Sitecore E-Commerce Services 2.2 on CMS 7.0 or Later

Developer's Cookbook

A developers guide to configure and develop Sitecore E-Commerce Services

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Chapter 1 Introduction

This document contains a technical overview of the Sitecore E-Commerce Services (SES). It also describes how to use the Unity application block to configure SES, the SES programming contracts, and includes instructions for configuring SES components.

You can use Sitecore to manage multiple websites. You can configure SES to use different data stores for each managed website. For example, different managed websites can store product, order, and other business information in different locations in Sitecore, and in different external systems.

This document contains the following chapters:

- **Chapter 1 — Introduction**
  This chapter contains a brief description of this manual.
- **Chapter 2 — SES Technical Overview**
  This chapter contains a description of the domain model, the Unity application block, and Sitecore E-Commerce Services product management system.
- **Chapter 3 — Adding Custom Product Search Criteria**
  This chapter describes how to extend the product search feature in SES.
- **Chapter 4 — SES Core Configuration**
  This chapter describes the configurable elements in SES including how to configure a multi-site installation.

Chapter 2

SES Technical Overview

This chapter provides a technical overview of Sitecore E-Commerce Services, including the domain model, the Unity dependency injection container, and information about how Sitecore E-Commerce Services manages product information.

This chapter contains the following sections:

- The SES Domain Model
- Unity Application Block Overview
- SES Product Management

2.1 The SES Domain Model

The SES domain model is an API layer that defines contracts to abstract SES functionality, such as product and customer information storage. The `Sitecore.Ecommerce.DomainModel` namespace in the `Sitecore.Ecommerce.DomainModel.dll` assembly contains the SES domain model.

The default implementation of the SES domain model stores data as items in the Sitecore content tree. For example, a product definition item describes each product that the website sells. You can replace elements of the domain model, and you can use different implementations based on logical conditions. Multiple managed websites can share implementations of the domain model and the data that those implementations abstract, or each managed website can use different implementations and data.

To integrate external systems with SES, you can implement processes that use the default implementation of the domain model to import data into Sitecore, or you can replace components of the SES domain model with custom implementations that access external systems directly.

SES includes a sample implementation that uses presentation components developed for the Web Forms for Marketers module to provide a complete online store. For more information about the Web Forms for Marketers module, see the SDN.

You can use the example implementation, or you can learn how to implement a custom solution using the code that it contains.

Important
Whenever possible, use contracts in the domain model rather than the concrete implementations of those contracts.

2.2 Unity Application Block Overview

SES uses the Unity application block (Unity) to support customization and integration with such external systems. The Unity application block is a lightweight, extensible dependency injection container, which among other features, provides symbolic names for different implementations of various SES features described by the domain model.

For more information about the Unity Application Block, see http://unity.codeplex.com/.

Dependency injection is a strategy for specifying relations between types in object-oriented applications. Dependency injection provides a form of inversion of control, moving logic for type specification from code to the dependency injection container. Unity injects the appropriate types into the application at runtime to allow the use of different implementations of a single function depending on configuration, conditions, and code. Unity provides constructor injection, property injection, and method call injection. The Unity container works like a factory to instantiate objects in a manner similar to the providers pattern, but with greater flexibility.

For more information about dependency injection, see:

- msdn.microsoft.com/en-us/.../cc163739.aspx
- http://martinfowler.com/articles/injection.html

Unity can designate the software components an application will use, and which software components other components can use. Complex objects typically depend on other objects. Unity helps to ensure that each object correctly instantiates and populates the right type of object for each such dependency.

The Unity architecture supports the loose coupling of application components. SES developers can reference relatively abstract types, and Unity injects the appropriate implementations at runtime.

The Unity application block provides the following benefits for developers who customize and extend SES:

Flexibility

Unity allows developers to specify types and dependencies through configuration and at runtime, deferring configuration to the container.

Simplification

The simplification of the object instantiation code, especially for hierarchical structures that contain dependencies — this simplifies application code.

Abstraction

The abstraction of requirements through type information and dependencies.

Service locator capability

SES supports the persistence of the container, such as within the ASP.NET session or application, or through Web services or other techniques. For more information about the Service Locator pattern, see http://msdn.microsoft.com/en-us/library/ff921142.aspx.

With Unity, you can easily configure SES to use custom implementations for specific features, including:

- Configuration components, such as general settings.
- Business objects, such as customers.
- Business logic, such as sending e-mail or locating a product.
- Payment providers, such as specific payment gateways.
- Internal logic, such as mapping in-memory storage to long-term storage.

With SES and Unity, you can use different implementations of an interface or descendants of an abstract or another base class to achieve a common function for different managed websites. For example, different managed websites can access customer information from different systems. Unity makes it easier to integrate external business systems that are typically involved in ecommerce into a SES implementation.

In this document, the term *contract* refers to an interface that a class implements, an abstract or concrete base class from which it inherits. The term *implementation* refers to a class that implements a given contract.

