



Best of Breed (BOB) Standard

A Discussion of the Solutions and Benefits BOB Brings to the Industry, and the Goals and Development Plans for the Standard

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1 Purpose

Create an open, industry developed, event driven protocol, for communication between gaming devices and gaming management systems, that facilitates innovations and efficiencies for the gaming community as a whole.

2 Problem

Today the gaming industry sector of game and system manufacturers design and develop products utilizing proprietary language (protocol) that create a barrier to market for other manufacturers and products. It complicates the installation of products on casino floors. It reduces the ability of the industry to evolve to newer, more efficient technology.

Though gaming manufacturers have banded together to break down the barrier to market – International Game Technology’s (IGT) donation of their proprietary SAS™ protocol to the Gaming Standards Association (GSA) for industry comment, update and change management is a good example of this newly found support – the problem still remains that the technology used today is not able to fully utilize the current features and benefits enjoyed by other industries, and is therefore retarding the gaming industry’s growth.

It’s like the gaming industry is driving on a two-lane highway (serial communication), utilizing a donkey cart to transport passengers (polled protocol – very slow) with “Rain Man” as the passenger – highly intelligent, but difficult to understand (GDAP, SDS, SAS all are proprietary languages).

Therefore, manufacturers spend approximately 80% of their software engineering time on development of code, the basis of the proprietary protocol, instead of the development of new and exciting products. The type of engineers required to write and maintain these codes are derived from a small labor pool and are therefore, highly expensive.

Operators, when trying to interface new machines with existing casino management systems, often experience difficulties with implementation of products on the casino floor due to ambiguities in proprietary protocols.

Plus, the technologies used today do not allow the industry to expand to incorporate new and exciting innovations such as client/server systems, downloadable games, Internet/Intranet environments.

3 Solution

GSA, through its member companies and advisory forums, is developing a Best of Breed (BOB) standard based on proven computer industry standard technologies, such as Ethernet, TCP/IP and XML.

By incorporating these proven standard technologies, BOB is taking the current, two lane highway and expanding it to an eight lane “super highway” (Ethernet), removing the donkey carts and replacing them with high performance vehicles (TCP/IP), where all the passengers are highly intelligent, but speak one universal language (XML).

BOB is a robust and flexible technology that will provide *reliable products quickly* to the industry at *significant savings* to manufacturers, operators and regulators. BOB will not only serve as a platform for such future technologies as client/server systems, downloadable games, and Internet/Intranet environments, but will also allow for the *co-existence of new and legacy equipment* -through *backward compatibility engineering*.

Because this standard is being developed by the industry, for the industry, the importance of legacy participation and backward compatibility is understood. Therefore GSA has developed a three-phase development plan and four implementation approaches for the migration to BOB that will ensure legacy participation and provide a growth path to full implementation of the standard. For more detailed information on the Development Plan and Implementation Approaches, please see titled sections below.

The development, acceptance, implementation, widespread deployment, change management and future technological advances to GSA's BOB standard will allow the gaming industry to concentrate on the creation of innovative, more appealing gaming products and increased efficiencies in operations.

4 Benefits

There are many benefits to the BOB standard, as outlined below, however the biggest benefit to any company is the participation in the development of the standard, providing the ability to influence the incorporation of the features and benefits which will be important to your company's bottom line.

4.1 Benefits to Manufacturers

- Reduced Engineering Time and Production Costs
 - Widely available XML source code reduces protocol programming efforts by approximately 80%
 - Larger, less expensive labor pool
 - Shared cost of co-development with GSA member companies vs. higher individual company development costs
- Increased Revenue
 - More focus on game content development
 - Reduction in overall cost of machine
 - “Off the Shelf” technology vs. proprietary technology
- Open and Extensible
 - “Standards with Innovation”
 - Allow “manufacturer specific” innovations while remaining compliant with the standard

4.2 Benefits to Operators

- Reduction in costs and operations
 - Centralized command and control of machines
 - Active games
 - Accepted denomination(s)
 - Changeable hopper limits
 - Open protocol “for the industry and by the industry”
 - Expanded product offerings = wider choice = lower end-user costs
- Increased Revenue
 - Downloadable Games
 - Audience specific game delivery
 - Patron specific game delivery
- Unprecedented Access to Game Floor Information
 - Capability to create or customize views of casino floor data
- Ability to Independently Innovate
 - Allows “operator specific” innovations, while remaining compliant with the standard

