Reconfiguration Service in Mobile Middleware

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# Outline

Motivation

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- Ubiquitous Applications

- Dynamically changing environment

- Variation in factors such as terminal size, power usage, etc.,
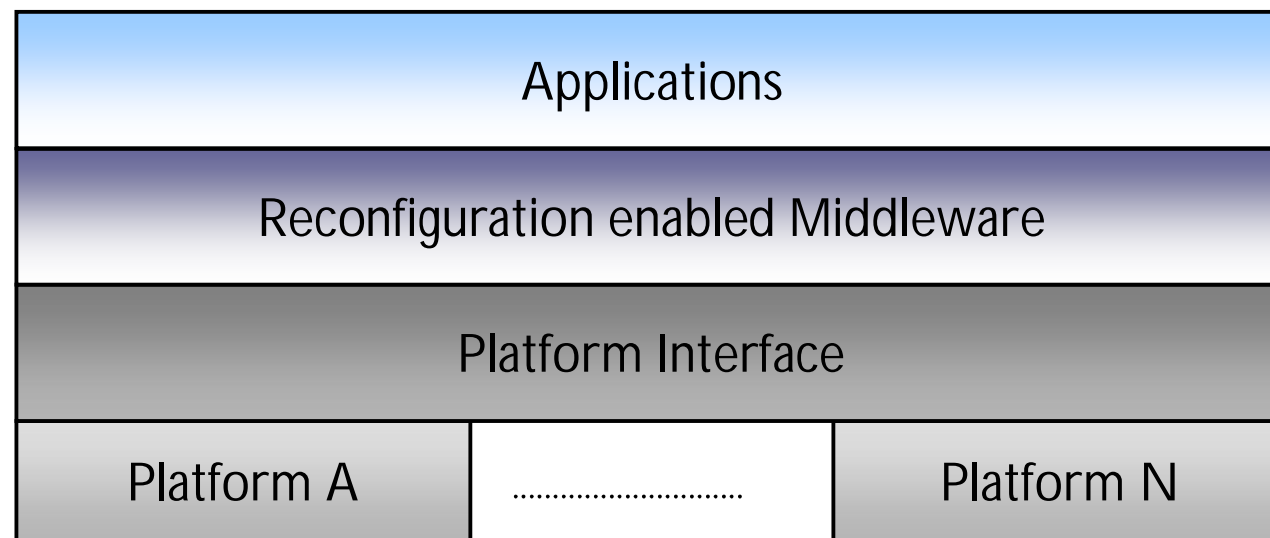
Reconfiguration

Reconfigurable System: Ability of a device to modify its constituent components, and therefore its mode of operation, to reflect changes in its operating environment

- Provide adaptive applications

- User can easily switch between devices

- Provide secured environment

- Helps to achieve power and network saving

- User freed from doing manual configurations!