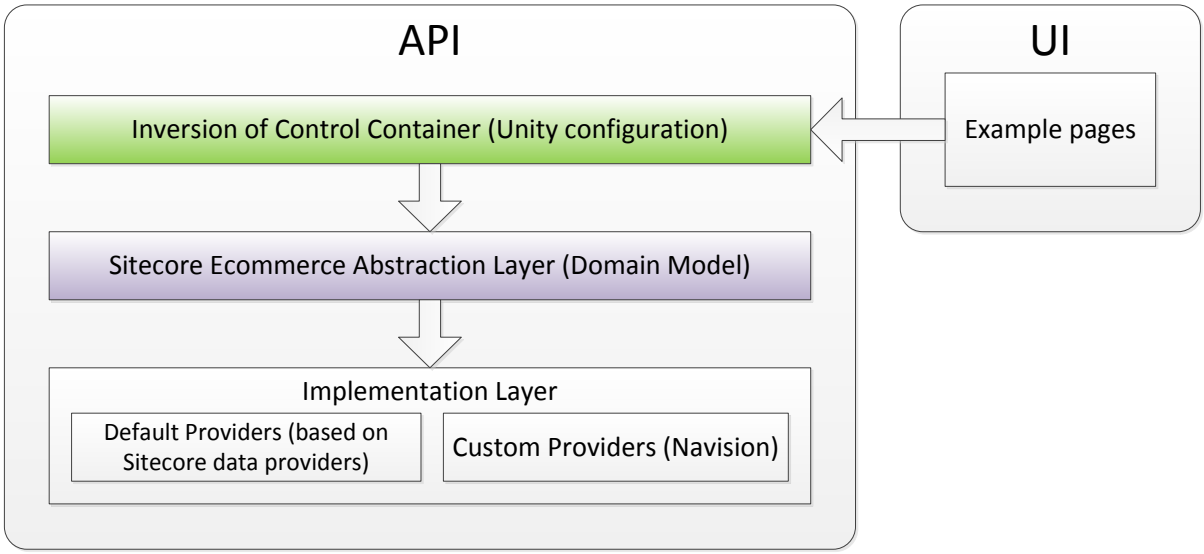
The SES entities defined with Unity include:

- Contracts define Application Programming Interfaces (APIs).
- Implementations define concrete instances that implement contracts.
- Mappings configure which implementations to inject.
- Dependencies configure which dependent implementations to inject.

Unity allows you to define contracts using interfaces, abstract classes, and concrete classes. An implementation can implement an interface, inherit from an abstract base class, inherit from a concrete base class, or inherit directly from `System.Object`. A contract defined by a concrete class can serve as its own implementation.

Note
To work with the SES APIs that depend on the Unity application block, you may need to add a reference to the `Microsoft.Practices.Unity.dll` assembly in the `/bin` subdirectory to the Visual Studio project. Remember to set the *Copy Local* property of the reference to *False*.

The following diagram describes the SES API layers. The example UI pages access APIs in the domain model, and SES uses Unity to resolve those API calls to concrete implementations of those contracts.



2.2.1 The Unity Configuration Files

The most important configuration file is `Unity.config` which determines the application-wide configuration of the dependency Injection containers. However, if you have a multi-shop solution, you must configure separate Unity entities for each webshop that differs from the standard configuration.

These configuration files must be called `<Site name>.Unity.config` and must be stored in the *App_Config* folder.

Each of the configuration files consists of two main parts:

- `/unity/aliases` — each of these elements in the Unity configuration file defines a type of alias which provides a symbolic name for a contract or implementation, such as an interface, an abstract type, or a concrete type.

  Aliases simplify configuration, provide easier access to types, help avoid duplication, and the use of incorrect type names.

  Aliases are not required.

- `/unity/container/register` — each of these elements in the Unity configuration file specifies a concrete type that implements a contract identified by a `/unity/alias` element.

2.2.2 The initialize Pipeline

To configure the Unity container, SES adds three processors to the `initialize` pipeline that is defined in the `Web.config` file:

- `ConfigureEntities`
- `ConfigureShopContainers`
- `RegisterEcommerceProviders`

Based on the configuration in the `Unity.config` file, the `ConfigureEntities` processor in the `initialize` pipeline initializes the entities for application-wide container.

The `ConfigureShopContainers` processor configures the Unity container for that site, based on `App_Config\<Site name>` setting in the `Unity.config` file, where `<Site name>` corresponds to a webshop.

Both of these processors load an inversion of the control containers into the SES context as a static resource in memory.

The `RegisterEcommerceProviders` processor in the `initialize` pipeline initializes various SES implementations. It configures providers for `PaymentSystem`, `ShippingProvider`, `NotificationOption`, `Country`, `Currency`, `VatRegion`, and `OrderStatus` entities, as well as registering the `QueryableContainerExtension` entity for Unity container.

Note
SES uses the `/App_Config/Include/Sitecore.Ecommerce.config` file to extend the `Web.config` file.

2.2.3 Dependency Injection

With Unity, you can configure dependencies between different entities.

We recommend that you implicitly inject dependencies as this limits the complexity of the `unity.config` file. You only need to explicitly inject dependencies if your implementation differs from the standard configuration.