4.3 Benefits to Regulators

- Increased Game/Casino floor integrity through centralized command and control of machine
- Remote access, from regulatory division to game, to ensure compliance
- Reduction in test development and time
 - Fewer proprietary protocols to test

5 Development Plan

In Phase I of the three-phase development plan, GSA’s BOB workgroup will develop an XML protocol with functionality that can work concurrently with the current industry protocols, such as IGT’s SAS™, Bally’s SDS, Aristocrat’s GDAP, etc. This will ensure legacy products can be updated to feature the BOB standard protocol. The operators are assured that they will have the same functionality, and more, from this new standard.

Phase I will also provide the ability to control and set up the casino floor from the centralized system. This is a great advantage over today’s scenario, where the casino operator must physically go to a machine to make changes such as active games, accepted denomination(s), hopper levels, etc. As well, Regulatory Agencies will have the ability to check game revisions remotely. The integrity of the game and floor is greatly increased, as is the overall efficiency of the floor operation.

Phase II of BOB will have the workgroup developing an open protocol that will provide for downloadable games. This Phase may not be applicable to all legacy machines, as there are physical limitations, i.e., mechanical reel machines, and downloadable games require Ethernet.

Phase III will take the industry to the full migration of BOB as the workgroup develops standard protocols that enable a client/server environment. This allows for Intranet/Internet, server based games and gives the operator the ability to truly cater to their patrons' desires and increase players' overall gaming experience.

Remember whether the casino floor is equipped with full or partial Ethernet, the operator will have the ability to utilize many new technologies that will stem from the BOB standard, developed independently by manufacturers, because they will have access to the "super highway", instead of just the "two lane highway".

6 Process Timeline

See Exhibit 'A'

7 Implementation Approaches

There are four approaches to implementing BOB which can be utilized in conjunction with one another, co-existing on the casino floor, or be utilized independently. This allows the casino operator to phase-in the BOB standard and prevents the need to immediately rewire the entire floor to accommodate the standard.

Approach number 1 (See Exhibit B) provides the operator with the ability to operate new or existing machines with BOB, SAS, SDS or other protocols. The Slot Machine Interface board (SMIB) transfers information to the Bank Controller/Translator, which translates SAS, SDS or other proprietary protocols to BOB, and transports the information via Ethernet to the Casino Management System (CMS). This approach requires that the Bank Controller/Translator have Ethernet capability and the system provider upgrade the Bank Controller/Translator with BOB (XML) software.

In approach number 2 (See Exhibit C) again, new or existing machines operating off serial communication utilizing the SAS, SDS or other proprietary protocols, transfer information to the SMIB. The SMIB then translates serial protocols into BOB and transports them, via Ethernet, through the Hub and then onto the CMS. Note that the older Bank Controller/Translator (hard drive) has been replaced with a more cost effective Ethernet Hub.

In Exhibit 'D' we see approach number 3, similar to approach 2 except that the slot machines have implemented the BOB protocol. As in approach number 2, the SMIB is equipped with Ethernet for outgoing communication from the machine and Ethernet Hubs have replaced the "hard drive" Bank Controller/Translator.

All of the above approaches are designed to incorporate legacy equipment and provide for backward compatibility. However, until the operator begins implementing banks of machines with "fully formed BOB" – XML, TCP/IP and Ethernet – the ability to accommodate downloadable games and the full capabilities of a client/server environment will not be available to them.

This brings us to the last implementation approach, number 4 (See Exhibit 'E'). This approach shows a bank or two of new machines that have implemented BOB in full format. The manufacturer has changed its physical layer from serial to Ethernet, enabling removal of the SMIB and full utilization of the XML language. This approach allows for the full functionality of BOB and gives the operator complete flexibility for the addition of future technologies.

