WHITE PAPER

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Verastream Event Handlers

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Verastream Event Handlers

Attachmate® Verastream® Host Integrator enables the full range of mainframe-based legacy applications to participate in today's service-oriented architectures. Whether your environment is IBM Mainframe, IBM iSeries (AS/400), UNIX, HP OpenVMS, or HP e3000, Verastream Host Integrator can give your users a new look and feel, without disturbing valuable code or associated business processes.

Although some organizations may be wary of using the screen interface, Verastream Host Integrator users have proven that integrating at the presentation level can be reliable, scalable, and secure. Attachmate has supported this integration environment for many years, and has developed considerable expertise in overcoming the challenges. This experience has led to the development of Verastream event handlers.

How Does Verastream Host Integrator Work?

Before describing event handlers, it's important to take a look at how integration with the mainframe application works in Verastream Host Integrator.

Verastream Host Integrator provides a graphical design tool that is used to describe the flow of the mainframe application's user interface. During this process, the developer selects fields on the screens that are of interest, such as fields that need to be accessed later for reading or writing information. The developer can also highlight scrolling tabular data that will need to be accessed later in the integration process.

When the developer has used the Verastream Host Integrator design tool to describe the mainframe application, higher-level abstractions can be created. These higher-level abstractions, or "procedures," are created through a wizard-driven process.

Once these steps are complete, the output of the design tool, referred to as a "model," is deployed to the Verastream runtime server. Client applications can then connect to the models and have access to the mainframe applications as if they were simple procedures, accepting inputs and generating outputs.

What are Verastream Event Handlers?

The Verastream server generates events at well-defined points in the execution of a model. These events correspond to many different actions, such as a client connecting to the server, a mainframe displaying a particular screen, the writing to or reading of information from a data field on a mainframe application screen, or the execution of a Verastream procedure. An event triggers the execution of an event handler, implemented in a procedural programming language.

An event handler can either replace or augment the Verastream server's normal processing. Once event handlers have been developed, they can be reused across multiple applications and platforms.

In the diagram at the bottom of the page, a simple event handler translates product codes as represented on the mainframe to more easily understood product descriptions for the calling application. In this illustrated scenario, the event handler gets control after the line items are returned from the mainframe application. The event handler uses a simple lookup table to convert the product codes to the appropriate product descriptions. Once this event handler is created, it can be reused to perform the product-code translation function in other models.

The same Verastream Host Integrator design tool that models the mainframe application is used to locate and implement the event handlers. While

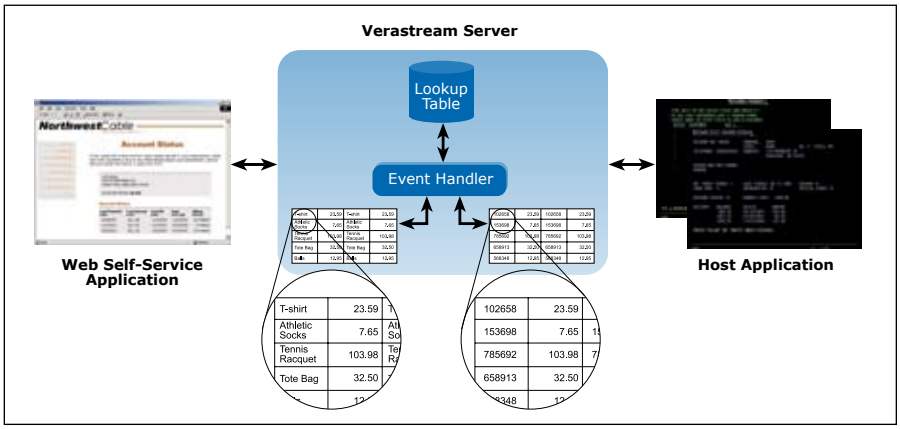

Diagram of event handler performing host code translation

developers navigate the mainframe application, they can select any of the possible events that Verastream Host Integrator is capable of triggering (such as a field-level read or write). Once they select an event, they can then browse for the event handler they want to attach to this event and simply click on the handler to associate it with the specified event. Developers are free to use handlers they have built themselves or those provided by Attachmate.

A Closer Look

Here are some of the unique functions enabled by Verastream event handlers:

- Fine-grained security access
- Transaction support
- Composition of multiple information sources
- Translation
- Conversions
- Handling of complex data

With Verastream Host Integrator, you don't have to make any changes to the existing mainframe application when you apply these functions, which are further discussed below.

