



Agenda

- ***Protocol Lifecycle & Release Schedules***
- ***Protocol Extensions***
 - G2S – Game-to-System
 - S2S – System-to-System
 - GDS – Gaming Device Standards
 - Transport & Security
 - Player User Interface
- ***CVT – Compliance Verification Tool***

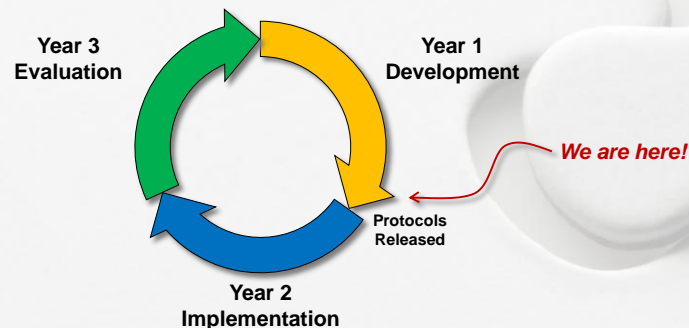
Agenda

- ***New Specifications***
 - Network GAT Interface
 - Simple System Interface
 - Trusted GAT Results File Format
 - Package Manifest File Format
 - Peripheral Manifest File Format
 - Point-to-Point WebSocket Specification
 - Transport Negotiation Specification
 - Third-Party Game Interface
 - Regulatory Submission Standard
- ***Open Discussion***

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Protocol Lifecycle Policy

- ***The GSA Protocol Lifecycle Policy describes a three-year lifecycle for GSA protocols.***



- ***The policy provides a framework for the orderly introduction of new releases.***

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Implementation

- ***Following the release of a new version of a protocol, members begin a coordinated implementation of the new version.***
 - Test tool suppliers update their products.
 - Independent test labs update their procedures.
 - Manufacturers integrate the changes into their products.
- ***The goal is to have products, which use the new version of the protocols, available in the marketplace one year after the release of the new version.***

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Release Schedule

- ***The new versions of all of the protocols have been completed.***
- ***The Intellectual Property (IP) disclosure period ends December 16.***
- ***The Member Voting period will start after the holidays – in January.***
- ***The protocols should be released in March.***

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Candidate Releases

- ***GSA is considering a new policy that will help identify the stability of its protocols – CIC-58.***
 - Other standards organizations, like W3C, do this.

Stage	Description
Working Draft	GSA is seeking feedback on a proposed protocol. Significant changes should be expected.
Candidate	The proposed protocol is ready for initial implementation. Minor changes should be expected.
Proposal	Initial implementations have been completed. Very few additional changes, if any, should be expected.
Recommendation	Implementations have been widely deployed and thoroughly tested. No further changes should be expected.

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Gaming Standards Association

Protocol Extensions *G2S, S2S, & GDS*

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Global Changes to G2S & S2S

- ***Time-to-live calculations should be based on the date/time that a command is received, not the date/time that it was sent.***
 - Too many NTP problems were being encountered in the field!
- ***For PIN authentication, all hashing algorithms have been deprecated except ISO 9564 Format 1 with RSA Encryption.***
 - The same method used by ATM machines.

Global Changes to G2S, S2S, & GDS

- ***The voucher layout now includes a PDF417 barcode. The barcode contains the manual authentication code (as well as other useful information).***



PDF417 Barcode

Global Changes to G2S

- ***A new attribute – usePlayerIdReader – has been added to the handpay, printer, bonus, voucher, wat, dft, and tournament classes.***
 - Tells the EGM to use player information from the ID reader associated with the current active player session.
 - Only the player device needs to be mapped to an ID reader device.
- ***Illegal Door Open Extension.***
 - The EGM can be configured to report illegal door open events.
 - If an employee does not have proper door-access permissions, an illegal door open event is generated.
 - Door-access permissions are set by the host using the setIdValidation command.

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G2S cabinet Class

- ***Internal Software Verification Extension.***
 - A fault can be reported if the EGM performs an internal software verification and it fails.
 - For example, following a door close or restart.
- ***Audit Win Limit Extension.***
 - The EGM can be configured to take a specific action if the base payable win exceeds a specified limit.
 - **Lock:** the EGM generates an event and then locks up until a resetAuditPending command is received from the host.
 - **Verify:** the EGM must perform an internal software verification and disable itself if the verification fails.

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G2S cabinet Class

- ***Significant Win Limit Extension.***
 - The EGM can be configured to report an event if the base payable win exceeds a specified limit.
- ***Logic Seal Extension.***
 - The EGM can be configured to lock up until a sealLogicDoor command is received from the host after the logic area has been accessed.

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G2S meters Class

- ***Snapshot subscriptions have been added.***
 - The EGM will perform a meter snapshot and then persist the snapshot until a meterInfo command, which contains the snapshot, is acknowledged by the host.
 - Triggers are available for coin drop, note drop, and door open.
- ***New meters have been added.***
 - Number of errors detected while reading IDs.
 - Number of illegal door opens.
 - Number of games played and amounts paid while Wager Match bonuses are active.
 - Number of games played and amounts paid while Multiple Jackpot Time bonuses are active.
 - Number of extended-play rounds.

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G2S gamePlay Class

- ***The EGM must indicate whether the full set of win levels for a payable are being reported or just the minimum required by the protocol.***
 - At least one win level for base payable win.
 - At least one win level for secondary game win.
 - At least one win level for each progressive jackpot link.

- ***The EGM can also report:***
 - Maximum number of lines and the maximum wager per line.
 - Number of lines bet and the wager per line.
 - Odds of hitting a win level and the minimum number of credits paid when the win level is hit.
 - Minimum wager required to be eligible for the progressive jackpot linked to a win level.

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G2S gamePlay Class

- ***Game Outcome Extension.***
 - The EGM can now report detailed information about game outcomes in a new log.
 - The new log contains a header record that identifies the particular game that was played.
 - Theme, payable, denomination, etc.
 - Sub-elements contain additional information about the game outcomes.
 - The content of the sub-elements is based on the type of game that was played.
 - For example, poker, spinning reels, keno, etc.
 - For poker, the sub-elements include the initial cards dealt, the cards held by the player, and the final cards dealt, as well as the value of the hand based on optimal play.

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G2S optionConfig Class

- ***New attributes were added to the optionConfig class to better describe option parameters to the host.***
 - Parameter Type: percent, count, money, time, date/time, etc.
 - Implied decimal places and decimal precision.
 - For example, the EGM can indicate that a parameter is a monetary value with 5 implied decimal places but the parameter can only be configured to 2 decimal places of precision.

12345000 => \$123.45

G2S download Class

- ***Events have been added for certain state transitions that were not previously reported.***
 - Script Waiting for Start Date/Time.
 - Script Waiting for EGM Disable.
- ***The EGM is now required to verify that all packages are available on the EGM before accepting a setScript command.***
 - A “Script Error” event is still generated if a package is missing at the time a script is executed.

G2S player Class

- **Multiple ID readers can trigger player tracking sessions.**
 - For example, a magnetic-stripe reader and an RFID reader.
 - Only one player tracking session can be active at one time.
 - Rules defined within the protocol determine which ID reader has priority.
- **Subscriptions can be set for player session “deltas”.**
 - The host can set a subscription with the EGM that specifies the meters that should be tracked.
 - The EGM calculates and reports the change in the meter values (deltas) during the player session.

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Other G2S Classes

- **In the noteAcceptor class, an Excessive Rejects Limit has been added.**
 - The EGM can be configured to generate an event if the number of consecutive notes or vouchers rejected by the EGM exceeds a specified limit.
- **In the voucher class, a new timer was added to help detect whether the ticket validation system is online.**
 - If the validation system does not acknowledge that a voucher has been issued within a specified time period, the validation system is declared offline and the voucher device is disabled.

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Other G2S Classes

- ***In the informedPlayer class, a series of new options were added.***
 - The maximum note denomination that will be accepted.
 - The maximum bet for a single game cycle.
 - The minimum time for a game cycle.
 - Whether continuous play should be enabled.
- ***In the smartCard class, a series of attributes and events were added for monitoring the state of the Secure Transaction Module on the EGM.***
- ***In the gat class, a cancelVerification command has been added.***

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G2S Standalone Progressive Class

Standalone Progressive Device

- Host-Owned Device
- Configuration:
 - Mystery or Traditional
 - Game-to-Jackpot Mappings
 - Reset / Maximum Values
- Monitoring:
 - Jackpot / Overflow Values
 - Contributions / Adjustments
- Jackpot Reset Logs

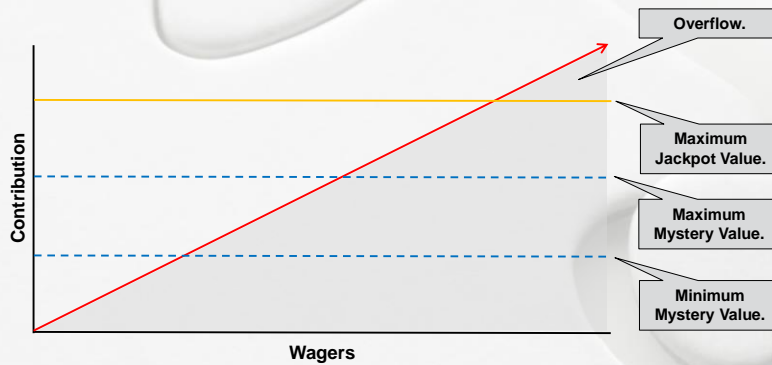
Progressive Device

- EGM-Owned Device
- Jackpot Payment Logs



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G2S Standalone Progressive Class



▪ **Jackpot Hits:**

- After a jackpot hit has been paid, the jackpot level is reset.
 - New jackpot value = startup value + overflow value.

G2S Standalone Progressive Class

Commands Originated by Host

Request	Response
getSpcProfile	spcProfile
getSpcStatus	spcStatus
setSpcState	spcStatus
getSpcLogStatus	spcLogStatus
getSpcLog	spcLogList

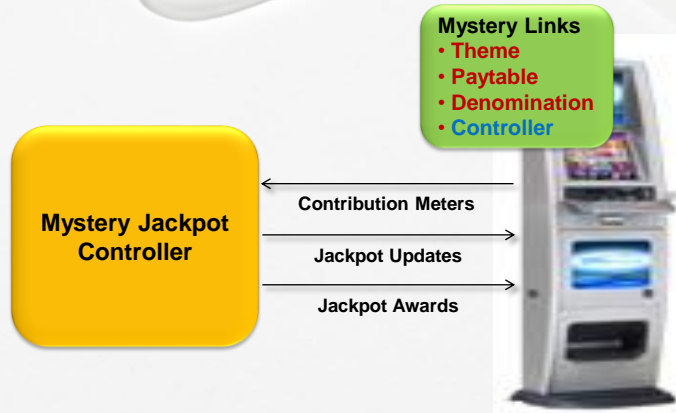
Reports the current jackpot values.

Commands Originated by EGM

Request	Response
spcLevelReset	spcLevelResetAck

Announces the new jackpot value.

G2S Mystery Jackpot Class



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G2S Mystery Jackpot Class

Standard Commands Originated by Host

Request	Response
getMysteryProfile	mysteryProfile
getMysteryStatus	mysteryStatus
setMysteryState	mysteryStatus
setMysteryLockOut	mysteryStatus
setMysteryMessage	setMysteryMessageAck
getMysteryLogStatus	mysteryLogStatus
getMysteryLog	mysteryLogList

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G2S Mystery Jackpot Class

Class-Specific Commands Originated by Host

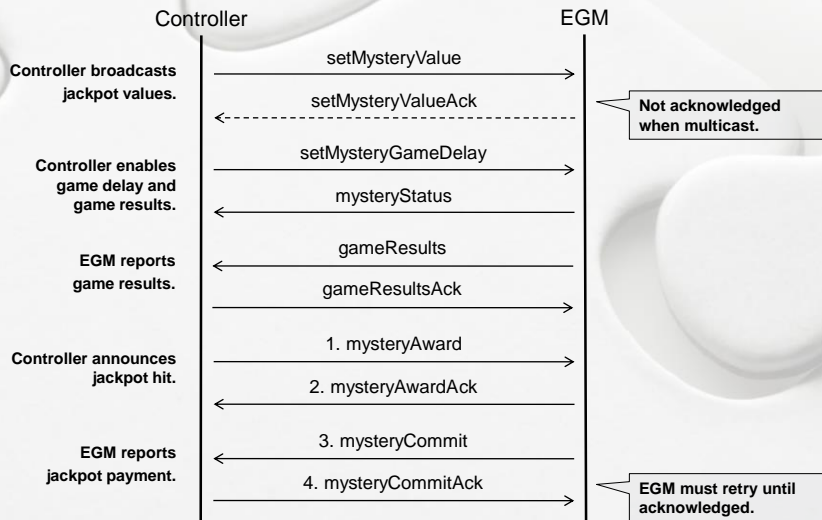
Request	Response
setMysteryValue	setMysteryValueAck
setMysteryGameDelay	mysteryStatus
skipMysteryGameDelay	mysteryStatus
mysteryAward	mysteryAwardAck

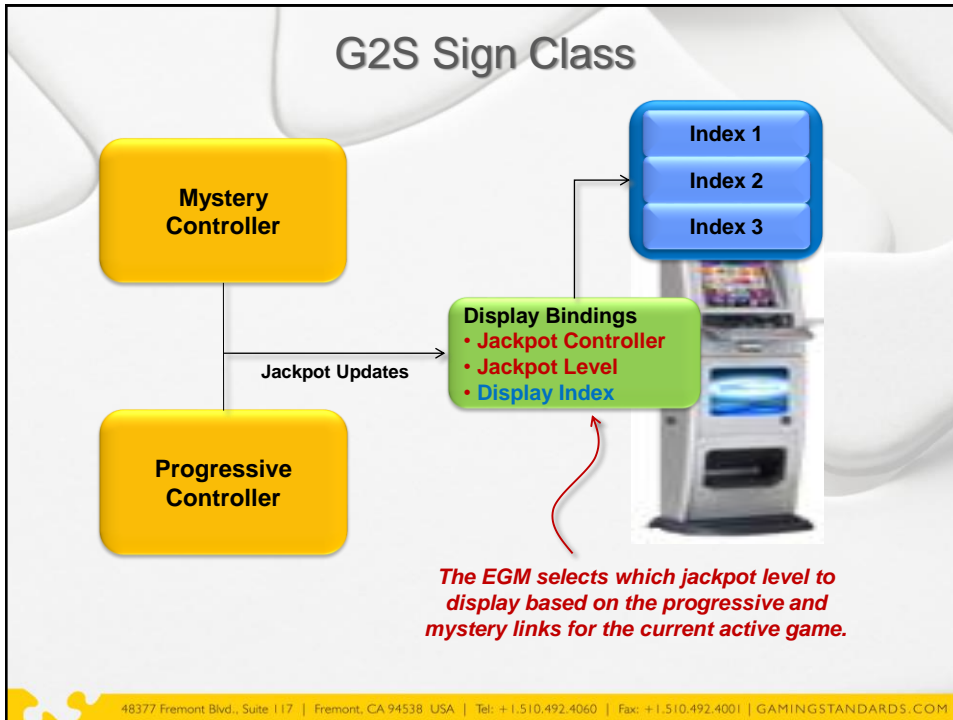
Commands Originated by EGM

Request	Response
gameResult	gameResultAck
mysteryCommit	mysteryCommitAck

While game-delay is enabled, individual game results can be sent to the host.

G2S Mystery Jackpot Class





G2S Sign Class

Commands Originated by Host

Request	Response
getSignProfile	signProfile
getSignStatus	signStatus
setSignState	signStatus
setDisplayText	signStatus
setJackpotHits	signStatus

Commands Originated by EGM

Request	Response
None	None

A list of recent hits can be displayed by the sign.

Overrides the progressive value displayed at a particular position.

