

# סיאסטה 2008 CSTA

מסיבת סוף השנה של בית הספר למדעי המחשב  
באוניברסיטת תל אביב לדורותיו

הארוע יתקיים ביום שישי, 11 ביולי,  
בגן הדקלים (מול הפסל של איינשטיין)  
מהשעה 15:00 ועד כניסת השבת

סטודנטים, סגל ובוגרים  
על טפס ובניאות זוגסן מוזמנים!  
הכניסה חופשית!

ההרשמה לתכנית האמנותית נפתחה!  
סטודנטים, אנשי סגל ובוגרים  
מוזמנים לפנות ל [nurit@cs.tau.ac.il](mailto:nurit@cs.tau.ac.il)



# Operating Systems

## Lesson 10



43.2%	21	16	37	משרות הפעלה	0368.2162.06
18.8%	26	6	32	משרות הפעלה	0368.2162.07
34.8%	15	8	23	משרות הפעלה	0368.2162.08



# Windows Security

- Protect from
  - Malicious user
  - A bug
- Account level security
  - Every action is performed under some process/thread
  - Every process/thread run under some account
  - Accounts and group of accounts has different privileges
- Accounts and groups examples
  - User account
  - System account
  - Guest account
  - Administrators groups
- System Privileges examples
  - Install software
  - Create or delete accounts
  - Change system date and time



# Access Control Model

- Control the ability of a **process** to access **securable objects**
- When a thread attempts to use a **securable object**, the system performs an access check before allowing the thread to proceed.
  - Compares the security information in the thread's **access token** against the security information in the object's **security descriptor**



# Access Control Components

- **Access Token**

- Contains information about a logged-on user (user, groups)
- Generated on user logon
- Contains a list of privileges

- **Security Descriptor**

- Contains the security information that protects a securable object



# Security Identifiers (SID)

- Identify entities that perform actions in the system
- Each account has a unique SID
- Each time a user logs on, the system retrieves the SID for that user
- The system uses the SID in the access token to identify the user



# Access Control List (ACL)

- List of Access Control Entries (ACE)
- System Access Control List (SACL)
  - Used by administrators for logging
- Discretionary Access Control List (DACL)
  - identifies the entities that are allowed or denied access to a securable object

