Reference Solution Description Template

Author:
Randy Jones

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INTRODUCTION

> *This document is a template from which reference solutions description documents may be created. For more information on how and when to use this template please refer to the DAIR 2.0 Package Integration Specification.*
>
> *Italics text within a border is instructional and to be deleted before publishing.*
>
> *Italics text inside angle brackets (e.g. <some text>) indicates mandatory text to update with applicable text.*
>
> *Italics text inside square brackets (e.g. [some text]) is considered optional and may either be replaced with applicable text or deleted prior to distribution.*
>
> *For an example of this template please refer to <name/link to example>*

The *<package name/link>* provides a deployable reference solution which enables DAIR participants to observe and study application of *<name(s)/links of advanced technologies used>* to solve the problem of *<high level problem statement>* .

The purpose of this document is to describe the reference solution for package *<package name here>* and how it demonstrates use of advanced technologies. DAIR participants wishing to learn how to apply and adopt *<name(s)/links of advanced technologies used>* should find this content useful in deciding how, when, and if they'd like to follow similar approaches in their solutions.

This content is part of the *<knowledge kit name/link>* associated with DAIR package *<name/link>*. Please follow the prior links for more supporting information.

PROBLEM STATEMENT

The problem statement should be framed by answering the following questions in plain terms such that either a technical or business audience can understand and identify with the problem:

What is the problem?

Why the problem is relevant (and to whom) and worth solving?

What are the traditional or present methods of addressing the problem?

Why the solution description later in the document provides a compelling means of addressing the problem relative to traditional solutions?

General Guidelines:

- keep the problem statement concise (i.e. should fit on 1-2 pages max)

- think of the problem statement much like an elevator pitch with a little more elaboration: sell the reader on adopting the approach to technology use you're advocating but avoid attempting to sell the reader on your firm/product/service.

- where appropriate, provide a forward reference to the Solution Description introducing the key technology and how it is a critical component in addressing the problem.
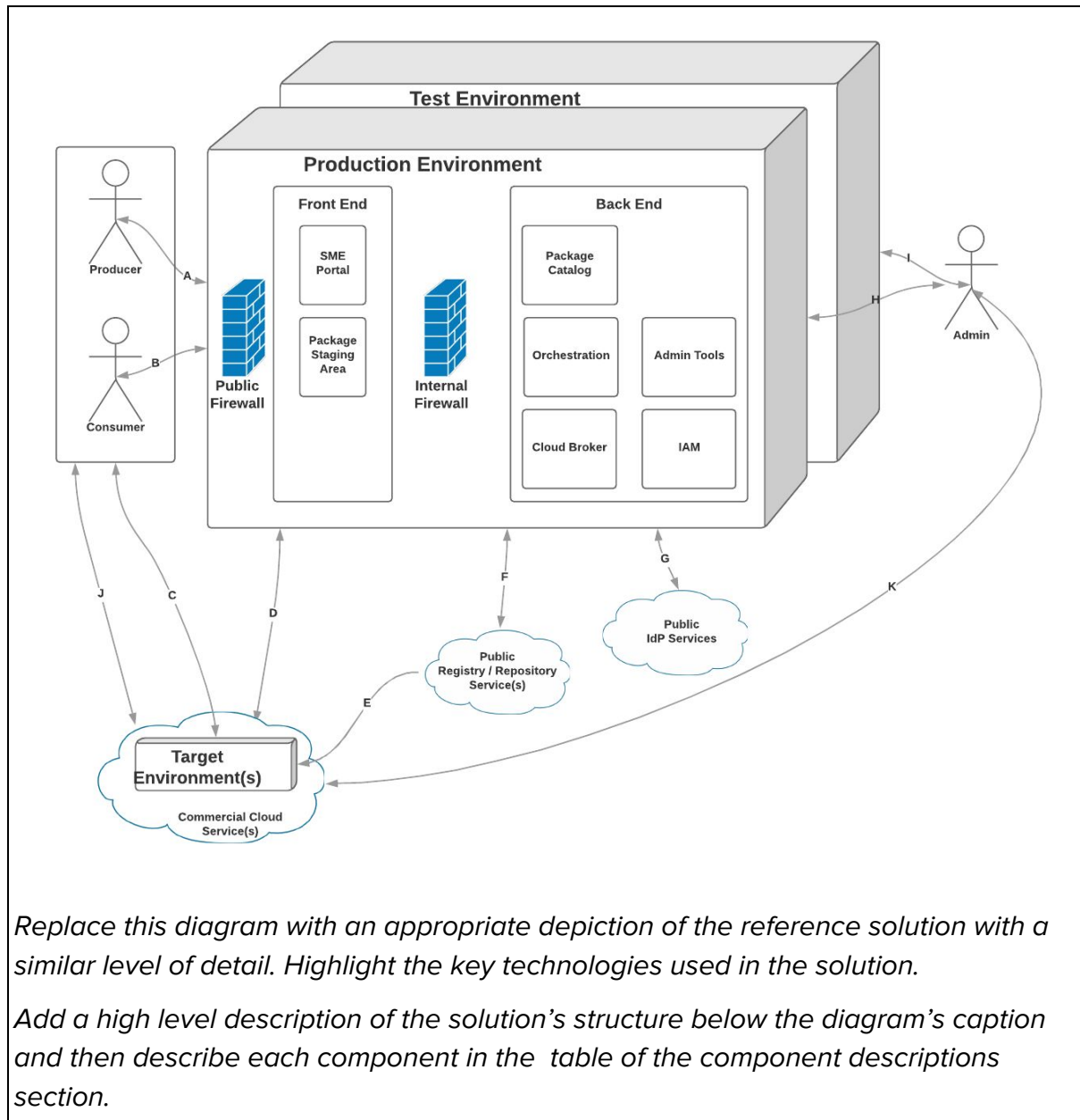
SOLUTION DESCRIPTION

