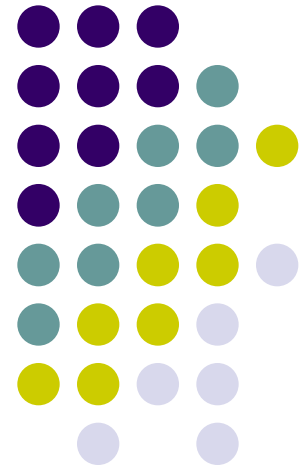
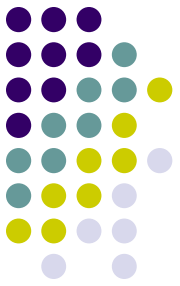


# Net-Centric Computing Overview

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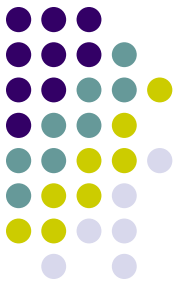




**“Network is Computer.”**

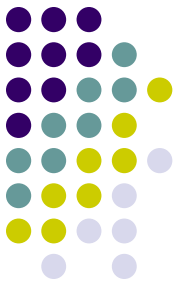
-- Sun Microsystems.

# What is Net-Centric Computing ?



“Distributed environments where applications and data are exchanged among peers across a network on as-needed basis.”

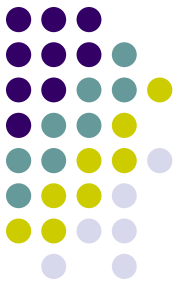
- Applications on distributed environments ?
  - more than one machine / one user.
  - multiple platform is possible.
- How can we exchange data ?
  - standard data formats.



# What is Net-Centric Computing ?

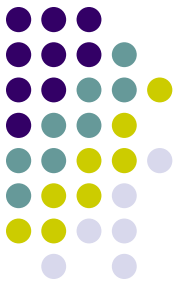
“Distributed environments where applications and data are exchanged among peers across a network on as-needed basis.”

- Are you my peers ?
  - security issues.
- How soon is as-needed ?
  - Real-time / batch data exchanging.
  - Push / Pull.



# What is NCC, really ?

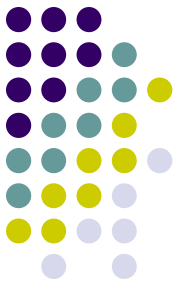
- Information system (applications).
- Multiple machines.
- Over the network.
- Seamlessly integrated.
- Using standard data formats.
- There are some securities.
- Example, anyone ?



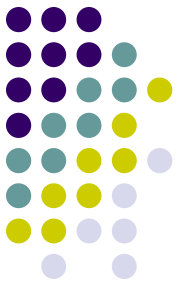
# Why NCC ?

- Stand alone system is not enough
  - Do you know “Starcraft” ?
- Collaborative among users
  - All works are workflows by nature.
- Pool of resources
  - Share disks, tapes backup, printers.
- Centralized management
  - Application codes.
  - Data consistencies.
- And much more...

# What will be taught in this class ?



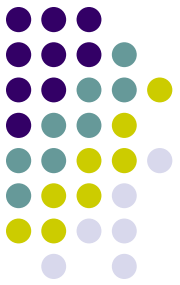
- Network application architectures and services
  - A touch on “here-and-there”.



# What will NOT be taught in this class ?

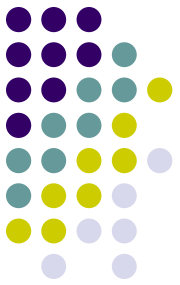
- How to write a Java (or other languages) program.
- How to create a web page.
- How to write a network game
  - You should study Distributed System.
- Low-level protocols (e.g. physical layer).





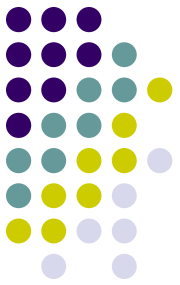
## What should you know to enjoy this class ?

- Use Internet **for studying** a lot
  - Search engine.
- Programming.
- HTML.
- Database skills.



