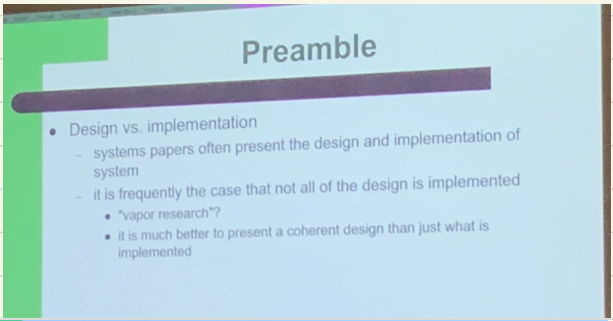
- J. K. Ousterhout, D. A. Scelza, and P. S. Sindhu, Medusa: An Experiment in Distributed Operating Systems Structure, Communications of the ACM, Vol. 23, No. 2, February 1980, pp. 92-105.

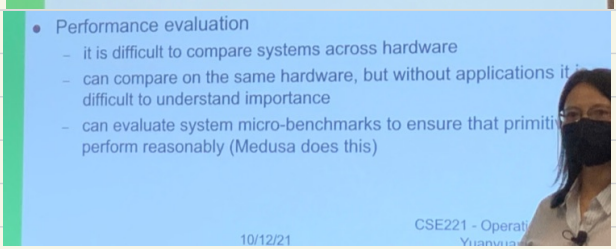
Q: What are the three distributed OS structures outlined in the paper, which structure does Medusa use, and why?

- D. D. Redell, Y. K. Dalal, T. R. Horsley, H. C. Lauer, W. C. Lynch, P. R. McJones, H. G. Murray, and S. C. Purcell, Pilot: An Operating System for a Personal Computer, Communications of the ACM, Vol. 23, No. 2, February 1980, pp. 81-92.

Q: How do the requirements of the Pilot operating system differ from the systems we have read about so far, and how does the design of Pilot reflect those differences?

Lec





Main Point

The component is distributed.

OS itself most others are replicated.

Approach

① Central node handle
1) bottleneck
2) SPF

② replicate OS
1) No Enough memory.

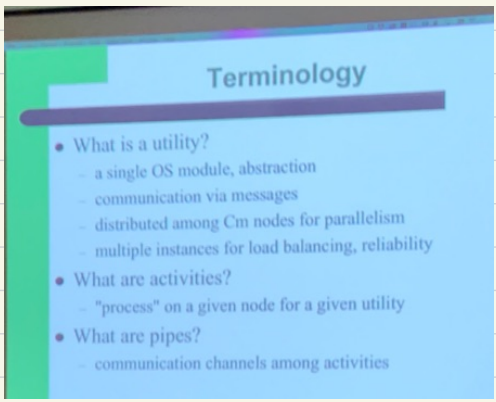
③ Components on different CPU/Node.

Terms

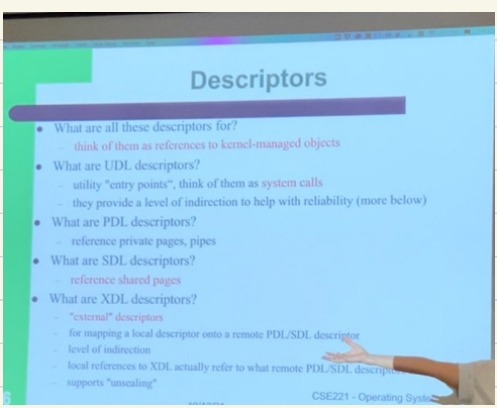
Utiley?

Activities

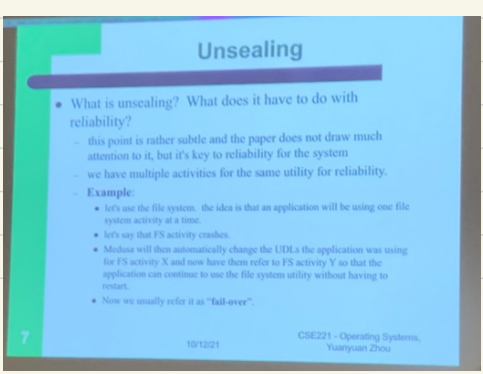
Pipes

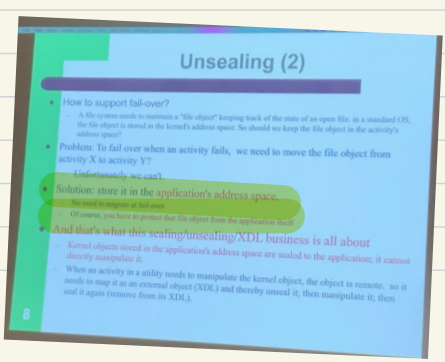


Descriptors : kernel managed objects

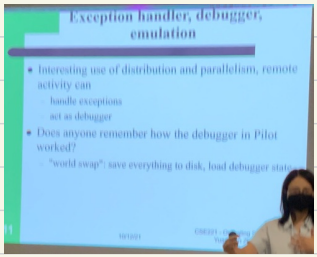


Unsealing





Exception
Debugger



co-schedule. Caller (gang schedule)

just like Tele-meeting
vs
email back and forth

?

