

Overview Briefing

Establishing Presence within the Service-Oriented Environment

AFCEA-GMU C4I Symposium
Lansdowne, Virginia
5/20/2009

This document is confidential and is intended solely for the use and information of the client to whom it is addressed.

Booz | Allen | Hamilton

Agenda

- ▶ Introduction to Service-Oriented Architecture and Dynamic Service Discovery
- ▶ Challenges to Conventional Dynamic Service Discovery Implementations
- ▶ Improving Dynamic Service Discovery through Service Presence
- ▶ Wrap-up and Questions

Booz | Allen | Hamilton

1

Service-Oriented Architecture is an architecture approach for organizing and using services to support interoperability between enterprise data assets and applications

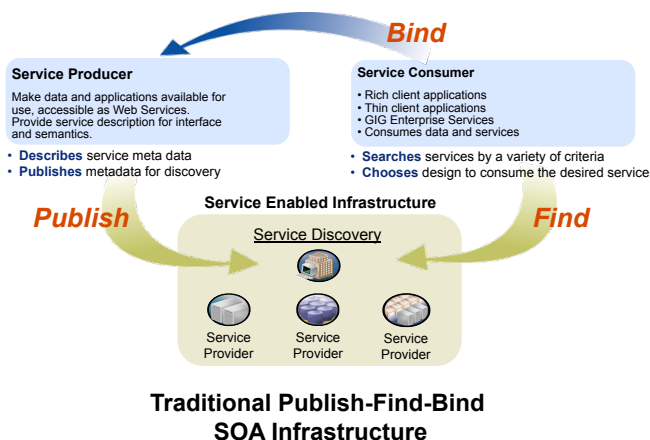
▶ **A Service-Oriented Architecture (SOA) provides infrastructure allowing individual service-enabled enterprise assets to interact, dynamically composing new information sharing processes and business functions**

- Dynamic service collaboration to satisfy new and changing business needs
- Increased efficiency in providing new functionality and composite service offerings
- Isolation of enterprise assets when combining data or functionality

▶ **Within the C4I community, SOA is rapidly gaining traction as the underlying technology vehicle driving real-time production systems and increasing tactical and operational capabilities**

- Enhanced situational awareness and information dissemination
- Improved interoperability between mobile, heterogeneous assets in non-traditional environments

Effective utilization of a Service-Oriented Architecture hinges upon discovering mission-critical services and information sources in a needs-centric fashion at runtime



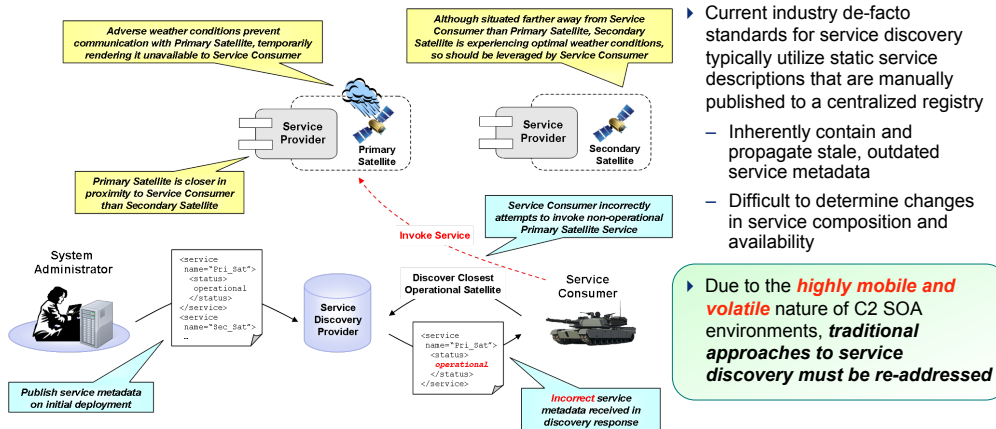
▶ **A robust discovery implementation can significantly enhance the overall capability of a SOA**

- Remove the need for manual developer interaction to leverage previously unknown services
- Better handle transient and dynamic enterprise situations

▶ **Publish-Find-Bind model is a key paradigm in effectively facilitating service discovery**

- Service providers **publish** service descriptions to broker
- Consumers **find** services that best satisfy their requirements
- Consumers **bind** to and leverage discovered services

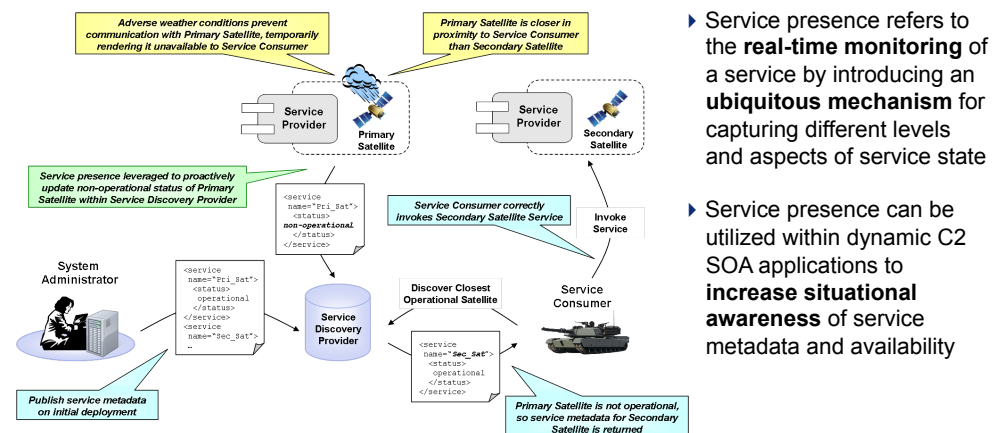
Publish-Find-Bind is a cornerstone of Service Oriented Architectures, but can it be realized in a more effective manner?