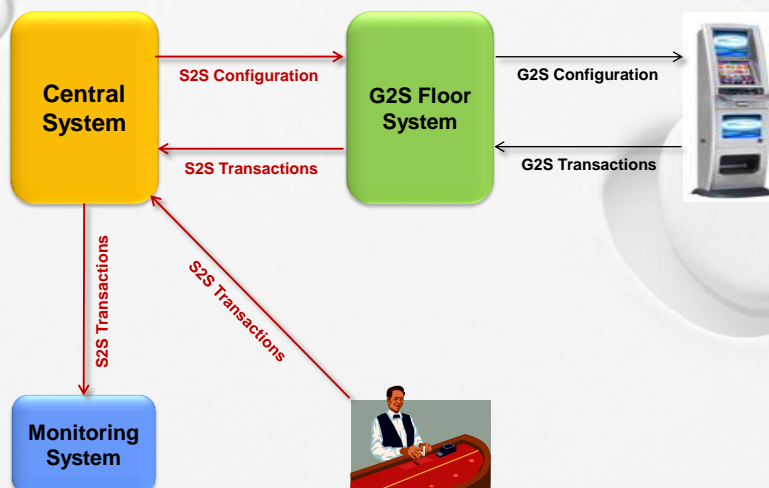
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S2S Alignment with G2S

- **The G2S alignment project has been completed!**
 - Player Tracking, Voucher, WAT, DFT, Bonus, Progressive, Handpay, Download, Mystery, and Sign.
- **A central system can use S2S to configure the EGMs managed by a G2S floor system.**
- **A G2S floor system can pass transaction requests from the EGMs to a central system.**
- **Other types of end-clients can access G2S services on the central system.**
- **Transactions can be reported to monitoring and accounting systems.**

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S2S Alignment with G2S



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GDS Changes

- ***Very minimal changes!***
- ***For all types of GDS devices, the USB iConfiguration string must identify the type of peripheral device.***
 - This change will make it easier to load the correct driver for a device.
- ***For card readers, a new command was added to set the color of bezels that use full-color RGB24 LEDs.***
- ***For printers, the metrics information was expanded to include the version of the Page Description Language (PDL) being used by the printer.***

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GDS Changes

- ***In Page Description Language (PDL), a “trim” option was added.***
 - When set to false, a presentation error is reported if the data specified for a region does not fit in the region.
 - For example, it may be Ok to trim text or graphics, but not barcodes.

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Protocol Extensions *Transport & Security*

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Network & Security Changes

- ***Support for wireless communications has been added.***
 - IEEE 802.11g at 54 Mb/second.
- ***The requirements were upgraded to reflect the latest industry standards.***
 - Security: upgraded from TLS 1.0 to TLS 1.2.
 - For backwards compatibility, TLS 1.0 is still required.
 - TLS 1.1 is still optional.
 - X509 v3 certificates: upgraded from RFC 3280 to RFC 5280.
 - RSA key pairs: upgraded from 1024 bits to 2048 bits.
 - Hash functions: upgraded from SHA-1 to SHA-256.
 - URLs: upgraded from RFC 2396 to RFC 3986.

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Network & Security Changes

- ***Distinguished Name recommendations for X.509 v3 certificates are now requirements.***
- ***Within the Distinguished Name,***
 - The Common Name (CN) must contain the application-level identifier of the end-entity.
 - For example, EGM ID, host ID, etc.
 - The Organizational Unit (OU) must identify the application-level role of the end-entity.
 - For example, G2S EGM, G2S Host, etc.

CN=GSA_1234,OU=G2S_egm

CN=8,OU=G2S_host

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Network & Security Changes

- ***First, make sure that your own certificate is correct.***
 - All entities must verify that their application-level role matches the role specified in their certificate.
 - For example, an EGM must make sure that its certificate specifies the G2S_egm role and no other roles.
- ***Second, make sure that certificate of the other entity is correct.***
 - When another entity is attempting to connect, all entities must verify that the role of the other entity is appropriate for their own role.
 - For example, a G2S_host must only accept connections from a G2S_egm or G2S_proxy.
 - When attempting to connect to another entity, some entities must verify that the role of the other entity is appropriate for their own role.
 - For example, a G2S_egm must only connect to G2S_host.
 - PUI content is the exception.

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Network & Security Changes

1. Check your own certificate.

1. Check your own certificate.



Host



EGM

2. Check the certificate of the entity attempting to connect.

3. Check the certificate of the entity to which you are attempting to connect.

Point-to-Point SOAP/HTTP Changes

- ***Very minimal changes!***
- ***The requirements were upgraded to reflect the latest industry standards.***
 - HTTP: upgraded from RFC 2616 to RFCs 7230-7235.
 - URLs: upgraded from RFC 2396 to RFC 3986.

Gaming Standards Association

Protocol Extensions *Player User Interface*

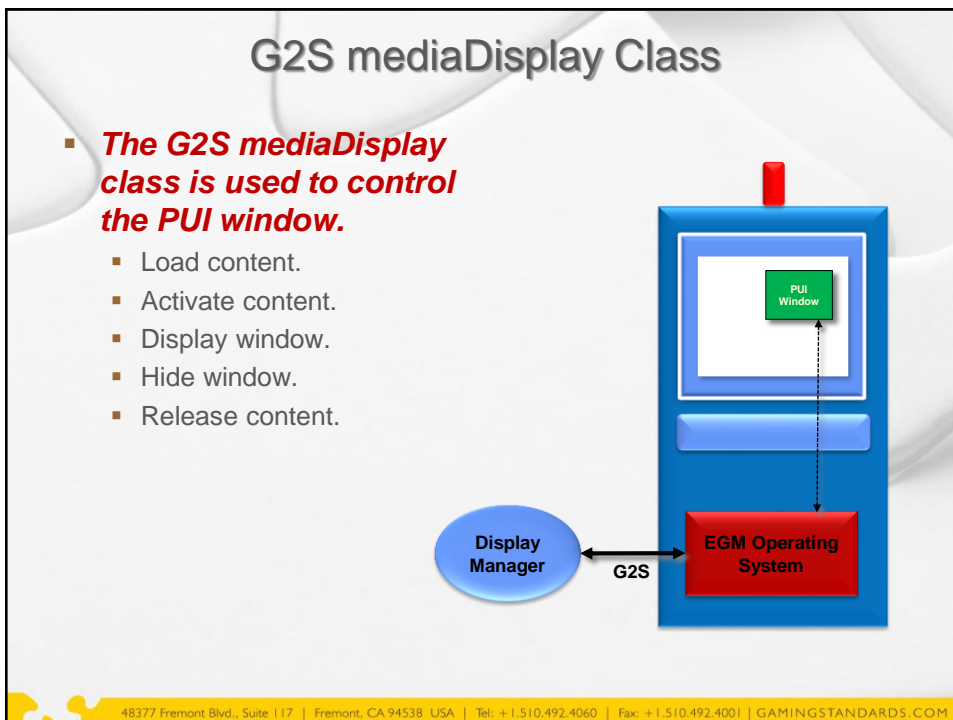
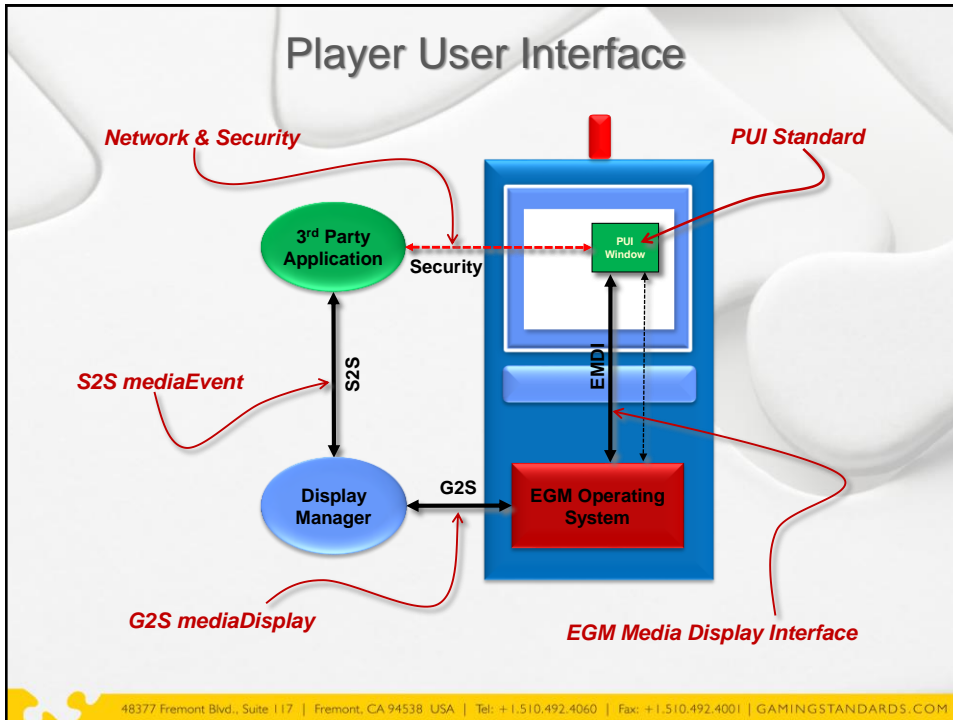
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Player User Interface

Window #1 **Window #2**

The screenshot shows a slot machine game interface. At the top, there is a header with the 'Aria' logo on the left, 'Play Responsibly' in the center, and the 'NCRG' logo on the right. Below the header is a 5x3 grid of symbols. The symbols are: Row 1: 9, 10, 9, bamboo, panda; Row 2: J, K, J, Q, panda; Row 3: K, panda, lotus, A, 9; Row 4: 9, panda, lotus, yin-yang, K. Below the grid, it says 'GAME OVER'. At the bottom, there are buttons for 'Credit' (\$5.00), 'Win' (0), and 'Bet' (0), along with a '7¢' button. Two red arrows point to 'Window #1' on the left side of the interface and 'Window #2' on the right side. 'Window #1' encompasses the Aria logo, the 'Welcome Player' button, and the navigation menu (Home, Inbox, Info, Preferences). 'Window #2' encompasses the 'Play Responsibly' text and the NCRG logo.

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G2S mediaDisplay Changes

- ***When content is loaded, the host can specify whether an EMDI connection is required.***
 - If an EMDI connection is required, the host can also specify how long the content should continue to be displayed after the EMDI connection is lost.
- ***When content is loaded, the host can specify whether the content should be scaled.***
 - If scaled, the content is scaled to fit the window; otherwise, the content is shown at its native resolution.

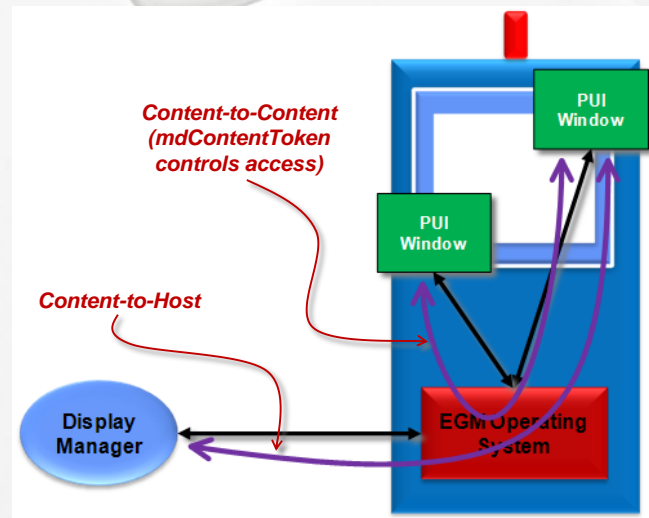
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G2S mediaDisplay Changes

- ***New commands were added that allow binary information to be communicated between content running in different windows (Content-to-Content) and between content and the host (Content-to-Host).***
 - The EGM simply acts as a conduit.
- ***When content is loaded, the host can assign a mdContentToken.***
 - Only content with the same mdContentToken can communicate with the specified content.

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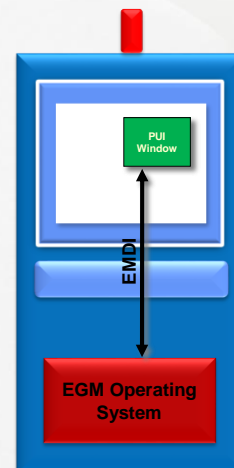
G2S mediaDisplay Changes



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EGM Media Display Interface (EMDI)

- ***PUI content can communicate directly to the EGM via EMDI.***
- ***The content can react to events as they happen on the EGM.***
- ***The content can also request that the EGM take certain actions associated with the PUI window.***



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EMDI Changes

- ***Improvements have been made to the coordination and management of player sessions.***
 - New events that report that player sessions have started/ended.
 - New commands to request status information about the current active player session.
 - New commands to request status information about ID readers.
 - New commands that allow PUI content to clear an ID reader.
- ***Access to the game play logs has been added.***
 - As well as events associated with the game cycle: primary game started, primary game ended, pay game results, etc.
- ***Events have been added that report the state of the PUI window: shown or hidden.***

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EMDI Changes

- ***An event has been added to report that the language selected for the EGM has been changed.***
 - The current language selection is reported in the cabinet status.
- ***Commands that support host-to-content, content-to-host, and content-to-content communications have been added.***
 - The EGM acts as a conduit for binary data.
- ***Access to the credit meters has been added.***
 - Cashable, promotional, and non-cashable credits are reported.

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PUI Standard

- **The PUI standard addresses requirements for the PUI window itself.**
 - HTML 5 requirements.
 - Flash 7 requirements.
 - Standard templates.
- **The goal is to have a consistent environment for PUI content across all EGMs.**



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PUI Standard

- **The new PUI Standard is a combination of:**
 - HTML and Flash requirements from G2S,
 - PUI Template Guidelines, and
 - New topics related to the PUI environment on the EGM:
 - Browser Isolation,
 - Browser Navigation,
 - Sound Levels,
 - Etc.

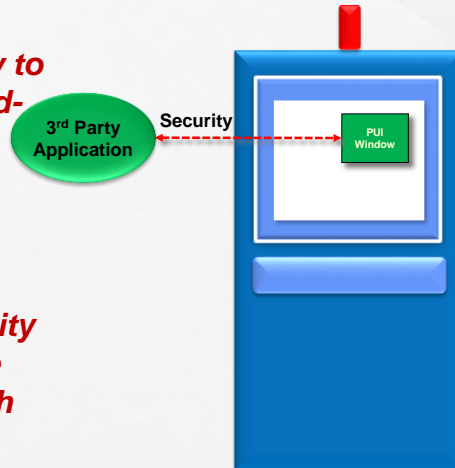
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Network & Security

- **The content running in the PUI window can communicate directly to systems running third-party applications.**

- Promotions.
- Self-Service.
- Sports Betting.

- **The Network & Security specification sets the requirements for such communications.**



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Network & Security Changes

- **Distinguished Name requirements also apply to PUI communications.**
- **Within the Distinguished Name,**
 - The Common Name (CN) must contain the application-level identifier of the end-entity.
 - For example, EGM ID, PUI host name, etc.
 - The Organizational Unit (OU) must identify the application-level role of the end-entity.
 - For example, PUI Content on EGM, PUI Host, etc.

CN=GSA_1234,OU=PUI_egm

CN=puiHost.domainName,OU=PUI_host

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Network & Security Changes

1. Check your own certificate.

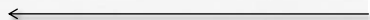
1. Check your own certificate.



PUI Host



PUI Content on EGM

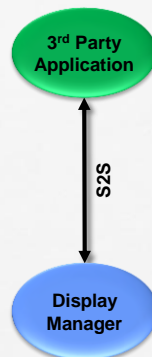


2. Check the certificate of the entity attempting to connect.

3. Check the certificate of the entity to which you are attempting to connect.

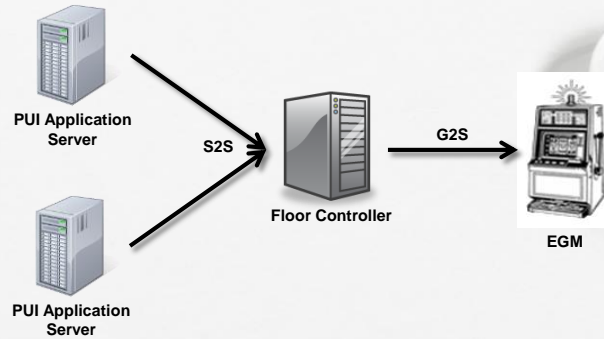
S2S mediaEvent Class

- **Third-party applications can communicate with the Display Manager using S2S.**
 - Specify Content.
 - Request Visibility.
- **This functionality is available through the mediaEvent class.**



S2S mediaEvent Class

- **The *mediaEvent* class allows multiple PUI application servers to manage PUI content on EGMs through a common G2S floor controller.**



- **No changes in this release!**

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Gaming Standards Association

Compliance Verification Tool

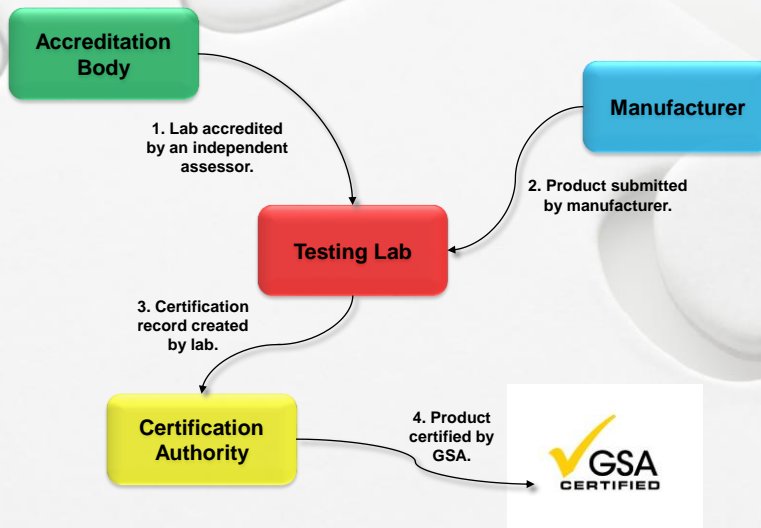
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GSA Certification Program

- ***GSA offers a certification program to its members.***
 - The goal of the GSA certification program is to ensure that gaming applications communicate in a consistent and predictable manner so that **interoperability** is not only achievable, but is expected of certified products.
- ***The GSA certification program is a voluntary program.***
 - The certification records for certified products are available on the GSA website.
- ***GSA certification is not a substitute for jurisdictional certification.***
 - However, it does provide a strong foundation.

