

# Modernization through Integration:

## Using Middleware to Connect Minecraft™ and Other Applications to NonStop

As NonStop users, we know that our systems generally run in silos, separated from the rest of our data centers because of an inability to exchange information with other platforms. Though older middleware, like remote procedure call middleware, has been long been available; its complexity, cost and interoperability problems have severely limited its appeal. More recently, middleware based on modern standards like SOAP and REST have made sending data to and from NonStop systems much easier, more reliable and far less costly.

In this article, we'll explore some different types of middleware and present an unusual use case in which a developer integrated the popular computer game Minecraft with NonStop.

### Middleware = Integration

There is more than one way to integrate HPE NonStop with other platforms, but the easiest way is with *middleware*. If, like many people, you aren't certain what middleware is, think of it as a bridge. Middleware is software that connects two applications, typically over a network, so it allows you to integrate with other platforms, applications, and Web services (at NuWave, we call this PAWS). These disparate applications can then exchange information or perform remote operations. Some middleware is designed for a specific purpose, such as ODBC middleware for database access; whereas general-purpose middleware supports either 1) *peer-to-peer (P2P) connectivity*, where each application consumes and provides services, or 2) *client-server connectivity*, where the client requests information from a server, which returns a response.



Middleware allows you to integrate applications on virtually *any* platform—including a mobile device—with data housed on your NonStop server. This makes your HPE NonStop data more valuable because it becomes easier to access, visualize and understand. Middleware also allows you to integrate data from external sources into your NonStop applications. These two capabilities give your NonStop servers increased functionality, value, and staying power at your organization.

Several common off-the-shelf (COTS) middleware products are available for NonStop systems, but despite this, some organizations have attempted to implement in-house solutions in order to save money. The problem with homegrown solutions is that when a complete accounting is made of the initial development costs, testing and ongoing maintenance, the "savings" are hard to find. On top of that, there's the opportunity cost, because while your developers are reinventing the wheel, they could have been working on solutions that provide real value to your customers. Unfortunately, even after doing all the work to complete an in-house solution, some companies still end up purchasing a COTS product to have the increased functionality and support.

### How to Find the Right Middleware

When you're looking for a middleware product, you should know the answers to the following questions:

1. Do I need the server piece or the client piece?
2. Do I need SOAP or JSON technology?

To answer the first question, you obviously need to know the difference between a server and a client. I'll explain this in more detail in the next section, but basically, the server piece allows you to *expose* your NonStop applications as Web services, so you can send NonStop data to other platforms and applications. The client piece allows your applications to *consume* Web services, so you can bring data into your NonStop applications.

Server-side solutions for NonStop include the following:

- **NuWave SOAPam Server**
- **NuWave LightWave Server**
- HPE NonStop SOAP
- comForte CSL
- ACI Webgate

Some of the client-side solutions available for NonStop are as follows:

- **NuWave SOAPam Client**
- HPE NonStop SOAP
- ACI Webgate

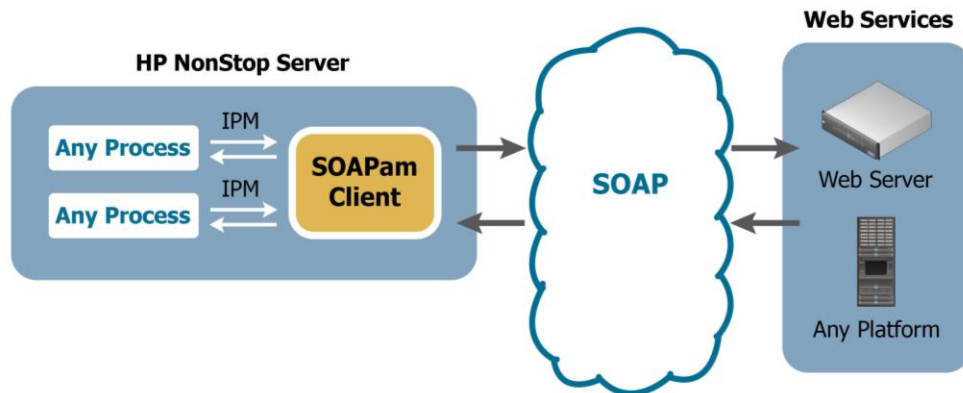
The second step, determining whether you need SOAP or Javascript Object Notation (JSON) technology, might require you to do a little bit of research. If you've already figured out that you need a *client*-side solution, then you just need to find out whether the Web service you want to access is a SOAP or JSON Web service.

