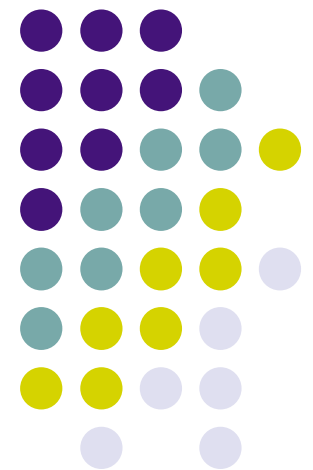# Supporting Context-Aware Applications Using Thin Clients
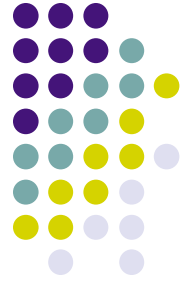
Cynthia Taylor, Joe Pasquale

UCSD

- Introduction
  - Sample device
  - Sample application
- Definitions
- Adding a Smart Proxy
- Proposed Experiment
- Conclusion

Devices

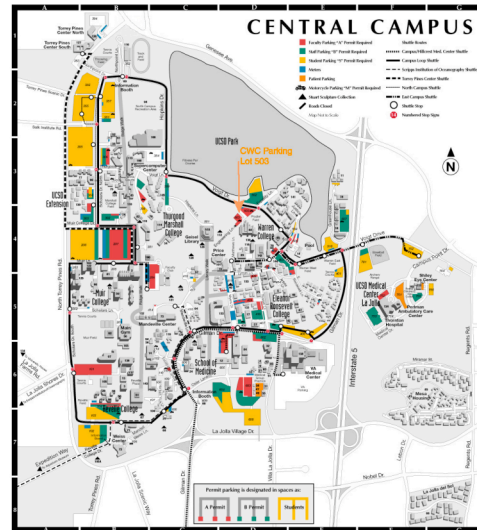Zypad Wearable Computer

128 MB Ram
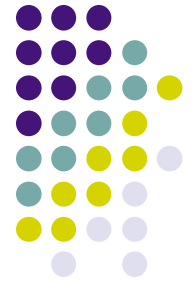GPS, Accelerometer

Video Glasses
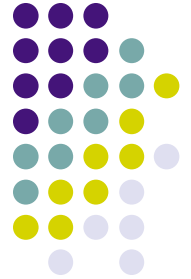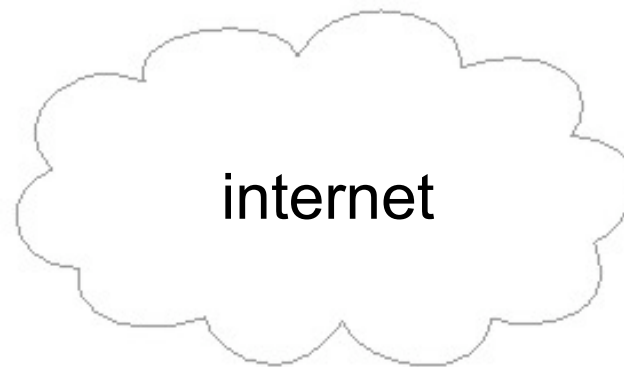
Application