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GSA Certification Process



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Compliance Verification Tool

- ***GSA and its members are working with RadBlue to develop a tool that will help automate the testing of G2S products in a repeatable and predictable manner.***
 - CVT 1.0 tests the most important EGM requirements in the six core classes of G2S. Released in November 2014.
 - CVT 2.0 tests the most important Host requirements in the six core classes of G2S. Released in August 2015.
 - CVT 3.0 will include the remaining EGM requirements in the six core classes. Scheduled for April 2016.
 - CVT 4.0 will include the remaining Host requirements in the six core classes. Scheduled for November 2016.
- ***Additional classes and extensions will be added to the CVT based on the needs of the users.***

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Network GAT Interface

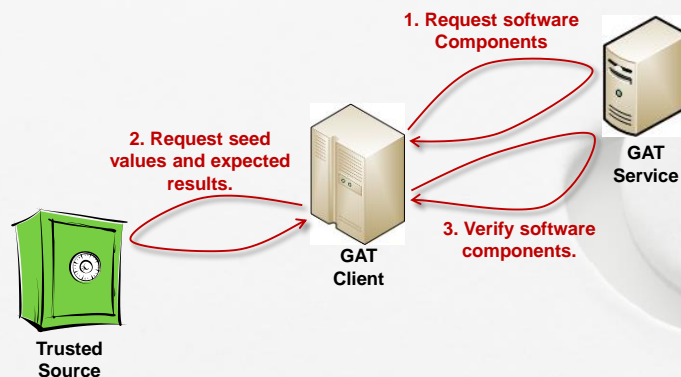
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Network GAT Interface

- **The Network GAT Interface (NGI) Provides a method for accessing Game Authentication (GAT) services using common network-based protocols.**
 - HTTP, REST, and JSON.
- **NGI is designed to be compatible with other methods of accessing GAT services.**
 - Serial GAT, G2S, and S2S.
- **NGI also includes new commands for requesting expected GAT results from a trusted source.**
 - A GAT client can compare the expected results to the actual results to determine whether software is authentic.

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Network GAT Interface



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Network GAT Interface

- **Components Resource**
 - Used by a client to get a list of software components and available authentication algorithms from a GAT service.
- **Expected Results Resource**
 - Used by a client to get a list of expected results for a particular component and algorithm from a trusted source.
- **Verification Resource**
 - Used to post a verification request for a particular component using a specific algorithm and seed value to the GAT service.
 - Used to get the results of a verification request from the GAT service.

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Components Resource Example

```
GET /gat/1.0/components/ABC_123 HTTP/1.1
Connection: Keep-Alive
Accept: application/json
Accept-Charset: utf-8
```

```
HTTP/1.1 200 OK
Date: Fri, 18 Oct 2013 15:13:23 GMT
Content-Length: 225
Connection: Keep-Alive
Content-Type: application/json; charset=utf-8
```

```
{
  "componentId": "ABC_123",
  "componentType": "NGI_software",
  "description": "The ABC123 Component",
  "size": 0,
  "algorithms": [
    {
      "algorithmType": "NGI_HMACSHA1",
      "supportsSeed": false,
      "supportsSalt": true,
      "supportsOffset": false
    }
  ]
}
```

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Expected Results Example

```
GET /gat/1.0/expectedResults?componentId=ABC_123
&algorithmType=NGI_HMACSHA1&supportsSalt=true HTTP/1.1
Connection: Keep-Alive
Accept: application/json
Accept-Charset: utf-8
```

```
HTTP/1.1 200 OK
Date: Fri, 18 Oct 2013 15:13:23 GMT
Content-Length: 273
Connection: Keep-Alive
Content-Type: application/json; charset=utf-8
```

```
{
  "componentId": "ABC_123",
  "algorithmType": "NGI_HMACSHA1",
  "expectedResultsList": [
    {
      "salt": "1A2B3C4D5E6F7081",
      "expectedResult": "ABC56DF718AA726FE9B72579BC45D1F2",
      "resultVersion": "1.0.0",
      "resultStatus": true,
      "expiration": "20140710T23:59:59.999-05:00"
    }
  ]
}
```

Verification Request Example

```
POST /gat/1.0/verificationTasks?componentId=ABC_123
&algorithmType=NGI_HMACSHA1&salt=1A2B3C4D5E6F7081 HTTP/1.1
Connection: Keep-Alive
Accept: application/json
Accept-Charset: utf-8
```

```
HTTP/1.1 201 Created
Date: Fri, 18 Oct 2013 15:13:23 GMT
Content-Length: 0
Connection: Keep-Alive
Content-Type: application/json; charset=utf-8
Location: /gat/1.0/verificationTasks/12345678
```

Verification Result Example

```
GET /gat/1.0/verificationTasks/12345678 HTTP/1.1  
Connection: Keep-Alive  
Accept: application/json  
Accept-Charset: utf-8
```

```
HTTP/1.1 200 OK  
Date: Fri, 18 Oct 2013 15:13:23 GMT  
Content-Length: 199  
Connection: Keep-Alive  
Content-Type: application/json; charset=utf-8
```

```
{  
  "verificationId": 12345678,  
  "componentId": "ABC_123",  
  "verifyState": "NGI_complete",  
  "algorithmType": "NGI_HMACSHA1",  
  "salt": "1A2B3C4D5E6F7081",  
  "verifyResult": "ABC56DF718AA726FE9B72579BC45D1F2"  
}
```

Gaming Standards Association
Simple System Interface

Simple System Interface

- ***S2S was designed for high-volume asynchronous two-way communications between large systems.***
 - Either end-point can initiate communications.
 - Either end-point can initiate transactions.
- ***For simple client-server applications, many of the features and capabilities of S2S are unused or unnecessary.***
 - This has been a barrier to adoption.
- ***The Simple System Interface (SSI) is an attempt to address the needs of those applications.***

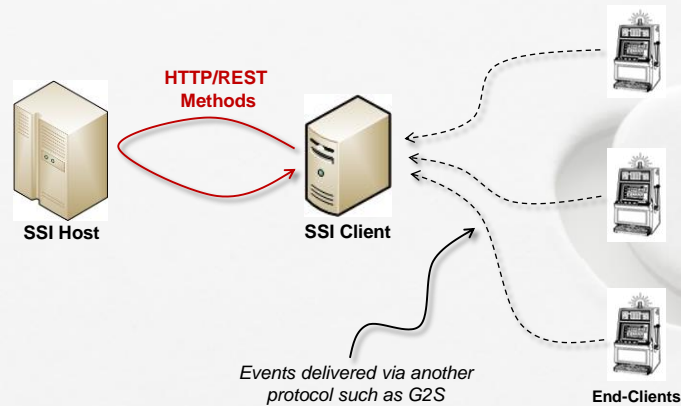
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Simple System Interface

- ***SSI uses common network-based protocols.***
 - HTTP, REST, and JSON.
- ***Standard HTTP verbs are used to access resources on an application server.***
 - GET, POST, PUT, and DELETE.
- ***JSON objects are used to communicate application-level data.***
- ***The first release includes methods for delivering event information to an application server.***

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Simple System Interface



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Simple System Interface

- **Event Subscription Resource**
 - Used by a client to get the host's event subscription.
 - The host may request that the raw data that was received from the end-client be included with the event.
 - For end-clients that are EGMs, the host may also request that the client include information about the player at the EGM and/or the location of the EGM.
 - Maps to information available in the G2S idReaderStatus and cabinetProfile commands.
- **Event Resource**
 - Used to post an event to the host.

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Event Example

POST /ssi/1.0/event HTTP/1.1

Connection: Keep-Alive

Accept: application/json

Accept-Charset: utf-8

```
{  
  "endClientType": "SSI_egm",  
  "endClientId": "GSA_123456",  
  "eventId": 12358132134,  
  "eventDateTime": "2015-03-19T11:24:35.813-05:00",  
  "eventCode": "G2S_GPE105",  
  "eventDesc": "Primary Game Ended",  
  "transactionId": 134711829  
}
```

HTTP/1.1 200 OK

Date: Fri, 18 Oct 2013 15:13:23 GMT

Content-Length: 0

Connection: Keep-Alive

Content-Type: application/json; charset=utf-8

Gaming Standards Association

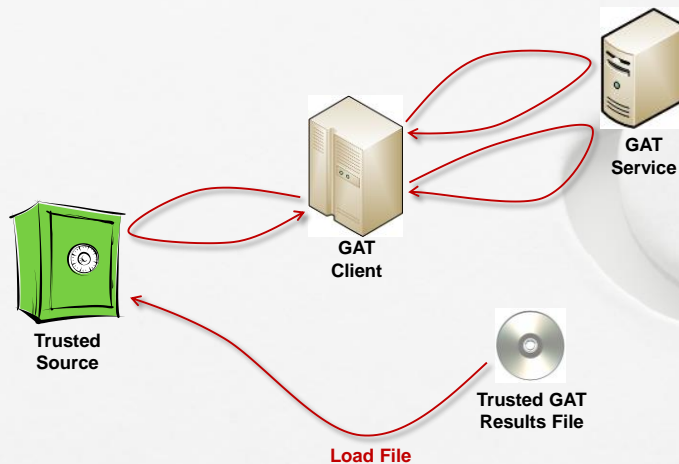
Trusted GAT Results File Format

Trusted GAT Results File Format

- ***Provides a standard format for delivering expected GAT results to a trusted source.***
- ***The file containing the expected GAT results can be digitally signed by anyone that trusts the contents.***
 - Manufacturer.
 - Independent Testing Lab.
 - Regulator.
- ***Other entities can check the digital signatures before using the expected GAT results.***

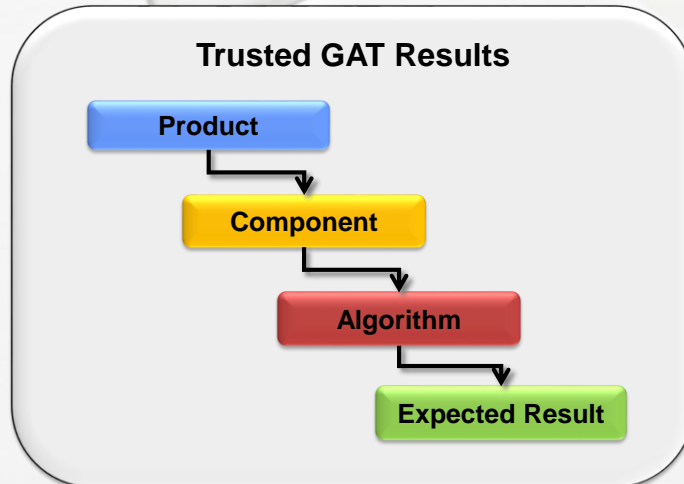
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Trusted GAT Results File Format



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Trusted GAT Results File Format



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Trusted GAT Results File Format

- ***The trustedGATResults element uniquely identifies a set of expected results.***
 - resultSetId – Manufacturer-assigned identifier for the set of expected results.
 - resultSetDateTime – Date/time that the file was created.
 - trustedGatResultsVersion – Version of the Trusted GAT Results File Format.
- ***Two files, which contain the same resultSetId and resultSetDateTime, must be exactly the same.***

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Trusted GAT Results File Format

- ***The product element contains information about the product for which the trusted results were generated:***
 - productId – Manufacturer-assigned product identifier.
 - productType – Product type, e.g. G2S_game, S2S_application.
 - mfgCode – GSA-assigned manufacturer code.
 - releaseNum – Release number for the product.
 - releaseDateTime – Date/time the product was released.

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Trusted GAT Results File Format

- ***The trustedComponent element contains information about a specific software component of the product:***
 - componentId – Manufacturer-assigned component identifier.
 - componentType – Component type, e.g. G2S_module.
- ***The resultList element identifies a specific algorithm for which trusted results were generated:***
 - algorithmType – Algorithm type, e.g. TGR_HMACSHA1.

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Trusted GAT Results File Format

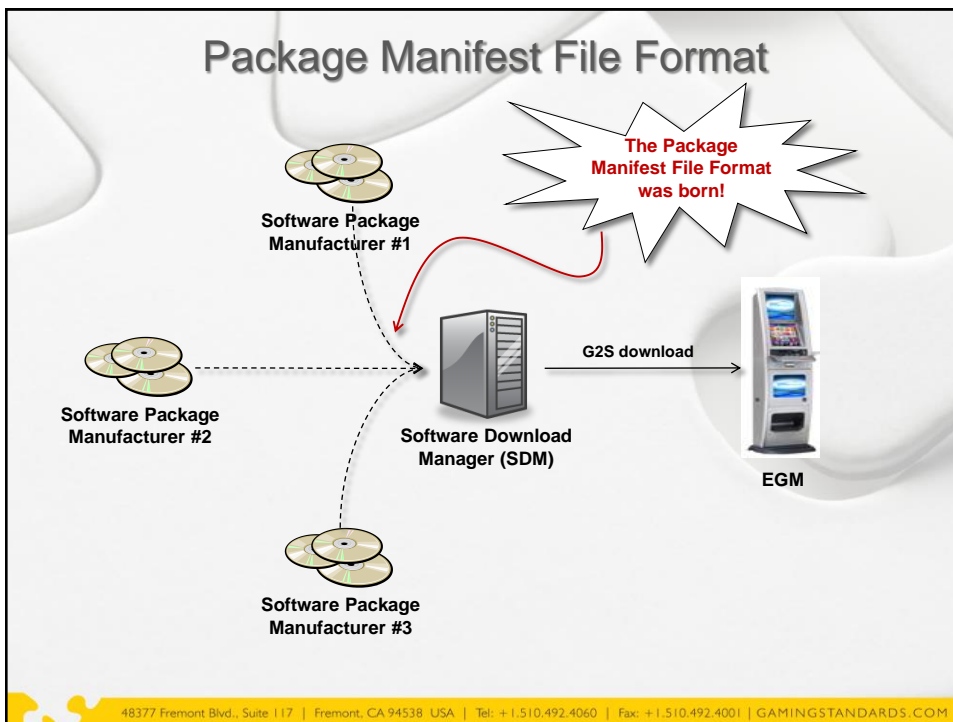
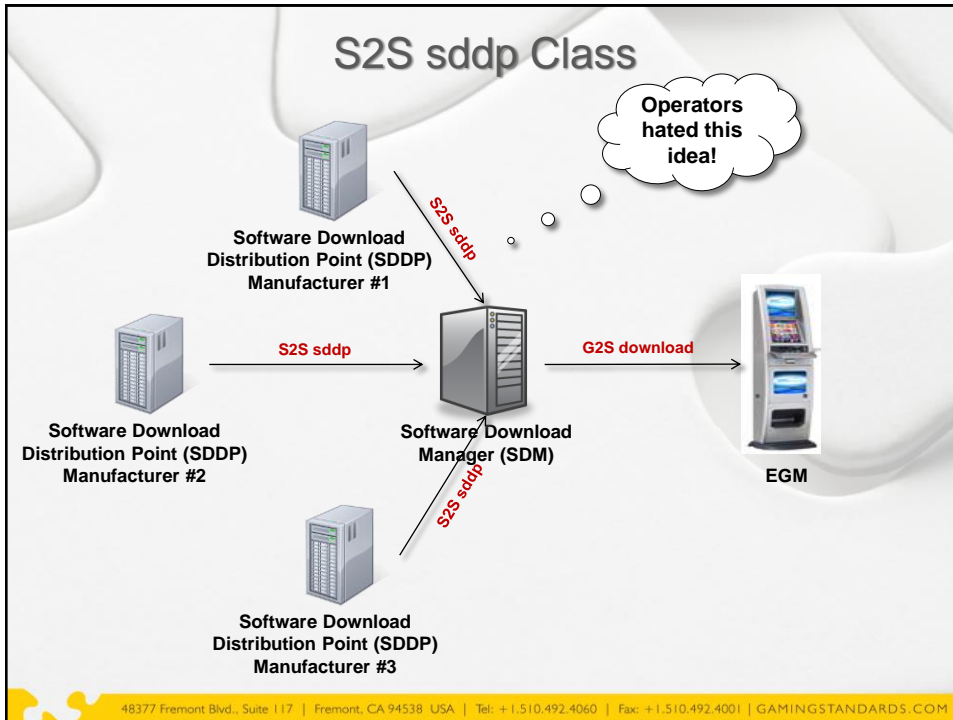
- ***The verificationResult element contains the expected result for a specific seed value, salt value, and/or offsets:***
 - seed – The seed value used to calculate the result.
 - Starting value for the authentication algorithm.
 - salt – The salt value used to calculate the result.
 - A set of bytes prepended to the component before calculating the expected result.
 - startOffset – The starting offset within the component.
 - endOffset – The ending offset within the component.
 - verifyResult – The expect result.

