WebSphere® SCA Feature Pack

Future-Proofing your applications with SCA

March 4th, 2009

SOA on your terms and our expertise

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SOA Foundation Architect
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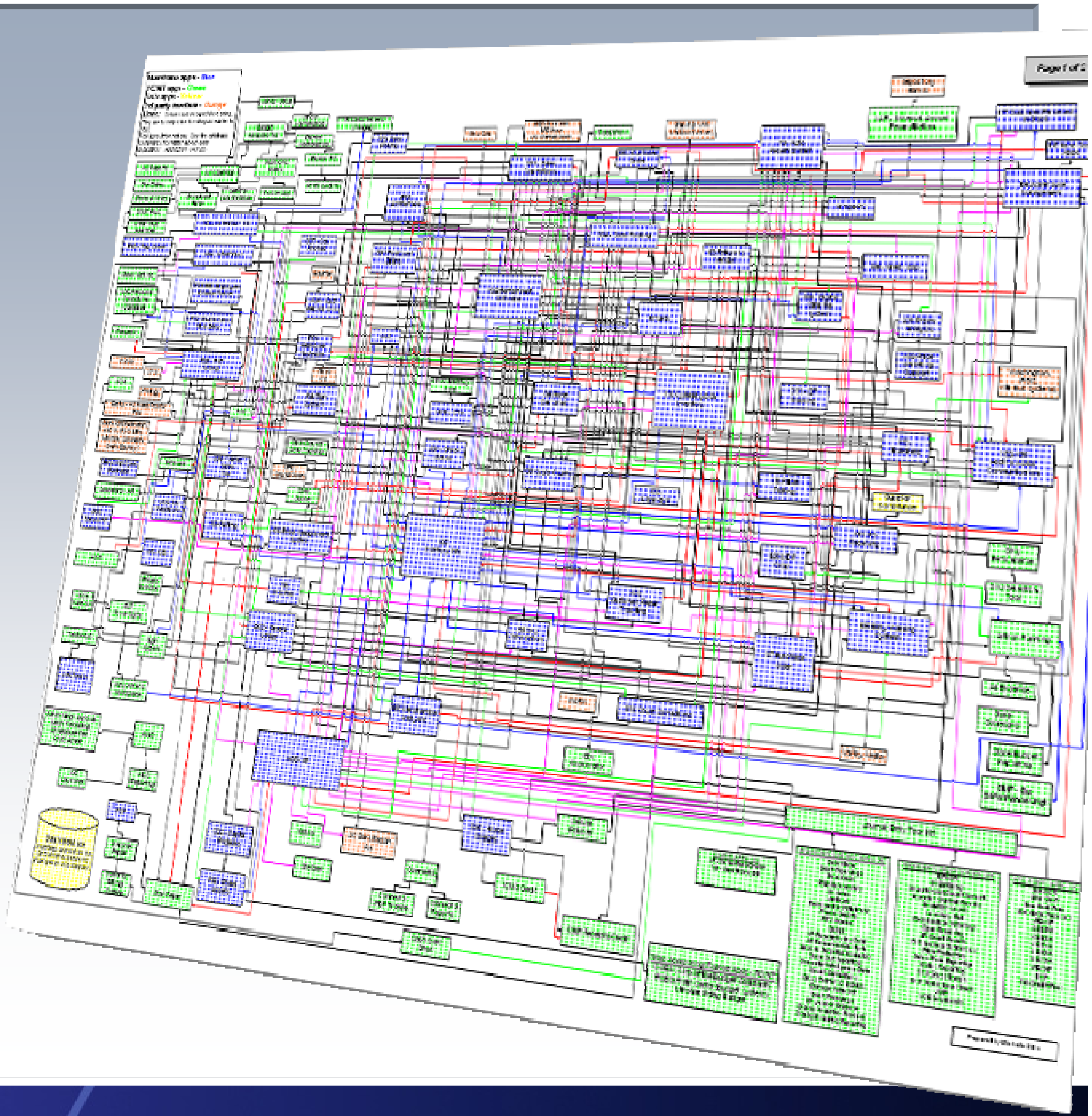
Agenda

- Business demands, application design and SOA
- What is Service Component Architecture?
- What WebSphere SCA Feature Pack Delivers
  - SCA User Scenarios
  - SCA Feature Pack Key Features
  - Tools
- Summary

Business Pressures, Application Design and SOA

What are the barriers to business flexibility and reuse?

- **Lack of business process standards**
- **Architectural policy limited**
- **Point application buys to support redundant LOB needs**
- **Infrastructure built with no roadmap**

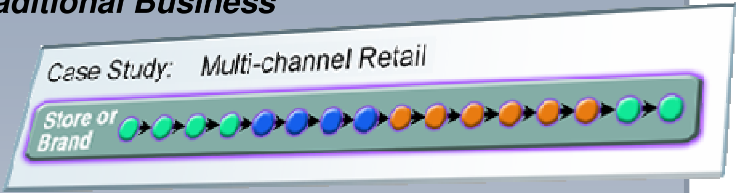


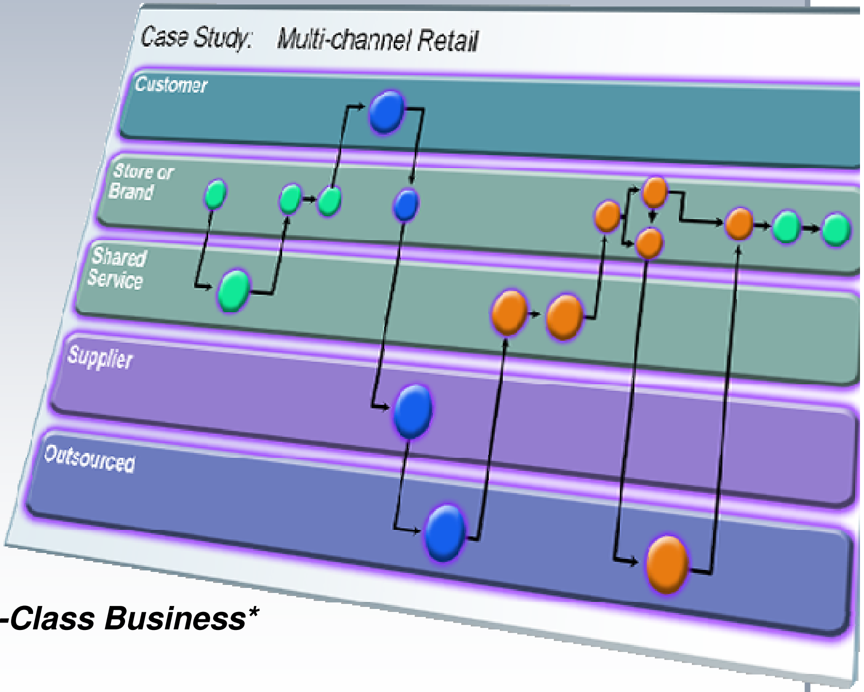
Why SOA for business flexibility and reuse?

Flexible business requires flexible IT

- Economics: globalization demands greater flexibility
- Business processes: daily changes vs. yearly changes
- Growth through flexibility is at the top of the CEO agenda
- Reusable assets can cut costs by up to 20%
- Crucial for flexibility and becoming an On Demand Business

*Traditional Business**





*Today's World-Class Business**

*Sources: CBDi

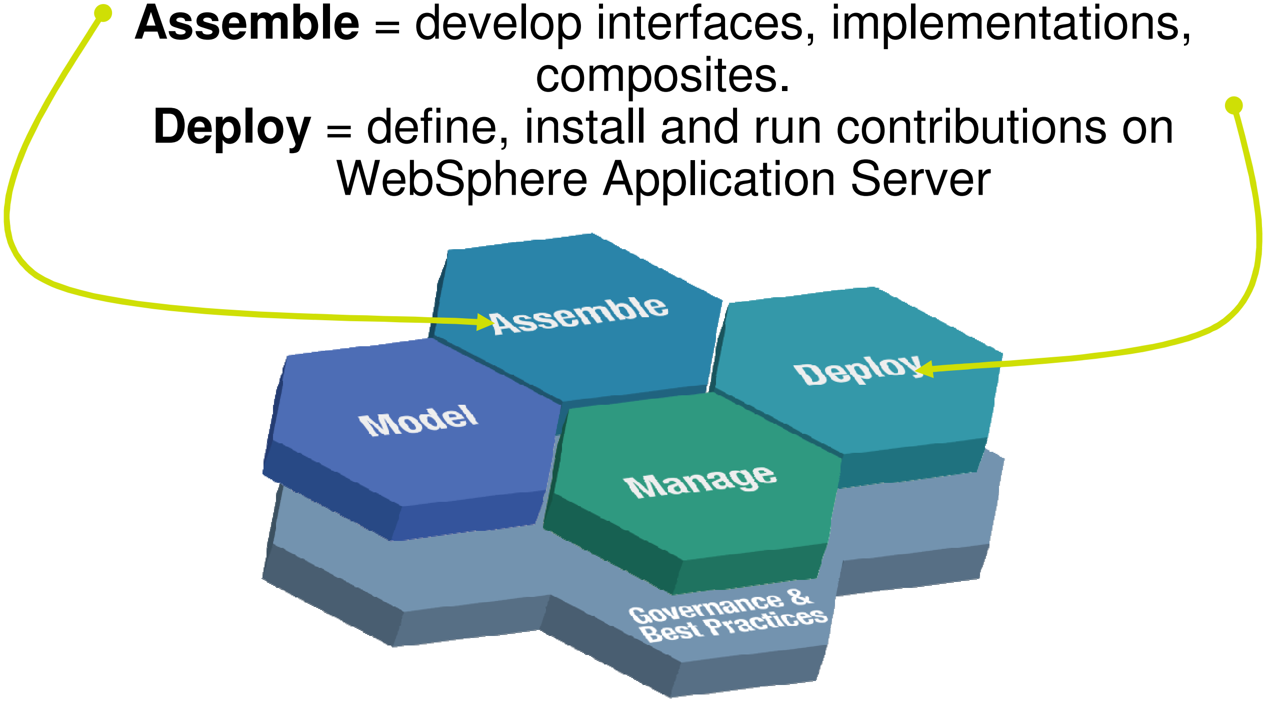
What is SCA

SCA Terms and Relations to SOA Foundation

SCA is the development, deployment model of the **SOA** Foundation.

SCA is the open standard model for service assembly.