The solution description section describes how the prior problem statement is addressed by the reference solution. While completing the sub-sections below, keep in mind that the goal of describing the solution is knowledge transfer to the reader. Where appropriate, explain any non-obvious considerations needed in the design of the solution.

This reference solution showcases how the *<name/link to key technology>* can be used to address the problem statement.

Solution Overview

The Solution Overview Diagram summarizes the structure of the reference solution.

Replace this diagram with an appropriate depiction of the reference solution with a similar level of detail. Highlight the key technologies used in the solution.

Add a high level description of the solution's structure below the diagram's caption and then describe each component in the table of the component descriptions section.

Solution Overview Diagram

The solution solves the problem by *<explain 'what' the solution does and why it is compelling>.*

Component Descriptions

Significant components used in the solution are summarized in the table below.

<

Component	Summary
SME Portal	*The SME Portal provides a web based user interface for SME participants to access DAIR services.*
Package Staging Area	*The package staging area provides storage where producers submit new and updated packages prior to QA.*
Package Catalog	*The package catalog provides a browsable list of packages available to consumers via the SME portal. Packages under going QA are also promoted into the package catalog from the package staging area. In this case, package write access is limited to administrators, and package read access is limited to the package author.*
Orchestration	*The orchestration component co-ordinates the deployment of reference solutions into cloud services via the cloud broker.*
Cloud Broker	*The cloud broker component manages the interface to cloud service providers. It provides policy based service access, quota monitoring, cost estimation and attribution functions for administration use.*
...	...

>

TECHNOLOGY DEMONSTRATION

The main requirement of a reference solution is to demonstrate how a technology is applied to solve a problem. This section provides instructions for the reader to deploy the reference solution to a cloud environment and observe its behavior in a guided fashion.

Think of this section as being like the script for a customer demo wherein a concrete set of actions are described for the reader needed to show how a technology works in the reference solution.

This section guides you through a demonstration showing the power of using < *key technology name(s)>* to address the needs of the *<problem statement name>*. This approach is compelling because it *<describe principal business value of approach>* .

The demonstration will illustrate *<describe specific outcomes of demonstration>*.

How to Deploy and Configure

In this section describe the pre-conditions needed for the demonstration. Describe how the reference solution needs to be configured for the demonstration. If appropriate, provide a summary diagram for the demonstration.

If you're a DAIR participant you can deploy the reference solution by navigating to the *<package name/link>* and follow any instructions on that page for deploying a new instance of the reference solution.

Describe the sequence of steps requiring execution by the user to demonstrate the solution. Among the items to describe in the procedure include deploying and configuring the solution. Follow this with the steps required to demonstrate compelling operation of the reference solution.

Assuming the reader has executed the procedure, it's expected there is an observable behavior (or asset) indicating successful operation. Describe what the user should be seeing and any possible alternatives. For example, describe what the user should be seeing on a UI (e.g. provide screen shots), or in a log file, or in a database.

TECHNOLOGY CONSIDERATIONS

The technology considerations section is where concise knowledge transfer is to be captured. As author of this document you are an expert on the reference solution and its constituent technologies. This is where you impart what you've learned to others.