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Package Manifest File Format

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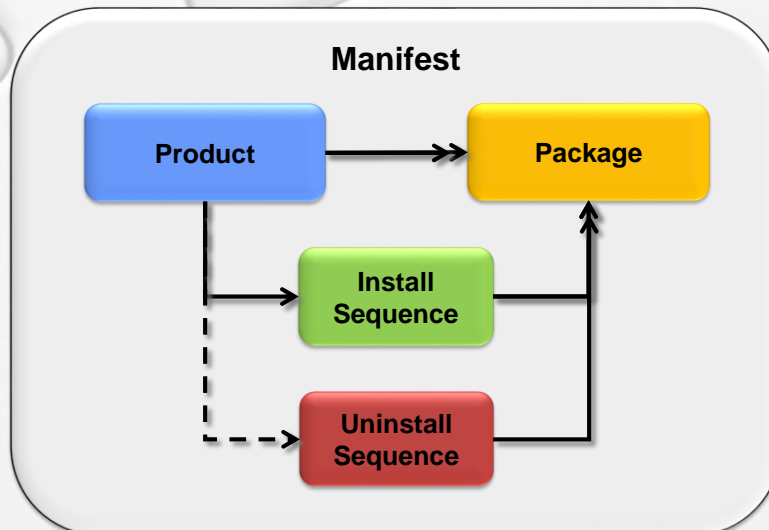


Package Manifest File Format

- **The Package Manifest File Format is designed so that any manufacturer's software packages can be imported onto an SDM and then installed on EGMs or systems.**
 - The manifest contains the information necessary for the SDM to successfully download and install a product on an end-point.
 - The manifest can be used with the G2S or S2S download class.
- **The manifest is stored inside the ZIP file containing the software packages.**
 - The manifest is found at the root level of the ZIP file.

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Package Manifest File Format



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Package Manifest File Format

- ***The manifest element uniquely identifies the contents of the ZIP file.***
 - manifestId – Manufacturer-assigned manifest identifier.
 - manifestDateTime – Date/time that the manifest was created.
 - manifestVersion – Version of the Package Manifest File Format.
- ***Two ZIP files, which contain the same manifestId and manifestDateTime, must be exactly the same.***

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Package Manifest File Format

- ***The product element contains information about the product, including:***
 - productId – Manufacturer-assigned product identifier.
 - productType – Product type, e.g. G2S_game, S2S_application.
 - releaseNum – Release number for the product.
 - Localized versions of the manufacturer name.
 - Localized versions of the product description.
 - Including pointers to graphics and descriptive documents contained in the ZIP file.
 - Theme, payable, and payback information for game software.

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Package Manifest File Format

- ***The package elements contains information about the software package, including:***
 - packageId – Manufacturer-assigned package identifier.
 - moduleId – Module resulting from installation of the package.
 - releaseNum – Release number of the package.
 - fileName – The name of the software file within the ZIP file.
 - Dependencies that must be satisfied before installation:
 - Modules – Required software modules.
 - Hardware – Required hardware components.
 - Storage – Required storage capacity.
 - Options – Required option settings.
 - Operator Actions – Required operator actions.
 - “and”, “or”, and “not” operations can be specified.

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Package Manifest File Format

- ***The installSeq and uninstallSeq elements contain the steps necessary to install the product.***
 - Download Package.
 - Maps to the addPackage command.
 - Delete Package.
 - Maps to the deletePackage command.
 - Create Package.
 - Maps to the createPackage command.
 - Upload Package.
 - Maps to the uploadPackage command.
 - Execute Script.
 - Maps to the setScript command.

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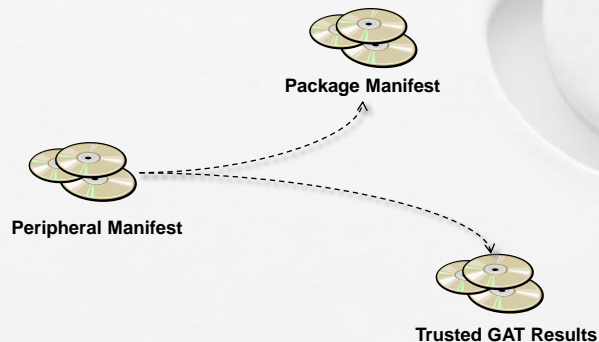
Gaming Standards Association

Peripheral Manifest File Format

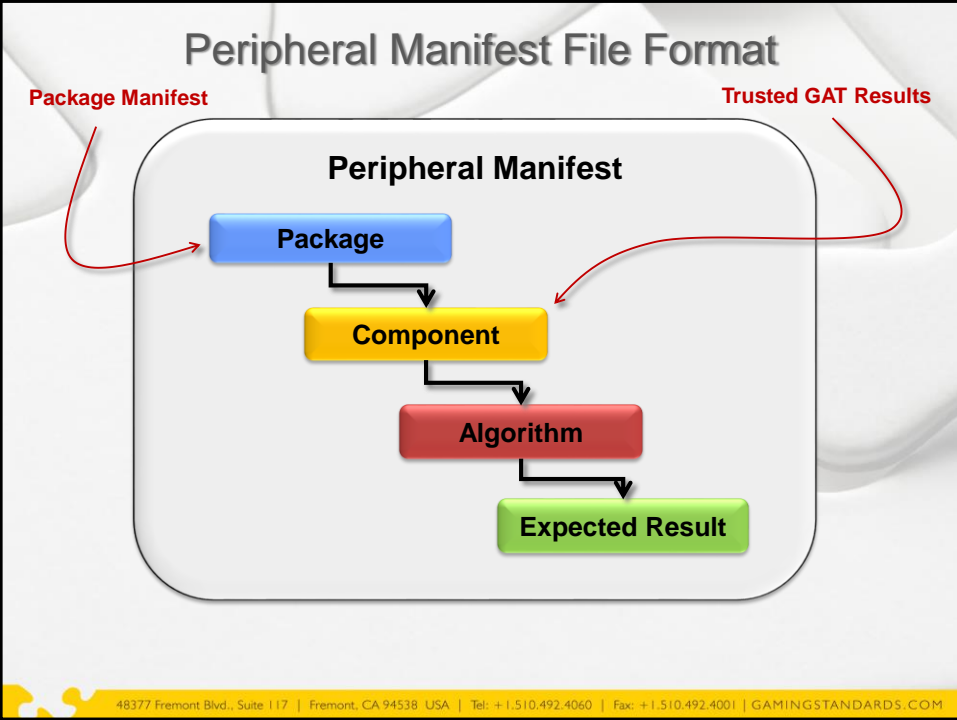
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Peripheral Manifest File Format

- ***The Peripheral Manifest File Format is used by peripheral device manufacturers to deliver firmware updates to EGM manufacturers.***
 - The files contain information that can be used in the Package Manifest as well as the expected GAT results for the firmware.



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Point-to-Point WebSocket Transport

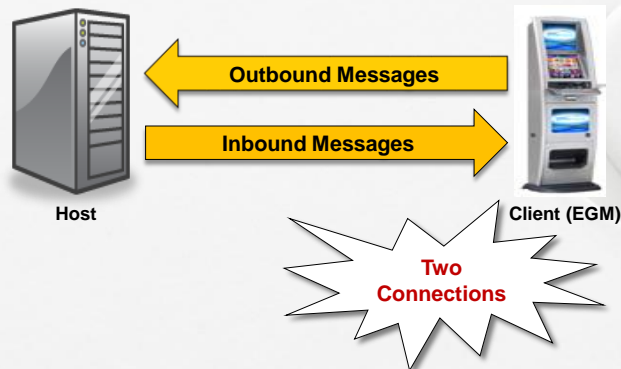
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WebSocket Transport

- ***What are the advantages of the proposed WebSocket Transport?***
 - A single connection between the client (EGM) and the host.
 - The client does not have to include an HTTP server.
 - Problems related to NAT (Network Address Translation) can be significantly reduced.
 - Lower bandwidth and processing requirements.
 - Elimination of HTTP and SOAP reduces the number of software layers.
 - Elimination of the HTTP and SOAP headers can reduce message sizes by up to 50%.

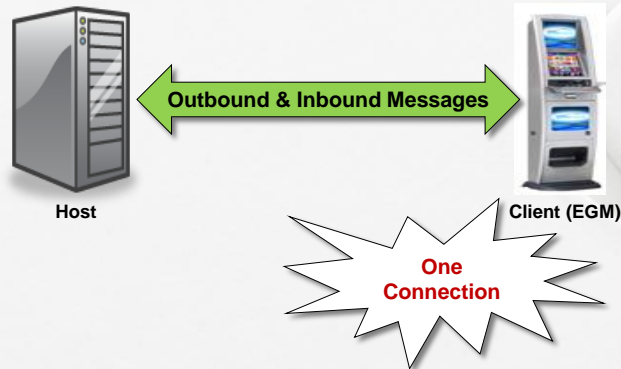
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SOAP/HTTP Transport



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WebSocket Transport



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Protocol Organization

- ***The old SOAP/HTTP specification has been broken into two documents.***
 - **GSA Network and Security Specification**
 - Basic networking requirements.
 - Security & Authentication.
 - DHCP, DNS, NTP, etc.
 - **GSA Point-to-Point SOAP/HTTP Transport Specification**
 - SOAP/HTTP transport requirements.
- ***The multicast specification is unchanged.***

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Protocol Organization

- ***Two new specifications have been introduced.***
 - **GSA Point-to-Point WebSocket Transport Specification**
 - WebSocket connection requirements.
 - WebSocket payload requirements.
 - **GSA Transport Negotiation Specification**
 - Generic method for determining the transports and message protocols supported by a host.

WebSocket Connection

- ***Per the GSA Network & Security Specification, secure TLS communications, as well as unsecure communications, must be supported.***
 - The security scheme is specified in the URL of the service.
 - **ws**://config.casino.com:80/g2s
 - **wss**://config.casino.com:443/g2s

G2S URI

- ***For G2S, the EGM ID and Host ID for the communications association must be appended to the base URL of the service.***
 - `ws://config.casino.com:80/g2s?EGMID=ABC_123&HOSTID=1`
 - `wss://config.casino.com:443/g2s?EGMID=ABC_123&HOSTID=1`
- The host must not accept the connection if the Host ID is not correct.
- As opposed to the SOAP/HTTP transport, the EGM ID and Host ID are only provided in the initial connection request. They are not provided by the transport layer with every message.
 - These values must be passed to the application layer with each application-layer message.

Persistent Connections

- ***When making a connection, clients must specify a persistent connection.***
 - Once a connection has been established, clients and service hosts must maintain the connection for at least 5 minutes unless the connection is no longer required at the application level.
- ***Once a connection has been established, both the client and the service host may send messages over the connection.***
 - Full asynchronous communications takes place over the single WebSocket connection.

Payload Structure

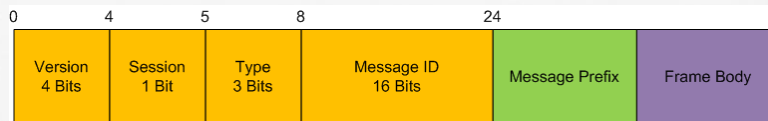
- **A special format is used to identify the contents of the WebSocket payload.**
 - The payload is broken into three parts:
 - A **frame prefix** that contains a message identifier for the message and identifies the type of application-layer data that is being sent.
 - A **message prefix** that contains additional information about the application-layer data that is being sent. The content of the message prefix varies based on the type of application data.
 - A **frame body** that contains the application layer data. For example, g2sMessage or g2sAck.



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Frame Prefix

- **The frame prefix identifies the type of application-layer data that is being sent and contains the message identifier for the message.**



Segment	Description	Size (bits)
Version	Indicates the version of the GSA Point-to-Point WebSocket Transport Specification.	4
Session	Indicates the direction of the application-layer data. <ul style="list-style-type: none"> • 0 – Client to Server • 1 – Server to Client 	1
Type	Indicates the type of application-layer data. <ul style="list-style-type: none"> • 000 – GSA message protocol request – e.g., g2sMessage • 001 – GSA message protocol response – e.g., g2sAck • 010 – GSA transport error 	3
Message ID	Message identifier for the application-layer data.	16

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Message Prefix – Requests (000)

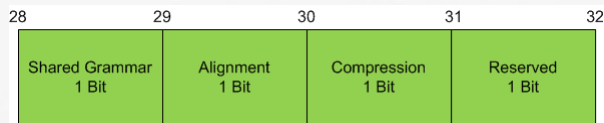
- Used for message protocol requests – for example, *g2sMessage* or *s2sMessage*.



Segment	Description	Size (bits)
Encoding	Identifies the method used to encode the application-layer data. <ul style="list-style-type: none"> 0000 – XML 0001 – GZIP 0010 – EXI From time to time, additional encoding methods may be added.	4
Options	Contains encoding-specific options used when encoding the application-layer data. <ul style="list-style-type: none"> If encoding = 0000 – all bits MUST be set to 0 (zero) If encoding = 0001 – all bits MUST be set to 0 (zero) If encoding = 0010 – EXI Options, see below 	4
Frame Body	Contains the application-layer data as defined in the GSA message protocol.	N

Message Prefix – EXI Options

- Identifies which EXI-related options were used for the encoding.



Sub-Segment	Description	Size (bits)
Shared Grammar	Indicates whether a shared grammar was used for the encoding. <ul style="list-style-type: none"> 0 – No shared grammar 1 – Shared grammar (default) 	1
Alignment	Identifies the type of alignment used for the encoding. <ul style="list-style-type: none"> 0 – Byte-aligned 1 – Bit-packed (default) 	1
Compression	Indicates whether EXI compression was used for the encoding. <ul style="list-style-type: none"> 0 – No EXI compression. 1 – EXI compression (default). 	1
Reserved	Reserved. MUST be set to 0 (zero).	1

Message Prefix – Responses (001)

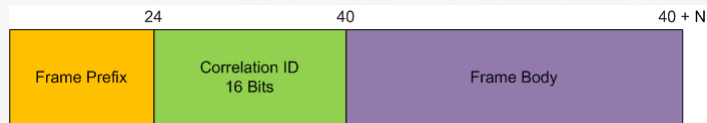
- Used for message protocol responses – for example, *g2sAck* or *s2sAck*.



Segment	Description	Size (bits)
Correlation ID	MUST be set to the message ID of the message that contained the corresponding request.	16
Frame Body	Contains the application-layer data as defined in the GSA message protocol. The application-layer data MUST be reported as XML ; no compression or special encoding is required.	N

Message Prefix – Errors (010)

- Used to report transport-related errors.
 - The frame body contains XML-formatted information about the error.



Segment	Description	Size (bits)
Correlation ID	MUST be set to the message ID of the message that contained the corresponding request.	16
Frame Body	Contains the application-layer data as defined in the GSA message protocol. The application-layer data MUST be reported as XML ; no compression or special encoding is required.	N

Error Data Example

```
<?xml version="1.0" encoding="utf-8"?>
<ws:gsaTransportError
  xmlns:ws="http://www.gamingstandards.com/xpt/schemas/websockets"
  ws:errorCode="XPT_WSX001"
  ws:errorText="EXI Shared Grammar Mismatch"
/>
```

G2S & S2S Message Handling

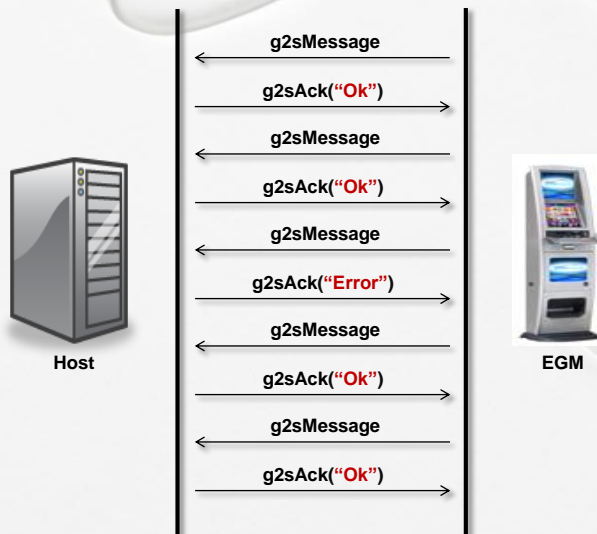
- ***What is being changed?***
 - The requirement that every message be acknowledged with a g2sAck / s2sAck has been removed.
 - Message-level errors will still be reported in g2sAcks / s2sAcks.
 - The requirement that messages be resent has been removed.
 - The requirement that errors be reported if commands are out of order has been removed.
 - "Command out-of-order" errors must not be generated.
 - Messages may be encoded using EXI (Efficient XML Interchange).
- ***These changes only apply when the WebSocket transport is used.***

G2S & S2S Message Handling

- **What are the advantages?**
 - By not requiring an acknowledgement to every message,
 - The number of messages on the wire can be reduced by almost 50%.
 - By not requiring that messages be resent if not acknowledged,
 - The sender will be able to discard commands immediately.
 - Message latency will be reduced.
 - By not requiring “command out-of-order” errors,
 - Fewer communication restarts and command retries will be required.
 - By using EXI,
 - The size of messages can be reduced by up to 60% compared to GZIP.