Assemble = develop interfaces, implementations, composites.
Deploy = define, install and run contributions on WebSphere Application Server



Open SCA v1.0

- OSOA - Consortium of industry vendors
  - http://www.osoa.org

- OSOA vendors have taken the specifications to OASIS for standardization and various Technical Committees have been created and are underway at the Open CSA Member Section.
  - www.oasis-opencsa.org

- An Apache project called **Tuscany** which hosts the multi-lingual open source for SCA v1.0
  - tuscany.apache.org/

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SIEMENS software AG Sun microsystems SYBASE TIBCO The Power of Now xcalia Zend The php Company

OASIS Open CSA

SCA: What it is

- Service Component Architecture.
- A concrete manifestation of an SOA way of thinking.
- Designed for building agile service oriented applications.
- A framework for implementing, assembling, composing and deploying services.
- Supports loose or tight coupling of coarse or fine grained services.
- Extends, exploits and complements existing technologies and standards.
- Language, Application Environment, Framework and Vendor neutral.
- Supports Java and Web Services, and more
- An extensible set of:
  - Protocol bindings (eg. SCA, WS, RMI, …)
  - Implementation languages (eg. Composite, Java, …)
  - Interface definitions (eg. WSDL, Java, …)
  - Pluggable Data bindings (eg. PoJo, JAXB, …)
  - Policies and Intents (eg. Integrity, Confidentiality).
- “Classic SCA” refers to Service Component Architecture as it is defined and built by IBM supported in a variety of WebSphere Family products starting with V6.
- “Open SCA” refers to Service Component Architecture as defined by the industry at both the OSOA collaboration

SCA: What it is NOT

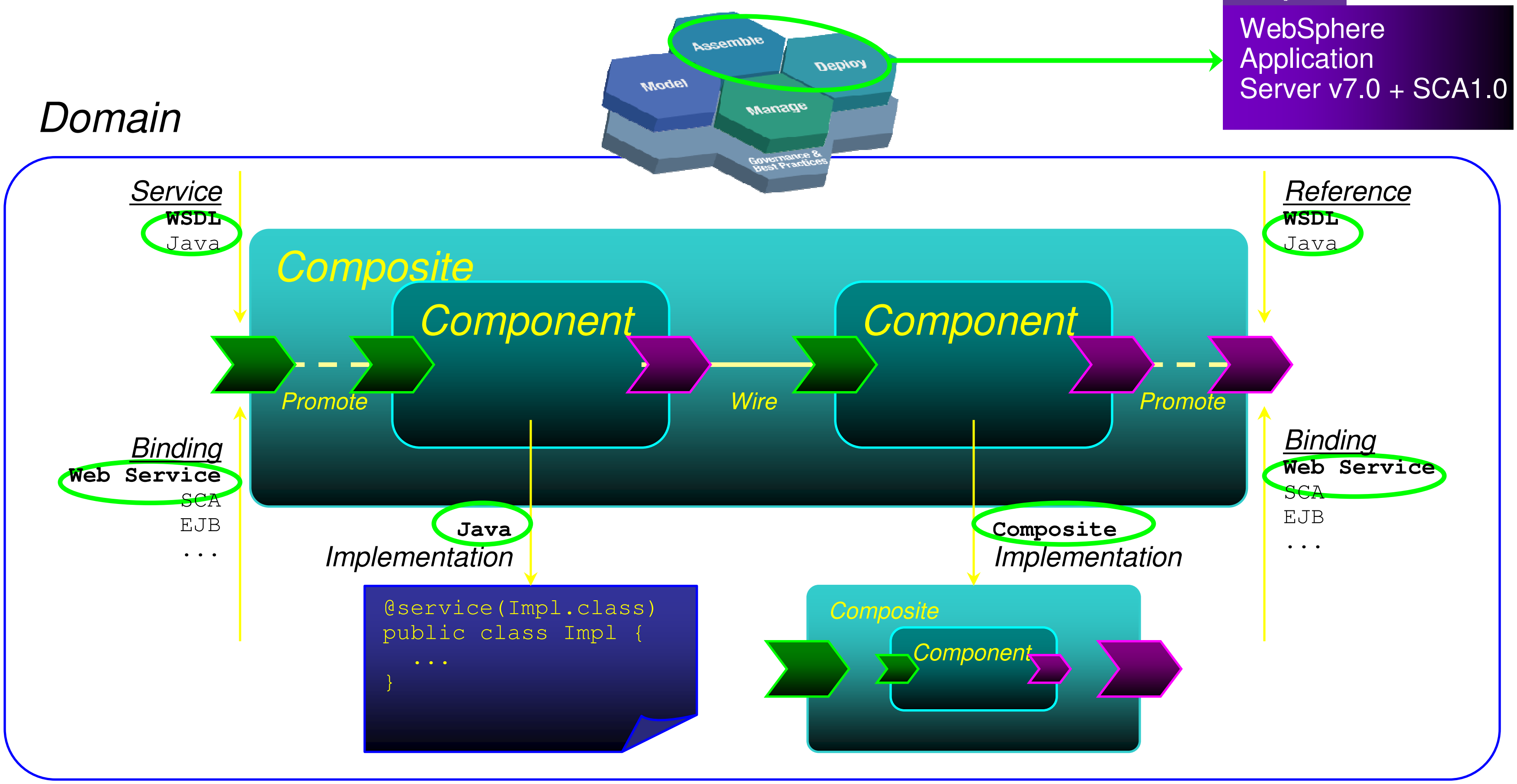
- Does not model individual ***workflows***
  - use BPEL or other workflow languages
- Is not ***Web services***
  - SCA can use / may use Web services, but can also build solutions with no Web services content
- Is not tied to a specific runtime environment
  - distributed, heterogeneous, large, small
- Does not force use of specific programming languages and technologies
  - aims to encompass many languages, frameworks, technologies
  - embrace not replace
  - adaptable to new technology.

Key benefits of SCA

- ***Separation of Concerns*** Developers in an SOA need only be concerned with what they need to be.
- ***Loose Coupling*** components integrate without need to know how others are implemented
- ***Flexibility*** Components can easily be replaced by other components
- ***Services*** can be *easily* invoked either synchronously or asynchronously
- ***Composition*** of solutions: clearly described
- ***Productivity*** easier to integrate components to form composite application
- ***Heterogeneity*** multiple implementation languages, communication mechanisms
- ***Declarative*** application of infrastructure services
- ***Simplification*** for **all** developers, integrators and application deployers

SCA Key Concepts

Design → Implement → Compose → Run → Test



```
@service(Impl.class)
public class Impl {
   ...
}
```

Reusability, Connectivity, Flexibility, Extensibility

Simple SCA Programming Model

- Java implementation with annotations

```
// This is the service interface
@Remotable
public interface Store {
   public List<Item> getCatalogItems();
   public List<Entry<String,Item>> getCartItems();
   public String add(String itemName, int quantity);
   public String checkoutCart();
   public void deleteCart() throws NotFoundException;
   public String getTotal()
}
```

```
// This is the service implementation
@Service(Store.class)
public class StoreImpl implements Store {

    @Reference public Catalog catalog;
    @Reference public Cart shoppingCart;
    @Reference public Total shoppingTotal;

     …
}
```

- The composite definition

```
<composite xmlns="http://www.osoa.org/xmlns/sca/1.0" name="StoreComposite"
targetNamespace="http://soa.sca.samples.candystore/">

  <component name="StoreComponent">
       <implementation.java class="soa.sca.samples.candystore.StoreImpl"/>
       <reference name="catalog" target="StoreCatalog"/>
       <reference name="shoppingCart" target="StoreShoppingCart/Cart"/>
       <reference name="shoppingTotal" target="StoreShoppingCart/Total"/>
   </component>
  <component name="StoreCatalog">
      <implementation.java class="soa.sca.samples.candystore.CandyCatalogImpl"/>
      <property name="currencyCode">USD</property>
      <reference name="currencyConverter" target="StoreCurrencyConverter"/>
   </component>
    …
</composite>
```

SCA v1.0

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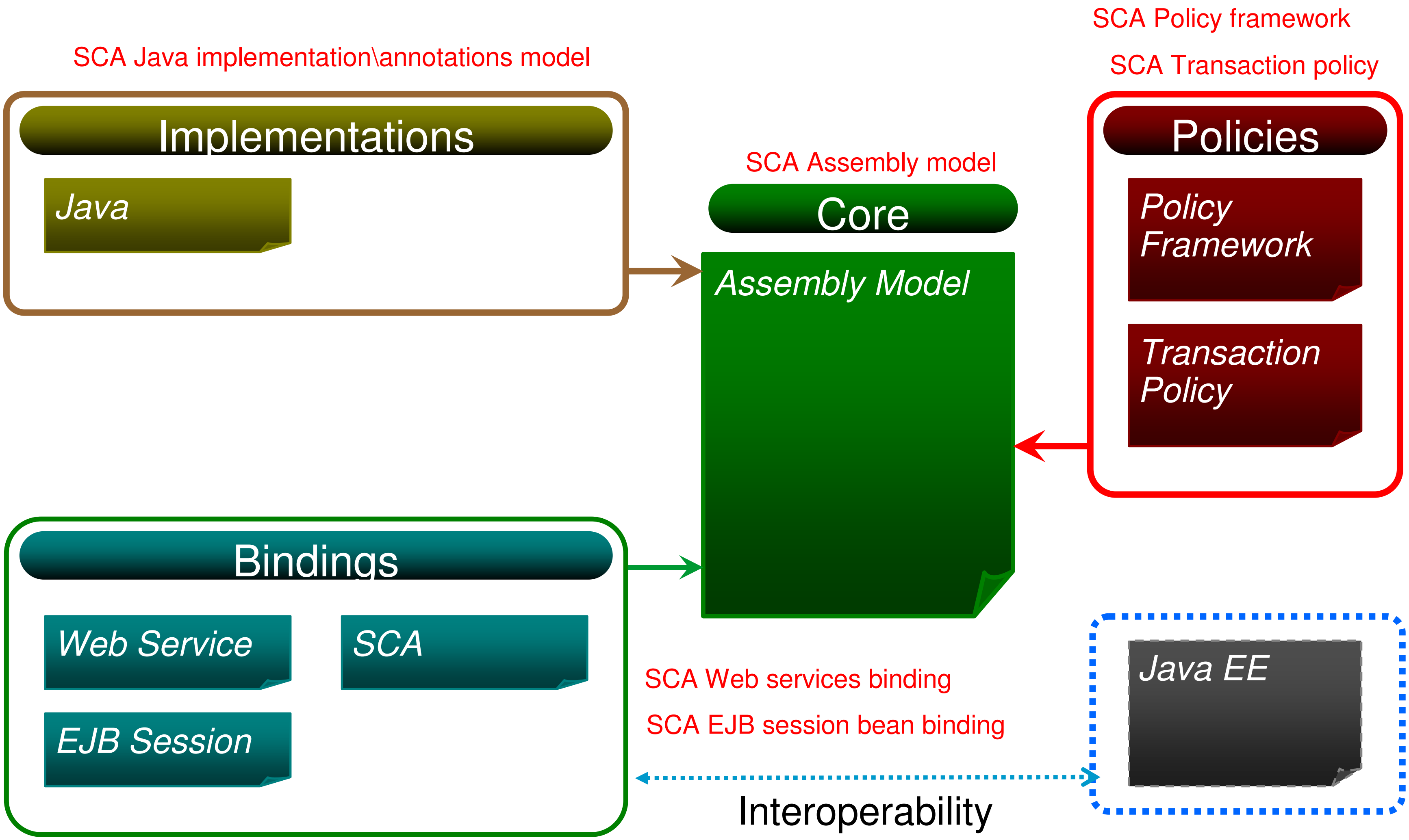
OASIS Open CSA

