

Today

⇒ * Quicksilver

Next week

(Lesson 9)

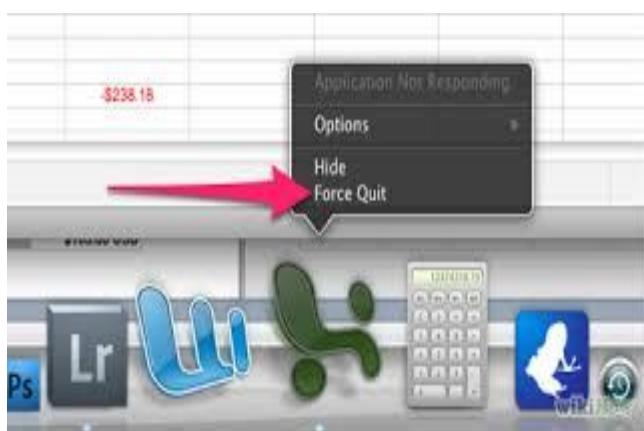
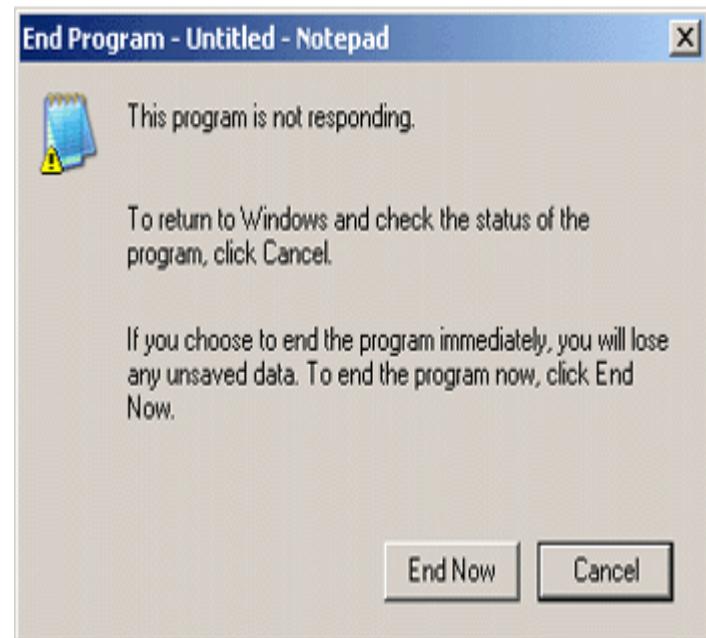
Internet scale computing

* giant scale services

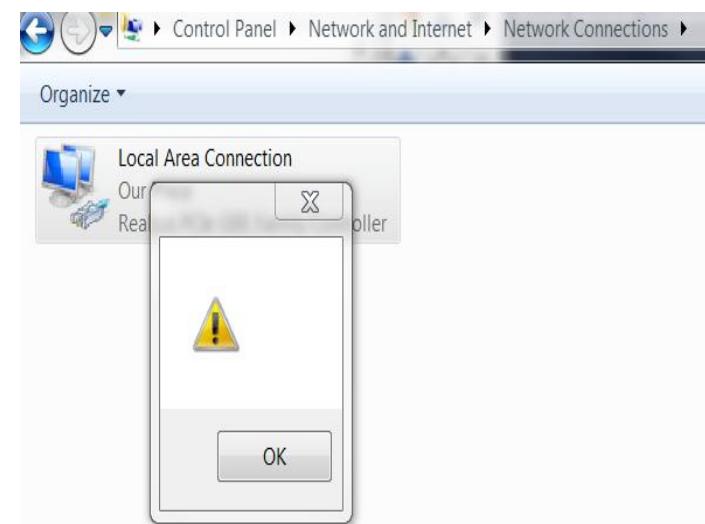
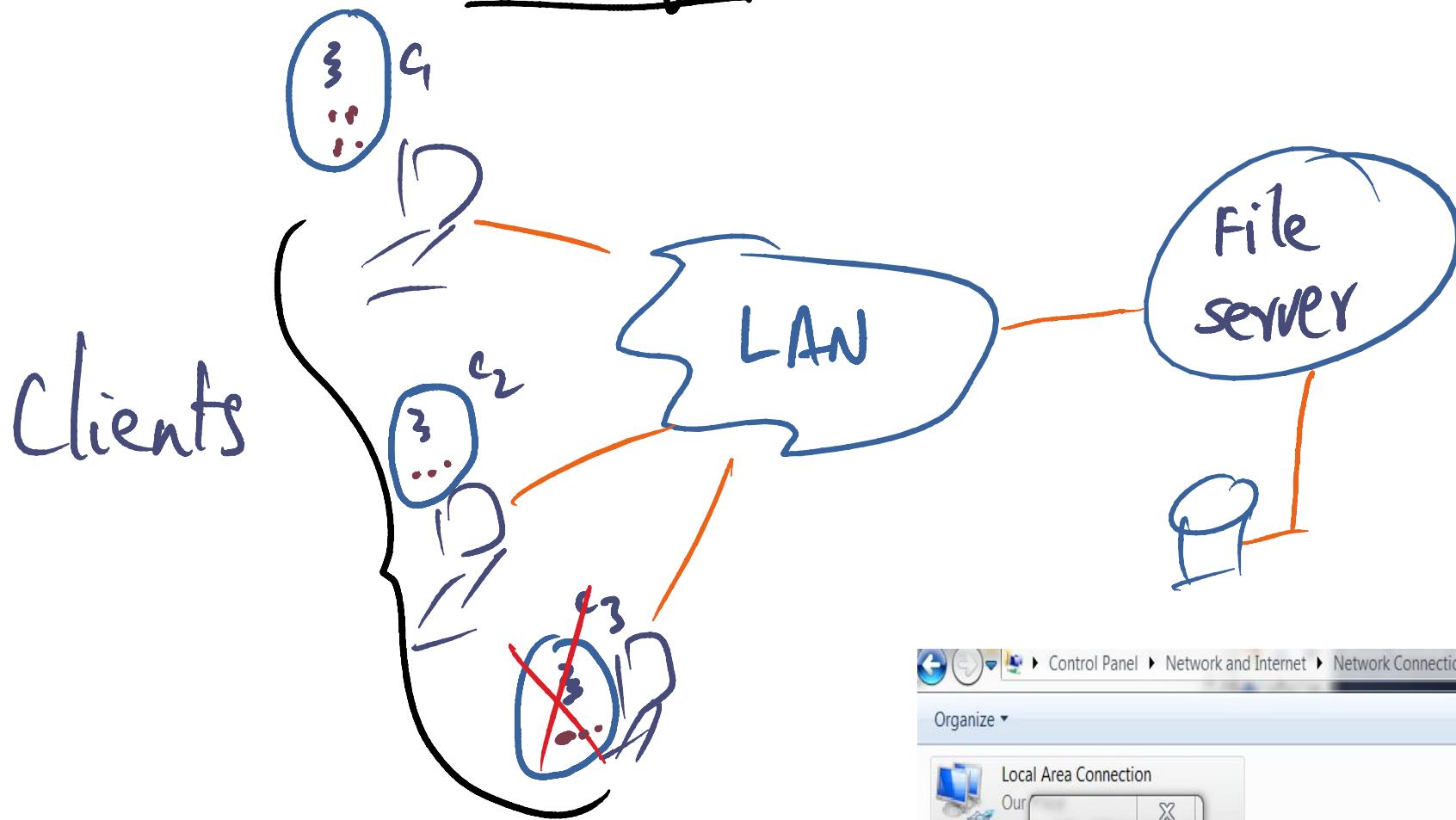
* Map-reduce programming model

* CDN (coral)

