US 20170120150A1

(19) United States

(12) Patent Application Publication

Berger et al.

(10) Pub. No.: US 2017/0120150 A1

(43) Pub. Date: May 4, 2017

(54) ENCOURAGING PLAYER SOCIALIZATION USING A NEMESIS AND AVENGER SYSTEM

(71) Applicant: **Blizzard Entertainment, Inc.**, Irvine, CA (US)

(72) Inventors: **Matthew Berger**, Orange, CA (US); **Evan Greenstone**, Tustin, CA (US)

(21) Appl. No.: **15/401,991**

(22) Filed: **Jan. 9, 2017**

Related U.S. Application Data

(63) Continuation of application No. 14/792,423, filed on Jul. 6, 2015, now Pat. No. 9,539,518, which is a continuation of application No. 14/328,964, filed on Jul. 11, 2014, now Pat. No. 9,076,292.

Publication Classification

(51) **Int. Cl.**

A63F 13/55	(2006.01)
A63F 13/822	(2006.01)
A63F 13/69	(2006.01)
A63F 13/67	(2006.01)
A63F 13/795	(2006.01)
A63F 13/30	(2006.01)

(52) **U.S. Cl.**

CPC ***A63F 13/55*** (2014.09); ***A63F 13/795*** (2014.09); ***A63F 13/30*** (2014.09); ***A63F 13/69*** (2014.09); ***A63F 13/67*** (2014.09); ***A63F 13/822*** (2014.09); *A63F 2300/807* (2013.01)

(57) **ABSTRACT**

In an approach, one or more player characters controllable by a first player account perform an action in an instance of a game world. In the event that the action meets one or more conditions for creating a nemesis, a computer system controlling the game instance selects a second player account to be invaded by a nemesis. When the second player account plays the game in the same or a different game instance, the computer system determines whether second one or more characters of the selected account meet one or more invasion conditions. If the invasion conditions are met, the computer system generates computer-controlled enemy NPCs for second one or more characters of the second player account to defeat. If the second account defeats the nemesis invasion, rewards are generated for the first and second player accounts. Otherwise, the computer system chooses a third player account for nemesis invasion.

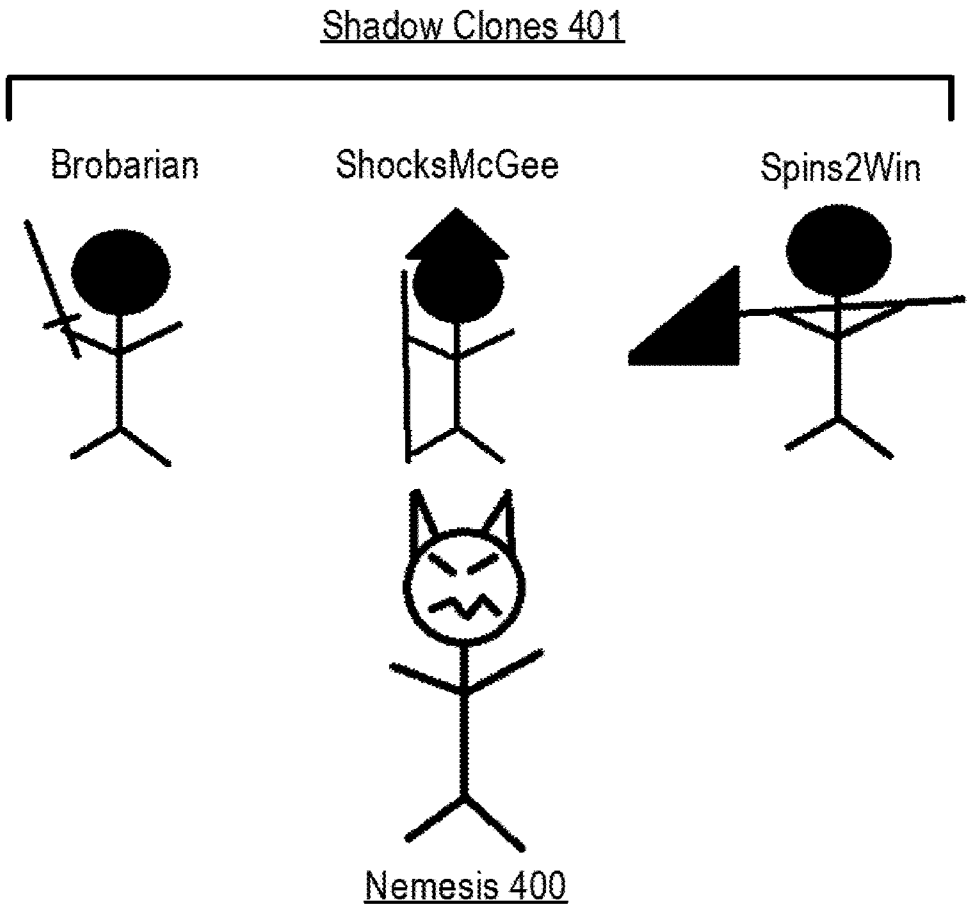


FIG. 1

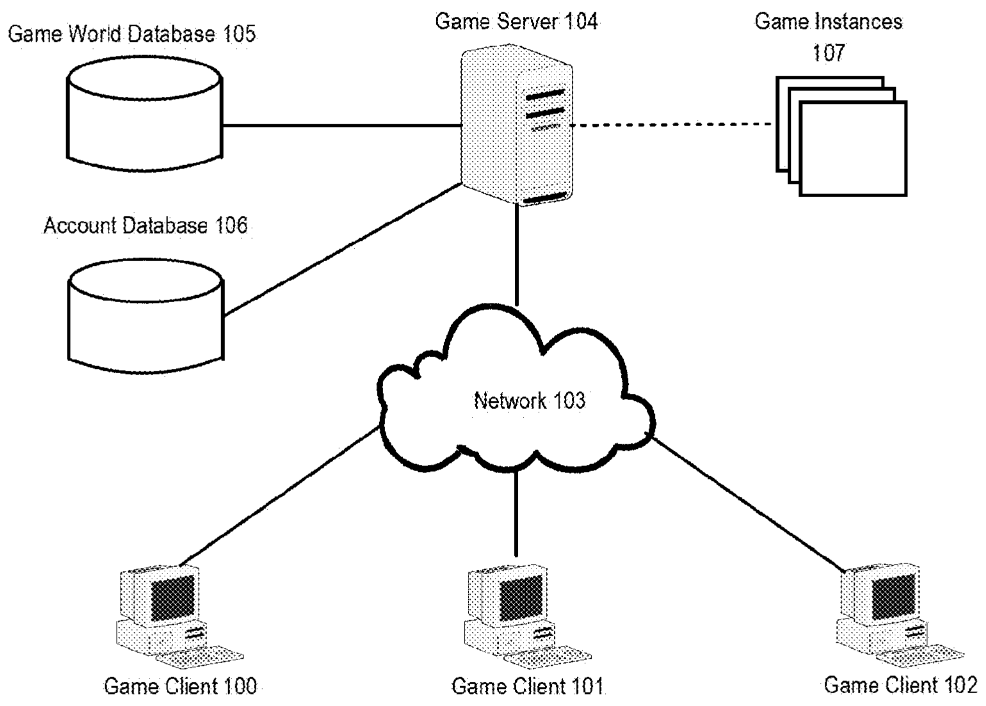

Game World Database 105
Game Server 104
Game Instances 107
Account Database 106
Network 103
Game Client 100
Game Client 101
Game Client 102

FIG. 2

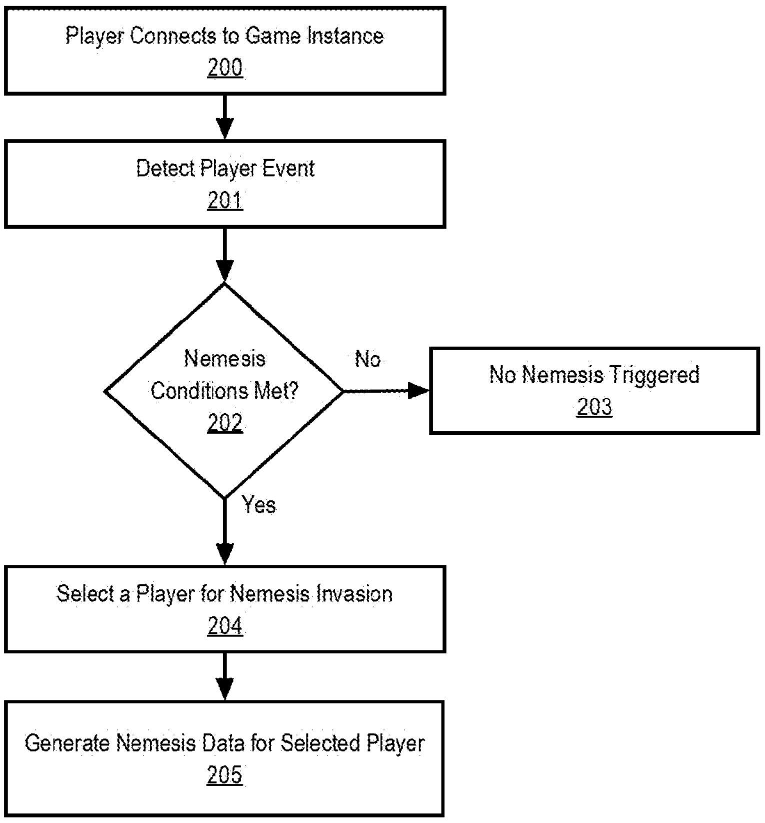

Player Connects to Game Instance
200
Detect Player Event
201
Nemesis Conditions Met?
202
No
No Nemesis Triggered
203
Yes
Select a Player for Nemesis Invasion
204
Generate Nemesis Data for Selected Player
205