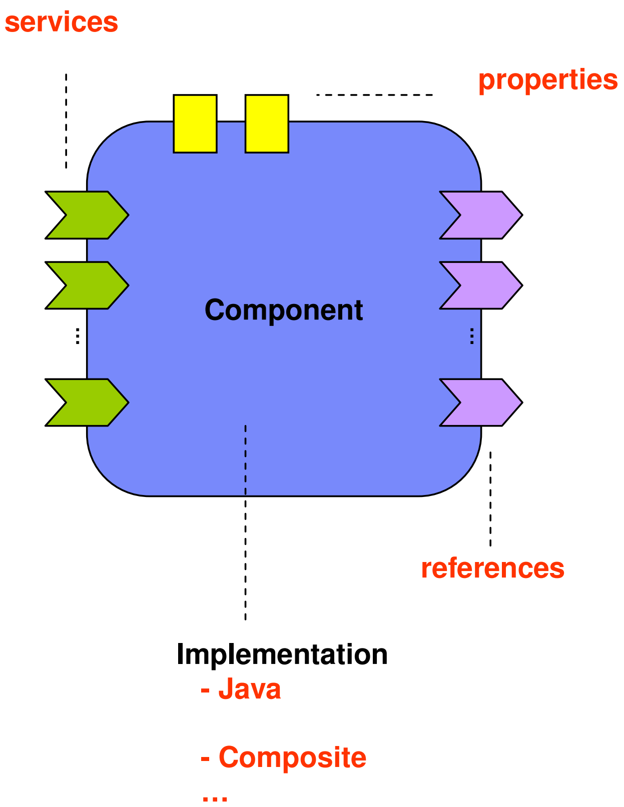
SCA v1.0 Specifications – Flexible & Extensible



What SCA Feature Pack Delivers

SCA Feature Pack User Scenario Themes

- Service composition
  - "Use what you've got and run it where it lives," or "Use your existing services to create new ones."
- Service development
  - "Know only what you need to know to get your job done," or "Maintain proper separation of concerns.
- Service agility and flexibility
  - ability to rewire, compose, and assemble business logic without impacting the business logic



SCA Feature Pack Support Overview

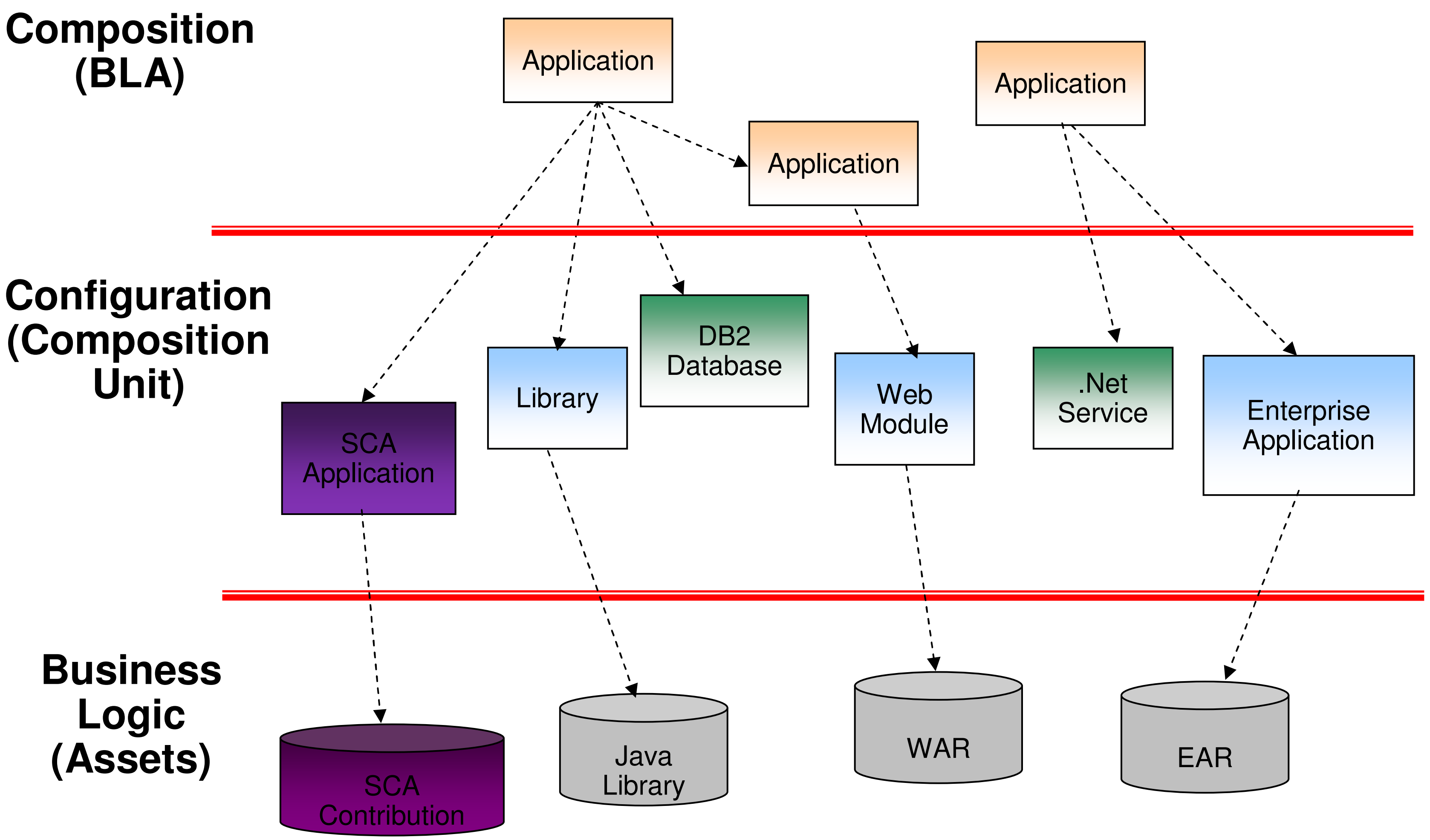
Features

- SCA Standards: SCA v1.0
  - Assembly Model specification
    - How to define structure of composite applications
  - Java Annotation, Java Component Implementation specifications
    - How to write business services in particular languages
    - Java, Composite
  - Binding specifications
    - How to wire services together
    - Web services, EJB2&3, default
  - Policy Framework and Transaction Policy specifications
    - How to add infrastructure services to solutions
    - Security, Transactions, Reliable messaging, etc.

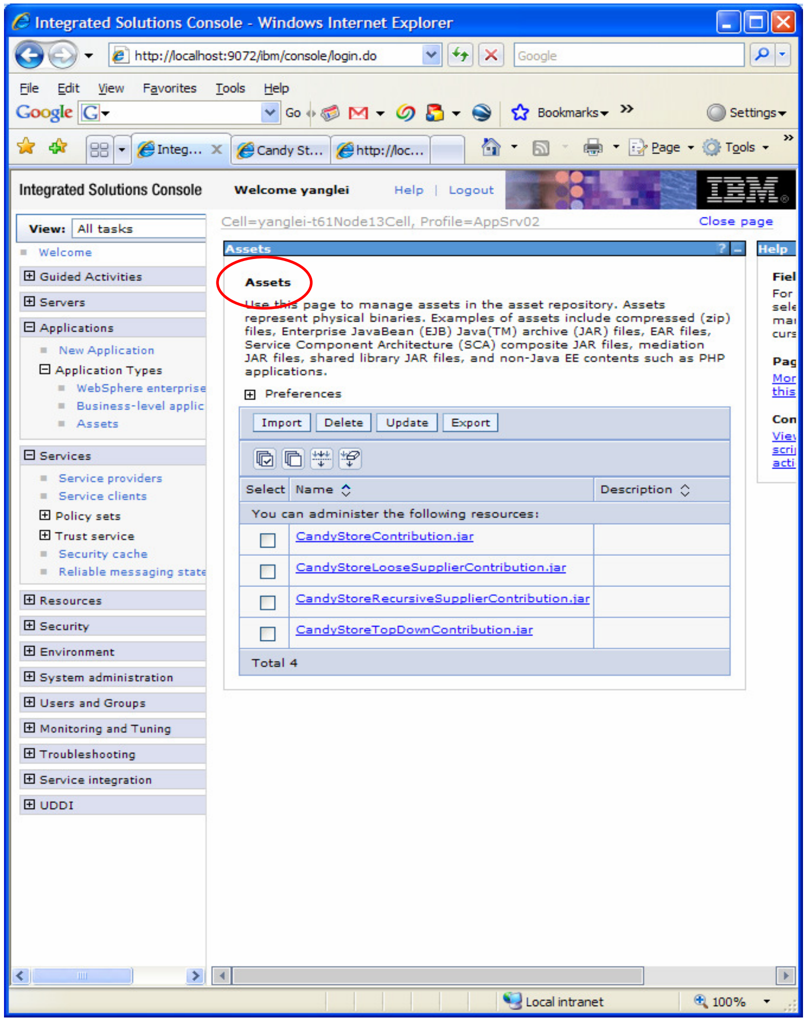
WebSphere Integration

- Business Level Application Management
  - Manage SCA POJO application first class as Assets. Composition Unit, BLA
- Security, Transaction, Reliability
- WebServices Policy support
- JAXB and POJO data binding
- Network Deployment
  - Highly available

