

Execution Architecture Soft Real Time design

by *Gerrit Muller* University of South-Eastern Norway-NISE

e-mail: `gaudisite@gmail.com`

`www.gaudisite.nl`

Abstract

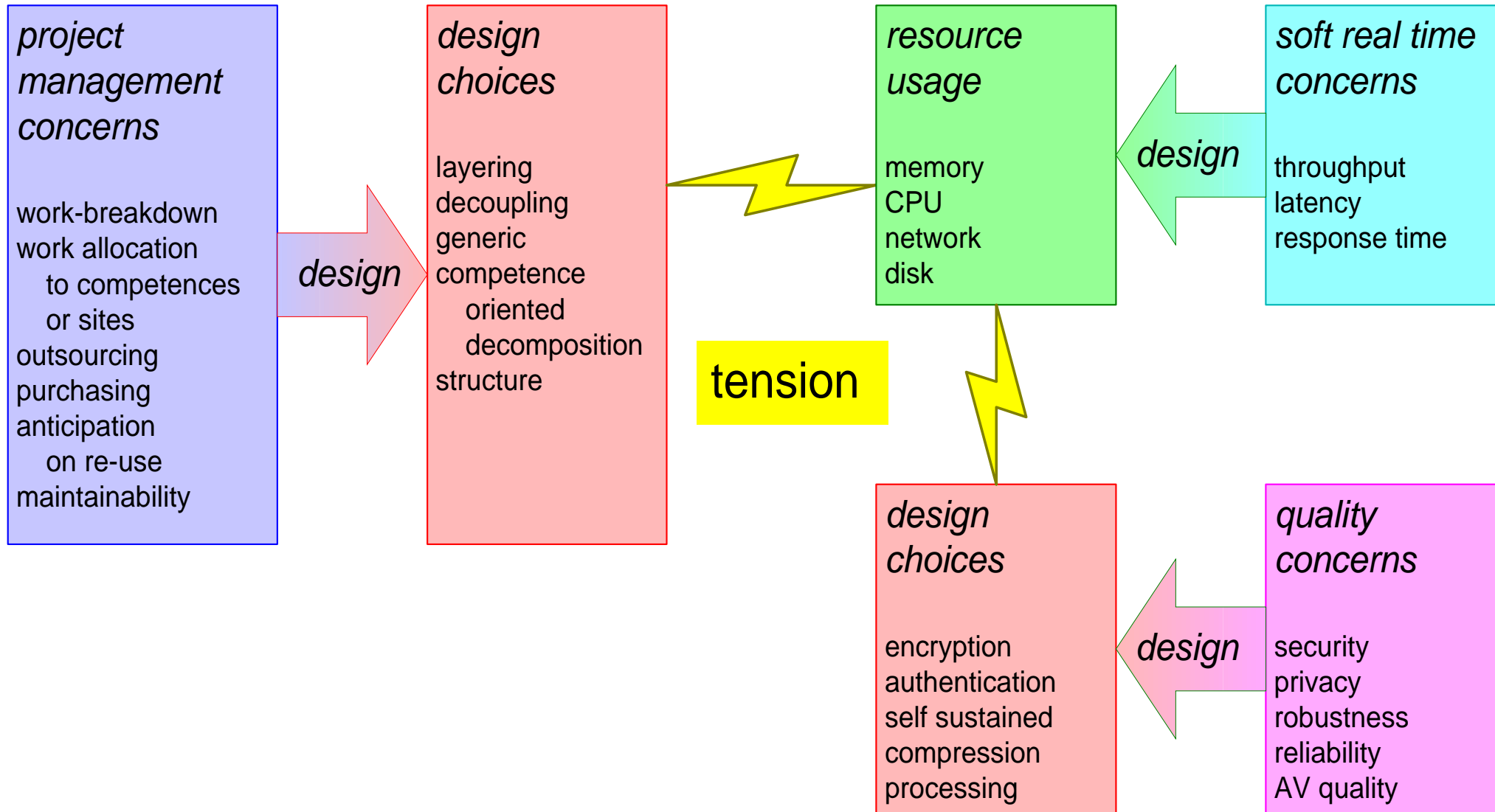
Distribution

This article or presentation is written as part of the Gaudí project. The Gaudí project philosophy is to improve by obtaining frequent feedback. Frequent feedback is pursued by an open creation process. This document is published as intermediate or nearly mature version to get feedback. Further distribution is allowed as long as the document remains complete and unchanged.