FIG. 3

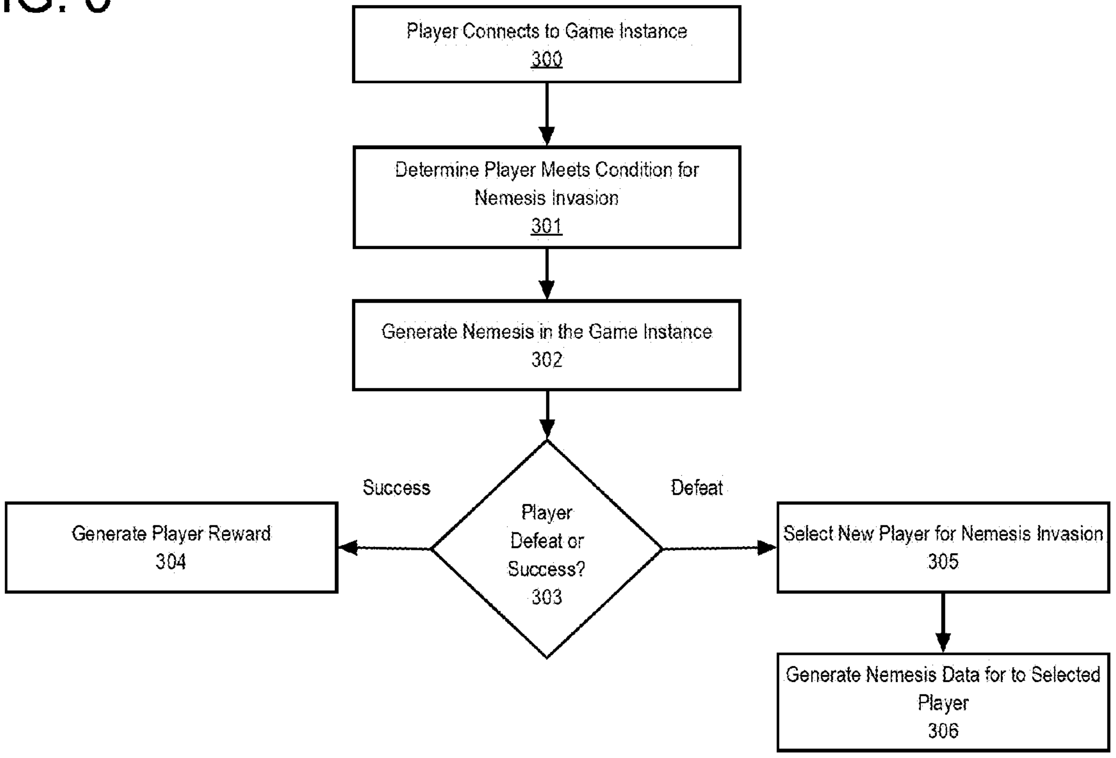

Player Connects to Game Instance
300
Determine Player Meets Condition for Nemesis Invasion
301
Generate Nemesis in the Game Instance
302
Player Defeat or Success?
303
Success
Defeat
Generate Player Reward
304
Select New Player for Nemesis Invasion
305
Generate Nemesis Data for to Selected Player
306

FIG. 4

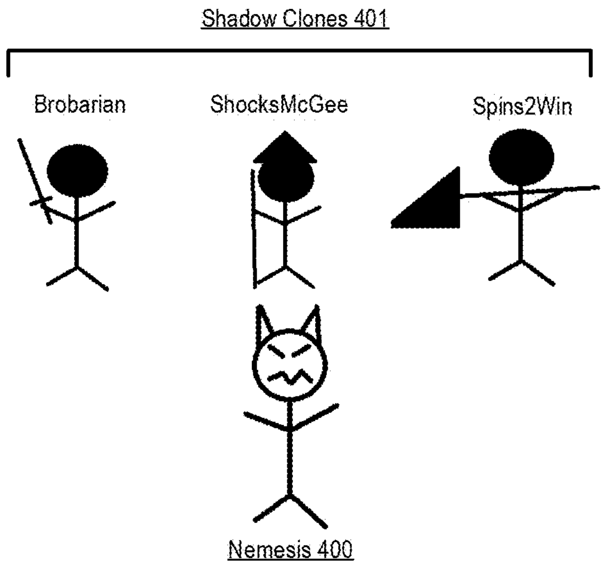
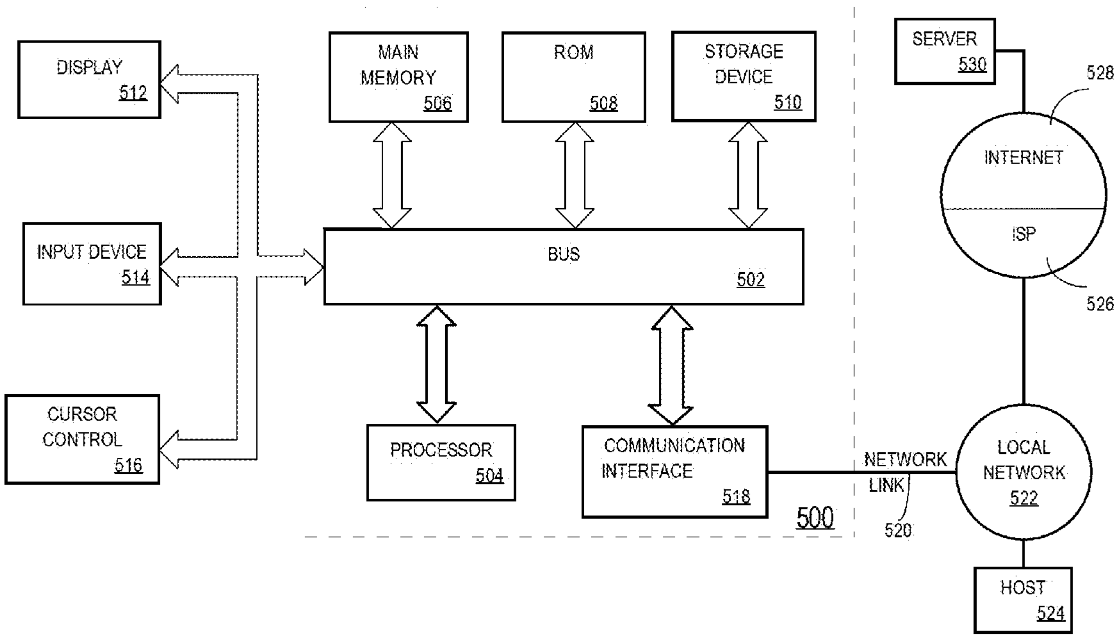

Shadow Clones 401
Brobarian
ShocksMcGee
Spins2Win
Nemesis 400

FIG. 5


DISPLAY 512
INPUT DEVICE 514
CURSOR CONTROL 516
MAIN MEMORY 506
ROM 508
STORAGE DEVICE 510
BUS 502
PROCESSOR 504
COMMUNICATION INTERFACE 518
500
NETWORK LINK 520
SERVER 530
528
INTERNET
ISP
526
LOCAL NETWORK 522
HOST 524

ENCOURAGING PLAYER SOCIALIZATION USING A NEMESIS AND AVENGER SYSTEM

CROSS-REFERENCE TO RELATED APPLICATIONS; BENEFIT CLAIM

[0001] This application claims the benefit as a continuation of application Ser. No. 14/792,423, filed Jul. 6, 2015, which is a continuation of Ser. No. 14/328,964, filed Jul. 11, 2014, now U.S. Pat. No. 9,076,292 issued Jul. 7, 2015, the entire contents of which are hereby incorporated by reference for all purposes as if fully set forth herein. The applicants hereby rescind any disclaimer of claim scope in the parent application or the prosecution history thereof and advise the USPTO that the claims in this application may be broader than any claim in the parent application.

FIELD OF THE INVENTION

[0002] The present invention relates to techniques for encouraging player socialization during play of a networked video game.

BACKGROUND

[0003] A video game is an electronic game that involves human interaction with a user interface to generate visual and/or auditory feedback on a gaming device. The gaming device may be a general purpose computing device that is programmed to execute the video game, or a special-purpose gaming machine or console.