Applications as Compositions - BLA



Sample BLA Managed SCA POJO Application



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Close page

Assets

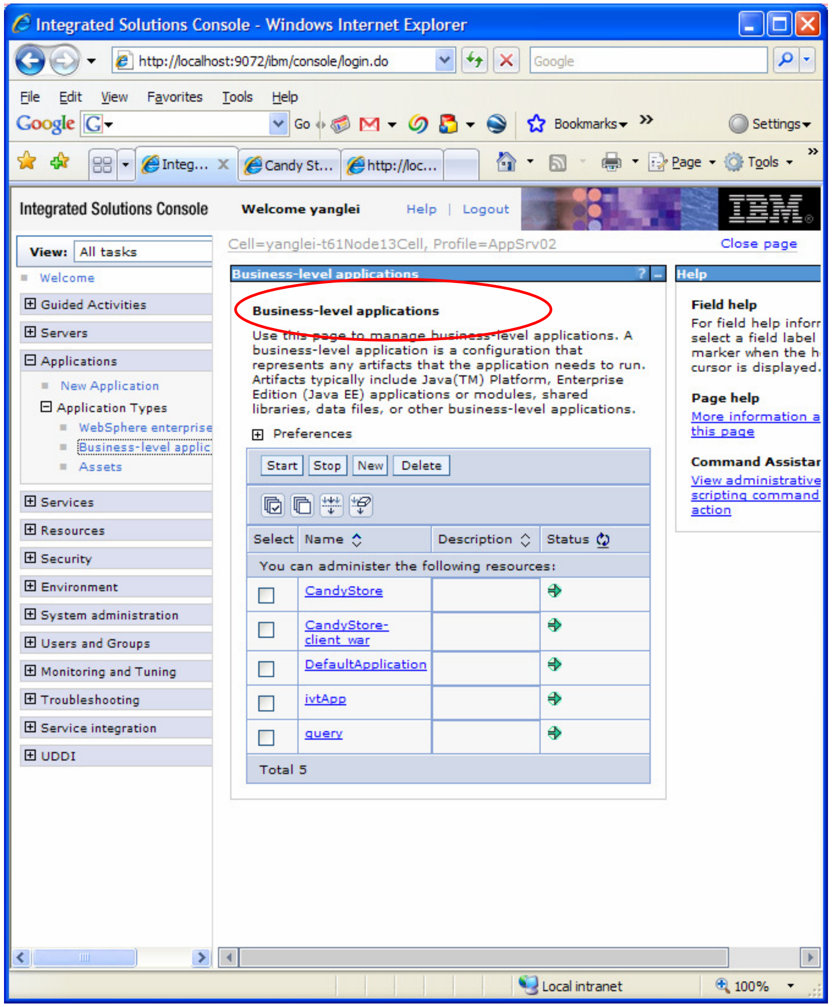
Assets

Use this page to manage assets in the asset repository. Assets represent physical binaries. Examples of assets include compressed (zip) files, Enterprise JavaBean (EJB) Java(TM) archive (JAR) files, EAR files, Service Component Architecture (SCA) composite JAR files, mediation JAR files, shared library JAR files, and non-Java EE contents such as PHP applications.

⊞ Preferences

Import | Delete | Update | Export

Select	Name	Description
You can administer the following resources:		
□	CandyStoreContribution.jar	
□	CandyStoreLooseSupplierContribution.jar	
□	CandyStoreRecursiveSupplierContribution.jar	
□	CandyStoreTopDownContribution.jar	
Total 4		



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Close page

Business-level applications

Business-level applications

Use this page to manage business-level applications. A business-level application is a configuration that represents any artifacts that the application needs to run. Artifacts typically include Java(TM) Platform, Enterprise Edition (Java EE) applications or modules, shared libraries, data files, or other business-level applications.

⊞ Preferences

Start | Stop | New | Delete

Select	Name	Description	Status
You can administer the following resources:			
□	CandyStore		➔
□	CandyStore-client_war		➔
□	DefaultApplication		➔
□	ivtApp		➔
□	query		➔
Total 5			

Help

Field help

For field help infor select a field label marker when the h cursor is displayed.

Page help

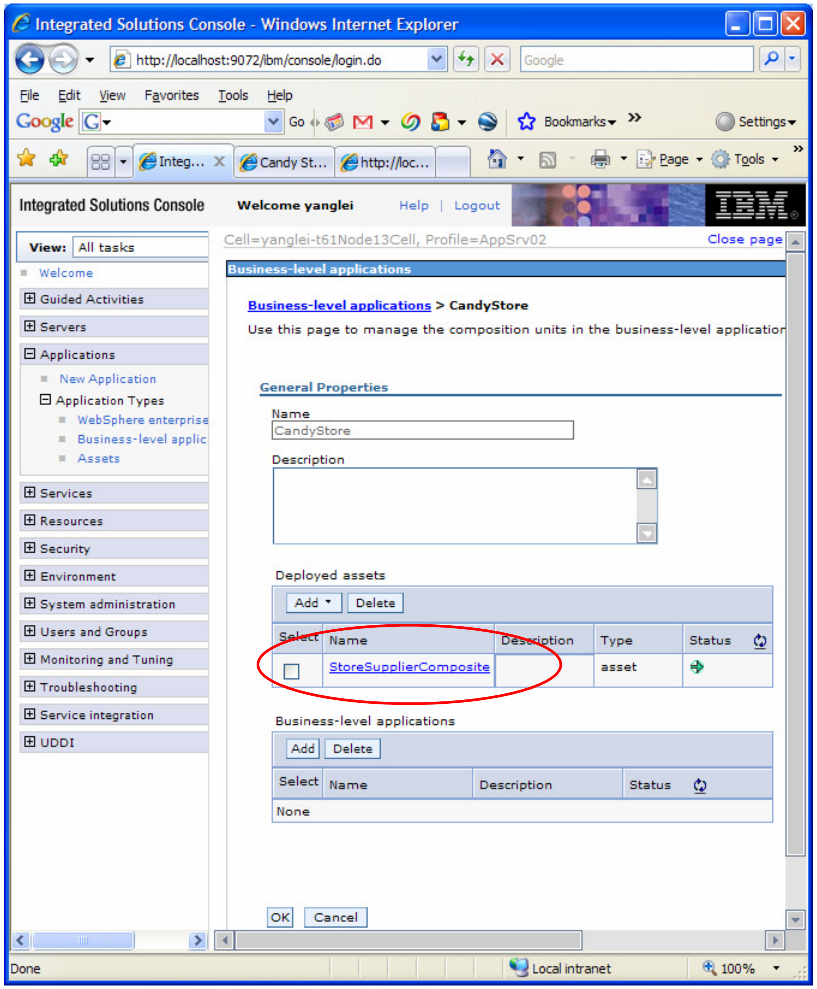
More information a this page

Command Assistar

View administrative scripting command action

SOA on your terms and our expertise

Sample BLA Managed SCA POJO Application



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Business-level applications

Business-level applications > CandyStore

Use this page to manage the composition units in the business-level application

General Properties

Name: CandyStore

Description:

Deployed assets

Add ▾ Delete

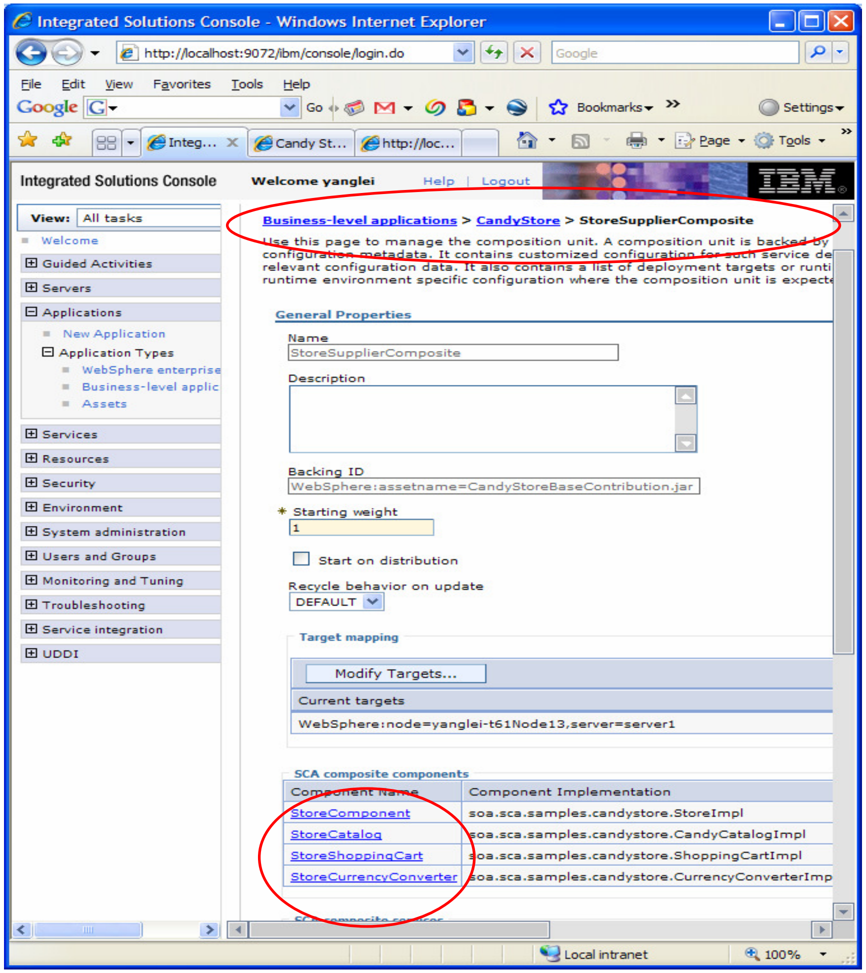
Select	Name	Description	Type	Status
□	StoreSupplierComposite		asset	➔

Business-level applications

Add Delete

Select	Name	Description	Status
None			

OK Cancel



Business-level applications > CandyStore > StoreSupplierComposite

Use this page to manage the composition unit. A composition unit is backed by configuration metadata. It contains customized configuration for such service de relevant configuration data. It also contains a list of deployment targets or runti runtime environment specific configuration where the composition unit is expecte

General Properties

Name: StoreSupplierComposite

Description:

Backing ID: WebSphere:assetname=CandyStoreBaseContribution.jar

* Starting weight: 1

□ Start on distribution

Recycle behavior on update: DEFAULT

Target mapping

Modify Targets...