For example, the `VisitorRepository` implementation of the `VisitorRepositoryBase` contract depends on the `Repository<T>` and `ICustomerManager<T>` contracts. However, you do not need to configure dependencies for the constructor for the `VisitorRepositoryBase` mapping in the `unity.config` file:

```
<unity>
...
  <alias alias="VisitorOrderRepositoryBase"
type="Sitecore.Ecommerce.OrderManagement.VisitorOrderRepositoryBase, Sitecore.Ecommerce.Core"
/>
...
```

```
  <alias alias="VisitorOrderRepository"
type="Sitecore.Ecommerce.Visitor.OrderManagement.VisitorOrderRepository,
Sitecore.Ecommerce.Visitor" />
...
  <container>
...
    <register type="VisitorOrderRepositoryBase" mapTo="VisitorOrderRepository">
       <!– Ensures that the lifetime is the same as that of the container and allows the
child containers to have their own registrations for this entity type. -->
      <lifetime type="hierarchical" />
       <!--Required by the DefaultVisitorOrderManager logging functionality.-->
      <interceptor type="VirtualMethodInterceptor" />
      <policyInjection />
    </register>
...
  </container>
...
</unity>
```

If the injection dependencies are not explicitly registered in the Unity configuration file, Unity takes the constructor with the biggest number of dependencies and injects these dependencies automatically.

For more information about Dependency Injection in Unity see `http://msdn.microsoft.com/en-us/library/ff660914.aspx`

Note
To indicate generic type parameters in the Unity configuration, append a single end quotation mark (“’”) followed by a number.

For example, to specify the `Sitecore.Ecommerce.DomainModel.Currencies.ICurrencyConverter<TTotals, TCurrency>` interface that requires two generic types, specify a type signature followed by a back quote and the number 2:

```
Sitecore.Ecommerce.DomainModel.Currencies.ICurrencyManager`2
```

2.2.4 How to Resolve a SES Component

Use the `Sitecore.Ecommerce.Context.Entity.Resolve()` method to resolve a type configured with Unity. Pass the type of the contract to the method as a generic type parameter. For example, to access the default implementation of the `IProductRepository` contract:

```
using Sitecore.Ecommerce;
...
Sitecore.Ecommerce.DomainModel.Products.IProductRepository productRepository =
  Sitecore.Ecommerce.Context.Entity.Resolve
  <Sitecore.Ecommerce.DomainModel.Products.IProductRepository>();
```

The signature of the `Resolve()` method is an extension method in the `Sitecore.Ecommerce.IoCContainerExtensions` class.

To use this signature, add the following line at the top of your class:

```
using Sitecore.Ecommerce;
```

Alternatively, fully designate this implementation of the `Resolve()` method:

```
Sitecore.Ecommerce.DomainModel.Products.IProductRepository productRepository =
  Sitecore.Ecommerce.IoCContainerExtensions.Resolve
  <Sitecore.Ecommerce.DomainModel.Products.IProductRepository>
  (Sitecore.Ecommerce.Context.Entity);
```

To access a named entity, pass the name of an entity as the first parameter to the `Sitecore.Ecommerce.Context.Entity.Resolve()` method.

For example, to retrieve the `IProductRepository` implementation called `MyProductRepository`:

```
Sitecore.Ecommerce.DomainModel.Products.IProductRepository myProductRepository =
  Sitecore.Ecommerce.Context.Entity.Resolve
  <Sitecore.Ecommerce.DomainModel.Products.IProductRepository>("MyProductRepository");
```

A dependency container can be used in different ways. In SES we use it as a service locater pattern only for the products on a webshop where we map templates to products. Otherwise we use it as a normal dependency container.

When we map a product to a template, we must define this mapping in the `unity.config` file. However every template doesn't need a mapping and in these cases there is a fallback whereby the unnamed entity mapping is used instead.

Here is a mapping example from the sample pages:

```
<container>
      <!-- Additional container registrations for example site-->
      <register type="ProductBaseData" mapTo="FlashProduct" name="{95681CF6-3635-49EC-A09A-
      CC548FA62389}"/>
      <register type="ProductBaseData" mapTo="LenseProduct" name="{8FAC8E12-7459-43F8-97E8-
      1BC6840B9226}"/>
      <register type="ProductBaseData" mapTo="OtherAccessoryProduct" name="{A93FA2C4-3AE4-
      45C2-8C3F-EFA7E129537E}"/>
      <register type="ProductBaseData" mapTo="PsCameraProduct" name="{7BD2FBC6-061B-40DD-B1F9-
      D8603A701624}"/>
      <register type="ProductBaseData" mapTo="SlrCameraProduct" name="{B072B7C7-6F3F-4316-
      B8D7-010629AEBEF1}"/>
</container>
```

The GUIDs in the named attributes are the template IDs.

