

# Saints Row<sup>TM</sup> 2

CONTINUE  
NEW GAME  
LOAD GAME  
**CO-OP**  
MULTIPLAYER  
OPTIONS  
DOWNLOADABLE CONTENT  
EXTRAS



# Coop Design for an Open World

David G. Bowring



- David Bowring
  - Gameplay Designer for Saints Row 2
    - COOP systems design
    - Mission design
    - Level design and scripting



# Volition Inc



- Saint's Row 2(XBOX360/PS3/PC)
  - 3<sup>rd</sup> person open world action shooter
  - Fully Featured COOP





# Topics Covered

- The SR2 Vision for Coop
- Strategies for Designing Coop Gameplay
- Developing Systems to Support Coop
- Why Do Coop?
- Lessons Learned



# Vision

- Non-tethered
- Drop in/out anytime co-op
- Both players earn rewards and progression
- Players are truly cooperative



# Split Screen







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# Ambition to Fruition

- Open world games are highly complex
- Decision not to tether increased complexity
- Afforded some of our greatest success as well



# Keys to open world

- Sandbox/Emergent gameplay is supported by gameplay systems
- Modal gameplay



# Keys to SR2 COOP

- Letting players do anything they could do in single player
- Make gameplay feel natural and seamless
- Encourage true cooperative play



**You're gonna need a bigger boat**



# Modal Gameplay

- Activities
  - One off special mechanics
- Missions
  - Story driven
  - Featured core mechanics



# Starting modal gameplay

- Players should be able to be separate in the sandbox
- Players need to be together for modal gameplay
- Teleport the players at the start





# Defining COOP for Missions

- Physically separate but parallel goals
- Specific coop mechanics
- No significant outward change to objectives

**STILWATER  
CORRECTIONAL**



# Missions

- Physically separate but parallel goals
  - Players can stay together or take separate paths
  - Each player must complete their goal
  - Players come together at the end







# Defining COOP for Missions

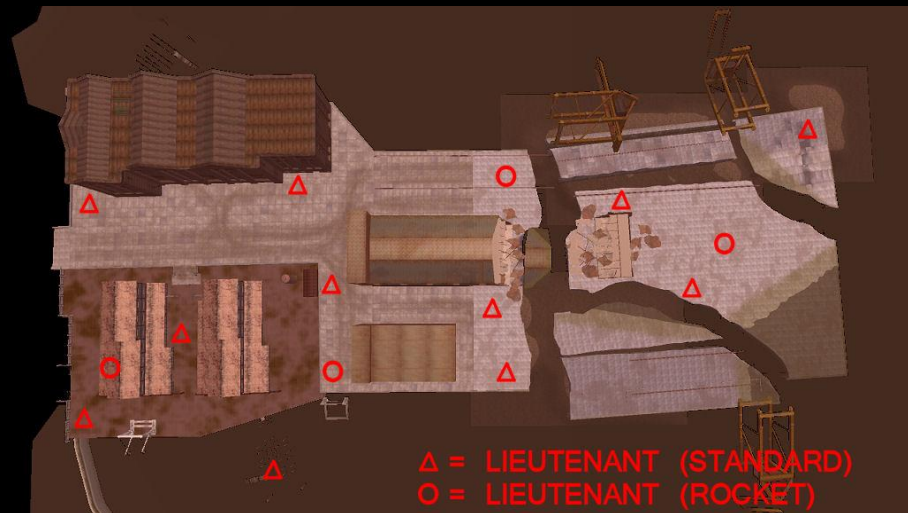
- Specific coop mechanics
  - Both players locked together





# Defining COOP for Missions

- No significant outward change to objectives







# Defining COOP for Activities

- Sometimes difficult to find a natural extension of gameplay
- Game stability offered problems with iteration



# Defining COOP for Activities

- A threshold score within a time limit
- Specific mechanics in a linear progression