Virtual Worlds
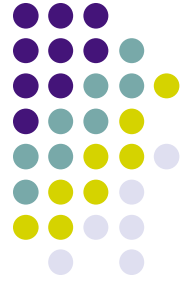

Maps

Historic Information

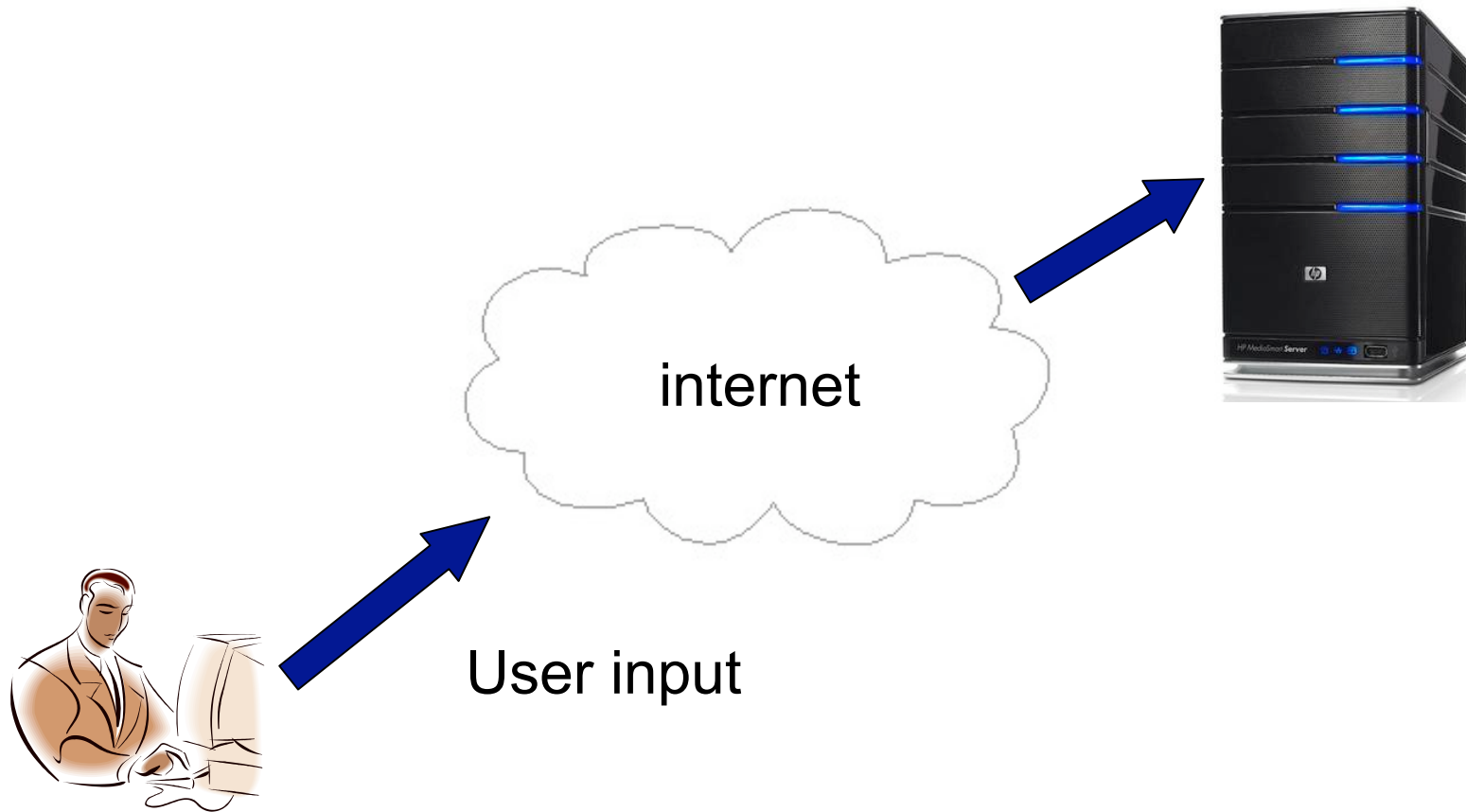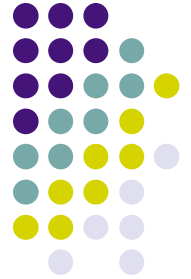- Displaying contextual information about the user's location