* Please watch videos before class *



Cleaning up state orphan processes



⇒ Quicksilver

- making recovery a first class citizen
in OS design

⇒ Quicksilver

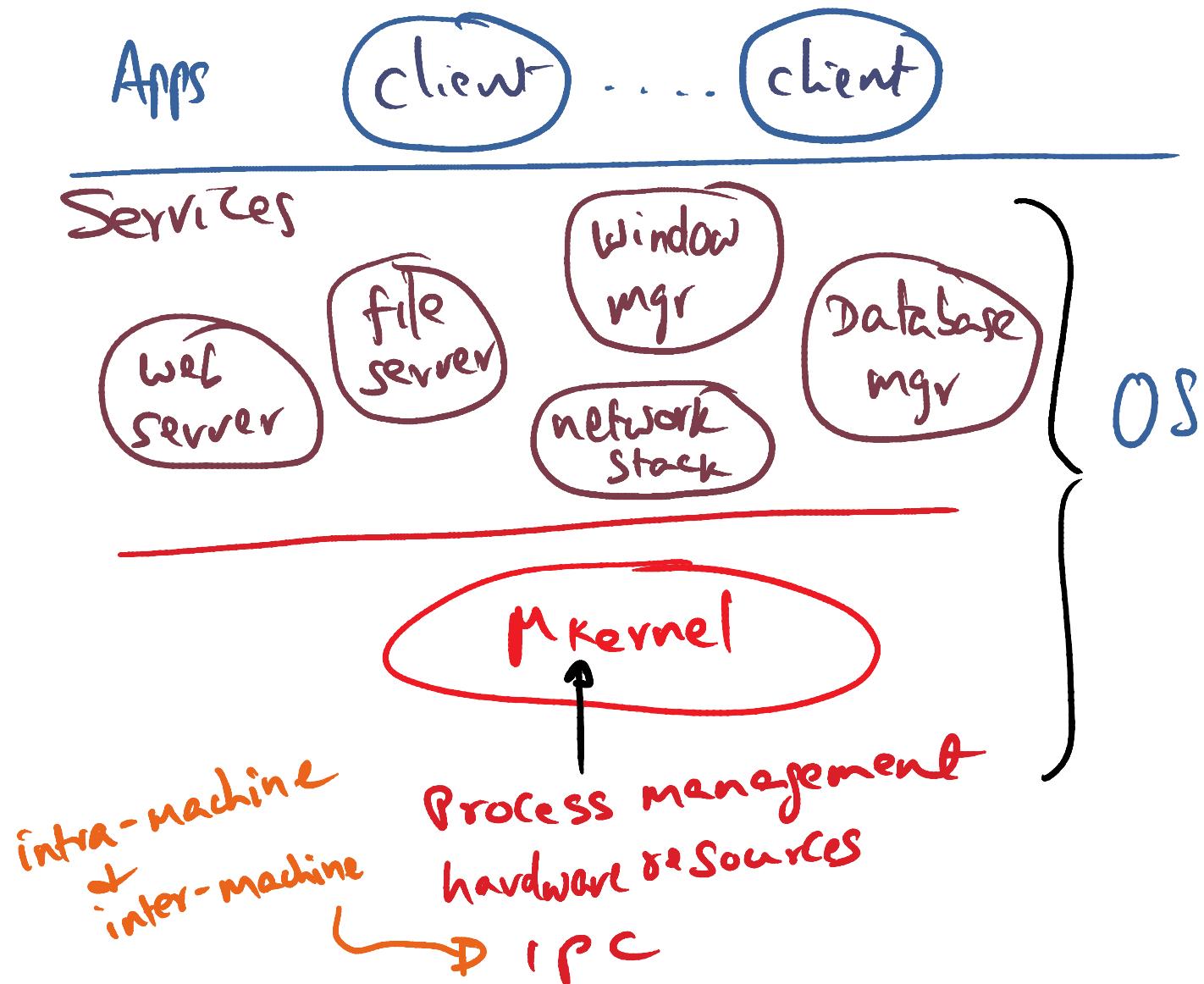
- making recovery a first class citizen
in OS design

When?

Who?

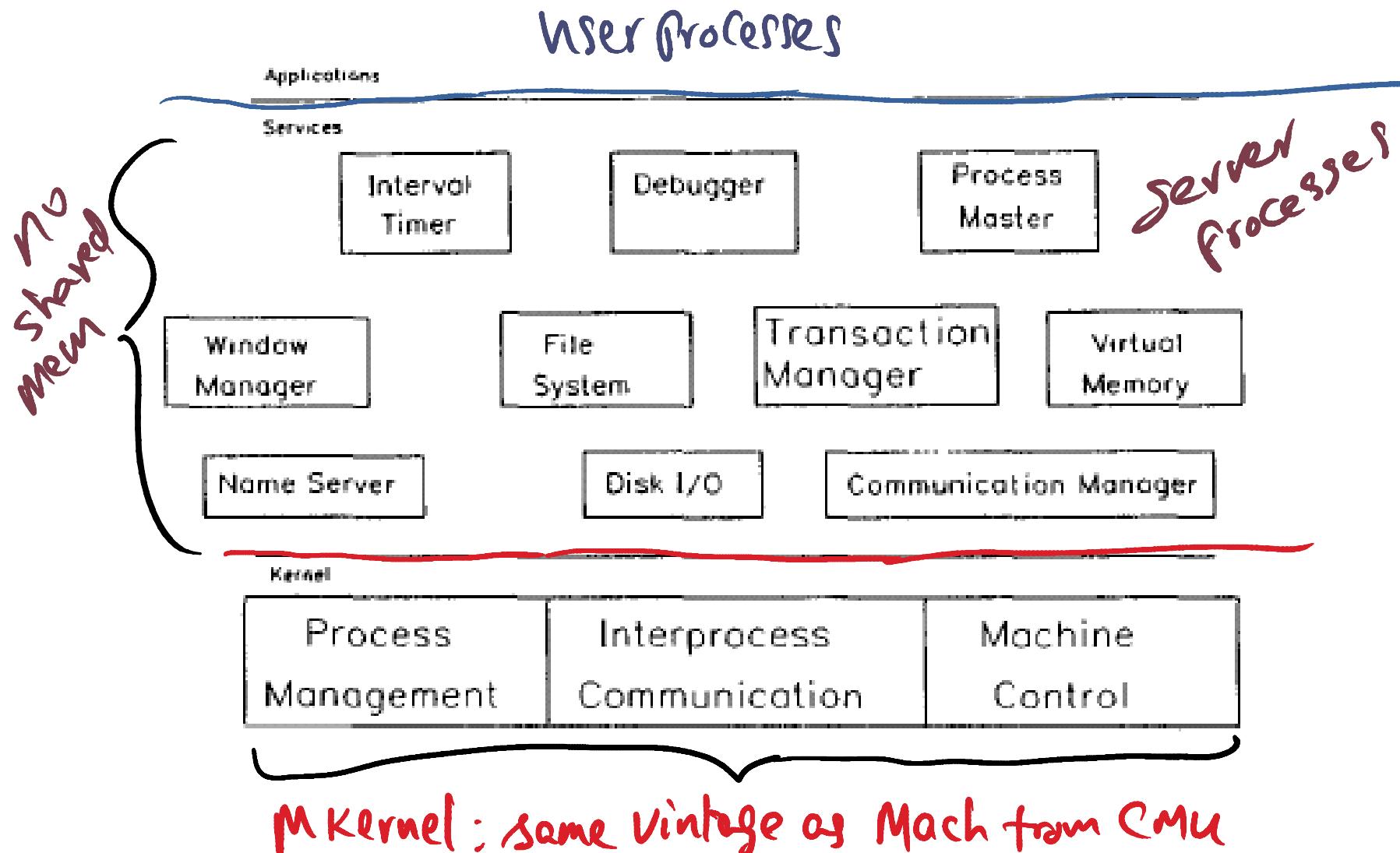
Distributed System Structure

Today



Quicksilver: System Architecture

Circa 1985 (figure reproduced from their paper)

