VERSATILE GAME ENGINE MODELING

Symbol Distribution Editor used for adding and configuring Symbols. Supported Symbols are Normal, Scatter, Wild and Bonus.

Prize Table Editor used for defining symbol payouts per tier (matches). The tool has prize checking features and can automatically set Win Level events.

Wild Substitutions Editor used for defining Wild symbol substitutions for base game and free spins.

Free Spins Editor used for defining initial and additional free spins.

Wild Substitutions

⭐ Reset Wild Substitutions ⭐ Delete Substitution

WILD SYMBOL	▲ WILD MULTIPLIER	FIND SYMBOL	BASE GAME SUBSTITUTE
⊿ WILD SYMBOL: Atkins (W)			
Atkins (W)	×1	Steak	Steak
Atkins (W)	×1	Ham	Ham
Atkins (W)	×1	Buffalo Wings	Buffalo Wings
Atkins (W)	×1	Sausage	Sausage
Atkins (W)	×1	Eggs	Eggs
Atkins (W)	×1	Butter	Butter
Atkins (W)	×1	Cheese	Cheese
Atkins (W)	×1	Bacon	Bacon
Atkins (W)	×1	Mayonnaise	Mayonnaise

Symbol Distribution

⊕ Add Symbol ⊗ Delete Symbol ▦ Create Reels ✅ Validate Reels ▦ Update from Reels

SYMBOL	TYPE	MUL	REEL 1 Σ	REEL 1 δ	REEL 2 Σ	REEL 2 δ	REEL 3 Σ	REEL 3 δ	REEL 4 Σ	REEL 4 δ	REEL 5 Σ	REEL 5 δ
Atkins (W)	Wild	×1	1	0	1	0	1	0	1	0	1	0
Steak	Normal	-	2	0	3	0	2	0	2	0	3	0
Ham	Normal	-	2	0	3	0	3	0	3	0	4	0
Buffalo Wings	Normal	-	3	0	3	0	3	0	3	0	3	0
Sausage	Normal	-	3	0	2	0	3	0	4	0	4	0
Eggs	Normal	-	4	0	3	0	3	0	3	0	3	0
Butter	Normal	-	4	0	3	0	4	0	4	0	4	0
Cheese	Normal	-	3	0	4	0	4	0	4	0	4	0
Bacon	Normal	-	4	0	4	0	4	0	5	0	4	0
Mayonnaise	Normal	-	4	0	5	0	4	0	4	0	3	0
Total:			**32**		**32**		**32**		**32**		**32**	

Bacon

Free Spins

▦ Add Free Spins ⊗ Delete Free Spins

SCATTER COUNT	INITIAL FREE SPINS	ADDITIONAL FREE SPINS
5	10	10
4	10	10
3	10	10

Prize Table

◎ Retarget RTP ... ⬇ Default Bet Levels ⊘ Default Coin Values ⚡ Auto Win Levels

SYMBOL	5 IN A ROW	×3	4 IN A ROW	×3	3 IN A ROW	×3	2 IN A ROW	×3
Atkins (W)	5,000	✓	500	✓	50	✓	5	✓
Steak	1,000	✓	200	✓	40	✓	3	✓
Ham	500	✓	150	✓	30	✓	2	✓
Buffalo Wings	300	✓	100	✓	25	✓	2	✓
Sausage	200	✓	75	✓	20	✓	0	✓
Eggs	200	✓	75	✓	20	✓	0	✓
Butter	100	✓	50	✓	15	✓	0	✓
Cheese	100	✓	50	✓	15	✓	0	✓
Bacon	50	✓	25	✓	10	✓	0	✓
Mayonnaise	50	✓	25	✓	10	✓	0	✓
Scale (S)	100	✓	25	✓	5	✓	0	✓
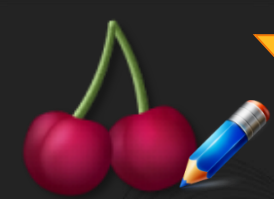
USER DEFINED WIN LEVELS, TOP PRIZE AND JACKPOT EVENTS

Small Win event occurs when Winnings are greater or equal to 20 x Bet amount. Value can be adjusted in Workbench.

Medium Win event occurs when Winnings are greater or equal to 40 x Bet amount. Value can be adjusted in Workbench.

Big Win event occurs when Winnings are greater or equal to 60 x Bet amount. Value can be adjusted in Workbench.

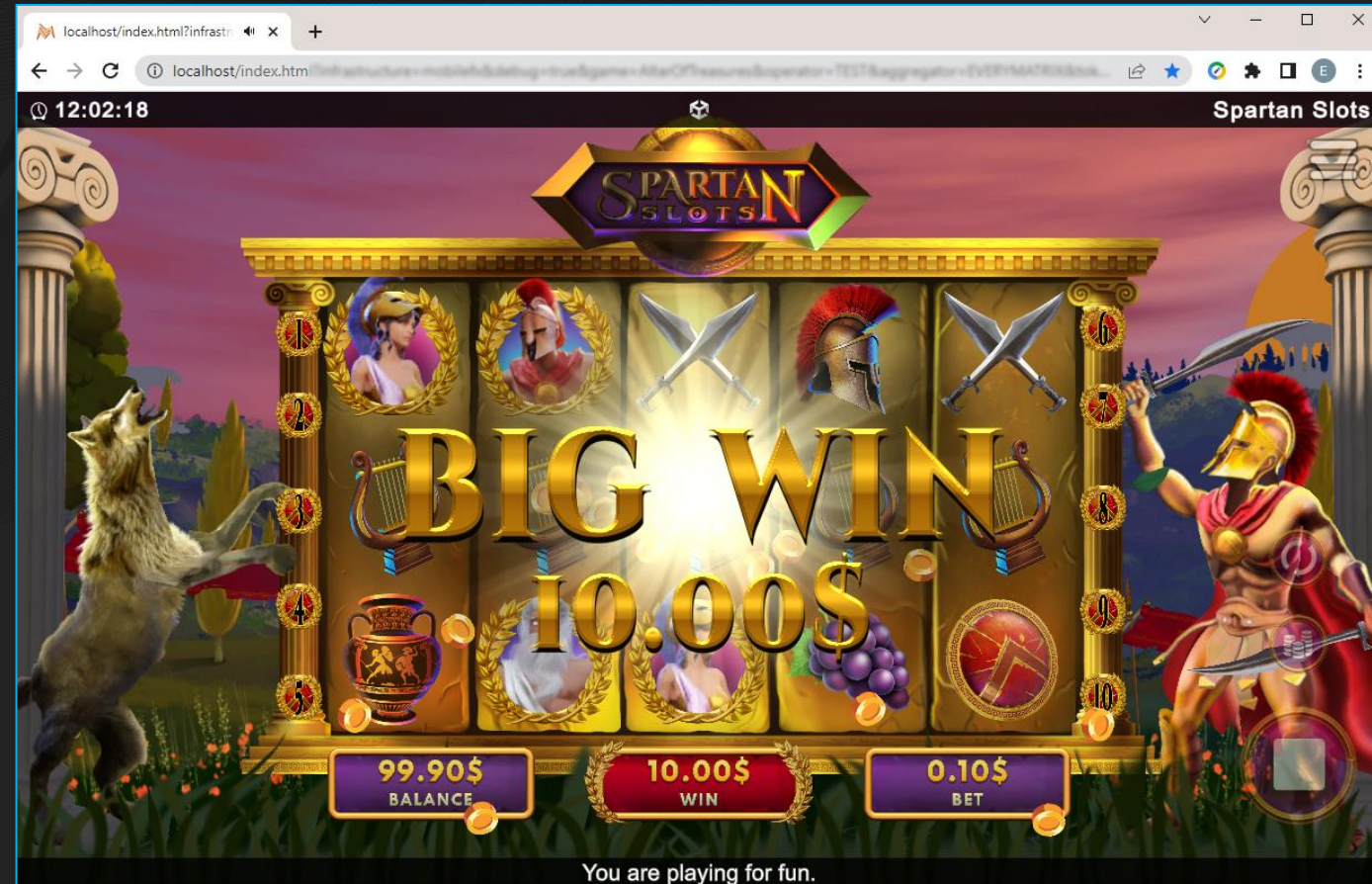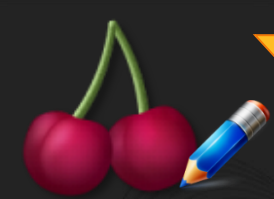**Mega Win** event occurs when Winnings are greater or equal to 80 x Bet amount. Value can be adjusted in Workbench.

Top Prize event occurs when Player riches Operator defined Maximum Win Cap.

Jackpot event occurs when Player wins the Jackpot.

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AUTOMATED REELS SYMBOL DISTRIBUTION AND PAY LINES GENERATION

Reel Strips

Add Reel Remove Reel Insert Symbol Remove Symbol

STOP	REEL 1	REEL 2	REEL 3	REEL 4	REEL 5
1	Scale (S)	Mayonnaise	Ham	Ham	Bacon
2	Mayonnaise	Buffalo Wings	Butter	Cheese	Scale (S)
3	Ham	Steak	Eggs	Atkins (W)	Steak
4	Sausage	Sausage	Scale (S)	Scale (S)	Ham
5	Bacon	Cheese	Cheese	Butter	Cheese
6	Eggs	Mayonnaise	Mayonnaise	Bacon	Sausage
7	Cheese	Ham	Butter	Cheese	Butter
8	Mayonnaise	Butter	Ham	Sausage	Bacon
9	Sausage	Bacon	Sausage	Steak	Buffalo Wings
10	Butter	Steak	Bacon	Eggs	Cheese
11	Buffalo Wings	Sausage	Steak	Bacon	Sausage
12	Bacon	Mayonnaise	Buffalo Wings	Mayonnaise	Ham
13	Eggs	Ham	Butter	Sausage	Butter
14	Mayonnaise	Atkins (W)	Mayonnaise	Cheese	Steak
15	Steak	Butter	Cheese	Butter	Mayonnaise
16	Buffalo Wings	Eggs	Sausage	Ham	Eggs
17	Butter	Cheese	Eggs	Mayonnaise	Sausage
18	Cheese	Bacon	Bacon	Bacon	Ham

Reel Strips Editor used for creating the Reels of a slot game. A game can have any number of reels and each reel can have an arbitrary number of Symbols.

Reels can be automatically created by defining the number of Symbols (Σ) and the minimum distance between same symbols (δ).

Pay Lines

1   2   3   4   5   6   7   8   9

mobileFX RGS Workbench

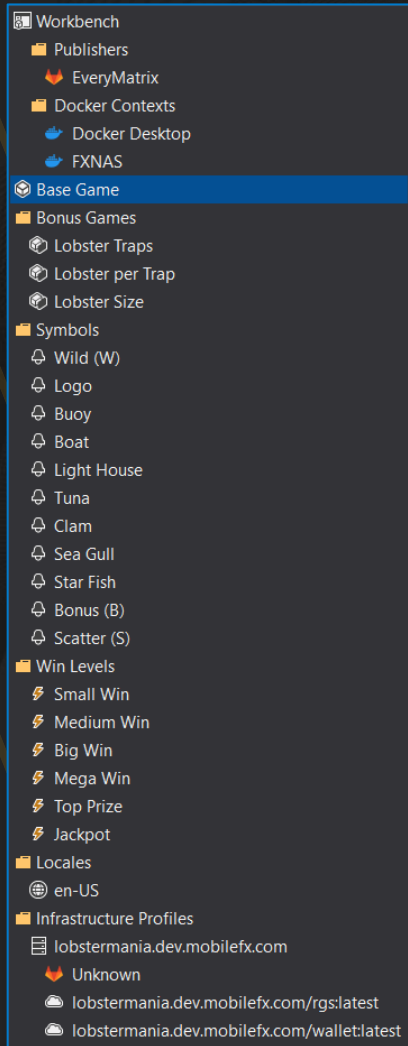How many Pay Lines to generate? Set to 0 to generate all possible Pay Lines.

20

OK   Cancel

Pay Lines Editor used for adding pay lines and drawing their layout. The software can automatically generate all possible pay lines.

