

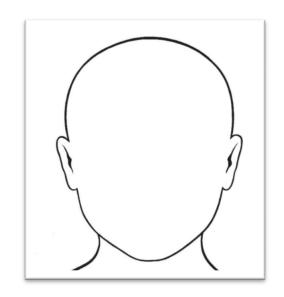
ENTERPRISE APPLICATION INTEGRATION

ARC-013



INTRODUCTION

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TRAINING ROADMAP: OVERVIEW

- Introduction
- Overview
- Requirements
- Tools
- Standards
- Patterns

- This training covers major aspects of Enterprise Integration.
- The goal of this training is to learn about Enterprise Application Integration architectural patterns, tools and techniques, and get hands-on experience with Application Integration tool.
- This training is targeted to developers, architects, team leads.

Pre-requisites:

- Enterprise application development experience
- Basic knowledge of the application integration tasks and techniques: Messaging, XML, SOAP



TRAINING ROADMAP: STRUCTURE

- 8 Hour sessions
- ◆ 15-30 mins breaks every 1.5 2 hours
- Lunches



INTRODUCTION – PRESENT YOURSELF

Name

Company and experience

- Company
- Development experience
- Technologies stack
- Projects

Why you're here

Your expectations from the training





1: OVERVIEW





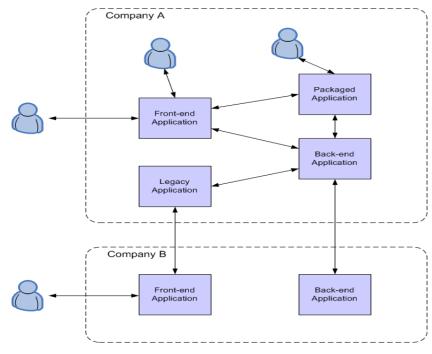
ENTERPRISE INTEGRATION: DEFINITION

Enterprise integration is a technical field of Enterprise Architecture, which focused on the study of topics such as system interconnection, electronic data interchange, product data exchange and distributed computing environments (source: "Enterprise application integration", Wikipedia)



ENTERPRISE INTEGRATION 2

Enterprise Integration may involve processes, systems, people and external organizations





ENTERPRISE INTEGRATION TYPES

Enterprise integration areas can be divided on the following types by the layer and involving components:

- **Process level integration**. Includes integration of people, IT system to automate fulfillment of the business processes within organization.
- **Presentation level integration**. Integration between user interface components of the separate applications.
- Application level integration. Integration between applications which enables the execution of the particular application scenarios.
- Data level integration. Integration on a data source level.

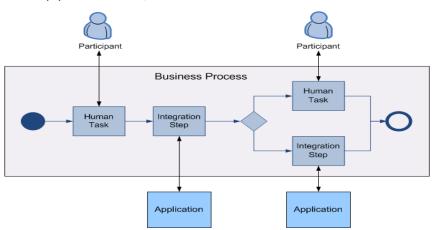


PROCESS LEVEL INTEGRATION 1

Business process is a set of related activities and human-assigned tasks which are performed to fulfill specific business function.

Business process activities may implement the following logic:

- Integration with another business processes and applications;
- Performing of human tasks;
- Execution of the business rules;
- Processing of incoming events;
- Scheduling and generation of the events;
- Execution of the custom logic.





PROCESS LEVEL INTEGRATION 2

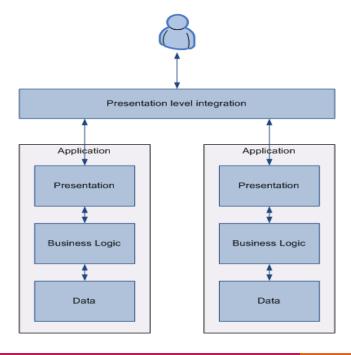
Types of business processes (not a complete classification):

- Human-centric business processes. Mainly focused on user to user interaction.
- Integration-centric business processes. These business processes are implemented mostly as a orchestration of the operations of separate enterprise applications.
- Document-centric business processes. This category contains business processes which automate the lifecycle of the documents.



PRESENTATION LEVEL INTEGRATION 1

Presentation level integration uses existing application user interface to implement integration between application.