Alternatively, if you need a *server*-side solution, then you need to know if the client can make SOAP or JSON requests, or both. If you have a client that can only send SOAP requests, then you'll probably want something like NuWave SOAPam Server. If you have a client that can only send JSON requests, then you'll need NuWave LightWave Server or a similar product. (There are also some middleware options that use neither SOAP nor JSON, and instead use proprietary messaging protocols or ODBC.)

### **“NonStop as Client” (Client-Side) Middleware**

Client-side solutions allow your NonStop applications to leverage data from public and private Web services via the internet or your intranet. These Web services could come from within your own organization, from a business partner, or from a commercial Web service provider like Paypal. For example, if you use one of your NonStop applications to generate price quotes for your international customers, you might access a public Web service to obtain currency exchange rates. Another example would be to access your supplier's private Web service to check your order status.

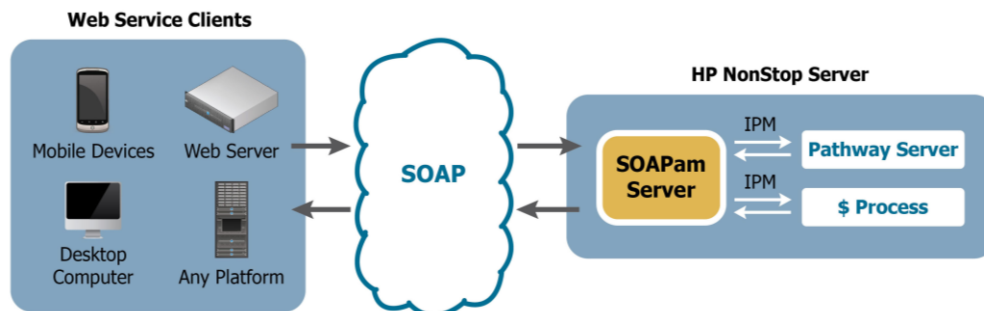
With NuWave SOAPam® Client, your NonStop application simply sends a formatted interprocess message (IPM) to SOAPam Client, which converts the IPM into a SOAP request and sends it to the Web service. The Web service returns a SOAP response with the requested information, and then SOAPam Client parses the response into a reply IPM and returns that to your NonStop application (see the diagram below, reading from left to right).



### “NonStop as Server” (Server-Side) Middleware

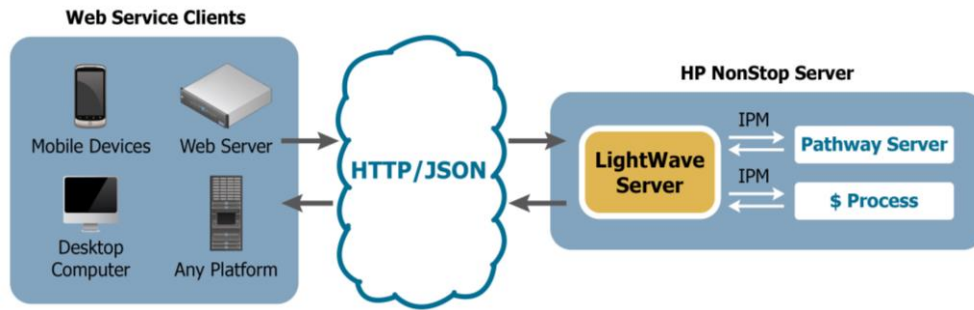
Server-side middleware exposes NonStop applications as Web services, so they can be accessed from virtually any platform, including Linux-, Unix-, and Windows-based platforms, allowing your coworkers, customers, or business partners to retrieve information from your NonStop server. You might use server-side middleware to share data within your enterprise or with your business partners around the world. You could even allow customers to check your inventory or place an order.

NuWave SOAPam Server works in a similar way to SOAPam Client, except that the process goes in the opposite direction. In this case, a Web service client on another platform (like a Unix or Linux server, a PC, or a mobile device) sends a SOAP request to SOAPam Server on NonStop, which converts that into a request IPM and sends it to your backend NonStop application. The NonStop application returns the data in an IPM to SOAPam Server, which the product converts back into a SOAP message and sends to the external application (read from left to right below).



