HUME
INTEGRATION SOFTWARE
Leadership in Network Integrated Manufacturing

Case Study

Agilent Technologies, Inc.

The Customer

Agilent Corporation is a major producer of semiconductor test equipment. Their leading-edge optoelectronic, mixed-signal, and digital integrated circuit technologies produce key building blocks for high-speed wired and mobile networks. Agilent has the critical systems expertise needed to help foundries succeed in an environment of relentless innovation, narrowing market windows, and growing demands for speed, bandwidth, and affordability. Let's explore one such example.

The Challenge

Agilent had been successfully selling and shipping its Model 4070 Parametric Tester to one of its major customers. This customer began undertaking a strategic upgrade of its manufacturing operation and Manufacturing Execution System (MES). This upgrade would allow them to automate operation of tools in the fab and reduce operator intervention.

The Solution

This required all equipment in the fab to have a common interface, thus simplifying the communication needs of the MES. Accordingly, the customer asked Agilent to implement the SEMI SECS/GEM standards on the 4070 tester. The SECS/GEM interface specifies a framework for passing recipes, error conditions, status, etc. For the SECS/GEM interface, Agilent chose an off-the-shelf package from Hume Integration Software.

Also required for the 4070 was a custom messaging scheme, or middleware, to pass and convert the commands of the MES into tester specific actions. In other words, where a user had been manually operating the equipment, now the middleware would take command; exactly what the customer wanted. To provide this sophisticated capability for the 4070, Agilent needed to develop software that would integrate the SECS/GEM messaging schemes into the 4070 test shell software. The test shell software, called SPECS, is what controls the detailed operation of the 4070. Agilent embarked on this daunting development task.

The task was completed, after an undesirably lengthy development cycle. The SECS/GEM implementation took place quickly. However, the homegrown middleware proved to be very complex and inflexible. Defining and maintaining the data structures was very time consuming. "It was like designing one gigantic IF_THEN_ELSE statement" according to one of the designers.

A Step Beyond

With foresight, Agilent realized that to implement this custom middleware for the next customer would be just as complicated and time consuming. A solution allowing a high-level approach was needed: a solution that eliminated the need to deal in detailed message structures. This would allow Agilent to develop the solution quickly and efficiently.

Agilent found such a solution from a single source. It is the Datahub SDK (Solution Development Kit) offered by Hume Integration Software. This intelligent middleware offered a unique set of capabilities perfectly suited to SECS/GEM automation challenges. Its high-level communication makes interface programming fast and flexible. It utilizes an in-memory SQL database that is easily configurable. Access to the data for all processes is by subscription, not polling. This assures that processes obtain the information they need when they need it. This intelligent data pipe eliminated the need for parsing and allows the exchange of programming statements not binary message structures.

Success

The implementation of the Hume middleware took a small fraction of the time required for the discrete development. The ensuing application was delivered quickly and its performance and reliability has been exemplary.