PRESENTATION LEVEL INTEGRATION 2

Presentation level integration may be useful in the following cases:

- Integration of the legacy or third-party applications which cannot be modified to provide another integration capabilities;
- Presentation capabilities provided by several separate applications should be presented to end-user as one singe application with consistent user interface.

Presentation level integration may be based on the following technologies:

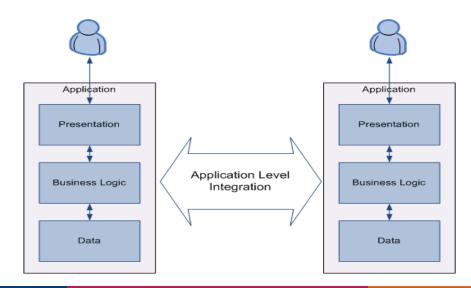
- Terminal emulation, data scraping;
- Usage of special tools for combining application user interfaces into single composite rich client application;
- Integration of web applications into portal or web mashup;



APPLICATION LEVEL INTEGRATION 1

Application level integration is the integration between applications which enables the execution of the particular application scenarios.

Usually this kind of integration is implemented based on integration interface and protocol (API, service interface, etc.).





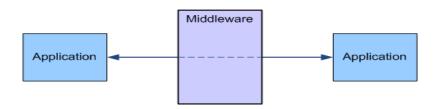
APPLICATION LEVEL INTEGRATION 2

Application level integration implementation types:

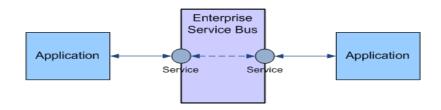
Direct integration



- Middleware integration



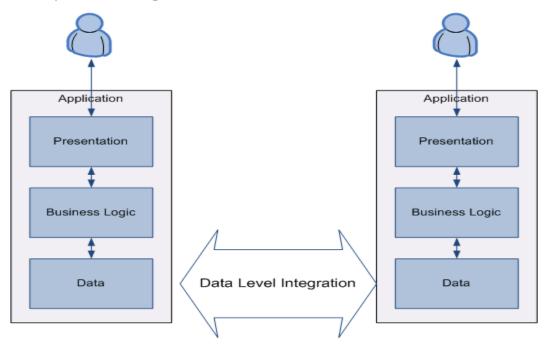
- Service Oriented Integration





DATA LEVEL INTEGRATION 1

Data Level Integration combines data from different data sources into one view available for business processing.





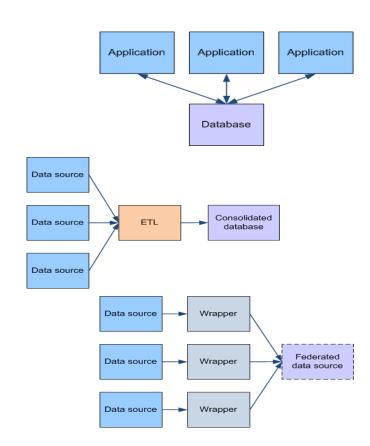
DATA LEVEL INTEGRATION 2

Main types of Data Level Integration:

Shared data source

Extract, Transform, Load (ETL)

- Federated data source





SERVICE ORIENTED ARCHITECTURE 1

Service-Oriented Architecture (SOA) is an architectural style that supports service-orientation.

Service-orientation is a way of thinking in terms of services and service-based development and the outcomes of services.

Service:

- Is a logical representation of a repeatable business activity that has a specified outcome (e.g., check customer credit, provide weather data, consolidate drilling reports)
- Is self-contained
- May be composed of other services
- Is a "black box" to consumers of the service



SERVICE ORIENTED ARCHITECTURE 2

Principle	Description			
Standardized Service Contract	Services adhere to a service-description.			
Loose Coupling	Services minimize dependencies on each other			
Service Abstraction	Services hide the logic they encapsulate from the outside world			
Service Reusability	Logic is divided into services with the intent of maximizing reuse			
Service Autonomy	Services should have control over the logic they encapsulate.			
Service Statelessness	Ideally, services should be stateless.			
Service Discoverability	Services can be discovered (usually in a service registry).			
Service Composability	Services break big problems into little problems.			