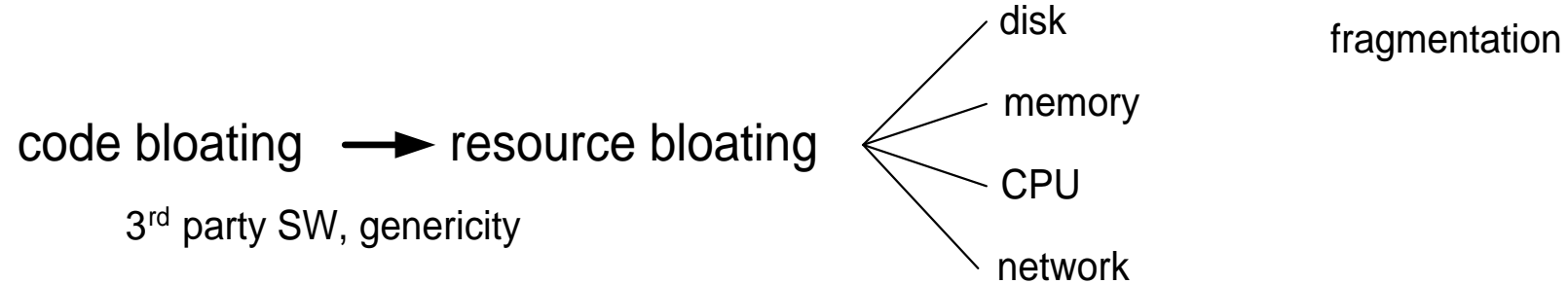
September 9, 2018
status: planned
version: 0.2