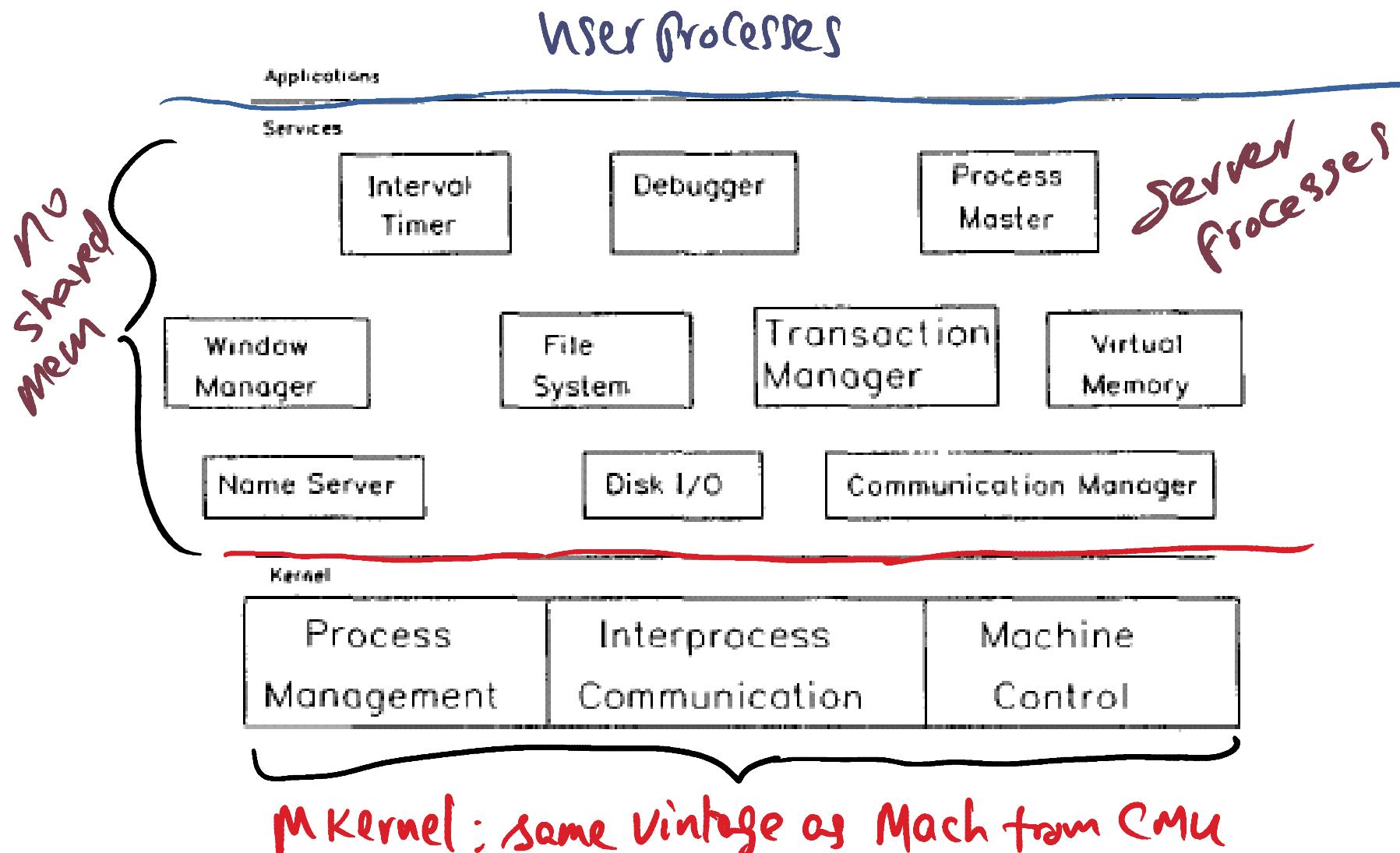


What sets Quicksilver apart from
Competition?

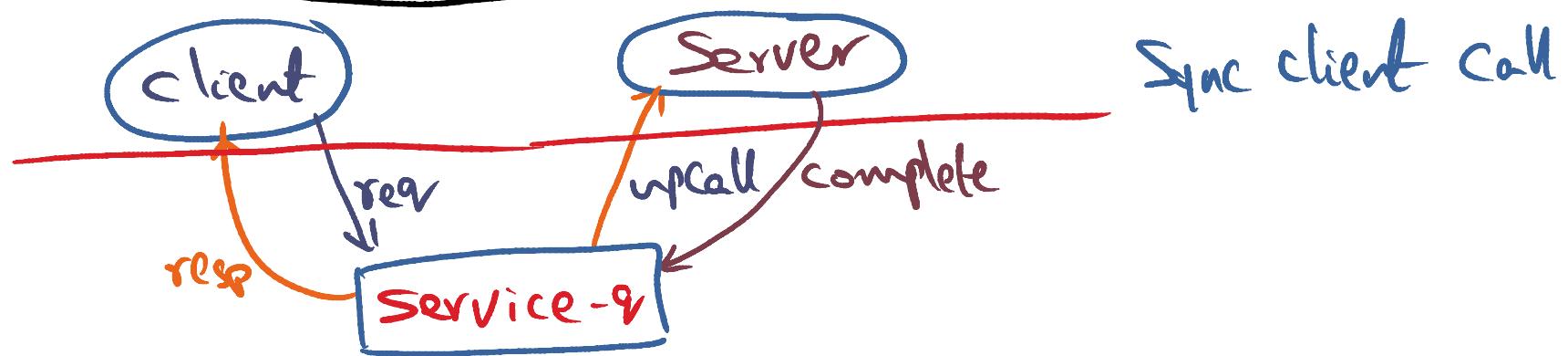
- New services such as a window manager for managing the real estate on the workstation screen and how it should be integrated into the OS
- Services not available on the workstation itself (e.g., file server may be remote), so integrating communication into the design of the OS
- Services (both within a workstation and remote) in a distributed system need to recover from failures
- Rather than ad hoc mechanism for each server use transactions as a unifying concept for recovery management of all servers
- First system to propose transactions in OS

Quicksilver: System Architecture

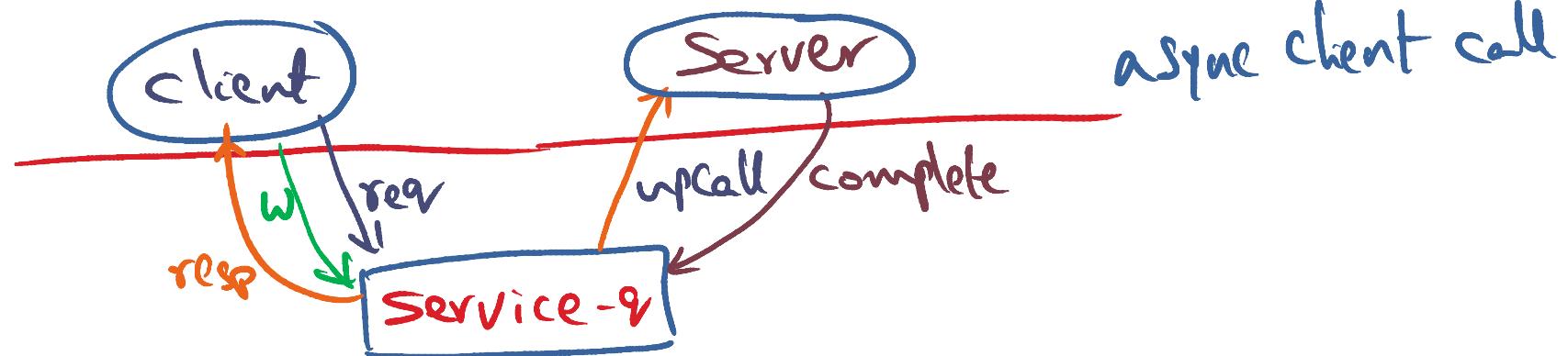
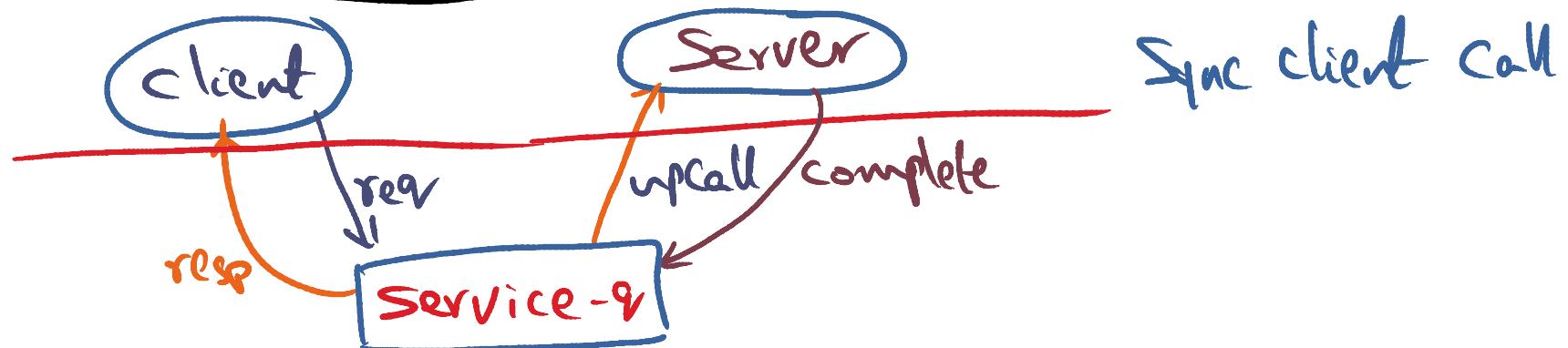
Circa 1985 (figure reproduced from their paper)