- Introduction
- Definitions
  - What is thin client computing?
  - Why thin client computing?
- Adding a Smart Proxy
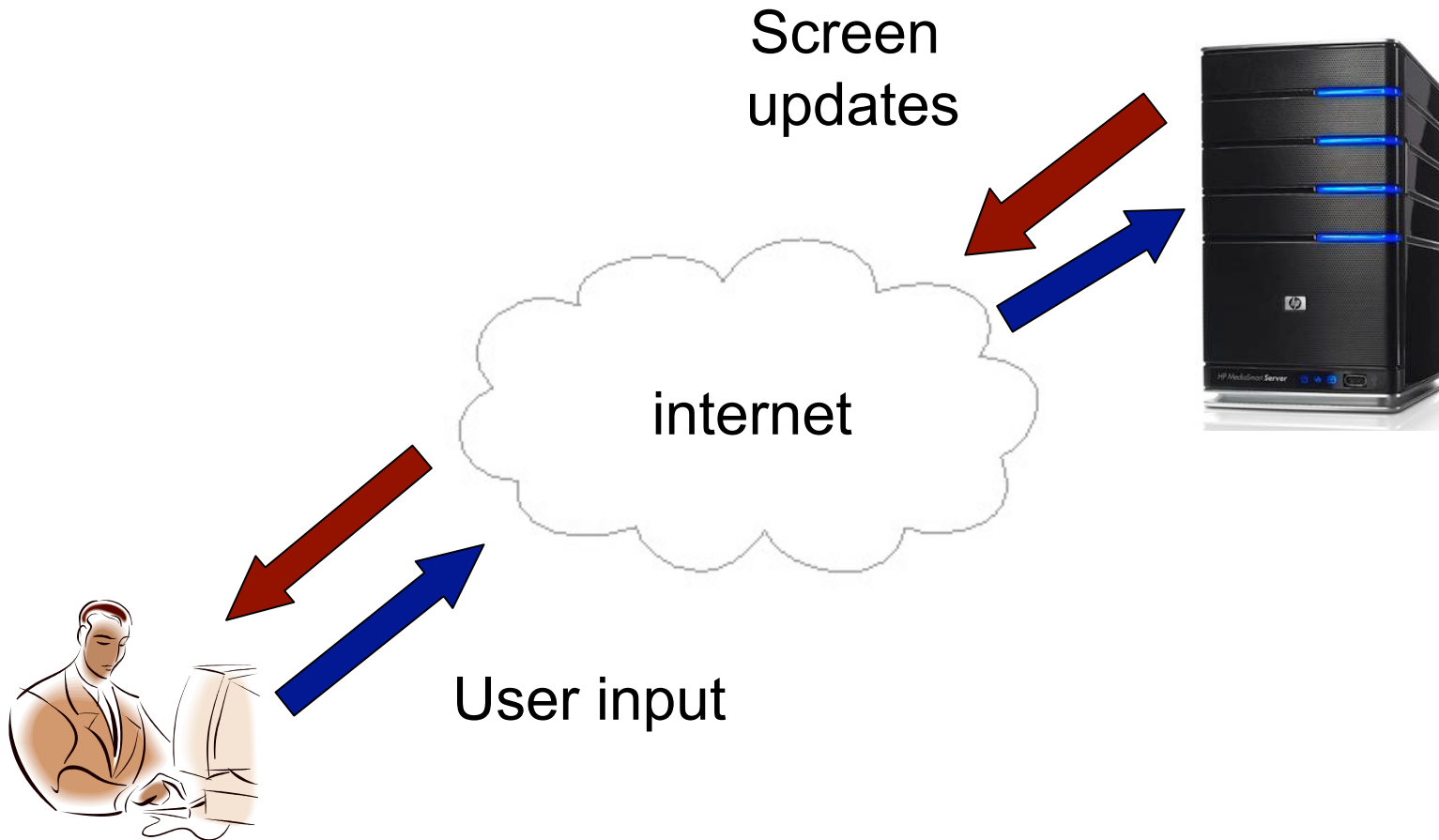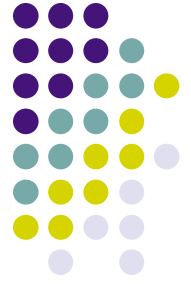- Proposed Experiment
- Conclusion

What is Thin Client Computing?

internet

What is Thin Client Computing?

internet

User input

What is Thin Client Computing?

Screen updates

internet
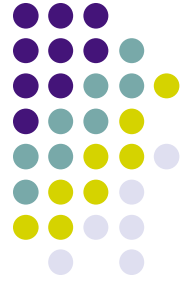
User input
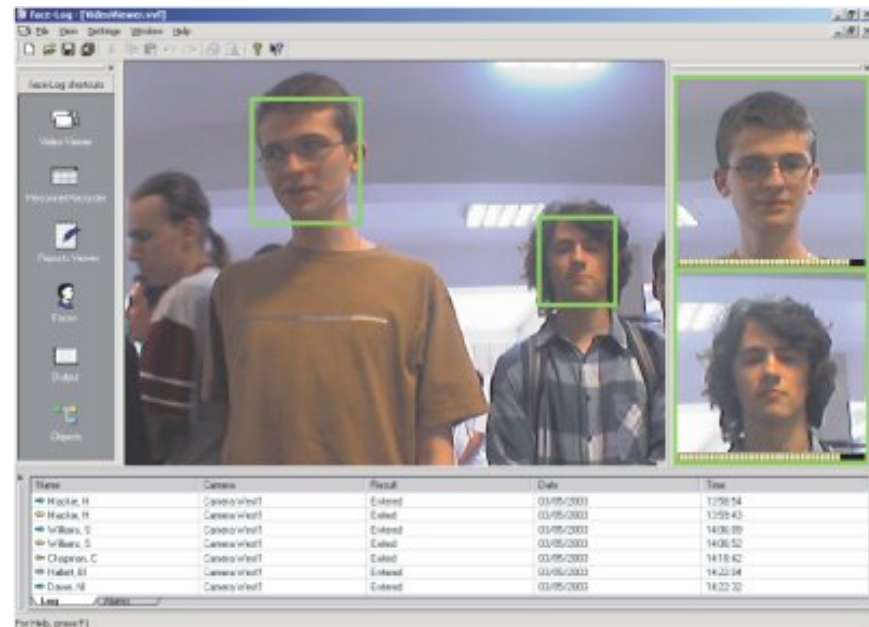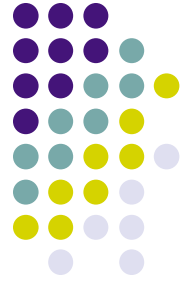
Why Thin Clients? Lightweight Devices
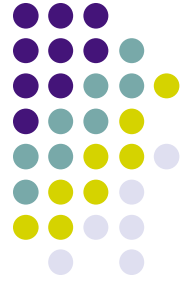
Why Thin Clients? Intensive Applications