logo
TBD

Tension between different types of concerns



Root causes of soft real time problems



abundant layering or decomposition

too fine granularity eg bitwise I/O

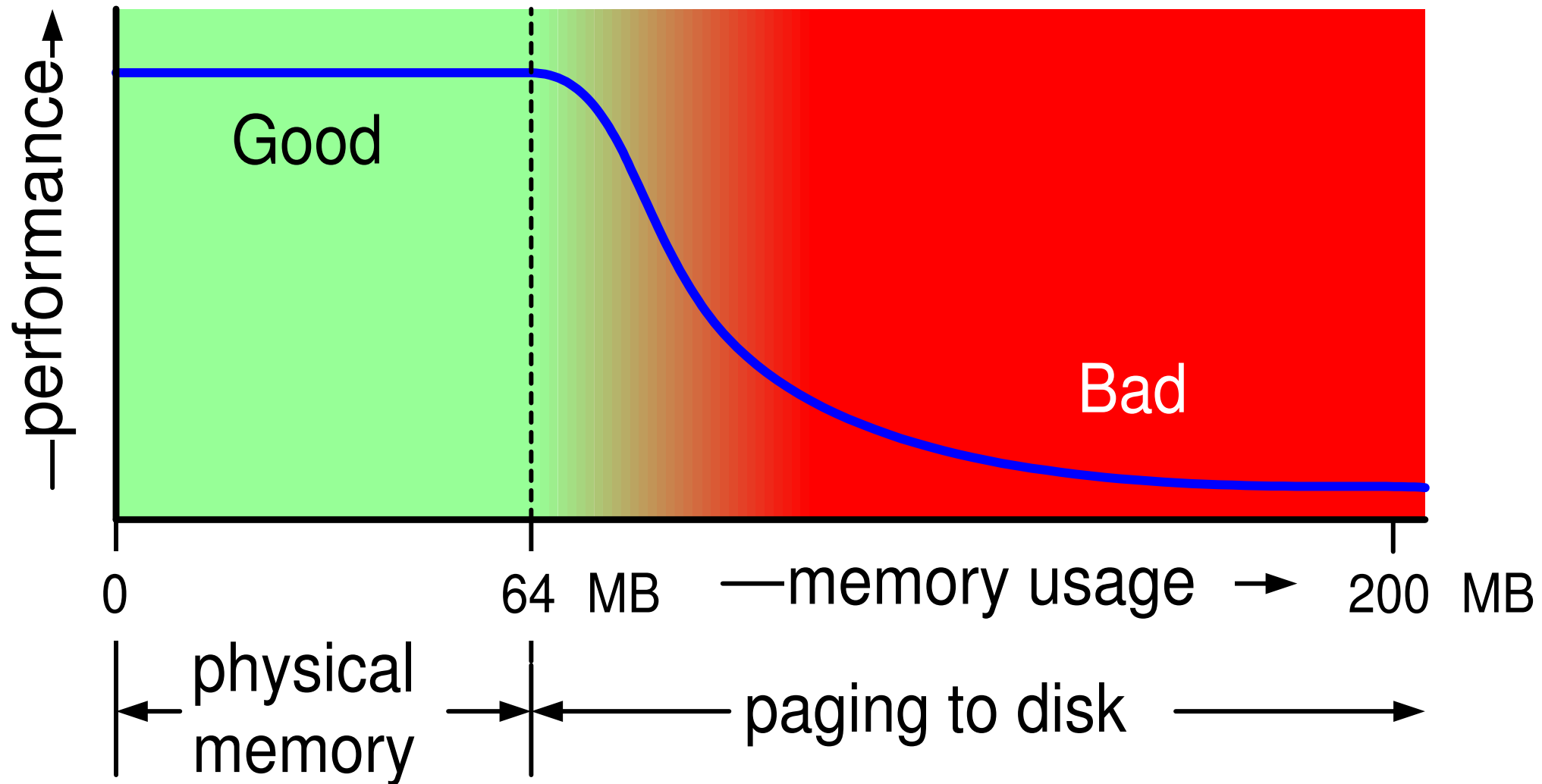
sequentialization

counterproductive optimization eg prefetching

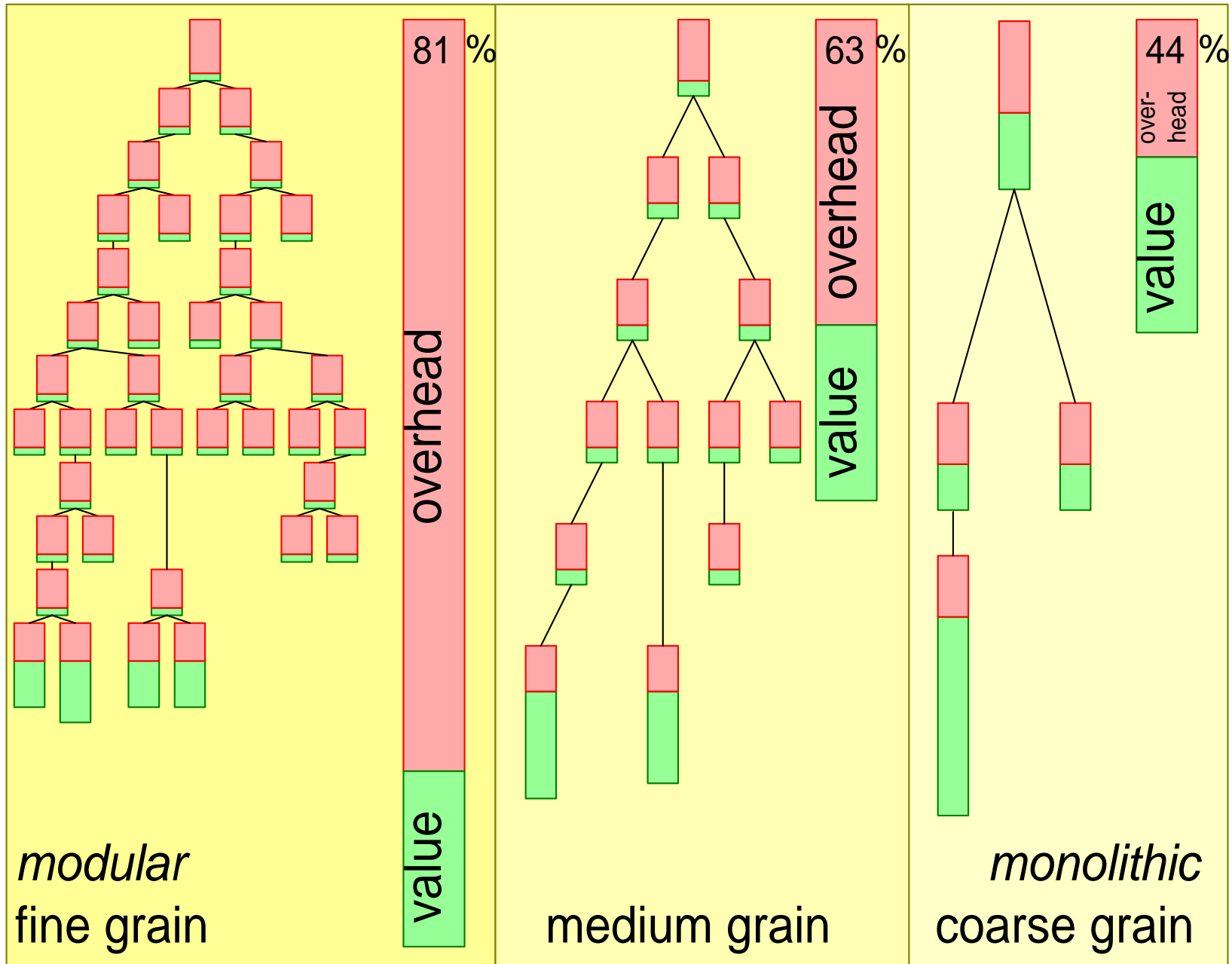
background activities virus scanners, firewalls, polling activities (Windows critical update)

