2024-05-28 0D in Python Example

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Goal

show how to manually build 0D in some existing language

Usage

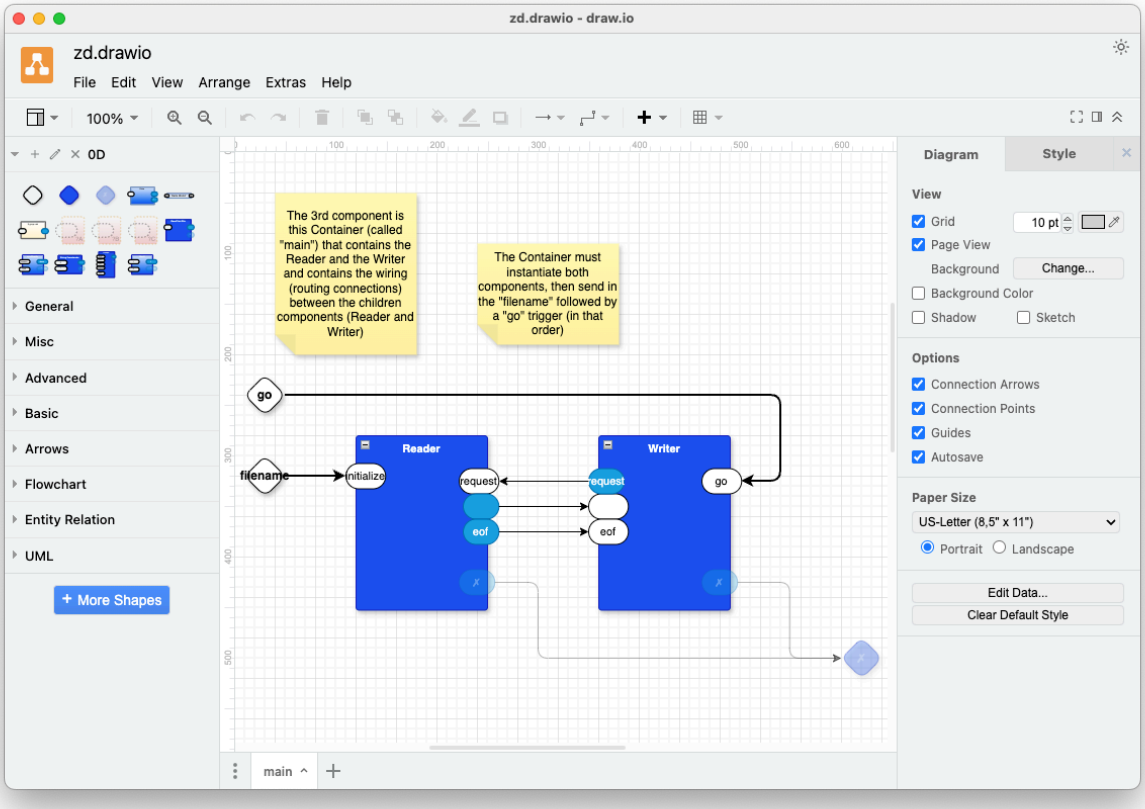
```
$ python3 main.py
```

Repository

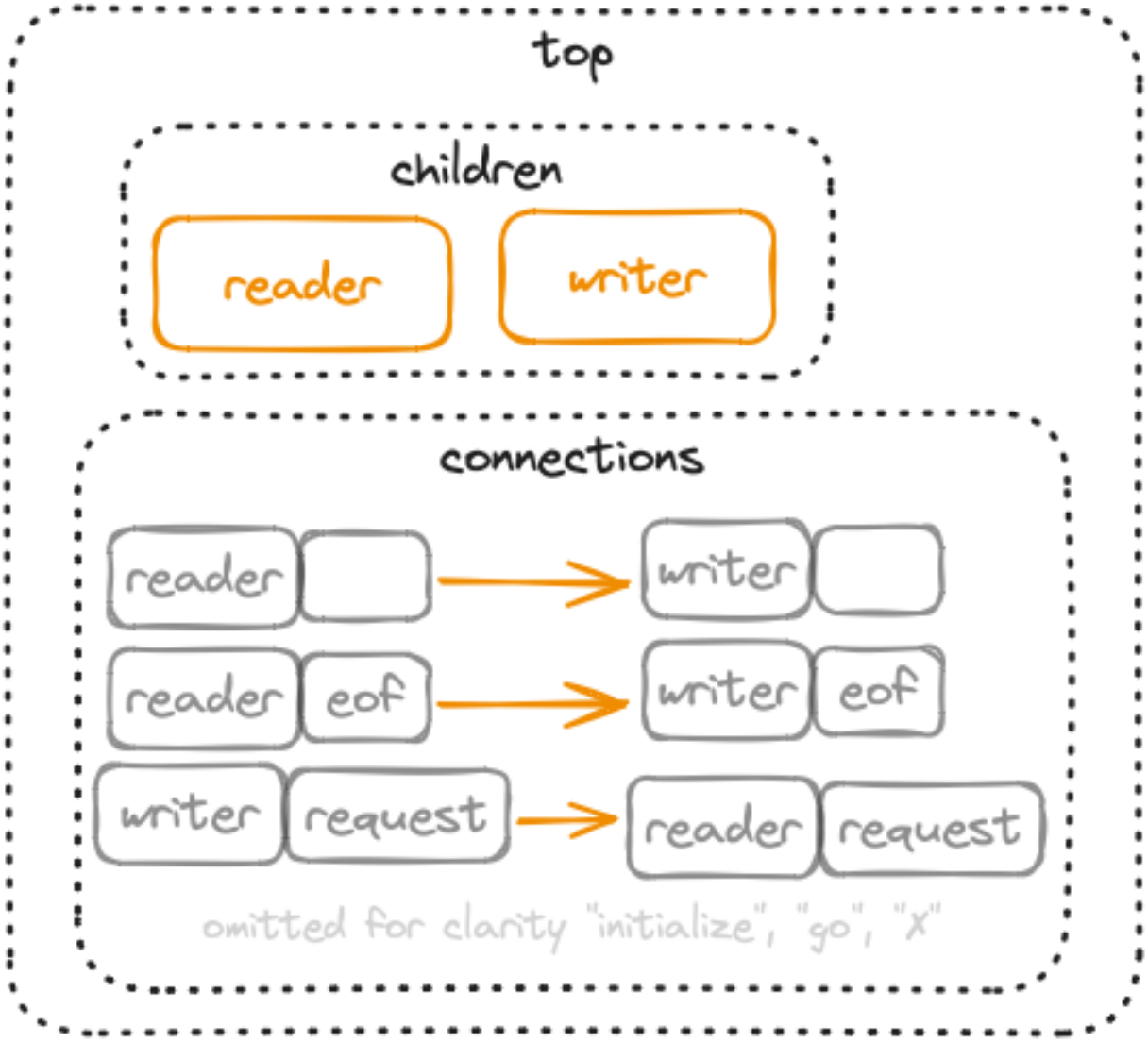
https://github.com/guitarvydas/zd-in-python