Current targets

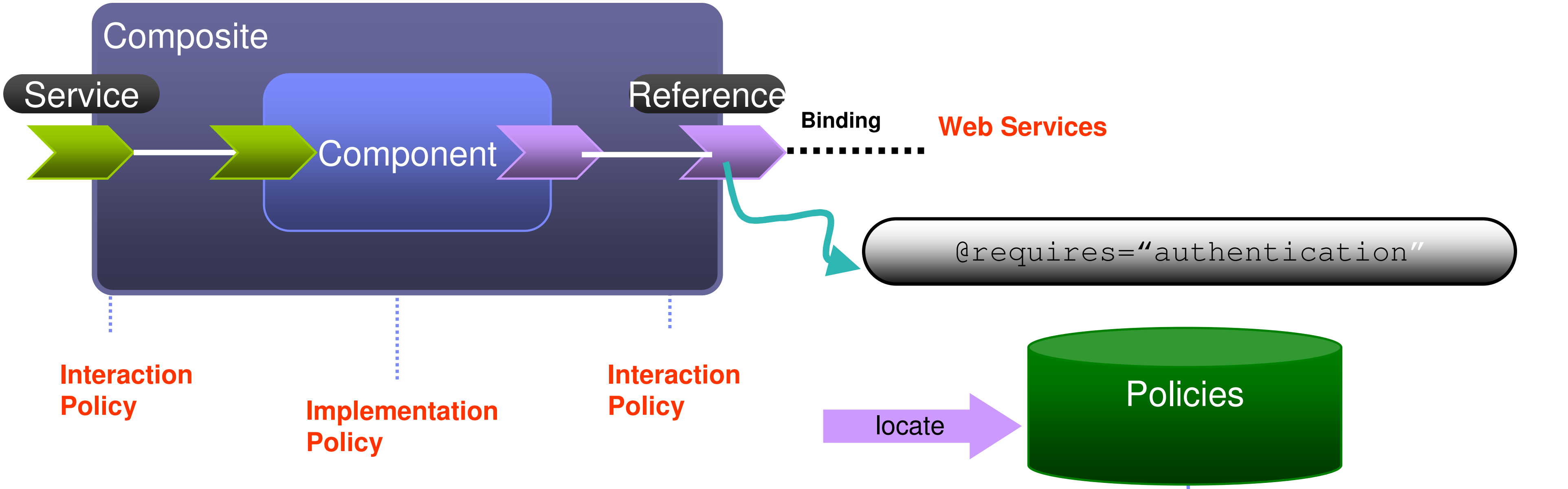
WebSphere:node=yanglei-t61Node13,server=server1

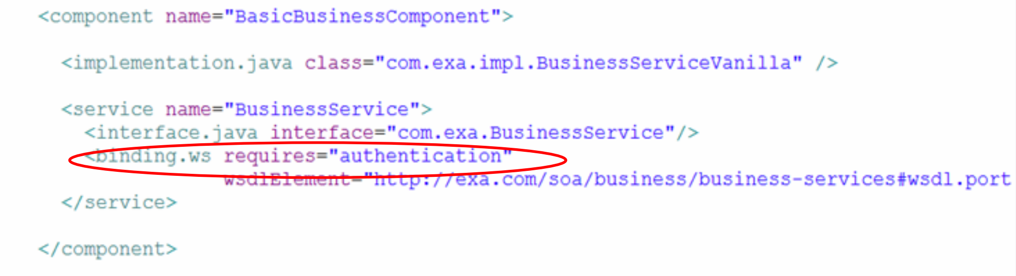
SCA composite components

Component Name	Component Implementation
StoreComponent	soa.sca.samples.candystore.StoreImpl
StoreCatalog	soa.sca.samples.candystore.CandyCatalogImpl
StoreShoppingCart	soa.sca.samples.candystore.ShoppingCartImpl
StoreCurrencyConverter	soa.sca.samples.candystore.CurrencyConverterImp

SCA composite services

Quality of Service (QoS) Integration



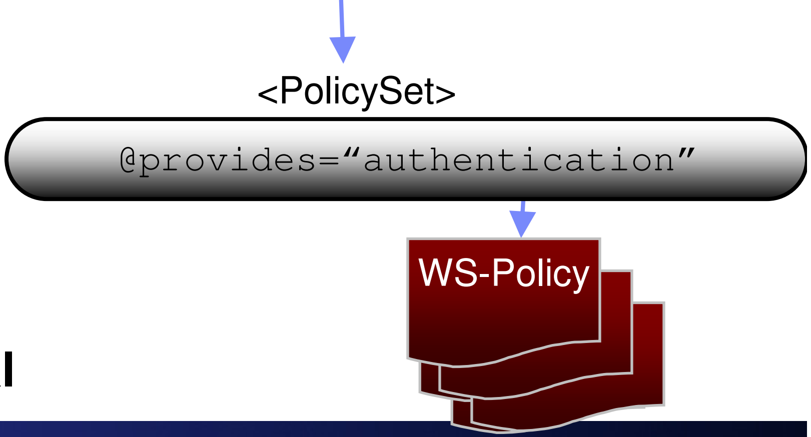


```
<component name="BasicBusinessComponent">

  <implementation.java class="com.exa.impl.BusinessServiceVanilla" />

  <service name="BusinessService">
    <interface.java interface="com.exa.BusinessService"/>
    <binding.ws requires="authentication"
                wsdlElement="http://exa.com/soa/business/business-services#wsdl.port
  </service>

</component>
```



Secure, Reliable, Transactional

SCA Application Lifecycle Management

Role/Stage

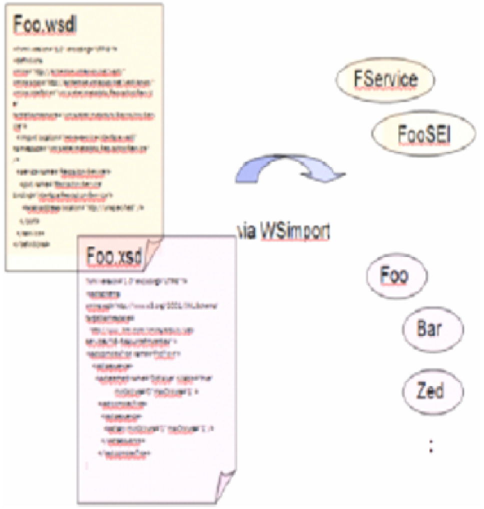
- Application Architect
  - Develop WSDL/XSD contracts (Top Down)
  - Develop java interfaces (Bottom Down)
- Application Developer
  - Generate top-down Java artifacts (Top Down)
  - Annotate java bean classes
- Assembler
  - Package portable classes, schemas and WSDLs into simple JAR packaging or reuse a WAR
- Deployer
  - Deploy packaged JAR or WAR
- Administrator
  - Administrate applications, manage service wiring and "policy"

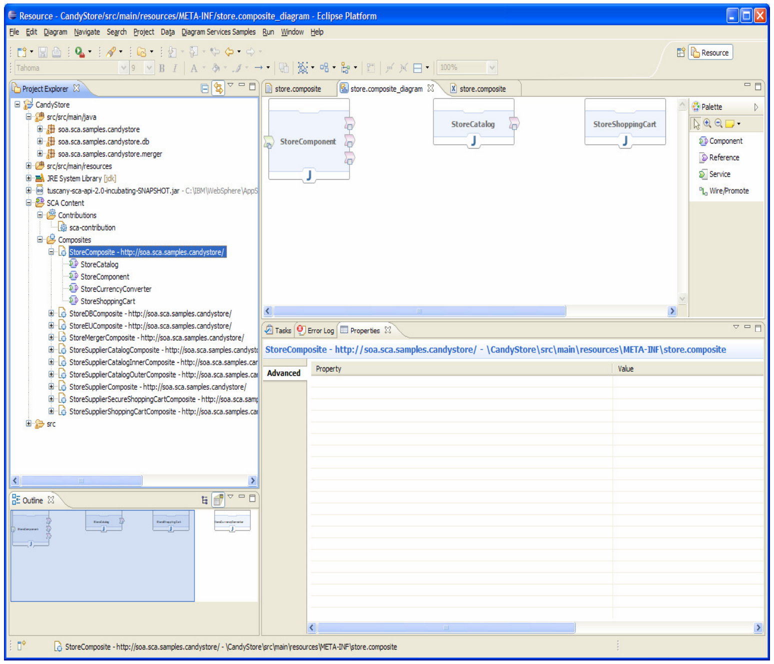
Key Values

- Business driven application design.
- Simple application development. Tooling can make things even more simple and easy
- Simple POJO packaging. Reusability
- POJO application as the first class manageable artifacts
- Ease of use: Managing QoS through console or command

Tooling

- Command-line tooling
  - JAXB 2.0 XSD->Java generation (xjc)
  - JAX-WS 2.0 WSDL->Java (wsimport)
  - JAX-WS 2.0 Java->WSDL (wsgen)
- RAD SCA Tool
  - Open Beta: http://www.ibm.com/developerworks/forums/forum.jspa?forumID=1542&start=0
  - Key Features:
    - Composite Editor
    - Java component implementation with annotation and JAXB data binding
    - Package SCA assets into contributions and run or debug them on the SCA Feature Pack enabled WebSphere Application Server.




Resource - CandyStore/src/main/resources/META-INF/store.composite_diagram - Eclipse Platform
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Project Explorer
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soa.sca.samples.candystore.db
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src/src/main/resources
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SCA Content
Contributions
sca-contribution
Composites
StoreComposite - http://soa.sca.samples.candystore/
StoreCatalog
StoreComponent
StoreCurrencyConverter
StoreShoppingCart
StoreDBComposite - http://soa.sca.samples.candystore/
StoreEUComposite - http://soa.sca.samples.candystore/
StoreMergerComposite - http://soa.sca.samples.candystore/
StoreSupplierCatalogComposite - http://soa.sca.samples.candyst
StoreSupplierCatalogInnerComposite - http://soa.sca.samples.car
StoreSupplierCatalogOuterComposite - http://soa.sca.samples.ca
StoreSupplierComposite - http://soa.sca.samples.candystore/
StoreSupplierSecureShoppingCartComposite - http://soa.sca.samp
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StoreCatalog
StoreShoppingCart
Palette
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Resource
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Advanced
Property
Value
StoreComposite - http://soa.sca.samples.candystore/ - \CandyStore\src\main\resources\META-INF\store.composite

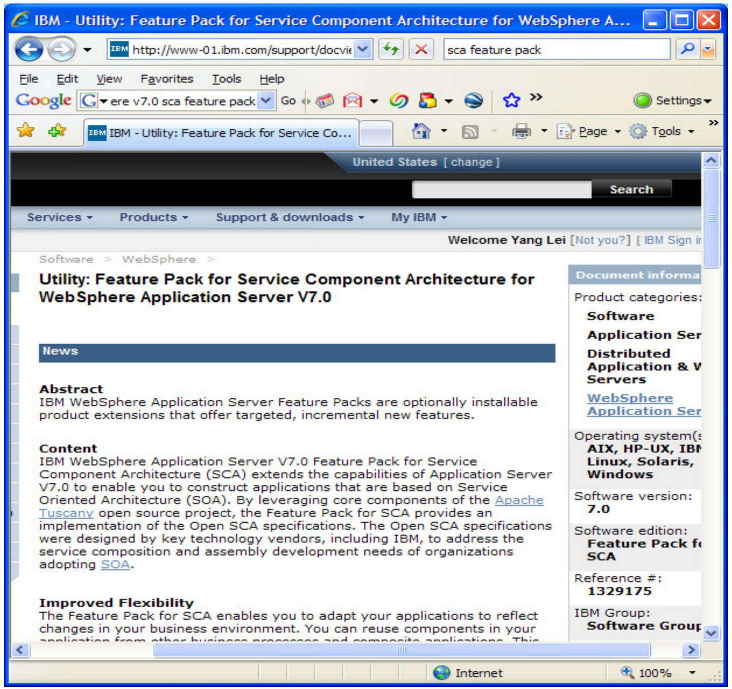
Summary

Summary

- Business pressures from competition, marketplace, mergers and acquisitions, etc. requires applications to adapt to rapid change.
- SCA applications are resilient to change.
  - Insulated from technology and infrastructural changes.
  - Architected to accommodate new technologies as they emerge.
  - Open

- Supported Versions of WebSphere Application Server
  - WebSphere Application Server 7.0

- WebSphere Application Server Editions
  - Express
  - Base
  - z/OS
  - Network Deployment


IBM - Utility: Feature Pack for Service Component Architecture for WebSphere A...
http://www-01.ibm.com/support/docvie
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File Edit View Favorites Tools Help
Google ere v7.0 sca feature pack Go
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Utility: Feature Pack for Service Component Architecture for WebSphere Application Server V7.0

News

Abstract
IBM WebSphere Application Server Feature Packs are optionally installable product extensions that offer targeted, incremental new features.