scaleability of algorithm e.g. searching brute force works upto ca 10000 entries

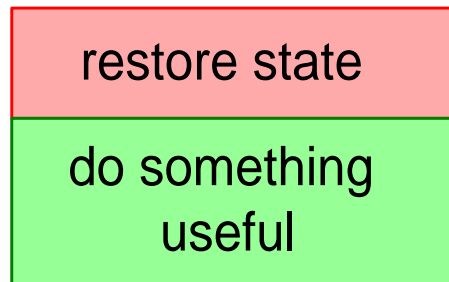
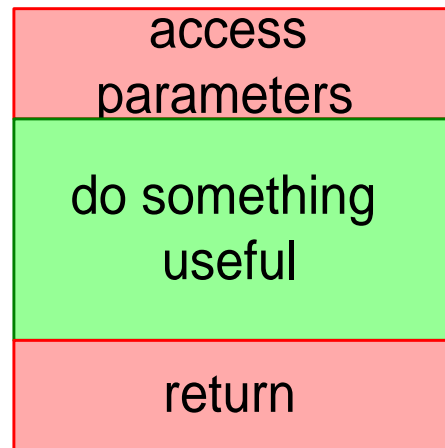
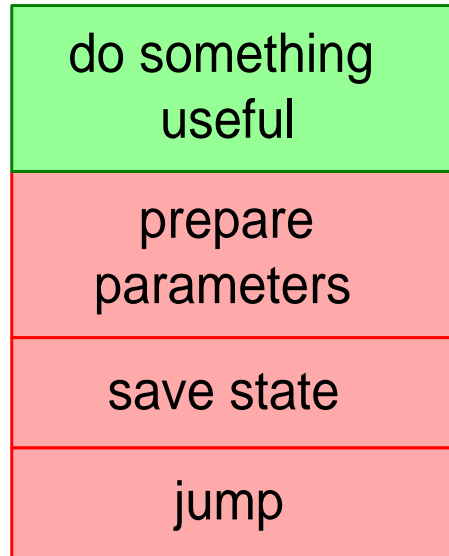
Performance as function of memory use



