Advanced Programming in the UNIX Environment

Week 08, Segment 1:
Interprocess Communication

Department of Computer Science
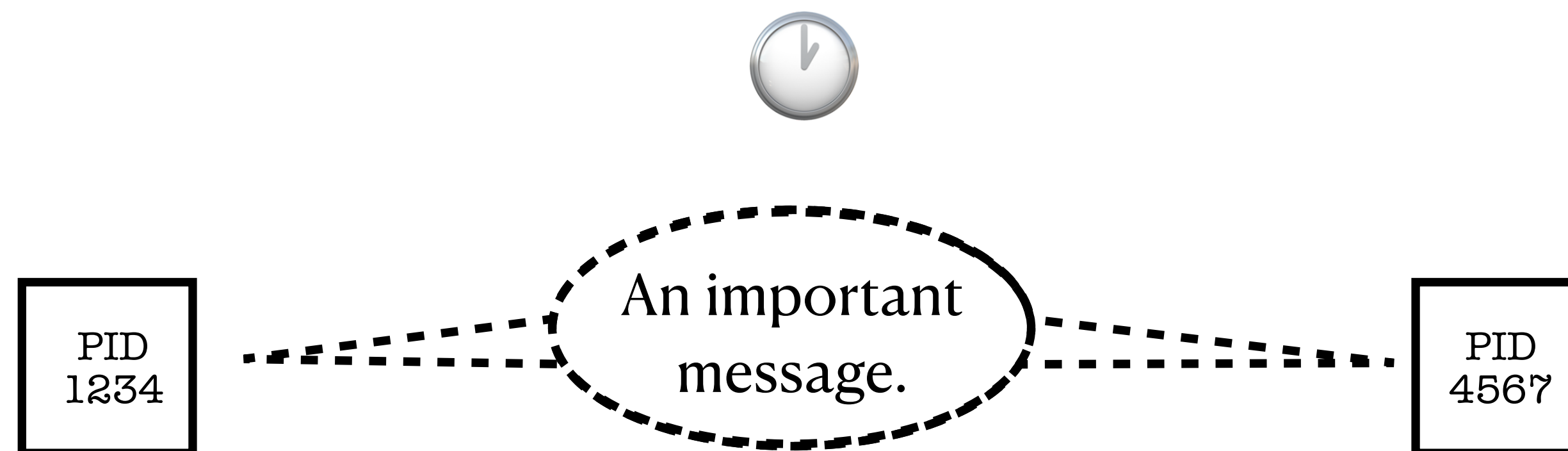**Stevens Institute of Technology**

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Interprocess Communication

- *asynchronous* vs. synchronous

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Interprocess Communication

- *asynchronous* vs. synchronous

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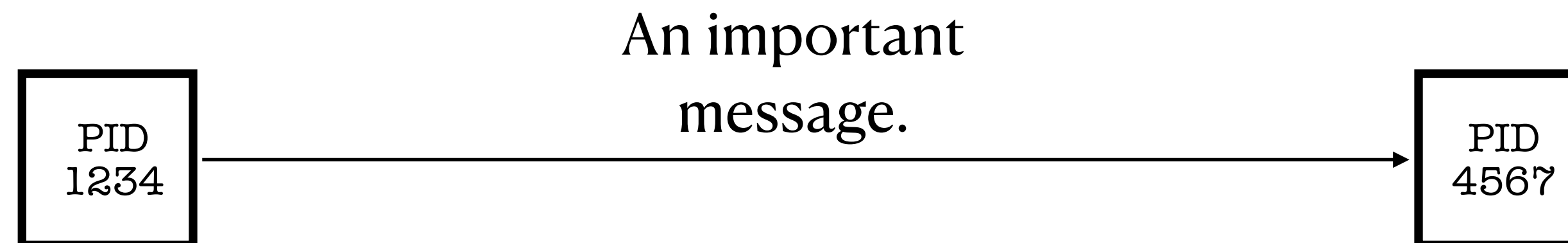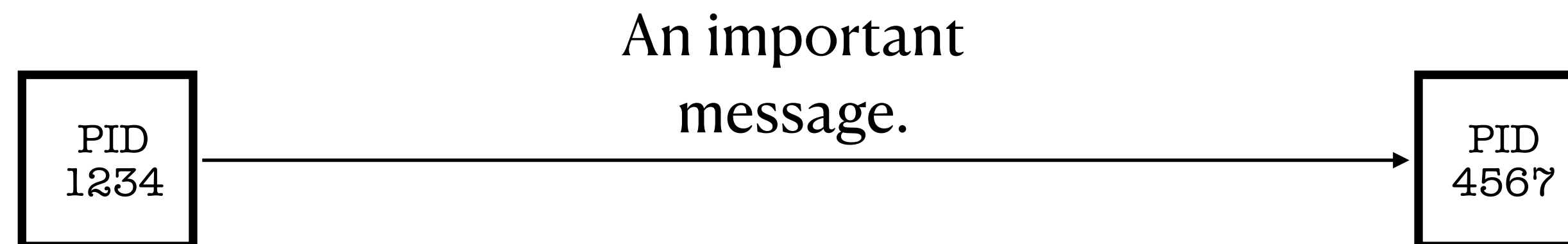# Interprocess Communication

