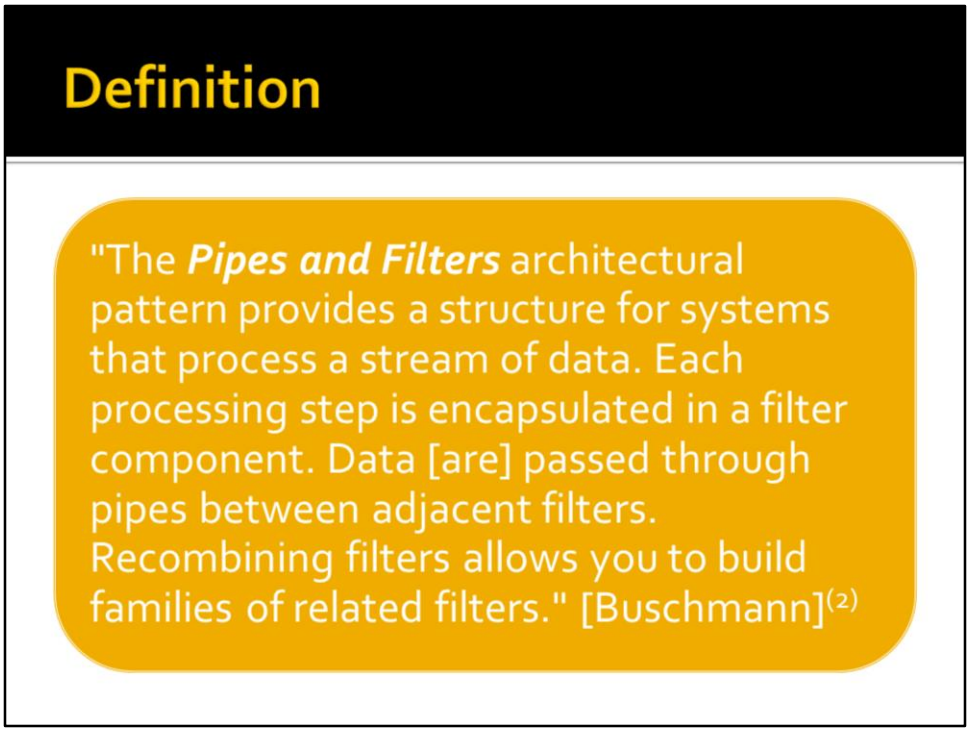
Architecture Patterns:

Pipes and Filters

Presentation by Alina Rozenbaum



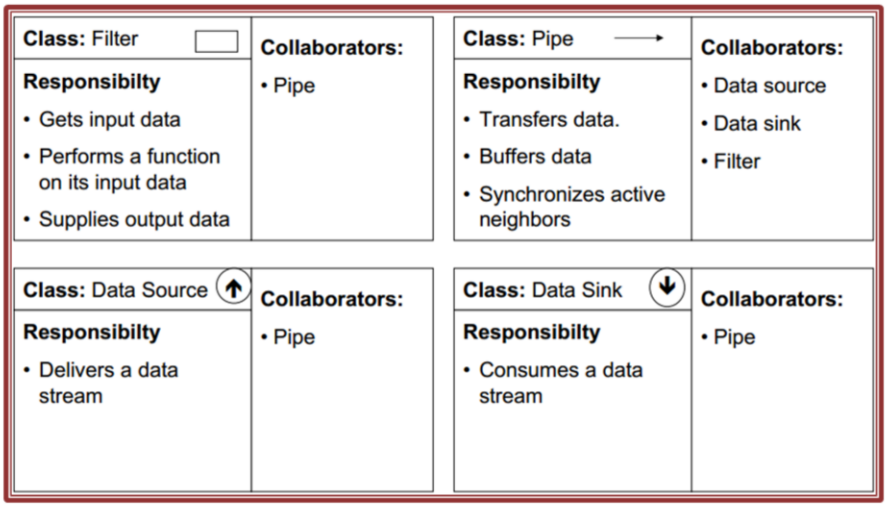
Important quote by Buschmann that summarizes the utility and format of Pipes and Filters.

Problem(2)

- Several developers build
- Can be divided into several processes
  - Separate processes
  - Work independently
  - Form a cohesive whole
- Is flexible with change

What kind of things does this Architectural Pattern need to accomplish?
What is it going to be utilized for?

Class Responsibility Cards(1)