Booz | Allen | Hamilton

4

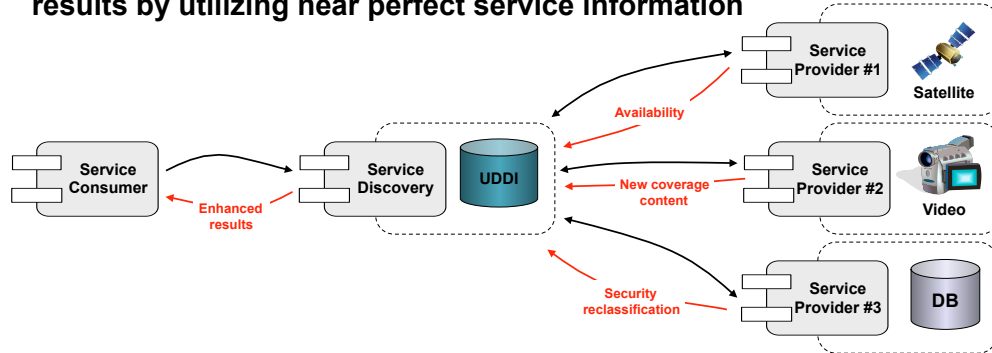
The application of presence offers a fundamentally different, proactive approach to dynamic service discovery



Booz | Allen | Hamilton

5

A dynamic service discovery implementation can transparently increase its capacity to provide more accurate service discovery results by utilizing near perfect service information

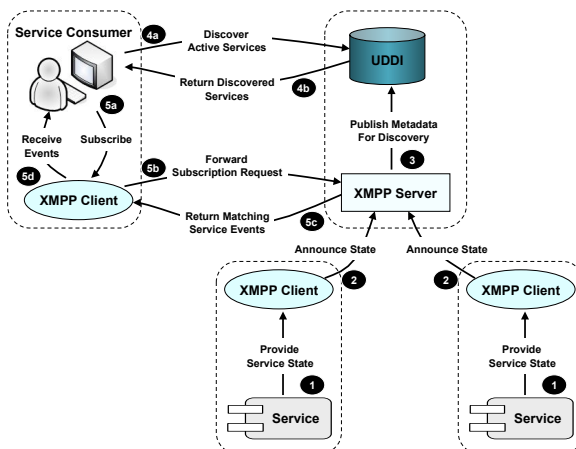


- ▶ Service presence **seamlessly** improves the **dependability** and **quality** of service discovery results by enabling relevant service metadata updates to be detected and broadcast in real-time
- ▶ While announcement-based service discovery mechanisms such as Jini and JXTA have been developed, the adoption of these technologies to provide service presence capabilities at the enterprise SOA level has been limited

Booz | Allen | Hamilton

6

Experimentation was conducted to establish service presence through an XMPP-driven prototype to augment the discovery infrastructure provided by a traditional registry implementation



- ▶ eXtensible Messaging and Presence Protocol (XMPP) was selected as the underlying technology vehicle for enabling service presence at the enterprise level
 - Open standards, XML-inspired protocol with powerful set of built-in, lightweight messaging, presence, and publish-subscribe functionalities
- ▶ Transparently improved the quality and reliability of UDDI-provided discovery results
- ▶ Notification-based, event-driven architecture created to enable service consumers to maintain a "buddy list" of services
 - Ex. Subscribe to presence of sensor service providers within a certain geo-location range

Booz | Allen | Hamilton

7

Conclusions and Next Steps

► **Event driven, service presence capabilities using P2P technologies can augment the service metadata publishing and retrieval infrastructure provided by a centralized registry to more dependably facilitate dynamic service discovery**

► Next Steps

- Investigate impact on governance and security
- Evaluate scalability and performance in bandwidth constrained, pervasive environments
- Develop presence-aware federated model
- Explore additional uses of XMPP within enterprise SOA

Questions or Comments?

Eric Konieczny
Consultant

Booz | Allen | Hamilton

Booz Allen Hamilton Inc.
8263 Greensboro Drive
McLean, VA 22102
Tel (703) 377-8953
konieczny_eric@bah.com

Sandeep Maripuri
Senior Associate

Booz | Allen | Hamilton

Booz Allen Hamilton Inc.
8263 Greensboro Drive
McLean, VA 22102
Tel (703) 377-5687
maripuri_sandeep@bah.com

Backup

What is Service Oriented Architecture?

- ▶ Service-Oriented Architecture (SOA) is an architecture approach for organizing and using services to support interoperability between enterprise data assets and applications
 - Packages core business functionality and processes as **reusable, interoperable services**
 - Focuses on establishing loosely-coupled, dynamically bound system components that can be leveraged within the context of larger applications by different groups of people both inside and outside of an organization
 - Provides a design framework for realizing the rapid, low-cost integration of previously existing IT capabilities to satisfy new business and system requirements
 - Stresses interoperability between services that are developed using different programming languages, operating systems, and platforms

Web services technologies have emerged as the underlying vehicle driving SOA implementations



Traditional Web Service Stack

Gartner defines a Web Service as:

▶ “A **software component** that can be accessed by another application (such as a client, a server or another Web service) through the use of generally available, **ubiquitous protocols and transports**, such as Hypertext Transport Protocol (HTTP)”

- ▶ Web services are encapsulated, loosely-coupled, contracted software components designed to support interoperable machine-to-machine interaction over a network
 - Typically described using an interface specification, such as WSDL, which offers a machine-readable description of the service's operations, input and output message format, and network protocol
 - Interaction with web services is typically performed using SOAP over HTTP, although RESTful paradigms are gaining significant traction within the enterprise community