[0004] Over the years a broad spectrum of games have been developed which span a plethora of different genres, such as role playing games, puzzle games, simulation games, shooters, and so forth. In addition, different games allow for different levels of interactions between the various human participants. A single-player game is designed to elicit input from only one player throughout the course of the gaming session. Thus, the other characters or participants that the player encounters throughout the game consist solely of non-player characters (NPCs) controlled by one or more computer systems. By sharp contrast, in a multiplayer game, the player is confronted with characters or situations controlled by human participants in addition to or instead of NPCs. However, the format and degree of interaction between the human participants can vary greatly depending on the design of the particular game being played. One critical factor in the design of multiplayer games is the scale of the multiplayer interaction.

[0005] At one end of the spectrum are games which are designed for an immense number of simultaneous players (e.g. hundreds, thousands, hundreds of thousands, or even more). Collectively, such games are referred to as massively multiplayer online (MMO) games. For example, World of Warcraft® is an example of a massively multiplayer online role playing game (MMORPG) where a participant's character(s) may team up with, fight, or otherwise interact in a virtual world with multiple other participants' characters simultaneously. MMOs often offload processing from participant devices to central servers to reduce the amount of network communications and graphics computations required by the participant devices for each additional character that is added to the environment. Furthermore many MMOs, especially MMORPGs maintain a persistent game world that is shared across all the participating players. However, in order to prevent overcrowding or interference with certain objectives within the game many MMOs also implement "dungeon instancing", which creates a copy of an area of the game world that is dedicated to a specific player or group of players. For example, cities and open areas of the game world may be shared between players, but specialized areas such as dungeons, lairs, keeps, etc. may be instantiated separately for each player or group or players and exist only as long as the area is in use by the associated players.

[0006] At the other end of the spectrum are games designed for a small number of simultaneous players. These games often also offer a solo or single-player game mode. Unlike MMOs, these games often localize processing on participant devices to maximize the quality of graphics and speed of the game. Furthermore, the limited number of players makes it more viable for network messages to be exchanged in a peer-to-peer fashion, rather than relying on a dedicated server to act as an intermediary. However, many games in this category still rely on a centralized server for authentication, saved data storage, and/or cheat prevention services. For example, in real-time strategy (RTS) games, such as Starcraft® or Warcraft®, a small number of human participants can compete simultaneously in individual game instances by collecting resources, gathering territory, constructing fortifications, building armies, and attempting to wipe out the opponents forces. These game instances are often instantiated for a particular match or round and then are reset or re-instantiated when the next match or round begins. As another example, the Diablo® series of games are action RPGs where a participant's character(s) team up with or otherwise interact in a virtual world with other participants' characters to build up their virtual characters with experience and equipment, fight monsters, and/or trade items. In many action RPGs, a player (referred to as the host) creates an instance of the game world for the other players to join and the instance persists until the host disconnects from the gaming session. However, in other implementations, a different player who is joined to the game instance is nominated as the new host, thus allowing the instance to persist until no players are left remaining.

[0007] Regardless of the scale of multiplayer interaction, multiplayer games enhance the gaming experience by stimulating the players' socially competitive and cooperative natures. For example, in MMORPGs and action RPGs players often group together to take on challenges and enemies that their own character may be ill equipped to tackle alone. As a result, players build lasting friendships or groups that play together on multiple occasions. To facilitate communication between players, multiplayer games often implement "friends lists" to which a player can add other players in order to keep track of their friends' online status and/or conveniently send messages to the added players. Furthermore, some games allow groups of players to establish "guilds" or "clans" that have access to unique features, such as a chat channel or in-game cosmetic effects that are shared between all participating members. However, most features that involve interactions between players require all participating players to be connected to the same game instance at the same time. Depending on each player's personal schedule, it may be rare for some players to find a convenient time to play together. As a result, there is a need for a mechanism that allows for the fostering of online relationships between players without necessarily requiring simultaneous play.

[0008] The approaches described in this section are approaches that could be pursued, but not necessarily approaches that have been previously conceived or pursued. Therefore, unless otherwise indicated, it should not be assumed that any of the approaches described in this section qualify as prior art merely by virtue of their inclusion in this section.

BRIEF DESCRIPTION OF THE DRAWINGS

[0009] In the drawings:

[0010] FIG. **1** illustrates an example operating environment upon which an embodiment may be implemented.

[0011] FIG. **2** illustrates a process for creating a nemesis in flow diagram form according to an embodiment.

[0012] FIG. **3** illustrates a process for a nemesis invasion in flow diagram form according to an embodiment.

[0013] FIG. **4** illustrates a depiction of a nemesis and shadow clone henchman according to an embodiment.

[0014] FIG. **5** illustrates an example computer system for performing various machine-implemented steps described herein.

DETAILED DESCRIPTION

[0015] In the following description, for the purposes of explanation, numerous specific details are set forth in order to provide a thorough understanding of the present invention. It will be apparent, however, that the present invention may be practiced without these specific details. In other instances, well-known structures and devices are shown in block diagram form in order to avoid unnecessarily obscuring the present invention.

General Overview

[0016] Systems, methods, and stored instructions are provided herein for encouraging player socialization using a nemesis and avenger system. As mentioned above, players who are "friends" within the game may not always be simultaneously connected to the same game instance. As one example, the players may be unable to find a convenient time to simultaneously play the game. As another example, players may be completing tasks in the game that are more efficiently performed alone or with a different group of players. In addition, even if players are connected to the same game instance, the game instance may represent an immense area to where the "friends" may rarely run into each other. For example, friends whose characters are at different "levels" in the game may quest or hunt in far removed areas appropriate to their level. In traditional gaming systems, the interaction between players in different game instances or locations is minimal, such as via an in-game chat room, or non-existent. In any event, the interaction is not one that affects the actual flow or experience of the game. However, the techniques described herein provide a way for players to affect each other's gameplay at a distance or even across different game instances.

[0017] In an embodiment, one or more player characters that are controllable by a first player account perform an action in an instance of a game world. In the event that the action meets one or more conditions, a computer system controlling the game world selects a second player account to be invaded by a particular creature. A creature that is invades the game world of a second player based on actions performed by a first player is referred to herein as a "nemesis". The one or more conditions that cause the creation of a nemesis are referred to herein as "creation conditions".

[0018] When the second player account is playing the game (in the same or a different game instance), the computer system determines whether one or more "invasion conditions" are satisfied. If the invasion conditions are satisfied, the computer system generates one or more computer-controlled nemesis creatures. According to one embodiment, the nemesis creatures are generated in the vicinity of a second one or more characters of the second player account. In the event that the second account is successful in defeating the nemesis invasion, rewards are generated for the first and second player accounts. However, in the event that the second account is defeated by the nemesis invasion, a third account is selected to be invaded by the computer-controlled nemesis and the process repeats until the nemesis invasion is defeated or until a threshold number of players have been defeated.

[0019] For example, assume the creation condition is that a player be defeated by an NPC that is flagged to create a nemesis. In this example, when one or more player characters of the first player account are defeated by a computer-controlled NPC, the computer system determines whether the computer-controlled NPC is of a type that is flagged to create a nemesis. If so, the computer system selects the second player account to be invaded by a nemesis. In addition, the computer system creates nemesis data specifying the characteristics, attributes, and abilities of the nemesis. According to one embodiment, the nemesis data is based on an "upgraded" version of the computer-controlled NPC that defeated the first player. In addition, the computer system associates that nemesis data with the second account. When the second account next plays the game, the computer system may determine whether the invasion conditions are satisfied. For example, the computer system may determine that the currently logged-in characters of the second account are an appropriate character-type and at an appropriate location for a nemesis invasion.

[0020] In response to determining that the invasion conditions are satisfied, the computer system generates a nemesis, based on the nemesis data, for the characters of the second account to battle. In some cases, the nemesis may be generated with one or more "henchman" NPCs that assist the nemesis in battle against the second player. For instance, the nemesis NPC can be assisted by "shadow clones" of the players that the nemesis and/or the precursor computer-controlled NPC had previously defeated. In one embodiment, each of the "shadow clones" uses the same gear, model, abilities, names, etc. as the corresponding defeated player. If the second player account manages to defeat the nemesis invasion, the computer system generates "gift boxes" containing a variety of in-game rewards that the second player can use and/or distribute back to the first player. However, if the second player is unsuccessful in defeating the nemesis invasion, the computer system selects a third player account, modifies the nemesis data to "upgrade" the nemesis to a more powerful version, and stores the nemesis data in association with the third player account for the next invasion.

Game Worlds and Instances

[0021] As used herein, a "game world" is a template for the context in which the players experience the game. For example, the game world may define the geometric characteristics of a map in which the game takes place, the computer-controlled NPCs that appear on the map, scripted events, objects that appear in the map, dialog for the NPCs, cut-scenes, game logic, and so forth. A "game instance" is an instantiated copy of the game world that keeps track of the current context. For example, the game instance may track the current position of the player and non-player characters, current attributes of the characters (e.g. health, action points, stamina, mana, status effects, etc.), current object states, and so forth. Thus, the game world acts as a blueprint from which the gaming device generates and controls a playable copy of the game for the player to experience. As a result, different players may be playing in different "instances" of the game, but are still playing within the same "game world". In a practical environment, the "game world" and "game instances" of an electronic game may be implemented by stored data, stored instructions, specialized hardware, or combinations thereof.