Overhead penalty of modularity



Function call overhead



Load and depth dependent
(hidden) side effects

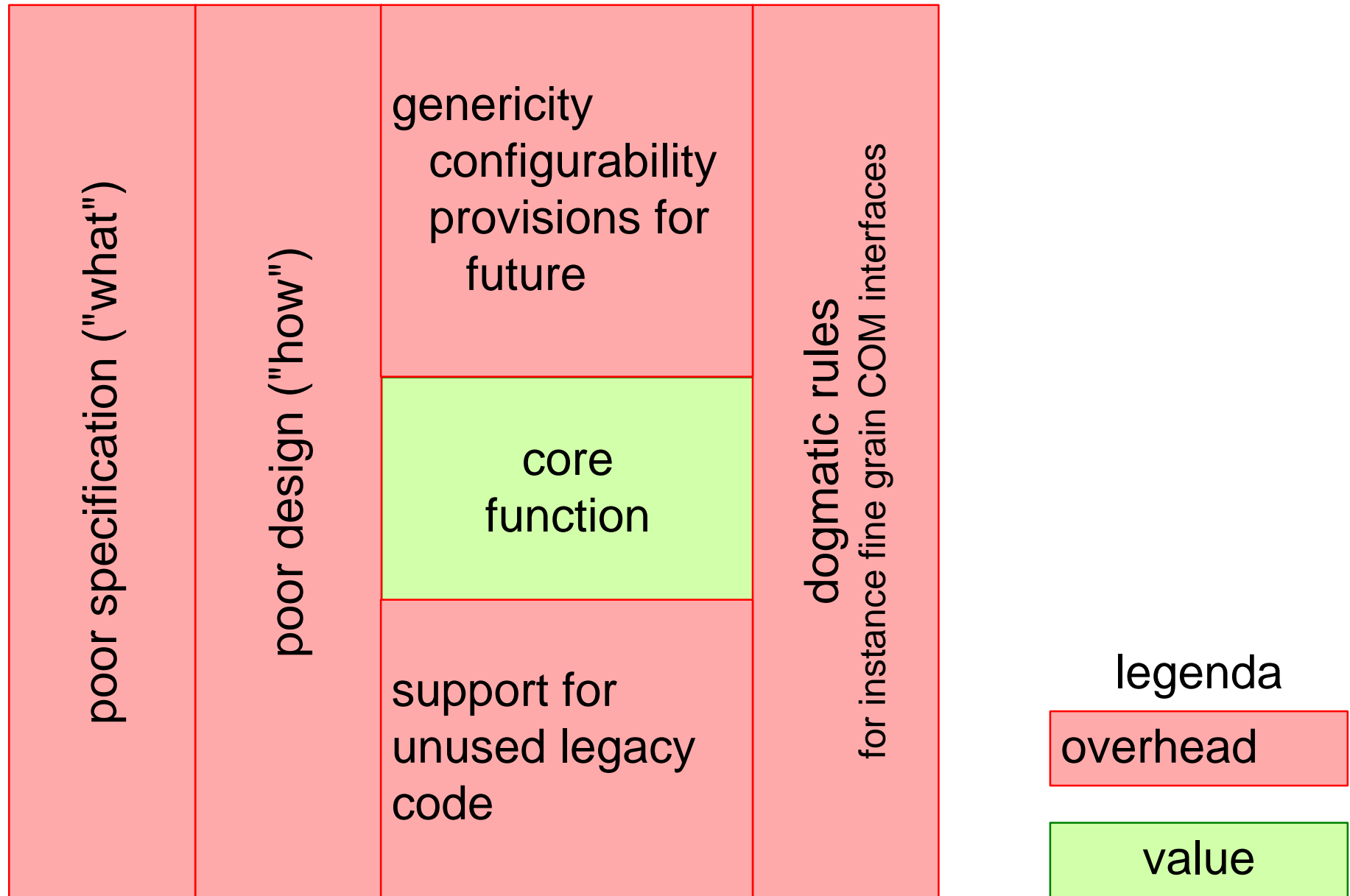
pipeline flush
I-cache disturbance
D-cache disturbance