Focus on communicating the things you've learned which had the most value for your own understanding of the subject matter. A useful exercise before continuing to write this section is to ask yourself <u>"what do I know now about the subject which I wished I'd known when I was first exposed to it?"</u> These are some of the most important items to capture in this section for the reader.

As a reminder, the audience for this document has various levels of technical background. Avoid describing the basics in each topic area. For example, <u>don't</u> describe the basics of how packet inter-networking works in the 'Networking Considerations' section but <u>do</u> describe things like:

- *non-obvious configuration, or rarely used network features*

- *bandwidth consumption characteristics as a factor of load*

- *delay characteristics as a factor of load*

As an additional reminder keep the description in this section focused upon the reference solution. References to generic technology resources (e.g. tutorials, user documentation, FAQ's, forums, blogs etc.) should be via other assets in the knowledge kit. Please refer to the DAIR Package Integration Specification for more information.

Deployment Options

Describe alternative (i.e. relative to the default) deployment options for the reference solution could be deployed to achieve different objectives with respect to performance, scalability, availability and/or cost.

Technology Alternatives

Describe alternatives to key technologies used in the reference solution.

Describe for the reader how and why to consider these alternatives to achieve different objectives with respect to performance, scalability, availability and/or cost.

Where appropriate, explain the rationale for your choice in the reference solution.

[Data Architecture Considerations]

Where the reference solution has a significant dependency upon data set(s), describe topics the reader could consider if using the same or similar technology.

Expand your description beyond the reference solution by comparing and contrasting it with a similar solution targeted for a production deployment.

Topics you may wish to address in your description could include:

> *- infrastructure cost as data scales*
>
> *- access performance as data scales*
>
> *- mechanisms for availability*
>
> *- data retention policy enforcement mechanisms*
>
> *- data access controls*

[Security Considerations]

Provide an assessment of security concerns and mitigating controls associated with the reference solution and its associated key technologies.

Expand your description beyond the reference solution by comparing and contrasting it with the reference solution were it targeted for a production deployment.

Topics you may wish to address in your description could include:

> *- perceived and real vulnerabilities and resulting risks*
>
> *- minimum controls needed to mitigate risks*
>
> *- performance and cost considerations of controls*
>
> *- recommended security best practices in a production environment*

> - applicable market or regulatory security requirements of the reference solution

[Networking Considerations]

> If the reference solution or dependent technologies have any unusual networking requirements describe them in this section. It is generally understood that most components require IP interconnectivity which can be omitted. Instead please focus on describing exceptional networking configuration or gotcha's. For example, if a reference solution required significant cloud inter-region bandwidth identify that as a potential cost driver.

[Scaling Considerations]

> Describe how the technology scales in the reference solution. If you have operational data or a simple model on how resources (i.e. cost items) scale as a function of offered load provide that information.

[Availability Considerations]

> Describe how the reference solution provides (or could provide) a highly available solution. If this section is provided describe the failure modes of the solution and how they are handled.

[UI Considerations]

> Where appropriate share what you've learned about extending (or replacing) any bundled open source user interface. Focus on sharing those gems of knowledge that you wish you had known prior to gaining experience with the technologies used in the reference solution.

[API Considerations]

> Describe any considerations related to API's available on the reference solution or bundled technologies. For example provide information on:
>
> - extending the API

- securing the API

- standards used

- proprietary stacks (e.g. AWS, GCP, etc) and schemas to consider and why

- aspects of compatibility and interoperability you may be aware of

Cost Considerations

Describe the cost drivers for the solution and how they are anticipated to scale in a production environment.

Where applicable, discuss tactics for controlling costs using cloud native computing tools.

Where applicable discuss options for cost reduction by design commercial service replacement with open source components.

License Considerations

It's anticipated that many components of the reference solution will be subject to open source and/or 3rd party commercial licenses. In this section describe any sensitivities to use, modification and/or distribution of the reference solution (or dependent components) which needs to be considered.

SOURCE CODE

Provide a description of where source code associated with the reference solution is stored and how it may be accessed.

GLOSSARY

The following terminology, as defined below, may be used throughout this document.

Update or replace the list below to reflect the subject matter of your reference solution.

Term	Description
API	Application Programming Interface.
AWS	Amazon web service.
DAIR	Digital Accelerator for Innovation and Research. Where used in this document without a version qualifier DAIR should be understood to mean DAIR 2.0 (vs. the basic DAIR 1.0 service).
GCP	Google cloud platform
UI	User interface.
IP	Internetworking protocol.
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