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GAME COMPONENTS AND PROPERTIES

Workbench
- Publishers
  - EveryMatrix
- Docker Contexts
  - Docker Desktop
  - FXNAS
- **Base Game**
- Bonus Games
  - Lobster Traps
  - Lobster per Trap
  - Lobster Size
- Symbols
  - Wild (W)
  - Logo
  - Buoy
  - Boat
  - Light House
  - Tuna
  - Clam
  - Sea Gull
  - Star Fish
  - Bonus (B)
  - Scatter (S)
- Win Levels
  - Small Win
  - Medium Win
  - Big Win
  - Mega Win
  - Top Prize
  - Jackpot
- Locales
  - en-US
- Infrastructure Profiles
  - lobstermania.dev.mobilefx.com
    - Unknown
    - lobstermania.dev.mobilefx.com/rgs:latest
    - lobstermania.dev.mobilefx.com/wallet:latest

Base Game

Game ID	a1cfa8af-0310-0de5-5a28-87832bb84f82
Game Name	**Atkins Diet**
Game Version	**1.0.0.0**

Operator

Vendor Name	**mobileFX**
Operator Name	**mobileFX**
Operator ID	
Operator Locale	**en-US**
Operator Locale Tokens Encoding	Unicode
Operator Wallet	**BlockChainWallet**
Operator Wallet Type	Backend Wallet
Operator Credit Rule	Credit Winnings Before Show Ticket

Game Design

Reels	5
Reel Visible Rows	3
Max Free Spins	0
Scatter Count For Free Spin Rounds	3
Variable Pay Lines	✔
Coinciding Pay Rule	Highest Prize
Prefer Line of Wilds if Pays the Same	✔
Pay Lines Direction	Left to Right
Base Game Multiplier Rule	Max
Free Spins Multiplier	3
Coin Values	1, 2, 5, 10, 20, 25, 50, 75, 100, 200
Bet Levels	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 20, 50, 100

Game Client

Game Client Build Path	
Unity3D Loader File	${GameClientBuildPath}/WebGL.loader.js
Unity3D Data File	${GameClientBuildPath}/WebGL.data
Unity3D WebASM File	${GameClientBuildPath}/WebGL.wasm
Unity3D Framework File	${GameClientBuildPath}/WebGL.framework.js
API Game Version	v2 (Unity3D)
API Game Protocol	JSON
Default Bet Line Index	0
Default Bet Level Index.	0
Default Coin Value Index	0

Game Components are configurable entities selectable by a tree structure, used for fast access and edit of game property subsets.
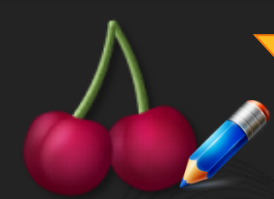
Operator Settings contain Operator-specific game identification and functional settings, including Wallet implementation and topology as well as Operator Credit Rule, which is often subject to jurisdiction regulations.

Game Design group contains common Slot game properties such as Reel View size, Scatter Count for Free Spins, Payline Direction, Coinciding Rule Strategy, Multipliers, Coin Values, Bet Levels, etc.
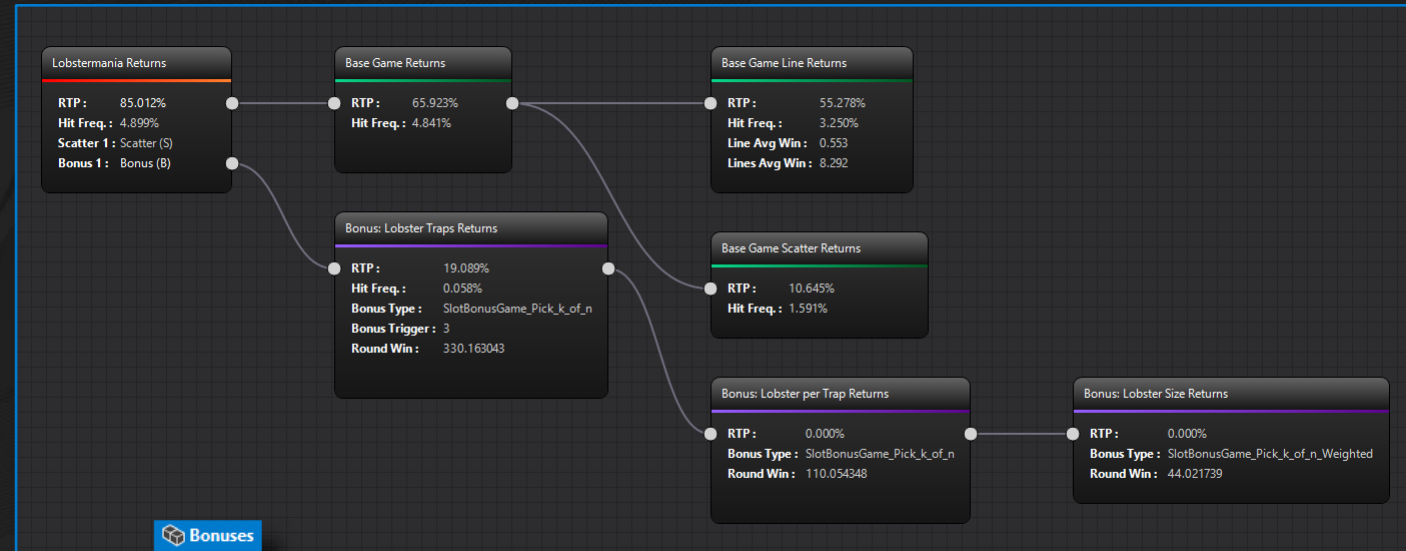
Game Client settings link the project with a Unity3D WebGL Game.

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INSTANT WIN (PICK K OF N) BONUS GAMES

Bonus Game Editor used for creating Weighted Pick k of n Instant Win Games. A Bonus Game is triggered by a dedicated Bonus Symbol. The Game Engine supports unlimited nested Bonus Games (Bonus game within Bonus Game, Bonus Game Levels). The Game Engine supports multiple Bonus Games and multiple Bonus Symbols.

Game Graph Viewer displays Base Game to Bonus and Bonus to Bonus trigger relations as well as RTP contribution and Hit Frequency of each game feature.

Lobstermania Returns
RTP : 85.012%
Hit Freq. : 4.899%
Scatter 1 : Scatter (S)
Bonus 1 : Bonus (B)

Base Game Returns
RTP : 65.923%
Hit Freq. : 4.841%

Base Game Line Returns
RTP : 55.278%
Hit Freq. : 3.250%
Line Avg Win : 0.553
Lines Avg Win : 8.292

Bonus: Lobster Traps Returns
RTP : 19.089%
Hit Freq. : 0.058%
Bonus Type : SlotBonusGame_Pick_k_of_n
Bonus Trigger : 3
Round Win : 330.163043

Base Game Scatter Returns
RTP : 10.645%
Hit Freq. : 1.591%

Bonus: Lobster per Trap Returns
RTP : 0.000%
Bonus Type : SlotBonusGame_Pick_k_of_n
Round Win : 110.054348

Bonus: Lobster Size Returns
RTP : 0.000%
Bonus Type : SlotBonusGame_Pick_k_of_n_Weighted
Round Win : 44.021739

📦 **Bonuses**

Bonus Game: Lobster Size   ▼ 🎲 Add Bonus ...   ❌ Delete Bonus

LBOUND	UBOUND	AWARD	WEIGHT	PROBABILITY	RETURNS
0	9	10	10.00000000	0.03105590	0.31055901
10	14	5	5.00000000	0.01552795	0.07763975
15	19	6	5.00000000	0.01552795	0.09316770
20	24	7	5.00000000	0.01552795	0.10869565
25	29	8	5.00000000	0.01552795	0.12422360
30	39	10	10.00000000	0.03105590	0.31055901
40	49	12	10.00000000	0.03105590	0.37267081
50	59	15	10.00000000	0.03105590	0.46583851
60	79	20	20.00000000	0.06211180	1.24223602
80	99	22	20.00000000	0.06211180	1.36645963
100	119	25	20.00000000	0.06211180	1.55279503
120	139	27	20.00000000	0.06211180	1.67701863
140	158	30	19.00000000	0.05900621	1.77018634
159	180	35	22.00000000	0.06832298	2.39130435
181	204	45	24.00000000	0.07453416	3.35403727
Total:			322.00000000		44.02173913

RETURN TO PLAYER CALCULATION (FULL CYCLE ANALYSIS)

Altar of Treasures RTP Calculation　　　　Cancel

Please wait while running full cycle RTP calculation ...

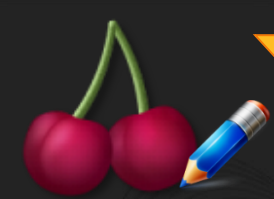|	
Bet Lines:	1
Full Cycle:	503,284,375 combinations
Processed:	136,033,062 combinations
Thruput (average):	68.02 million combinations / sec
Progress:	27.03 %
Elapsed Time:	2 sec
Remaining Time:	5 sec

Full Cycle Analysis algorithm utilizes multiple CPU-cores and calculates Hits, Probabilities and Returns of all possible reel combinations. Full Cycle method calculates **accurate Base Game RTP**; Free Spins RTP is calculated statistically by calculating the probabilities of triggering initial and additional free spins and further verified by simulation.

Prize Rule Permutations are automatically computed during Full Cycle analysis by compiling Pay Table Prizes. Each Prize Rule holds the pay amount per [Normal + Wild] Symbol occurrences. Any coinciding rules are eliminated and Prize Rules are stored in a tree structure for fast Win Line identification and winnings lookup.

⊞ Prize Rule Permutations

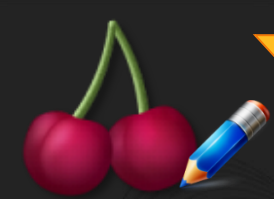| SYMBOL ▲	S + W	REEL 1	REEL 2	REEL 3	REEL 4	REEL 5	BASE GAME HITS	BASE GAME PROBABILITY	SYMBOL PAY	BASE GAME MULTIPLIER	BASE GAME LINE PAY	BASE GAME TOTAL PAY	BASE GAME RETURNS
◢ SYMBOL: Atkins (W)													
Atkins (W)	0 + 2	Atkins (W)	Atkins (W)	-			1,024	0.00003052	5	×1	5	5,120	0.00015259
Atkins (W)	0 + 3	Atkins (W)	Atkins (W)	Atkins (W)	-		513	0.00001529	50	×1	50	25,650	0.00076443
Atkins (W)	0 + 4	Atkins (W)	Atkins (W)	Atkins (W)	Atkins (W)	-	28	0.00000083	500	×1	500	14,000	0.00041723
Atkins (W)	0 + 5	Atkins (W)	Atkins (W)	Atkins (W)	Atkins (W)	Atkins (W)	1	0.00000003	5,000	×1	5,000	5,000	0.00014901
◢ SYMBOL: Bacon													
Bacon	2 + 0	Bacon	Bacon	-			524,288	0.01562500	0	×1	0	0	0.00000000
Bacon	1 + 1	Bacon	Atkins (W)	-			131,072	0.00390625	0	×1	0	0	0.00000000
Bacon	1 + 1	Atkins (W)	Bacon	-			131,072	0.00390625	0	×1	0	0	0.00000000
Bacon	3 + 0	Bacon	Bacon	Bacon	-		53,248	0.00158691	10	×1	10	532,480	0.01586914
Bacon	1 + 2	Bacon	Atkins (W)	Atkins (W)	-		3,328	0.00009918	10	×1	10	33,280	0.00099182
Bacon	1 + 2	Atkins (W)	Bacon	Atkins (W)	-		3,328	0.00009918	10	×1	10	33,280	0.00099182
Bacon	1 + 2	Atkins (W)	Atkins (W)	Bacon	-		3,328	0.00009918	10	×1	10	33,280	0.00099182
Bacon	2 + 1	Bacon	Bacon	Atkins (W)	-		13,312	0.00039673	10	×1	10	133,120	0.00396729
Total:							1,829,888	0.05453491				21,293,527	0.63459656

CONFIDENCE LEVELS

Confidence Levels are calculated during Full Cycle analysis per Bet Line for 1,000 to 1,000,000,000 spins for 90%, 95% and 99% intervals.