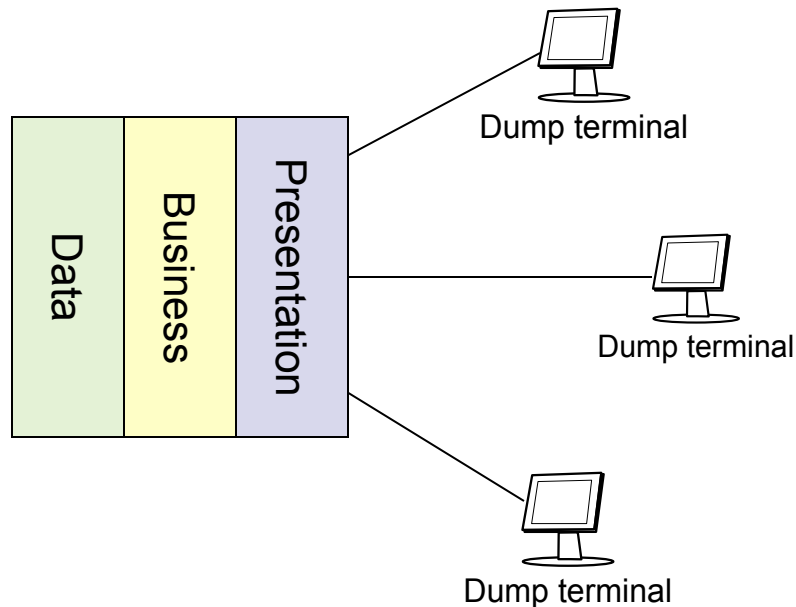
# The Revolution of NCC

- “Tier”-based paradigms
  - Where the codes (or logics) are ?
  - Presentation / Business / Data logics.
- Types of NCC architectures
  - One-tier.
  - Client/server (two-tier).
  - Three-tier.
  - Multi-tier.



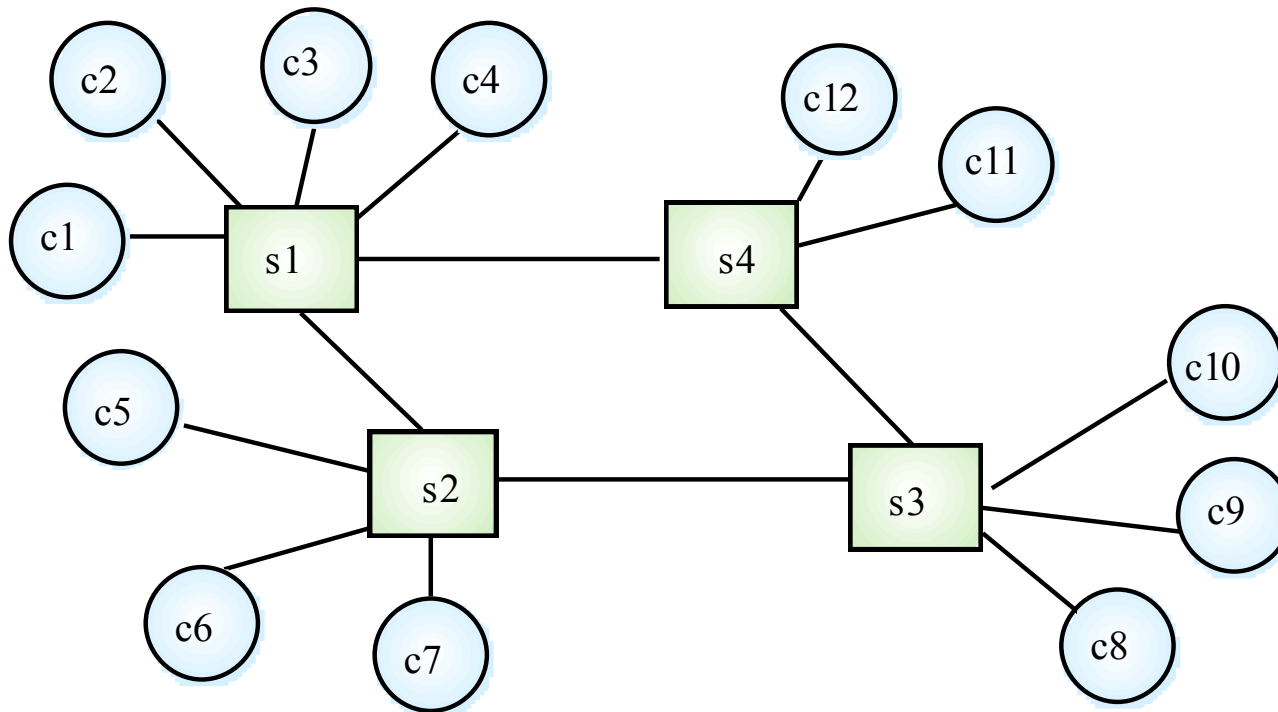
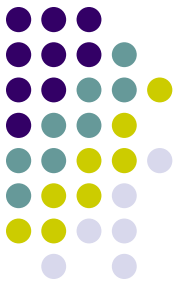
# Single-Tier Architecture

- Mainframe with “dumb” terminals.