[0022] Depending on the embodiment, the game world can be deterministic (causes generation of the same exact game instance each time), stochastic (generates random characteristics for the game instance), or a combination of both. For example, the game world may define that a particular area within the game always use the same tile set giving the appearance of a cave. However, the enemies populating the area, the size of the area, the objects found within that area, the number of rooms, the configuration of the rooms, the size of the rooms, and so forth, may be fully or partially randomized. Thus, different instances of the same game world may not always be generated to be exactly identical.

[0023] In some embodiments, players can save the state of a particular instance to resume again at a later time. Depending on the embodiment, the state of the instance may be completely saved, such that the context is identical to where the player left off, or partially saved, such that only particular aspects of the context are carried over from the prior gaming session. For example, the player's character and progress through the map may be saved for the next time play is resumed, but the non-player characters populating the map may be reset each time the instance is regenerated.

Example Operating Environment

[0024] FIG. **1** illustrates an example operating environment upon which an embodiment can be implemented. As shown, a game server **104** hosts game instances **107** for game client **100**, game client **101**, and game client **102** (collectively "the game clients") and is communicatively coupled to the game clients over network **103**. In addition, the game server **104** is communicatively coupled to game world database **105**, which contains data associated with generating and controlling game instances, and account database **106**, which contains data associated with registered gaming accounts.

[0025] In an embodiment, the game clients and game server **104** represent one or more software components or applications executing on respective computing devices, such as personal computers, workstations, laptops, netbooks, tablet computers, game consoles, smartphones, combinations thereof, and so forth. For example, the game clients may be executing on computing devices associated with individual players of the games and the game server **104** may be executing on one or more computing devices associated with the game publisher or developer. However, in other embodiments, the game clients and the game server **104** may be implemented by specialized hardware instead of or in addition to the aforementioned software components and/or applications.

[0026] In an embodiment, network **103** represents any combination of one or more local networks, wide area networks, or internetworks. Data exchanged over the networks may be transferred using any number of network layer protocols, such as Internet Protocol (IP), Multiprotocol Label Switching (MPLS), Asynchronous Transfer Mode (ATM), Frame Relay, and so forth. Furthermore, in embodiments where the networks represent a combination of multiple sub-networks, different network layer protocols may be used at each of the underlying sub-networks.

[0027] In an embodiment, the game world database **105** and account database **106** each represent a collection of one or more storage devices. The game world database **105** stores data associated with generating and controlling game instances, such as the maps on which the game takes place, enemy NPCs, friendly NPCs, player and NPC abilities, scripted events, cut scene breakpoints, geometric characteristics of the map, objects, object interactions, and so forth. In addition, the game world database **105** stores the game logic which controls how the game reacts to various input or actions supplied by the players. The account database **106** stores data associated with one or more accounts, such as authentication information for each account, "friends" of each account, characters associated with each account, saved games associated with each account, game progress associated with each account, mail/message data for each account, pending nemesis invasion for the account, and so forth.

[0028] Although FIG. **1** depicts only a particular number of elements, a practical environment may contain hundreds or thousands of each depicted element. In addition, a practical environment may contain additional components which have been omitted from FIG. **1** to avoid obscuring the illustration. For example, the game world database **105** and account database **106** may be communicatively coupled to or accessible by the game server **104** over one or more additional networks or by network **103**. In addition, other embodiments may contain a different number of databases than illustrated in FIG. **1**. For example, an account established with the game server **104** may be shared among multiple games from the same developer or publisher. Thus, the data in the account database **106** may be divided into a global account database that maintains information that is shared among the multiple games and a game specific account database that stores account data unique to a particular game. For example, the global account database may keep track of the authentication information for a given account, whereas the game specific database tracks the playable characters that are accessible to the account in a particular game. Furthermore, the game server **104** may be divided into multiple game servers that are each responsible for a subset of the responsibilities for the game server **104**. For example, the environment may contain an authentication server that is responsible for authenticating the game clients when an account is accessed. As another example, the game world may be divided into multiple separate areas and different game severs may be responsible for generating and maintaining instances for different areas.

Establishing a Game Instance

[0029] In an embodiment, the game clients establish a game instance with the game server **104** by "logging in" to an account and requesting an instance. The game client requesting the instance will be referred to as the "requesting game client". For example, the requesting game client may log into an account by providing one or more credentials such as passwords, account names, secret codes, authenticator codes, and so forth. The game server **104** compares the credentials to data associated with the account within the account database **106** and if a match is found the game server **104** allows access to the account. For example, the game server **104** may send information from the account database **106** to the requesting game client for display, such as characters available for play on the account, available game modes, online status of friends and/or guildmates associated with the account, and so forth. In addition, once access to the account has been granted, the requesting game client provides an option, via a user interface, widget, or other input mechanism, that allows the associated player to request a game instance. In some embodiments, the requesting game client sends additional information with the request that is used by the game server **104** to generate the game instance. For example, the account may be associated with multiple characters which can be selected by the player via a user interface provided by the requesting game client. Each of the characters available for selection may be associated with different locations in the game world, progress with various objectives, equipment, available NPCs, and so forth. Thus, the requesting game client sends with the request an identifier indicating which character will be played. This additional data allows the game server **104** to generate an instance tailored to that character. As other examples, the information sent with the request may specify an ID for a particular saved game, a particular game mode, a particular map, and various other game options which control aspects of the requested game instance.

[0030] The game server **104** responds to the request from the requesting game client by generating a game instance for the associated account based on data from the game world database **105**. For example, the requesting game client may request an instance for a particular character. In response, the game server **104** looks up the specified character in the account database **106** and discovers that the character is associated with a particular area within the game world. The game server **104** then looks up the aforementioned location in the game world database **105** to discover enemy NPCs, friendly NPCs, events, map characteristics, objects, and so forth that correspond with the location to generate the instance. Depending on whether the game world is fully or partially stochastic in nature, the game server **104** may randomly select characteristics for the instance from a set of potential characteristics. For example, the game world database **105** may specify that an enemy NPC within the location may have a 30% chance to be Enemy A, a 20% chance to be Enemy B, and a 50% chance to be Enemy C.

[0031] After the game instance is generated, the game server **105** sends data back to the requesting game client that describes the game instance. In response, the requesting game client generates a user interface for the player that displays the environment and provides the player with the ability to control their playable character(s). For example, the game server **105** may send back data describing the geographic characteristics of the map, characteristics and equipment of the player, the location and type of each enemy, the location of the player, status of the player and non-player characters, objects, dialog, and so forth. The game clients then process that information into a user interface for the player. For example, the game clients may visually display the map within the vicinity of the player, render the player and non-player characters based on models correlating to the character and/or equipment types, display chat rooms or channels to communicate with other players or NPCs, render the various objects in the instance, and so forth.

Joining a Game Instance

[0032] In some embodiments, once a game instance is created for the requesting game client, the other game clients have an option to join the established instance. For example, the game clients may be configured, when not actively joined to an instance, to display a menu that lists established game instances that can be browsed and joined. As another example, the game clients may be configured to display a friends list that identifies which friends are currently in active games and provide an option to join a friend's associated instance. In one embodiment, the game client associated with an active instance provides an option that allows the game instance to be "open" or "closed". When the game instance is "open" other players are allowed to freely join the game instance. However, when the game instance is "closed" other players are not allowed to join the instance or are only allowed to join by explicit invitation by the host player of the instance.

[0033] When joining a game instance, the game clients send a message to the game server **104** specifying an identifier associated with the instance. For example, the identifier could be the name or ID of the host player or account associated with the instance. In response, the game server **104** locates the appropriate instance in the active game instances **107**, and sends back data describing the current state of the game instance. In response, the game clients render the game instance in a user interface for the players in the same manner described above in the "ESTABLISHING A GAME INSTANCE" section.

[0034] In other embodiments, the game clients provide an option for players to group together prior to the instance being generated and enter the instance simultaneously. For example, the game clients may provide the ability for a host player to invite one or more other players to participate in the game. Once the host has invited the players, the game client of the host provides an option to request an instance from the game server **104**. As a result of selecting the option, the game server **104** establishes the instance and automatically joins all players in the group to the instance. In other embodiments, players may be randomly assigned to the instance to meet a minimum number of players for the game. For example, in a ten player game the host may invite only three additional players, leaving the game server **104** to fill in the remaining six players.

Controlling a Game Instance

[0035] In some embodiments, the game server **104** periodically sends instance update messages to the connected game clients to keep the respective user interfaces updated with the current state of the instance. For example, depending on the rules of the game world, the instance may be updated in real-time based on the actions of computer controlled enemies, environmental triggers, or the actions of the players participating in the instance. As a result, the game instance may change even without input being supplied by every participating player. In response to receiving the update messages from the game server **104**, the game clients process the update message to update the user interface to display the current state of the instance. In other embodiments, the game server **104** sends the instance update messages based on one or more conditions instead of or in addition to a periodic timer. For example, in a turn-based game the game instance may not progress until each participating player has provided input, thus rendering the periodic updates unnecessary.