During Simulation (if enabled) raw winnings are recorded into a dynamic Histogram and progressive RTP is rendered on top of Confidence Levels Chart (blue dots in chart), thus proving the game behaves within acceptable limits.
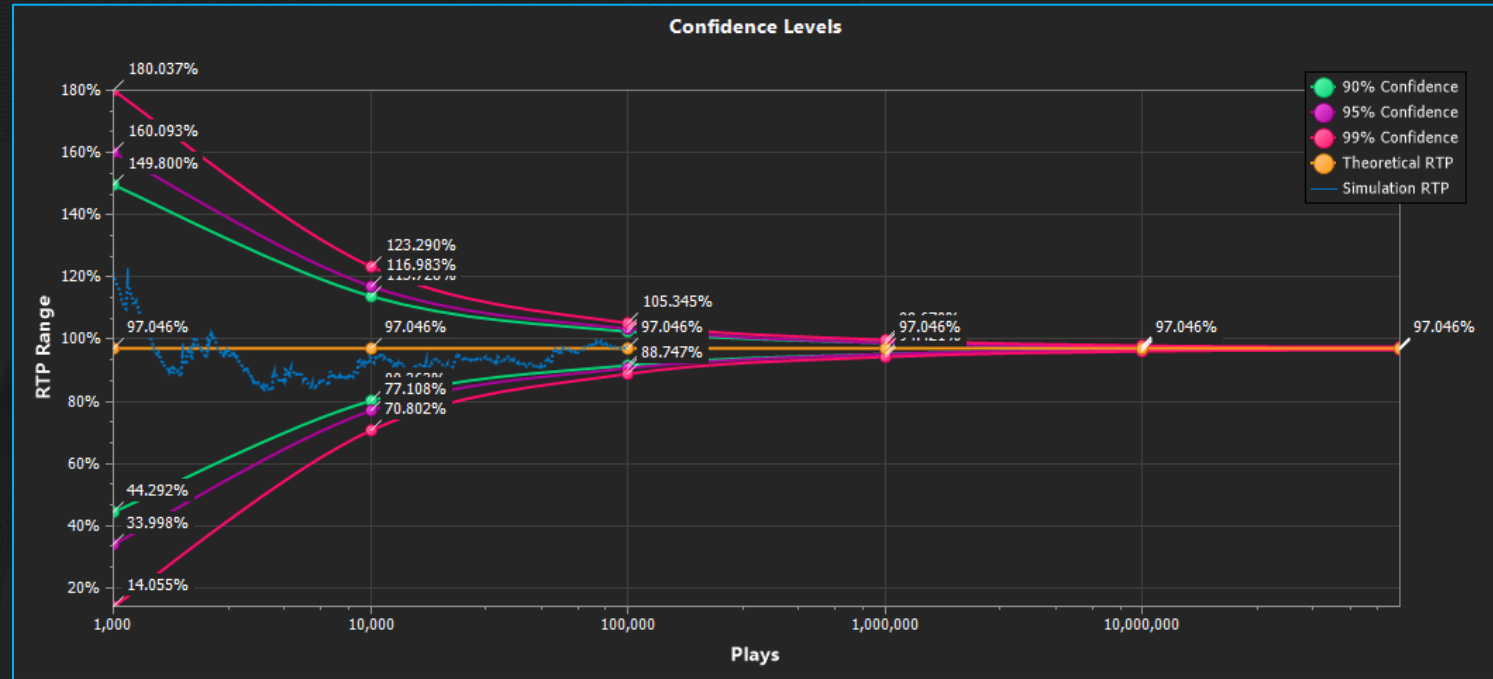
Confidence Levels

BET LINES	PLAYS	FULL CYCLE RTP	90% CONFIDENCE RANGE	90% CONFIDENCE LOWER RTP	90% CONFIDENCE HIGHER RTP	95% CONFIDENCE RANGE	95% CONFIDENCE LOWER RTP	95% CONFIDENCE HIGHER RTP	99% CONFIDENCE RANGE	99% CONFIDENCE LOWER RTP	99% CONFIDENCE HIGHER RTP
1	800,000,000	97.046%	± 0.059%	96.987%	97.105%	± 0.070%	96.975%	97.116%	± 0.093%	96.953%	97.139%
1	900,000,000	97.046%	± 0.056%	96.990%	97.101%	± 0.066%	96.979%	97.112%	± 0.087%	96.958%	97.133%
1	1,000,000,000	97.046%	± 0.053%	96.993%	97.099%	± 0.063%	96.983%	97.109%	± 0.083%	96.963%	97.129%
▲ BET LINES: 2											
2	1,000	97.046%	± 37.303%	59.743%	134.348%	± 44.581%	52.464%	141.627%	± 58.684%	38.362%	155.729%
2	2,000	97.046%	± 26.377%	70.669%	123.423%	± 31.524%	65.522%	128.569%	± 41.496%	55.550%	138.541%
2	3,000	97.046%	± 21.537%	75.509%	118.582%	± 25.739%	71.307%	122.785%	± 33.881%	63.165%	130.927%

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HITS, PROBABILITIES, RETURNS

Reel View Probabilities

SYMBOL ▲	REEL INDEX	SYMBOL COUNT	REEL SYMBOLS	PROBABILITY
SYMBOL: A				
A	1	6	40	0.45000000
A	2	5	40	0.37500000
A	3	5	40	0.37500000
A	4	7	40	0.52500000
A	5	6	40	0.45000000
SYMBOL: J				
J	1	6	40	0.45000000
J	2	5	40	0.37500000
J	3	5	40	0.37500000
J	4	5	40	0.37500000

Line Hits

Multiplier: ×1 ×2 ×4 ×8 ×16 [Total]

SYMBOL	5 IN A ROW	4 IN A ROW	3 IN A ROW	2 IN A ROW	TOTAL
TEN	8,575	60,025	323,400	0	392,000
J	16,128	64,512	380,160	0	460,800
Q	14,112	79,968	443,520	0	537,600
K	15,552	88,128	414,720	0	518,400
A	15,552	88,128	357,120	0	460,800
P1	2,520	22,680	142,800	0	168,000
P2	1,260	15,540	117,600	0	134,400
P3	160	6,240	57,600	0	64,000
Total:	**73,859**	**425,221**	**2,236,920**	**0**	**2,736,000**

Line Probabilities

Multiplier: ×1 ×2 ×4 ×8 ×16 [Total]

SYMBOL	5 IN A ROW	4 IN A ROW	3 IN A ROW	2 IN A ROW	TOTAL
TEN	0.00008374	0.00058618	0.00315820	0.00000000	0.00382812
J	0.00015750	0.00063000	0.00371250	0.00000000	0.00450000
Q	0.00013781	0.00078094	0.00433125	0.00000000	0.00525000
K	0.00015187	0.00086063	0.00405000	0.00000000	0.00506250
A	0.00015187	0.00086062	0.00348750	0.00000000	0.00450000
P1	0.00002461	0.00022148	0.00139453	0.00000000	0.00164063
P2	0.00001230	0.00015176	0.00114844	0.00000000	0.00131250
P3	0.00000156	0.00006094	0.00056250	0.00000000	0.00062500
Total:	**0.00072128**	**0.00415255**	**0.02184492**	**0.00000000**	**0.02671875**

Hits, Probabilities, Returns are calculated during Full Cycle analysis and reported per Multiplier and per Symbol. Workbench also calculates Reel View probabilities per Symbol and Scatter probabilities and Returns per Tier.

Line Returns

Multiplier: ×1 ×2 ×4 ×8 ×16 [Total]

SYMBOL	5 IN A ROW	4 IN A ROW	3 IN A ROW	2 IN A ROW	TOTAL
TEN	0.00632813	0.00885937	0.01856250	0.00000000	0.03375000
J	0.01151719	0.00921375	0.02111484	0.00000000	0.04184578
Q	0.01316250	0.01864687	0.04021875	0.00000000	0.07202812
K	0.01378125	0.03904688	0.03675000	0.00000000	0.08957812
A	0.01759570	0.03988359	0.03305859	0.00000000	0.09053789
P1	0.00675000	0.01822500	0.02868750	0.00000000	0.05366250
P2	0.00369141	0.01821094	0.03691406	0.00000000	0.05881641
P3	0.00234375	0.03427734	0.04218750	0.00000000	0.07880859
Total:	**0.07516992**	**0.18636375**	**0.25749375**	**0.00000000**	**0.51902742**

Scatter Returns

SCATTERS	PAY	HITS	PROBABILITY	RETURNS
5	250	2,916	0.00002848	0.00711914
4	100	115,020	0.00112324	0.11232422
3	10	1,713,960	0.01673789	0.16737891
Total:	**360**	**1,831,896**	**0.01788961**	**0.28682227**
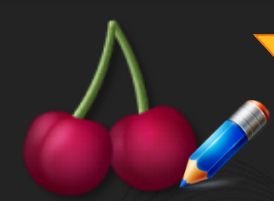
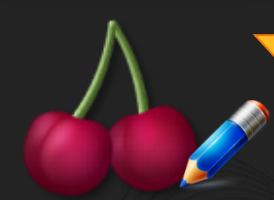# HITS, PROBABILITIES, RETURNS

Free Spins Returns are calculated during Full Cycle analysis and reported per Scatter Tier, displaying probabilities for Initial Free Spins and Additional Free Spins, Scatter Probability, Expected Free Spins, Average Win and contribution to RTP.

Free Spins Returns

SCATTERS	INITIAL FREE SPINS	ADDITIONAL FREE SPINS	SCATTER PROBABILITY (CONTRIBUTING TO FREE SPINS)	INITIAL FREE SPINS PROBABILITY $n_1 p_1$	ADDITIONAL FREE SPINS PROBABILITY $n_2 p_2$	EXPECTED FREE SPINS $n_1/(1-n_2 p_2)$	EXPECTED FREE SPINS AVERAGE WIN $n_1 p_1/(1-n_2 p_2)$	WINS PER FREE SPIN	RETURNS
5	15	5	0.00002848	0.00042715	0.00014238	16.47352460	0.00046911	1.61169937	0.00075606
4	10	5	0.00112324	0.01123242	0.00561621	10.98234973	0.01233584	1.61169937	0.01988166
3	5	5	0.01673789	0.08368945	0.08368945	5.49117487	0.09191068	1.61169937	0.14813239
Total:			**0.01788961**	**0.09534902**	**0.08944805**		**0.10471563**		**0.16877012**

Bonus Returns are calculated during Full Cycle analysis and reported per Bonus Game and Bonus Symbol, displaying Average Returns, Bonus Game Probability and Bonus Game contribution to RTP.

Bonus Games Returns

BONUS GAME	BONUS LEVEL	BONUS SYMBOL	SYMBOL COUNT MIN	SYMBOL COUNT MAX	PER SPIN AVERAGE RETURNS	PER SPIN BONUS RETURNS	BONUS GAME PROBABILITY	BONUS GAME RETURNS
Lobster Traps	First	Bonus (B)	3	Unlimited	3.00000000	330.16304348	0.00057817	0.19088983
Lobster per Trap	Next				2.50000000	110.05434783	0.00000000	0.00000000
Lobster Size	Next				44.02173913	44.02173913	0.00000000	0.00000000
Total:							**0.00057817**	**0.19088983**

VOLATILITY INDEX

BetLine Statistics

BET LINES	BASE GAME VARIANCE	BASE GAME STANDARD DEVIATION WIN	BASE GAME STANDARD DEVIATION RTP	FREE SPINS VARIANCE	FREE SPINS STANDARD DEVIATION WIN	FREE SPINS STANDARD DEVIATION RTP	TOTAL VARIANCE	TOTAL STANDARD DEVIATION WIN	TOTAL STANDARD DEVIATION RTP	90% CONFIDENCE VOLATILITY INDEX	95% CONFIDENCE VOLATILITY INDEX	99% CONFIDENCE VOLATILITY INDEX
3	144.138	12.00574843	4.00191614	166.278	12.89488788	4.29829596	310.416	17.61863016	5.87287672	9.63151782	11.51083837	15.15202194
4	192.184	13.86304418	3.46576104	221.704	14.88973398	3.72243349	413.888	20.34424173	5.08606043	8.34113911	9.96867845	13.12203592
5	240.230	15.49935458	3.09987092	277.130	16.64722867	3.32944573	517.360	22.74555373	4.54911075	7.46054162	8.91625706	11.73670573
6	288.276	16.97869226	2.82978204	332.556	18.23612532	3.03935422	620.832	24.91650573	4.15275095	6.81051157	8.13939187	10.71409746
7	336.322	18.33908365	2.61986909	387.982	19.69726660	2.81389523	724.304	26.91290212	3.84470030	6.30530850	7.53561259	9.91932678
8	384.368	19.60530509	2.45066314	443.408	21.05726373	2.63215797	827.776	28.77110258	3.59638782	5.89807603	7.04892013	9.27868058
9	432.414	20.79456626	2.31050736	498.834	22.33460097	2.48162233	931.248	30.51636260	3.39070696	5.56075941	6.64578563	8.74802395
10	480.460	21.91939745	2.19193974	554.260	23.54273656	2.35427366	1,034.720	32.16707057	3.21670706	5.27539957	6.30474583	8.29910421
11	528.506	22.98925799	2.08993254	609.686	24.69183041	2.24471186	1,138.192	33.73710824	3.06700984	5.02989614	6.01133929	7.91288539
12	576.552	24.01149686	2.00095807	665.113	25.78977576	2.14914798	1,241.665	35.23726032	2.93643836	4.81575891	5.75541919	7.57601097

Volatility Index is a measure of how often a Slot is likely to hit a winning combination and consequently its average payout size. During Full Cycle analysis RGS Workbench calculates statistical Variance, Standard Deviation and Volatility Index per Bet Line. Using Workbench Monte Carlo Simulator and Variance Charts, game developers can better visualize a game's variance.

