

# Game Design and Practice 2

## (게임설계및실습II)

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### Chapter 11: Online Gaming – Part 1

Fall Semester

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## Introduction

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- ❑ **Online gaming** has grown from a tiny fraction of the interactive entertainment business into a major market in its own right.
- ❑ **Online gaming** is a technology rather than a genre, a mechanism for connecting players together rather than a particular pattern of gameplay.



## What Are Online Games?

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- ❑ **Online games** refer to multiplayer distributed games in which the players' machines are connected by a network.
  - This is as opposed to multiplayer local games in which all the players play on one machine and look at the same screen.
- ❑ While online games can, in principle, include solitaire games that happen to be provided via the Internet, such as *Bejeweled*, the online aspect of solitaire games is incidental rather than essential to the experience.
- ❑ *Bejeweled* is simply a puzzle game.
- ❑ Online games do not need to be distributed over the Internet; games played over a local area network (LAN) also qualify as online games.



## Advantages of Online Games

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- ❑ **Player Socializing**
  - ❑ Online games offer opportunities for **social interaction**.
  - ❑ The social aspect enhances the players' enjoyment of the experience.
  
  - ❑ Girls and women have traditionally shown less interest in interactive entertainment, especially games for personal computers, in part because these tend to offer solitary activity.
  
  - ❑ Women represent a much greater proportion of the online game market than they do the single-player game market, partially because they enjoy interacting with others.
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## Advantages of Online Games

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- ❑ **Player Socializing**
  - ❑ At the moment, most games offer only limited social interaction with conversation restricted to typing text (*chatting*), which is awkward while you are trying to play a fast-paced game, but more and more games include voice communication.
  
  - ❑ When enough people get broadband access, online games could include video as well.
  
  - ❑ A time might come when we see players dressing appropriately for their roles in the game so that they'll look cool on camera.
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## Advantages of Online Games

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- ❑ **Player Socializing**
  - ❑ As the creator of such an online game, you're more than just a game designer; you must also be a social architect.
  - ❑ This is actually your toughest challenge, far more difficult than designing the core mechanics of a single-player game.
  - ❑ An online game isn't an experience that you lead a player through; it's a petri dish for growing social situations, and it's nearly impossible to predict in advance what will happen there.
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## Advantages of Online Games

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- ❑ **Human Intelligence Instead of Artificial Intelligence**
  - ❑ In single-player games, the player competes against the computer, so the computer has to have enough **artificial intelligence (AI)** to be a good opponent; building the AI for a complex game presents a huge programming task and one that is difficult to get right.
  - ❑ But if the players compete against each other, as they do in most online games, you don't usually need as much AI.
  - ❑ The players provide all the intelligence required in many situations.
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## Advantages of Online Games

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- ❑ **Human Intelligence Instead of Artificial Intelligence**
  - ❑ You can use AI in an online game if you want to:
  - ❑ You might include nonplayer characters (NPCs) who need to behave intelligently, or you might design a game in which all the players play cooperatively against artificial opponents.
  
  - ❑ Several popular games have limited NPCs but have some large opponents that the online players must work together to combat.
  - ❑ *Guild Wars*, for example, encourages this type of play.
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## Advantages of Online Games

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- ❑ **Human Intelligence Instead of Artificial Intelligence**
  - ❑ The AI-controlled enemies are challenging to beat with a team of online friends and impossible for an individual.
  - ❑ But many online games rely on their players to provide most of the intelligence in the game, and this can make the game easier to develop in that respect.
  
  - ❑ A real-time strategy game, for example, still needs AI for its individual units when played online, but players supply the strategic and tactical thinking.
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## Advantages of Online Games

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- ❑ **Online Gameplay Versus Local Multiplayer Gameplay**
  - ❑ Multiplayer gameplay, whether online or local, offers great flexibility to the game designer, allowing
    - purely competitive (everyone for himself),
    - purely cooperative (us against the machine), or
    - team-based (us versus them) play.
  - ❑ In online play, a network links the players, who occupy (generally, but not necessarily) separate locations.
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## Advantages of Online Games

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- ❑ **Online Gameplay Versus Local Multiplayer Gameplay**
  - ❑ Local play can be broken into two categories: LAN play or physically local play.
    - **LAN play** is virtually identical to online play except that Internet access is not required — a technical distinction that has little or no impact on game design.
    - In **physically local play** (hereafter referred to simply as local play), all the players sit in the same room, playing the game on the same machine and, most important, looking at the same screen.
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## Advantages of Online Games