- asynchronous vs. *synchronous*

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Interprocess Communication

- asynchronous vs. synchronous

- *unidirectional* vs. bidirectional

An important
message.

```
PID        ----------------->        PID
1234                                 4567
```

Interprocess Communication

- asynchronous vs. synchronous

- unidirectional vs. *bidirectional*

An important
Got it.
message.

```
+------+                          +------+
| PID  |<------------------------>| PID  |
| 1234 |                          | 4567 |
+------+                          +------+
```

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Interprocess Communication

- asynchronous vs. synchronous

- unidirectional vs. bidirectional

- *related processes* vs. unrelated processes

```
$ ps -o pid,ppid,pgid,sid,comm | ./cat1 | ./cat2
```
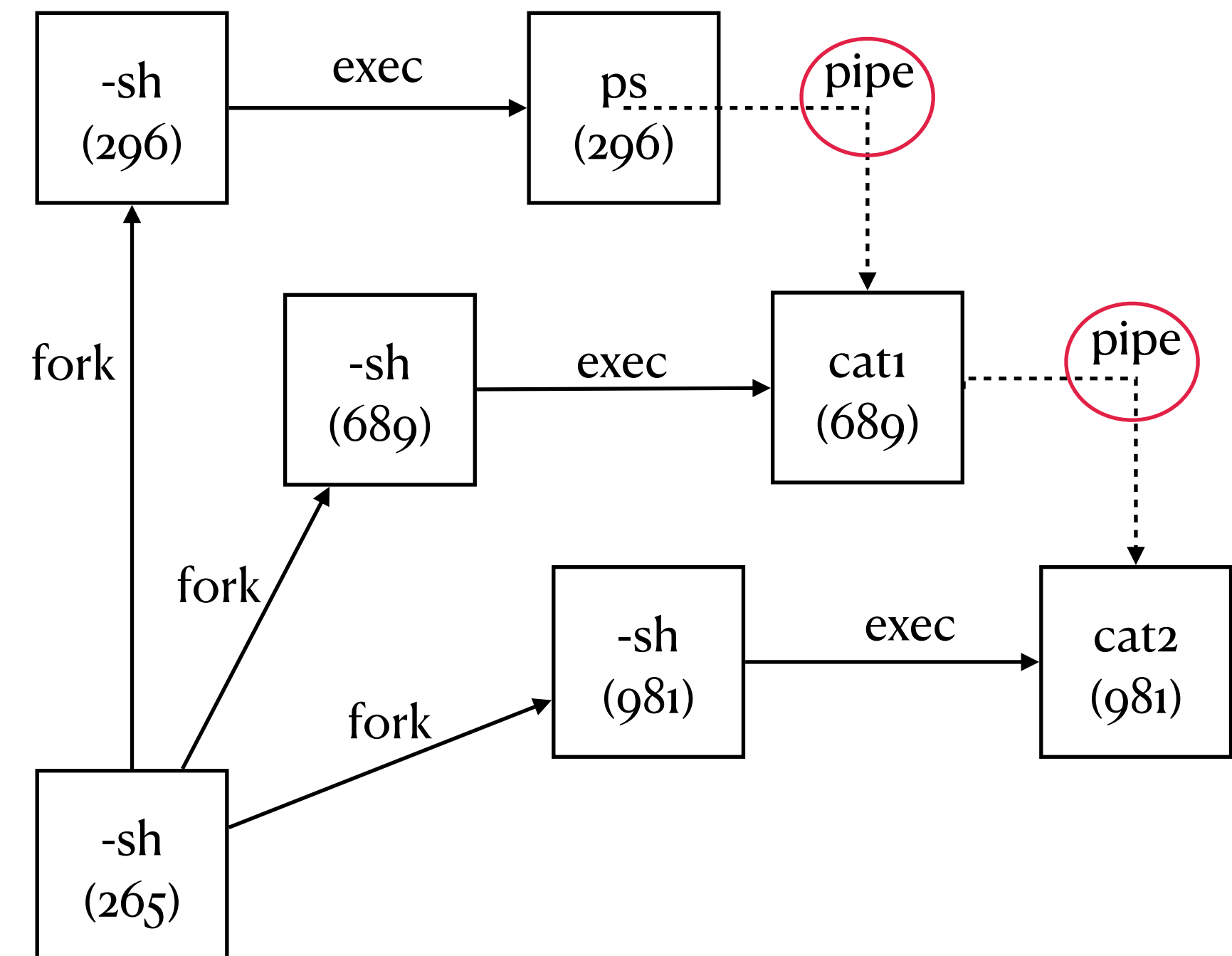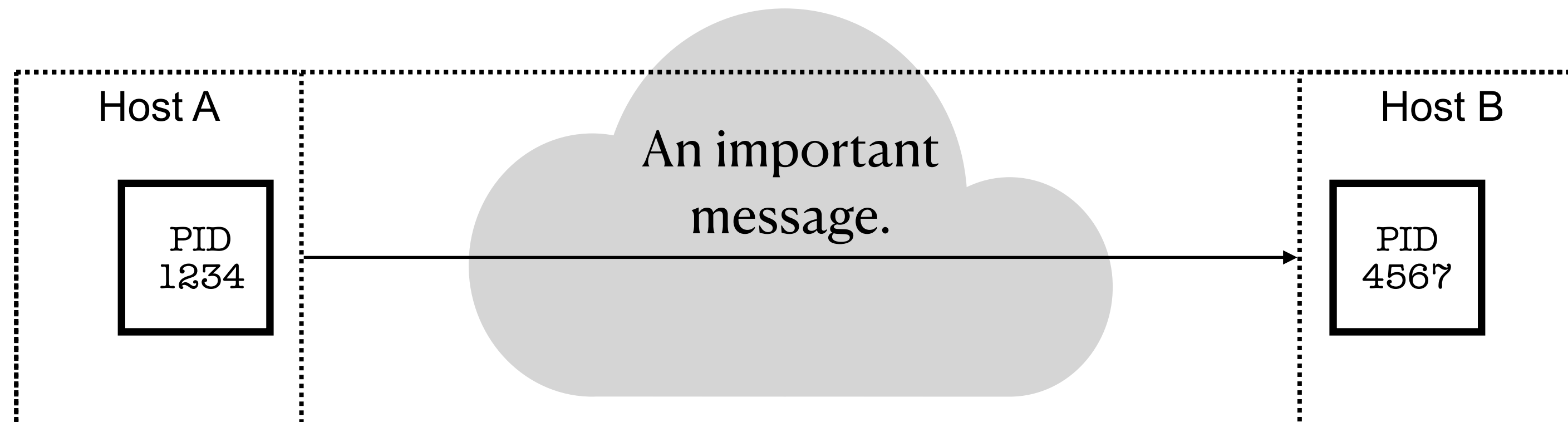
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Interprocess Communication

