# Impact of computer threats



| | Availability | Confidentiality | Integrity |
|---|---|---|---|
| **Hardware** | Equipment is stolen or disabled, thus denying service. | | |
| **Software** | Programs are deleted, denying access to users. | An unauthorized copy of software is made. | A working program is modified, either to cause it to fail during execution or to cause it to do some unintended task. |
| **Data** | Files are deleted, denying access to users. | An unauthorized read of data is performed. An analysis of statistical data reveals underlying data. | Existing files are modified or new files are fabricated. |
| **Communication Lines** | Messages are destroyed or deleted. Communication lines or networks are rendered unavailable. | Messages are read. The traffic pattern of messages is observed. | Messages are modified, delayed, reordered, or duplicated. False messages are fabricated. |

# Goals of computer security



- Computer security is needed to ensure:

  - Confidentiality: prevention of unauthorized disclosure of information
  - Integrity: prevention of unauthorized modification of information
  - Availability: prevention of unauthorized withholding of information or resources
  - Authentication : Guarantee that only authorized persons can access to the resources

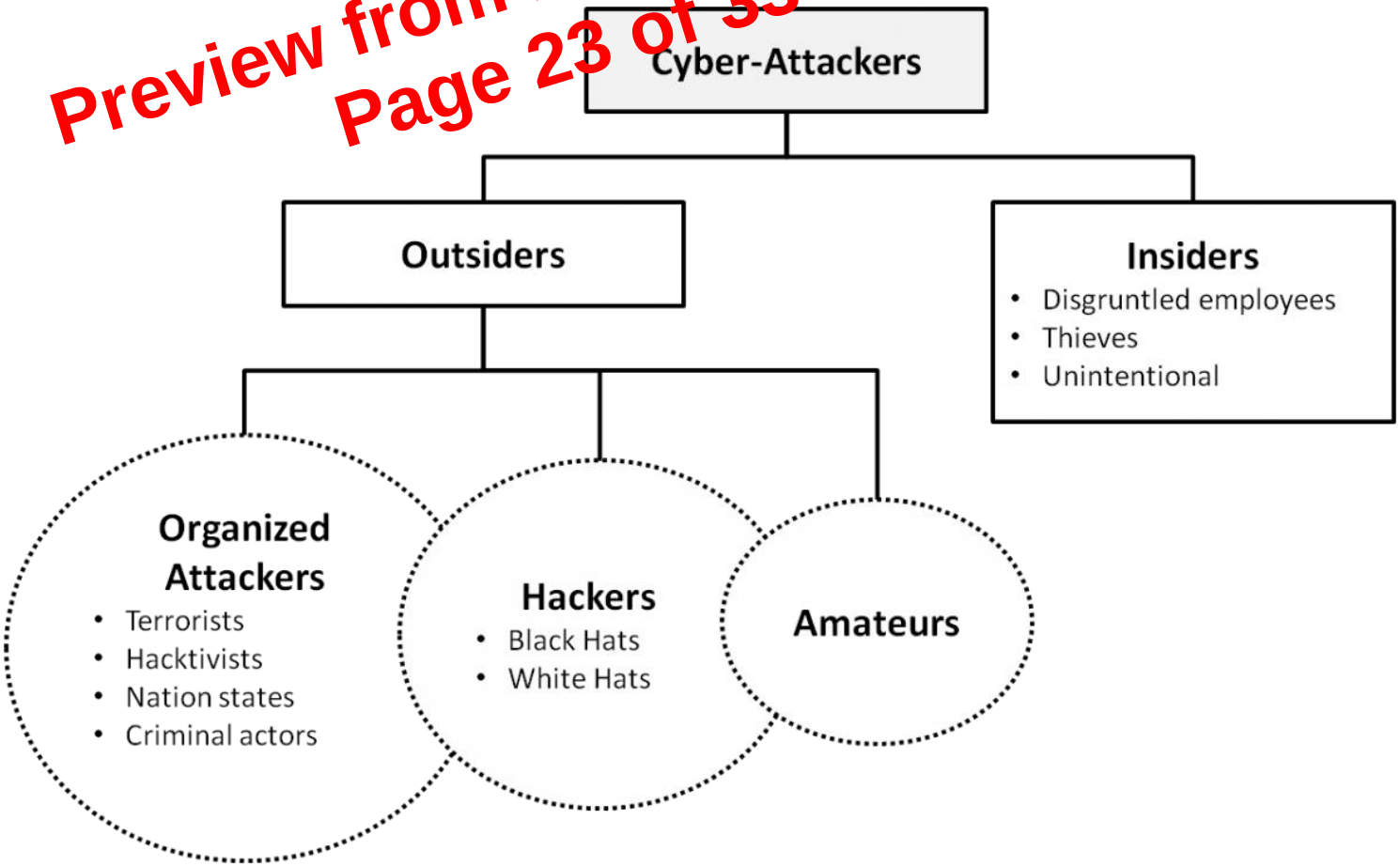
# Active attacks



- Active attacks involve some modification of the data stream or the creation of a false stream
- Active attacks can be sub-divided into four categories: masquerade, replay, modification of messages, and denial of service
- **Masquerade**: Pretending to be a different entity
- **Replay**: Capture of data unit and retransmission for an unauthorized effect
- **Modification of messages**: Some portion of a legitimate message is altered
- **Denial of service**: Prevents or inhibits normal use of communications facilities

# Categories of cyber attackers



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# Categories of cyber attackers



*2)* **Organized attackers**: This category includes organizations of terrorists, hacktivists and criminal actors.

- **Terrorists** are those who seek to make a political statement or attempt to inflict psychological and physical damage on their targets, in order to achieve their political gain or create fear in opponents or the public.

- **Hacktivists** seek to make a political statement, and damage may be involved, but the motivation is primarily to raise awareness, not encourage change through fear.

- **Nation-state attackers** gather information and commit sabotage on behalf of governments and are generally highly trained, funded, tightly organized, and are often backed by substantial scientific capabilities.