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- ❑ **Online Gameplay Versus Local Multiplayer Gameplay**
  - ❑ For the last 30 years, local play has been the standard mode of interaction for multiplayer console games: Each player holds a controller, and all players look at the TV.
  - ❑ This may change now that the new generation of consoles has network capability, but local play is likely to remain the most common way people use multiplayer games because it incurs no network charges and lets friends play together in groups.
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## Advantages of Online Games

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- ❑ **Online Gameplay Versus Local Multiplayer Gameplay: PROBLEMS WITH LOCAL PLAY**
  - ❑ Local play as just described presents the game designer with serious difficulties.
  - ❑ For one thing, because all the players share the same TV, any user interface elements displayed must be duplicated for each player, taking up valuable screen space.
  - ❑ If the game maintains a separate point of view for each player, you must subdivide the screen into little windows.
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## Advantages of Online Games

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- ❑ **Online Gameplay Versus Local Multiplayer Gameplay:** PROBLEMS WITH LOCAL PLAY
  - ❑ Each player will find it harder to see a small individual window than the full screen image, and activity in the other players' windows will distract him.
  - ❑ More important, however, because local play uses a single display device, you have no way to hide information.
  - ❑ Each player can see everything the others do. This works well for fighting games, but not as well for any game in which players might want to keep their activities secret — war games, for instance.
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## Advantages of Online Games

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- ❑ **Online Gameplay Versus Local Multiplayer Gameplay:** PROBLEMS WITH LOCAL PLAY
  - ❑ Finally, local play necessarily imposes limits on the number of people who can participate at one time.
  - ❑ Consoles seldom support more than four players; PCs support even fewer.
  - ❑ Even if you could add players indefinitely, the screen would become crowded with characters and other data, and the machine itself would bog down as the computing tasks grew.
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## Advantages of Online Games

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- ❑ **Online Gameplay Versus Local Multiplayer Gameplay:** BENEFITS OF NETWORKED PLAY
  - ❑ Online gaming solves all these problems.
  - ❑ Each player uses her own screen, and the entire display supports only her gaming experience.
  - ❑ The game can present her with her own unique perspective, including exactly as much information as the designer wants her to have and no more.
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## Advantages of Online Games

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- ❑ **Online Gameplay Versus Local Multiplayer Gameplay:** BENEFITS OF NETWORKED PLAY
  - ❑ And online games can support large numbers of people (although games requiring a central server may find the server capacity limiting); it's not uncommon for some games to support tens of thousands of players online at a time.
  - ❑ With an online game, players can always find other people to play with at any hour of the day or night.
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## Disadvantages of Online Games

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- ❑ Playing games over a network, especially the Internet, presents the designer with certain disadvantages, as well.
- ❑ You should also be aware that strangers playing your game anonymously over a network can cause social friction and that this can range from minor misbehavior to serious criminal offenses.



## Disadvantages of Online Games

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- ❑ **Technical Issues:** COMMUNICATION MODELS
- ❑ Your programming team will need to choose a communication model from the two currently in use in networked gaming.
- ❑ In the first, *client/server*, each player runs a program, called the *client*, on his computer, that communicates with a central program, the *server*, on a computer owned by a company providing the game service.
- ❑ In the client/server model, the server runs the game engine, sending packets of information to the various clients, and the clients merely present that information to the players.



## Disadvantages of Online Games

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- ❑ **Technical Issues:** COMMUNICATION MODELS
  - ❑ The other model, *peer-to-peer*, involves direct communication between the players' computers.
  - ❑ Implementation of peer-to-peer (sometimes abbreviated P2P) communication is quite straightforward for two-player games but becomes more complicated as more players are involved.
  - ❑ The players' systems must decide which machine to designate as the *host* — that is, which will control the game while the others become *guests*.
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## Disadvantages of Online Games

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- ❑ **Technical Issues:** COMMUNICATION MODELS
  - ❑ If the host logs out of the network, one of the guests' computers must take over and become the new host — preferably automatically and without anyone's noticing (this is known as *automated host migration*, a feature already supplied by Microsoft's DirectPlay facilities).
  - ❑ Some companies also operate *matchmaking* services in which the company's server functions only to allow players to find one another and connect together in peer-to-peer networks.
  - ❑ All of this is programming work that offline games don't have to bother with.
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## Disadvantages of Online Games

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- ❑ **Technical Issues:** LATENCY
  - ❑ The Internet is designed for redundancy rather than speed, so it doesn't make any guarantees about how long a given packet of data will take to get from one point to another.
  - ❑ This phenomenon is called *latency*.
  - ❑ In many games, a faster connection translates into a gaming advantage, making players with high-speed connections more likely to win the game.
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## Disadvantages of Online Games