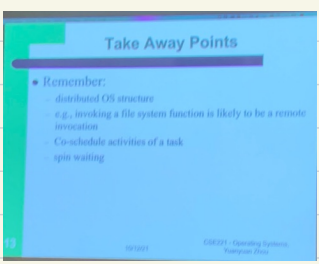
CPU schedule all together?

Spin-wait
comm

Take a chance that other thread will return faster than CTX

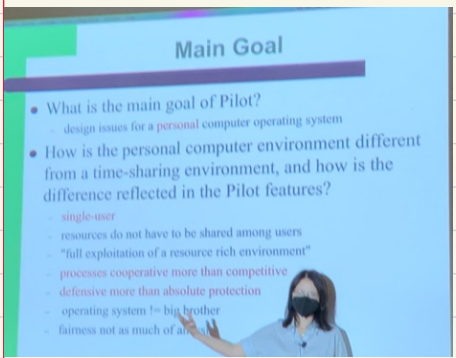
for uni-processor

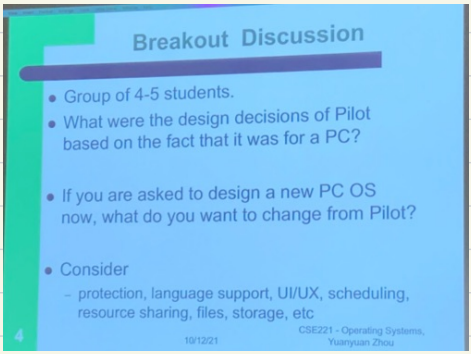
Don't! No one will release.



Android – Don't spin
taking too much battery

Pilot

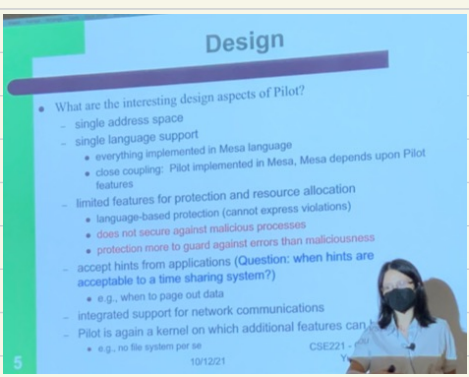




Bad Design
1. Bind to MesA
2. Ignore Security
3. Single memory space
4. Virtual memory mapping file system

Design

Not foreseeing the Internet



why paper not talking about scheduling?

Files Attributes

Files Attributes

- Files have just four attributes, e.g., size and type.
- Files can also be made "permanent" and/or "immutable".
- What does "permanent" imply about a file?
  - If a file is not permanent, what is it used for?
  - How does this compare with OSes today?
- What is an "immutable" file?
  - Why is it useful? (hint: cached files, CDN))

new version everytime

- Integration of networks into Pilot have influenced how files are named. How is this?
- Note that files and volumes do not implement a file system per se, but are the "kernel" of a file system. What is missing?

Using name/tag with/ special format instead.

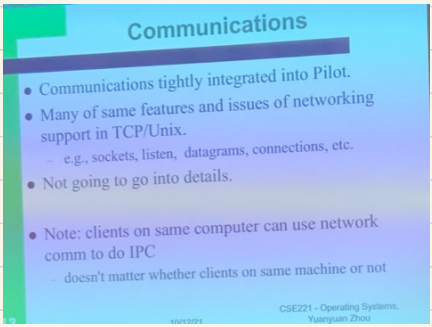
Virtual Memory

Virtual Memory

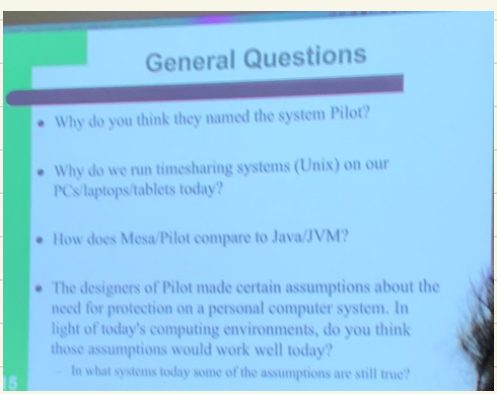
- What is unique about the Pilot virtual memory system?
- Linear virtual address space is partitioned into hierarchical memory "Spaces". Spaces serve three purposes:
  - **Allocation**: data can only be accessed in allocated regions of virtual memory
  - **Mapping**: maps data to backing store
  - **Swapping**: unit of swapping between memory and backing store (note: not paged)

Implementation

- What is an example of the circular dependency problem?
  - circularity between files and VM: files can only be accessed via virtual memory, and virtual memory requires files for backing store
- How does kernel/manager break circularity?
  - manager maintains full "database" (e.g., complete file data structures)
  - kernel does low-level operations with a cache of data
  - low-level disk I/O with already open files



Conclusio Pilot is still OS
JVM is runtime library



→ Security missing