Fine-grained security access

When exposing mainframe information to new applications or users, take the necessary measures to avoid risk. Start by restricting information to those who are authorized to view and update it. Because few mainframe applications were built to accommodate new sets of users, their access control is very coarse-grained.

Consider for example an HR benefits application created 10 years ago under the assumption that only HR staff would operate it. After logging onto the application, HR staff had access to Social Security numbers and payroll information for employees. If you now need to expose the HR application in a new web self-service portal, you must ensure that this highly sensitive information is not displayed to unauthorized users.

With Verastream Host Integrator, an event handler can be attached to the data fields that should remain confidential. The event handler can query any number of authentication stores to validate the user before returning any selected information. In addition, the event handler can log any interaction with the sensitive data to provide an audit trail.

Transaction logging

When working with a mainframe application through the presentation layer, it can be difficult to confirm the successful completion of work that requires multiple mainframe application updates. For example, if several mainframe applications must be updated together, or if a mainframe application and a database must be updated, it is important to know whether all the updates succeeded, if only some succeeded, or none succeeded.

With Verastream event handlers, you can implement different strategies for dealing with failed updates. Event handlers can generate an audit trail of the updates they perform for storage in a persistent database, allowing reliable recovery from system failure. Event handlers can attempt to recover from partial updates (for example, by restoring the previous value of a screen entry if the new value is not acceptable). If this fails, the audit trail provides a record of what was done so that recovery is possible.

Composition of multiple information sources

Often it is beneficial to consolidate information sources for the end user instead of providing each piece of information separately. For example, you might want to provide customer information that includes the normal name, address, and phone number, along with the last 10 account transactions.

In this example, suppose the contact information is stored in a relational database and the transactions are contained in a host application. Using an event handler, you can execute the database query in-line with the query of the transactions being accessed from the mainframe. The information is combined within the event handler so that the requesting program receives the combined result.

Translation

Many mainframe applications use cryptic codes and other space-saving mechanisms to preserve screen real estate. To translate this data, users often resort to an inefficient system of manual notes and references.

Another common scenario is an application written for users who speak only one language. When businesses want to expand into additional markets, they must serve users who speak other languages.

Verastream event handlers provide a number of translation options. They include lookup tables in addition to more dynamic mechanisms such as linking to language-translation software.

Conversions

Often mainframe applications present location-specific data that is not in an appropriate format for new users of the information. Examples of location-specific data are currency or dates that require an alternate format to accommodate new consumers.

Verastream event handlers can again play a role, by automatically converting currencies or dates based on the locale of the requestor.

Handling complex mainframe applications

Verastream Host Integrator can handle most mainframe data formats using the graphical design tool. However, there is some mainframe information that might require additional processing. Some of these complex data scenarios include mainframe records that have a variable length, or a mainframe application that has many alternate paths based on the information input. In addition, there are transient errors such as brief network outages or mainframe messages that can alter the normal flow of the mainframe application.

Verastream event handlers can address these complex scenarios. An event handler can execute as each variable-length record is processed, or it can format the information in a more consistent fashion before being returned to the calling application.

Processing transient errors is similar. An event handler captures the error, performs the proper recovery routine, and then continues the normal execution of the transaction.

Extending the Life of Your Legacy Systems

With Verastream Host Integrator, developers can encapsulate data and logic via the screen interface to create reusable services or components (e.g., COM, .NET, Java, or web services). The result is a flexible application-development platform for ongoing projects. And with the addition of event handlers, Verastream Host Integrator can further extend the useful life of your legacy applications. You can add capabilities beyond those originally designed into the mainframe application, including fine-grained access control and transaction support.

The Verastream Product Line

Verastream Host Integrator is part of the Attachmate Verastream legacy integration suite, a complete range of mainframe, desktop, and web modernization tools. Our solutions deliver the full spectrum of basic rejuvenation to customized presentation and sophisticated high-performance integration. Verastream-generated services can be mixed, matched, and reused selectively to extend legacy functionality to new applications or new users. No code changes to legacy applications are required.

About Attachmate

Attachmate helps businesses extend, manage, and secure their IT investments. We offer a broad range of solutions—from terminal emulation, legacy integration, and PC lifecycle management products to innovative systems and security management tools. With our technology, more than 65,000 customers worldwide are putting their IT assets to work in new and meaningful ways. Learn more at **www.attachmate.com**.

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