Content
IBM WebSphere Application Server V7.0 Feature Pack for Service Component Architecture (SCA) extends the capabilities of Application Server V7.0 to enable you to construct applications that are based on Service Oriented Architecture (SOA). By leveraging core components of the Apache Tuscany open source project, the Feature Pack for SCA provides an implementation of the Open SCA specifications. The Open SCA specifications were designed by key technology vendors, including IBM, to address the service composition and assembly development needs of organizations adopting SOA.

Improved Flexibility
The Feature Pack for SCA enables you to adapt your applications to reflect changes in your business environment. You can reuse components in your

Document informa
Product categories:
Software
Application Ser
Distributed Application & W Servers
WebSphere Application Ser

Operating system(s
AIX, HP-UX, IBM Linux, Solaris, Windows

Software version:
7.0

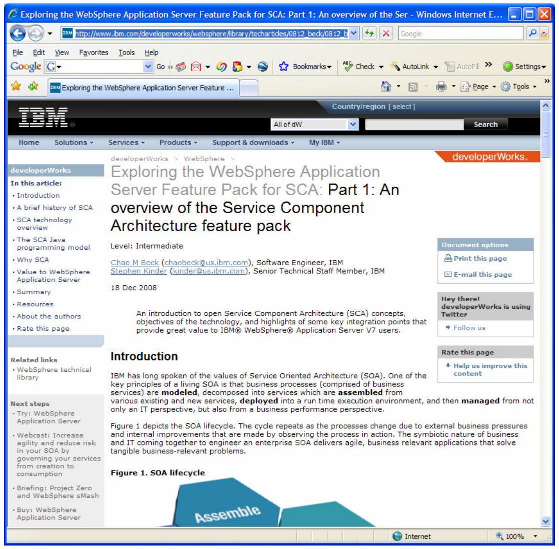
Software edition:
Feature Pack f SCA

Reference #:
1329175

IBM Group:
Software Grou

Best Practices

- Check Release Note and InfoCenter information for documented restrictions and/or limitations
- Check shipped samples for similar desired support
  - Binding samples
  - Green thread samples
- Check IBM developerWorks for information
  - N-parts series on SCA Feature Pack
    - Part 1 SCA Feature Pack Overview
      http://www.ibm.com/developerworks/websphere/library/techarticles/0812_beck/0812_beck.html
  - More coming


Exploring the WebSphere Application Server Feature Pack for SCA: Part 1: An overview of the Ser - Windows Internet E...
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Exploring the WebSphere Application Server Feature Pack for SCA: Part 1: An overview of the Service Component Architecture feature pack

Level: Intermediate

Chao M Beck (chaobeck@us.ibm.com), Software Engineer, IBM
Stephen Kinder (kinder@us.ibm.com), Senior Technical Staff Member, IBM

18 Dec 2008

An introduction to open Service Component Architecture (SCA) concepts, objectives of the technology, and highlights of some key integration points that provide great value to IBM® WebSphere® Application Server V7 users.

Introduction

IBM has long spoken of the values of Service Oriented Architecture (SOA). One of the key principles of a living SOA is that business processes (comprised of business services) are **modeled**, decomposed into services which are **assembled** from various existing and new services, **deployed** into a run time execution environment, and then **managed** from not only an IT perspective, but also from a business performance perspective.

Figure 1 depicts the SOA lifecycle. The cycle repeats as the processes change due to external business pressures and internal improvements that are made by observing the process in action. The symbiotic nature of business and IT coming together to engineer an enterprise SOA delivers agile, business relevant applications that solve tangible business-relevant problems.

Figure 1. SOA lifecycle

developerWorks

In this article:
- Introduction
- A brief history of SCA
- SCA technology overview
- The SCA Java programming model
- Why SCA
- Value to WebSphere Application Server
- Summary
- Resources
- About the authors
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- Webcast: Increase agility and reduce risk in your SOA by governing your services from creation to consumption
- Briefing: Project Zero and WebSphere sMash
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References

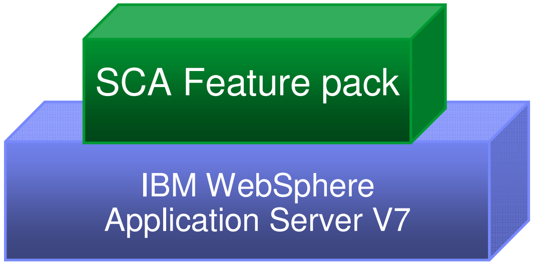
- Open Service Oriented Architecture Web site f Specifications
  - http://www.osoa.org/
- OASIS Open CSA Web site for SCA v1.x
  - http://www.oasis-opencsa.org/sca
- Apache Tuscany Web site
  - http://incubator.apache.org/tuscany/
- SCA feature pack support website
  - http://www-01.ibm.com/support/docview.wss?rs=180&context=SSEQTP&dc=DB600&uid=swg21329175
- DeveloperWorks
  - http://www.ibm.com/developerworks/websphere

Questions

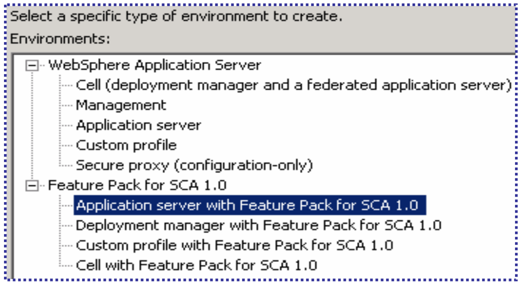
Backup

SCA Feature Pack Installation

- Install WebSphere Application Server V7
- Download SCA feature pack from the website
  - **Unzip the SCA Feature Pack** into an empty directory
    - ending up with an SCA (directory)
  - **Install the SCA Feature Pack:**
    - Run install.exe in the SCA directory
  - **Create new / augment existing profile with SCA features**



** New SCA Feature pack sits directly on top of WebSphere application Server v7



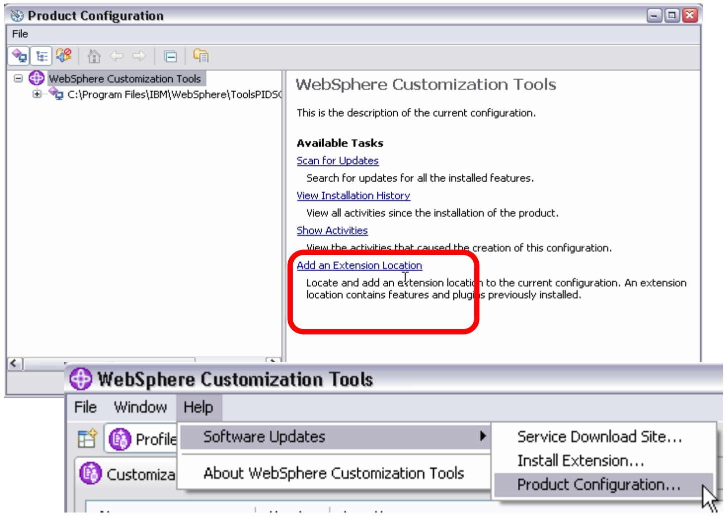
Select a specific type of environment to create.

Environments:

- WebSphere Application Server
  - Cell (deployment manager and a federated application server)
  - Management
  - Application server
  - Custom profile
  - Secure proxy (configuration-only)
- Feature Pack for SCA 1.0
  - Application server with Feature Pack for SCA 1.0
  - Deployment manager with Feature Pack for SCA 1.0
  - Custom profile with Feature Pack for SCA 1.0
  - Cell with Feature Pack for SCA 1.0

WebSphere for z/OS – Feature Pack for SCA

- WebSphere Support Team published a recorded presentation of SCA Feature Pack installation and configuration on z/OS
  - http://publib.boulder.ibm.com/infocenter/ieduasst/v1r1m0/index.jsp?topic=/com.ibm.iea.wasfpsca/wasfpsca/7.0/Installation/WASv7SCA_zOS_Installation/player.html
- In summary, the document provides:
  - A summary of what the "FPSCA" is and how it relates to a WebSphere z/OS configuration
  - Detailed installation steps using WebSphere Customization Tool
  - How to configure SCA Feature Pack by creating/augmenting a profile
  - Special note on setting up EJB role for EJB binding
  - Information on how to validate the driver level



WebSphere Customization Tools

This is the description of the current configuration.

Available Tasks

Scan for Updates

Search for updates for all the installed features.

View Installation History

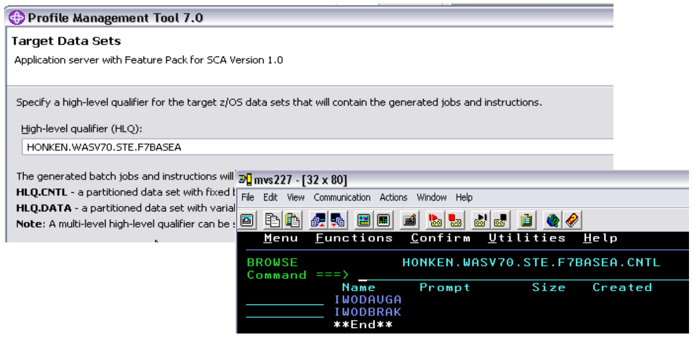
View all activities since the installation of the product.

Show Activities

View the activities that caused the creation of this configuration.

Add an Extension Location

Locate and add an extension location to the current configuration. An extension location contains features and plugins previously installed.


Profile Management Tool 7.0
mvs227 - [32 x 80]
File Edit View Communication Actions Window Help

Target Data Sets

Application server with Feature Pack for SCA Version 1.0

Specify a high-level qualifier for the target z/OS data sets that will contain the generated jobs and instructions.