[0036] In order to control the playable characters, players manipulate the user interface provided by the game clients via one or more input mechanisms. For example, the user interface may be configured to receive input via widgets displayed in the interface, mouse input, keyboard input, gamepad input, joystick input, voice controls, or any other appropriate input mechanism. In response to receiving user input to control one or more characters, the game clients convert that input into one or more messages that are sent to the game server **104**. The game server **104** then manipulates the instance based on the rules provided by the game world database **105** and the player input. In some embodiments, the user interface of the client computers attempt to predict the result of the player's actions by automatically updating the user interface to a state that approximates the impact of the action on the game instance. For example, if a game client receives input to jump a character forward, the game client may render that animation before receiving input from the server that the action was successful. Due to network delay between the game clients and the game server **104**, such approximations may provide a smoother gameplay experience for the players. However, in such embodiments, the user interface of the game clients is still updated with the actual state of the instance upon being updated by the game server **104**. Depending on the embodiment, the game clients may implement an appropriate smoothing or anti jitter rendering algorithm to minimize the effect of the correction.

Generating a Nemesis

[0037] FIG. **2** illustrates a process for generating a nemesis in block diagram form according to an embodiment. In order to illustrate clear examples, the following explanation is provided in the context of interactions between game server **104** and game client **100**. However, the same process is equally applicable to the other game clients. Furthermore, the following explanation assumes that game client **100** has logged into a player account (referred to as the "active account").

[0038] At block **200**, game client **100** connects to a game instance on behalf of the active account. For example, the game client **100** may connect to the game instance as a result of establishing the instance with the game server **104** as discussed above in the "ESTABLISHING A GAME INSTANCE" section. As another example, the game client **100** may connect to the game instance as a result of joining an instance requested by another player as discussed above in "JOINING A GAME INSTANCE" section.

[0039] At block **201**, the game server **104** detects an event involving one or more player characters that are controllable by the game client **100**. In some embodiments, the event involves an interaction between the one or more player characters and a computer-controlled NPC. For example, the interaction may be combat between the player characters and the NPC, dialog with the NPC, defeat of the NPC by the player characters, defeat of the player characters by the NPC, and so forth. In other embodiments, the event involves an interaction between the player characters and an object or area in the game instance. For example, the player characters may use a particular item, interact with a particular object, enter or leave a particular area, and so forth. In still other embodiments, the interaction may be between characters of different players, such as one player defeating another player, trade between the players, chat between the players, combat between characters of the players, and so forth.

[0040] At block **202**, in response to detecting the event, the game server **104** determines whether the event meets one or more creation conditions for creating a nemesis. In some embodiments, the game world database **105** defines the conditions which are used by the game server **104** to determine whether to create a nemesis. In one embodiment, the game world database **105** defines the creation condition to be the defeat of the player characters by an NPC. In an alternative embodiment, player defeat may be only one of several creation conditions. For example, another condition may be that the defeat must be from a particular type of NPC, or under particular circumstances.

[0041] For particularly tough NPCs that are likely to result in a great number of player deaths, such as a boss encounter, the condition may be refined to prevent an undue number of nemesis invasions. For example, the creation condition may be the first defeat of the player by a particular boss, so that subsequent defeats by the same boss will not result in nemesis creation.

[0042] As yet another example, the game world database **105** may define the condition to only be met when the defeat is due to an NPC that belongs to one or more categories of nemesis-enabled NPCs. For example, the game world database **105** may define the different types to be boss NPCs and non-boss NPCs, where player character death at the hands of a boss NPC will not trigger a nemesis but player character death by a non-boss NPC will. As yet another example, the condition may be refined based on the location at which the action took place. Thus, particularity difficult locations may be exempt from triggering a nemesis.

[0043] At block **203**, if the detected action did not meet the nemesis creation conditions, then the game server **104** does not trigger the creation of a nemesis. As a result, the game server **104** updates the game instance according to the rules set forth in the game world database **105** and continues as normal.

[0044] At block **204**, if the detected event meets the nemesis creation conditions, then the game server **104** selects a different player account for the nemesis to invade. According to one embodiment, the game server **104** selects an account based on account selection criteria.

Account Selection Criteria

[0045] As mentioned above, when the nemesis creation conditions are met by one user, another user's account is selected based on account selection criteria. In some embodiments, the game server **104** selects the different player account based on the friend list of the player that satisfied the nemesis creation conditions. For example, the account database **106** may associate each player account with a list of other player accounts who are friends with the active account. As another example, the account database **106** may associate each player account with a clan or guild containing member players. However, in other embodiments, the game server **104** may select players from a pool of all players with accounts registered with the game server **104**. In some embodiments, if the set of players associated with the active account is empty, the game server **104** instead selects the active account for invasion. As a result, even a player with an empty friends list and no clan/guild will still be able to participate in a nemesis event and become familiar with the game mechanic.

[0046] In some embodiments, the game server **104** selects the different player randomly with equal chance given to each player account in the pool of eligible player accounts. However, in other embodiments, the game server **104** may weigh accounts with certain characteristics higher than others. For example, the game server **104** may base the selection on whether the player account is connected to a live instance, how active the player account is, number of pending nemesis invasions for the account, time since the account was last invaded by a nemesis, whether the player account is connected to the same instance as the active account, and so forth. In an embodiment, metrics related to the aforementioned selection criteria is stored within the account database **106** in associated with each account. Furthermore, the game server **104** may prevent nemesis invasions for accounts with certain characteristics. For example, the game client of an account may provide an option to set a flag which is registered with the game server **104** and prevents the account from being selected for invasion. As another example, the game client may prevent the selection of players who are participating in the same instance as the active account to prevent circular invasions. However, in other embodiments, the game server **104** can still select other accounts for invasion which are participating in the same instance as the active account of the game client **100**.

[0047] In some embodiments, the game server **104** selects the different player account based on the event that triggered the generation of the nemesis. For example, the game world database **105** may define an item in the game which, when used by player characters, causes a nemesis to be generated and sent after an account of the player's choosing. As another example, the characters of the active account may have access to a weapon that has a chance upon slaying an NPC to spawn a nemesis within the same game instance for the player to fight.

[0048] In some embodiments, the game client **100** provides an option to establish a nemesis group of one or more game accounts. Thus, in such embodiments, the selected account is chosen from among the players that have been established as part of the nemesis group.

The Nemesis Data

[0049] At block **205**, the game server **104** generates nemesis data, for the selected player account, that describes the nemesis. In an embodiment, the game server **104** generates a nemesis record for the selected player account and associates that nemesis record with the player account in the account database **106**. Each nemesis record associated with an account represents an impending invasion by a nemesis. As such, when the nemesis invasion is concluded, that record is removed from association with the player account. In an embodiment, the nemesis record specifies one or more of: abilities associated with the nemesis, a list of players defeated by the nemesis, the player that caused the initial creation of the nemesis, an identifier of a model with which to render the nemesis, character data associated with player characters defeated by the nemesis (e.g. class, sex, model, equipment, abilities, etc.), location from which the nemesis was initially created, level of the nemesis, equipment of the nemesis, attributes of the nemesis, size of the nemesis, and so forth. Depending on the exact implementation, not all of the aforementioned data may be relevant and thus some of the aforementioned data may be omitted from the nemesis record. In an embodiment, multiple nemesis records may be associated with the same account. Thus, a single account may be queued up for multiple pending nemesis invasions.

Nemesis Characteristics

[0050] In some embodiments, the nemesis is generated with one or more initial characteristics that are included in the nemesis record. In one embodiment, the initial characteristics are deterministic. For example, the nemesis may be generated with a set amount of health, a set amount of mana, a particular set of abilities, and so forth. However, in other embodiments, one or more of the nemesis characteristics are selected randomly from a range or set of characteristics. For example, the nemesis may be generated based on a certain range of health, a certain range of mana, one or more abilities selected randomly from a pool of available abilities, a randomized model, and so forth. In still other embodiments, the initial characteristics may be based on the circumstances that caused the generation of the nemesis. For example, the nemesis may be triggered by the defeat of the player at the hands of a particular NPC and the nemesis may be an "upgraded" version of the NPC. Thus, the game server **104** uses the initial characteristics of the NPC a base-line and scales those attributes higher to make the nemesis a tougher version of the NPC. Furthermore, the game server **104** may add abilities that ordinarily would not be available to the particular NPC to create the nemesis. In some embodiments, the attributes of the nemesis are scaled based on one or more characteristics of the selected account. For example, the attributes may be scaled based on an account wide level associated with the selected account. Thus, as the account's "level" increases, the attributes are scaled upwards to provide the player of the selected account with a suitable challenge. As another example, the attributes may be based on the level of the playable character(s) of the selected account.

[0051] In some embodiments, the game world database **105** defines one or more groups of abilities for the game server **104** to choose from when selecting abilities for a nemesis. Thus, the game server **104** chooses an ability group and from that point forward abilities for the nemesis are selected from the chosen ability group. Depending on the embodiment, the different ability groups may be defined such that abilities that work well together from a gameplay or aesthetic standpoint are contained within the same ability group. For example, one ability group may be representative of a "fire" nemesis ability set that includes only abilities that deal fire damage. However, another ability group may be representative of an "ice" nemesis ability set that includes only abilities that deal ice damage. In some embodiments, each of the ability sets is associated with an identifier and that identifier is included in the nemesis record. Thus, if the nemesis is further "upgraded" as a result of a future invasion, the game server **104** can use the identifier to choose additional abilities for the nemesis from the same ability group. As a result, the nemesis remains consistent with the chosen theme, even when being "upgraded" during chains of invasions against other players.