# Defining COOP for Activities

- a threshold score within a time limit





# Defining COOP for Activities

- Specific mechanics in a linear progression
  - Each player has to be successful at their role



# Escort

- Gave each player a role
- Each player had to succeed
- Provided for some good fodder in design meetings





**MATURE**

**17+™**

**M**

Blood and Gore  
Intense Violence  
Sexual Content  
Strong Language  
Use of Drugs

**ESRB CONTENT RATING**

**[www.esrb.org](http://www.esrb.org)**



# Great Risk Brings Great Reward

MISSION

## 3RD STREET SAINTS APPOINTED DEFENDER COMPLETE

### GAT FOUND GUILTY, STILL GOES FREE

By Tyson Allen  
ULTOR TIMES



**Sentence** - One factor, diam dayibus tempus dictum, sedipsum laudat esse, ut vestibulum nulla ipsum eget ipsum. In a nec eget nunc intelligit laudat. Cras sem augue, rutrum vitae, aliquet a, tristique quis, velit. Pellentesque euismod, nunc ut ultrices faucibus, felis nunc porttitor laoreet, vel pretium nunc diam et erat. Tunc laudat, diam eget nunc vestibulum, ante nunc rhoncus quam, nec rhoncus dui purus semper erat.

Mauris interdum felis ut erat massa. Nulla tortor tempus, laudat ut, sedibus in, faucibus quis justo. Pretium interdum. Donec laoreet posu, gravida ut, varius ut, nunc ut, sem. Phasellus faucibus sagittis ut amet ut, nunc massa. Nunc nunc posu. Mauris vestibulum vestibulum mauris. Cras eget tunc vestibulum ad tunc laoreet per congue nunc, per congue vestibulum. Curabitur nunc ut, vestibulum nunc, porttitor laoreet, porta ac, felis. Praesent ut felis ut erat vestibulum congue. Mauris erat. Quisque vestibulum eget tunc vestibulum vestibulum. Nulla ultrices odio ut erat. Nulla vestibulum vestibulum vestibulum vestibulum. My mother said to me that she was

One factor, diam dayibus tempus dictum, laoreet vestibulum nulla ipsum eget ipsum. In a nec eget nunc intelligit laudat. Cras sem augue, rutrum vitae, aliquet a, tristique quis, velit. Pellentesque euismod, nunc ut ultrices faucibus, felis nunc porttitor laoreet, vel pretium nunc diam et erat. Tunc laudat, diam eget nunc vestibulum, ante nunc rhoncus quam, nec rhoncus dui purus semper erat.

CASH  
**\$500**

**A** CONTINUE



# DEVELOPING SYSTEMS TO SUPPORT COOP



# Topics Covered

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  - Why Do Coop?
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# Vehicle Camera



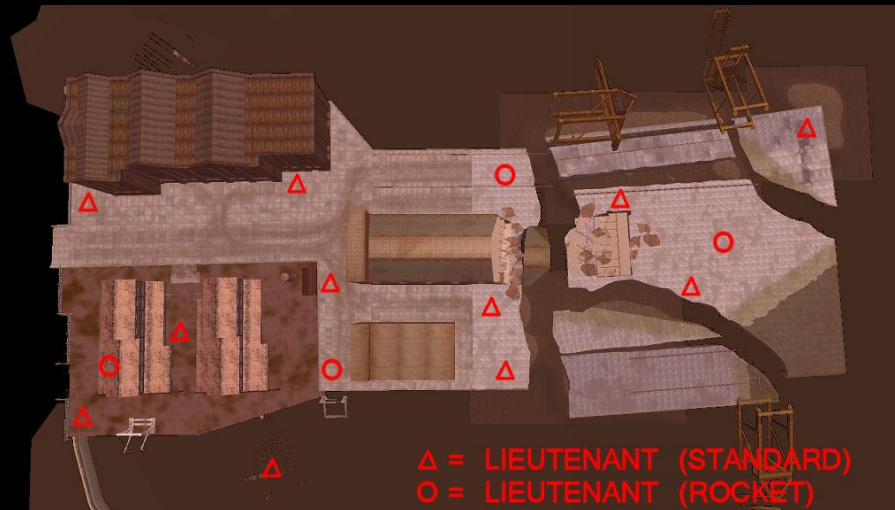


# Trigger Placement



# Spawning

- Two methods
  - Function that held spawning
  - Spawn NPCs early



# Balancing

- Decrease players hit points
- Decrease players weapon damage
- Increase numbers of enemies