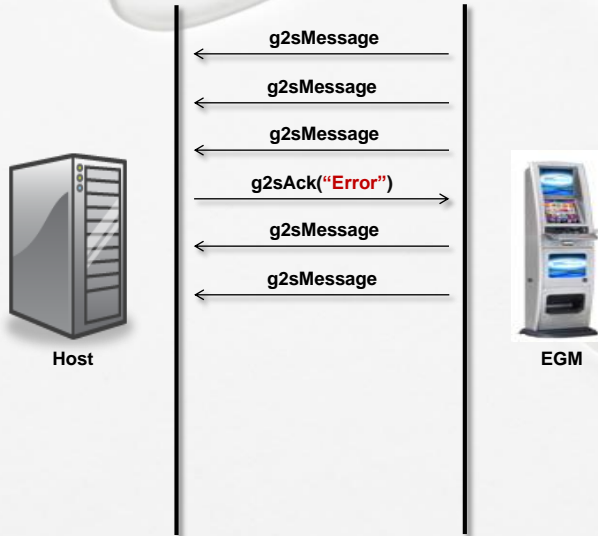
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Current Message Handling



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New Message Handling



Gaming Standards Association
Transport Negotiation

Transport Negotiation

- **Requesting Transport Options**
 - An HTTP GET operation is used to request the transport options supported by a host.
 - The URL of the information is formed by appending “gsaTransportOptions” to the base URL of the host.
 - <http://config.casino.com:80/gsaTransportOptions>
 - <https://config.casino.com:443/gsaTransportOptions>
 - The response contains an XML file that identifies the transport options supported by the host.
 - If an HTTP error is reported, other GSA-defined transports can be used – i.e. SOAP/HTTP.

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Transport Negotiation

- **The Transport Negotiation mechanism uses the same DHCP information as the SOAP/HTTP Transport.**
 - The base URL of the host, as well as the security scheme, can be picked up from DHCP Option 43.
 - gsaCC=shs:config.casino.com:443+1
 - gsaCC=shu:config.casino.com:80+1
 - An HTTP GET operation is performed to request the transport options.
 - <https://config.casino.com:443/gsaTransportOptions>
 - <http://config.casino.com:80/gsaTransportOptions>

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XML Structure

- **The transport options are returned to the client in a `gsaTransportOptions` element.**
 - Each service supported by the host is identified in a `gsaService` sub-element.

```
<?xml version="1.0" encoding="utf-8"?>
<ws:gsaTransportOptions
  xmlns:ws="http://www.gamingstandards.com/xpt/schemas/websockets"
  <ws:gsaService
    ws:gsaTransport="webSocket"
    ws:gsaTransportVersion="2.0"
    ws:gsaProtocol="G2S"
    ws:gsaProtocolVersion="3.0"
    ws:gsaEncoding="xml"
    ws:gsaService="wss://config.casino.com:443/g2s"
  />
/>
```

gsaService Attributes

Attribute	Restrictions	Description
gsaTransport	type: xs:string use: required maxLen: 16	Identifies the GSA transport supported by the service. For example, webSocket.
gsaTransportVersion	type: xs:string use: required maxLen: 8	Identifies the version of the GSA transport supported by the service.
gsaProtocol	type: xs:string use: required maxLen: 16	Identifies the GSA protocol supported by the service. For example, G2S or S2S.
gsaProtocolVersion	type: xs:string use: required maxLen: 8	Identifies the version of the GSA protocol used for message handling and communications by the service.
gsaEncoding	type: xs:string use: required maxLen: 16	Identifies the message encoding expected by the service. For example, xml, gzip-xml, or exi.
gsaService	type: xs:string use: required maxLen: 256	Contains the URI of the service in the following format: transport://host[":"port][path] . For example, wss://config.casino.com:443/g2s.

Efficient XML Interchange (EXI)

- **When EXI is supported by a service, two additional sub-elements are needed to fully describe the service.**
 - The **exiDictionary** sub-element contains additional information needed by EXI to construct the shared grammar used to encode the messages.
 - The **exiHash** sub-element contains a hash value of the file containing the schema.

EXI Service Example

```
<ws:gsaService
  ws:gsaTransport="webSocket"
  ws:gsaTransportVersion="2.0"
  ws:gsaProtocol="G2S"
  ws:gsaProtocolVersion="3.0"
  ws:gsaEncoding="exi"
  ws:gsaService="wss://config.casino.com:443/g2s"
>
  <ws:exiDictionary
    ws:dictionaryURI="http://config.casino.com/g2sSchema"
    ws:initialXSD="g2sMessage.xsd"
    ws:dictionaryNS="http://www.gamingstandards.com/exi/1"
  >
    <ws:exiHash
      ws:hashAlgorithm="SHA1"
      ws:dictionaryHash="E88A42506F716D8D74245C3C74CB5EC1D0
57FD25"
    />
  </ws:exiDictionary>
</ws:gsaService>
```

exiDictionary Sub-Element

exiDictionary Attributes

Attribute	Restrictions	Description
dictionaryURI	type: xs:anyURI use: required	The location of the GZIP-compressed TAR file containing the schema used to generate the shared grammar for the service.
initialXSD	type: xs:string use: required	The initial schema file used to generate the shared grammar.
dictionaryNS	type: xs:anyURI use: required	Namespace used to identify the shared grammar when serializing and de-serializing messages.

exiHash Attributes

Attribute	Restrictions	Description
hashAlgorithm	type: xs:string use: required	Identifies the algorithm used to generate the hash value. For example, SHA1, MD5, etc.
dictionaryHash	type: xs:string use: required	The hash value for the GZIP-compressed TAR file containing the schema; reported as a hexadecimal character string.

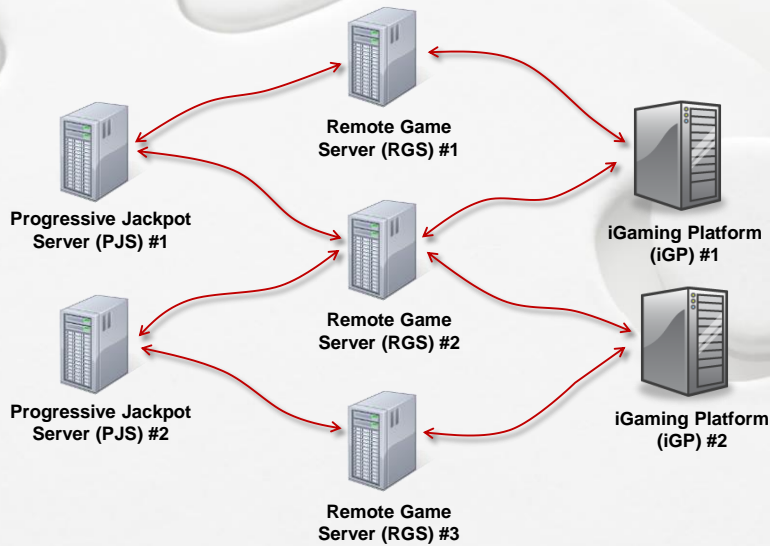
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Gaming Standards Association

Third-Party Game Interface

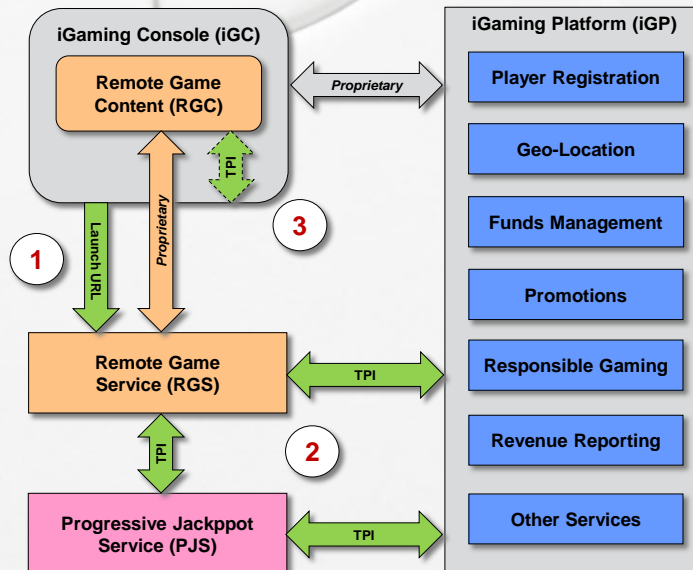
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Third-Party Game Interface



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Third-Party Game Interface



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Terminology

- ***iGaming Platform (iGP)***
 - Provides administrative services for the iGaming operation.
- ***iGaming Console (iGC)***
 - Provides the player with access to games and administrative services.
- ***Remote Game Service (RGS)***
 - Provides game services for the iGaming operation.
- ***Remote Game Content (RGC)***
 - Allows the player to play the games offered by the RGS.
- ***Progressive Jackpot Service (PJS)***
 - Provides progressive jackpot services for the iGaming operation.

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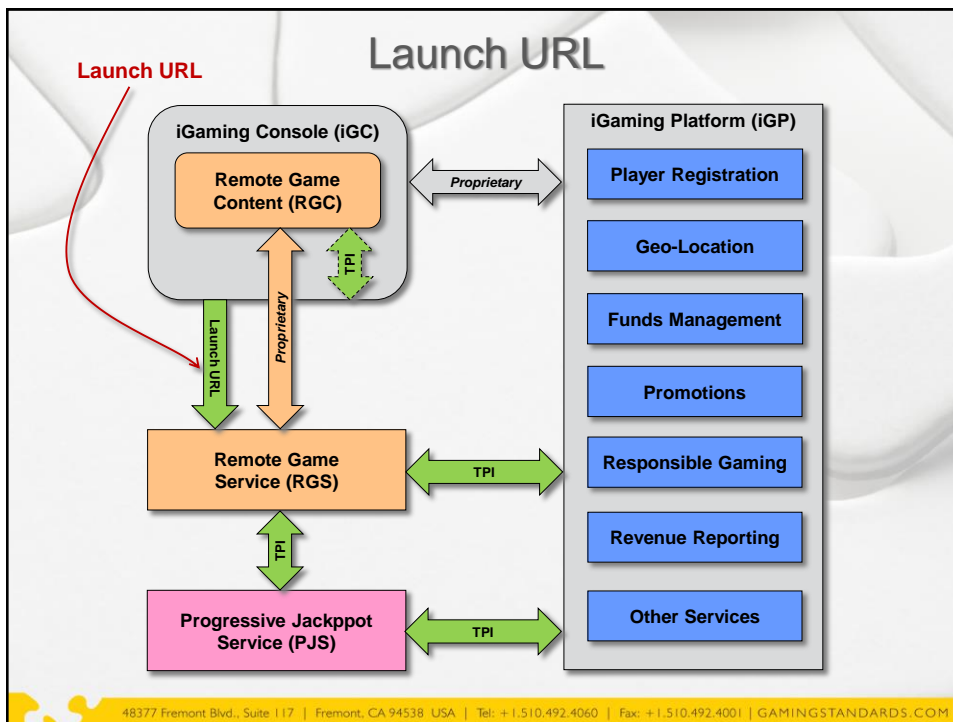
Terminology

- ***Launch URL***
 - Used by the iGaming Console (iGC) to launch games on a Remote Game Service (RGS) for a player.
- ***Third-Party Game Interface (TPI)***
 - Used to communicate information about game play between a Remote Game Service (RGS) and a iGaming Platform (iGP).
 - Used to communicate information about progressive jackpots between a Progressive Jackpot Service (PJS) and a Remote Game Service (RGS) or an iGaming Platform (iGP).
 - Used to coordinate information displayed to players in the Remote Game Content (RGC) and the iGaming Console (iGC).

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Third-Party Game Interface Launch URL

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Terminology

- **Player Identifier**
 - The unique identifier used by the iGP to identify the player.
- **Player Account**
 - A player may have multiple accounts on the iGP.
 - For example, a free-play account and real-money account.
 - Each Player Account is denominated in a single currency.
- **Account Balances**
 - A player may have multiple Account Balances within a single Player Account.
 - Cashable, Promotional, Non-cashable, and/or Free Spins.
 - An Account Balance may be Blocked.
 - Blocked funds cannot be used for gaming.

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Terminology

- **Brand & Skin**
 - The brand and style offered by the iGP.
 - Each Game Session is associated with a specific Brand and Skin.
 - The iGP may support more than one Brand and more than one Skin per Brand.
 - The RGS may also support multiple Brands and multiple Skins per Brand.
- **Distribution Channel**
 - The distribution channel through which the game will be played.
 - For example, PC, tablet, mobile, etc.
- **Presentation Format**
 - The presentation format in which the game will be rendered.
 - For example, HTML or Flash.

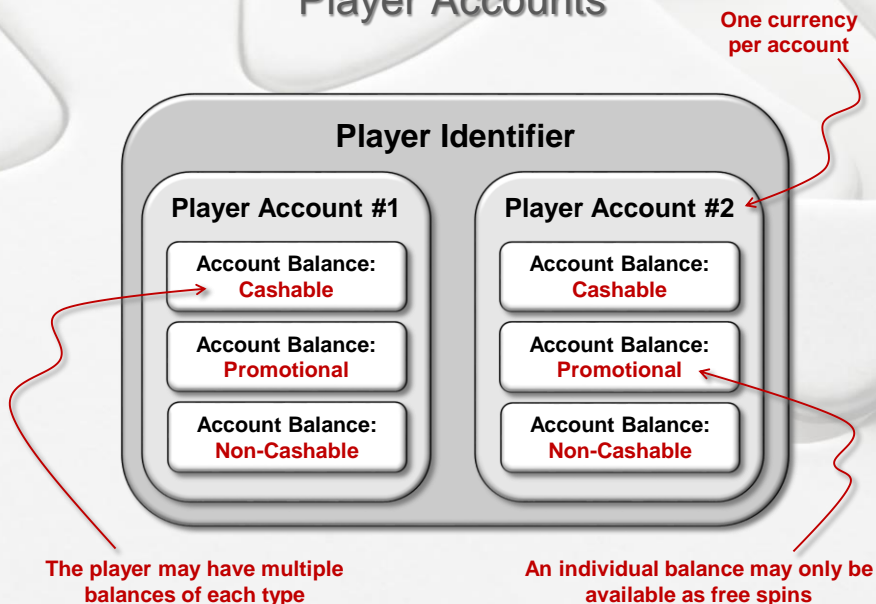
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Terminology

- **Bet Configuration**
 - A specific betting configuration for a game.
 - Maximum bet, minimum bet, bet increments, etc.
- **Free Spin Configuration**
 - A specific configuration within a Bet Configuration for free spins.
 - Value of a free spin.
- **Bet Configurations and Free Spin Configurations are defined by the game manufacturer and are a static part of the game.**
 - The iGP can select the Bet Configuration and Free Spin Configuration for a game but cannot change the parameters of the Bet Configuration or Free Spin Configuration.