Rough Sketches

Main

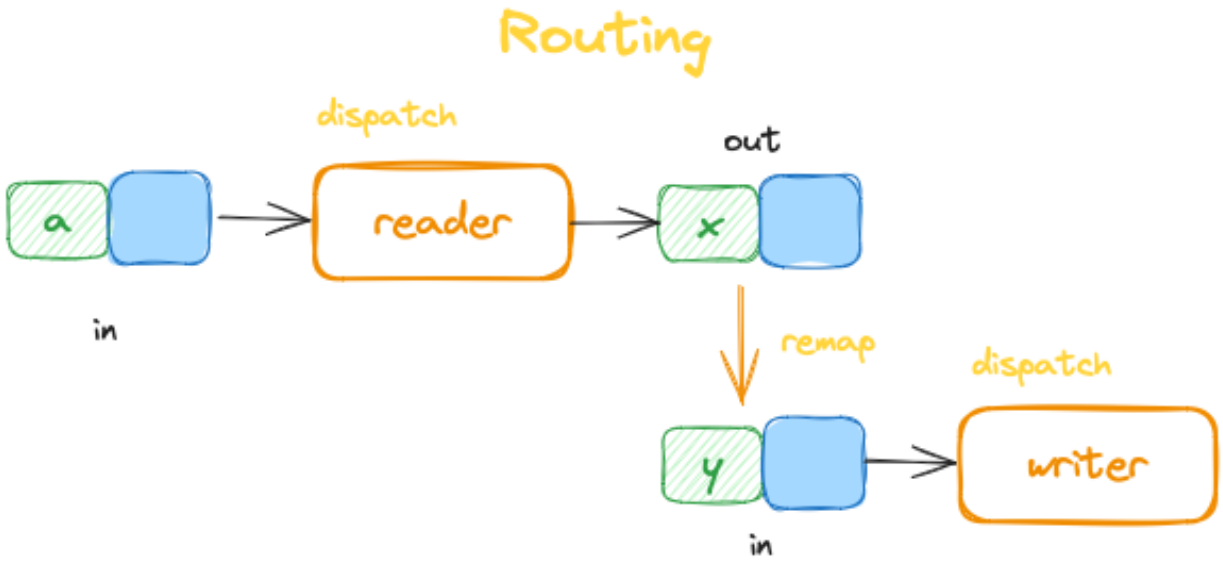


Container


top
children
reader
writer
connections
reader
writer
reader
eof
writer
eof
writer
request
reader
request
omitted for clarity "initialize", "go", "X"

Routing

Ports "a", "x", "y" are fictitious, but, meant to show mapping of output port name to input port name during message routing.



Method

For this exemplar, I use Python.

I build a simple file reader which consists of 3 components:

1. reader: read a char on request

2. writer: request a char, read it and print it, repeat until EOF

3. top: (Container, router) connect 1 -> 2, and 2 -> 1, using 1-way connections only (bi-directional connections require extra software)

In this example, I hard-code children into Container. This is not good, but, done for sake of clarity.

In this example, I omit *directions* in Connections. *Direction* is needed to support recursive containers. This has been omitted for the sake of clarity.

Points of interest

1. Connections are owned by a Container, *not* by the components themselves. Components react to a single message at a time and produce outputs (plural) to an output queue. Parent Containers route messages between their children.

2. Message routing requires mapping a sender's output port to a receiver's input port.

3. Each single routing is specified as a Connection descriptor. All routing within a Container must be done atomically to allow fan-out.

4. Message routing allows fan-out, hence, in general (before various kinds of optimization) messages must be copied. Fan-out is vital to abstraction which is used to simplify DX by enabling layering.

Miscellaneous

Use draw.io (https://app.diagrams.net) to edit and read `zd.drawio`

In this example, I manually wrote the code, but, elsewhere I show how to compile `.drawio` files into running Python (wip: https://github.com/guitarvydas/0D)

Appendix - See Also

See Also

References *https://guitarvydas.github.io/2024/01/06/References.html*
Blog *https://guitarvydas.github.io/*
Blog *https://publish.obsidian.md/programmingsimplicity*
Videos *https://www.youtube.com/@programmingsimplicity2980*
[see playlist "programming simplicity"]
Discord *https://discord.gg/Jjx62ypR (Everyone welcome to join)*
X *(Twitter) @paul_tarvydas*
More writing *(WIP): https://leanpub.com/u/paul-tarvydas*