The fallback is located in the `unity.config` file which applies to every webshop:

```
<register type="ProductBaseData" mapTo="SitecoreProduct" />
```

If you use `Context.Entity.Resolve<EntityType>(instanceName)` to resolve a named instance and the entity is not registered, Unity throws an exception. To avoid this, we use `IsRegistered<typeof(EntityType)>(instanceName)` to check the existence of the named instance. If the named instance is not registered, `Context.Entite.Resolve<EntityType>()` is used without the `instanceName`. However, `IsRegistered()` is not a thread safe method.

To avoid concurrency issues, you must use the `TypeTrackingExstesion` thread safe method and the `IUnityContainer` extension methods that are placed in `Sitecore.Ecommerce.Unity.UnityIoCContainerExtensions`. This is an extension that we have made to overcome these challenges and contains the following:

- Two overloads of `HasRegistration` which are thread safe analogs of `IsRegistered()`:
  - `public static bool HasRegistration([NotNull] this IUnityContainer container, [NotNull] Type type, [NotNull] string name)`
  - `public static bool HasRegistration([NotNull] this IUnityContainer container, [NotNull] Type type)`
- Public static `T SmartResolve<T>(this IUnityContainer container, string name)` — returns a named instance if it is registered in a container or returns the default unnamed instance — in the same way as when you call `Context.Entite.Resolve<EntityType>()`.

The `TypeTrackingExtension` method is added to the parent container and all the child containers. If you create a new child container, you must register this extension to the container. Use the `UnityIoCContainerExtensions.RegisterExtension<ExtensionType>()` method to register the extension. The default Unity `AddExtension` and `AddNewExtension` methods do no check whether the extension is already registered before adding it.

For more information about how SES resolves types, see the section *How to Configure Unity for Multiple Implementations of the Same Contract*.

2.2.5 How to Add an Implementation to the Unity Configuration

To add an additional implementation of a contract to the Unity configuration:

1. In the Visual Studio project, create a class that implements the required interface or inherits from the appropriate base class.
2. In the Unity configuration, insert an additional `/unity/alias` element.
3. In the new `/unity/alias` element, set the `alias` attribute to a unique alias.
4. In the new `/unity/alias` element, set the `type` attribute to the signature of the .NET class.

Alternatively you can use *Initialize* pipeline to perform some registrations from code. It might be useful if you want to deliver your product in several independent packages but do not want to introduce too many configuration files.

That is how the Sitecore E-Commerce Order Manager configured.

The `Sitecore.Ecommerce.Apps` assembly contains a `Sitecore.Ecommerce.Apps.Pipelines.Loader.ConfigureUnityContainer` processor. This processor reads the Unity Container from `PipelineArgs` and configures it:

```
public void Process(PipelineArgs args)
{
  IUnityContainer container = args.CustomData["UnityContainer"] as IUnityContainer;
  container.RegisterType<ContextSwitcherDataSource, ContentContextSwitcherDataSource>();
}
```

For more information about how to configure SES to use the implementation, see the sections *How to Replace a SES Component* and *How to Configure Unity for Multiple Implementations of the Same Contract*.

2.2.6 How to Add a Contract to the Unity Configuration

To add a contract to the Unity configuration:

1. In the Unity configuration file, add a `/unity/alias` element. Set the `alias` attribute of the new `/unity/alias` element to a unique value that identifies the contract. Set the `type` attribute of the new `/unity/alias` element to the .NET type of the interface or class that defines the contract. For example:

   ```
   <alias alias="MyType" type="Namespace.MyType, MyAssembly"/>
   ```

   If the type that defines the contract does not also serve as the implementation of that contract, configure one or more implementations of the contract.

   For more information about how to define an implementation of the contract, see the section *How to Add an Implementation to the Unity Configuration*.

2.2.7 How to Replace a SES Component

To configure SES to use a custom component for a feature:

1. In the Unity configuration, add a `/unity/alias` element to register the new implementation.

   For more information about how to add an implementation to the Unity configuration, see the section *How to Add an Implementation to the Unity Configuration*.

2. In the Unity configuration, set the `mapTo` attribute of the `/unity/container/register` element with a value for the `type` attribute that specifies the value of the `alias` attribute of the `/unity/alias` element that defines the contract or implementation to the value of the `alias` attribute of the new `/unity/alias` element that specifies the implementation.

In the `/unity/container/register` element, the `type` attribute identifies the alias of the contract, the `mapTo` attribute identifies the alias of the implementation, and the optional `name` attribute defines a token with which to resolve the implementation in API calls.

2.2.8 How to Configure Unity for Multiple Implementations of the Same Contract

In Unity, you can define several implementations of the same contract.

To use different implementations of the same contract for different purposes:

1. Add any required implementations to the Unity configuration.

   For more information about how to add an implementation to the Unity configuration, see the section *How to Add an Implementation to the Unity Configuration*.

2. For each implementation, in the Unity configuration, create a `/unity/container/register` element.

Note
To create the new `/unity/container/register` element, copy an existing `/unity/container/register` element that is associated with the same contract.

