

**WHY UNDERSTANDING THIS GAMING TECHNOLOGY  
HISTORY LESSON WILL MAKE YOU MONEY**

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# **WHITE PAPER**

**GAMING STANDARDS**



**A S S O C I A T I O N**

## Obstacles Preventing Operators From Getting Access

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The amount of data generated, processed, stored and reported on, in today's modern casino is staggering. Data transmitted from Electronic Gaming Machines (EGMs) to Systems and from Systems to other Systems, used for regulated purposes, such as determining game outcome, calculating gross gaming revenue, or transactions containing personal identifiable information (PII) must be exchanged in a secure fashion. The need to secure that data ensuring it is not accessed by unauthorized persons or tampered with in violation of regulations is of paramount importance.

The amount of unique data elements, pieces of information generated by EGMs during play, also continues to increase. Casino Operators, looking to better understand customer preferences, identify trends, and improve their marketing capabilities, would find great value in having access to that data. However, there are obstacles that are preventing operators from getting that access.

Due to the speed with which technology is adopted in the gaming industry, data security on the casino floor is often still thought of in the physical sense. EGMs with tamper-proof tape on the Central Processing Unit (CPU) enclosure door, perhaps more tape on the Game Theme and Operating System media (E-Proms, SD Chips, Hard Drives, etc.) to aid in identifying unauthorized access and changes, are examples of this. Requiring that the data connection from an EGM to a Casino Management System (CMS) use physical wire on a closed-loop network with the CMS servers being in the Casino's computer room, are other examples. In the current era of internet and mobile device banking, mobile device payment systems, and online retail transactions, those casino requirements seem to be archaic.

However, many of those requirements are still in place because of legacy devices, legacy systems, legacy communication protocols, legacy EGM capabilities and legacy thinking.

## Legacy Devices

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It used to be that EGMs had a single serial communication port that was used by the CMS system via a Slot Machine Interface Board (SMIB) that was plugged into it. As used in this document, CMS is inclusive of Slot Accounting System functionality. The SMIB was wired to the CMS in some cases through a Bank Controller that acted as a switch allowing multiple EGMs (wire-in) to connect to it and one connection (wire-out) connecting it to the CMS.

When non-CMS systems were developed that needed to connect to the EGM, secondary serial communication ports were added by slot manufacturers. This allowed an External Bonus system or a Wide Area Progressive system to get meter information from the EGM and send bonus or progressive information back to the EGM.

As high-speed networks became more common, a network port was introduced. Over time, CMS SMIBs started to use the network port as opposed to the serial port. However, they were still limited by the casino's legacy network capabilities, in many cases using twisted-pair wiring, and the communication protocols used between EGMs and systems. The reason for this limitation is that Operators could not justify the cost of running high-speed network cable (CAT5 or CAT6) which in some cases required significant operational disruption such as jack-hammering concrete casino floors.

## Legacy Systems

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CMS's were originally developed in a world where only one system could connect to an EGM. That system was often referred to as the System of Record, and it was responsible for collecting all the data necessary (such as wagers, wins, etc.) to calculate Gross Gaming Revenue which forms the basis for gaming taxes paid by a casino. Since only one system could be connected to the EGMs, the functionality provided by these systems continued to grow. They evolved from basic slot accounting systems, adding online monitoring capabilities, then player tracking, analysis, marketing, and the list goes on. These systems became huge, monolithic and the source of all the data that a casino operator and regulator had access to.

However, as feature rich as they became, the CMSs were still limited by the communication protocol used to connect to the EGMs and therefore only had access to the data that it was designed to provide. When CMSs were needed to connect to other systems, such as for checking player credit or connecting to payment systems, proprietary interfaces were created. These interfaces, known as Application Program Interfaces (APIs) were purpose-built and managed by either the CMS or other system developer.

## Legacy Protocols

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The most commonly used legacy protocol is the Slot Accounting System (SAS). Many others existed, such as BESS, DXS, QCOM and VLC just to name a few. As its name implies, the SAS serial protocol was developed to collect information necessary for a system to perform slot accounting. SAS evolved over time adding functionality such as Ticket-in / Ticket-out, Real-time Event mode reporting, and more. However, adding functionality to this type of protocol is difficult and often results in breaking backwards compatibility. SAS version 6.02 was released 12 years ago and after that decade plus, SAS version 6.03 was just released with minimal additional functionality required to support Regulatory Authority mandated requirements. Despite its enhancements, SAS remains a relatively slow speed serial protocol even though, in some cases, it is being run on high-speed networks.

## Legacy EGM Capabilities

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Many people think of an EGM as some sort of mysterious black box. Perhaps this is a hold-over from the early days of mechanical slot machines whose multiple gears, springs, and fans were true engineering marvels that not many people understood. The advent of electro-mechanical slots perhaps further increased the mystery of how these machines worked. Today EGMs are computers using the same sort of CPUs, Random Access Memory (RAM) and Graphics Processing Units (GPUs) as high-end video gaming computers that can be purchased from companies such as ASUS, Dell, HP and MSI.

The graphics and processing capabilities of today's EGMs have advanced considerably, many supporting 4 or more high-definition monitors, some with 3-D, and incredibly rich audio. So too have the applications, the game theme software that runs on these EGM computers, advanced. The richness of the games being developed today, the number of bonus rounds, types of play mechanics, and options that a player has, are terrific. However, one area of EGM operation has changed very little. That area is related to the data elements they transmit to the CMS and how it is sent.