[0052] In some embodiments, the game server **104** also chooses appearance characteristics for the nemesis such as the model that will be utilized and/or modifications to a base model, such as equipment appearance, skins, textures, and so forth. For example, the NPC that triggered the generation of the nemesis may use a particular model when rendered by the game clients. The game server **104** places in the nemesis record, an identifier for the model so that the model can be reused when the nemesis invades the player. Furthermore, in some embodiments, the model may be modified to make the nemesis appear more menacing than the original NPC. For example, the model's size and color scheme may be adjusted, the equipment displayed on the model may be adjusted, and so forth. In other embodiments, the game server **104** utilizes a single model or a small group of models specific to "nemesis" NPCs. However, even for embodiments which utilize a specific nemesis model, the model may still be modified based on the circumstances that triggered the creation of the nemesis. For example, the event triggering the creation of the nemesis may take place in a location or level populated almost exclusively with murderous halberd-wielding bovines. As a result, the nemesis record may specify to modify the base nemesis model to add horns in order to represent the location from which the nemesis hails. However, in other embodiments, the game world contains no cow level.

[0053] In some embodiments, in addition to generating the nemesis data, the game server **104** also performs clean-up operations with respect to the game world. For example, after the player is defeated by an NPC, the game client **100** may display the NPC as escaping through a "nemesis portal" and the game server **104** may remove that NPC from the game instance.

[0054] Although the characteristics of the nemesis are described above as being generated at the time the nemesis record is associated with the selected player account, in other embodiments the characteristics are instead selected when the nemesis actually invades a game instance to which the selected player account is connected. Furthermore, in some embodiments, rather than associating the nemesis record with a particular account, the nemesis record is stored with a conditional selection after a particular event has been recorded by one or more other players. For example, the nemesis invasion may be queued up to trigger on the next account in the active account's friend list that connects to a game instance.

Nemesis Invasions

[0055] FIG. **3** illustrates a process for a nemesis invasion in block diagram form according to an embodiment. In order to illustrate clear examples, the following explanation is provided in the context of interactions between game server **104** and game client **101**. However, the same process is equally applicable to the other game clients. Furthermore, the following explanation assumes that game client **101** has logged into a player account (referred to as the "active account").

[0056] At block **300**, game client **101** connects to a game instance on behalf of the active account. For example, the game client **101** may connect to the game instance as a result of establishing the instance with the game server **104** as discussed above in the "ESTABLISHING A GAME INSTANCE" section. As another example, the game client **101** may connect to the game instance as a result of joining an instance requested by another player as discussed above in "JOINING A GAME INSTANCE" section.

[0057] At block **301**, the game server **104** determines that one or more conditions are met for a nemesis invasion as defined by the game world database **105**. In an embodiment, one condition is whether one or more nemesis records are associated with the active account in the account database **106**. If no pending nemeses are found for the active account, then the conditions for a nemesis invasion are not met. However, even if there is at least one pending nemesis for the active account, the game world database **105** may define additional conditions that need to be met to trigger a nemesis invasion. In particular, there are some circumstances where it might be desirable to protect the player from nemesis invasions. For example, games often utilize "safe zones", such as taverns, questing hubs, and towns, where the player may exchange goods, heal their characters, obtain quests, converse with NPCs, and so forth. Since players expect some degree of safety in such areas, the game world database **105** may define locations which are off limits to nemesis invasions. As another example, there may be areas with certain scripted events, such as boss encounters, which are important to the storyline of the game that would be unduly interrupted by a nemesis invasion. As such, the game world database **105** may only consider the active account eligible for invasion only within certain areas of the game world. In some embodiments, the game server **104** stores the last time the active account received a nemesis invasion within the account database **106**. In order to prevent invasions from triggering one after another in short succession, the game world database **105** may define a condition that sets a minimum time between invasions. Other examples of conditions include whether combat is currently being waged between the player character and other player or computer-controlled characters, whether a scripted event is currently progressing, the number of players connected to the game instance, and so forth.

[0058] In some embodiments, a condition for a nemesis invasion depends on a characteristic of the player character (s) currently being used in the game instance. For example, characters of the active account may be flagged as either "normal" (respawns after death) or "hardcore" (deleted after death). Since the penalty for being killed in "hardcore" mode is very punishing, the game world database **105** defines a condition for invasion as being connected to the game instance with a "normal" character. As a result, when the active account is playing with a hardcore character, that character is protected from invasions. However, if the player of that account later switches to a "normal" character, then the possibility of being invaded by a nemesis is enabled.

[0059] At block **302** the game server **104** generates a nemesis in the game instance to which the active account is connected. In an embodiment, the game server **104** generates the nemesis by modifying the game instance to include the nemesis. Thus, when the game server **104** sends the next instance update message, the game client **101** is informed of the generation of the nemesis. Depending on the embodiment, the game server **104** may insert the nemesis in the immediate vicinity of the player characters or at a more distant location to give the player additional time to react. Furthermore, the artificial intelligence (AI) of the nemesis may be configured to start a distance from the location of the player characters in an attempt to "hunt down" or play "cat and mouse" games with the player characters. For example, the nemesis may be granted increased speed and aggression towards than players compared to other hostile NPCs in game world. As another example, each hostile NPC may be associated with an "awareness area" that signifies how close player characters need to approach before the NPC will react. In addition, each NPC may also be associated with a "leash area" that signifies how far the NPC will chase the player characters before turning back or otherwise giving up on the pursuit. Depending on the embodiment, the "awareness area" and the "leash area" may be tied to a particular location in the game world or centered on the NPC. For example, in the case of the "leash area", the NPCs may give up pursuit after chasing the player characters a particular distance, the player characters leave a particular game location, after the player characters put a threshold distance between themselves and the NPC, when the NPC loses sight of the player characters due to intersecting game objects, and so forth.

[0060] In some embodiments, the nemesis has an infinite "awareness area" and "leash area". As a result, the nemesis will, regardless of its initial spawn point, hunt down the player characters constantly without the player characters being able to run, hide, or otherwise avoid the encounter. However, in some embodiments, the game server **104** is configured to abandon the nemesis invasion temporarily and restart the invasion at a future point in time in response to detecting "abandonment" conditions. For example, the player characters may reach a safe area, such as a town, where hostile NPCs are unable to enter. As another example, the player may disconnect from the game instance, such as through manually exiting the game, a game crash, loss of internet connection, and so forth. Thus, since the invasion has yet to run its full course, the game server **104** temporarily abandons the invasion for resumption at a future time. For example, the game server **104** may remove the nemesis invader from the game instance, but keep the nemesis record representing the invasion associated with the active account. Thus, once the invasion conditions are met, the active account can again be invaded by the same nemesis, effectively restarting the abandoned invasion.

[0061] In some embodiments, to give players time to react, the nemesis waits a set period of time before becoming "active". For example, the nemesis may hang back and taunt that the player is not prepared for the imminent encounter. However, for cases where the player may not be inclined to stay awhile and listen to the dialog of the nemesis, the nemesis can be activated early through a hostile action performed by the player characters.

[0062] In some embodiments, the game server **104** precedes the generation of the nemesis with one or more precursor events. The precursor events include one or more of: a change to the music being played by the game client **101**, a sound effect being played that warns the player of an impending invasion, change to the environment (e.g. the ambient light being dimmed, fog rolling in, a storm starting, and so forth), taunts by the nemesis, changes to the minimap, and so forth. For example, before actually inserting the nemesis into the game instance, the game server **104** may cause the game client **101** to display a preview model of the nemesis emerging from a portal and/or slowly becoming corporeal from a "ghostly" state. As another example, vibration-enabled controller of the player may vibrate to announce the arrival of the nemesis. In some embodiments, the precursor events are designed to free the player from other engagements so that the player characters can focus on the nemesis. For example, lightning strikes may appear that that kill off enemy players or NPCs in the immediate vicinity.

[0063] In an embodiment, the game server **104** generates the nemesis based on information contained in a nemesis record associated with the active account. For example, the nemesis record may specify the abilities of the nemesis, the attributes of the nemesis, the model to use for the nemesis, the size of the nemesis, the characters that the nemesis previously defeated, equipment for the defeated characters, and so forth. Thus, when the game server **104** inserts the nemesis into the game instance, the server computer creates the nemesis with the characteristics, attributes, and/or model specified in the nemesis record. In some embodiments, in the event that more than one nemesis record (and thus more than one nemesis invasion) is queued up for the active account, the game server **104** applies selection criteria to determine which nemesis will invade. For example, the game server **104** may select the nemesis that has killed the most player characters or the most overall number of invasions.

[0064] In some embodiments, rather than an encounter with a lone nemesis NPC, the nemesis is generated along with a number of NPC henchman assist the nemesis against the player characters. For example, the NPC henchman may be based on the location in which the invasion takes place, the location from which the nemesis was generated, a pre-set nemesis henchman character type, random selection of enemy NPC types, and so forth.