8 Features of the Standard

- Physical Hardware Layer = Ethernet (vs. Serial Cabling)
 - Board bandwidth allows for an increased exchange, and different type, of information
 - Downloadable games
 - Audio/visual streaming
 - Client/Server based environment
 - Intranet/Internet capabilities
 - Cost effective, “off the shelf” technology
 - Proven reliability
- Transport Layer = TCP/IP (vs. RS232)
 - Increased transmission speed
 - Cost effective, “off the shelf” technology
 - Proven reliability
- Data Content Layer = XML (vs. Proprietary SAS, SDS, GDAP, etc.)
 - Open and Extensible protocol
 - Source code is open and readily available
 - Allows for creation of standards without limiting industry’s ability to develop proprietary features on top of the standard
 - Rapid development environment
 - Reduces protocol development by approximately 80%
 - Event driven protocol
 - Provides “real-time” reporting of events
 - Cost effective, “off the shelf” technology
- “Phase-In” Development Plan
 - Allows BOB standard to be utilized immediately
 - Ensures legacy equipment participation
 - Provides a growth path to full migration
- Multiple Implementation Approaches
 - Allows for co-existence of current technology
 - Different wiring and physical connectivity methods can be mixed on the gaming floor
 - Does not require immediate re-wire of casino floor
 - Cost effective for the operator

9 Goals of the BOB Workgroup

1. Focus on using industry standards, including but not limited to, TCP, SSL, fully formed XML, and other IP protocols for the primary protocol and physical transport technologies, including but not limited to, Ethernet and other IP transport mechanisms.
2. In its standards accommodate, where practical, existing computer industry standards such as streaming audio/video on the physical transport layer.
3. Focus on the definition of standardized message schemas related to moving data and the sequence of those messages.
4. Provide recommended implementation guidelines as they relate to the physical transport layer and interface connectors, as appropriate.
5. Communicate regularly with regulatory and testing agencies to cultivate acceptance.

GSA BOB STANDARD PROCESS TIMELINE EXHIBIT 'A'

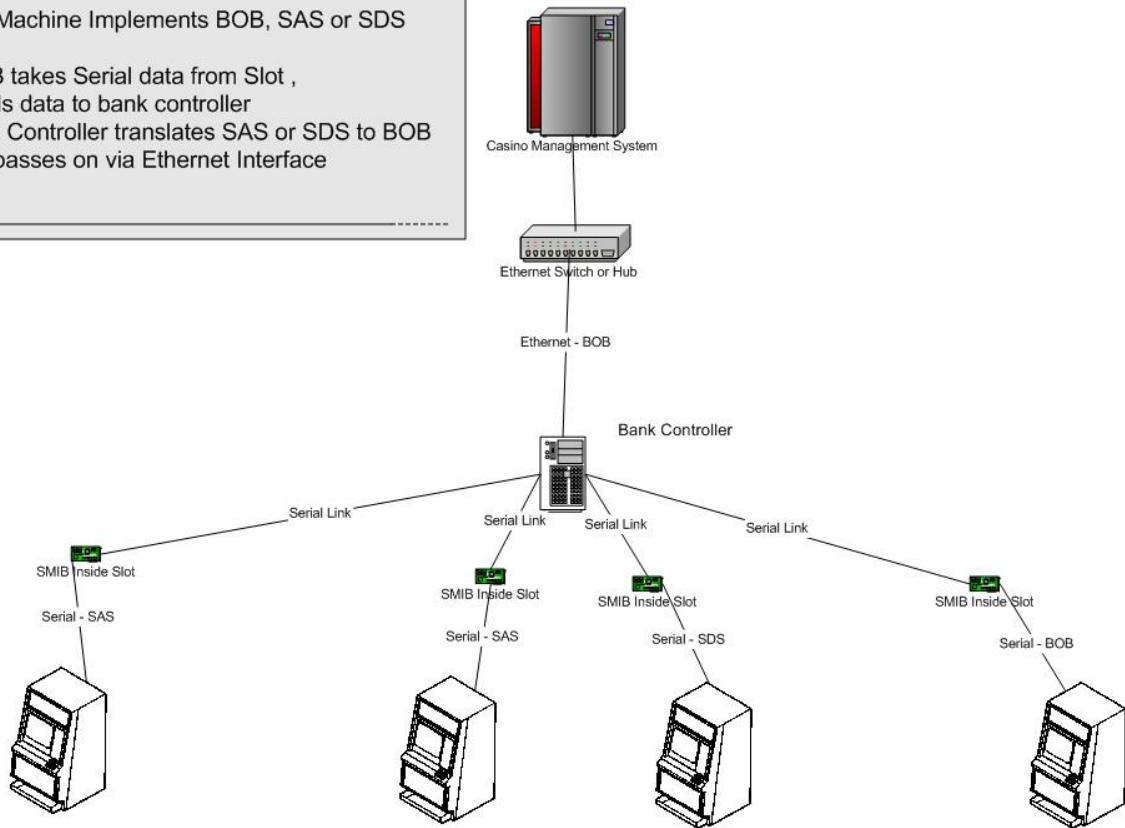
ACTIVITIES	MONTH													
	0	1	2	3	4	5	6	7	8	9	10	11	12	13
Team Formed	X													
Funding Secured	X													
Development Begins		X												
Schema Complete						X								
Phase I Conversations Complete						X								
Documentation Complete						X								
GSA – Tech Workgroup Vote to release spec for Member Review						X								
GSA – General Membership Review (30 days) & Response to Comments							X							
Testing Tools Complete							X							
GSA – Board of Directors Process Review (10 days)								X						
GSA – Final Adoption Vote (30 days)								X	X					
Training & Support Delivered to GSA members for implementation								X	X	X	X	X	X	X
Operators begin test implementation														X
Regulatory Liaison working to assure regulatory acceptance		X	X	X	X	X	X	X	X	X	X	X	X	X