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- ❑ **Technical Issues:** DROPPED AND GARBLED PACKETS
  - ❑ What happens to your game if it doesn't get some of the information it needs because of a glitch in the network?
    - Your system will require a mechanism for detecting a missing packet or one containing bad data, and requesting that the packet be resent from the server or host.
    - Packets can also arrive out of order, which can cause confusion if your client receives information that a race car is about to cross the finish line, but the next packet indicates that the car is 100 yards back on the track instead.
    - Every packet must have a unique serial number, in sequence, so that you can tell if one is missing or if packets are arriving in the wrong order.
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## Disadvantages of Online Games

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- ❑ **It's Harder to Suspend Disbelief**
  - ❑ For some players, gaming is a form of escapism that takes them away to a magical place, and they want it to stay magical while they're there.
  - ❑ To them, it's particularly important that nothing occur in the game to break their suspension of disbelief, but in online games there will always be players who won't stay in character or who will talk about real-world issues and events while they're in the game.
  - ❑ Unless there's a strong (and enforced) ethos of in-character role-playing, people who play in an online game have to accept that their imaginary world includes a lot of entirely real people.
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## Disadvantages of Online Games

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- ❑ **Misbehavior**
  - ❑ Unfortunately, playing with strangers — particularly anonymous strangers — creates opportunities for a variety of types of misbehavior that can ruin the game for others.
  - ❑ These range from simple rudeness to harassment, cheating in various forms, and outright fraud.
  - ❑ Rudeness might not sound very serious, but it drives away other customers.
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## Disadvantages of Online Games

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- ❑ **Misbehavior**
  - ❑ Furthermore, if you want children to play your game, it is particularly important to make sure you offer a safe environment — you may even have a legal obligation to make sure adults don't use your game environment to abuse children — and that means hiring customer service people to monitor the players.
  - ❑ Self-contained networks such as America Online have some tools at their disposal to manage these problems, but on open networks such as the Internet, it's much harder.
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## Disadvantages of Online Games

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- ❑ **The Need to Produce Content**
  - ❑ When you're building a single-player game to be sold in retail stores, your job generally finishes when the gold master disc goes off to manufacturing.
  - ❑ The players buy the game and you can go off to work on another project.
  - ❑ Online games don't work this way; they earn money either through advertising revenue, micropayments, or subscriptions.
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## Disadvantages of Online Games

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- ❑ **The Need to Produce Content**
  - ❑ To keep people interested, you have to change things, and that means producing new content on an ongoing basis.
  - ❑ This is expensive for the service provider and ties up skilled development staff.
  - ❑ The problem is most obvious with persistent worlds, but even simple games need to be kept fresh.
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## Disadvantages of Online Games

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- ❑ **Customer Service**
  - ❑ All game companies require customer service staff to help players with problems, but online games need far, far more of them.
  - ❑ With offline games, players mostly need help with technical difficulties; for gameplay problems, they can buy strategy guides or find hints on the Internet.
  - ❑ But in a live, online environment, players expect to get help immediately, and they demand help for a much larger range of issues than they do in offline games.
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## Disadvantages of Online Games

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- ❑ **Customer Service**
  - ❑ Players expect customer service people not only to solve technical problems but also to explain the user interface, answer questions about game content, and enforce justice by investigating and punishing misbehavior by other players.
  - ❑ With thousands of players logged on at any one time, providing these services can become very expensive.
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## Design Issues for Online Gaming

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- ❑ This section addresses some design issues peculiar to online games:
    - the problems presented by players arriving or disappearing during play,
    - the pros and cons of real-time versus turn-based play,
    - things to consider when providing a chat feature, and
    - a variety of issues regarding security and the prevention of cheating.
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## Design Issues for Online Gaming

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- ❑ **Arriving Players**
  - ❑ Players can log on wanting to play your game at any time, and the game must be capable of dealing with them intelligently.
  - ❑ In most non-computer games, all the players must be present at the beginning of the match or it won't be fair.
  - ❑ The usual solution for this problem is to start new matches at frequent intervals and to have a waiting area, or *lounge*, where the players can hang around while they wait for a new match to begin.
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## Design Issues for Online Gaming

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- ❑ **Arriving Players**
  - ❑ In a game that can be played with any number of players, you can simply start a new match, say, every three minutes, and whoever is waiting may play.
  - ❑ In games requiring a fixed number of players, you will need to establish a matchmaking service that allows them to form groups and to wait (more or less patiently) for enough players to join a particular group; the game begins as soon as the required number of players arrives.
  - ❑ The number of players needed for a game should be small, however, to minimize waiting times.
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## Design Issues for Online Gaming