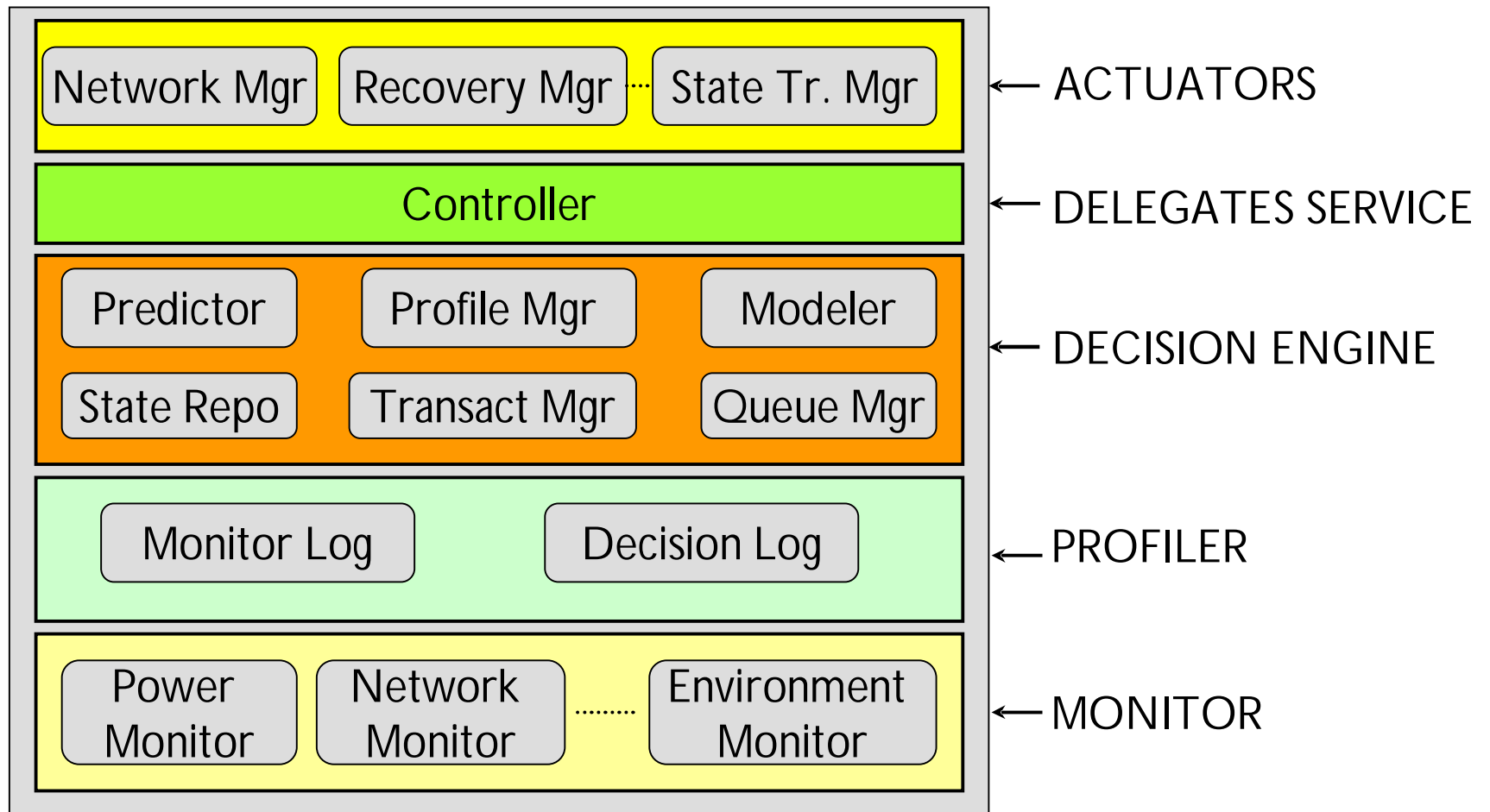# Key Requirements of Reconfiguration Service
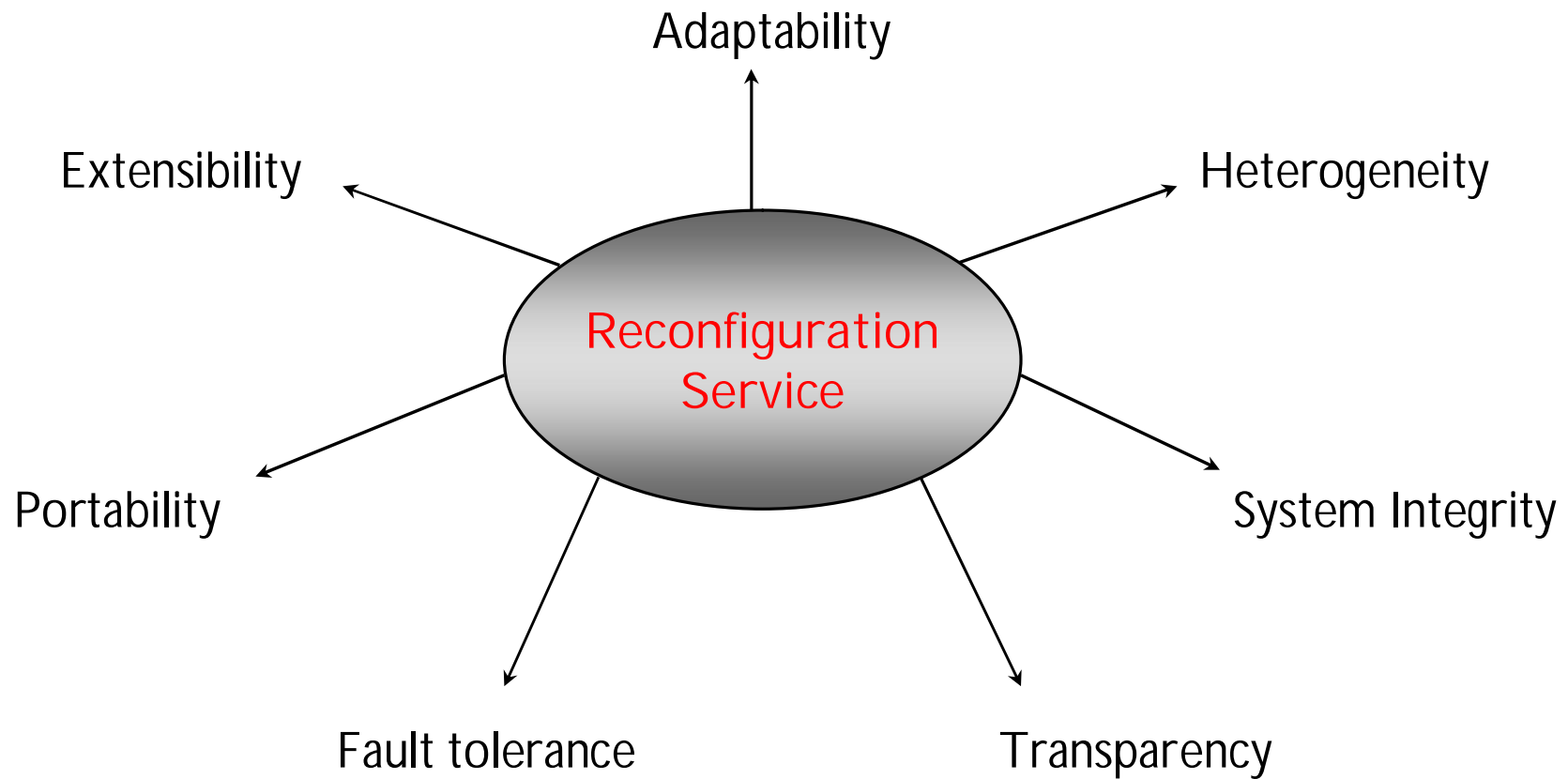
Reconfiguration Service in Middleware