GSA BOB STANDARD IMPLEMENTATION APPROACH #1 EXHIBIT 'B'

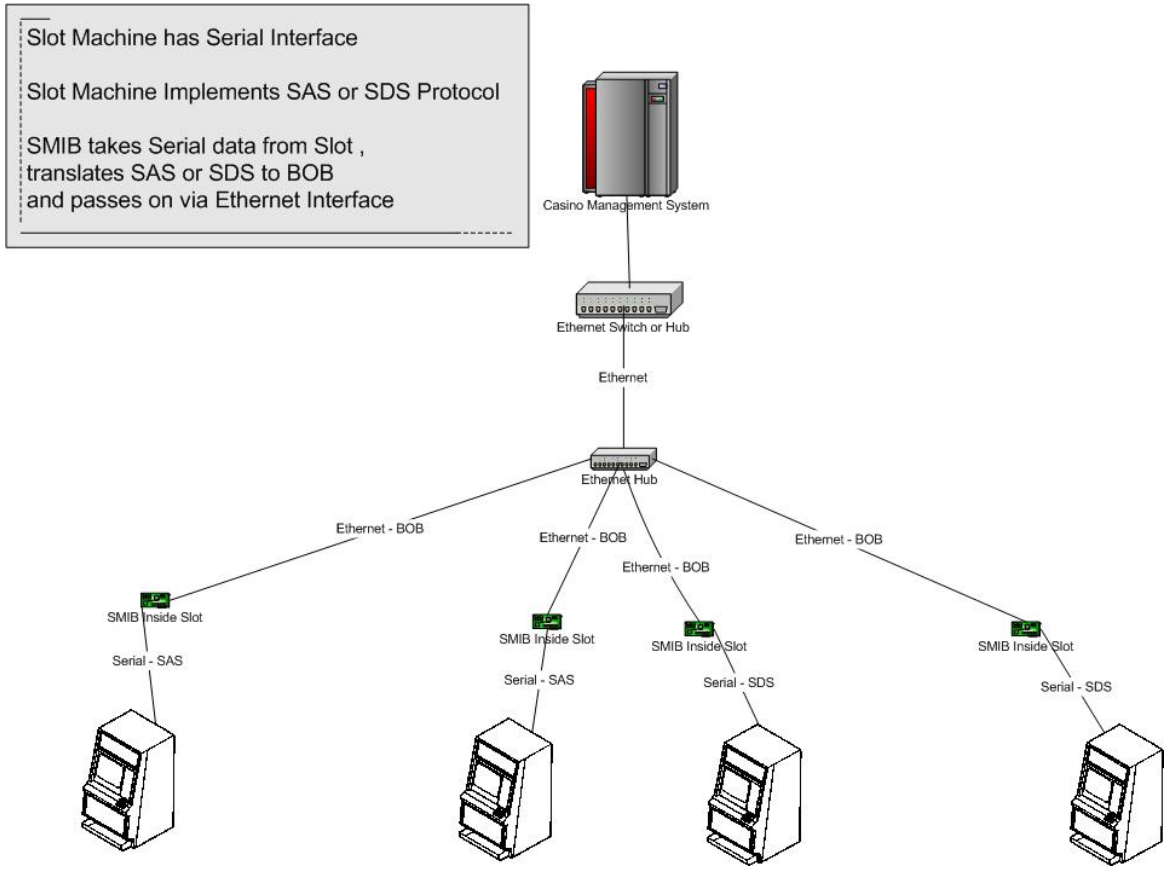
Slot Machine has Serial Interface

Slot Machine Implements BOB, SAS or SDS

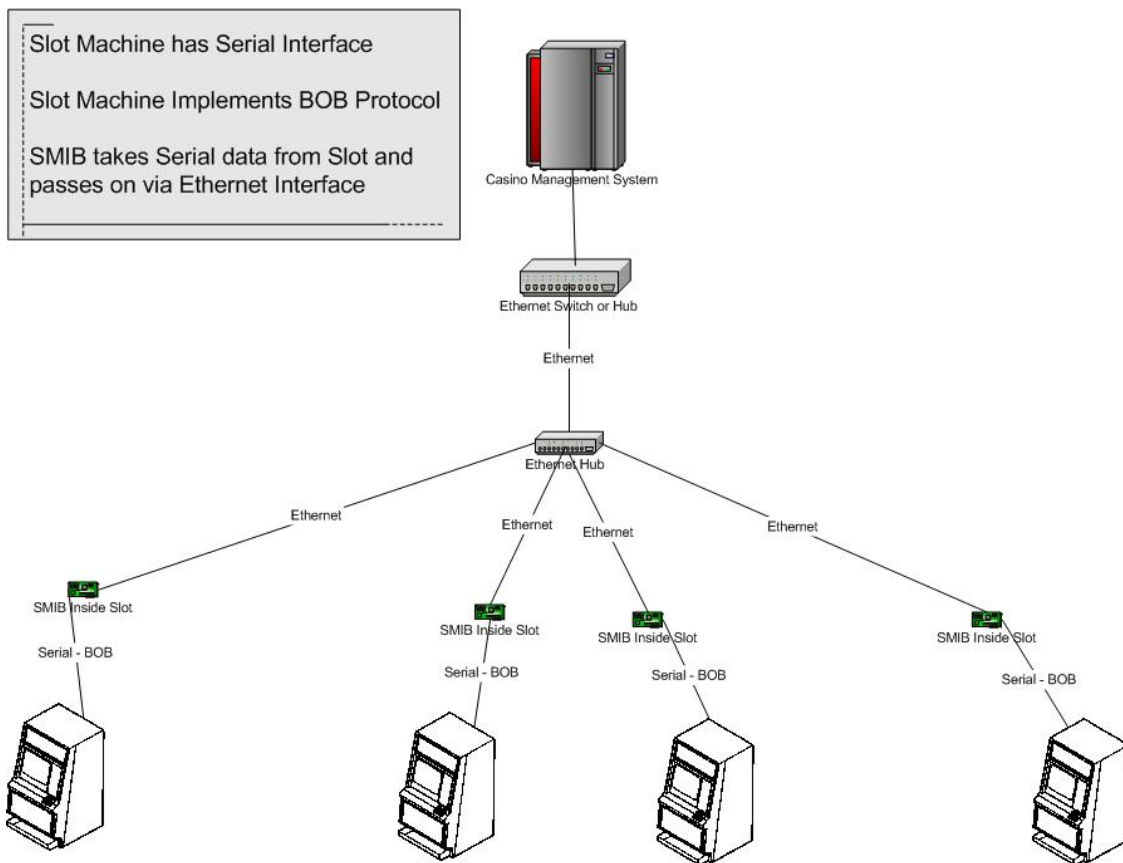
SMIB takes Serial data from Slot ,
 Sends data to bank controller
 Bank Controller translates SAS or SDS to BOB
 and passes on via Ethernet Interface



GSA BOB STANDARD IMPLEMENTATION APPROACH #2 EXHIBIT 'C'



GSA BOB STANDARD IMPLEMENTATION APPROACH #3 EXHIBIT 'D'



GSA BOB STANDARD IMPLEMENTATION APPROACH #4 “FULLY IMPLEMENTED BOB” EXHIBIT ‘E’