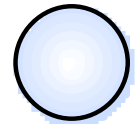


- Pros:
  - Good security and management.
- Cons:
  - Difficult to improve.
  - Vendor “locked-in”.

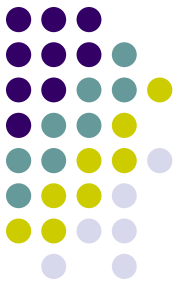
# A client-server system



Server process



Client process



# Thin and fat clients

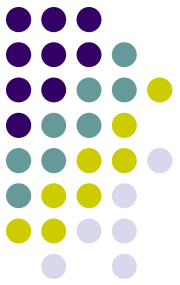
- ***Thin-client model***

- In a thin-client model, all of the application processing and data management is carried out on the server. The client is simply responsible for running the presentation software.

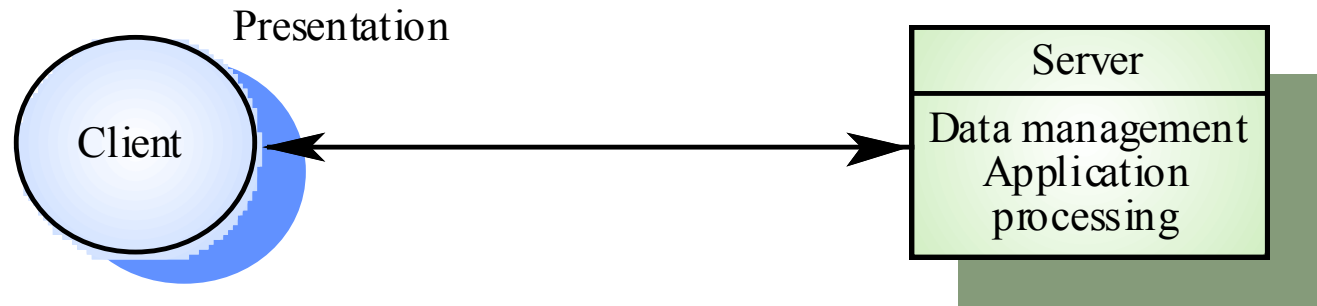
- ***Fat-client model***

- In this model, the server is only responsible for data management. The software on the client implements the application logic and the interactions with the system user.