SOA PRINCIPLES TO QUALITY ATTRIBUTES: DISCUSSION

SOA principles:

- Standardization
- Loose coupling
- Reusability
- Composability
- Discoverability

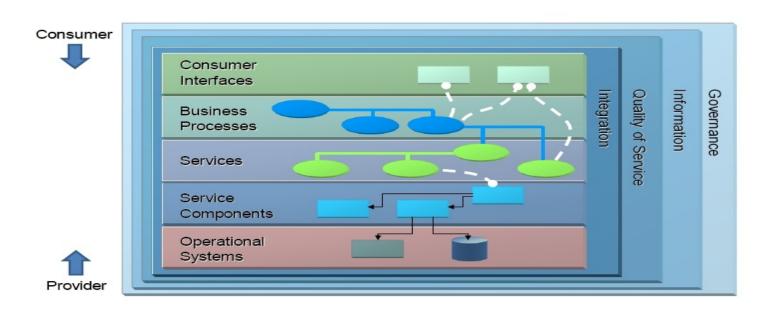
Quality attributes:

- Interoperability
- Modifiability/Maintanability
- Performance
- Reusability
- Security
- Testability
- Scalability
- Reliability



SERVICE ORIENTED ARCHITECTURE 3

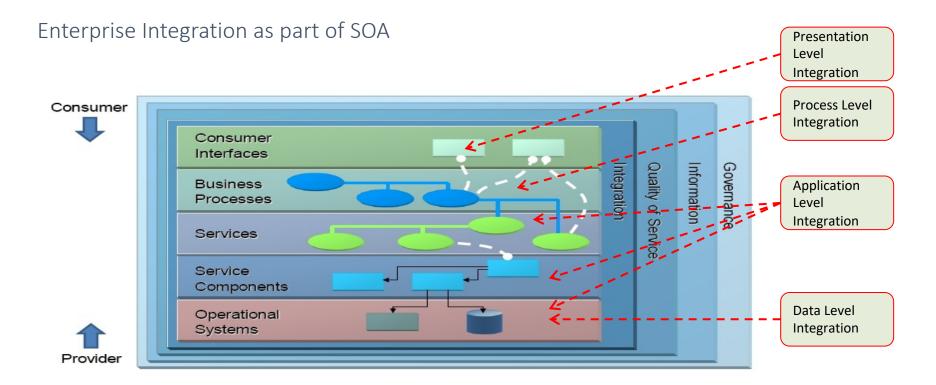
Logical Solution View of SOA Reference Architecture



Source: SOA Reference Architecture Technical Standard, The Open Group



SERVICE ORIENTED ARCHITECTURE 4





THE OPEN GROUP SERVICE INTEGRATION MATURITY MODEL V2

- 1	Service Foundation Levels							
	自自							
	Sile	Integrated	Componentized	Services	Composite Services	Virtualized Services	Dynamically Re-Configurable Services	
Business View	Isolated Business Line-driven	Business Process Integration	Componentized Business Functions	Business provides & consumes services	Composed Business Services	Outsourced Services BPM & BXM	Business Capabilities via Context-aware Services	
Governance & Organization	Adhoc LOB IT Strategy and Governance	Object-Oriented Modeling	Common Governance Processes	Emerging SOA Governance	SOA and IT Governance Alignment	60A & IT Governance Infrastructure Alignment	Governance via Policy	
Methods	Structured Analysis & Design	Object-Oriented Modeling	Component-based Development	Service-Oriented Modeling	Service-Oriented Modeling	Service-Oriented Modeling for Infrastructure	Business Process Modeling	
Applications	Modules	Objects	Components	Services	Applications comprised of Composite Services	Process Integration via Service	Dynamic Application Assembly	
Architecture	Monolithic Architecture	Layered Architecture	Component Architecture	Emerging SOA	SOA	Grid-enabled SOA	Dynamically Re-configurable Architecture	
Information	Application-specific Data Solution	LOB-specific (Data subject areas established)	Canonical Models	Information as a Service	Enterprise Business Data Dictionary & Repository	Virtualized Data Services	Semantic Data Vocabularies	
Infrastructure & Management	LOB Platform-specific	Enterprise Standards	Common Re-usable Infrastructure	Project-based SOA Environment	Common SOX Environment	Virtual SOA Environment: Sense and Respond	Context-aware Event-based Sense & Respond	
	Level 1	Level 2	Level 3	Level 4	Level 5	Level 6	Level 7	7



IBM'S OSIMM MAPPING