NuWave LightWave Server™ also allows other platforms to request your NonStop data, but it uses JSON and REST technology, so you have a REST client—usually a web or mobile application—sending a JSON request via a RESTful API to LightWave Server on NonStop. LightWave Server sends an IPM to your

backend NonStop application or process, the process returns a reply, and then LightWave Server converts that into a JSON response and sends it back to the client via a RESTful API (see below).



## Minecraft™

So middleware allows you to send and receive information from your HPE NonStop applications, but what if you want to send NonStop data to a different kind of client application, like a computer game? A friend of NuWave's, Damian Ward of Vocalink, wanted to integrate his favorite computer game with his favorite enterprise platform; so he used LightWave Server to create a data visualization of NonStop CPU utilization within the game of Minecraft.

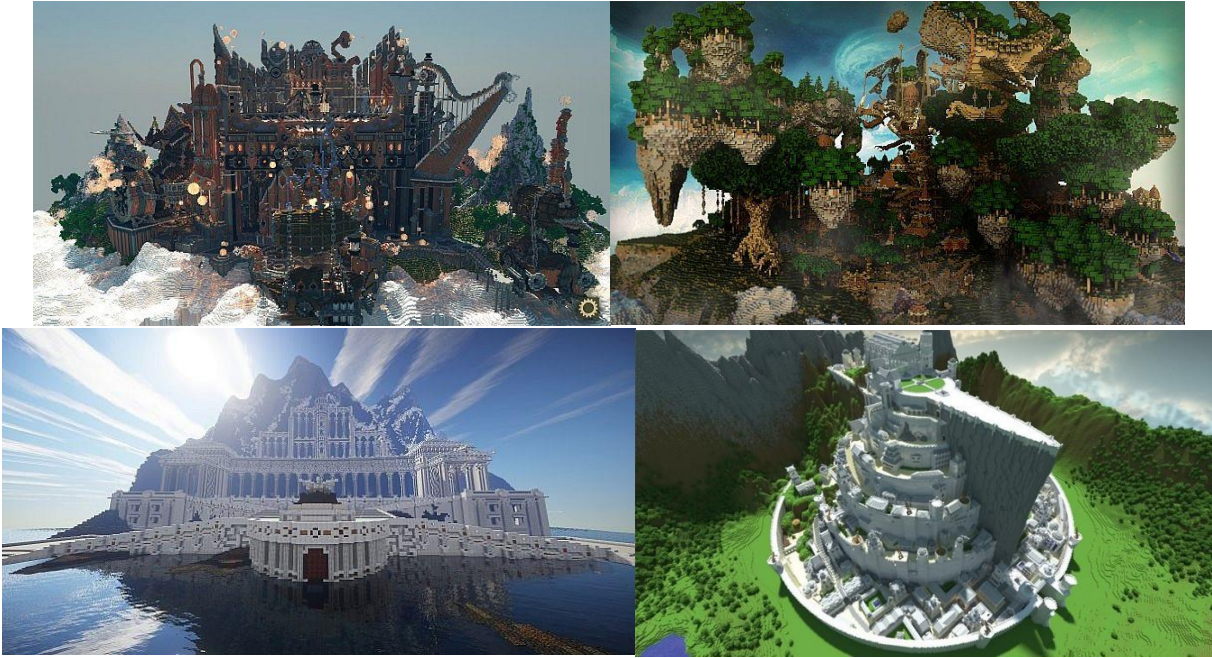
# MINECRAFT



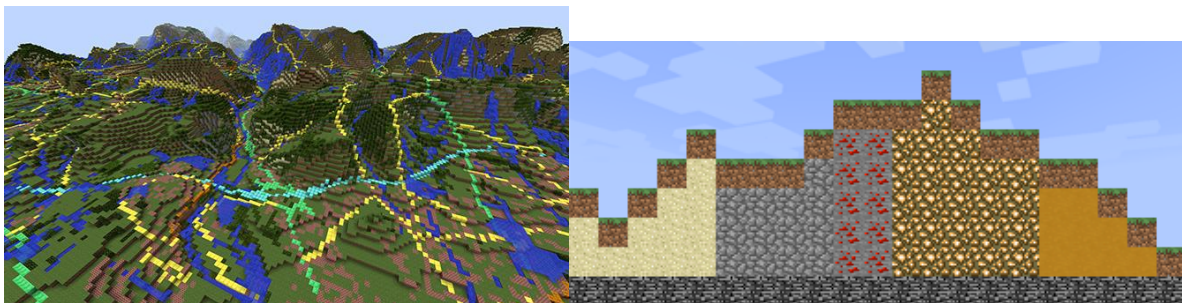
For those of you who aren't familiar with Minecraft, here's a summary of its awesomeness. When Minecraft was launched in 2009, it started out as a game of breaking and placing blocks, as well as mining raw materials and creating tools in a virtual world to create buildings and landscapes for its users to explore. Since then, however, it has become more of a game framework and has sold over 22 million copies. There are currently over 30,000 single-player and multi-player Minecraft servers running worldwide.



In this game, you can create stunning worlds and structures, which are only limited by your imagination—see below.



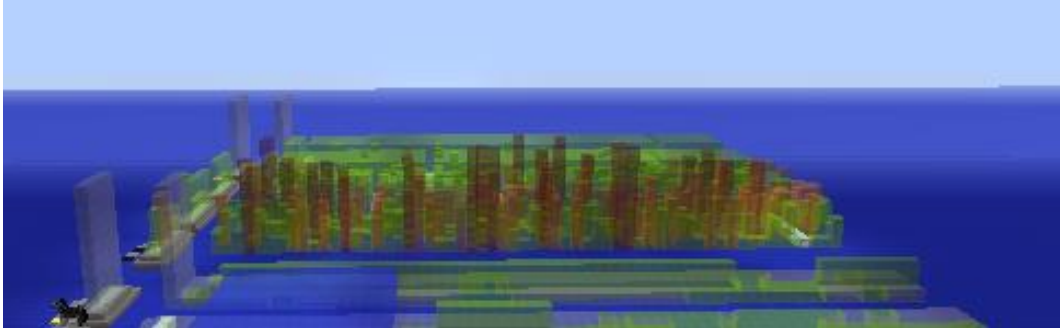
Since Minecraft has such a strong framework, the game is now being used for real-world applications. One example is in the UK, where survey data has been inputted into Minecraft to inexpensively create a surface model of the UK for use by their government agencies (see the images below). The image on the right illustrates how the geology blocks (representing