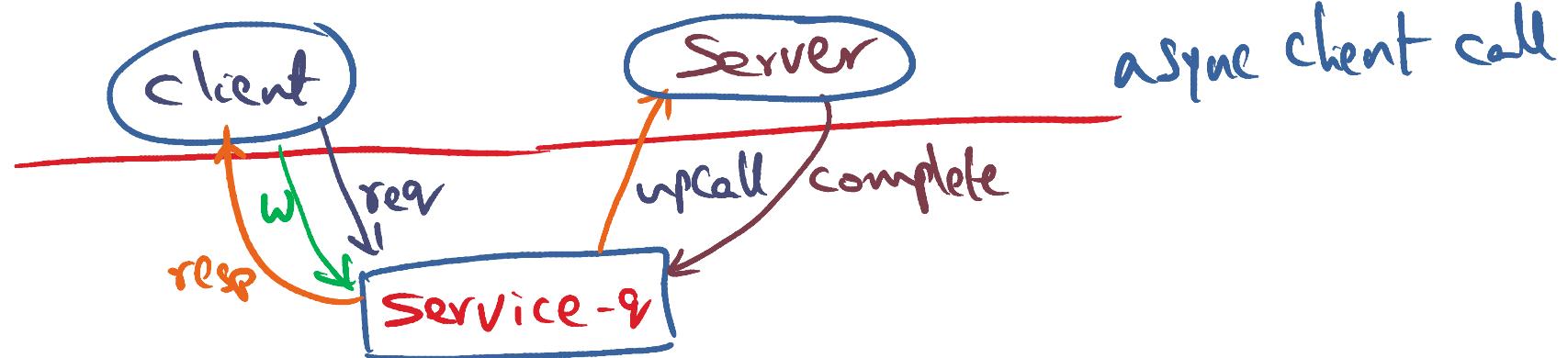
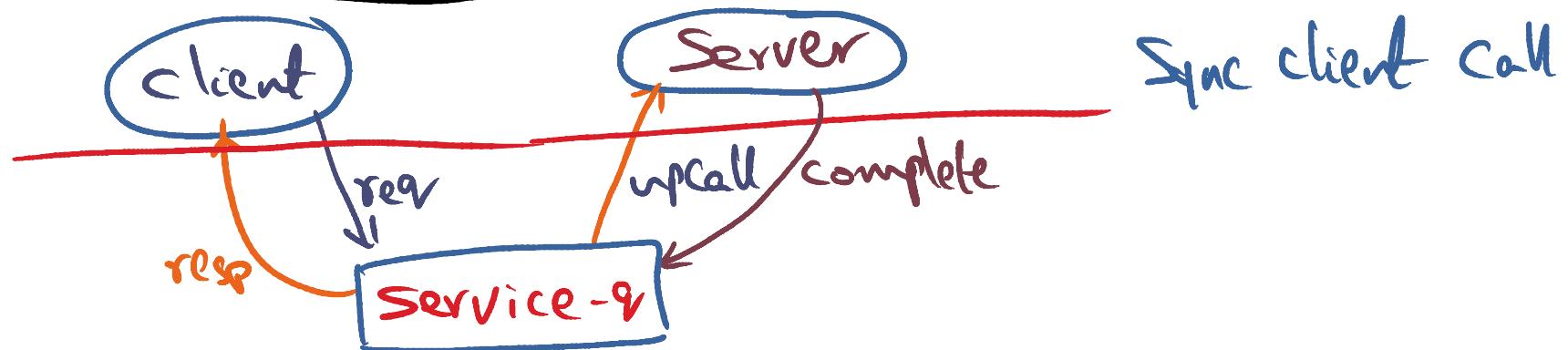
IPC fundamental to System Services