3. In the new `/unity/container/register` element, set a unique value for the `name` attribute.

For example, you can configure the `/unity/container/register` elements in the Unity configuration to:

- Make SES use the `PaymentProvider` implementation with the alias `AmazonPaymentProvider` for the Amazon payment system.
- Use the default the `PaymentProvider` implementation with the alias `OfflinePaymentProvider` as the default option.

```
<!-- contract -->
<alias alias="PaymentProvider" type="Sitecore.Ecommerce.DomainModel.Payments.PaymentProvider,
Sitecore.Ecommerce.DomainModel" />
<!-- implementations -->
<alias alias="AmazonPaymentProvider"
type="Sitecore.Ecommerce.Payments.Amazon.AmazonPaymentProvider,
Sitecore.Ecommerce.Payments.Amazon" />
<alias alias="OfflinePaymentProvider"
type="Sitecore.Ecommerce.Payments.OfflinePaymentProvider, Sitecore.Ecommerce.Kernel" />
<!-- uses -->
<container>
  <register type="PaymentProvider" mapTo="OfflinePaymentProvider">
    <property name="PaymentSystem" />
  </register>
  <register type="PaymentProvider" mapTo="AmazonPaymentProvider" name="Amazon">
    <property name="PaymentSystem" />
  </register>
```

Use the following setting in Unity to access a named implementation by passing the name of the implementation to the `Sitecore.Ecommerce.Context.Entity.Resolve()` method:

```
Sitecore.Ecommerce.DomainModel.Payments.PaymentProvider paymentProvider =
  Sitecore.Ecommerce.Context.Entity.Resolve
    <Sitecore.Ecommerce.DomainModel.Payments.PaymentProvide>("Amazon");
```

If you pass a parameter to the `Sitecore.Ecommerce.Context.Entity.Resolve()` method and if an implementation exists, Unity injects that type.

If you do not pass a parameter to the `Sitecore.Ecommerce.Context.Entity.Resolve()` method, Unity injects the default implementation of the contract.

Note

If no default implementation exists, Unity raises an error.

2.3 SES Product Management

SES stores product information in repositories that typically exist outside of the content tree of any managed website, thereby allowing multiple websites to share product repositories.

SES provides logic to generate product URLs that appear to be within the website, and enhances the logic that Sitecore applies to determine and present the product definition items associated with these URLs.

2.3.1 Product URLs and Product Resolution

SES adds the `ProductResolver` processor after the default `ItemResolver` processor in the `httpRequestBegin` pipeline defined in the `Web.config` file. If the default `ItemResolver` cannot resolve the context item from the requested URL, then the `ProductResolver` uses a `VirtualProductResolver` to attempt to determine a product from the requested URL. If the `VirtualProductResolver` can determine the product, it sets the context item to the item that defines that product.

How to Specify the Product URL Format

To specify the product URL format for a managed website or branch:

1. In the **Content Editor**, in the home item for the managed website or the root item of the branch, select the **System** section,
2. In the **Display Products Mode** field, select one of the `ProductUrlProcessor` definition items.

Note
If the **Display Products Mode** field does not exist for an item, add the `Ecommerce/Product Categories/Product Search Group Folder` data template to the base templates for the data template associated with the item.

SES uses the value of the **Display Products Mode** field in the nearest ancestor of the context item that defines a value for that field. For example, given the URL `/products.aspx`, if the `<home>/products` item has a value for **Display Products Mode** field, SES applies that value, otherwise SES applies the value of the **Display Products Mode** field in the home item.

2.3.2 Product Presentation

The URLs of SES product pages map to items that do not define layout details. For more information about the layout details, see the manual Presentation Component Reference.

Important
Do not update the layout details for a product or the standard values of a data template for products.

Note
To preview the presentation of a product, use the **Page Editor** or the **Preview** viewer to navigate from a page that links to the product to the product detail page.

SES replaces the `InsertRenderings` processor in the `renderLayout` pipeline defined in the `Web.config` file with the `ProcessProductPresentation` processor. When processing an HTTP request for a product page, the `ProcessProductPresentation` processor applies the layout details from the item that is specified in the **Product Detail Presentation Storage** field.

This field is in the nearest ancestor of the logical parent item of the virtual product item that defines a value for that field. For example, in the `/products/product_name.aspx` URL, if the `<home>/products` item has a value in the **Product Detail Presentation Storage** field, SES applies

that value, otherwise SES applies the value in the **Product Detail Presentation Storage** field of the *Home* item.

Note
If the **Product Detail Presentation Storage** field does not appear in an item, add the `Ecommerce/Product Categories/Product Search Group` data template to the base templates of the data template associated with the item.

How to Specify a Product Presentation Format

To specify the presentation format that you want to use to display the products associated with a page:

1. In the **Content Editor**, edit the page definition item.
1. In the page definition item, on the **Content** tab, in the **Products in Category** section, in the **Product Detail Presentation Storage** field, select a product presentation definition item.

How to Update a Product Presentation Format

To update an existing product presentation format:

1. In the **Content Editor**, edit the product presentation definition item. The product presentation definition item is a child of the `/Sitecore/System/Modules/Ecommerce/System/Product Presentation Repository` item.
2. In the product presentation definition item, edit the layout details.