Variance	Volatility Index	Win Frequency	Win Sizes	Description
Very High	13 – 16	Vey Rare	Very Big	Very high risk, very high reward
High	9 – 12	Rare	Big	high risk, high reward
Medium	5 – 8	Average	Average	average risk, average reward
Low	1 – 4	Often	Small	low risk, low reward

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MONTE CARLO SIMULATOR

mobileFX RGS Workbench (pre-alpha) - Neon Burst

File   Game Engine   Game Client   Deployment   View   Help

Maximized Workspace View

Open Design ...   Save Design   Calculate RTP   Refresh   Export Excel PAR sheet ...   Infrastructure: neonburst.dev.everymatrix.com   Start RGS Server   Stop RGS Server   Start RGS in Docker   Stop RGS Docker

Game Graph   Reel Strips   Bonuses   Prize Rule Permutations   Prize Rule Combinations   Simulation   Visualization   Localization   Responsible Gaming   Integration   µServices

Start Simulation   Stop Simulation   Refresh Datasets

Wager: bet lines: 10   bet level: 1   coin value: £0.01   stake: £0.10   Simulation: players: 1e3   x   spins: 1e5   integral: 1eX   Presets   Options   Charts

PLAYER	COIN VALUE	BET LINES	TOTAL PLAYS	PLAYS NO WINS	PLAYS WINS ≤ BET	PLAYS WINS > BET	PLAYS ANY WINS (HIT FREQ.)	TOTAL BET	BASE GAME LINE RETURNS	BASE GAME SCATTER RETURNS	TOTAL FREE SPINS RETURNS	RTP	TOTAL HITS	STANDARD DEVIATION WIN	STANDARD DEVIATION RTP
3	1	10	100,000	75.618%	13.229%	11.153%	24.382%	1,000,000	49.860%	27.160%	17.015%	94.035%	20.184%	61.38	6.14
4	1	10	100,000	75.914%	13.244%	10.842%	24.086%	1,000,000	49.650%	28.520%	16.805%	94.975%	20.092%	62.37	6.24
5	1	10	100,000	75.710%	13.250%	11.040%	24.290%	1,000,000	50.323%	30.390%	16.711%	97.425%	20.252%	62.62	6.26
6	1	10	100,000	75.926%	13.375%	10.699%	24.074%	1,000,000	48.107%	29.020%	15.008%	92.135%	20.064%	58.08	5.81
7	1	10	100,000	75.620%	13.464%	10.916%	24.380%	1,000,000	49.832%	27.230%	16.848%	93.911%	20.168%	60.70	6.07
8	1	10	100,000	75.541%	13.396%	11.063%	24.459%	1,000,000	49.040%	28.820%	18.658%	96.518%	20.228%	64.27	6.43
9	1	10	100,000	75.634%	13.313%	11.053%	24.366%	1,000,000	50.473%	29.150%	15.616%	95.239%	20.228%	59.64	5.96
Average:				75.785%	13.280%	10.935%	24.215%		49.637%	28.518%	16.358%	94.513%	20.119%		

WIN AMOUNT	BASE GAME LINE HITS	BASE GAME SCATTER HITS	FREE SPINS TOTAL HITS	TOTAL HITS	BASE GAME LINE WINNINGS	BASE GAME SCATTER WINNINGS	FREE SPINS TOTAL WINNINGS	TOTAL WINNINGS	TOTAL RETURNS
2,560	0	0	1	1	0	0	2,560	2,560	0.256%
2,000	0	4	21	25	0	8,000	42,000	50,000	5.000%
1,280	2	0	1	3	2,560	0	1,280	3,840	0.384%
1,000	0	110	0	110	0	110,000	0	110,000	11.000%
800	5	0	2	7	4,000	0	1,600	5,600	0.560%
640	8	0	4	12	5,120	0	2,560	7,680	0.768%
500	1	0	0	1	500	0	0	500	0.050%
480	0	0	8	11	0	0	3,840	5,280	0.528%
400	13	0	4	17	5,200	0	1,600	6,800	0.688%
Total:	164,578	1,816	17,778	184,172	490,396	288,200	186,582	965,178	96.518%

Returns per Symbol   Returns per Prize   Winnings Histogram (Bins)   Winnings Histogram (Raw)
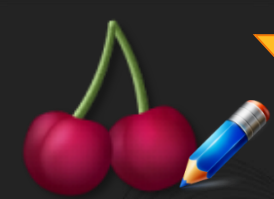
RTP Distribution for 1,000 players
Bet £0.01 per line, 10 lines, 1e5 plays

526   474

Player 8 Volatility Experience
Bet £0.01 per line, 10 lines, 1e5 plays

97,412

Winnings in , log1p scale

Confidence Levels

- 90% Confidence
- 95% Confidence
- 99% Confidence
- Theoretical RTP
- Simulation RTP

118.424%   112.682%   109.719%   102.086%   100.270%   96.919%   94.529%   92.140%   88.789%   86.973%   79.340%   76.377%   70.634%

Plays

Pay Lines   Symbol Statistics   BetLine Statistics   Confidence Levels   Free Spins Returns   Bonus Games Returns
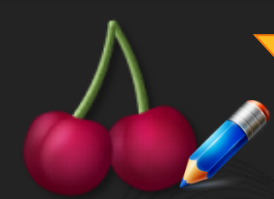
CPU: 1 %, Memory: 1,248,016 K / 134,217,728 K

Symbol Distribution   Prize Table   Wild Substitutions   Free Spins   Line Hits   Line Probabilities   Line Returns   Reel View Probabilities   Scatter Returns

Properties   Infrastructure   Publishing CI/CD

Monte Carlo Simulator is using several presets, such as Volatility Simulation, Variance and Standard Deviation Simulation and RTP Distribution Simulation.

User-defined simulation profiles can be defined with arbitrary Bet Lines, Bet Levels, Coin Values, number of Players and number of Plays.

Simulation engine utilizes multi-CPU running simulation tasks in parallel. Simulation dataset detail level can be adjusted from recording Histograms of winnings to full raw winnings.

MONTE CARLO SIMULATOR: VOLATILITY CHARTS

Volatility Charts are used to visualize the volatility of the game for single line vs multiline plays and for small bet vs large bet amounts.
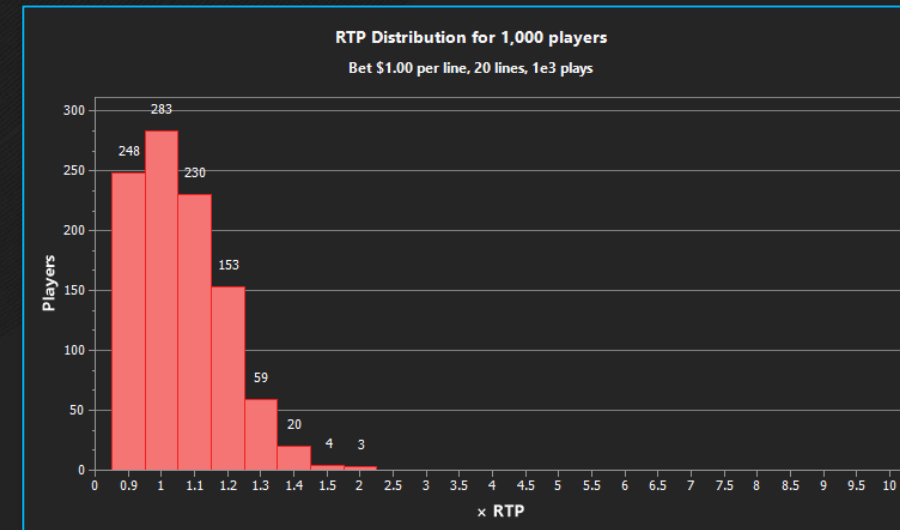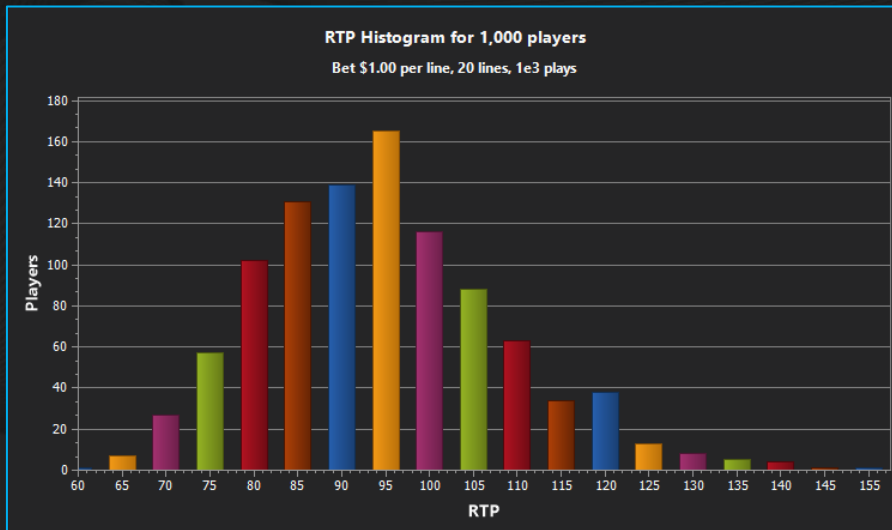
The charts display Plays (Y-axis) vs Winnings (X-axis) in log1p scale. The more "bumps" a game has in a chart, the more volatile it is, thus the better the player experience will be.

For example, these charts show that the more lines a game has It increases the variability of results, making it much more interesting for the player, even though the Player gets the same RTP, and It's more expensive!

Player 1 Volatility Experience
Bet $0.01 per line, 1 lines, 1e5 plays

Player 1 Volatility Experience
Bet $0.01 per line, 20 lines, 1e5 plays

Player 1 Volatility Experience
Bet $1.00 per line, 1 lines, 1e5 plays

Player 1 Volatility Experience
Bet $1.00 per line, 20 lines, 1e5 plays
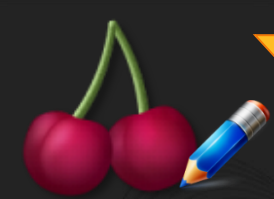
MONTE CARLO SIMULATOR: RTP HISTOGRAM AND RTP DISTRIBUTION CHARTS

RTP Histogram for 1,000 players
Bet $1.00 per line, 20 lines, 1e3 plays

RTP Distribution for 1,000 players
Bet $1.00 per line, 20 lines, 1e3 plays

RTP Histogram Chart visualizes Plays per RTP for a Simulation Session.

RTP Distribution Chart visualizes Plays per RTP Multiplier for a Simulation Session.

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DATASET VISUALIZATION TOOL

RTP Breakdown: 97.046%

- Base Game Lines: 63.460%
- Base Game Scatter: 6.976%
- Free Spins : 26.610%

Base Game Lines 63.460%

Free Spins 26.610%

Base Game Scatter 6.976%

Returns per Symbol
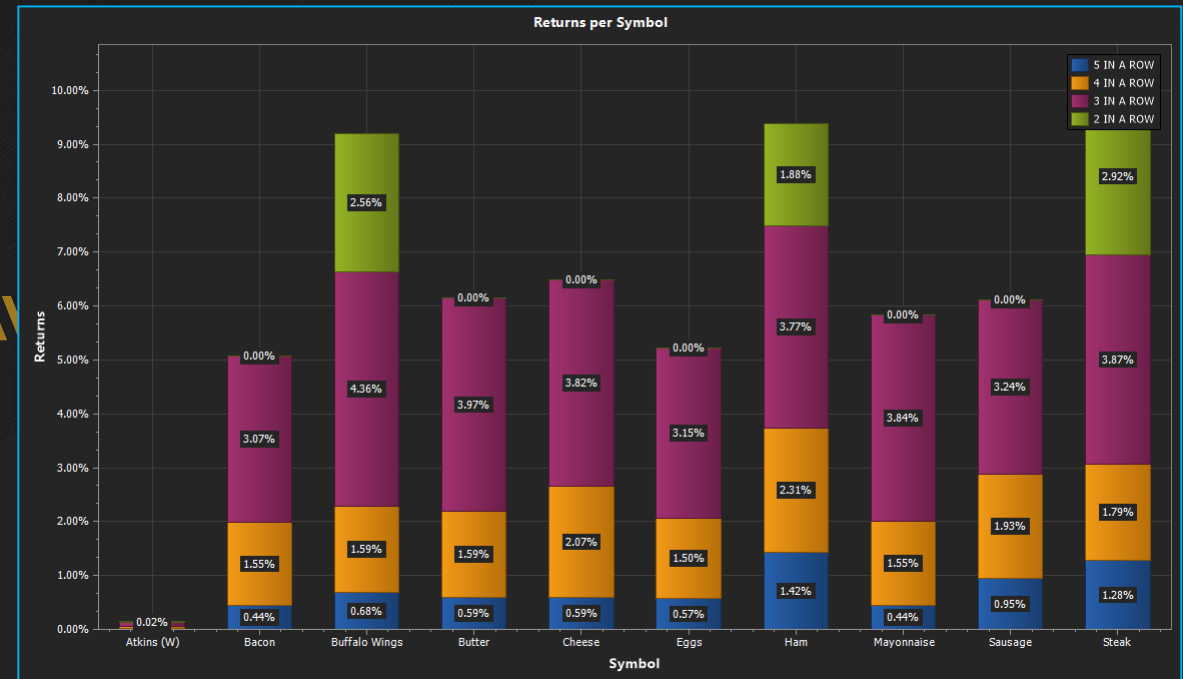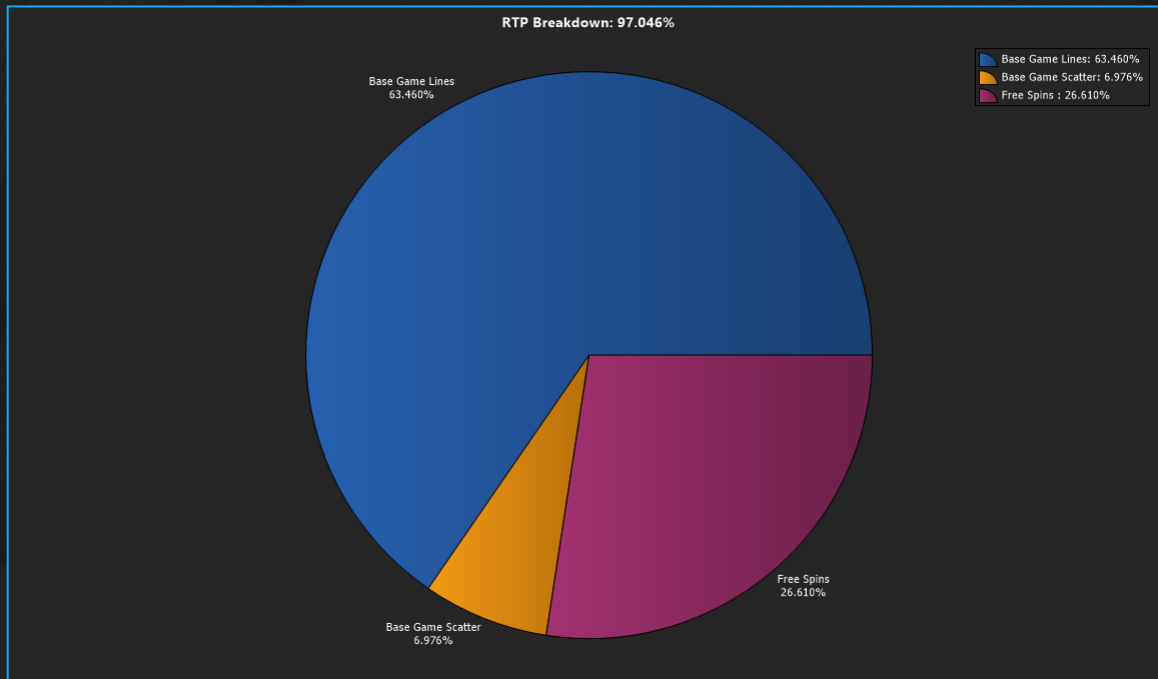
Visualization Tool implements chart visualization of key game features such as RTP Breakdown, Hits per Symbol, RTP per Symbol, Probabilities per Symbol, Confidence Levels – RTP, Confidence Levels - House Edge, Hits per Feature per Win Amount, Total Hits per Feature per Win Amount, RTP Histogram, RTP Distribution, Volatility Experience, etc. Any Dataset can be visualized and chart images can be exported to file or Clipboard.