legenda

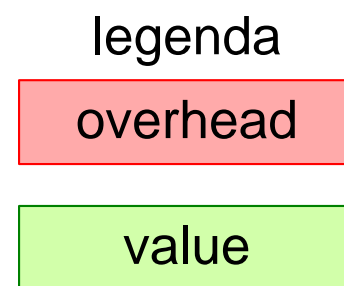
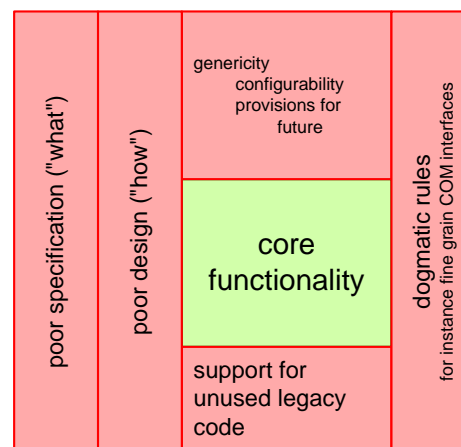
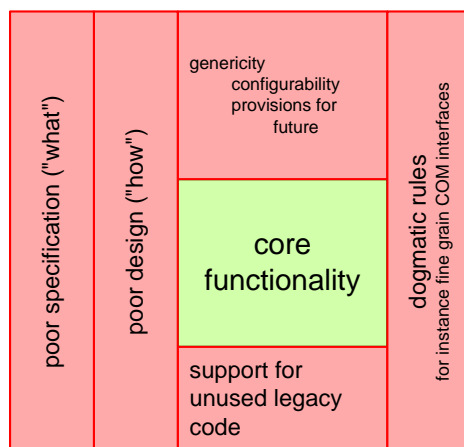
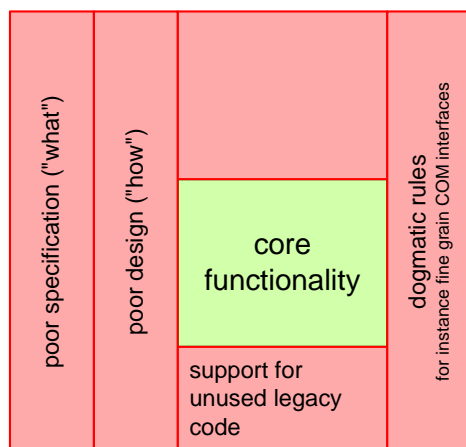
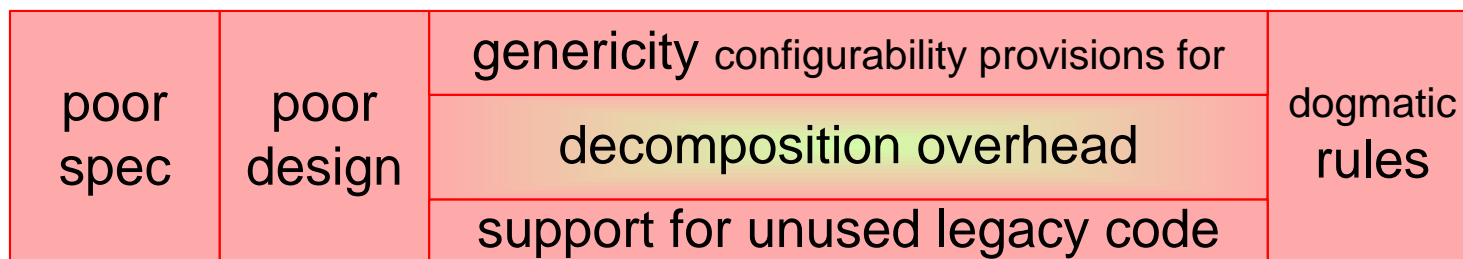
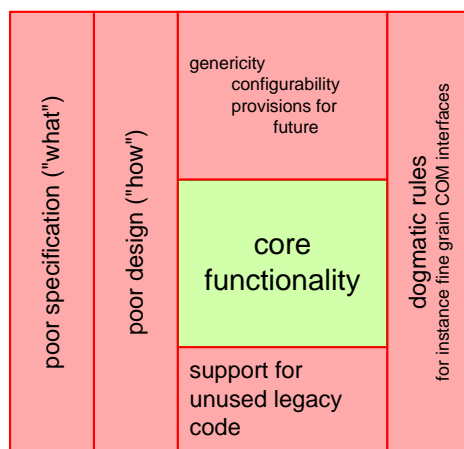
overhead

value

Bloating explained



Bloating causes more bloating



causes even more bloating...

Bloating causes performance and resource problems.
Solution: special measures:
memory pools, shortcuts, ...

