Supporting Reconfigurable Object Distribution for Customizable Web Applications

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Background

- It is difficult to build a good Web application
  - need assumptions on execution contexts
- Thin clients? Fat clients?
- Broadband? Dial-up? 3G?

Web Applications do not adapt well !!

Analysis

Rigid composition structure !!

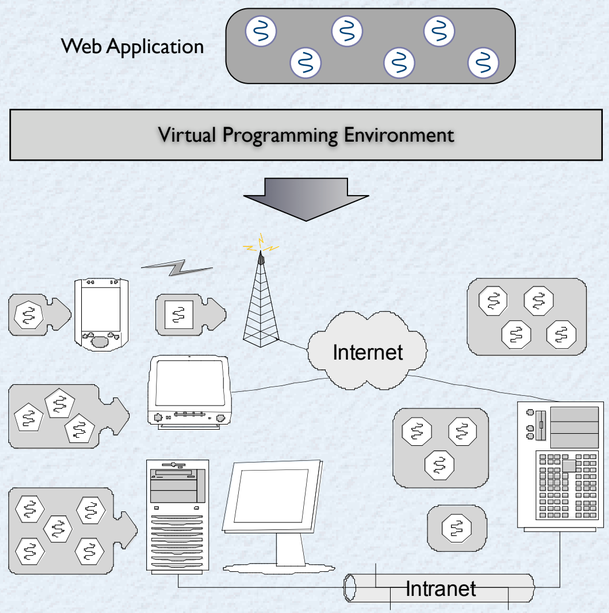
Location: Where to run? Where to create?
Timing: When to load? How much to load?

Basic Ideas

- A *generic* Web application = a composition of objects
  - the base design of a product line
- Adaptable objects
- Reconfigurable object distribution

Customizable Web applications !!

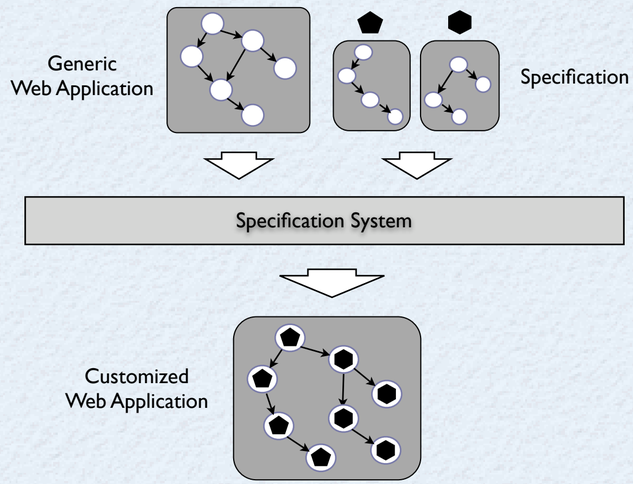
Virtualization



- Virtual programming environment
  - platform independent
  - location agnostic

  Focus on building objects and their interaction !!
- Applications are adaptable to a variety of
  - execution platforms
  - distribution plans

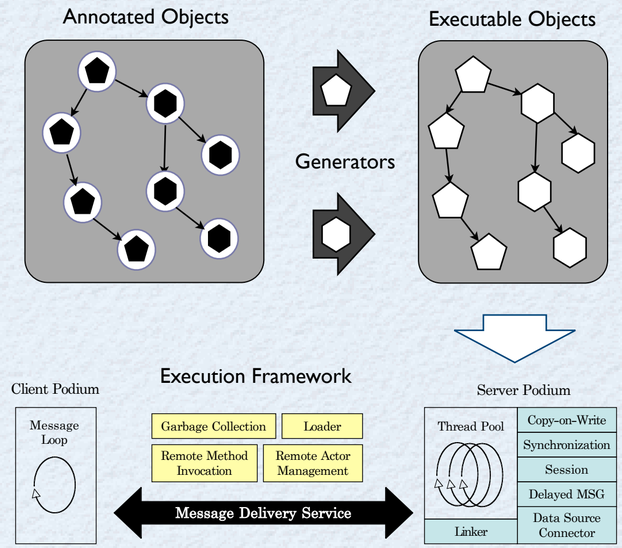
Separation of Concerns



- How to express concerns?
  - execution platform
  - loading policy

  Object annotation !!
- How to annotate objects?
  - by creation prototype (type, class)
  - by object genealogy
- Specification = rules of annotation
- How to enforce specification?
  - application transformation
  - annotation prototypes
  - prototype splitting

Generative Components



- Runtime execution environment
  - full-fledged middleware? *impractical*
  - retargetable compiler? *non-scalable*

  Balanced strategy !!
- Light-weight object execution framework
  - support object interaction only
  - host native objects
- Native (executable) object generators
  - convert object logic into target languages