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OPERATOR LOCALIZATION TOOL

Localization

TOKENID	EL	EN	EN-GB	ET-EE	LT-LT	LV-LV
BTN_CONTINUE	✓	✓	✓	✓	✓	✓
BTN_CONTINUE_PLAY	✓	✓	✓	✓	✓	✓
BTN_EXIT_TO_LOBBY	✓	✓	✓	✓	✓	✓
BTN_MAX_BET	✓	✓	✓	✓	✓	✓
BTN_OPEN_HISTORY	✓	✓	✓	✓	✓	✓
BTN_OPEN_WALLET	✓	✓	✓	✓	✓	✓
BTN_RELOAD_GAME	✓	✓	✓	✓	✓	✓
BTN_START_AUTOPLAY	✓	✓	✓	✓	✓	✓
MSG_COMPATIBILITY_ERROR	✓	✓	✓	✓	✓	✓
MSG_DEFAULT	✓	✓	✓	✓	✓	✓
MSG_FREE_SPINS_AWARD	✓	✓	✓	✓	✓	✓
MSG_FREE_SPINS_END_COINS	✓	✓	✓	✓	✓	✓
MSG_FREE_SPINS_END_CURRENCY	✓	✓	✓	✓	✓	✓
MSG_FREE_SPINS_REMAIN	✓	✓	✓	✓	✓	✓
MSG_FUN_MODE	✓	✓	✓	✓	✓	✓
MSG_GENERIC_ERROR	✓		✓	✓	✓	✓
MSG_REALITY_CHECK_HH_MM	✓	✓	✓	✓	✓	✓
MSG_REALITY_CHECK_MM	✓	✓	✓	✓	✓	✓
MSG_RESPONSIBLE_SESSION_TIME_LIMIT	✓	✓	✓	✓	✓	✓
MSG_WIN_LEVEL_BIG_WIN	✓	✓	✓	✓	✓	✓
MSG_WIN_LEVEL_JACKPOT	✓	✓	✓	✓	✓	✓

Tokens | Game Rules

Localization

Locale: (Heat Map) | Add Locale ... | Delete Locale | Default Tokens | Add Token ... | Clear Token | Delete Token | Copy Tokens ...

TOKENID	EN
BTN_CONTINUE	Continue
BTN_CONTINUE_PLAY	Continue Playing
BTN_EXIT_TO_LOBBY	Exit to Lobby
BTN_MAX_BET	Max Bet
BTN_OPEN_HISTORY	Open History
BTN_OPEN_WALLET	Open Wallet
BTN_RELOAD_GAME	Reload Game
BTN_START_AUTOPLAY	Start Autoplay
MSG_COMPATIBILITY_ERROR	Your web browser is not compatible with this game. A WebGL enabled browser is required.
MSG_DEFAULT	Good Luck!
MSG_FREE_SPINS_AWARD	Free Spins: $(1)
MSG_FREE_SPINS_END_COINS	You won $(1) coins after $(2) Free Spins!
MSG_FREE_SPINS_END_CURRENCY	You won $(1) after $(2) Free Spins!
MSG_FREE_SPINS_REMAIN	$(1) Free Spins Left - Total Wins: $(2)
MSG_FUN_MODE	You are playing for fun.
MSG_GENERIC_ERROR	An unexpected error has occurred. Please close the game in order to return to the lobby. We ...
MSG_REALITY_CHECK_HH_MM	You have been playing for $(1) hours and $(2) minutes.
MSG_REALITY_CHECK_MM	You have been playing for $(1) minutes.
MSG_RESPONSIBLE_SESSION_TIME_LIMIT	You have set a Session Time Limit that has now been reached.
MSG_WIN_LEVEL_BIG_WIN	Big Win: $(1)!
MSG_WIN_LEVEL_JACKPOT	Jackpot: $(1)!

Tokens | Game Rules

Localization Tool edits Locales and Localization Tokens. Locales are defined by ISO639-1 language code, ISO3166-1-alpha-2 country code and ISO-4217 currency code and bare information about currency formatting, currency symbol, currency symbol position and currency fractional units (cents, pence, satoshi, etc.). Localization Tokens are string resources with several translations that can be set by Operator. A Heat Map displays at a glance which tokens are missing translation. Tokens can be exported and imported from Excel for use by external Translation Agencies.

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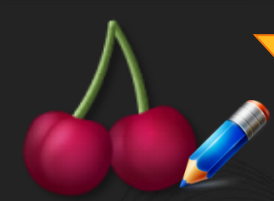
RESPONSIBLE GAMING SETTINGS TOOL

🔑 Responsible Gaming

Default Settings | Add Setting … | Delete Setting

ENABLED	KEY	TYPE	VALUE	NOTIFICATION	SIBLING	UI PAGE	UI CAPTION	UI EDITABLE	UI -/+ BUTTONS	UI SMALL STEP	UI LARGE STEP	UI MAX VALUE
✓	Allow_Statistics	BOOL	false			NO_UI				1	1	0
✓	AutoPlay_MaxRounds	INT	999			PAGE_AUTO_PLAY	TXT_SETTINGS_AUTO_PLAY_MAX_ROUNDS	✓	✓	1	100	999
✓	AutoPlay_StopOn_AnyWin	BOOL	false			PAGE_AUTO_PLAY	TXT_SETTINGS_AUTO_PLAY_STOP_ON_ANY_WIN	✓		1	1	0
✓	AutoPlay_StopOn_LoseAmount	BOOL	false		AutoPlay_StopOn_LoseAmountValue	PAGE_AUTO_PLAY	TXT_SETTINGS_AUTO_PLAY_STOP_ON_LOSE_AMOUNT			1	1	0
✓	AutoPlay_StopOn_LoseAmountValue	CURRENCY	0			PAGE_AUTO_PLAY		✓		1	1	0
	AutoPlay_StopOn_LoseCoins	BOOL	false		AutoPlay_StopOn_LoseCoinsValue	PAGE_AUTO_PLAY	TXT_SETTINGS_AUTO_PLAY_STOP_ON_LOSE_COINS			1	1	0
	AutoPlay_StopOn_LoseCoinsValue	COINS	0			PAGE_AUTO_PLAY		✓		1	1	0
✓	AutoPlay_StopOn_TimeSeconds	BOOL	false		AutoPlay_StopOn_TimeSecondsValue	PAGE_AUTO_PLAY	TXT_SETTINGS_AUTO_PLAY_STOP_ON_TIME_SECONDS			1	1	0
✓	AutoPlay_StopOn_TimeSecondsValue	TIME	00:00			PAGE_AUTO_PLAY		✓		1	1	0
✓	AutoPlay_StopOn_WinAmount	BOOL	false		AutoPlay_StopOn_WinAmountValue	PAGE_AUTO_PLAY	TXT_SETTINGS_AUTO_PLAY_STOP_ON_WIN_AMOUNT			1	1	0
✓	AutoPlay_StopOn_WinAmountValue	CURRENCY	0			PAGE_AUTO_PLAY		✓		1	1	0
	AutoPlay_StopOn_WinCoins	BOOL	false		AutoPlay_StopOn_WinCoinsValue	PAGE_AUTO_PLAY	TXT_SETTINGS_AUTO_PLAY_STOP_ON_WIN_COINS			1	1	0
	AutoPlay_StopOn_WinCoinsValue	COINS	0			PAGE_AUTO_PLAY		✓		1	1	0
✓	Lobby_Exit_Lobby	BUTTON		GAME_TO_LOBBY_MESSAGE_EXIT_TO_LOBBY		PAGE_LOBBY	BTN_EXIT_TO_LOBBY		✓	1	1	0
✓	Lobby_Open_History	BUTTON		GAME_TO_LOBBY_MESSAGE_OPEN_GAME_HISTORY		PAGE_LOBBY	BTN_OPEN_HISTORY			1	1	0
✓	Lobby_Open_Wallet	BUTTON		GAME_TO_LOBBY_MESSAGE_OPEN_WALLET		PAGE_LOBBY	BTN_OPEN_WALLET			1	1	0
✓	Lobby_Reload_Game	BUTTON		GAME_TO_LOBBY_MESSAGE_RELOAD_GAME		PAGE_LOBBY	BTN_RELOAD_GAME			1	1	0
✓	RealityCheck_Max_Time_Per_Session	BOOL	false		RealityCheck_Max_Time_Per_Session_Value	PAGE_OPTIONS	TXT_SETTINGS_REALITY_CHECK_TIMEOUT			1	1	0
✓	RealityCheck_Max_Time_Per_Session_Value	TIME	00:00			PAGE_OPTIONS		✓		1	1	0
✓	RealityCheck_Message_Interval	BOOL	false		RealityCheck_Message_Interval_HHMMValue	PAGE_OPTIONS	TXT_SETTINGS_REALITY_CHECK_INTERVAL			1	1	0
✓	RealityCheck_Message_Interval_HHMMValue	TIME	00:00			PAGE_OPTIONS		✓		1	1	0
✓	Spin_Allow_Fast_Spins	BOOL	false			PAGE_OPTIONS	TXT_SETTINGS_ALLOW_FAST_SPINS			1	1	0
✓	Spin_Allow_Slam_Stop	BOOL	true			NO_UI				1	1	0
✓	Spin_Duration_Millis_Max	INT	10000			NO_UI				1	1	0

Responsible Gaming Tool is used for defining and editing settings that affect game's run-time behavior. Such settings include Operator specific, Responsible Gaming, Player Protection, Self Exclusion, Statistics, Error Handling and other. When developing games with **mobileFX Unity3D Slot Game Template**, the settings are automatically organized into Pages accessible through the game menu. Settings that require Player input are rendered by the template as controls. Supported controls are Labels, Edit Boxes, Check Boxes, Range Spinners, Command Buttons and Numpad.

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MICRO SERVICES ARCHITECTURE

RGS Architecture is based on Docker micro services. Each game is the single tenant in an ecosystem of dockerized services: RGS, RNG, Wallet, Web, Logs, RDBMS, etc. The entire ecosystem serves a single game for a single Operator.

In RGS Workbench, you can define multiple such ecosystems per game (DEV/FAT/UAT/DEV/OPERAOTR) with **Infrastructure Profiles**.

ARCHITECTURE COMPONENTS

RGS

RGS	
Name :	spartanslots-dev-unity-com.rgs
Image :	spartanslots.dev.unity.com/rgs:latest
Game :	Spartan Slots
LOGS_URL :	http://spartanslots-dev-unity-com.graylog
LOGS_PORT :	5555
API :	8080 : 8080 /tcp
	RNG
	RDBMS
	MongoDB
	Wallet
	Graylog

RGS

RGS hosts the math Game Engine and implements an HTTP REST API for serving Game Client Bet requests. RGS connects with RNG, RDBMS, MongoDB, Wallet and Graylog services.

