Connecting the Dots

Diving into G2S for a look

at its Real World Potential

G2S PROTOCOL
GAMING STANDARDS ASSOCIATION

BY RUSS RISTINE

Editor's Note: In this second installment of a series of articles on GSA's Game-to-System (G2S) protocol and the networked casino floor, contributor Russ Ristine look at some of the potential real-world applications.

Most everyone agrees that the networked casino floor will bring a host of general benefits. But not everyone is aware of the possible applications that the Gaming Standards Association's powerful Game-to-System (G2S) protocol may bring to the gaming floor.

Most slot managers are already familiar with the general concepts of code download and remote configuration, since these are the first applications that most electronic gaming machine (EGM) manufacturers are touting as the main reasons for moving to this new environment. However, many may not be aware that the control mechanisms for download and configuration are expressed using G2S. This means that, because the EGMs from all manufacturers should be using exactly the same commands, slot operators really should (and will) be able to buy a generic download and configuration application (from Amazon?) that will work with every G2S EGM on the floor (assuming all G2S EGMs are certified as having implemented the protocol

in a consistent manner).

But first, here are some definitions:
1) Code Download – A G2S download management system directs an EGM to download new software from a server (probably on the property). Depending on the capability of the EGM, this software can be a new game, a note acceptor update, or even a new printer template (Leprechaun coupons for St. Patrick's Day?).
2) Code Verification – The G2S Game Authentication Terminal (GAT) class verifies that the game, printer, note acceptor, etc. software running in every G2S EGM is legitimate. The GAT routines that are included in G2S have been used for years by regulators to validate code in EGMs by going to the EGM and connecting a laptop directly to a serial port inside of the EGM.

A casino operator can use this functionality to compare the digital signatures generated by the EGM for any code module against a known set (provided by the local testing agency) to ensure that all of the code in every G2S EGM is legitimate. Since Code Verification is automatically done by the system over the property's high-speed floor network, it can be performed automatically on all of the EGMs every day (vs. 10 percent of the games per year, as is the common practice with manual verifications).
3) Remote Configuration – Each G2S EGM exposes a group of configuration

options through the G2S protocol (much like they now do through the operator screens). An authorized G2S server can read the current configuration settings in the EGM, compare them against the standard settings, and then automatically make any changes that are needed for the EGM to conform to standard property settings.
4) Authorization – In G2S, one or more servers can be designated as authorizers of an EGM change (such as installing new code or changing configuration parameters). This ensures that the accounting server has a chance to grab a copy of the EGM's meters before the automatic update occurs.

With these basic definitions out of the way, let's look at some applications made possible by G2S:

Controlling active notes

Let's say your soft count team reports that counterfeit $20 bills are being accepted by certain EGMs. You do a bit of research and quickly determine that all of these EGMs use model 1357 note acceptors made by the Great Note Acceptors company (GNA), running revision ABC-12345 of the software (all of which is reported to every G2S host every time the EGM starts up). You contact GNA, talk to your account representative, who says the company is working diligently to get this problem resolved, and the new code

should be submitted for approval within three days.

After reminding your rep that time is of the essence, you decide to disable the acceptance of $20 notes on all EGMs with a GNA 1357 note acceptor running software rev ABC-12345. Fifteen minutes later, all of these EGMs have confirmed that they are no longer accepting $20 notes, and so you head off to lunch, knowing that the property is temporarily protected against this particular threat and that a long--term solution is in the works.

When the new note acceptor code is available, you download it to a test machine in the slot shop to confirm that it really works. If successful, you can then set up a scheduler in your Software Management Application to automatically download the code to the appropriate EGMs on your floor. Once the code is downloaded to all EGMs, you verify it's correct by requesting that the EGM generate a digital signature of the new code package. If all is well, you tell the EGMs to install the new code, and then to remotely configure these EGMs so they again accept $20 notes.

The interesting thing in all of this is that you didn't have to send out teams of slot technicians to reconfigure the note acceptors or change out the software – you just used the tools available to you in this new world.

