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Modular Architecture

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Document History

Date	Version	Author	Description
08-06-2005	Draft 1.0	Nasly	Initial Draft

1. Purpose

The document describes a modular architecture that can be used as the architectural basis for the Air Arabia Project. The overall strategy is to adopt a "product line" model, which relies on well-defined elements and well-defined processes for assembling them into a working whole.

2. Objectives of the Modular Architecture

The overall architecture is driven by a set of objectives, which can effectively deliver a range of Air Industry solutions.

The intent of the architecture is to ensure the application and supporting environments are:

Flexible

- Ability to cater for wide variety of business capabilities and integration strategies
- Ability to add functionality without degrading the architecture

Cost Effective

- Minimize the cost associated with the development, deployment and maintenance

Supportable

- Minimize the complexity and cost of supporting delivered applications

Usable

- Ability to anticipate and accommodate use cases through out the product engineering lifecycle

3. Strategies for achieving the objectives

The strategies for achieving fore mentioned core objectives are:

- **Layering and Controlled Specialization**

  The elements with constrained dependencies are grouped into layers. The upper-level layers depend only on the lower-level layers. The controlled specialization enforces the concept of defining common services at lower-level layers while specialized services per vertical/deployment are defined at the higher-level layers. This strategy promotes stabilization of lower-level layers while allowing faster and efficient expansion of upper-level layers.

- **Modularization**

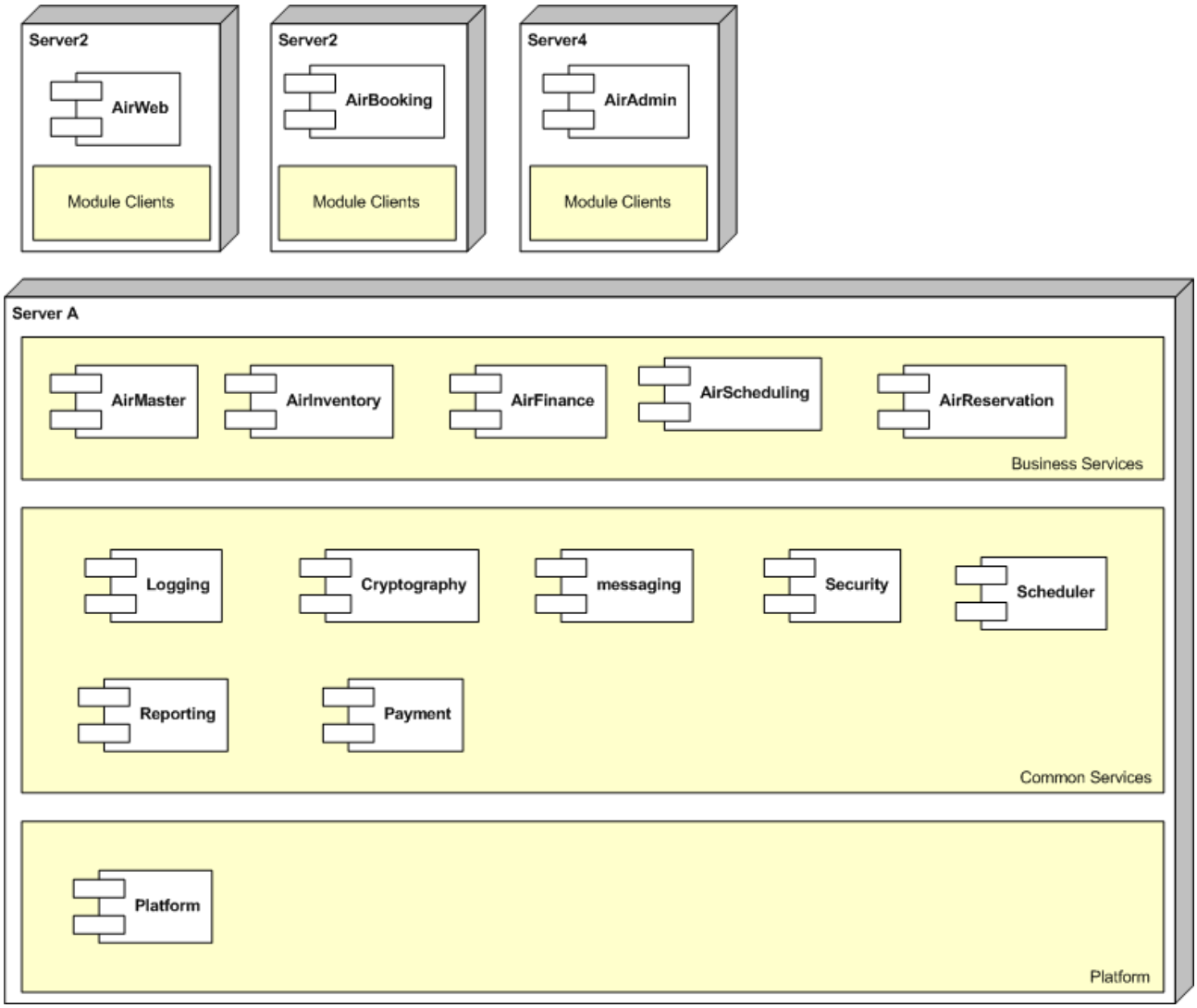
  A key concept in developing flexible and extensible architecture is strong encapsulation of coherently related functionalities into logically separable units – modules. Each module participates in a well-defined life-cycle. A module provides a well managed and well defined set of service interfaces and contracts to the application.

  At highest level, applications are comprised of functional modules, configuration data and application content and data. Specific business requirements are realized by assembling the required modules to form the application.

- **Dynamic configuration through configuration repository**

4. The layered view

Following diagram illustrates the modules organized into layers which form the application.



5. The Structure of a Module

A module comprised of:

- Service Interface, through which module's delegates are accessed
- Module Implementation
- Module Proxy, which wraps the module implementation and the life cycle interceptor; Clients acquire the module service interface by looking up this proxy through the lookup service
- Module Configuration, which is captured as spring xml beans

6. The Framework Module

This is the container module of the modular application framework. It handles modules' lifecycle (i.e. module initialization, destruction, etc.) and facilitates communication among modules. At the application start up module configurations are loaded from a central configuration repository, which is implemented using Spring Framework's hierarchical bean factory creation facility.