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Player Accounts



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Account Balance Example

```
"TPI_accountBalance": {
  "TPI_playerId": "00101977",
  "TPI_accountId": "Z100187",
  "TPI_currencyCode": "USD",
  "TPI_accountMsg": "Welcome back!",
  "TPI_availBalanceAmt": 50000,
  "TPI_availFreeSpinCnt": 0,
  "TPI_balanceArray": [
    {
      "TPI_balanceType": "TPI_cashable",
      "TPI_balanceAmt": 50000
    },
    {
      "TPI_balanceType": "TPI_cashable",
      "TPI_balanceAmt": 2500,
      "TPI_balanceStatus": "TPI_blocked",
      "TPI_balanceRestrict": "Deposit Pending"
    },
    {
      "TPI_balanceType": "TPI_nonCashable",
      "TPI_balanceAmt": 10000,
      "TPI_balanceStatus": "TPI_blocked",
      "TPI_balanceRestrict": "Required Wagers Not Made",
      "TPI_freeSpins": true,
      "TPI_freeSpinValue": 100
    }
  ]
}
```

The available balances are specific to the game, bet configuration, and free spin configuration selected for the game session

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Launch Parameters

- **The Launch URL contains a series of standard parameters.**
 - Remote Game Service Identifier
 - iGaming Platform Identifier
 - Player Identifier
 - Player Account Identifier
 - Game Identifier
 - Brand Identifier
 - Skin Identifier
 - Bet Configuration Identifier
 - Free Spin Configuration Identifier
 - Distribution Channel
 - Presentation Format
 - Locale (Language) Code
 - Currency Code
- **The Launch URL can also contain manufacturer-specific parameters.**

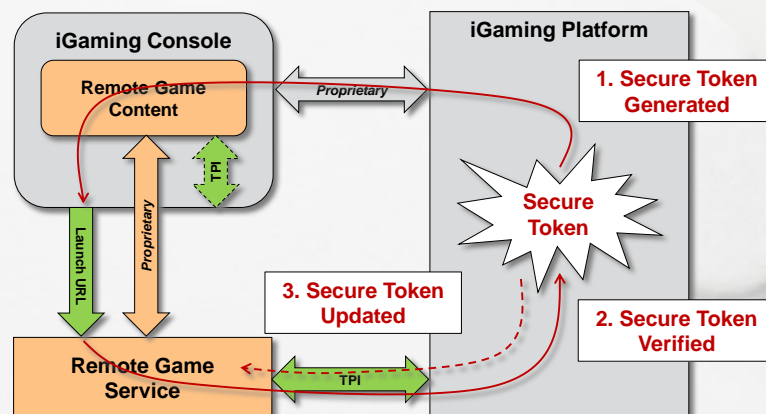
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Secure Token

- **The Launch URL also contains a Secure Token.**
 - The Secure Token uniquely identifies the specific instance of a game that was launched for a player.
 - The Secure Token is included in most requests from the RGS to the iGP.
 - For added security, the iGP can change the Secure Token when it responds to a request from the RGS.

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Secure Token



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Launch URL

- **The Launch URL is formed by appending the launch parameters to the base URL of the RGS.**
- **The Launch URL is presented to the RGS in an HTTP GET command.**
- **If the Launch URL is valid, the response to the HTTP GET command contains the game content (or a loader for the game content).**
 - If the Launch URL is invalid, the response contains an appropriate HTTP status code.
- **The contents of the HTTP request and response are typically secured using TLS (HTTPS).**

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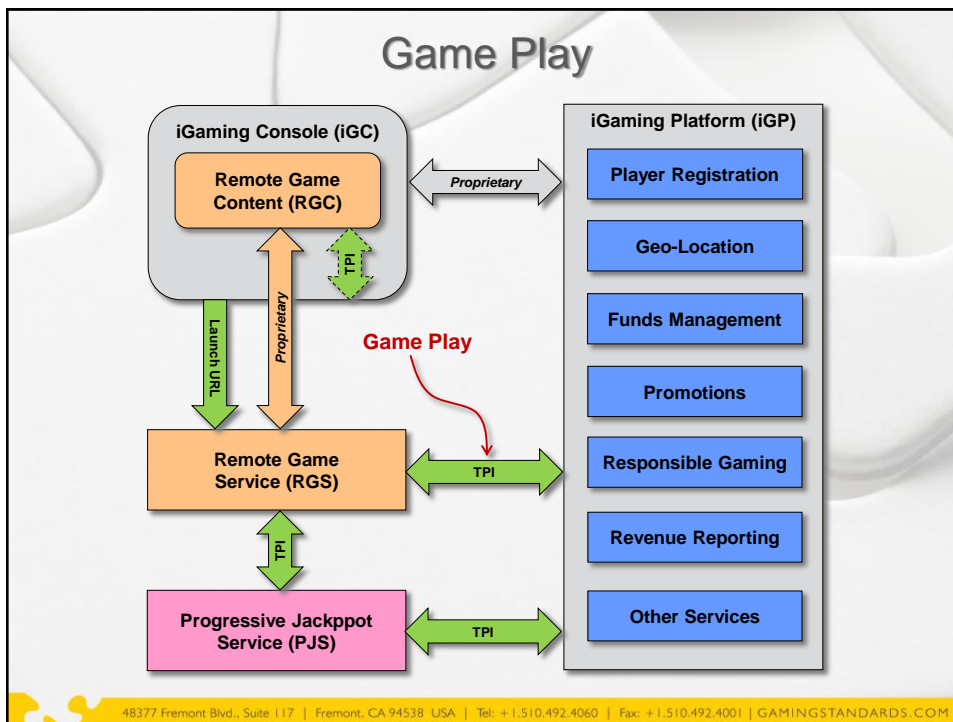
Launch URL Example

```
https://www.gameService.com/playGame
?rgsId=ABC
&igpld=Operator
&playerId=someone@somewhere.com
&accountId=Z00147823
&gameId=ABC_1234
&brandId=OurBrand
&skinId=OurSkin
&betConfigId=maxBet
&freeSpinId=freeSpinValue500
&presentType=TPI_internet
&channelType=TPI_HTML5
&localeCode=fr-CA
&currencyCode=CND
&secureToken=A1B2C3D4E5F60718
```

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Third-Party Game Interface Game Play

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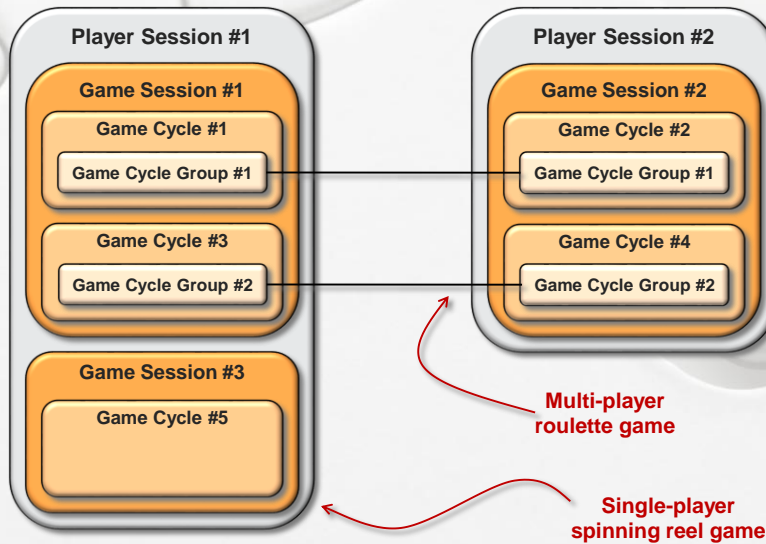
Terminology

- **Player Session**
 - A player session is established when the player successfully logs onto the iGP.
 - The player session ends when the player logs off or is disconnected from the iGP.
 - The player session is not identified through the Third-Party Game Interface.
- **Game Session**
 - A Game Session is established when a game is launched on the RGS.
 - Multiple Game Sessions can be launched during a Player Session.

Terminology

- **Game Cycle**
 - A Game Cycle is typically started when a player places a wager on a game.
 - Multiple bets can be made during a Game Cycle.
 - The Game Cycle typically ends once the outcomes of all bets are known.
 - The Game Cycle may remain open for an extended period of time.
 - For example, sports betting, communications failures, etc.
- **Game Cycle Group**
 - Multiple Game Cycles may be dependent of the same outcome.
 - For example, multi-player roulette, sports betting, etc.

Terminology

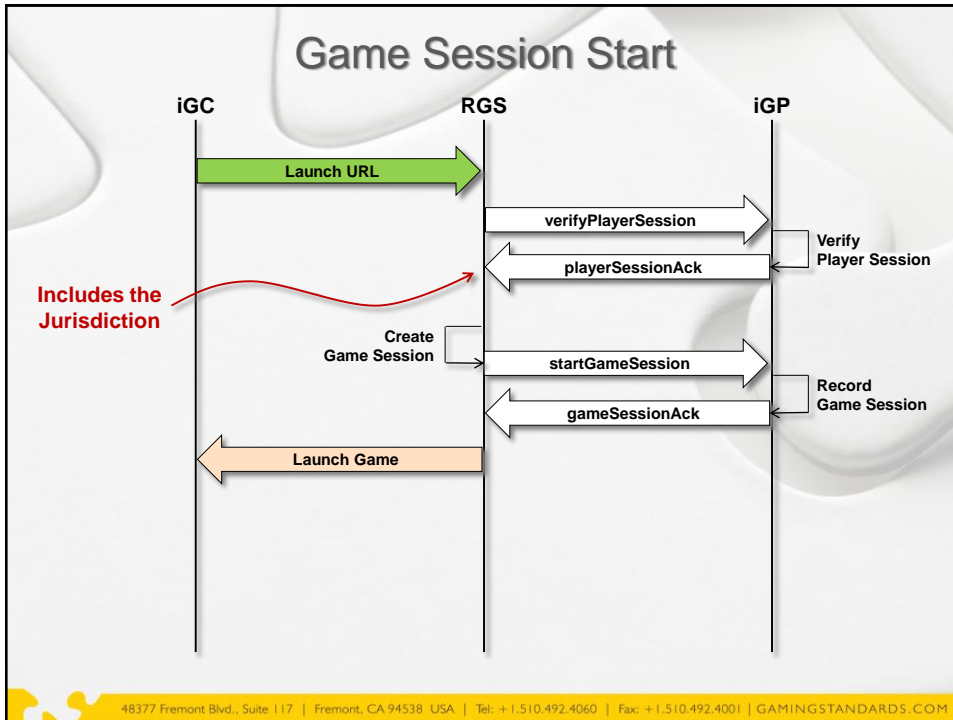


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Game Session Start

- ***Starting a Game Session is a two-step process.***
 - First, the player and game information, which was presented in the Launch URL, is verified by the iGP.
 - The iGP can provide additional information about the player and the player session in its response, including the Jurisdiction in which the player is located.
 - Second, the RGS starts a new Game Session for the player, reporting the information about the Game Session to the iGP.

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Game Session Start

- ***If some aspect of the Player Session changes, the iGP can force the RGS to terminate the Game Session.***
 - For example, the player moves into another jurisdiction.
- ***The iGP has four options:***
 1. Interrupt current game cycle and then end game session;
 - a. Do not start new game session, or
 - b. Start new game session.
 2. Finish current game cycle and then end game session;
 - a. Do not start new game session, or
 - b. Start new game session.

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Monetary Transactions

- ***During game play, Monetary Transactions are initiated by the RGS and then approved by the iGP.***
 - Player Account Identifier.
 - Game Session Identifier.
 - Game Cycle Identifier.
 - Game Cycle Group Identifier.
 - Secure Token.
 - Transaction Identifier. ← **Multiple transactions per command are allowed**
 - Transaction Amount.
 - Transaction Type – Debit or Credit.
 - Transaction Category – Wager, Win, etc.
 - Transaction Description. ← **Includes detailed information about the wager or win**
 - Free Spins, Progressive Hits, etc.

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Monetary Transactions

- ***The response from the iGP includes a breakdown of the Account Balances that were affected by the Monetary Transactions and the remaining balances in those accounts.***
 - Balance Type: cashable, non-cashable, etc.
 - Account Sequence. ← **Used to sequence transactions within an account**
 - Amount Applied.
 - Transaction Type – Debit or Credit.
 - Remaining Amount.

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Monetary Transactions

- ***If a Monetary Transaction is approved, the iGP assigns:***

- Reference Identifier.
- Transaction Day.

The gaming day is managed by the iGaming Platform

- ***The RGS can request that the iGP cancel specific Monetary Transactions (or a whole game cycle), in which case, iGP assigns:***

- Cancellation Identifier.
- Cancellation Day.

Monetary Transactions

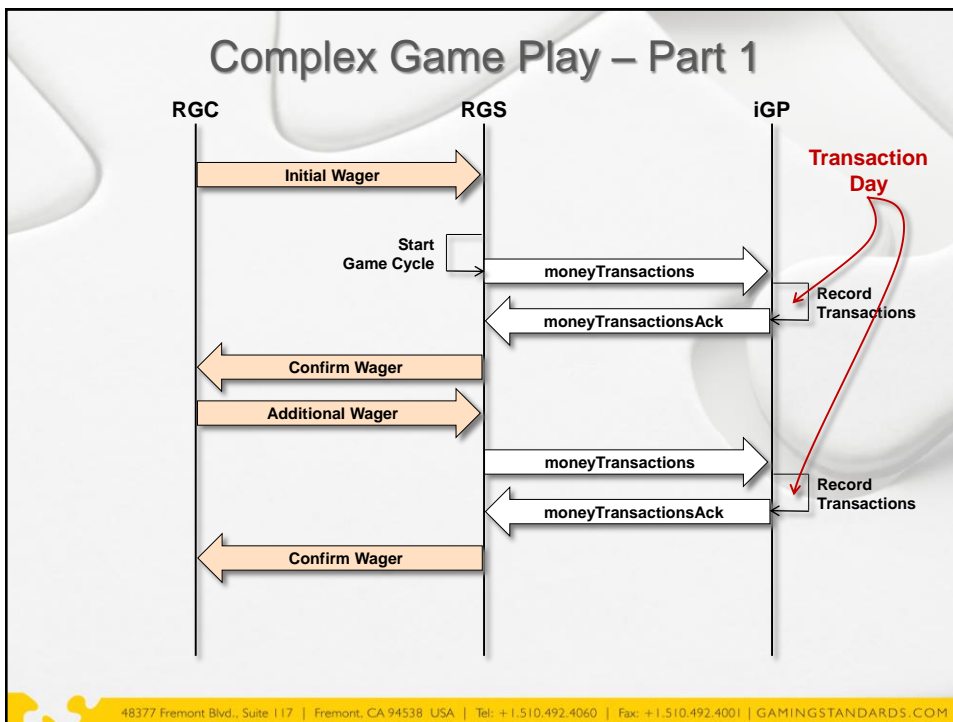
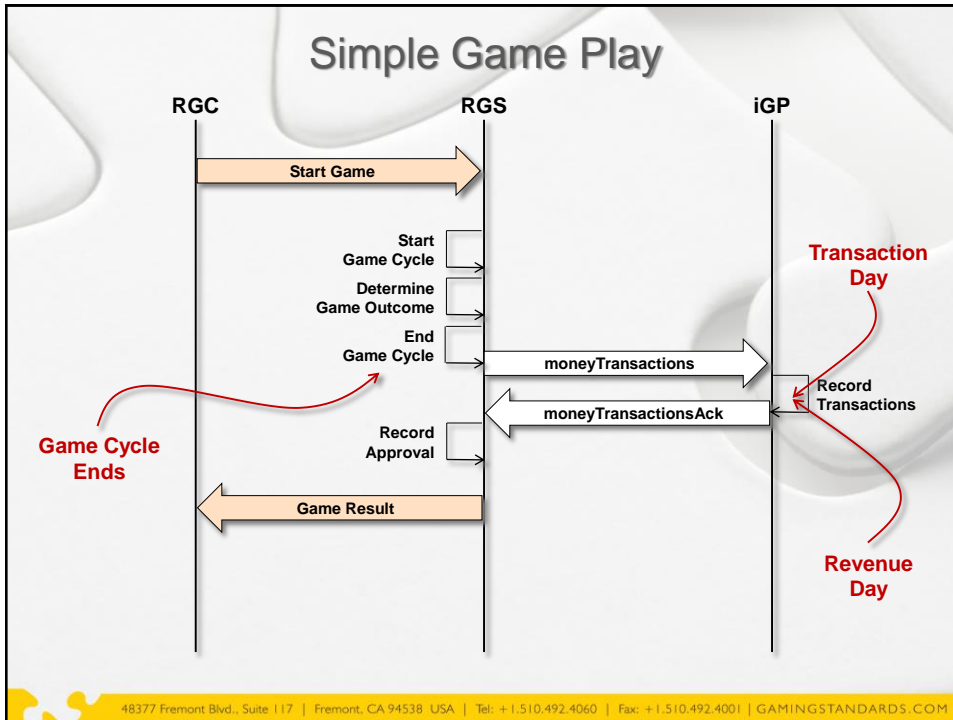
- ***When the Game Cycle is finished, the RGS sets a special indicator in the Monetary Transaction request.***

- Game Cycle Finished.