- asynchronous vs. synchronous

- unidirectional vs. bidirectional

- *related processes* vs. unrelated processes

- network communication

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Means of Interprocess Communications

- two processes reading from/writing to a file on a shared file system

synchronous	❌
asynchronous	✅
bidirectional	✅
related processes	✅
unrelated processes	✅
network communication	❌
variable data	✅

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Means of Interprocess Communications

- two processes reading from/writing to a file on a shared file system

- Signals

synchronous	❌
asynchronous	✅
bidirectional	❌
related processes	✅
unrelated processes	✅
network communication	❌
variable data	❌

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Means of Interprocess Communications

- two processes reading from/writing to a file on a shared file system

- Signals

- Semaphores

synchronous	❌
asynchronous	✅
bidirectional	❌
related processes	✅
unrelated processes	✅
network communication	❌
variable data	❌

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Means of Interprocess Communications

- two processes reading from/writing to a file on a shared file system

- Signals

- Semaphores

- Shared Memory

- Message Queues

synchronous	❌
asynchronous	✅
bidirectional	✅
related processes	✅
unrelated processes	✅
network communication	❌
variable data	✅

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Means of Interprocess Communications

- two processes reading from/writing to a file on a shared file system

- Signals

- Semaphores

- Shared Memory

- Message Queues

- Pipes

synchronous	✅
asynchronous	❌
bidirectional	❌
related processes	✅
unrelated processes	❌
network communication	❌
variable data	✅

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Means of Interprocess Communications

- two processes reading from/writing to a file on a shared file system

- Signals

- Semaphores

- Shared Memory

- Message Queues

- Pipes

- Fifos

synchronous	✅
asynchronous	❌
bidirectional	❌
related processes	✅
unrelated processes	✅
network communication	❌
variable data	✅

Means of Interprocess Communications

- two processes reading from/writing to a file on a shared file system

- Signals

- Semaphores

- Shared Memory

- Message Queues

- Pipes

- Fifos

- Socketpairs

synchronous	✅
asynchronous	❌
bidirectional	✅
related processes	✅
unrelated processes	❌
network communication	❌
variable data	✅

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Means of Interprocess Communications

- two processes reading from/writing to a file on a shared file system

- Signals

- Semaphores

- Shared Memory

- Message Queues

- Pipes

- Fifos

- Socketpairs

- Sockets

synchronous	✅
asynchronous	❌
bidirectional	✅
related processes	✅
unrelated processes	✅
network communication	✅
variable data	✅

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Means of Interprocess Communications

- two processes reading from/writing to a file on a shared file system

- Signals

- **Semaphores**

- **Shared Memory**

- **Message Queues**

- Pipes

- Fifos

- Socketpairs

- Sockets

Interprocess Communications Links

- https://beej.us/guide/bgipc/html/single/bgipc.html
- https://users.cs.cf.ac.uk/Dave.Marshall/C/
- https://tldp.org/LDP/lpg/node7.html
- https://en.wikipedia.org/wiki/Inter-process_communication

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