High-level qualifier (HLQ): HONKEN.WASV70.STE.F7BASEA

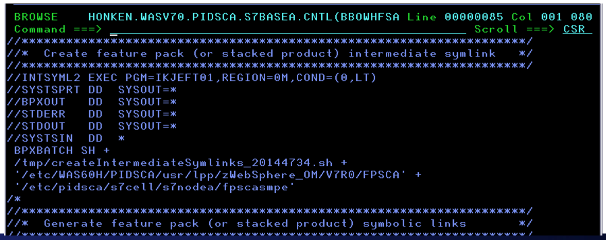
The generated batch jobs and instructions will

HLQ.CNTL - a partitioned data set with fixed b

HLQ.DATA - a partitioned data set with varial

Note: A multi-level high-level qualifier can be s

```
  Menu  Functions  Confirm  Utilities  Help
BROWSE              HONKEN.WASV70.STE.F7BASEA.CNTL
Command ===> _
                Name         Prompt        Size    Created
__________     IWODAUGA
__________     IWODBRAK
               **End**
```

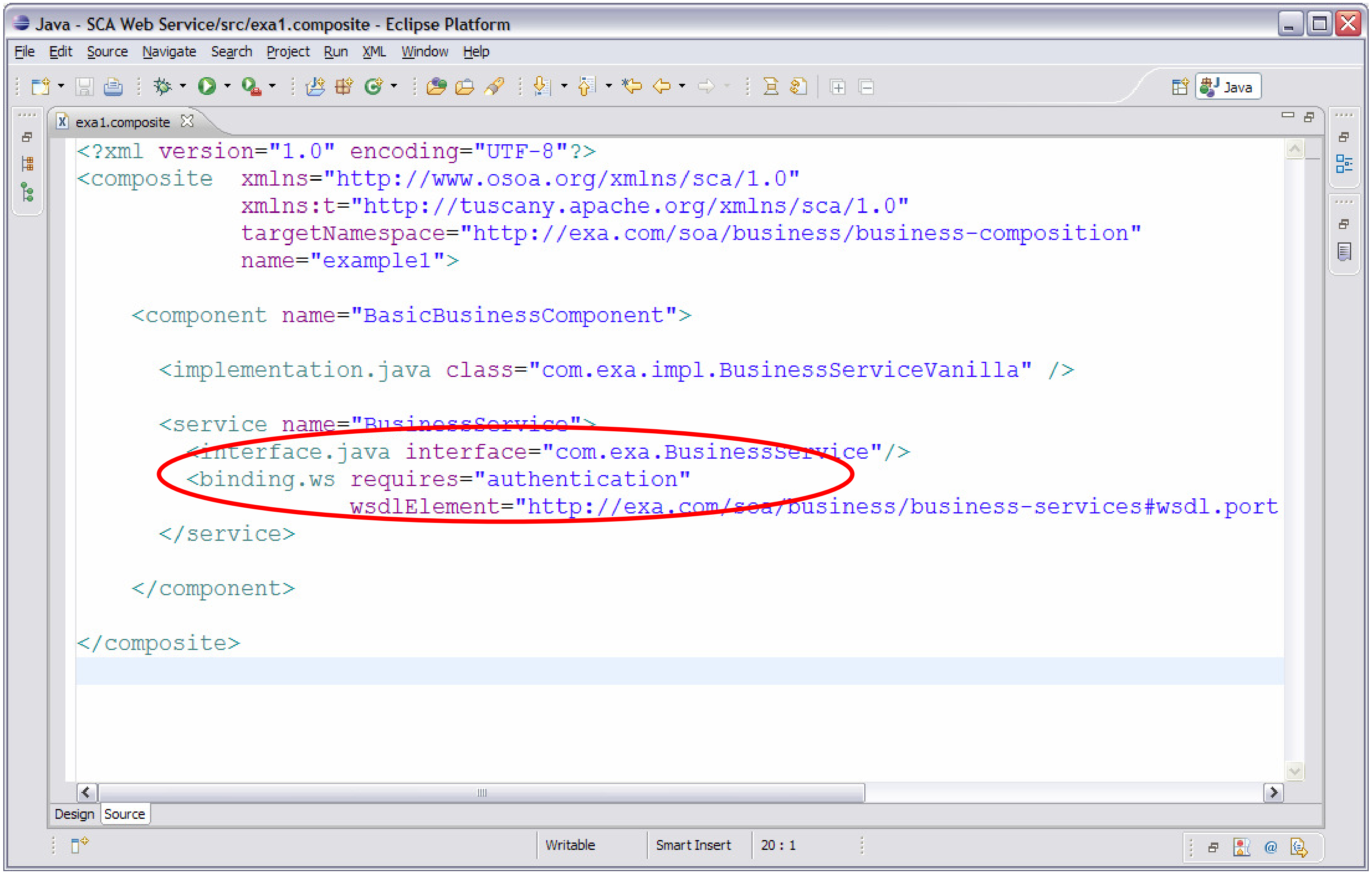


```
BROWSE    HONKEN.WASV70.PIDSCA.S7BASEA.CNTL(BBOWHFSA Line 00000085 Col 001 080
Command ===> _                                                Scroll ===> CSR
//*******************************************************************/
//*  Create feature pack (or stacked product) intermediate symlink   */
//*******************************************************************/
//INTSYML2 EXEC PGM=IKJEFT01,REGION=0M,COND=(0,LT)
//SYSTSPRT DD  SYSOUT=*
//BPXOUT   DD  SYSOUT=*
//STDERR   DD  SYSOUT=*
//STDOUT   DD  SYSOUT=*
//SYSTSIN  DD  *
 BPXBATCH SH +
 /tmp/createIntermediateSymlinks_20144734.sh +
 '/etc/WAS60H/PIDSCA/usr/lpp/zWebSphere_OM/V7R0/FPSCA' +
 '/etc/pidsca/s7cell/s7nodea/fpscasmpe'
/*
//*******************************************************************/
//*  Generate feature pack (or stacked product) symbolic links       */
```

Security Policy Scenario

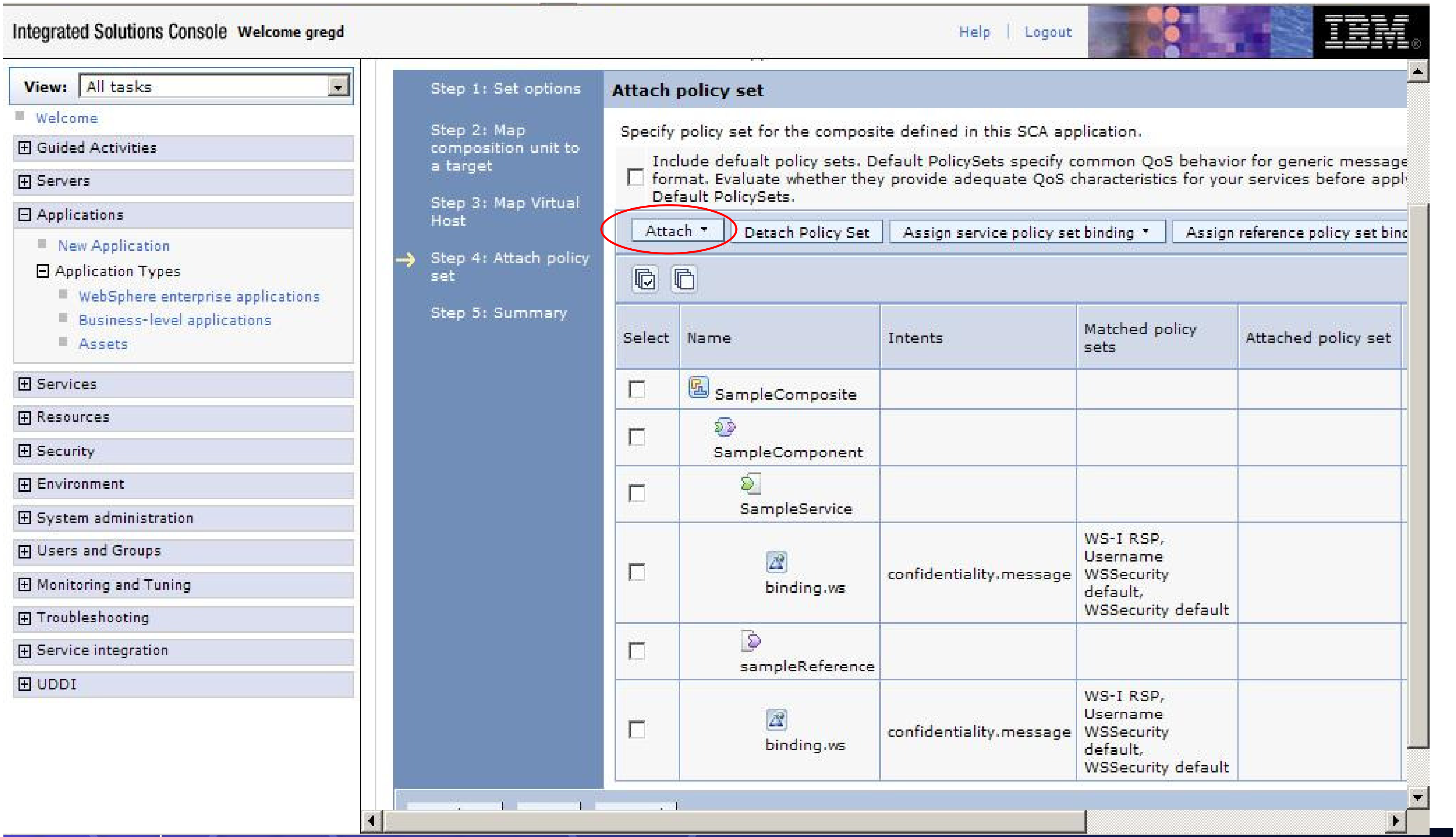
- Add a requirement (SCA intent) for authentication
- Bind the intent to a concrete policy

Security Policy Example – SCA Intent


Java - SCA Web Service/src/exa1.composite - Eclipse Platform
File Edit Source Navigate Search Project Run XML Window Help
Java
exa1.composite
Design Source
Writable
Smart Insert
20 : 1

```
<?xml version="1.0" encoding="UTF-8"?>
<composite  xmlns="http://www.osoa.org/xmlns/sca/1.0"
            xmlns:t="http://tuscany.apache.org/xmlns/sca/1.0"
            targetNamespace="http://exa.com/soa/business/business-composition"
            name="example1">

    <component name="BasicBusinessComponent">

      <implementation.java class="com.exa.impl.BusinessServiceVanilla" />

      <service name="BusinessService">
        <interface.java interface="com.exa.BusinessService"/>
        <binding.ws requires="authentication"
                    wsdlElement="http://exa.com/soa/business/business-services#wsdl.port
      </service>

    </component>

</composite>
```