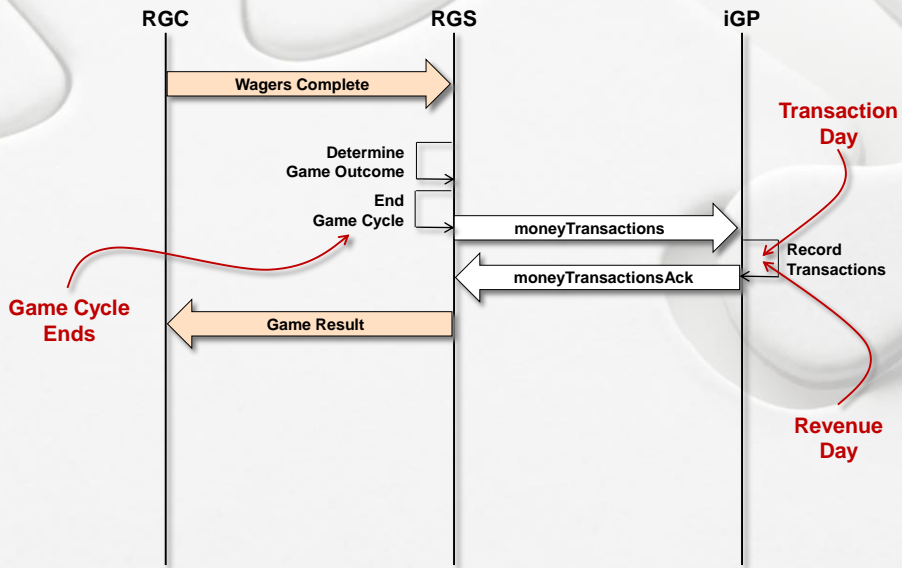
- ***In its response, the iGP assigns:***

- Revenue Day.

Revenue reporting can be based on Revenue Day or Transaction Day



Complex Game Play – Part 2



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Third-Party Game Interface

Unfinished Game Cycles

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Unfinished Game Cycles

- ***Unfinished game cycles are inevitable!***
 - The player closes the browser.
 - The player loses the internet connection.
 - The game outcome won't be determined until some point in the future; for example, sports betting.

- ***This leaves the RGS with three choices:***
 1. **Void** the Game Cycle and cancel any Monetary Transactions already recorded for the Game Cycle.
 2. **Auto-complete** the Game Cycle and record any additional Monetary Transactions required to finish the Game Cycle.
 3. **Suspend** the Game Cycle and let the player complete it later.

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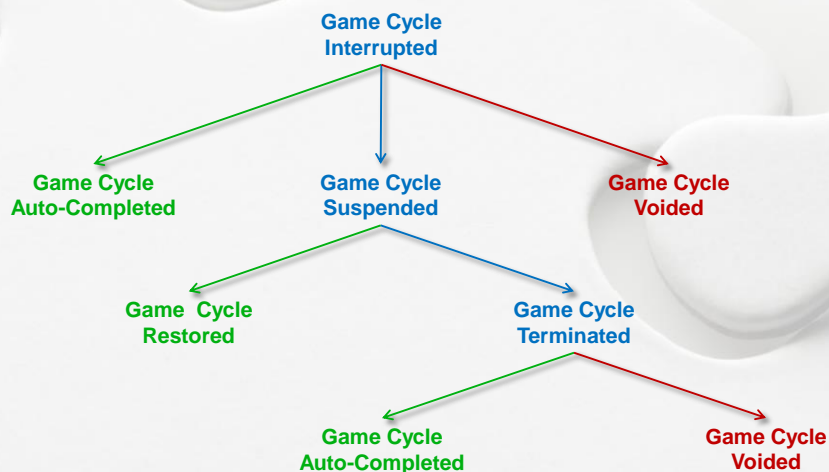
Unfinished Game Cycles

- ***Suspended games remain unfinished until:***
 1. The player returns and completes the Game Cycle.
 2. The RGS terminates the Game Cycle.
 3. The iGP directs the RGS to terminate the Game Cycle.

- ***Game design, as well as operational and jurisdictional requirements, will determine whether interrupted Game Cycles should be voided, auto-completed, or suspended.***
 - Likewise, game design, as well as operational and jurisdictional requirements, will determine whether terminated Game Cycles should be voided or auto-completed.

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Unfinished Game Cycles



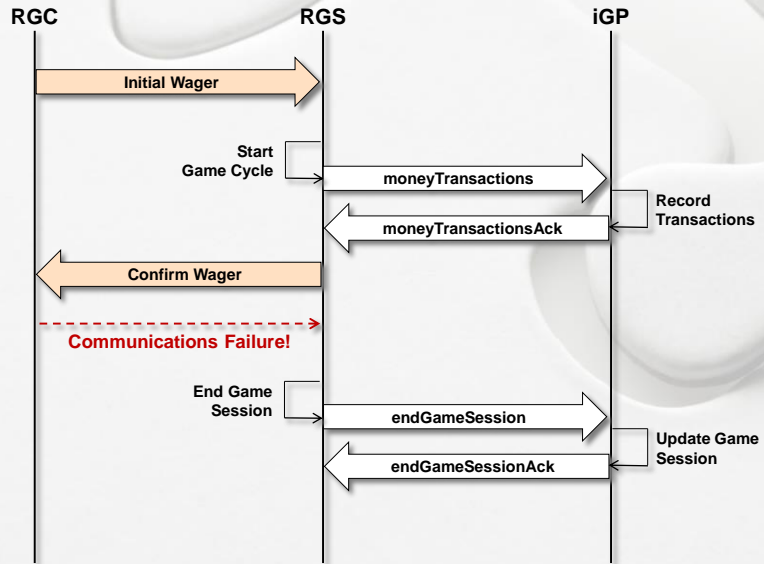
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Reconciliation Commands

- **Reconciliation commands are used to complete unfinished Game Cycles.**
- **Reconciliation commands are the same as Monetary Transactions, except no Secure Token is required.**
 - It is assumed that the Game Session has ended and that the Secure Token may have been discarded.
 - A Game Session and Secure Token are required to start a Game Cycle and place wagers, but not to complete the Game Cycle.

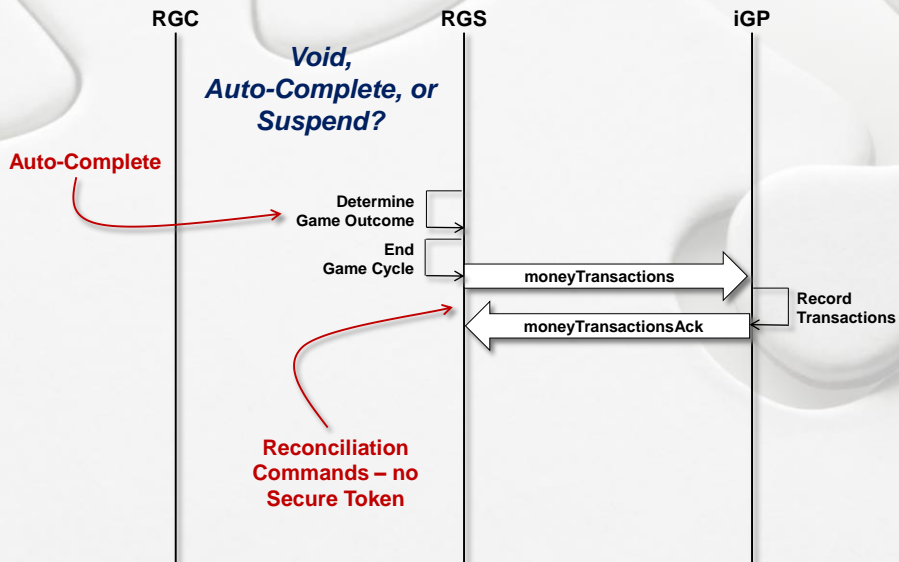
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Unfinished Game Cycle – Part 1



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Unfinished Game Cycle – Part 2

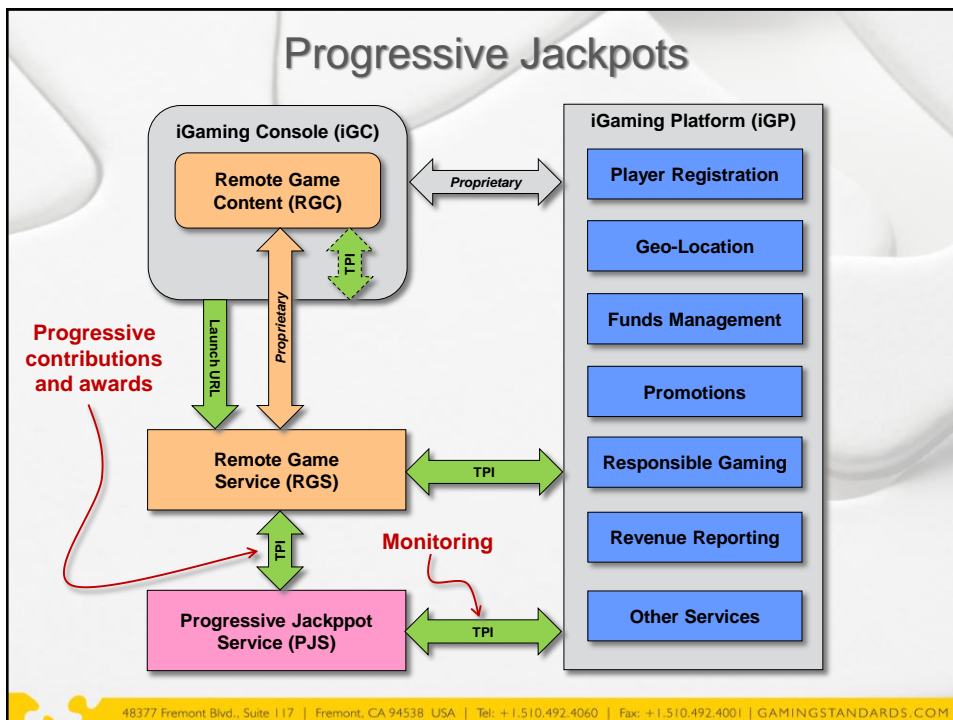


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Third-Party Game Interface

Progressive Jackpots

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Terminology

- **Jackpot Controller Identifier**
 - Identifies a specific Jackpot Controller managed by the Progressive Jackpot Service (PJS).
 - A Progressive Jackpot Service may manage more than one Jackpot Controller.
- **Jackpot Controller Type**
 - Indicates whether a Jackpot Controller supports standard or mystery progressive jackpots.
- **Jackpot Level Identifier**
 - Identifies a specific jackpot within a Jackpot Controller.

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Terminology

Progressive Jackpot Service

Jackpot Controller #1

Type = Standard

Jackpot Level #1

Jackpot Level #2

Jackpot Level #3

Jackpot Level #4

Jackpot Level #5

Jackpot Controller #2

Type = Mystery

Jackpot Level #1

Jackpot Level #2

Jackpot Controller #3

Type = Mystery

Jackpot Level #1

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Progressive Configuration

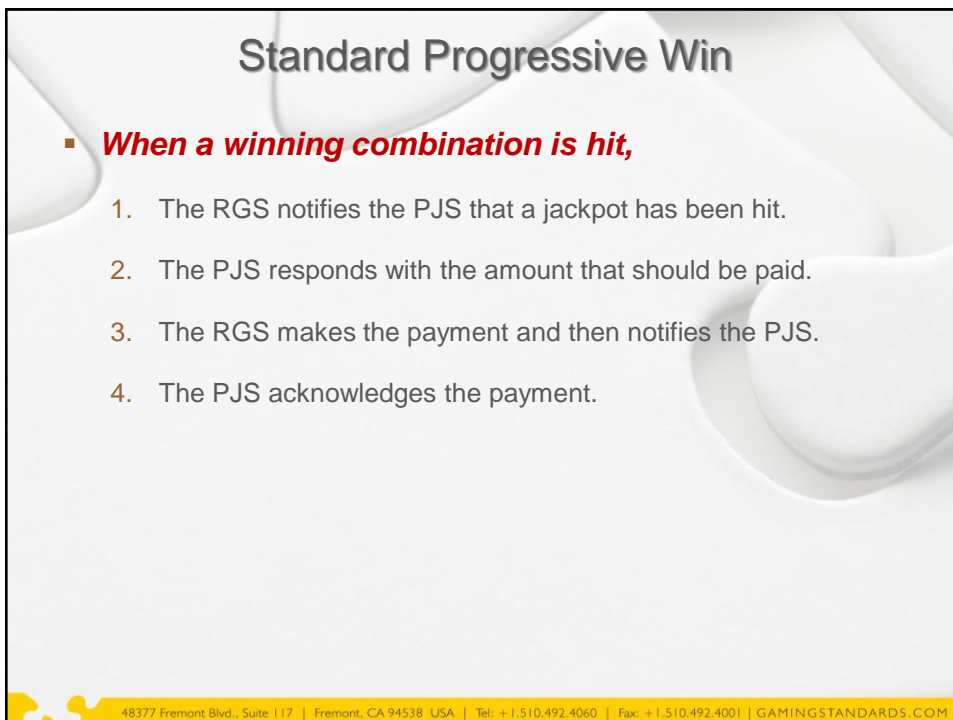
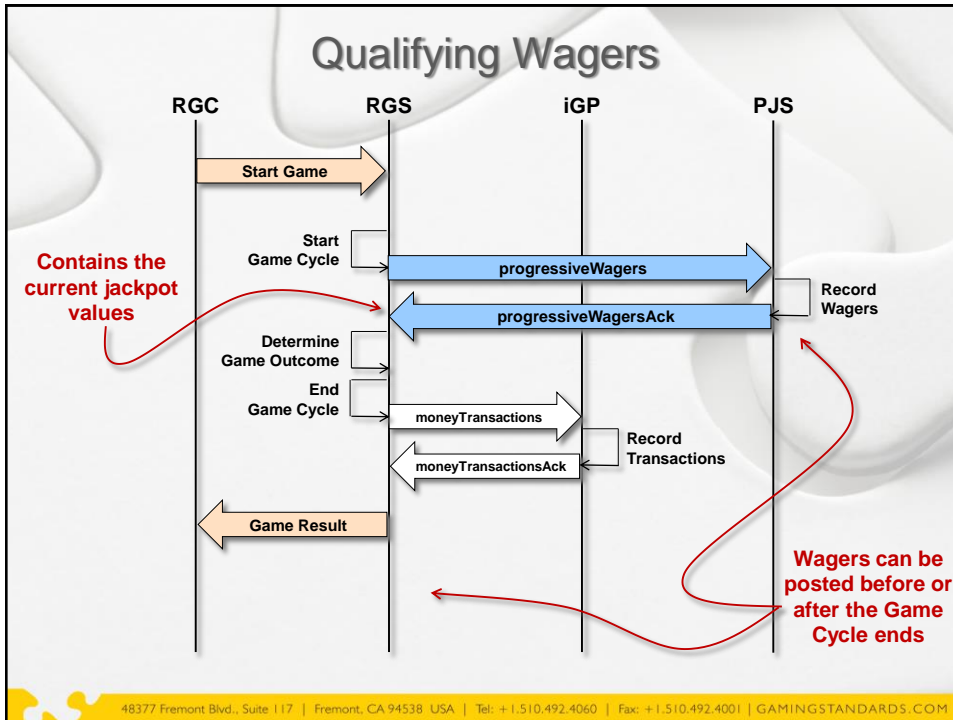
- ***Jackpot Controllers and Jackpot Levels are configured on the PJS.***
 - The RGS and iGP can read the information, but cannot change it.
 - Increment percent, maximum value, reset value, mystery minimum, mystery maximum, etc.
- ***The links between games and Jackpot Levels are configured on the RGS.***
 - The PJS and iGP can read the information, but cannot change it.
 - For standard progressives, Jackpot Levels are mapped to individual win levels (winning combinations) within a game.
 - For mystery progressives, Jackpot Levels are mapped to specific wager denominations.