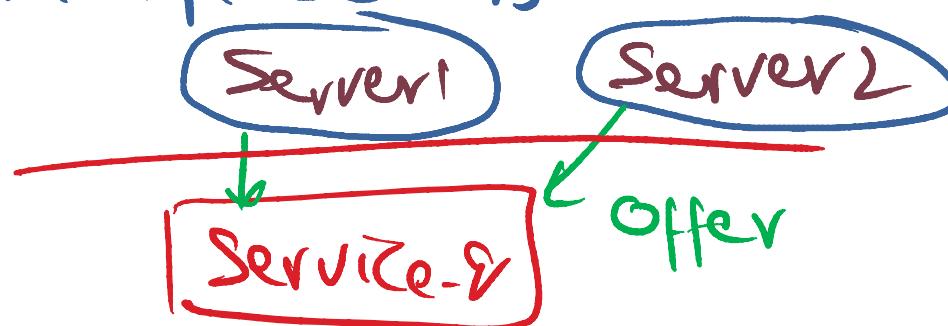
IPC fundamental to System Services



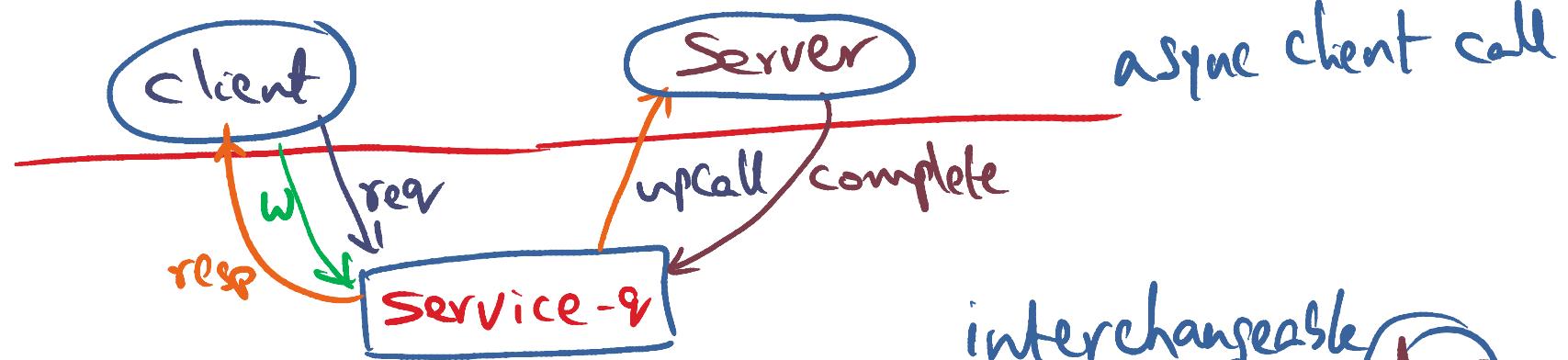
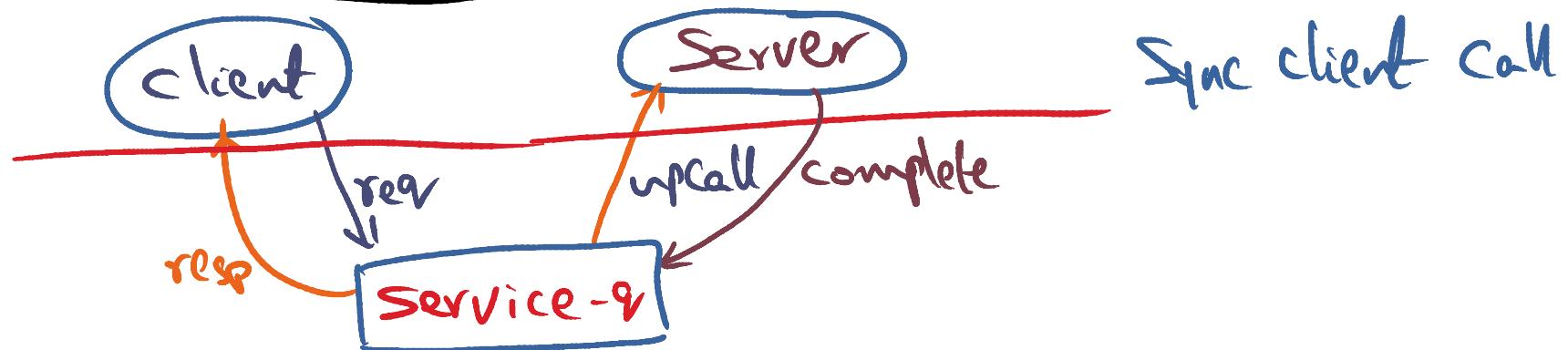
IPC fundamental to System Services



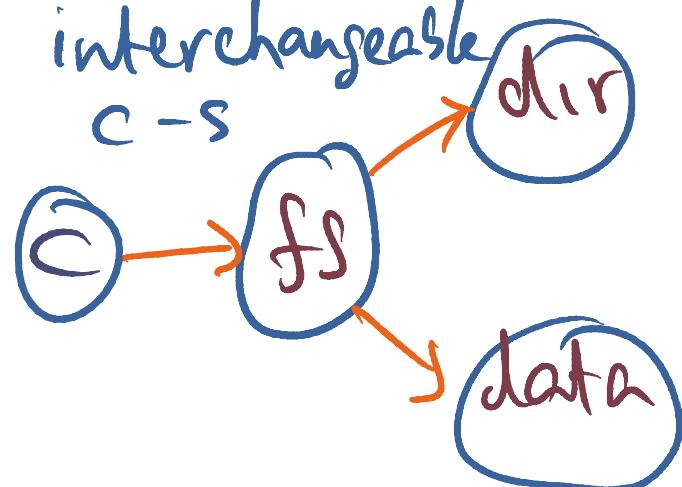
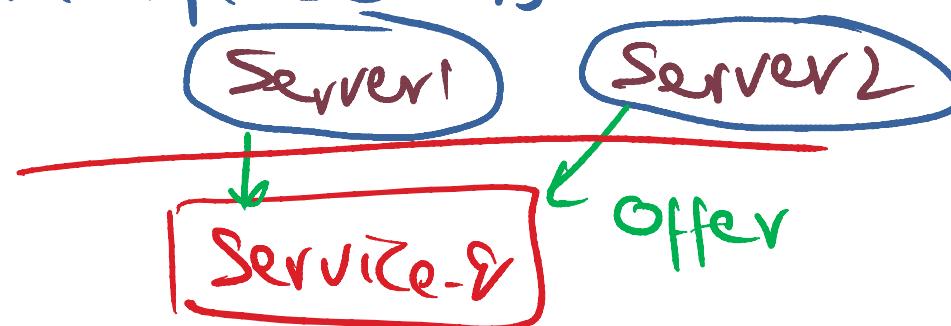
Multiple Servers



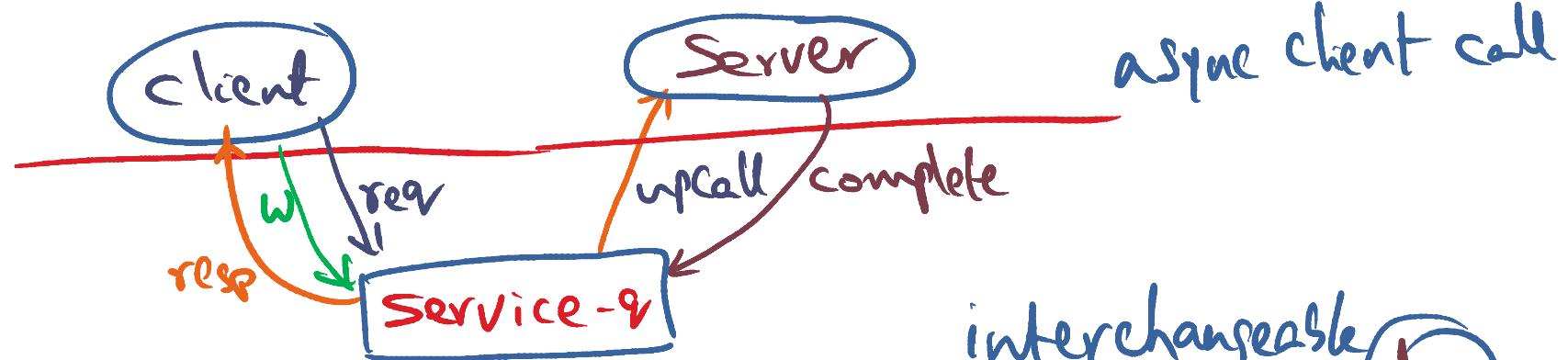
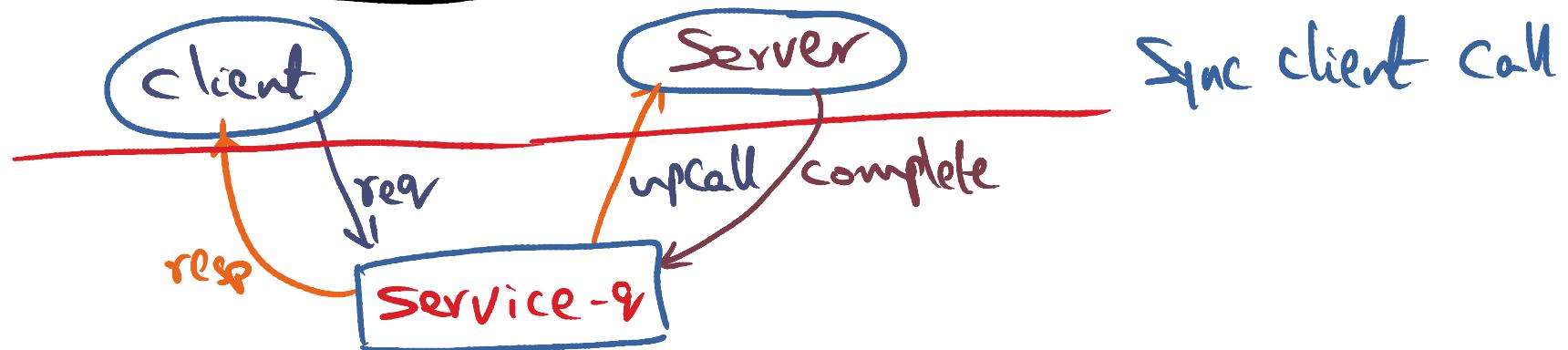
IPC fundamental to System Services