# Measure twice, cut once

- Evaluate features carefully
- New features adds much more risk in a coop scenario
- We didn't cut much of anything



# Saving game progression

These basic rules apply:

- The client joins at the point where the server has progressed
- Players must still complete all prerequisites for rewards
- Both players earn progression and mission/activity specific rewards when playing together





# Case Study: Coop Game Progression

- Client has completed the first 2 missions of an 8 mission set.
- Server has completed the first 6 missions of the same 8 mission set.
- Client then joins the server's game and completes the last 2 missions of the 8 mission set and then disconnects and resumes playing in single player.





# What happens for server:

- Server receives mission specific reward for all missions
- Server receives achievements for completing all missions in the set
- The server then can continue with the game as if they had never played coop.



# What happens for the client:

- Mission 1 ●
- Mission 2 ●
- Mission 3 ●
- Mission 4 ●
- Mission 6 ●
- Mission 7 ●
- Mission 8 ●



Achievement unlocked  
10G - Completed Eight Mission Set

# Too Complex?

- Allow players to have more opportunities to join
- Players gain rewards that can be taken back to their single player game
- Players progress the game

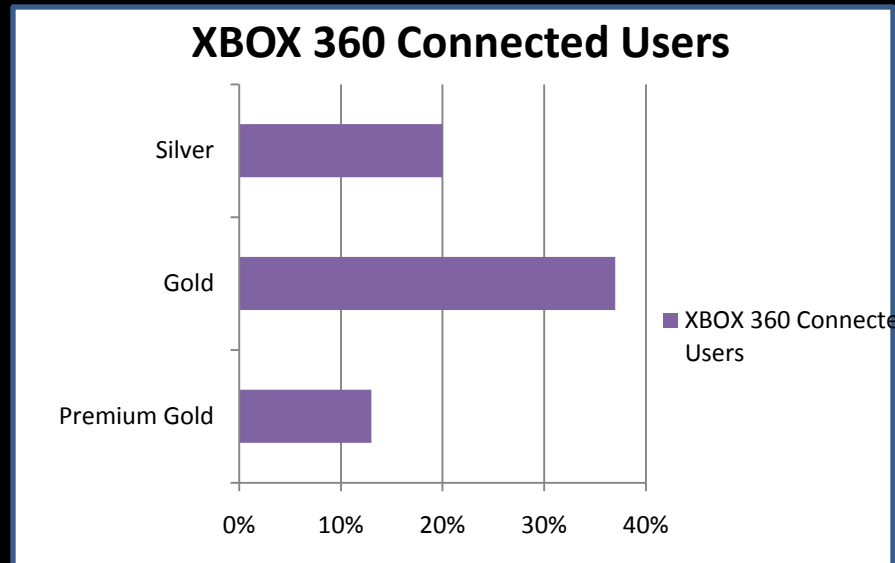


# Topics Covered

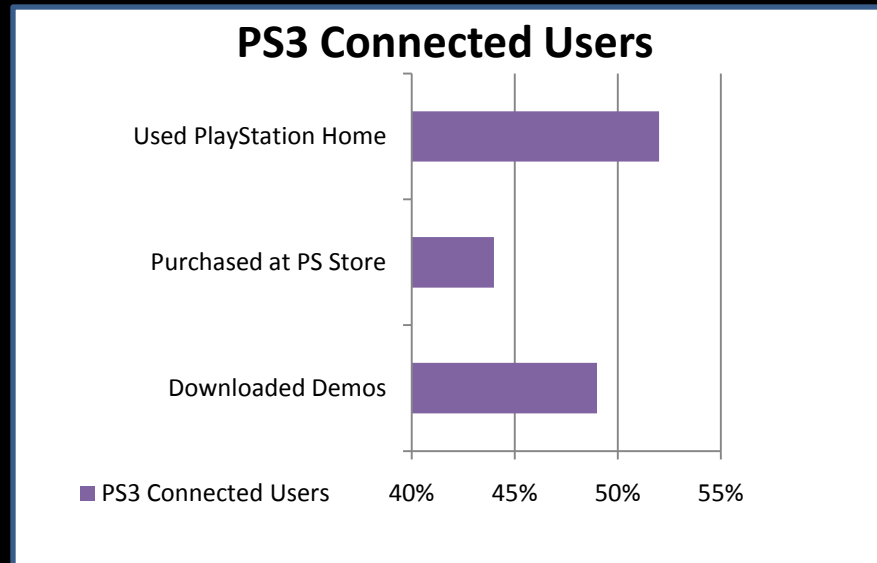
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# Players are connected!



# Players are connected!





# Players are connected!

## Reasons to provide online content:

- Help players discover your product
- Players expect online features
- Increase shelf life
- Providing players a social gaming experience



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# Drop in/out anytime co-op

- Join anytime
- Progression is saved
- Players earn rewards



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# Saints Row<sup>TM</sup> 2

CO-OP

Xbox LIVE

System Link

LOAD GAME

CO-OP

MULTIPLAYER

OPTIONS

DOWNLOADABLE CONTENT

EXTRAS

(A) SELECT (B) BACK





# Saints Row™

XBOX LIVE

Join Friend

New Game

Load Game

Quick Match

MULTIPLAYER

OPTIONS

DOWNLOADABLE CONTENT

EXTRAS

(A) SELECT (B) BACK





# Saints Row™

XBOX LIVE

Join Friend

New Game

Load Game

Quick Match

MULTIPLAYER

OPTIONS

DOWNLOADABLE CONTENT

EXTRAS

(A) SELECT (B) BACK



# Joining a Cheater

- Not handled well
- Possibility of lost progression





# Story

- Difference in sets due to overall game progression
- Each player is the star of their own cutscene

