run. If a script generated an error, somebody had to carve out the time to check a log file and find the problem. The consultant’s experience as a database developer and administrator told him that, if there wasn’t time to troubleshoot, objects would go missing and the databases would fall out of sync.

## FIRST SOLUTION: COMPARE AND SYNCHRONIZE IN TOAD FOR ORACLE

The IT group had been planning a shift to database DevOps inside the company. The consultant saw that that would require

DevOps tools and a reliable process for keeping the schemas synchronized across all databases. Those requirements kicked off a year-long automation project.

“What made things especially difficult was the naming convention we apply to our schemas,” says the consultant. “All of our schemas have different names and we place a facility identifier at the beginning of every schema. That means we can’t do straight compares. We need to be able to customize the search criteria.”

“I had worked with Toad for Oracle at a previous company,” says the team’s release engineer, “and I knew about automating its Schema Compare and Sync feature using Automation Designer in Toad. The feature allows you to compare schemas and then generate DDL change scripts to keep the schemas in sync.”

The engineer used Automation Designer in Toad for Oracle to create a set of tasks in an automation job. Microsoft Team Foundation Server (TFS), the build automation tool the group used, then launched the Toad automation jobs via PowerShell to run all the synchronization tasks.

“I wrote a series of custom scripts to synchronize one set of schemas with all the other sets of schemas in the same database,” says the engineer. “I’d never done anything like that before, so it took a lot of trial and error involving schema snapshots and the Search-and-Replace feature in Toad to get us to an acceptably automated process.”

While it was a step forward on the path to automating database DevOps, the job executed slowly. And, because environments were often added or changed, the engineer still had to continually modify and troubleshoot tasks in the job.

## SWITCHING TO TOAD DEVOPS TOOLKIT

When Quest released Toad DevOps Toolkit, the engineer downloaded a trial copy and put together a proof of concept comparing it to multiple DevOps automation tools, including Redgate Schema Compare for Oracle.

“Toad DevOps Toolkit got the nod,” says the engineer. “First, unlike the other products, it’s primarily PowerShell-focused, and I had already invested a lot of time and effort in using PowerShell to call automation jobs in Toad. Next, it now takes much less time to execute our tasks, especially the work involving the snapshots. Then, Toad DevOps Toolkit makes it easier to recreate or add new environments. That helps free up my time from having to tinker with every little task in Automation Designer. Now, I only have to tinker with the schema generation task. And finally, I can customize, which is necessary for synchronizing schemas in one database to differently named schemas in the other databases. None of the other products I tried offered that level of customization.”

With Toad DevOps Toolkit, the database DevOps process flows smoothly. The consultant and the PL/SQL developer make all their changes to a main, “gold” set of schemas. Toad DevOps Toolkit, integrated with the company’s build automation tools (TFS and now Azure DevOps), takes those changes, compares the schemas across all databases and synchronizes them automatically.

## THE BENEFITS OF RELIEVING THE RELEASE BOTTLENECK

The release engineer no longer has to maintain scores of scripts and tasks. “The maintenance has been minimal since we moved to Toad DevOps Toolkit,” he says. “The work of adding and updating environments is quick, easy and painless.”

On the business side, the consultant’s group has created a product team

that includes a dozen process and management people in addition to a few dozen developers. “The big benefit to the business is that there are fewer headaches and issues with databases being out of sync,” says the consultant. “That’s because it’s easier for us to find and troubleshoot errors that come up during a synchronization.”

By accelerating database DevOps, Toad DevOps Toolkit has helped automate plenty of work done by the consultant and his fellow developers. “It has saved us an enormous amount of time,” he says. “It’s nice to know that, whenever we add a column to the table, we don’t need to create a script and run it in thousands of schemas. Being able to make a change in one place and have Toad DevOps Toolkit synchronize it across 7,600 schemas in all databases is great.”

Instead of managing objects in the database, the PL/SQL developer can now spend more time creating database views and procedures for six different application development teams. “In any sprint,” the consultant says, “our developers need us to make database changes so they can complete their tasks. But because we had a database bottleneck for so long, developers were putting off changes or rolling them to the next branch. Before Toad DevOps Toolkit, we used to have a two- or three-week backlog of requests from developers. Now it’s just a few days.”

## ABOUT QUEST SOFTWARE

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