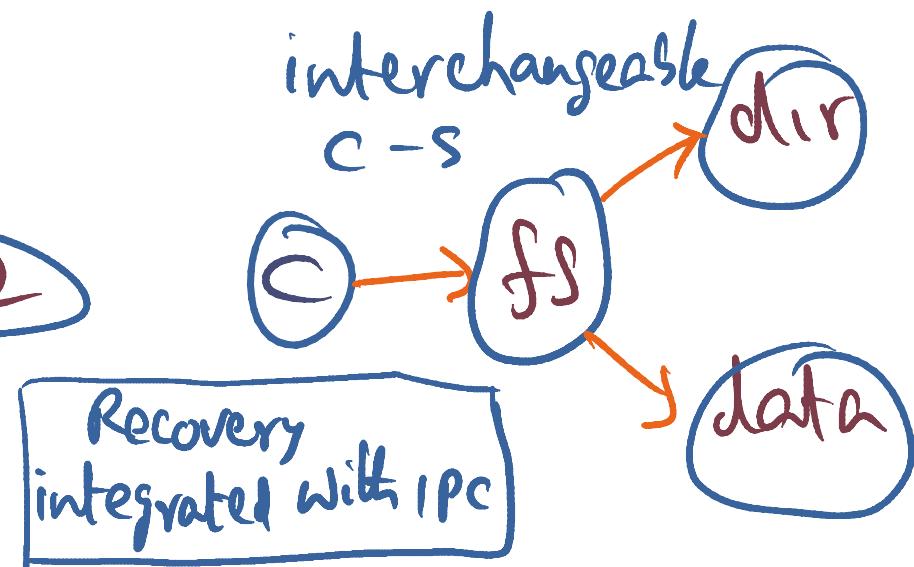
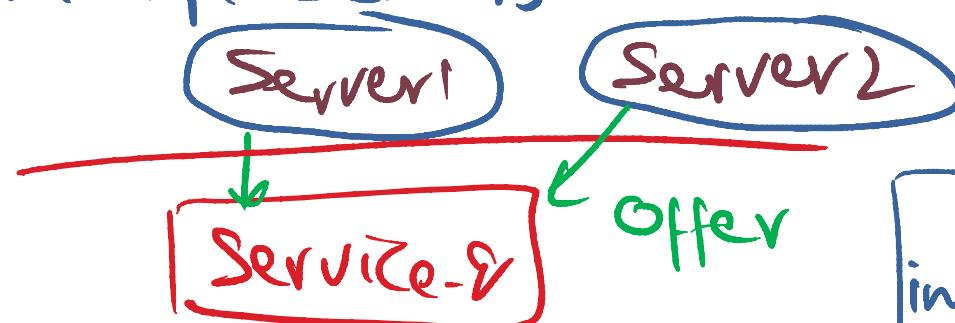
multiple servers



IPC fundamental to System Services



multiple servers



Bundling Distributed IPC & Actions

Transaction \Rightarrow Secret source for
recovery management

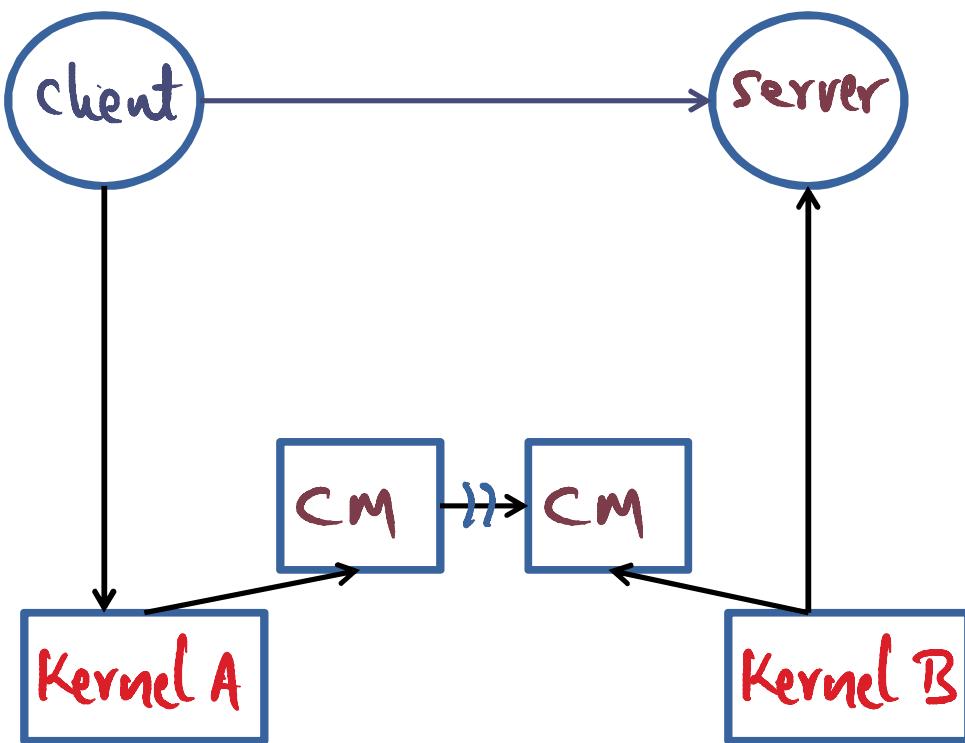
Bundling Distributed IPC & Actions

Transaction \Rightarrow Secret source for
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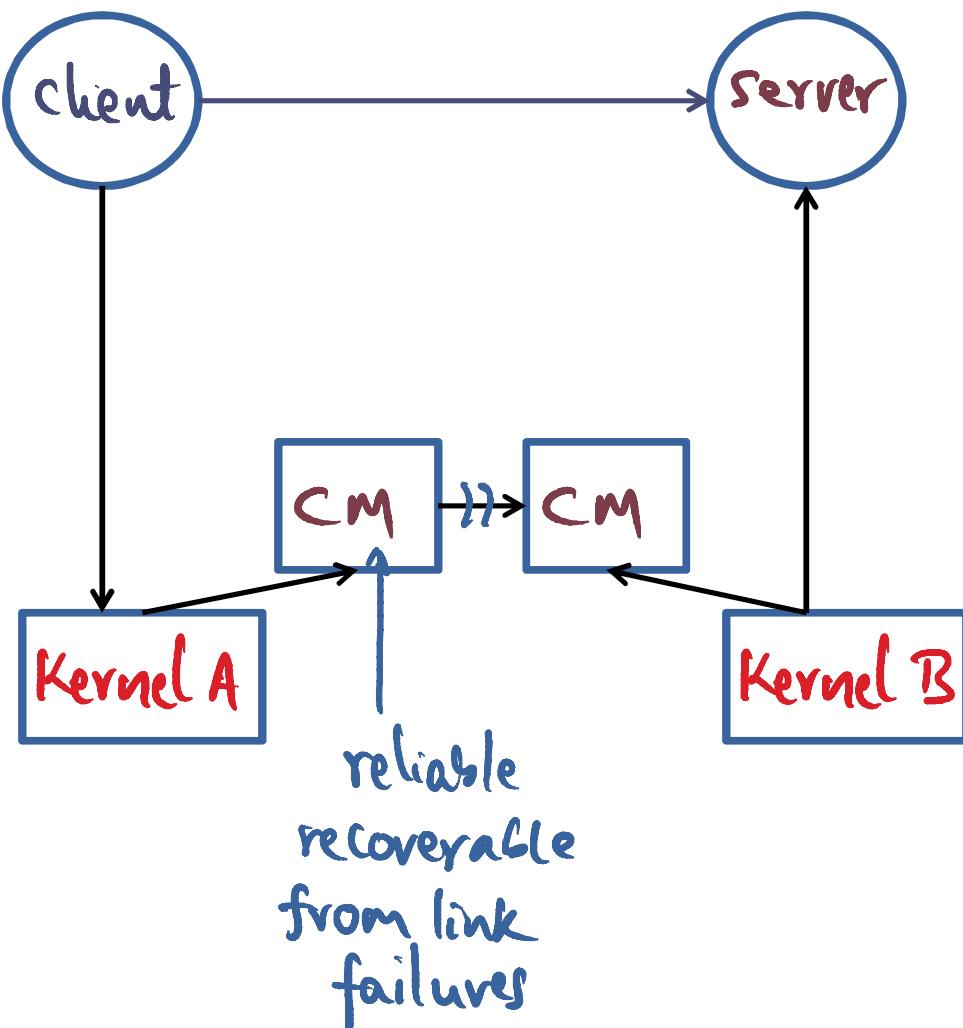
Bundling Distributed IPC & Actions