Wallet	
Name :	spartanslots-dev-unity-com.wallet
Image :	spartanslots.dev.unity.com/wallet:latest
ENGINE_HOST :	spartanslots-dev-unity-com.rgs
ENGINE_PORT :	8080
API :	81 : 81 /tcp

WALLET

Can be either a proxy to an external Wallet, or a Wallet implementation. Wallet API is expected to expose methods for Login, Session, Balance, Debit, Credit, Refund and Reconciliation transactions.

RNG	
Name :	spartanslots-dev-unity-com.rng
Image :	spartanslots.dev.unity.com/rng:latest
API :	82 : 82 /tcp

RNG

Can be either a proxy to an external Operator RNG Device, or a certifiable 64-bit Mersenne Twister implementation provided by mobileFX.

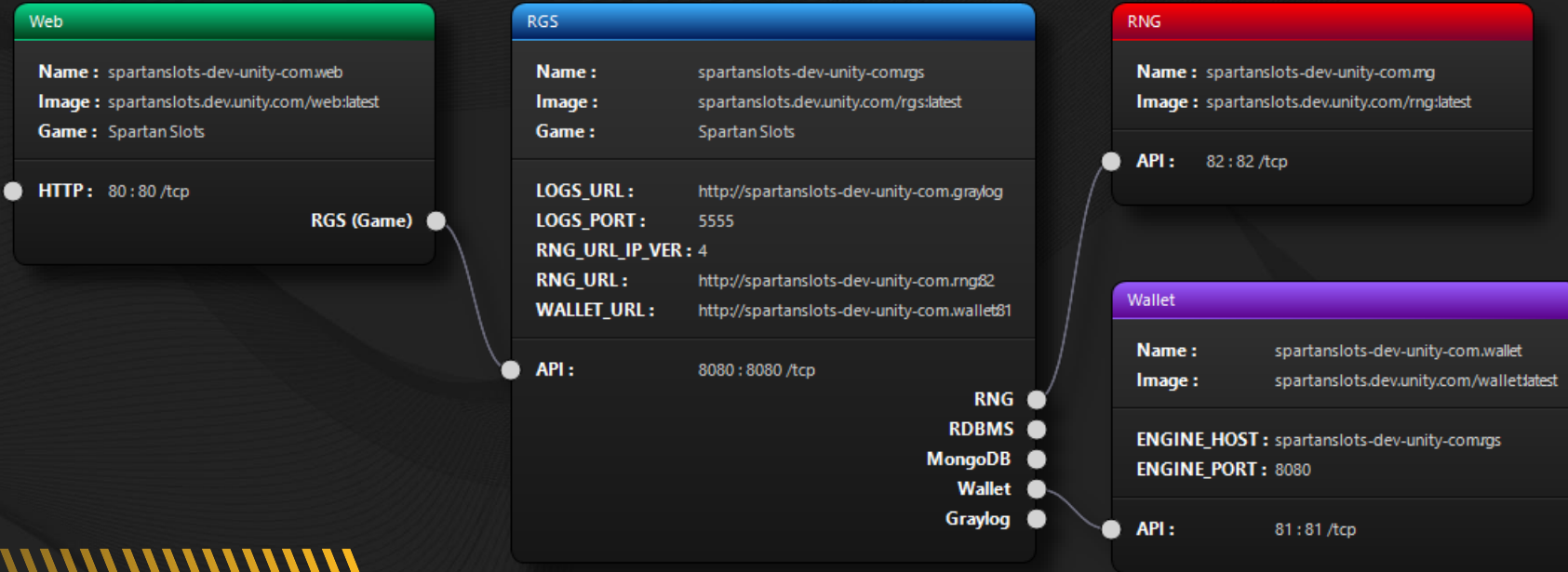| Web	
Name :	spartanslots-dev-unity-com.web
Image :	spartanslots.dev.unity.com/web:latest
Game :	Spartan Slots
HTTP :	80 : 80 /tcp
	RGS (Game)

WEB

Is a Lighttpd Web server that hosts Game Client HTML files. mobileFX Web components are optimized for Unity WebGL WebASM game loading over CDN networks.
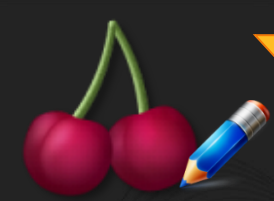
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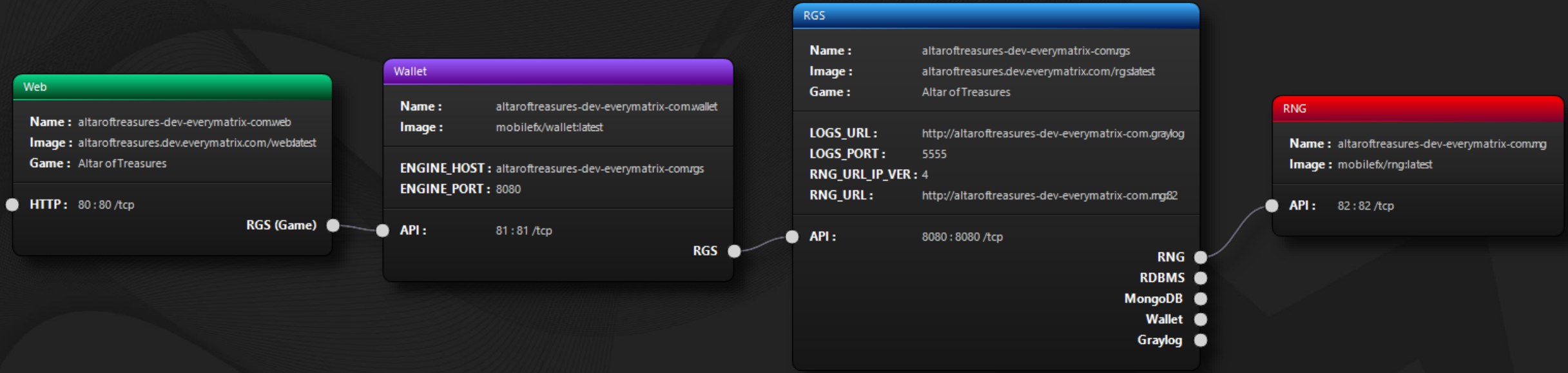# BACKEND WALLET ARCHITECTURE

Web
Name : spartanslots-dev-unity-com.web
Image : spartanslots.dev.unity.com/web:latest
Game : Spartan Slots

HTTP : 80 : 80 /tcp

RGS (Game)

RGS
Name : spartanslots-dev-unity-com.rgs
Image : spartanslots.dev.unity.com/rgs:latest
Game : Spartan Slots

LOGS_URL : http://spartanslots-dev-unity-com.graylog
LOGS_PORT : 5555
RNG_URL_IP_VER : 4
RNG_URL : http://spartanslots-dev-unity-com.rng:82
WALLET_URL : http://spartanslots-dev-unity-com.wallet:81

API : 8080 : 8080 /tcp

RNG
RDBMS
MongoDB
Wallet
Graylog

RNG
Name : spartanslots-dev-unity-com.rng
Image : spartanslots.dev.unity.com/rng:latest

API : 82 : 82 /tcp

Wallet
Name : spartanslots-dev-unity-com.wallet
Image : spartanslots.dev.unity.com/wallet:latest

ENGINE_HOST : spartanslots-dev-unity-com.rgs
ENGINE_PORT : 8080

API : 81 : 81 /tcp

Backend Wallet Architecture is used when the RGS Server is placed in front of a Wallet, receiving Bet requests from Game Clients directly. In Backend Wallet Architecture configuration, Game Clients (Native or WebGL) can communicate directly with RGS by taking advantage of mobileFX Slot Template for Unity3D.

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FORWARD WALLET ARCHITECTURE

Web
- **Name :** altaroftreasures-dev-everymatrix-com.web
- **Image :** altaroftreasures.dev.everymatrix.com/web:latest
- **Game :** Altar of Treasures

HTTP : 80 : 80 /tcp

RGS (Game)

Wallet
- **Name :** altaroftreasures-dev-everymatrix-com.wallet
- **Image :** mobilefx/wallet:latest

- **ENGINE_HOST :** altaroftreasures-dev-everymatrix-com.rgs
- **ENGINE_PORT :** 8080

API : 81 : 81 /tcp

RGS

RGS
- **Name :** altaroftreasures-dev-everymatrix-com.rgs
- **Image :** altaroftreasures.dev.everymatrix.com/rgs:latest
- **Game :** Altar of Treasures

- **LOGS_URL :** http://altaroftreasures-dev-everymatrix-com.graylog
- **LOGS_PORT :** 5555
- **RNG_URL_IP_VER :** 4
- **RNG_URL :** http://altaroftreasures-dev-everymatrix-com.rng:82

API : 8080 : 8080 /tcp

RNG
RDBMS
MongoDB
Wallet
Graylog

RNG
- **Name :** altaroftreasures-dev-everymatrix-com.rng
- **Image :** mobilefx/rng:latest

API : 82 : 82 /tcp

Forward Wallet Architecture is used when the RGS Server is placed behind a Wallet. The Wallet receives Bet requests from Game Clients and forwards them to the RGS server. In Forward Wallet Architecture configuration, Game Clients must implement proprietary Wallet API calls and the Wallet must implement the RGS API. mobileFX RGS Workbench provides real-life templates for Forward Wallet Proxy client and server implementation.

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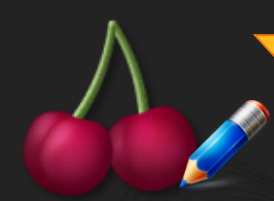
DEPLOYMENT TO ANY DOCKER CONTEXT

Docker Context represents a Docker hosting environment. RGS Workbench can deploy game components to any Docker Context over HTTP Docker API. You can deploy to Docker Desktop, NAS Docker Stations or any remote docker context.

At minimum, RGS Workbench generates 7 docker containers: RGS, RNG, Wallet, Web, Graylog, MongoDB, Elastic Search, grouped together per Infrastructure Profile.

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PUBLISHING TO GITLAB CI/CD PIPELINES

Publishing to GitLab tool can be used for deploying Production Docker Images of the game directly to

Operator and Aggregator Continuous Integration / Continuous Development (CI/CD) pipelines.

Infrastructure Progress Console

```
65 + Creating resource [dist/assets/mobilefx.mp4] ...
66 + Creating resource [dist/assets/favicon.ico] ...
67 + Creating resource [dist/assets/WebGL.data.unityweb] ...
68 + Creating resource [dist/assets/WebGL.wasm.unityweb] ...
69 + Creating resource [dist/assets/WebGL.framework.js.unityweb] ...
70 + Creating resource [dist/assets/WebGL.loader.js] ...
71
72 Commit publishing image: altaroftreasures.release.com/web:latest
73 add 'dist/assets/ForwardWalletProxy.js'
74 add 'dist/assets/WebGL.data.unityweb'
75 add 'dist/assets/WebGL.framework.js.unityweb'
76 add 'dist/assets/WebGL.wasm.unityweb'
77 add 'dist/config.json'
78 [master 4f3ef7f] Publish
79  5 files changed, 155 insertions(+), 41 deletions(-)
80  rewrite dist/assets/WebGL.framework.js.unityweb (99%)
81
82 Pushing image: altaroftreasures.release.com/web:latest
83 Pushing to https://gitlab.intg.rgsmatrix.com/partners/mobilefx/altar-of-tre
84 Enumerating objects: 17, done.
85 Counting objects: 100% (17/17), done.
86 Delta compression using up to 64 threads
87 Compressing objects: 100% (9/9), done.
88 POST git-receive-pack (chunked)
89 Writing objects: 100% (9/9), 27.46 MiB | 2.24 MiB/s, done.
90 Total 9 (delta 3), reused 0 (delta 0), pack-reused 0
91 To https://gitlab.intg.rgsmatrix.com/partners/mobilefx/altar-of-treasures/a
92    4dd966c..4f3ef7f  master -> master
93 updating local tracking ref 'refs/remotes/origin/master'
94
95
96 Done in 78 sec.
97
```