For more information about applying layout details, see the manual Presentation Component Cookbook that is available on the SDN.

Note
You can use access rights to control which users can apply various product presentation formats.

To apply access rights:

1. You can change the type of the **Product Detail Presentation Storage** field in the `Ecommerce/Product Categories/Product Search Group` item from *Lookup* to *Droptree*.
2. Create folders under `/Sitecore/System/Modules/Ecommerce/System/Product Presentation Repository` that you can use to store the different groups of presentation format definition items.
3. Apply access rights to those folders.

How to Define a New Product Presentation Format

To define a new product presentation format:

1. In the **Content Editor**, select the `/Sitecore/System/Modules/Ecommerce/System/Product Presentation Repository` item.
2. In the **Content Editor**, insert a new product presentation definition item using the `Ecommerce/Product/Product Presentation Storage` data template.
3. In the new product presentation definition item, update the product presentation format.

   For more information about updating the product presentation format, see the section *How to Update a Product Presentation Format*.

4. Optionally, you can apply the new product presentation format to the existing pages. For more information about applying a product presentation format, see the section *How to Specify a Product Presentation Format*.

Chapter 3

Adding Custom Product Search Criteria

This chapter describes how to extend the product search feature in SES. It shows how to customize the search options and how to have more control over product presentation in both of the frontend and backend. By the frontend we mean the display of search results for the page visitor and by the backend we mean the Content Editor and Template Manager.

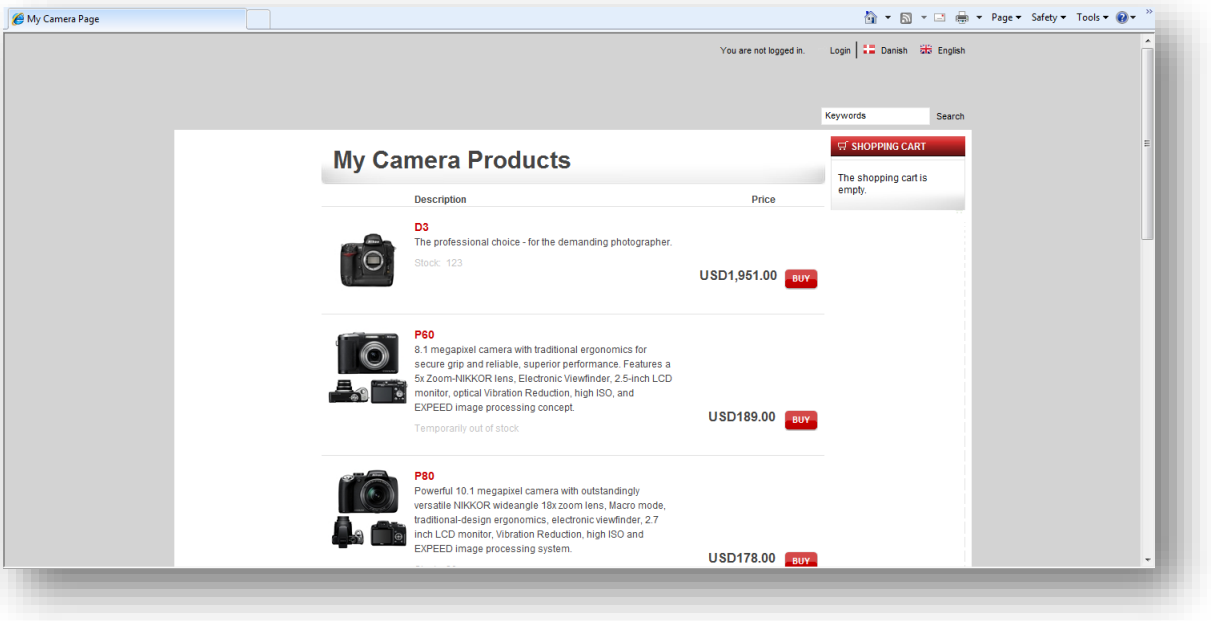
This chapter contains the following sections:

- The Need for Product Search Configuration and Extensibility
- Extending the Product Search Group Template
- Extending the Resolve Strategy
- Extending the Product Search Catalog

3.1 The Need for Product Search Configuration and Extensibility

To illustrate the need for changing product search, consider the case of a camera and photographic supply webshop that is divided into sections that contain different models, categories, proficiency levels, and interrelated products. A vendor will not usually show all the cameras on the same page but they will rather show each camera with a group of products of the same proficiency level. For example, professional cameras are usually shown with professional lenses and others accessories. Moreover, one product can be shown in multiple groups.

This chapter explains how to create a different classification than the one used in the repository.