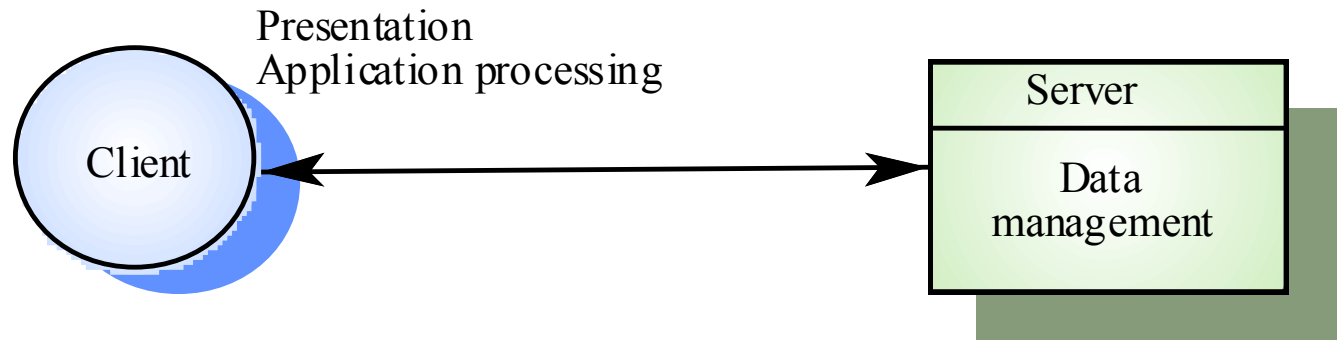
# Thin and fat clients

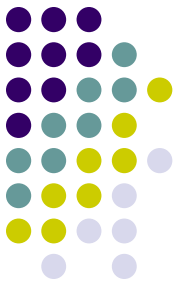


**Thin-client  
model**



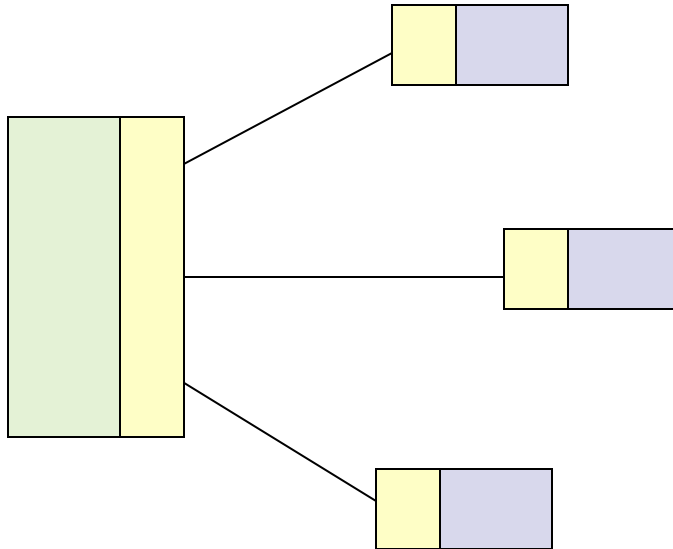
**Fat-client  
model**



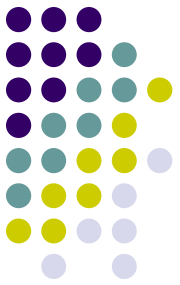


# Client/Server Architecture

- Database server with fat clients (PCs).

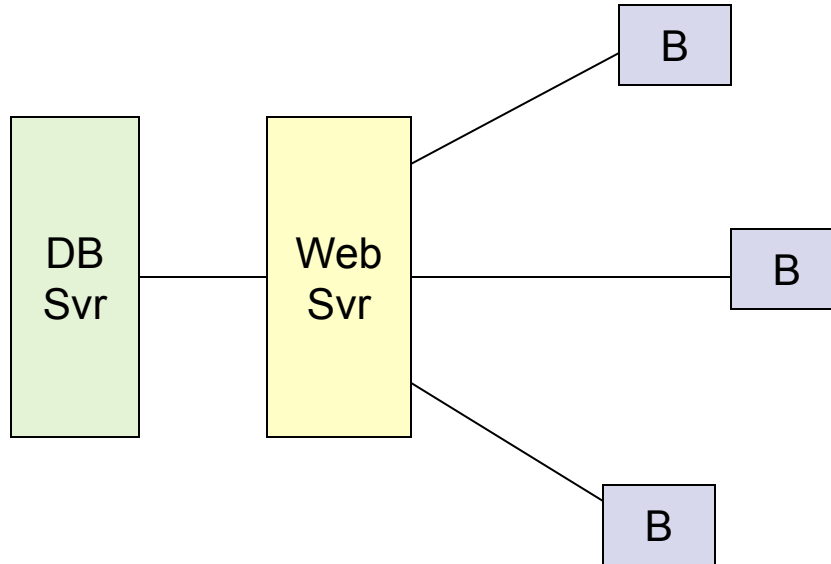


- Pros:
  - Cheap and simple.
- Cons:
  - Difficult to manage.
  - Performance.
  - Security problems.



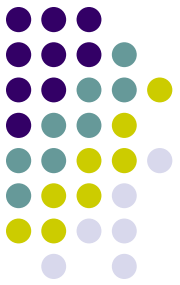
# Three-Tier Architecture

- Database + Web server with Browsers (Thin clients).