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- ❑ **Arriving Players**
  - ❑ You can, however, prevent those advantages from spoiling the game for other players:
    - **Get rid of the victory condition.** Without winners and losers, an online entertainment ceases to be a game per se and becomes a different kind of amusement.
      - ❑ The player focuses on her own achievements rather than on defeating all the other players.
      - ❑ In this case, the old cliché becomes apt: It's not whether you win or lose, but how you play the game.
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## Design Issues for Online Gaming

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- ❑ **Arriving Players**
  - ❑ You can, however, prevent those advantages from spoiling the game for other players:
    - **Discourage competition between experienced players and newcomers.**
      - ❑ You can measure the progress of your players and see to it that only those who are fairly matched come into direct conflict.
      - ❑ Tournament chess uses a ranking system to do just that.
      - ❑ A highly ranked player who beats a newcomer gets little or no reward for it.
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## Design Issues for Online Gaming

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- ❑ **Arriving Players**
  - ❑ You can, however, prevent those advantages from spoiling the game for other players:
    - **Be sure that direct competition is consensual.**
      - ❑ If experienced players do get the chance to compete directly with newcomers, you should give the newcomers the option to refuse to play.
      - ❑ No one should be forced to take part in an unfair competition.
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## Design Issues for Online Gaming

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- ❑ **Disappearing Players**
  - ❑ Just as players can appear at any time, they can log off at any time, or lose their connection to the game for technical reasons.
  - ❑ If possible, your game should deal with this neatly and with minimal disruption to other players.
  - ❑ In many games, such as racing games, players compete against one another in a free-for-all.
  - ❑ If one player disappears, it doesn't make that much difference — his car vanishes from the track, and that's all.
  - ❑ In effect, the player forfeits the race and the others continue.
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## Design Issues for Online Gaming

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- ❑ **Disappearing Players**
  - ❑ On the other hand, if the game requires players to work in teams, the disappearance of one player could put his team at a serious disadvantage.
  - ❑ In games that require a fixed number of participants, your only options are to give the person a chance to reconnect, assuming the disappearance was a mistake, to include an AI element that can take over for the missing player, or to shut down the game.
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## Design Issues for Online Gaming

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- ❑ **Disappearing Players**
  - ❑ Tournaments require special consideration.
  - ❑ If players compete to get the best win-loss ratio, one might deliberately choose to log out rather than lose the game — which can deny the other person victory.
  - ❑ Should the vanishing player be forced to forfeit?
  - ❑ What if the disconnection was an accident, caused by a bad line?
  - ❑ Unfortunately, there's no sure way to tell if it was.
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## Design Issues for Online Gaming

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- ❑ **Disappearing Players**
  - ❑ You may find that one of the following suggestions solves the problem of vanishing players for your game:
    - **The vanishing player forfeits the game.**
      - ❑ This solution may unfairly penalize players who are disconnected by accident.
      - ❑ It's only a good solution if the network connections are extremely reliable, such as a local area network.
      - ❑ If the players run the risk of being disconnected accidentally and you are offering something valuable to the winner (such as a cash prize in a tournament), then you should not require vanishing players to forfeit the game.
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## Design Issues for Online Gaming

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- ❑ **Disappearing Players**
  - ❑ You may find that one of the following suggestions solves the problem of vanishing players for your game:
    - **Institute a penalty for disconnections that is less severe than forfeiture.**
      - ❑ If a player disconnects in the middle of combat session, the avatar remains in the game for a minute, taking additional damage.
      - ❑ Unfortunately, the avatar doesn't fight very well by itself.
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## Design Issues for Online Gaming

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- ❑ **Disappearing Players**
  - ❑ You may find that one of the following suggestions solves the problem of vanishing players for your game:
    - **Institute a penalty for disconnections that is less severe than forfeiture.**
      - ❑ On the MSN network, players who get disconnected once have 10 minutes to reconnect and resume the game; if they fail to do so, they forfeit or, in some games, an artificial player managed by the server takes over for them.
      - ❑ If they get disconnected twice, they forfeit automatically.
      - ❑ In many games, the game tries to reconnect to the player for a limited amount of time.
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## Design Issues for Online Gaming

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- ❑ **Disappearing Players**
  - ❑ You may find that one of the following suggestions solves the problem of vanishing players for your game:
    - **Award victory to whomever is ahead in the game at the time of the disconnection.**
      - ❑ This solution seems fair but means that the moment someone goes ahead, she can disconnect to deny her opponent a chance to catch up.
      - ❑ Again, you should consider this only in circumstances in which it is difficult or impossible to disconnect intentionally.
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## Design Issues for Online Gaming