- Machine Learning/Vision
  - Object recognition
  - Speech recognition
- Graphics
  - Rendering
- Data Storage
  - Video

- Introduction
- Definitions
- Adding a Smart Proxy
  - Resource Assumptions
  - Server-Client vs Server-Smart Proxy-Client
  - Uses of the Smart Proxy
- Proposed Experiment
- Conclusion

Resource Assumptions: Active Wireless Spaces
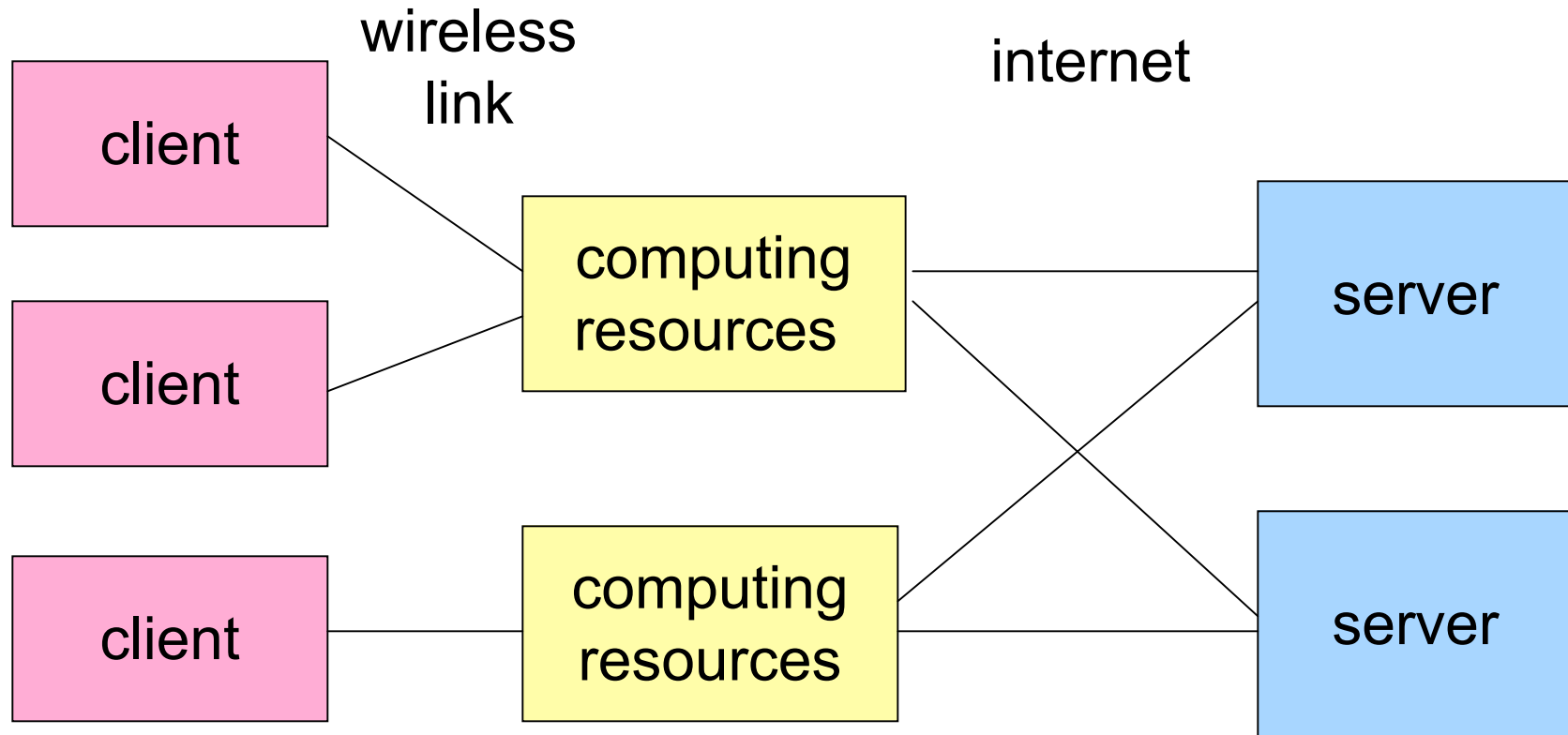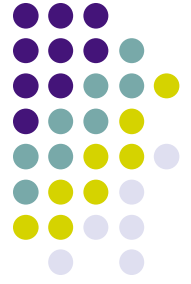
wireless link