Changing game code

"**W**in Like a Wildman" turns out to be an incredibly popular new game from the Slick Slot Company. Since it's available as a downloadable game that will run on 20 percent of the machines on your floor, you decide to add it to another 30 EGMs to see whether its popularity will withstand increased availability.

Using your new Software Management Application (which talks G2S to the EGMs), you instruct 30 EGMs to download a copy of the "Win Like a Wildman" software from your secure (in-house) EGM download server. As with the note acceptor software, the EGMs calculate a digital signature on the newly downloaded code package (which, this time, contains the "Win Like a Wildman" code), and then send that signature to the Software Management Application for comparison with the expected package signature. If they match, the code is installed, and the system automatically configures the game using the settings that worked so well for "Win Like a Wildman" in other games.

All of this has occurred in the background, without interrupting players who happened to be playing the EGMs. The newly downloaded game is not available for play, it's just been downloaded, verified, installed, configured and is now ready for "Win Like a Wildman" to appear on the 30 games – when you are ready.

On the day of the big "Win Like a Wildman" rollout and promotion, you send a message to the 30 EGMs to enable play, and when they are all ready and waiting, you turn on the new "Win Like a Wildman" game (again using the system). Your local regulators may want to verify the code before it's presented to the public, but they can do that from their desk, using a different seed for the digital signature of the "Win Like a Wildman" module. Once they give their approval, you enable the EGMs, and all of the wonderful marketing activities begin. Lunch time again!

Tapping into the data in your EGMs

With G2S, your slot analyst can easily access the extensive information that is currently locked inside most slot machines from the comfort of her office. In that new "Win Like a Wildman" game that you just activated in 30 EGMs, she can quickly determine which machines and which of the 10 supported bet denominations are most popular.

Adding a small G2S server with a simple database means that your slot analyst can run a simple yield management or trend analysis software to see what happens to the games if certain denominations are deactivated on certain days of the week (also possible through G2S). If there's an in-house player tracking system that speaks GSA's System-to-System (S2S), the slot analyst can determine the average age and demographics of the club players who prefer this new game, so the marketing department can dream up some sexy new promotions to further drive business.

A couple weeks later, when the yield management analysis indicates that "Win Like a Wildman" fever is cooling off, your Software Management Application (using G2S) lets you easily disable the worn-out Wildman game on 20 of the 30 EGMs without having to remove the code (you just disable the Wildman game software). Using GSA protocols, you have quickly and easily tuned your floor to the optimal mix.

Running a cruise (or closing for the day)

The cruise heads out, the bon-voyage party happens, and then, when the ship is an appropriate distance from shore, the EGMs "automagically" come to life. What has really happened is that someone has indicated that it's time to open the casino, causing a G2S server to inform all EGMs that they can now accept money and be playable.

When the cruise is about to end, a last call message is displayed to all players, after which they can no longer add any money to the machine (though they can still play with whatever money is on the credit meter). Ten minutes later, a second G2S command goes to all of the machines, informing the players that gaming has ended. The players discover that they can no longer make any wagers (though they are still free to cash out, which they all do and head off to the bar – or to bed).

In summary, G2S has been designed to take EGM communications from the 20-year-old technology that is currently being used to report EGM meters, tilts and events to a local proprietary slot machine interface board, to a 21st century protocol that is perfectly positioned to rapidly evolve communications between an EGM and multiple systems by capitalizing on the technology advances that have occurred in the last dozen years in the world of the Internet.

Though initial deployments will be fueled by remote configuration and code download (and server-based gaming in its various forms), the real compelling advances are around the corner, just out of sight. G2S has moved from the domain of the protocol engineers, to the first implementations in EGMs and systems, and now to the first field trials.

As with ticketing, note acceptors, and credit meters (all radical changes at the time), the industry needs a few forward-thinking properties to explore these new concepts on a bank or two of EGMs, after which we all will be yanked into the future. And what an exciting ride that will be. **SlotManager**

Russ Ristine *has many years' experience in gaming system development, including serving as former VP of systems development for Bally Systems, and as a GSA consultant. His latest adventure is Radical Blue Gaming, a gaming consulting and product development company. He may be reached by e-mail at russ@radblue.com.*