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- ❑ **Disappearing Players**
  - ❑ You may find that one of the following suggestions solves the problem of vanishing players for your game:
    - **Record it as a tie.**
      - ❑ While this solution might motivate a losing player to disconnect intentionally, it still makes a fairly neutral solution.
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## Design Issues for Online Gaming

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- ❑ **Disappearing Players**
  - ❑ You may find that one of the following suggestions solves the problem of vanishing players for your game:
    - **Record it as a "disconnected game."**
      - ❑ You then have to decide exactly what this means in the context of a tournament.
      - ❑ If other players can view the records, they can tell when someone racks up a suspiciously high number of disconnections and avoid playing with that person.
      - ❑ Or the server can determine that a player is being disconnected too often and prevent him from playing for a period of time.
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## Design Issues for Online Gaming

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- ❑ **Disappearing Players**
  - ❑ You may find that one of the following suggestions solves the problem of vanishing players for your game:
    - **Abandon the game entirely.**
      - ❑ This is the fairest solution in the case of accidental disconnections, but it is unfair to whomever is leading if the player who is behind pulls the plug.
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## Design Issues for Online Gaming

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- ❑ **Disappearing Players**
  - ❑ You may find that one of the following suggestions solves the problem of vanishing players for your game:
    - **Use referees.**
      - ❑ The World Cyber Games, a large gaming tournament, keeps a log file during play, and in the event of disconnection, a referee can examine the file to adjudicate victory.
      - ❑ If the players agree, they can also restart the match.
      - ❑ This requires a human referee to be available, however, which adds to the operating costs.
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## Design Issues for Online Gaming

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- ❑ **Disappearing Players**
  - ❑ There's no one right answer to this problem; it depends too much on the nature of the individual game.
  - ❑ It's up to you as the designer to think about the problem and try to decide what's fair.
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## Design Issues for Online Gaming

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- ❑ **Real-Time Versus Turn-Based Games**
  - ❑ Many online games take place in real time with each player acting simultaneously.
  - ❑ This offers players maximum freedom; they always have something to do and can order their activities any way they like.
  - ❑ It's also more immersive than turn-based gaming. Waiting your turn while other players act harms suspension of disbelief.
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## Design Issues for Online Gaming

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- ☐ **Real-Time Versus Turn-Based Games**
  - ☐ Unfortunately, real-time gaming tends to make a strategy game into an action game.
    - Whichever player moves his pieces fastest has the advantage.
  - ☐ Turn-based games seem rather old-fashioned nowadays, but there is still a demand for them.
  - ☐ Many simpler online games are automated versions of non-computerized card games and the like, and they still require players to take turns.
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## Design Issues for Online Gaming

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- ☐ **Real-Time Versus Turn-Based Games**
  - ☐ For this to work smoothly, you must include certain features:
    - **Limit the number of players in one game.**
      - ☐ Four or five is a good maximum.
      - ☐ With more than this, players will have to wait too long between turns and will grow impatient.
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## Design Issues for Online Gaming

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- ❑ **Real-Time Versus Turn-Based Games**
  - ❑ For this to work smoothly, you must include certain features:
    - **Set a time limit on the length of a player's turn.**
      - ❑ A slow player or one who has left to answer the phone mustn't be allowed to hold up the game.
      - ❑ Both the player whose turn it is *and* all the other players should be able to see a countdown timer.
      - ❑ The length of time will naturally vary depending on the sort of game; for a card game such as hearts, 10 seconds should be plenty.
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## Design Issues for Online Gaming

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- ❑ **Real-Time Versus Turn-Based Games**
  - ❑ For this to work smoothly, you must include certain features:
    - **Determine a reasonable default action if the player runs out of time.**
      - ❑ In games in which it's possible to pass, the best default might simply be to pass without acting, but in a game such as checkers, in which a move is required, the game will have to choose a move.
      - ❑ It doesn't have to be a very smart move, however.
      - ❑ It's up to the player to supply the intelligence; if he doesn't, it's his own fault.
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## Design Issues for Online Gaming

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- ❑ **Real-Time Versus Turn-Based Games**
  - ❑ For this to work smoothly, you must include certain features:
    - **Let players do other things while waiting for their turn.**
      - ❑ They should definitely be allowed to chat with one another, study the battlefield, organize their units, or do anything else that doesn't actually influence the gameplay.
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## Design Issues for Online Gaming

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- ❑ **Chat**
  - ❑ Every multiplayer game for machines that use keyboards should include a chat feature — a mechanism that enables players to send messages to one another.
  - ❑ Voice chat, implemented with microphones, is now a common feature of online console games and many PC games as well.
  - ❑ Depending on the nature of the game, players should be able to send private messages to one other individual, messages only to members of their own team (if any), or general broadcast messages to all other players who might reasonably be interested.
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## Design Issues for Online Gaming