Transaction \Rightarrow Secret Share for
recovery management



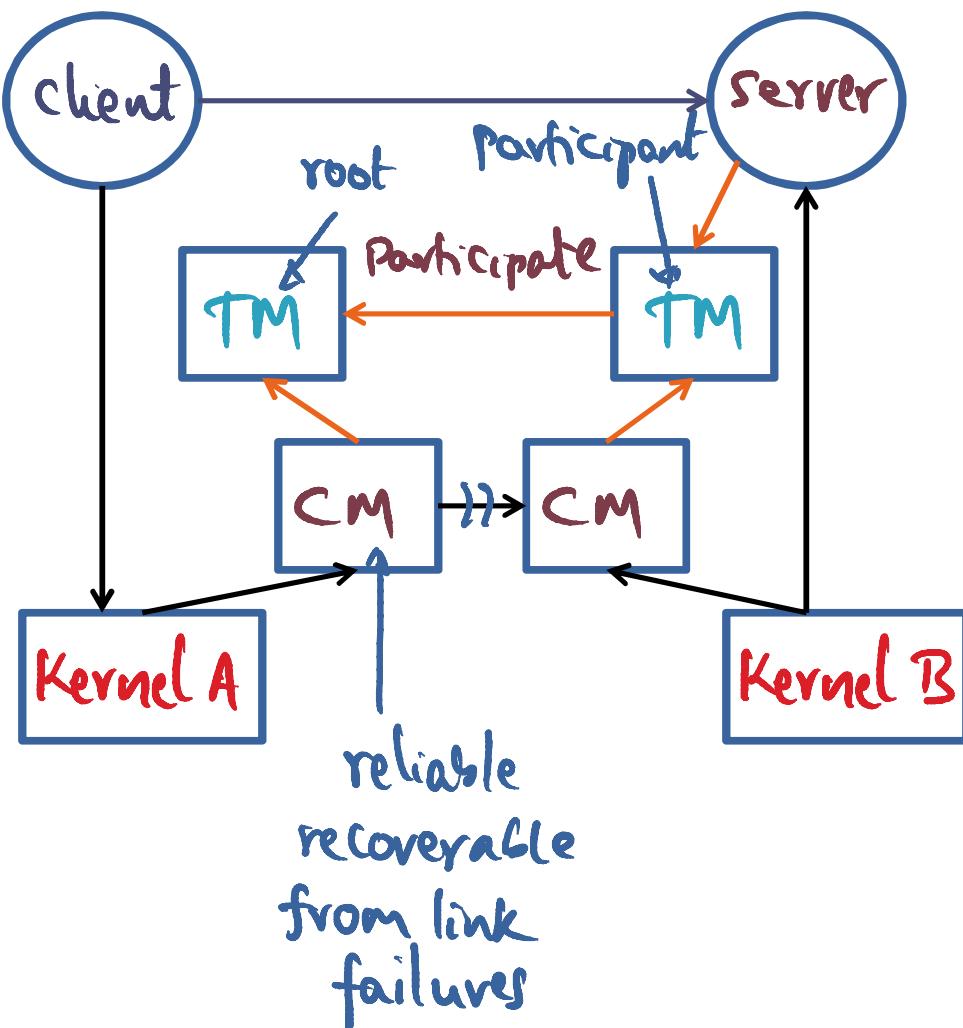
Bundling Distributed IPC + Actions

Transaction \Rightarrow Secret Service for
recovery management



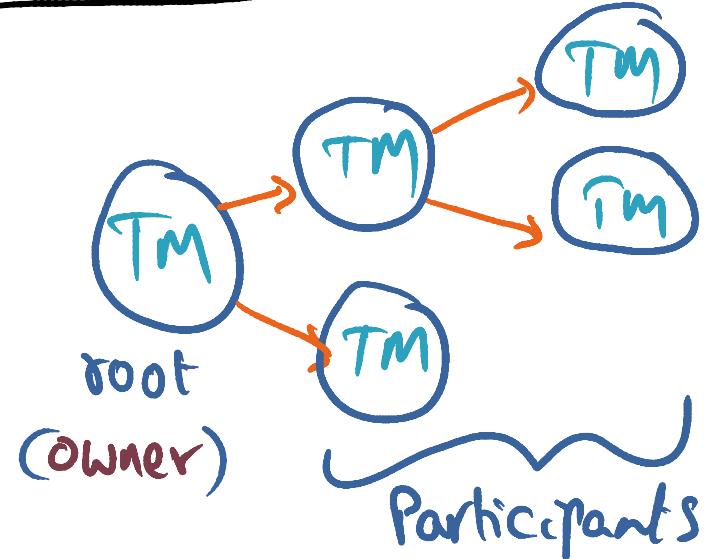
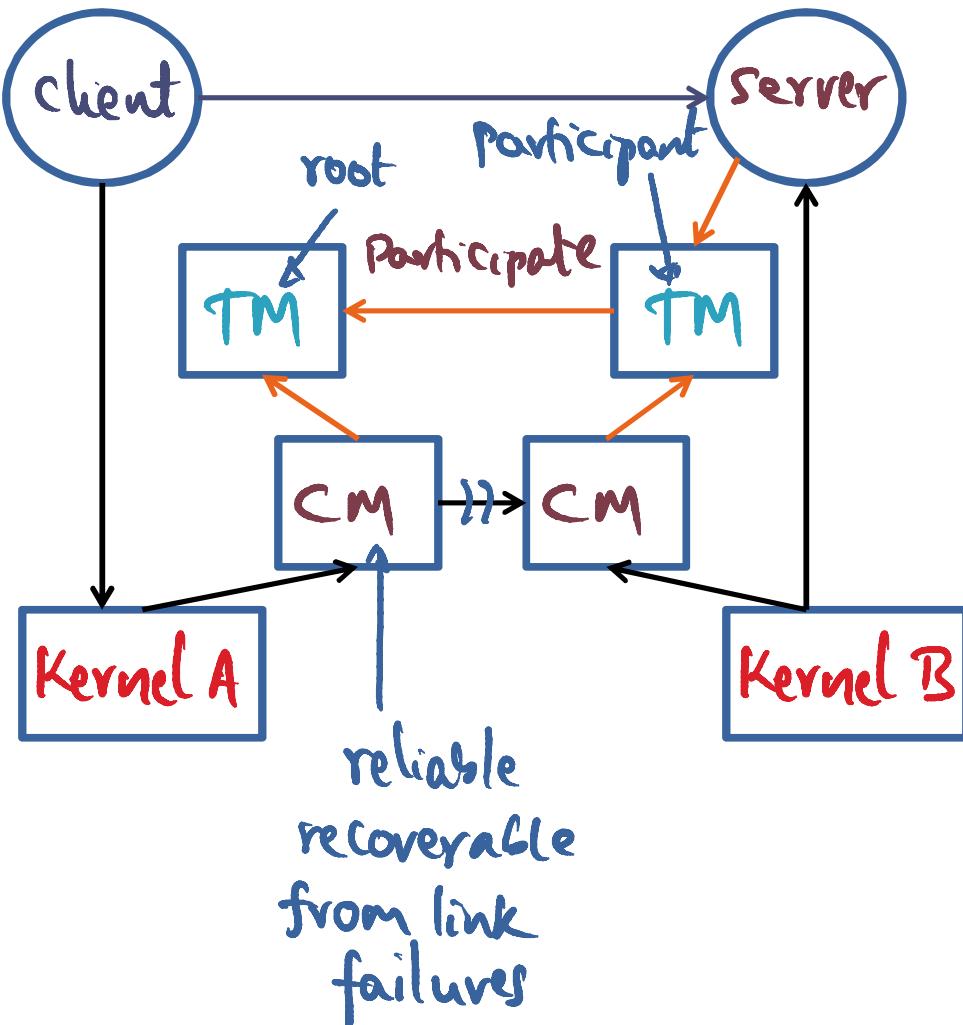
Bundling Distributed IPC + Actions