Applications
Reconfiguration enabled Middleware
Platform Interface

Platform A	………………………	Platform N

Reconfiguration Service Stack

Challenges

- End user satisfaction

- Security issues such as authorization, authentication, delegation

- Fault tolerance

- Portability Issues

- System Integrity

- Resource constraints while doing computations

Work In Progress

- Prototype implementation and demonstrated a simple application using reconfiguration service (monitor input & policy based decisions)

- Design and Implementation of Decision Engine:

  - Prediction Algorithm to predict the future state of the device based on the past monitor inputs

  - Mathematical model to design the reconfiguration decision

  - Inputs: current monitor input, predictor output, past reconfiguration decision, policy, user preferences

  - Access to device description repository

User Scenario

- User scenario – 1: Moving the current email client application from user's mobile phone to laptop or vice versa.

- User scenario – 2: Moving the current instant messaging application from the user's mobile phone to laptop or vice versa.

- User scenario – 3: Uploading file from user's laptop to his work repository using a low bandwidth network.

- User scenario – 4: Downloading emails with out attachments because of sudden drop in network bandwidth.

Related Work

- End-to-End Reconfigurability (E^2R): http://e2r2.motlabs.com

- Ambient Networks: http://www.ambient-networks.org

- Dynamo – Power Aware Middleware: http://www.ics.uci.edu/~dsm/dyn/release/

THANK YOU!