Publishing CI/CD
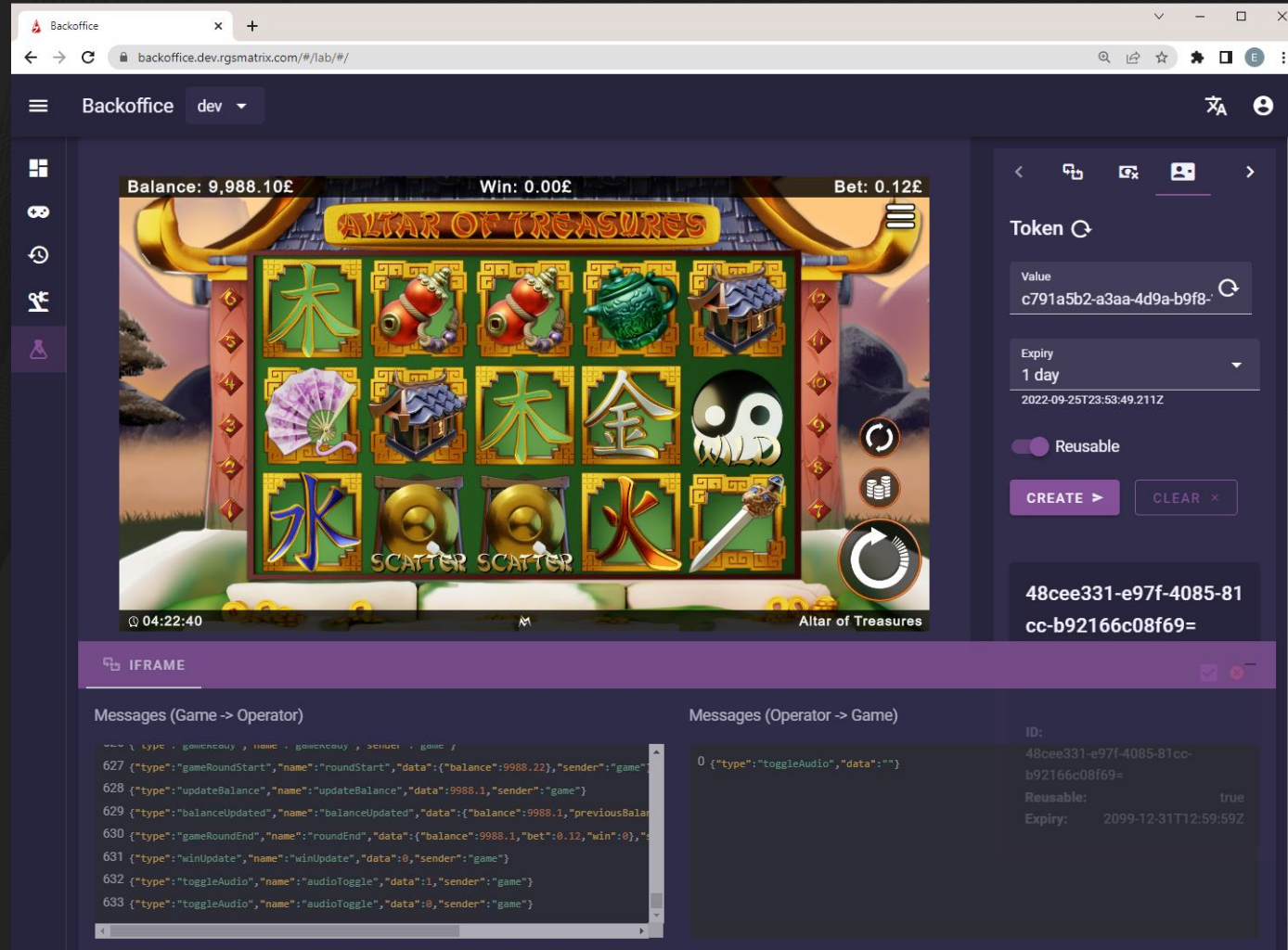
- EveryMatrix
  - Altar Of Treasures
    - altaroftreasures-fe
      - Pipeline 36442 - manual
        - STAGE: package
          - package
            - 2022-09-16T16:31:42.004Z: success
        - STAGE: deploy
        - STAGE: restart
      - Pipeline 36439 - manual
      - Pipeline 36435 - manual
      - Pipeline 36434 - manual
      - Pipeline 36433 - manual
      - Pipeline 36421 - manual
      - Pipeline 36408 - manual
      - Pipeline 36407 - manual
      - Pipeline 36377 - manual

Properties   Publishing CI/CD

Pipeline · Partners / mobileFX / A

gitlab.intg.rgsmatrix.com/partners/mobilefx/altar-of-treasures/altaroftreasures-se...

Projects   More

No related merge requests found.

Pipeline   Jobs 8

Package	Deploy	Restart
package	0- deploy DEV	0- restart/deploy...
	1- deploy TEST	1- restart/deploy ...
	2- deploy STAGE	2- restart/deploy...

RGS Workbench monitors GitLab

Pipelines for completion and errors

and can initiate builds remotely.

PUBLISH CASINO GAMES TO TOP-SELLING PUBLISHERS

Casino Game Publishers

Our goal is to integrate RGS Workbench with top-selling Casino Game Publishers and Casino Game Aggregators.

We want to abstract the Integration, Localization and Certification hassle from Game Vendors.
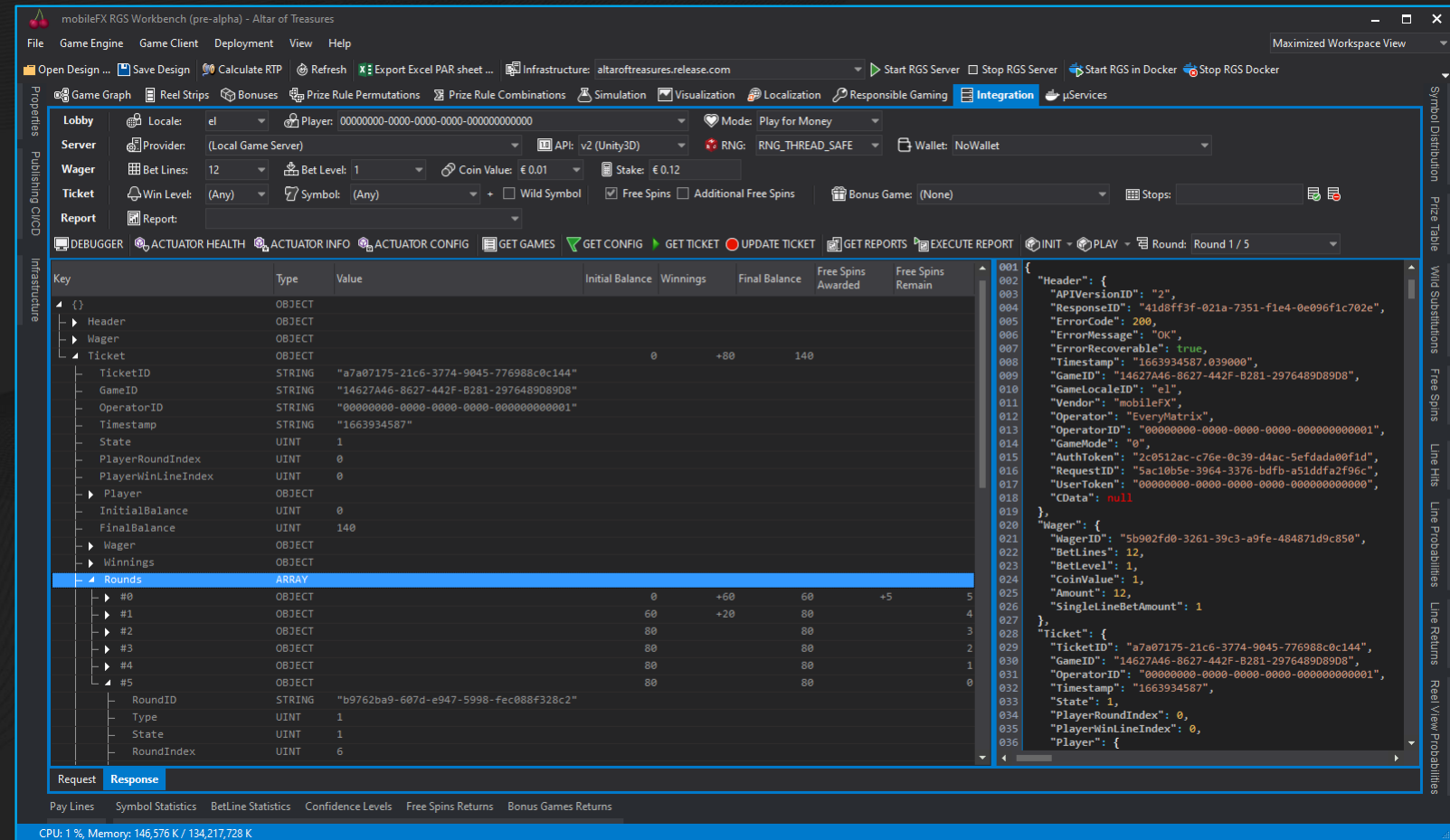
Every Matrix RGS Workbench is publishing Slot games to EveryMatrix Slots Matrix RGS distribution platform with a single click!

INTEGRATION TOOL TEST LAB

Integration Tool

- Visualize Request / Response JSON pairs for all API methods. Especially for Bet requests, the tool visualizes the **Money Path**.

- Configure game launch parameters like a **Lobby** would do such as Localization, Player Token and Play Mode.

- Open a Game Session and start placing Bets with customizable Wager Bet Lines, Bet Level and Coin Value.

- Define **Ticket Filters** and let the tool play until a Ticket matching your criteria is fetched.

mobileFX RGS Workbench (pre-alpha) - Altar of Treasures

File   Game Engine   Game Client   Deployment   View   Help

Maximized Workspace View

Open Design ...   Save Design   Calculate RTP   Refresh   Export Excel PAR sheet ...   Infrastructure: altaroftreasures.release.com   Start RGS Server   Stop RGS Server   Start RGS in Docker   Stop RGS Docker

Game Graph   Reel Strips   Bonuses   Prize Rule Permutations   Prize Rule Combinations   Simulation   Visualization   Localization   Responsible Gaming   Integration   µServices

Lobby	Locale: el	Player: 00000000-0000-0000-0000-000000000000	Mode: Play for Money
Server	Provider: (Local Game Server)	API: v2 (Unity3D)	RNG: RNG_THREAD_SAFE	Wallet: NoWallet
Wager	Bet Lines: 12	Bet Level: 1	Coin Value: € 0.01	Stake: € 0.12
Ticket	Win Level: (Any)	Symbol: (Any) + Wild Symbol	Free Spins Additional Free Spins	Bonus Game: (None)	Stops:
Report	Report:		

DEBUGGER   ACTUATOR HEALTH   ACTUATOR INFO   ACTUATOR CONFIG   GET GAMES   GET CONFIG   GET TICKET   UPDATE TICKET   GET REPORTS   EXECUTE REPORT   INIT   PLAY   Round: Round 1 / 5

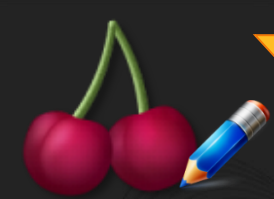| Key	Type	Value	Initial Balance	Winnings	Final Balance	Free Spins Awarded	Free Spins Remain
{}	OBJECT						
Header	OBJECT						
Wager	OBJECT						
Ticket	OBJECT		0	+80	140		
TicketID	STRING	"a7a07175-21c6-3774-9045-776988c0c144"					
GameID	STRING	"14627A46-8627-442F-B281-2976489D89D8"					
OperatorID	STRING	"00000000-0000-0000-0000-000000000001"					
Timestamp	STRING	"1663934587"					
State	UINT	1					
PlayerRoundIndex	UINT	0					
PlayerWinLineIndex	UINT	0					
Player	OBJECT						
InitialBalance	UINT	0					
FinalBalance	UINT	140					
Wager	OBJECT						
Winnings	OBJECT						
Rounds	ARRAY						
#0	OBJECT		0	+60	60	+5	5
#1	OBJECT		60	+20	80		4
#2	OBJECT		80		80		3
#3	OBJECT		80		80		2
#4	OBJECT		80		80		1
#5	OBJECT		80		80		
RoundID	STRING	"b9762ba9-607d-e947-5998-fec088f328c2"					
Type	UINT	1					
State	UINT	1					
RoundIndex	UINT	6					

```
001 {
002   "Header": {
003     "APIVersionID": "2",
004     "ResponseID": "41d8ff3f-021a-7351-f1e4-0e096f1c702e",
005     "ErrorCode": 200,
006     "ErrorMessage": "OK",
007     "ErrorRecoverable": true,
008     "Timestamp": "1663934587.039000",
009     "GameID": "14627A46-8627-442F-B281-2976489D89D8",
010     "GameLocaleID": "el",
011     "Vendor": "mobileFX",
012     "Operator": "EveryMatrix",
013     "OperatorID": "00000000-0000-0000-0000-000000000001",
014     "GameMode": "0",
015     "AuthToken": "2c0512ac-c76e-0c39-d4ac-5efdada00f1d",
016     "RequestID": "5ac10b5e-3964-3376-bdfb-a51ddfa2f96c",
017     "UserToken": "00000000-0000-0000-0000-000000000000",
018     "CData": null
019   },
020   "Wager": {
021     "WagerID": "5b902fd0-3261-39c3-a9fe-484871d9c850",
022     "BetLines": 12,
023     "BetLevel": 1,
024     "CoinValue": 1,
025     "Amount": 12,
026     "SingleLineBetAmount": 1
027   },
028   "Ticket": {
029     "TicketID": "a7a07175-21c6-9045-776988c0c144",
030     "GameID": "14627A46-8627-442F-B281-2976489D89D8",
031     "OperatorID": "00000000-0000-0000-0000-000000000001",
032     "Timestamp": "1663934587",
033     "State": 1,
034     "PlayerRoundIndex": 0,
035     "PlayerWinLineIndex": 0,
036     "Player": {
```