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- ❑ **Chat**
  - ❑ In a game played by thousands of players, any one player should be able to broadcast messages only to those in his vicinity or on his team, whatever that might mean in the context of the game — the players at his table, the players in the same room of a dungeon, and so on.
  - ❑ Unfortunately, chat brings a new set of problems: the potential for rude, abusive, or harassing behavior.
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## Design Issues for Online Gaming

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- ❑ **Chat**
  - ❑ People who pay to play your game expect that others will meet certain minimum standards of civility.
  - ❑ This is particularly important for games that will be played by children; parents rightfully want to protect their kids from abusive or offensive behavior.
  - ❑ In a sporting event, the referee enforces rules that maintain these standards, or if there is no referee, then the collective authority of the other players must suffice.
  - ❑ Online, it's much more difficult to police players' behavior.
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## Design Issues for Online Gaming

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- ❑ **Chat:** LIMITED CONTENT
  - ❑ The surest solution is to restrict what players may say to each other. *Mario Kart* for the Nintendo Wii offers no voice chat and only allows players to choose remarks from a fixed list of phrases.
  - ❑ This guarantees that they can't say anything offensive, but it doesn't really meet the social need that chat supplies.
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## Design Issues for Online Gaming

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- ❑ **Chat:** PROFANITY FILTERS
  - ❑ Designers have tried **profanity filters**, but they aren't fully reliable, and they sometimes produce laughable results.
  - ❑ Words such as *damn* and *hell* are perfectly legitimate when talking about religion, even if they're considered swearing in another context — and don't think that people won't talk about religion when they're in your dungeon; they'll talk about everything under the sun.
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## Design Issues for Online Gaming

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- ❑ **Chat:** PROFANITY FILTERS
  - ❑ In any case, people can easily get around such filters by misspelling the words (and of course, profanity filters don't solve the problem for voice chat).
  - ❑ A profanity filter should always be backed up by other means, such as online customer service representatives to whom players can report bad behavior.
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## Design Issues for Online Gaming

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- ❑ **Chat:** COMPLAINT AND WARNING SYSTEMS
  - ❑ Some chat systems include complaint mechanisms designed to discourage online rudeness.
  - ❑ Some online games give players a Report button they can push whenever they receive an offensive message.
  - ❑ The offending message is, if it consists of text, automatically forwarded to someone in authority (usually online customer service staff), who can then investigate and take appropriate action: warn the offender to mend his ways, kick him offline, or even ban his account.
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## Design Issues for Online Gaming

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- ❑ **Chat:** COMPLAINT AND WARNING SYSTEMS
  - ❑ The America Online Instant Messenger includes a fully automated system that allows users to warn each other, either anonymously or openly, when one participant behaves badly.
  - ❑ A user can be warned once per message that he sends; the more warnings he receives, the less frequently the system permits him to send messages.
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## Design Issues for Online Gaming

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- ❑ **Chat:** COMPLAINT AND WARNING SYSTEMS
  - ❑ If he receives enough complaints, he may be unable to send any further messages for several hours.
  - ❑ The record of the complaints is deleted over time, so a user's bad behavior is not held against him permanently.
  - ❑ If he has behaved himself for a while, he can resume sending messages.
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## Design Issues for Online Gaming

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- ❑ **Chat:** IGNORING OTHER PLAYERS
  - ❑ Some chat mechanisms allow a player to hide messages from other individuals whose behavior they find offensive, a practice called *ignoring*.
  - ❑ The player simply selects the name of a person he wants to ignore, and he no longer receives chat messages from that person, no matter what the person writes.
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## Design Issues for Online Gaming

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- ❑ **Chat:** IGNORING OTHER PLAYERS
  - ❑ You can permit this to take place silently (the other player doesn't know she's being ignored) or automatically send a message telling her that she has been ignored — the online equivalent of deliberately turning your back on someone.
  - ❑ This mechanism is both effective — the users have full control over whom they hear from and whom they don't — and inexpensive because it doesn't require staff intervention.
  - ❑ You should also include the ability to turn chat off entirely if players simply don't want to hear from anyone else.
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## Design Issues for Online Gaming

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- ❑ **Chat:** MODERATED CHAT SPACES
  - ❑ The most effective, but also the most expensive, way of keeping order in a chat space is to give one person authority to discipline the others at all times.
  - ❑ Internet Relay Chat uses this method; the creator of a chat room exercises the authority to kick people out.
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## Design Issues for Online Gaming