Shadow Clones

[0065] In some embodiments, the henchmen are based on the previous player characters that the nemesis (or its predecessor NPC) had defeated. For example, the nemesis may be surrounded by "shadow clones" of the defeated player characters that use the same model, abilities, attributes, and names as the defeated players. Furthermore, the defeated players may each be associated with a particular banner, portrait, or symbol that can be displayed with the associated "shadow clone" model. However, in order to prevent the encounter from being too difficult, the "shadow clones" can be set to use a reduced set of abilities and/or a scaled down set of attributes. Furthermore, to reduce the information that would need to be stored in the nemesis records, the game server **104** may utilize "archetype" models that correspond to base character attributes, such as "class" or "sex", of the defeated players to avoid the need to import over all the unique model features associated with a defeated character. In addition, the model of the "shadow clones" may be modified to differentiate the clones from regular players, such as giving the clones a shadowy or demonic appearance.

[0066] FIG. **4** illustrates a depiction of the nemesis and a number of shadow clone henchman according to an embodiment. In FIG. **4**, the nemesis **400** is generated in the vicinity of loyal shadow clones **401** representing the players that the nemesis had previously defeated. In this particular case, the nemesis **400** had defeated three previous players. As depicted, the appearance and name of the shadow clones **401** are based on the players that the nemesis **400** had defeated. For example, the player character corresponding to the shadow clone "ShocksMcGee" may have belonged to the "wizard" character archetype within the game. As a result, the corresponding shadow clone uses a model that depicts a wizard hat and staff. Similarly, the player character corresponding to the shadow clone "Spins2win" may be specialized in halberd-wielding skills and thus wields a halberd.

Invasion Notifications

[0067] In some embodiments, when a nemesis invasion begins, the game server **104** sends a message that causes the game clients of other players to display information about the invasion. For example, the game server **104** may select players who have been defeated by the nemesis (or its precursor NPC) to receive the message. As another example, the game server **104** may select players from the friend or guild list of the active account who are currently online to receive the message. Furthermore, in some embodiments, the game server **104** also causes an invitation to be displayed by the game clients of the other players to join the game instance and defend the player from the nemesis. In response to accepting the invitation, the game server **104** automatically joins the participating player accounts to the instance.

Invasion Outcome

[0068] At block **303**, the game server **104** determines whether or not the player characters succeeded against the invasion. In an embodiment, the success conditions includes one or more of: the player characters killing the invading forces, the player characters completing one or more objectives while the nemesis invasion is ongoing, the player characters surviving a set period of time, and so forth. In an embodiment, the defeat conditions include: death of the player characters by the invading forces, death of one or more particular player characters, death of one or more player characters of the host, failure of one or more objectives, failure to defeat the invasion within a time limit, and so forth.

[0069] In some embodiments, the difficulty of the nemesis and/or the henchmen is scaled based on characteristics, such as level, of the character(s) being invaded. Thus, for example, even though a "high level" character caused the initial generation of the nemesis, a "low level" player being invaded by the nemesis has a fighting chance to succeed against the invasion. If there are multiple players connected to the same game instance, the invasion may also be scaled based on the number of players. Thus, the attributes and/or abilities of the NPC invaders may be increased for each additional player participating in the instance.

[0070] At block **304**, if the player characters meet the success condition, the game server **104** generates one or more player rewards. In an embodiment, the one or more player rewards include both rewards for the active account and/or rewards for the accounts associated with the players defeated by the nemesis. For example, upon defeating the nemesis, the game server **104** may generate in-game currency, equipment, consumable items, experience, cosmetic items, and so forth for the characters of the active account. Additionally, the game server **104** may generate the same or similar types of items for all or a subset of the players previously defeated by the nemesis. In some embodiments, the items for the defeated players automatically appear in the inventory of the players' characters, a bank vault or stash box associated with the accounts of the defeated players, or are mailed for pickup at a "mail box" or other equivalent in-game object. However, in other embodiments, the items for the defeated players are instead picked up by the player of the active account, who then trades, mails, or otherwise gives the items to the associated defeated players. For example, the game server **104** may drop within the game instance "gift boxes" filled with a random assortment of items and bound to specific defeated player accounts. The player of the active account is then responsible for distributing the "gift boxes" to the appropriate players to encourage a sense of community within the game. In some embodiments, the "gift boxes" generate items appropriate to the character that opens the box. For example, if a character that specializes in sword combat opens the box, the probability of a sword being generated from the box is increased or guaranteed. In addition, some embodiments assign the gift box to be "account bound" and therefor sharable between different characters of the same account. Thus, even though the player's "barbarian" class character participated in the nemesis encounter, the player may instead open the box with their "wizard" class character to get appropriate "wizard items". In some embodiments, when the nemesis is defeated, the game server **104** causes the defeated players to receive a message informing the defeated players that they have been avenged and identifying the player or players who defeated the nemesis. In some embodiments, the rewards generated for defeating the nemesis are scaled based on characteristics of the nemesis. For example, the rewards may be scaled based on the number of players that the nemesis had defeated.

[0071] In some embodiments, when the nemesis is defeated, the nemesis record associated with the active account in the account database **106** is removed to prevent the nemesis from being regenerated in another invasion. However, in other embodiments, the nemesis record may be modified and/or recycled. For example, after a first defeat the attributes of the nemesis may be modified and the model changed to an "undead" or "zombified" version of the nemesis to re-invade again at a future point in time. In addition, when the nemesis re-invades various aspects of the invasion, such as the precursor events, may be modified. For example, the resurrected nemesis may exclaim that its previous defeat was merely a setback before commencing hostile actions against the player characters. In other embodiments, the "zombified" version of the nemesis may instead invade another player account, such as one of the previously defeated player accounts, rather than the active account.

[0072] At block **305**, if the player characters meet the defeat condition, the game server **104** selects a new player account for nemesis invasion. In an embodiment, the game server **104** selects the new player account for nemesis invasion according to the same techniques discussed above in the "GENERATING A NEMESIS INVASION" section. However, in some embodiments, the game server **104** prevents the selection of players who have already been defeated by the nemesis.

[0073] At block **306**, the game server **104** generates nemesis data for the selected player account that describes the nemesis. In some embodiments, the game server **104** generates the nemesis data according to the same techniques described above in the "GENERATING A NEMESIS INVASION" section. However, in other embodiments, the nemesis data is generated based on the nemesis that triggered the present invasion. For example, the nemesis for the new player may be an "upgraded" version of the previous nemesis. Thus, as more players fall victim to the nemesis, the nemesis becomes more and more powerful. As a result, the game server **104** may start with the characteristics of the invading nemesis and scale those characteristics based on the number of defeated players. For example, the nemesis might be granted an additional ability randomly selected from a set of potential abilities for every defeated player up to a cap number of abilities. In embodiments which include an ability group identifier in the associated nemesis record, the additional ability or abilities may be selected from the identified ability group. Furthermore, the health, damage, model size, or other attributes of the nemesis may increase with each defeated player. In an embodiment, the game server **104** locates the current nemesis record for the invasion associated with the active account, modifies the attributes of the nemesis, adds the current active account to the list of defeated players, stores a new nemesis record within the account database **106** in association with the selected new player account, and removes the nemesis record associated with the current active account that corresponded to the invasion. As a result, the selected new player account is flagged to be invaded by the improved nemesis.

[0074] In some embodiments, if the nemesis reaches a threshold number of player kills, the nemesis "retires" and the game server **104** does not select a new player for invasion. In embodiments where the nemesis grows more powerful after each player kill, retirement prevents the nemesis from becoming so powerful that players do not have a reasonable chance to succeed against the invasion. However, in other embodiments, when a nemesis "retires" a special boss fight is unlocked for the player to defeat. For example, upon the nemesis "retiring" a previously inaccessible game area may become available which houses a "boss nemesis". The 'boss nemesis" may possess one or more unique abilities and provide one or more unique rewards to the player or players who defeat the encounter. Furthermore, depending on the embodiment, the "boss nemesis" may also be assisted by shadow clone henchman representing the previously defeated players in the same manner as the nemesis invasion. In some embodiments, the game clients provide a mechanism that allows players to "invite" or "summon in" other players on their friends or clan list to participate in the "boss nemesis" encounter. In one embodiment, the players that can be summoned in are limited to the players who have been previously defeated by the nemesis. As a result, those players who had previously tasted their own fear during the nemesis invasions are granted an opportunity to band together and exact revenge. However, in other embodiments, rather than relying on one player to "invite" the others, the game server **104** instead automatically invites any of the previously defeated players who are online or otherwise available to participate in the "boss nemesis" encounter. In other embodiments, the "boss nemesis" may be accessed in ways which do not require the nemesis to "retire". For example, upon defeating a nemesis, players may be rewarded with a special item that allows the "boss nemesis" to be accessed. However, in other cases, the players may need to collect a threshold number of items from defeated nemeses to unlock the "boss nemesis".