# “No battle plan ever survives contact with the enemy”

- Helmuth Karl Bernhard Graf von Moltke



# Notoriety





# Diversion HUD



# Technical underpinnings

- Saints Row 1 multiplayer code
- Client /Server relationship



# Client Server



AI, Scripting, processing

Report Client  
actions

Update Client  
with Results



# Be warned!

- Flexibility in approach is vital
- Be ready to re-engineer or cut features



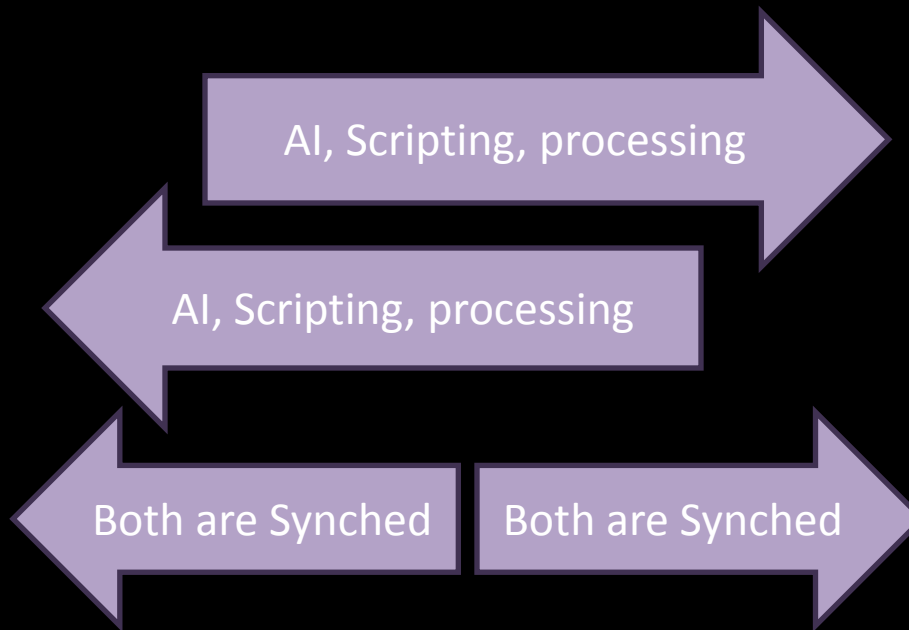


# No Tether Strikes Again

- As objects in the world increased the client suffered



# Rethinking Solutions: Hybrid solution





# Downside

- All systems had to re-engineered
- Hampered designs ability to iterate gameplay



# Upside

- Limited parallel processing
- More AI in a coop game



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# Lessons Learned - Programming

- Every system had to be COOP friendly
- Every system touched could break COOP
- Enormous amounts of bugs were created



# Lessons Learned - QA

- 37% of all Bugs involved COOP
- Staffing issues

```
[Saints Row 2] Strongholds - Strip Club; Co-Op
sh_m_stripclub

If the server begins the Strip Club stronghold while the client is far away (at Saints HQ, for instance), when the Stronghold
begins neither player will have controller functionality. To the server, the client will not appear to have warped to the
stronghold starting point, though the client will see himself in front of the strip club.

In debug, when this occurs the assert multi_game_coop.cpp will hit on line 2084. Skipping this assert will cause the
server to see the client warp, and both players will regain functionality.

C+D 7/31/08 04:00 PS3 Devkit Packfile Testerkit.self <Occurring on PS3>
C+D 7/31/08 09:00 Xbox360 Release Packfile <Occurring on Xbox360>

TTY:
mp_packet: 6692] Packet sent - type 14, rop_create
delete_timeout: 0x6f4e2] Sending create npc 2218
mp_packet: 6692] Packet sent - type 14, rop_create
delete_timeout: 0x6f4e2] Sending create npc 2217
mp_packet: 6692] Packet sent - type 14, rop_create
multi_acks: 6692] Sent acks for VolAstraea:1. Resetting count to 0
/multi_multi_game_coop.cpp(2084): Assertion failed! (Waiting_for_partner_dialog_handle !=
INVALID_DIALOG_BOX_HANDLE)

Source Code:
dialog_box* dialog = dialog_box_system_box( LOCALIZE( "COOP_TITLE" ), LOCALIZE
("ACT_DEMO_DERBY_WAITING_ON_PLAYER"), DIALOG_PRIORITY_ACTION);
Waiting_for_partner_dialog_handle = dialog->get_handle();
} else {
Assert( Waiting_for_partner_dialog_handle != INVALID_DIALOG_BOX_HANDLE );

Callstack:
Type Function
void multi_game_coop_waiting_dialog(bool)
int waiting_for_player_dialog(lua_State*)
StkId luaD_precall(lua_State*, lua_TObject*)
StkId luaV_execute(lua_State*)
void resume(lua_State*, void*)
```

# Lessons Learned - Design

- Focus on stability not new features
- Make cuts early
  - We didn't cut much of anything on SR2
  - Pushed content into the game until the last minute





# Lessons Learned - Design

- Story continuity may take a back seat



# Lessons Learned - Design

- Un-tethered in an open world creates huge complexity
  - Creates huge possibilities for emergent gameplay



# Lessons Learned - Design

- Coop was well worth the time and effort
- Coop was well regarded by our players/reviewers
- Design everything with COOP in mind



# QUESTIONS?

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