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- ❑ **Chat:** MODERATED CHAT SPACES
  - ❑ If the enforcer also participates in the game, this method is subject to abuse.
  - ❑ When people set up their own online matches among their friends, you can let them police themselves; but when they are paying someone to arrange the game for them (as in a match making service or persistent world), the moderator must be an impartial representative of the game's provider — a customer service agent, in effect, whether paid or unpaid.
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## Design Issues for Online Gaming

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- ❑ **Collusion**
  - ❑ *Collusion* is a form of cheating in which players who are supposed to be opponents work together in violation of the rules.
  - ❑ Computer games seldom have written rules because the designers assume that the game will enforce the rules automatically: The players simply can't make illegal moves, in most cases.
    - However, software can't detect certain kinds of collusion between players.
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## Design Issues for Online Gaming

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- ❑ **Collusion:** DESIGNING TO REDUCE COLLUSION
  - ❑ The designer of an online game must try to anticipate collusion as much as possible.
  - ❑ You can't prevent players from colluding, but you can design the game to minimize the effects of cheating.
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## Design Issues for Online Gaming

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- ☐ **Collusion:** DESIGNING TO REDUCE COLLUSION
  - ☐ You should consider in what ways the following types of collusion might affect your game:
    - **Sharing secret knowledge.**
      - ☐ Does the player ever have secret knowledge that she can share to someone else's benefit?
      - ☐ In the trivia game described previously, some players receive the correct answer before the time runs out.
      - ☐ Withholding this information prevents collusion.
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## Design Issues for Online Gaming

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- ☐ **Collusion:** DESIGNING TO REDUCE COLLUSION
  - ☐ You should consider in what ways the following types of collusion might affect your game:
    - **Passing cards (or anything else) under the table.**
      - ☐ Does the game include mechanisms to transfer assets from one player to another?
      - ☐ Is there any way to abuse these mechanisms?
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## Design Issues for Online Gaming

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- ☐ **Collusion:** DESIGNING TO REDUCE COLLUSION
  - ☐ You should consider in what ways the following types of collusion might affect your game:
    - **Taking a dive.**
      - ☐ What are the consequences if one player deliberately plays to lose?
      - ☐ If you allow gambling on matches (even if only with play money or points), you should look out for this.
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## Design Issues for Online Gaming

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- ☐ **Collusion:** DESIGNING TO REDUCE COLLUSION
  - ☐ If you're designing a game in which the competition mode is supposed to be every player for herself, try imagining what would happen if you made it a team game in which you encouraged players to collaborate.
  - ☐ If it's already a team game, try to imagine what would happen if one player on the team spied for the other team.
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## Design Issues for Online Gaming

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- ❑ **Technical Security**
  - ❑ People feel a strong impulse to test the limits of computer software — to see what it will do with nonsensical inputs (such as firing upon their own troops in a war game).
  - ❑ Similarly, players often think of ways to do things that the designers never intended or expected.
  - ❑ Sometimes these unanticipated maneuvers, such as using the rocket launcher to propel the player upward in *Quake*, even become standard tactics.
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## Design Issues for Online Gaming

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- ❑ **Technical Security**
  - ❑ Making unexpected but legal moves is not cheating; one can argue that designers should anticipate these tactics or that testers should discover them.
    - But other forms of cheating, such as hacking the game's software or data files, are clearly unfair.
  - ❑ In a single-player game, it doesn't really matter, but cheating in multiplayer games presents a more serious problem.
    - People who wouldn't dream of cheating their close friends in person — say, playing poker around the living room table — happily cheat strangers when protected by the distance and anonymity that an online game offers.
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## Design Issues for Online Gaming

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- ❑ **Technical Security**
  - ❑ Players have a moral right to expect a fair game when they're playing against other people, and they have a legal right to a fair game as well if they're paying money for the privilege.
  - ❑ This becomes even more crucial if they're playing for prizes.
  - ❑ Although all game software comes with a disclaimer that the publisher sells the software as is and without any warranty, the moment you start to give out prizes with monetary value, you must be very careful to ensure that your game is fair if you don't want to end up in court.
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## Design Issues for Online Gaming

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- ❑ **Technical Security**
  - ❑ The legitimate players aren't the enemy, of course, but the handful of cheaters are.
  - ❑ We lock our doors at night not to protect ourselves from the honest majority of the population but to protect ourselves from the dishonest minority.
  - ❑ You will have to design your game with the same consideration in mind.
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## Design Issues for Online Gaming

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- ❑ **Technical Security:** USE A SECURE TELECOMMUNICATIONS PROTOCOL
  - ❑ It takes an extremely dedicated hacker to tamper with the data stream between the client software and the server, but it takes only one.
  - ❑ If the stakes are high enough, someone will decide the reward is worth the time spent.
  - ❑ To foil hackers, your software must use a secure telecommunications protocol.
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## Design Issues for Online Gaming