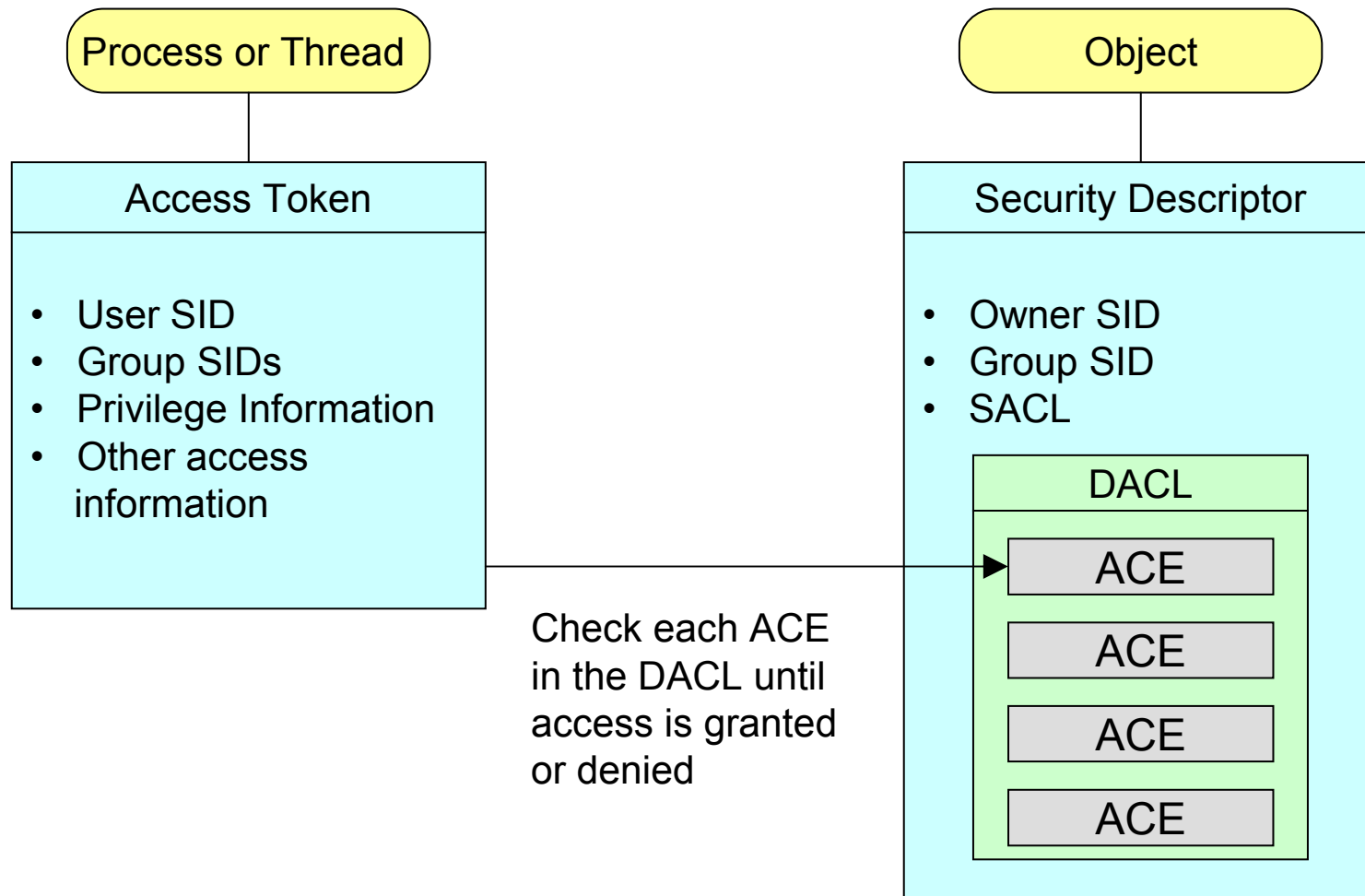




# Access Control Entry (ACE)

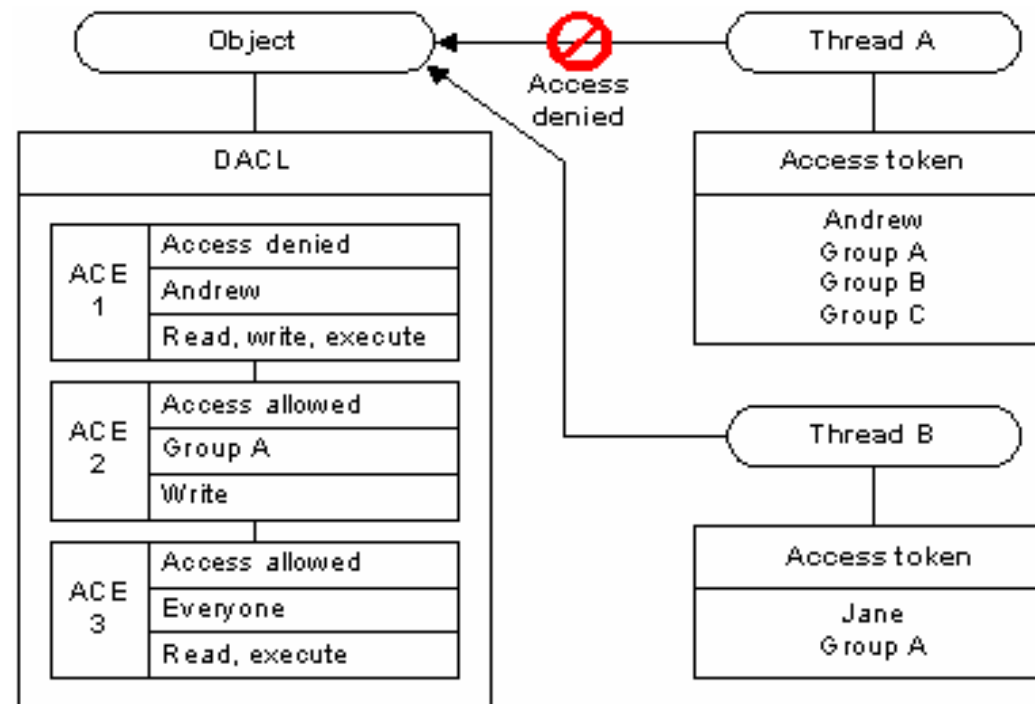
- A (SID) that identifies the entity to which the ACE applies
- Access mask that specifies the access rights
- Type of ACE (allow/deny)

# Threads and Securable Objects



# Controlling Access

- Allow access to one thread while denying access to another





# Example: Token Dump

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## EX#5

- “Fortune teller” TCP socket server
  - 2 processes server.exe and client.exe
  - Client.exe <IP address> <port>
  - Server.exe <directory> <port>
  - Server will respond with “words of wisdom” to connecting clients
  - Client will connect, receive “words of wisdom”, wait for any key from user and exit
  - Server will never exit



## EX#5: Server

- Accept folder name (with trailing slash) and port as command line parameters
- In a folder will be 10 files named 0.txt 1.txt and 9.txt
- Server will accept connection from client, randomly select a file and send its content to a client, then disconnect
- Files are ASCII files with no more than 256 characters each



## Ex#5: Client

- Gets Server's IP and port as command line parameters
- Connect on start
- Obtain data from socket and disconnect
- Print data to a console
- Wait for user's "any key"
- Exit



## EX#5: Tips

- Server: 80 lines of code
- Client: 50 lines of code
- Data is ASCII but file names are in UNICODE
- Don't forget to add ws2\_32.lib to a linker input properties in the project
- Use rand\_s to generate random numbers





## Ex#5: Challenge (optional)

- Server can handle only single client
- Open new thread for each connected client, pass socket handle
- Test using delay(sleep) between characters to see that indeed several clients are connected
- Open files using read sharing
- Traffic reduction: Send only single NULL character (use true string length)