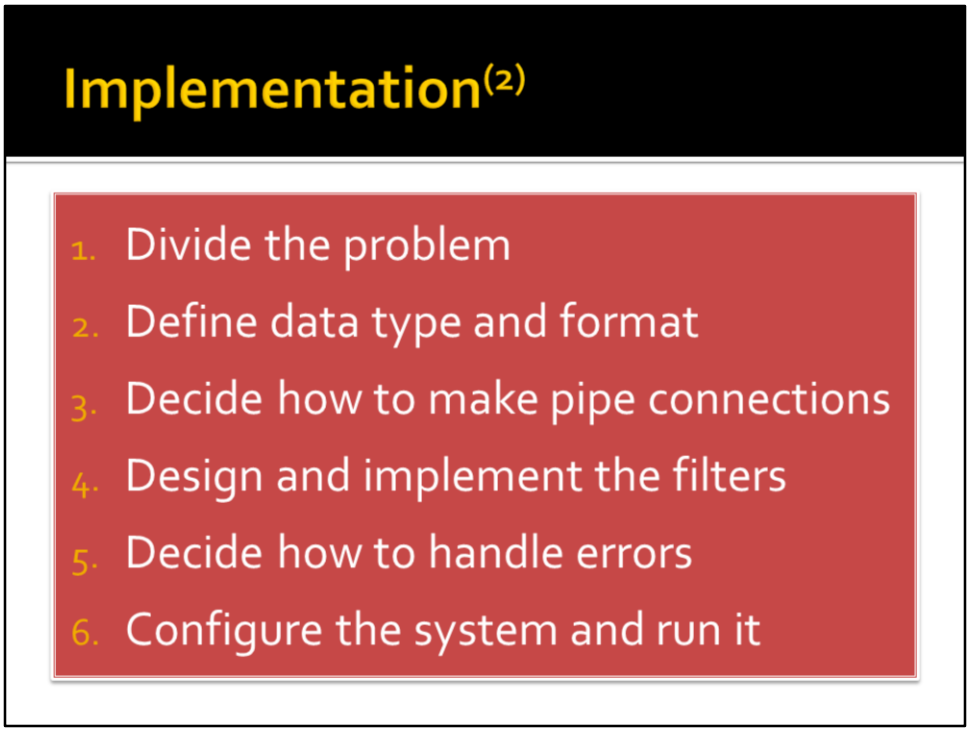


- "Data source" AKA"Data Pump"
- Two types of filters:
  - Active – Separate process; pulls data from pump and pushes transformed data to output
  - Passive – actively either called as a:
    - Function – pull output from filter
    - Procedure – push data into filter

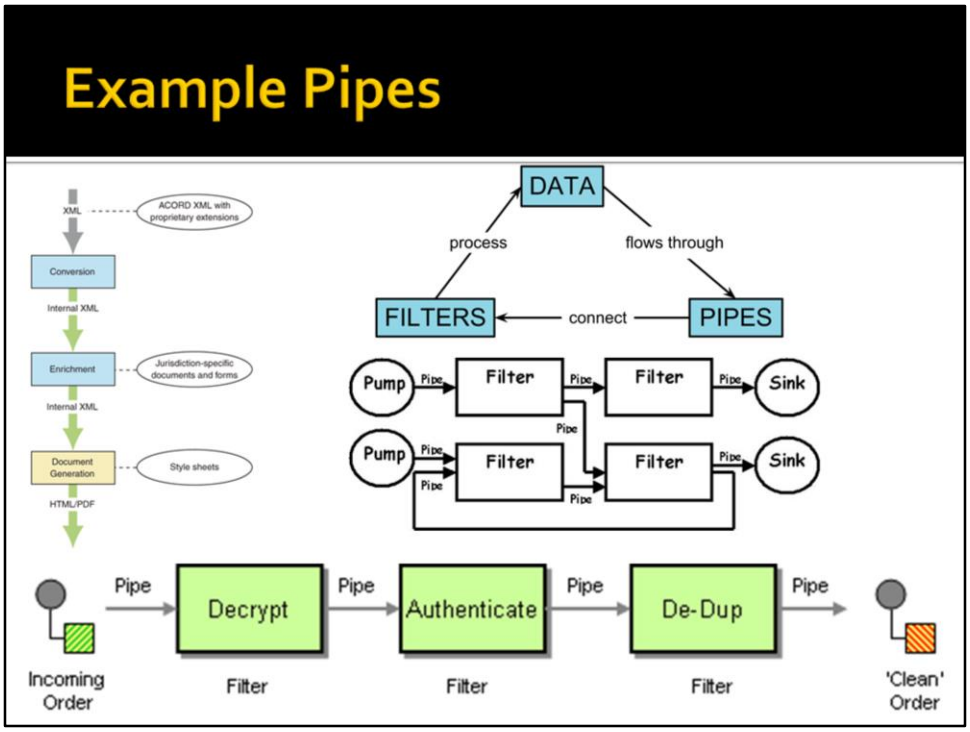
Forces(2)

- Separate filters should be interchangeable, replaceable and moveable
- Non-adjacent steps share no info
- Can execute parallel steps
- Can display/store final results many ways
- Various sources of data input
- Small and many rather than big and few
- No more than one action per step

Deeper description of the previous slides' Class Responsibility collaboration cards.



1. Steps depend on each other for information
2. Sometimes one of those elements needs to be a converter/translator/decoder to make data readable
3. Active vs passive filters
4. Each filter needs different implementation
    1. Active filter: needs its own “thread of control” (address)
    2. Passive filter: does not need it
5. There needs to be a system for letting the user know of errors and how to handle them without backing up the system.
6. Using a standard program to create the pipeline.



Generalized and specific examples of pipes and filters, as well as a circular logic diagram giving a simple description.

References

- (1): http://www.csee.wvu.edu/~ammar/CU/swarch/lecture%20slides/slides%204%20sw%20arch%20styles/supporting%20slides/SWArch-4-PipesandFilter.pdf
- (2): http://www.cs.olemiss.edu/~hcc/csci58100/notes/pipes.html
- (3): http://msdn.microsoft.com/en-us/library/ee658117.aspx
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- (5): http://enterpriseintegrationpatterns.com/PipesAndFilters.html
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- (7): http://teaching.software-carpentry.org/2012/09/06/week-1-shell-pipes-and-filters/
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