3.2 Extending the Product Search Group Template

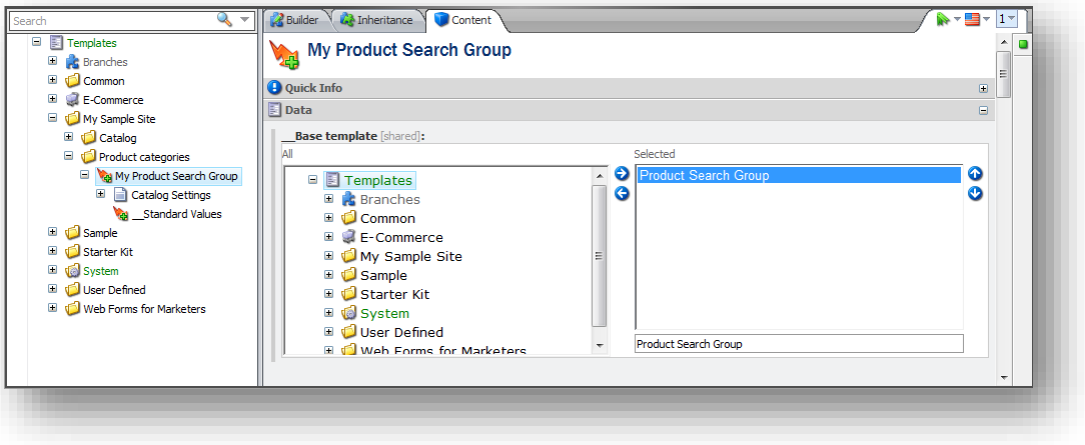
This section describes how to classify a product according to your business needs. You must create or edit the classifications that you need in the *Product Search Group* template.

A convenient starting point is to extend this template with additional fields for storing search criteria. You can use the *Product Search Group* template to define a category structure that reflects the way the products are presented on the front end and not in the structure of the repository.

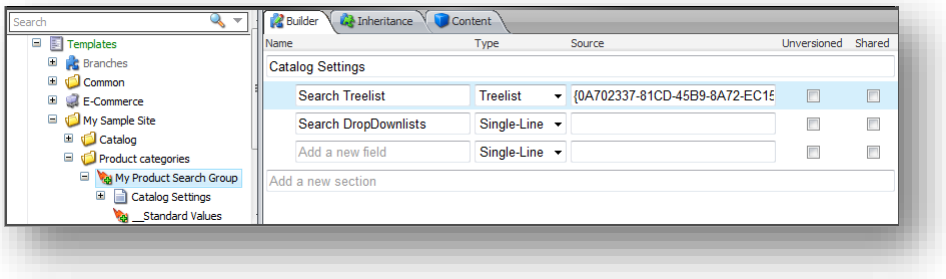
This section describes how to use the Content Editor to add a new search criterion to the *Product Search Group* template by applying an additional filter to the products selected.

To add a new search criterion to the *Product Search Group* template:

1. Log in into the **Content Editor** and navigate to the *Product Search Group* template.



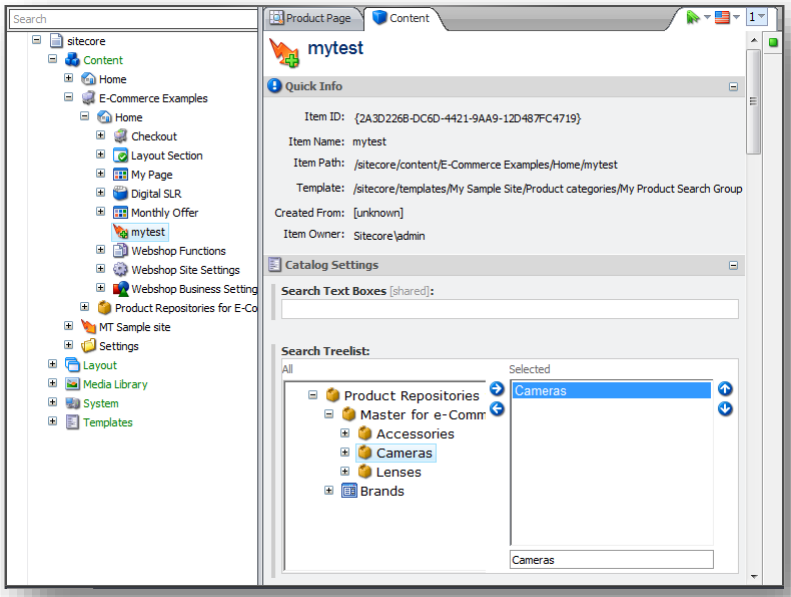
2. In the **Content** tab, create a new template that inherits from the *Product Search Group* template and call it *My Product Search Group*.
3. Click the **Builder** tab and in the **Catalog Settings** section, add a new criterion, call it *Search Treelist*.



4. In the **Type** field, select *Treelist* as the type. You must select *Treelist* as the type if you want to select multiple folders from the product repository.
5. In the **Source** field, enter the path (or GUID) of the product repository.
6. Create a page item that inherits from the *My Product Search Group* template and call it *mytest*.

   You should now be able to select the domain for your search from the treelist.

In the following image, *Cameras* is the selected domain.



3.3 Extending the Resolve Strategy

To search for products in the domain selected in the Treelist control, you must:

- Extend the `DatabaseCrawler` to index this product category *parent* folder.
- Extend the `QueryCatalogProductResolveStrategy` class to find the products based on a particular product category folder.