Administrative console: intents



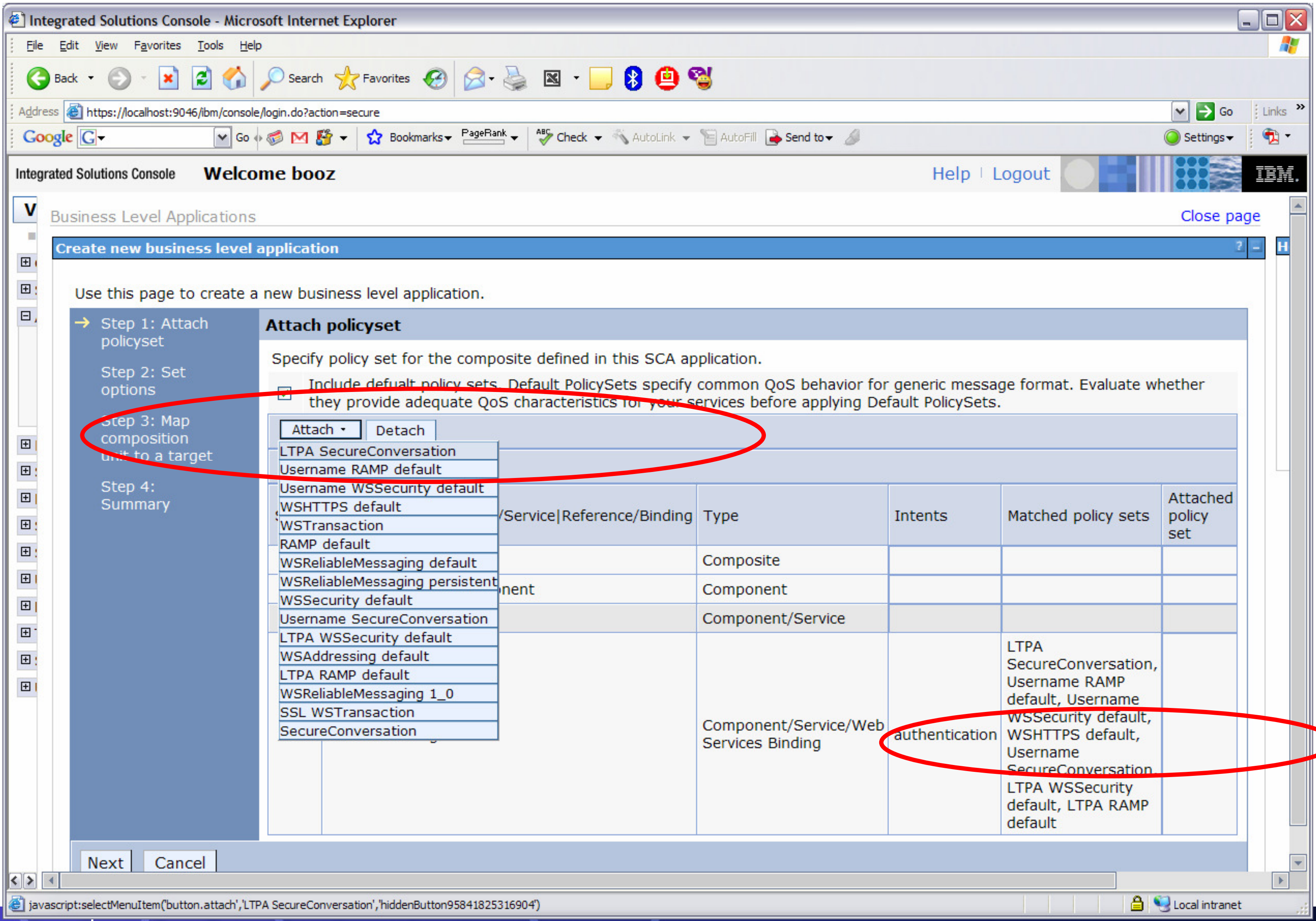
Attach policy set

Specify policy set for the composite defined in this SCA application.

□ Include defualt policy sets. Default PolicySets specify common QoS behavior for generic message format. Evaluate whether they provide adequate QoS characteristics for your services before appl Default PolicySets.

Select	Name	Intents	Matched policy sets	Attached policy set
□	SampleComposite			
□	SampleComponent			
□	SampleService			
□	binding.ws	confidentiality.message	WS-I RSP, Username WSSecurity default, WSSecurity default	
□	sampleReference			
□	binding.ws	confidentiality.message	WS-I RSP, Username WSSecurity default, WSSecurity default	

Security Policy Example – Map to PolicySet


Integrated Solutions Console - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Back Search Favorites
Address https://localhost:9046/ibm/console/login.do?action=secure
Go Links
Google G Go Bookmarks PageRank Check AutoLink AutoFill Send to Settings
Integrated Solutions Console Welcome booz
Help | Logout
Business Level Applications
Close page

Create new business level application

Use this page to create a new business level application.

→ Step 1: Attach policyset

Step 2: Set options

Step 3: Map composition unit to a target

Step 4: Summary

Attach policyset

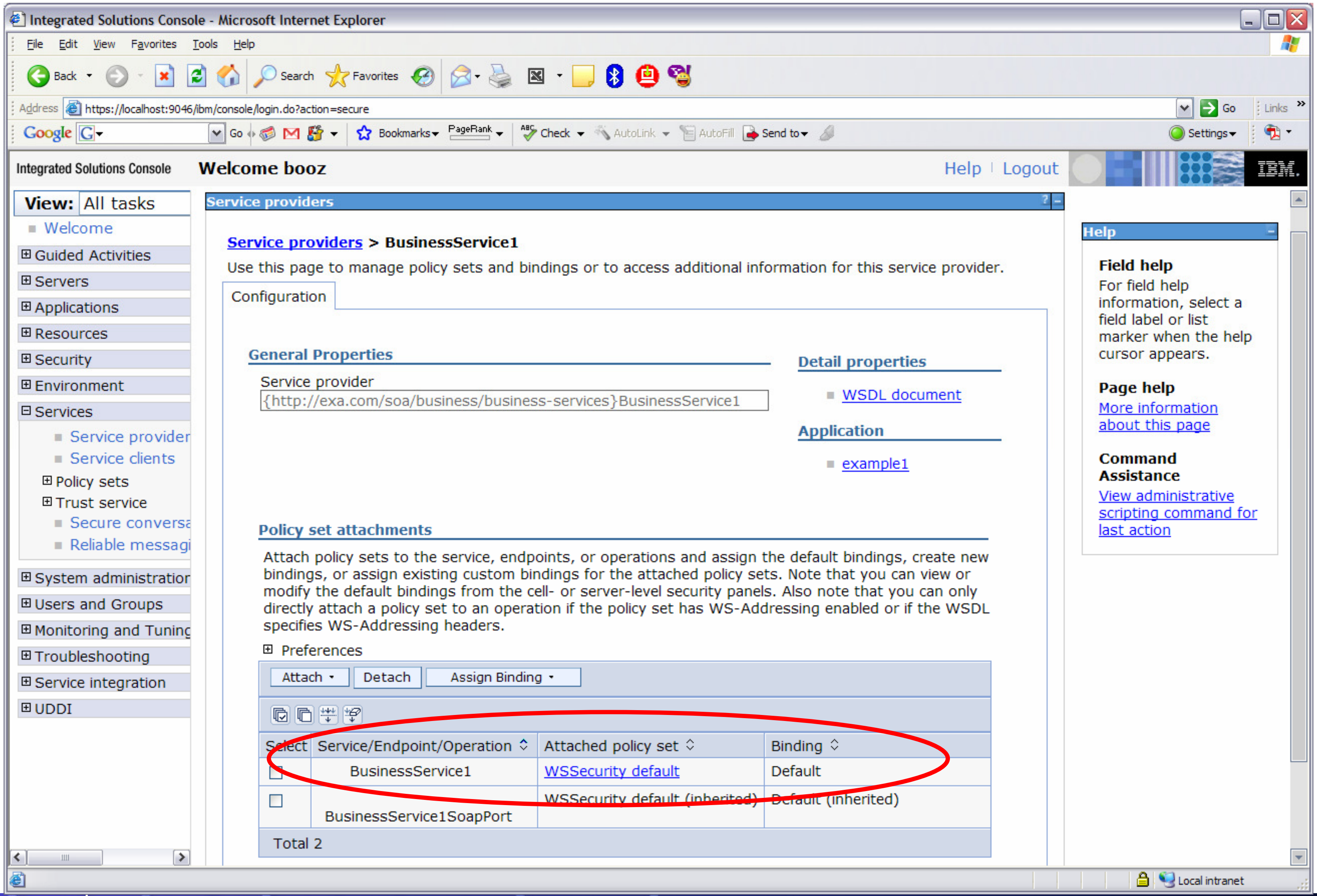
Specify policy set for the composite defined in this SCA application.

□ Include defualt policy sets. Default PolicySets specify common QoS behavior for generic message format. Evaluate whether they provide adequate QoS characteristics for your services before applying Default PolicySets.

/Service|Reference/Binding	Type	Intents	Matched policy sets	Attached policy set
	Composite			
nent	Component			
	Component/Service			
	Component/Service/Web Services Binding	authentication	LTPA SecureConversation, Username RAMP default, Username WSSecurity default, WSHTTPS default, Username SecureConversation LTPA WSSecurity default, LTPA RAMP default	

Next Cancel
javascript:selectMenuItem('button.attach','LTPA SecureConversation','hiddenButton95841825316904')
Local intranet

Security Policy Example – Service Providers



Welcome booz

Service providers

Service providers > BusinessService1

Use this page to manage policy sets and bindings or to access additional information for this service provider.

Configuration

General Properties

Service provider: {http://exa.com/soa/business/business-services}BusinessService1

Detail properties

- WSDL document

Application

- example1

Policy set attachments

Attach policy sets to the service, endpoints, or operations and assign the default bindings, create new bindings, or assign existing custom bindings for the attached policy sets. Note that you can view or modify the default bindings from the cell- or server-level security panels. Also note that you can only directly attach a policy set to an operation if the policy set has WS-Addressing enabled or if the WSDL specifies WS-Addressing headers.

⊞ Preferences

Attach ▾ | Detach | Assign Binding ▾

Select	Service/Endpoint/Operation	Attached policy set	Binding
□	BusinessService1	WSSecurity default	Default
□	BusinessService1SoapPort	WSSecurity default (inherited)	Default (inherited)
Total 2			

Help

Field help
For field help information, select a field label or list marker when the help cursor appears.

Page help
More information about this page

Command Assistance
View administrative scripting command for last action