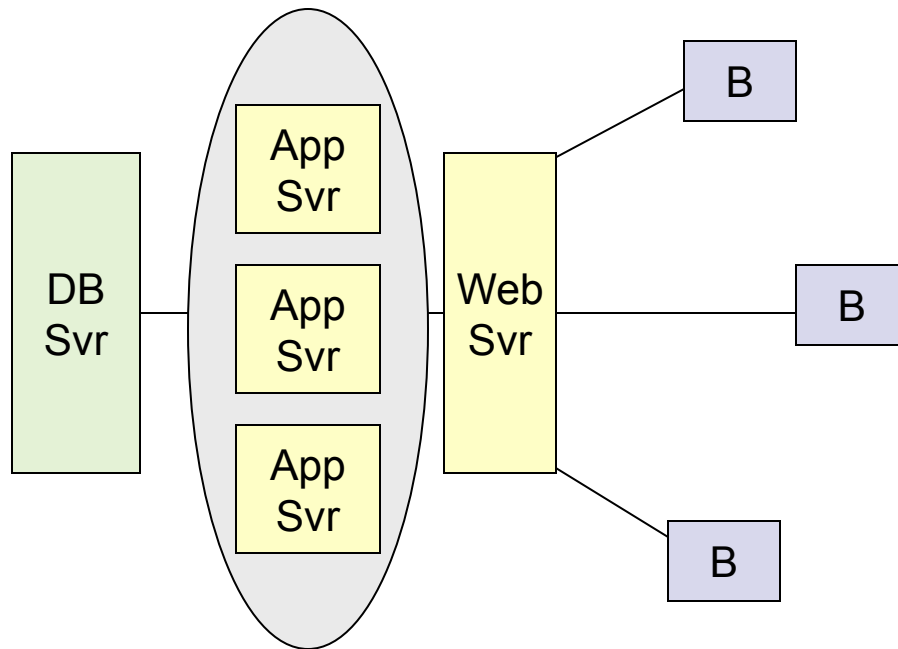
- Pros:
  - Cheap and simple.
  - Good performance.
  - Simple to manage with good security.
- Cons:
  - Slightly difficult to develop.



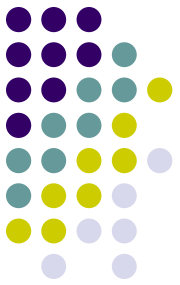


# Multi-Tier – The Current Trends

- Database + App + Web server with Browsers.

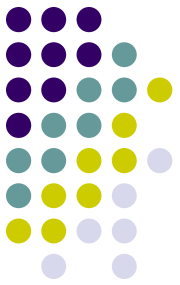


- Pros:
  - More flexible.
- Cons:
  - More expensive.



# Basic Terminologies

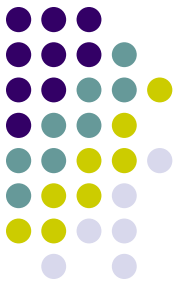
- Internet
  - Anyone don't know ?
- Intranet
  - Very important.
  - Internal applications.
- Extranet
  - Integrating with external parties.
  - VPN.



# E-everything – Buzz Words

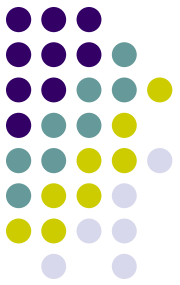
- E-Commerce.
- E-Business.
- E-Service.
- E-Learning.
- E-Billing.
- E-Government.
- EAI (Enterprise Application Integration).

# A-2-Z



- **From who To who.**
- B2C.(Business-To-Consumer. A transaction that occurs between a company and a consumer, as opposed to a transaction between companies (called B2B). The term may also describe a company that provides goods or services for consumers.)
- B2B.(Business-To-Business. A transaction that occurs between two companies, as opposed to a transaction involving a consumer. The term may also describe a company that provides goods or services for another company.)
- B2E.(business-to-employee, an approach in which the focus of business is the employee, rather than the consumer.)
- G2G.(Government to Government, describing internal or external Government to Government data communications, similar to "B2B")
- B2G.(B2G networks provide a platform for businesses to bid on government opportunities)

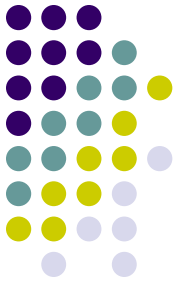
# Net-Centric Services

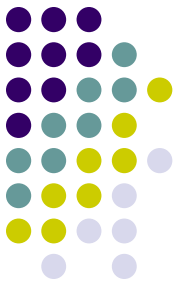


- Locator Services
  - Naming service (DNS).
  - Directory service (LDAP).
    - (The Lightweight Directory Access Protocol is an application protocol for accessing and maintaining distributed directory information services over a network.)
- Data Repository Services
  - User profiles (Database).
- Security Services
  - Authentication service (Login).
- And more ...

# Summary

- NCC Architectures.
- Basic Terminologies.





# References

- S. Tilley *et al.*, “The State of Net-Centric Computing in Early 2001”, *The Proceeding of the 3rd International Workshop in Net-Centric Computing*, May 2001, pp. 57-61.
- S. Tilley, “The Era of Net-Centric Computing”, *SEI Interactive*, Vol.1, No.1, June 1998.
- R. Peacock, “Distributed Architecture Technologies”, *IEEE IT Professional*, May/June 2000, pp. 58-60.