Transaction \Rightarrow Secret Share for
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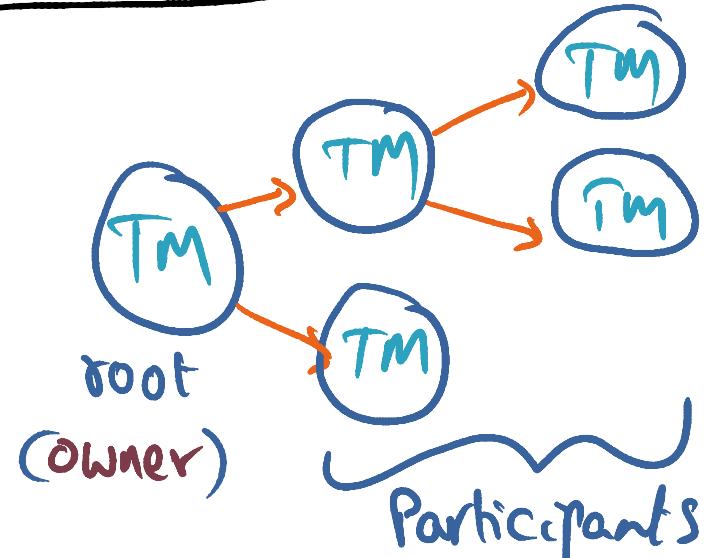
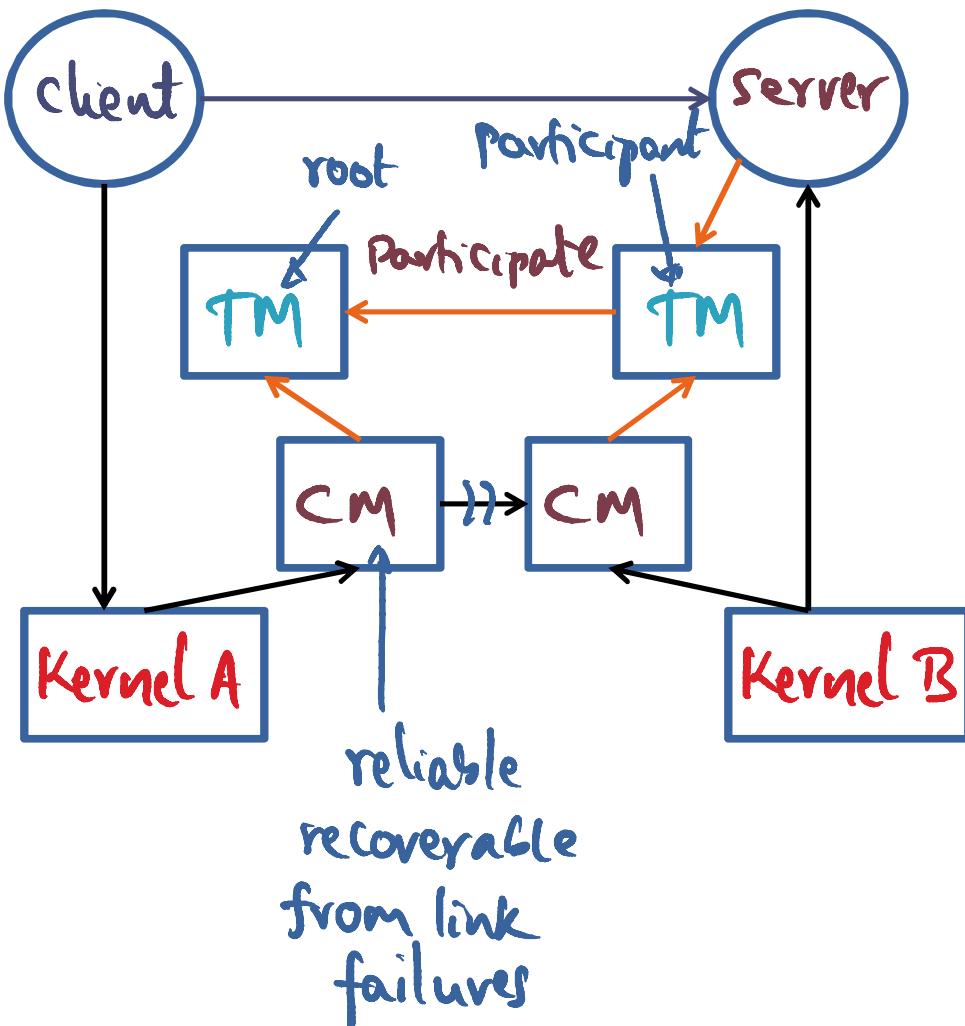
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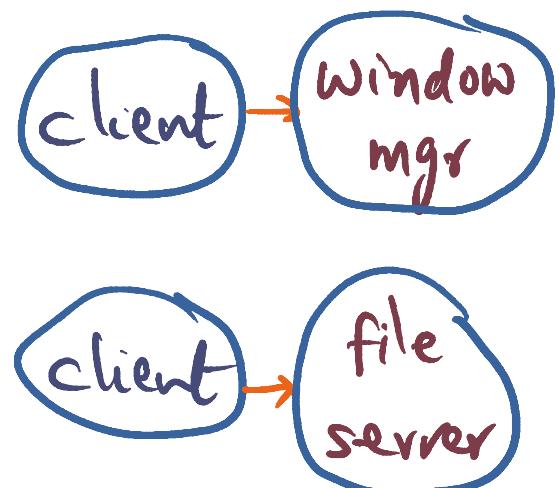


Bundling Distributed IPC & Actions

Transaction \Rightarrow Secret Share for recovery management



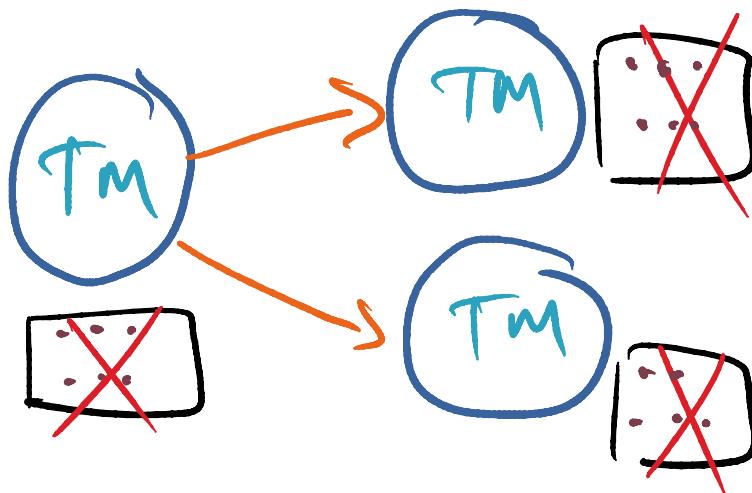
Examples



upshot of bundling IPC + Recovery

Reclaim Resources

- breadcrumbs left behind by failed clients/servers



Examples:

memory, file handles,
Communication handles,
orphan Windows, ...