different minerals and deposits) are repeated from the bedrock layer up to the elevation model height and grass block. Inspired by the Ordnance Survey (OS), the British Geological Survey (BGS) has reproduced the 2D geology of mainland Great Britain and the surrounding islands within the world of Minecraft, and they are working on a 3D geological model as well.



Minecraft, at its core, is basically a simple and inexpensive 3D rendering engine, but it is designed to support, and encourage, user extension plugins known as "mods". Plugins can add features or modify game behavior and are coded in Java. Damian and his daughter are both huge fans of the game; so one day, Damian came up with the idea to use a mod to create a 3D rendering of NonStop CPU utilization

within the world of Minecraft. He developed a plugin that uses one of LightWave Server's RESTful APIs to connect Minecraft to a NonStop Pathway server that returns CPU status. Since the REST APIs are based on HTTP and JSON, communicating with the CPU status server using LightWave Server was simple.

With Damian's new plugin installed, Minecraft can display the NonStop server's real-time CPU utilization graphically, as bars of different heights and colors, within his Minecraft world (see image below). How cool is that?



So whether you want to increase the value and functionality of your HPE NonStop servers, or you just want to impress your kids, there is a middleware solution that can get the job done. And if you need a middleware product that has a small footprint and can get you up and running quickly and affordably, that's where NuWave comes in.

To learn more about NuWave solutions, visit [www.nuwavetech.com](http://www.nuwavetech.com), and stay tuned for other interesting use cases like this one!

*About the author: Gabrielle Guerrero is the director of business development for NuWave Technologies, a company that specializes in HPE NonStop middleware and consulting services. You can send her questions or comments by emailing [gguerrera@nuwavetech.com](mailto:gguerrera@nuwavetech.com).*