Peer-to-Peer Embodiments

[0075] In the embodiment depicted by FIG. **2** the game server **104** maintains the game instances and coordinates the input supplied by the game clients. However, in another embodiment, the operating environment is based on a peer-to-peer model rather than a client-server model. In such an embodiment, each of the game clients incorporates aspects of both a client and a server. For example, each of the game clients may have access to a copy of the game world database **105** and is capable of generating their own instances of the game world. Thus, a player associated with a game client can cause the game client to generate a game instance to which themselves or other players can connect to play the game. As a result, it is the responsibility of the game client hosting the game instance to initialize the game instance and coordinate the progression of the game between the participating players. Since the peer-to-peer model does not rely on a centralized server, each of the game clients maintains their own database to store information related to nemesis invasions. When one game client generates an invasion, the nemesis data describing the invasion is forwarded to the game client of the player selected for invasion. Thus, when the game client of the selected player generates an instance for that player, the game client generates invasions based on the received nemesis data. Furthermore, in some embodiments, when the game client of the selected player connects to a game instance hosted by another game client, the game client of the selected player sends the nemesis data to the other game client so that the other game client can generate nemesis invasions for the selected player during the gaming session.

Same Instance Embodiments

[0076] In the embodiment depicted by FIG. **2** the game server **104** maintains separate game instances for individuals or groups of players. However, some game types (in particular MMORPGs) have the tendency is to either maintain one comprehensive persistent world and/or create individual instances only for a relatively small portion of the game's content. However, the game world may be extremely large to where friends or guildmates participating within the same "instantiation" of the game world, but different locations, may rarely run into each other. As a result, similar to how players participating within different game instances or playing at different times may lack social interaction, the same holds true for players participating in the same instance but at different locations within the game world. Thus, the nemesis creation and invasion processes depicted by FIG. **2** and FIG. **3** respectively may occur within the same game instance. For example, a first player being killed by an NPC at one location within the game instance may trigger a nemesis invasion to be generated for a second player at another location within the game instance. Thus, there is no requirement to the techniques described herein that the player triggering the invasion and the player being invaded must reside on different game instances.

Hardware Overview

[0077] According to one embodiment, the techniques described herein are implemented by one or more special-purpose computing devices. The special-purpose computing devices may be hard-wired to perform the techniques, or may include digital electronic devices such as one or more application-specific integrated circuits (ASICs) or field programmable gate arrays (FPGAs) that are persistently programmed to perform the techniques, or may include one or more general purpose hardware processors programmed to perform the techniques pursuant to program instructions in firmware, memory, other storage, or a combination. Such special-purpose computing devices may also combine custom hard-wired logic, ASICs, or FPGAs with custom programming to accomplish the techniques. The special-purpose computing devices may be desktop computer systems, portable computer systems, handheld devices, networking devices or any other device that incorporates hard-wired and/or program logic to implement the techniques.

[0078] For example, FIG. **5** is a block diagram that illustrates a computer system **500** upon which an embodiment of the invention may be implemented. Computer system **500** includes a bus **502** or other communication mechanism for communicating information, and a hardware processor **504** coupled with bus **502** for processing information. Hardware processor **504** may be, for example, a general purpose microprocessor.

[0079] Computer system **500** also includes a main memory **506**, such as a random access memory (RAM) or other dynamic storage device, coupled to bus **502** for storing information and instructions to be executed by processor **504**. Main memory **506** also may be used for storing temporary variables or other intermediate information during execution of instructions to be executed by processor **504**. Such instructions, when stored in non-transitory storage media accessible to processor **504**, render computer system **500** into a special-purpose machine that is customized to perform the operations specified in the instructions.

[0080] Computer system **500** further includes a read only memory (ROM) **508** or other static storage device coupled to bus **502** for storing static information and instructions for processor **504**. A storage device **510**, such as a magnetic disk, optical disk, or solid-state drive is provided and coupled to bus **502** for storing information and instructions.

[0081] Computer system **500** may be coupled via bus **502** to a display **512**, such as a cathode ray tube (CRT), for displaying information to a computer user. An input device **514**, including alphanumeric and other keys, is coupled to bus **502** for communicating information and command selections to processor **504**. Another type of user input device is cursor control **516**, such as a mouse, a trackball, or cursor direction keys for communicating direction information and command selections to processor **504** and for controlling cursor movement on display **512**. This input device typically has two degrees of freedom in two axes, a first axis (e.g., x) and a second axis (e.g., y), that allows the device to specify positions in a plane.

[0082] Computer system **500** may implement the techniques described herein using customized hard-wired logic, one or more ASICs or FPGAs, firmware and/or program logic which in combination with the computer system causes or programs computer system **500** to be a special-purpose machine. According to one embodiment, the techniques herein are performed by computer system **500** in response to processor **504** executing one or more sequences of one or more instructions contained in main memory **506**. Such instructions may be read into main memory **506** from another storage medium, such as storage device **510**. Execution of the sequences of instructions contained in main memory **506** causes processor **504** to perform the process steps described herein. In alternative embodiments, hard-wired circuitry may be used in place of or in combination with software instructions.

[0083] The term "storage media" as used herein refers to any non-transitory media that store data and/or instructions that cause a machine to operate in a specific fashion. Such storage media may comprise non-volatile media and/or volatile media. Non-volatile media includes, for example, optical disks, magnetic disks, or solid-state drives, such as storage device **510**. Volatile media includes dynamic memory, such as main memory **506**. Common forms of storage media include, for example, a floppy disk, a flexible disk, hard disk, solid-state drive, magnetic tape, or any other magnetic data storage medium, a CD-ROM, any other optical data storage medium, any physical medium with patterns of holes, a RAM, a PROM, and EPROM, a FLASH-EPROM, NVRAM, any other memory chip or cartridge.

[0084] Storage media is distinct from but may be used in conjunction with transmission media. Transmission media participates in transferring information between storage media. For example, transmission media includes coaxial cables, copper wire and fiber optics, including the wires that comprise bus **502**. Transmission media can also take the form of acoustic or light waves, such as those generated during radio-wave and infra-red data communications.

[0085] Various forms of media may be involved in carrying one or more sequences of one or more instructions to processor **504** for execution. For example, the instructions may initially be carried on a magnetic disk or solid-state drive of a remote computer. The remote computer can load the instructions into its dynamic memory and send the instructions over a telephone line using a modem. A modem local to computer system **500** can receive the data on the telephone line and use an infra-red transmitter to convert the data to an infra-red signal. An infra-red detector can receive the data carried in the infra-red signal and appropriate circuitry can place the data on bus **502**. Bus **502** carries the data to main memory **506**, from which processor **504** retrieves and executes the instructions. The instructions received by main memory **506** may optionally be stored on storage device **510** either before or after execution by processor **504**.

[0086] Computer system **500** also includes a communication interface **518** coupled to bus **502**. Communication interface **518** provides a two-way data communication coupling to a network link **520** that is connected to a local network **522**. For example, communication interface **518** may be an integrated services digital network (ISDN) card, cable modem, satellite modem, or a modem to provide a data communication connection to a corresponding type of telephone line. As another example, communication interface **518** may be a local area network (LAN) card to provide a data communication connection to a compatible LAN. Wireless links may also be implemented. In any such implementation, communication interface **518** sends and receives electrical, electromagnetic or optical signals that carry digital data streams representing various types of information.

[0087] Network link **520** typically provides data communication through one or more networks to other data devices. For example, network link **520** may provide a connection through local network **522** to a host computer **524** or to data equipment operated by an Internet Service Provider (ISP) **526**. ISP **526** in turn provides data communication services through the world wide packet data communication network now commonly referred to as the "Internet" **528**. Local network **522** and Internet **528** both use electrical, electromagnetic or optical signals that carry digital data streams. The signals through the various networks and the signals on network link **520** and through communication interface **518**, which carry the digital data to and from computer system **500**, are example forms of transmission media.

[0088] Computer system **500** can send messages and receive data, including program code, through the network (s), network link **520** and communication interface **518**. In the Internet example, a server **530** might transmit a requested code for an application program through Internet **528**, ISP **526**, local network **522** and communication interface **518**.

[0089] The received code may be executed by processor **504** as it is received, and/or stored in storage device **510**, or other non-volatile storage for later execution.

[0090] In the foregoing specification, embodiments of the invention have been described with reference to numerous specific details that may vary from implementation to implementation. The specification and drawings are, accordingly, to be regarded in an illustrative rather than a restrictive sense. The sole and exclusive indicator of the scope of the invention, and what is intended by the applicants to be the scope of the invention, is the literal and equivalent scope of the set of claims that issue from this application, in the specific form in which such claims issue, including any subsequent correction.

What is claimed is:

1. A method comprising:
detecting that a particular event has occurred within a first game instance;
wherein the particular event involves:
first one or more player characters that are controllable by a first account, and
a particular computer-controlled character,
in response to detecting that the particular event has occurred, performing steps of:
selecting a second account from one or more accounts based on a friends list associated with the first account,
wherein the second account is a different account than the first account;
storing data associated with the second account that flags the second account to be invaded by one or more computer-controlled characters,
based on the data that flags the second account, generating the one or more computer-controlled characters in a second game instance;
wherein the second game instance includes second one or more player characters that are controllable by the second account;
wherein the method is performed by one or more computing devices.

* * * * *