Request   Response

Pay Lines   Symbol Statistics   BetLine Statistics   Confidence Levels   Free Spins Returns   Bonus Games Returns
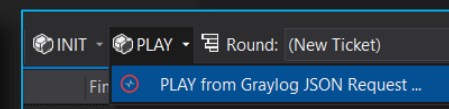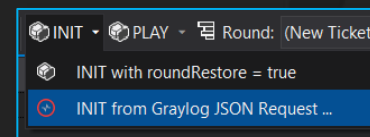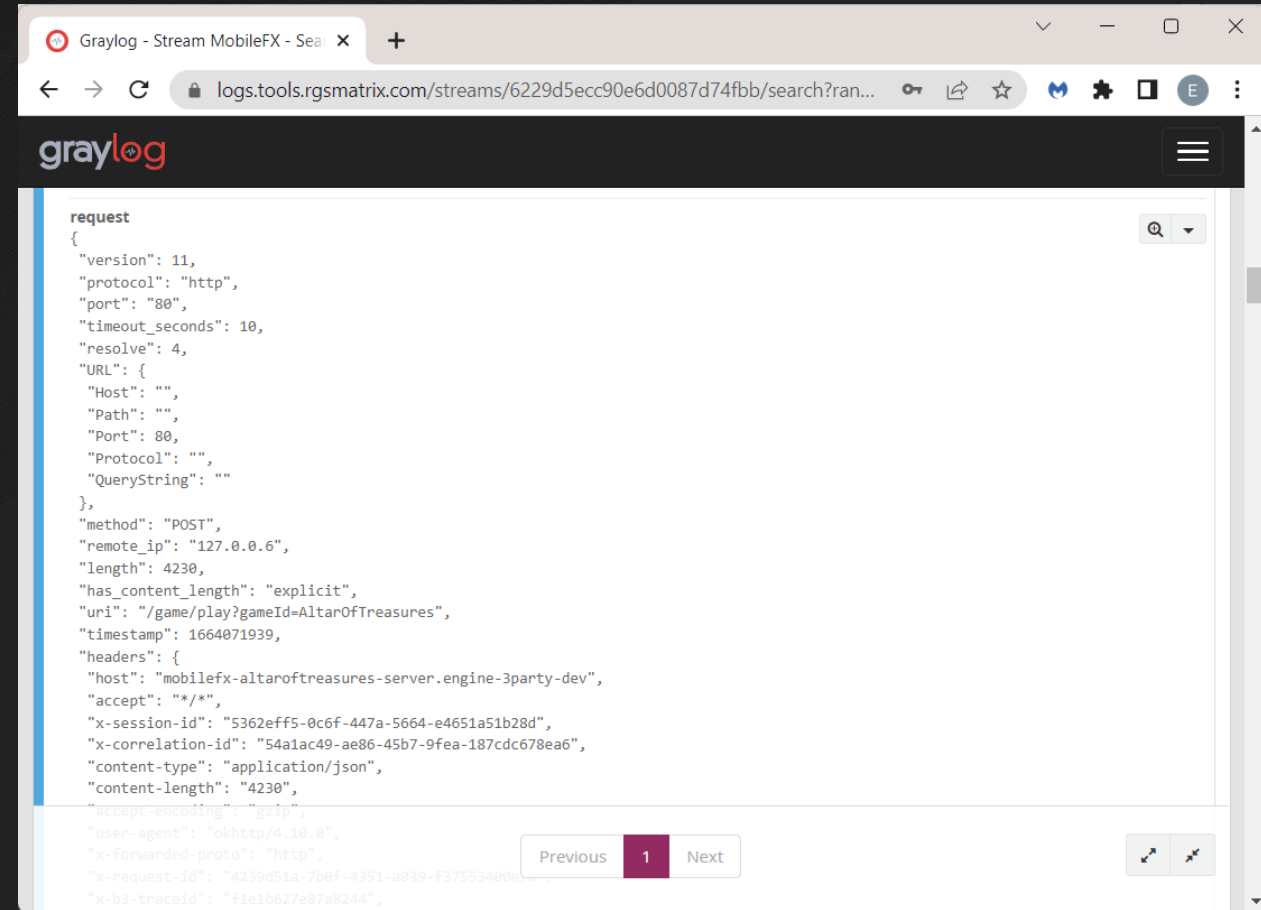
CPU: 1 %, Memory: 146,576 K / 134,217,728 K

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GRAYLOG INTEGRATION AND S.E.H.

Graylog Integration any HTTP Request Response pairs (body and headers) are logged to Graylog and can be replayed and debugged by copying their JSON representation into RGS Workbench. This is a particularly useful feature when integrating with Forward Wallets and proprietary APIs.

Structured Exception Handling (S.E.H.) is a coding style where Exceptions are handled, serialized for logging and re-thrown to be handled at discrete Entry Points in the code (in this case: RGS Initialization, API Calls, ORM). With S.E.H., RGS obtains and transports to Graylog over async GELF UDP protocol the Call Stack that raised the exception, including detailed exception information such as service name, exception reason, game name, file name, runtime class, error line, etc., and most importantly the user data that caused the exception.
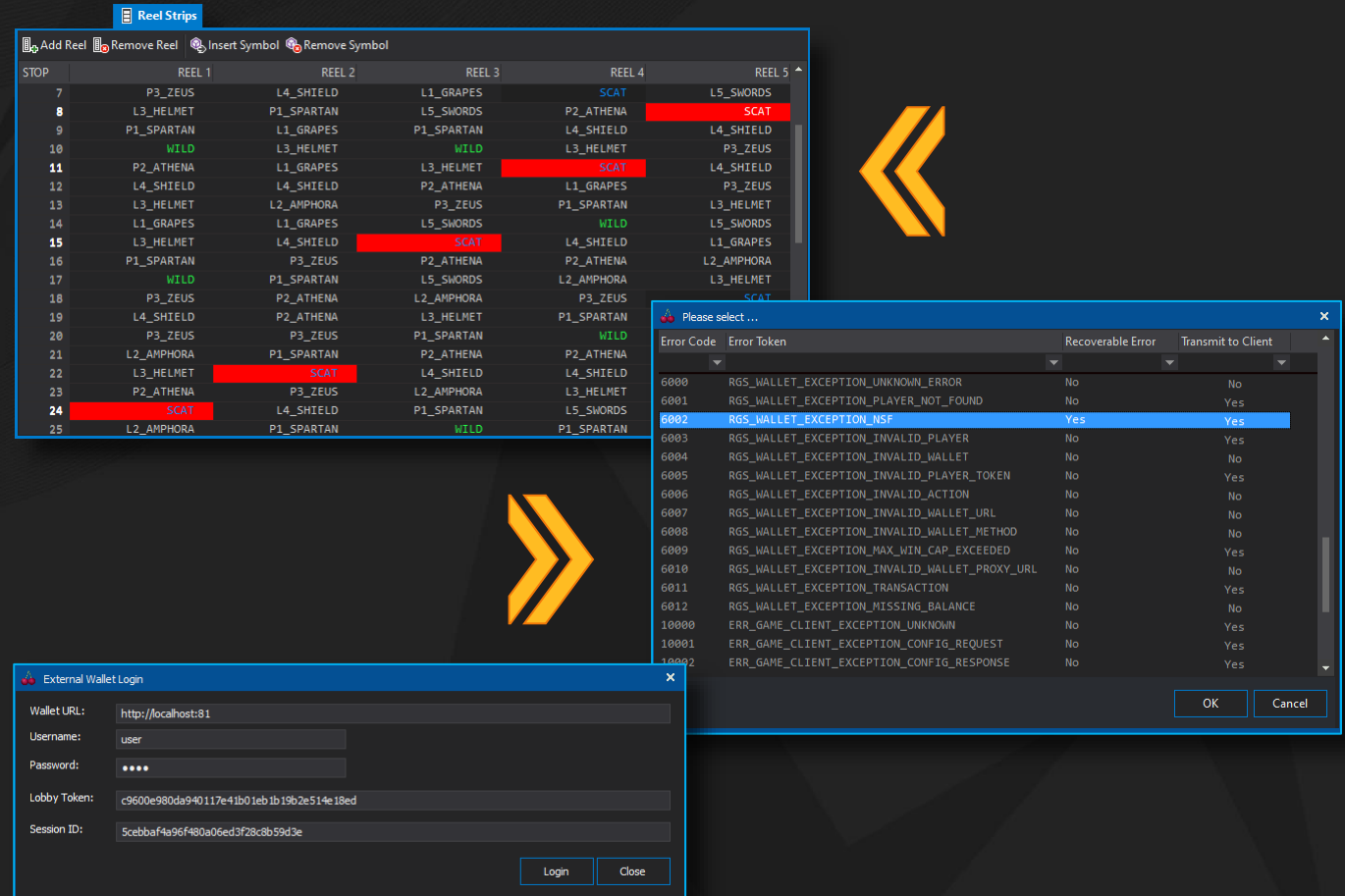
Graylog - Stream MobileFX - Sea... +

logs.tools.rgsmatrix.com/streams/6229d5ecc90e6d0087d74fbb/search?ran...

graylog

```
request
{
 "version": 11,
 "protocol": "http",
 "port": "80",
 "timeout_seconds": 10,
 "resolve": 4,
 "URL": {
  "Host": "",
  "Path": "",
  "Port": 80,
  "Protocol": "",
  "QueryString": ""
 },
 "method": "POST",
 "remote_ip": "127.0.0.6",
 "length": 4230,
 "has_content_length": "explicit",
 "uri": "/game/play?gameId=AltarOfTreasures",
 "timestamp": 1664071939,
 "headers": {
  "host": "mobilefx-altaroftreasures-server.engine-3party-dev",
  "accept": "*/*",
  "x-session-id": "5362eff5-0c6f-447a-5664-e4651a51b28d",
  "x-correlation-id": "54a1ac49-ae86-45b7-9fea-187cdc678ea6",
  "content-type": "application/json",
  "content-length": "4230",
  "accept-encoding": "gzip",
  "user-agent": "okhttp/4.10.0",
  "x-forwarded-proto": "http",
  "x-request-id": "4239d51a-7b0f-4351-a039-f37553400e",
  "x-b3-traceid": "f1e1b627e97a8244",
```

Previous 1 Next

INIT ▾ PLAY ▾ Round: (New Ticket)
INIT with roundRestore = true
INIT from Graylog JSON Request ...

INIT ▾ PLAY ▾ Round: (New Ticket)
Fir PLAY from Graylog JSON Request ...

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END-TO-END INTEGRATION TESTING: DEBUGGER COMMANDS

RNG Emulation using low-level RGS debugger API can push RNG stops into RNG Queue. With this tool, Game Developers can force and test cases like Free Spins, Win Levels, Bonus Games, etc.

Error Emulation using low-level RGS debugger API can push all possible RGS Errors (such as Insufficient Funds, Max Win Cap Reached, Invalid Player Token, etc.) to RGS Server. The error will occur on next API call either if it is from a Game Client or the Integration tool itself.

Wallet Login can perform login to a Wallet in order to obtain a valid Player Token. Furthermore it can establish a Game Session by simulating game launch from Player and obtain a Player Session ID that can be used for placing Bets from tool UI.

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RGS BLUEPRINT

Linux Console	Linux Daemon	Windows Console	Windows Service	RGS Workbench

HTTP SERVER	UDP Server

Game API	Debugger API	RNG API	Reports API	Simulation API	Discovery API

JSON

Game Context	RNG	Reporting Engine	Simulation Engine	UDP Client

Slot Game Engine	Bonus Game Engine	Statistics

Wallet	Data Writer

Responsible Gaming Settings	Localization

ORM

Logger

SEH

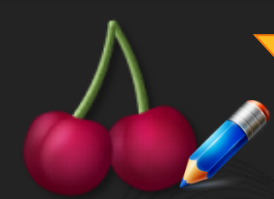Unity Partner

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USING THE LATEST TECHNOLOGIES

Specs

- RGS Workbench and Server are developed entirely in C++17 for 64-bit Intel and AMD architectures

- RGS Workbench and Server are statically linked, they have zero runtime dependencies

- RGS Workbench and Server use boost::asio and boost::beast asynchronous networking

- RGS platform is coded in header-only style

- RGS Workbench IDE is coded in MFC for Windows 10 or later

- 3rd party and sample Web Server, Wallets and External RNG are implemented in node.js with minimal code

- RGS is using Graylog over GELF UDP protocol for logging exceptions and logs in MongoDB and Elastic Search

- RDBMS driver is SQLX for SQLite and MySQL databases

- Memory leak and profiling performed using Visual Studio 2017 toolchain and VLD

ABOUT MOBILE FX

- mobileFX is a privately owned technology company founded on 2012, with offices in Athens and London.

- Our mainstream business is provision of software development services for Gaming & Gamification, Mobile Marketing, Proximity Marketing and Digital Signage.

- We invest on emerging technologies with in-house R&D. We provide cutting-edge specialized technology and services for a vast array of niche markets including Telco Operators, Advertising Agencies, Media Shops, Public Sector, Transport Operators, Tourist Operators, Online Casino Operators and Solution Integrators.

- mobileFX is founding and board member of gi-Cluster in Athens, a Gaming and Creative Content ecosystem counting over 60 corporate and academic members.

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