internet

client

client

client

computing resources

computing resources

server

server

Server-Client vs Server-Smart Proxy-Client

client ——— server

Server-Client
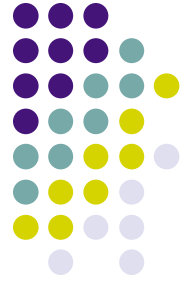
client ——— smart proxy ——— server
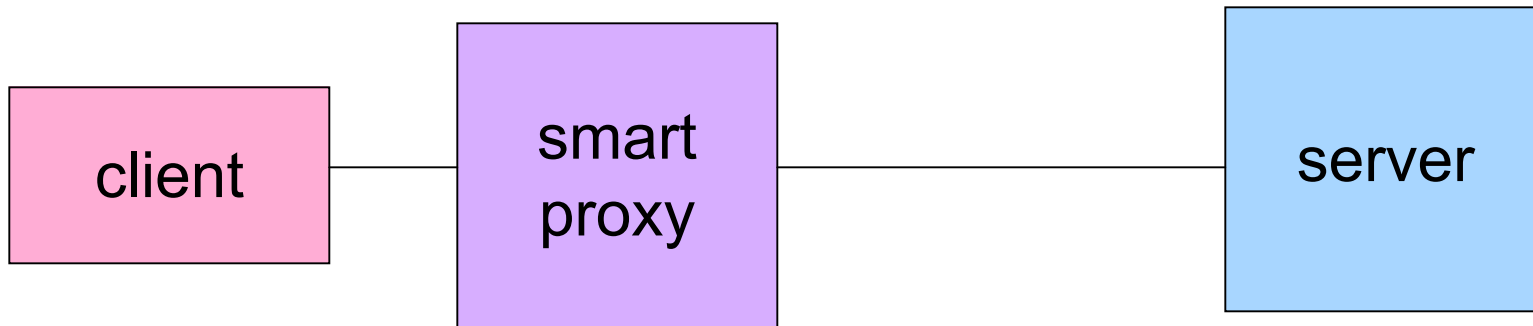
Server-Smart Proxy-Client

Uses of the Smart Proxy

- Buffering updates
- Compress or Decompress Updates
  - Scalable Video Coding
- Video Processing
- Encryption

- Introduction
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- Adding a Smart Proxy
- Proposed Experiment
  - Experiment
  - Advantages
- Conclusion
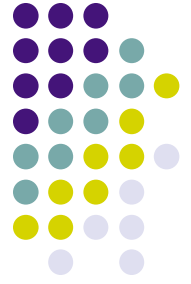
Experiment

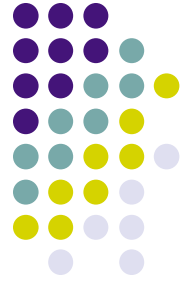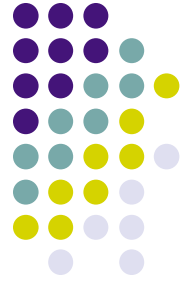- Server sends smart proxy larger chunks of video based on GPS coordinates from Zypad client.

- Smart proxy selects which video should be displayed based on accelerometer and sends it to the client

Advantages

- Smart proxy can quickly send fine-grained updates to the client.
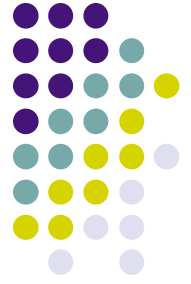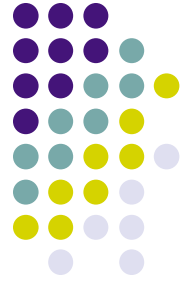
- Smart proxy can cache video and data related to its locality.

- Smart proxy doesn't need to keep large amounts of video, since all video is originally stored on the server and sent to the smart proxy as needed.

- Client doesn't have to do anything more complicated than displaying video and forwarding GPS and accelerometer coordinates.

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Conclusion

- By adding a smart proxy to thin client systems, we can have faster updates that are finely-tuned to fit the client device's needs.

- This will help us build context-aware applications that require a significant amount of computation, but can be accessed by low-power devices.