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- ❑ **Technical Security:** USE A SECURE TELECOMMUNICATIONS PROTOCOL
  - ❑ Make sure that the telecommunications protocol you use provides the following features.
    - First, all data should be encrypted to prevent users from understanding it outright.
    - ❑ Each packet of data should be sent with suitable error-checking and error-correcting facilities, which will enable the software to detect whether the data has lost integrity in transmission.
    - ❑ Even though Internet communications are far more reliable than the old modem-based systems were, it's always a good idea to verify that the arriving data is correct.
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## Design Issues for Online Gaming

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- ❑ **Technical Security:** USE A SECURE TELECOMMUNICATIONS PROTOCOL
  - ❑ Make sure that the telecommunications protocol you use provides the following features.
    - Second, you might want to consider a *heartbeat* mechanism.
      - ❑ In this system, your client software sends a short packet to your server at regular intervals, even when the client doesn't need to transmit data, simply to tell the server that the client is still present.
      - ❑ This enables you to detect disconnections.
      - ❑ If the nature of the game allows the client to remain silent indefinitely, the server doesn't know if the client has disconnected or if the player is just thinking.
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## Design Issues for Online Gaming

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- ❑ **Technical Security:** USE A SECURE TELECOMMUNICATIONS PROTOCOL
  - ❑ Make sure that the telecommunications protocol you use provides the following features.
    - Each packet should include a unique serial number, to indicate the correct order of packets and to prevent spurious packets from being inserted by unauthorized means.
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## Design Issues for Online Gaming

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- ❑ **Technical Security:** DON'T STORE SENSITIVE DATA ON THE PLAYER'S COMPUTER
  - ❑ A game typically contains two kinds of data about a player.
  - ❑ Your game needs to keep
    - settings or preferences about the way the player appears and likes to play,
    - information that's actually relevant to the game state: the player's position, score, possessions, and so on.
  - ❑ This second kind of information shouldn't be stored on the player's own computer.
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## Design Issues for Online Gaming

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- ❑ **Technical Security:** DON'T STORE SENSITIVE DATA ON THE PLAYER'S COMPUTER
  - ❑ Even with encryption techniques, you have to assume that someone will tamper with any data kept on the player's machine to give that player an unfair advantage.
  - ❑ If your game truly generates too much sensitive data about each character to store it all on the server, at least store a checksum over the data when the player logs out so that when he logs back in again, you can check his data and determine whether it has been improperly modified in the meantime.
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## Design Issues for Online Gaming

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- ❑ **Technical Security:** DON'T SEND THE PLAYER DATA HE ISN'T SUPPOSED TO HAVE
  - ❑ A common characteristic of real-time strategy games is the *fog of war*, in which unexplored areas of the map appear dark and the player cannot detect movements of the enemy unless a friendly unit nearby can plausibly see them.
  - ❑ Single-player games store all of this information in the player's computer; it's just not visible to the player.
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## Design Issues for Online Gaming

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- ❑ **Technical Security:** DON'T SEND THE PLAYER DATA HE ISN'T SUPPOSED TO HAVE
  - ❑ Online games should not send any such hidden information to the player.
  - ❑ If the player hacks the game to lift the fog of war, he can see unexplored areas and watch the movements of enemy units, giving him a significant advantage over his opponents.
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## Design Issues for Online Gaming

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- ❑ **Technical Security:** DON'T LET THE CLIENT PERFORM SENSITIVE OPERATIONS
  - ❑ In designing a client/server game, you must always strike a balance between the amount of processing that the server does and the amount that the client does.
  - ❑ It saves CPU time on the server for you to offload as much of the processing work onto the client as you can, but it isn't always safe.
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## Design Issues for Online Gaming

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- ❑ **Technical Security:** DON'T LET THE CLIENT PERFORM SENSITIVE OPERATIONS
  - ❑ Suppose, for example, that you're designing a simple role-playing game in which the player occasionally encounters monsters and must fight them.
  - ❑ It reduces the load on the server if the server sends the client some information about the current monster and lets the fight take place entirely on the player's computer.
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## Design Issues for Online Gaming

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- ❑ **Technical Security:** DON'T LET THE CLIENT PERFORM SENSITIVE OPERATIONS
  - ❑ After the fight, the client sends a message back to the server reporting whether the player won, lost, or ran away, but this presents a danger: If the player hacks the client, he can program it to report that he wins every fight.
  - ❑ In fact, the server, not the client, should perform the computations for the fight and determine whether the player won or lost.
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