While enhancements to the entertainment delivering aspects of EGMs continued to ratchet upwards, the type of data being provided remained largely stagnant. The means to communicate that data was still, in most cases, the SAS protocol which had not changed in over a decade. The connectivity between EGM and CMS continued to be via SMIB and driven by CMS providers. Even though, the amount of data available from each EGM increased commensurate with the advancements in game design. The Legacy Protocol and Legacy Devices have dampened the ability to make advances in data element and data transmission capabilities.

## Legacy Thinking

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Perhaps the adage of “If it ain’t broke, don’t fix it!” best describes what seems to have happened. The regulatory data needed to oversee gaming was and continues to be supported by SAS and CMS’s via their SMIBs. By and large, given the maturity of the protocol and systems, there are few issues with the accuracy of the data. The physical security of tamper-evident tape, physical wire, and closed-loop networks, have passed the test of time. It all ‘works’, so why change it.

Checking in to a hotel by writing your name on a ledger, paying in cash and getting a physical key, all ‘worked’ too, yet very few of us would think that that process ‘works’ given today’s technology. Going to a bank and waiting in line to speak with a Teller to access cash or cash a check, also ‘worked’, yet few would consider giving up the efficiency of ATMs, internet and mobile banking. So, if technology advancements have made things better in the Hotel, Banking and in so many other industries, why has technology advancement been arrested on the casino floor? Perhaps Legacy Thinking is the reason.

## How do we Remove these 'legacy' Barriers?

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As with many other industries looking to modernize, changes must be applied in an incremental manner ensuring that the various constituents affected by those changes are all satisfied that from their perspective, at best things have improved and at worst nothing has been taken away.

There are a few things that can be implemented which will provide Operators access to the incremental data being generated by EGMs while maintaining the status quo for all other constituents, even as the foundation for further improvements is being established.

Data is being created by an 'ecosystem' which as we described above is comprised of EGMs, SMIBs, Protocols and CMSs. To be viable, the solution must not require wholesale changes to EGMs, must not require implementation of high-speed networks, and must not touch SMIBs or CMSs but rather work in parallel with them.

The solution has already been developed, is proven, and exists within many EGMs being used on casino floors today. That solution is the Game-to-System (G2S) protocol. Many EGM manufacturers already have EGM Operating Systems (OS) that run G2S because there are gaming jurisdictions around the world that require the use of G2S in EGMs.

G2S is the right solution because:

- It does not require replacing EGMs, just upgrading the OS in ones that allow it, to the manufacturer's OS version that supports G2S. A very minor update.
- It eliminates the need to run new cabling by either using an existing high-speed network or using an in-EGM wireless communication device. Cellular communication is recommended.
- It can run on a simple G2S data collection system that is separate from and does not touch the existing SMIB and CMS. The G2S data collection system is connected to the EGMs network port and subscribes, i.e. only gets, the information that is needed for its specific purpose, such as data analysis, marketing, security etc.
- It is designed to allow a single EGM to be connected to multiple servers running different systems via the EGM's network port. This is identical to how one networked printer can be shared by multiple computers using different applications.
- It allows for secure firewall protection between the G2S data collection system and EGMs ensuring that no data can be transmitted from the system to EGMs.
- It resolves the Legacy Protocol issues in that it is a modern protocol designed to operate over high-speed TCP/IP networks and enables transmission of the additional data elements available within the EGMs that older protocols like SAS do not.

- It is a secure protocol utilizing the same level of Transport Layer Security (TLS) encryption and data security as is used for online gaming, online banking and online retail transactions.
- It sets the foundation for future enabling of other G2S functionality, such as direct Player Tracking system connectivity to the EGM (instead of being done via CMS SMIB) and even future elimination of the SMIB altogether (via G2S enabled CMSs).

Using G2S on the portion of EGMs that can have their OS's upgraded and using wireless communication starts to provide Operators with access to bottom-line improving information without the significant cost of EGM replacement and re-wiring the casino floor. The replacement cycle of EGMs may never go back to pre-recessionary times. This means that we will continue to deal with floor mix that will contain EGMs of various capabilities. The G2S wireless solutions looks to exploit the capabilities of newer EGMs while waiting for the older ones to be finally replaced. If enough value is seen through the incremental data being collected from the newer EGMs via G2S, then perhaps that may provide an ROI that will expedite the replacement cycle.

## SUMMARY

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Using G2S provides Casino Operators with access to the richer, deeper, and more granular data they need to improve their analysis, marketing and to efficiently deal with auditing and accounting tasks. It does so without touching the System of Record, the CMS and SMIB which today convey regulated data via SAS over a physical wire on a closed-loop network. It also provides the data without requiring costly network cable replacement. This means that nothing in how things are done today changes, but it allows Casino Operators with access to data they cannot get today. Lastly it sets the foundation for additional improvements, when, through normal or perhaps expedited replacement, the entire casino floor is running G2S capable EGMs.

G2S was developed by volunteer engineers from the largest slot machine manufacturers and CMS developers who are members of the Gaming Standards Association (GSA). It is a protocol that leverages Computer Industry standards and extensible, i.e. it can easily be updated without breaking backwards compatibility, to support future needs.

To learn more or to get involved in GSA, please contact GSA and to participate, consider joining GSA, which has membership levels for Suppliers, Operators (including the Operators-only Operators Advisory Committee) and Regulators (Regulator-only Regulatory Committee).