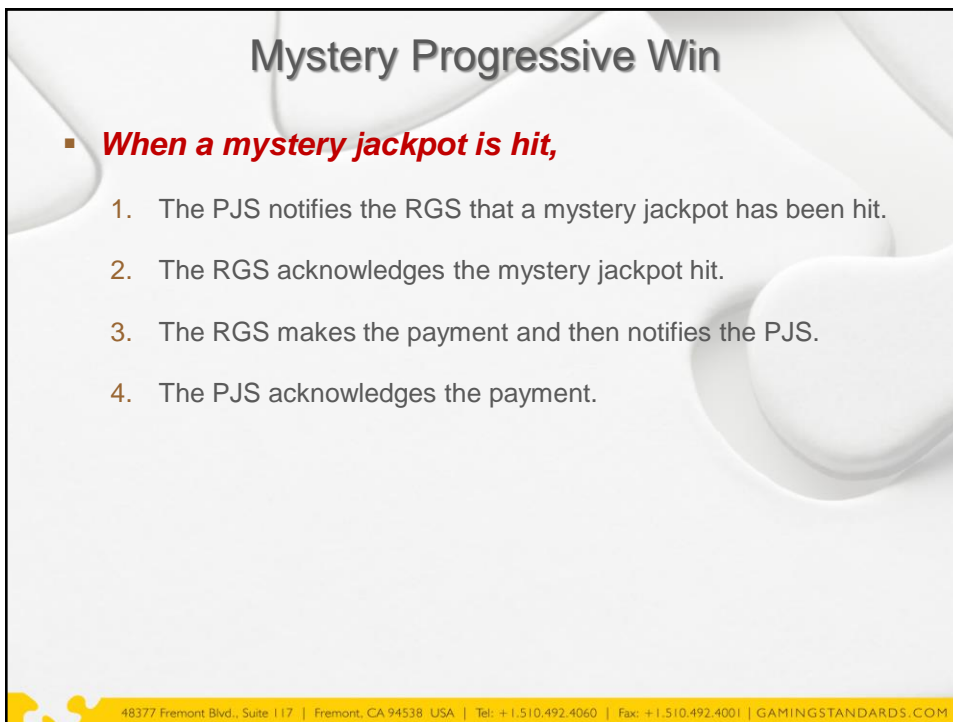
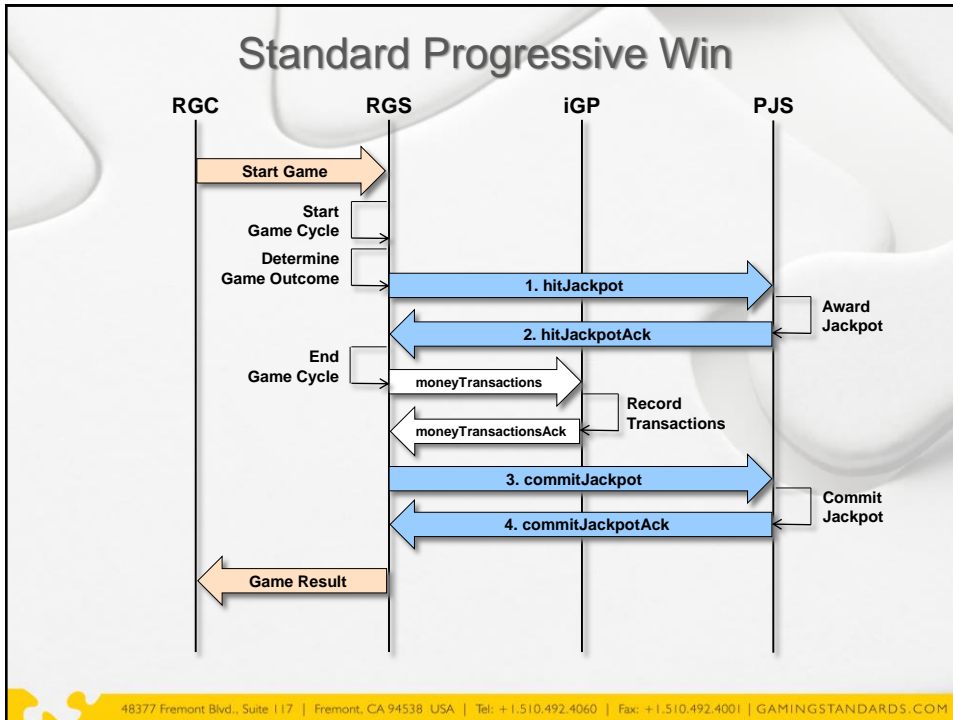
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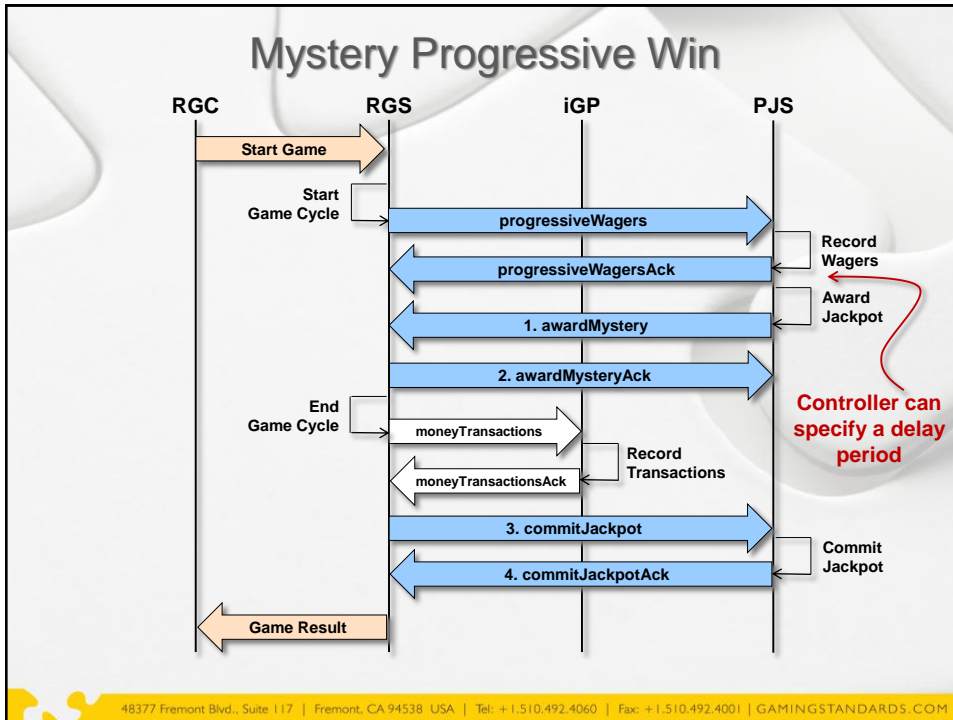
Qualifying Wagers

- ***When a game is played that is linked to a jackpot, the RGS reports the Qualifying Wagers to the PJS.***
 - Qualifying Wagers are reported by Jackpot Controller, not Jackpot Level.
 - The PJS is responsible for calculating the contribution to each Jackpot Level and incrementing the jackpot values.
 - A specific wager may be a Qualifying Wager for more than one Jackpot Controller.
- ***If a Game Cycle is voided, the Qualifying Wagers can also be voided.***

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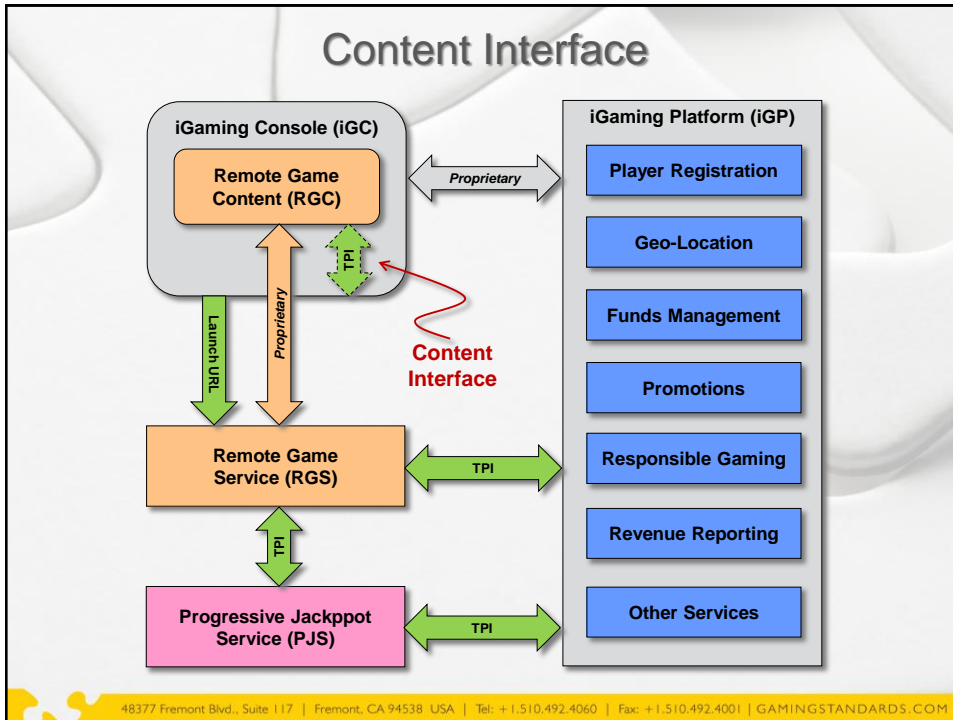






Third-Party Game Interface Content Interface

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- ## Content Interface
- ***The Content Interface is used to coordinate the activities of the iGaming Console (iGC) and the Remote Game Content (RGC).***
 - Account Balances.
 - Game State – Idle / Active.
 - Game Results – Wagers / Wins.
 - UI State – Mute / Language.
 - Jackpot Balances.
 - ***The protocol specifies which objects should be communicated, not how.***
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Third-Party Game Interface

Game Discovery

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Game Discovery

- ***The iGP can query the RGS to find out information about the set of games available on the RGS.***
- ***The game information cannot be changed by the iGP.***
 - It is intended to help operators configure the set of games offered by the iGP.

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Game Discovery

- ***The information supplied by the RGS includes:***
 - **Game Identifier.**
 - Game Type, Game Title, and Game Description.
 - Manufacturer, Release Number, Theme, and Paytable.
 - Base URL of the Third-Party Game Service.
 - A list of **Distribution Channels** in which the game is available.
 - A list of **Presentation Formats** in which the game is available.
 - A list of **Locales** (languages) in which the game can be displayed.
 - A list of **Currencies** in which that game can be played.
 - A list of **Jurisdictions** in which the game has been approved.
 - A list of **Betting Configurations** available for the game.
 - A list of additional **Manufacturer-Specific Parameters** that can be used when the game is launched.

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Third-Party Game Interface Event Reporting

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Event Reporting

- ***The Third-Party Game Interface includes a very flexible event reporting mechanism.***
- ***The GSA, as well as manufacturers, can define events.***
 - For example, Game Cycle Started, Game Cycle Finished, etc.
- ***Events can be reported by the iGP, RGS, or PJS.***
- ***Events can also be reported to a Central Monitoring System.***

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Event Reporting

- ***All events include:***
 - Event Identifier.
 - Event Code.
 - Event Description.
 - Date/time that the event occurred.
- ***Event-specific information can also be included with the events.***
 - The information is included in a sub-element of the event.
 - Different sub-elements can be defined for different events.
- ***For example, the Game Cycle Ended event might include a sub-element that contains a complete set of information about the game cycle.***

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Event Reporting

```
"TPI_eventReport": {
  "TPI_eventId": 1234,
  "TPI_eventCode": "TPI_CPE001",
  "TPI_eventText": "Invalid Remote Game Service Identifier",
  "TPI_eventDateTime": "2015-10-27T09:30:39-05:00"
  "TPI_gameEnded": {
    "TPI_brandId": "myBrand",
    "TPI_skinId": "mySkin",
    "TPI_gameId": "ABC_myGame",
    "TPI_betConfigId": "myBetConfig",
    "TPI_channelType": "TPI_HTML5",
    "TPI_presentType": "TPI_internet",
    "TPI_playerId": "00101977",
    "TPI_accountId": "Z100187",
    "TPI_currencyCode": "USD",
    "TPI_gameSessionId": "ABCD1234EFGH5678",
    "TPI_gameType": "TPI_spinningReel",
    "TPI_mfgCode": "ABC",
    "TPI_themeId": "ABC_myTheme",
    "TPI_paytableId": "ABC_myPaytable",
    "TPI_releaseNum": "1.2.3",
    "TPI_terminalId": "123.345.567.789",
    "TPI_affiliateId": "myAffiliate",
    "TPI_jurisdictionCode": "US-CT",
    "TPI_gameCycleId": "9876FEDC5432BAFE",
    "TPI_gameCycleExc": 1,
    "TPI_turnoverAmt": 100,
    "TPI_theoreticalWin": 96,
    "TPI_actualWin": 200,
    "TPI_timePlayed": 4,
    "TPI_gamesPlayed": 1
  }
}
```

Game Session
Information

Game Cycle
Information

ISO 3166-2

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Event Reporting

- **The set of events reported by an end-point, as well as the destination, are configured through an administrative interface.**
 - The protocol does not include a subscription mechanism.
- **The choice of events is based on operational and jurisdictional requirements.**

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Third-Party Game Interface

Central Monitoring

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Central Monitoring

- ***This is not easy!***
 - If it was, someone else would have already done it.
- ***We need to find a reasonable balance between regulatory requirements and system capabilities.***
 - Unfortunately, we may not be able to meet all requirements.
- ***We need to provide hooks that can be used to address unique regulatory requirements as well as unique system capabilities.***
 - The standard needs to accommodate supplier-specific and jurisdiction-specific extensions.

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United Kingdom

- ***The United Kingdom has taken a hands-off approach to monitoring online gaming activities.***
 - No requirements to verify players against a central system.
 - No requirements to check a central exclusion list.
 - No requirements to check responsible gaming limits.
 - No requirements for online reporting of gaming revenues.



- **Central monitoring is not an issue!**

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Italy

- ***Italy has taken a very different approach. All transactions must be approved by the central system before they take place.***
 - Player registrations must be approved by the central system.
 - Player deposits and withdrawals must be approved by the central system.
 - Game buy-ins and cash-outs must be approved by the central system.
- **The central system knows everything!**
 - There are no specific requirements to check exclusion lists or responsible gaming limits.
 - There are no specific requirements for online revenue reporting.



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France

- **France requires that a data collection module be inserted between the player and the gaming system. Critical transactions must be written to a “data vault” in a prescribed format.**
 - Player registration, deposits, withdrawals, wagers, wins, etc.
- **Provides general guidelines for reports that must be periodically posted to a central site.**



- **Players must be checked against a central exclusion list.**
- **Systems must allow players to set RG limits and self-exclude.**

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Spain

- **Spain requires that specific data be periodically written to a “safe” database in a prescribed format.**
 - Near Real-Time: wagers and wins.
 - Daily/Monthly: player registrations, various summaries of money movements.
- **Player identity must be verified against a central system.**
- **Players must be checked against a central exclusion list.**
- **Systems must allow players to set RG limits.**



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Denmark

- ***Denmark provides general guidelines for data that must be stored in auditable logs.***
 - Player registration, deposits, withdrawals, wagers, jackpot contributions, wins, adjustments, etc.
- ***Player identity must be verified against a central system.***
- ***Systems must allow players to set RG limits.***



- ***Players must be checked against a central exclusion list.***
- ***Self-exclusions must be recorded in the central exclusion list.***

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Belgium

- ***Belgium operates a centralized responsible gaming system which enforces nationwide loss limits.***
 - Game buy-ins (wagers) must be approved by the central system.
 - Cash-outs (wins), as well as session details, must be reported to the central system.
- ***Players must be registered in the central system.***
- ***Players must be checked against a centralized exclusion list.***
- ***There are no specific requirements for online revenue reporting.***



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New Jersey

- ***New Jersey provides general guidelines for the reports that must be generated by an operator. Systems must provide a mechanism for exporting the reported data in an approved format.***
- ***Player identity must be verified using an approved methodology.***
- ***Players must be within the physical boundaries of New Jersey.***
- ***Systems must allow players to set RG limits and self-exclude.***



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Commonalities

- ***Player Identification: player identity must be verified against a central database.***
- ***Exclusion Lists: players must be checked against a central exclusion list.***
- ***RG Limits: players must be able to set responsible gaming limits.***
- ***Transaction Logs: systems must be able to log critical transactions.***
- ***Periodic Reports: systems must be able to report win/loss and money movements for specific periods.***

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Central Monitoring

- *The OGC committee would like to find a jurisdiction (or jurisdictions) that has already decided that central monitoring will be required but has not decided the detail.*
- *The OGC committee would like to work with the jurisdiction to develop the central monitoring standard (or a part thereof).*

Gaming Standards Association

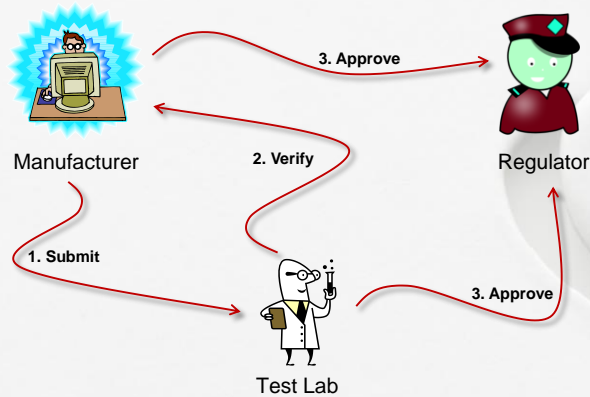
Regulatory Submission Standard

Regulatory Submission Standard

- ***In the past few years, a number of protocols have been developed for communicating product approval information between manufacturers, test labs, and regulators.***
 - Gaming Informatics
 - GLI
 - Ohio
 - Missouri
- ***The goal is to establish a single standard that can be used in all jurisdictions.***
 - And, that can be easily extended to meet unique needs.

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Regulatory Submission Standard



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Regulatory Submission Standard

- ***The submission information includes product information as well as expected GAT results.***
- ***The intent is to have one standard that can accommodate the needs of both land-based gaming and online gaming.***
- ***The S2S committee hopes to have the first draft ready for comment in January.***

Questions & Discussion