Extending the Database Crawler

Essentially, you use the `DatabaseCrawler` class to build product and web indexes.

The `Sitecore.Ecommerce.Search.DatabaseCrawler` class scans a specific repository, such as, a database or file system, extracts information, and stores it in a search index. It then makes this information available to Sitecore Search.

The `Sitecore.Ecommerce.Search.DatabaseCrawler` class performs the following functions:

- `IndexAllFields` — Extracts data from a specific document that is requested by the crawler or the monitor. The data extracted consists of metadata and content.
  - `Metadata` — The Indexer extracts metadata that the system understands. You can filter and prioritize the metadata, for example, by using the **_name** or **_template** field.
  - `Content` — The Indexer also extracts body content and prioritizes it. You can use boost to prioritize the content in the document. This is usually only applied to a single field, giving the document a single prioritization.
- `DatabaseCrawler` — Traverses the storage system and uses the indexer to populate the search index.
- `MonitorChanges` — Monitors changes in the repository and updates the search index.

The following code shows how to extend the `DatabaseCrawler` class to add a special field to a document in Lucene that represents the parent category folder in SES:

1. In Visual Studio, create a new project and call it `Sample1`.
2. Add the following class to the project and call it `SampleDatabaseCrawler`.

```
namespace Sample1.Kernel.Search
{
    using Lucene.Net.Documents;
    using Sitecore.Data;
    using Sitecore.Data.Items;

    // SampleDatabaseCrawler class is inherited from Sitecore.Ecommerce.Search.DatabaseCrawler
    // Created so we can add the needed field to the Lucene index products when resolving
    // products based on which product category folder they are located in
    public class SampleDatabaseCrawler : Sitecore.Ecommerce.Search.DatabaseCrawler
    {
        // Overridden method for adding special fields to the Lucene product index
        // <param name="document">The Lucene document to add a new field to</param>
        // <param name="item">the item to get the value from</param>
        protected override void AddSpecialFields(Document document, Item item)
        {
            //Call the base class for setting the base special fields on the Lucene document
            base.AddSpecialFields(document, item);
            //Add the field _parent to the document for the Luceneindexeer
            document.Add(CreateTextField("_parent", ShortID.Encode(item.Parent.ID)));
        }
    }
}
```

Once you have extended the `DatabaseCrawler` class to create the **_parent** field for the Indexer, you are ready to extend the search strategy to use this index.

Extending the ICatalogProductResolveStrategy Class

The `ICatalogProductResolveStrategy` contract defines the way that SES retrieves the products that are displayed on a given webpage.

The implementation of this contract:

1. Reads search criteria form the current item based on the product search group template.
2. Builds and executes a search using the criteria against the product repository.
3. Returns the list of products to display.

The following classes are the default Implementations of the `ICatalogProductResolveStrategy` contract:

ProductListCatalogResolveStrategy

You can use this class to retrieve the products that have been manually selected and associated with the webpage item — `sitecore/system/Modules/Ecommerce/System/Product Selection Method`.

QueryCatalogProductResolveStrategy

You can use this class to retrieve the products that result from the search and store the query parameters on the webpage item — `sitecore/system/Modules/Ecommerce/System/Product Selection Method`. It implements the `CatalogProductResolveStrategyBase` class which implements the `ICatalogProductResolveStrategy` interface.

You can also extend the class that represents the `QueryCatalogProductResolveStrategy` to accommodate the search:

1. In Visual Studio, open the project called `Sample1` that you created in the last subsection.
2. Add the following class and name it `SampleQueryCatalogProductResolveStrategy`.

```
namespace Sample1.Kernel.Catalogs
{
    using System.Collections.Generic;
    using System.Linq;
    using Sitecore.Data;
    using Sitecore.Data.Items;
    using Sitecore.Diagnostics;
    using Sitecore.Ecommerce;
    using Sitecore.Ecommerce.Configurations;
    using Sitecore.Ecommerce.Search;

    // <summary>
    // SampleQueryCatalogProductResolveStrategy class is inherited from
       Sitecore.Ecommerce.Catalogs.QueryCatalogProductResolveStrategy
    // Created to implement the functionality to resolve products based on which
       repository folder they are located in.
    // </summary>
    public class SampleQueryCatalogProductResolveStrategy :
                 Sitecore.Ecommerce.Catalogs.QueryCatalogProductResolveStrategy
    {
        // <summary>
        // The Search TreeList field name
        // </summary>
        private read only string searchTreelistFieldName;

        // <summary>
        // Initializes a new instance of the SampleQueryCatalogProductResolveStrategy
           class.
        // </summary>
        // <param name="searchTextBoxesFieldName">Names of the searchtextboxes</param>
        // <param name="searchChecklistsFieldName">Names of the Checkboxes</param>
        // <param name="searchTreelistFieldName">name of the treelist field</param>
        public SampleQueryCatalogProductResolveStrategy(string
               searchTextBoxesFieldName, string searchChecklistsFieldName, string
               searchTreelistFieldName)
```

```
            : base(searchTextBoxesFieldName, searchChecklistsFieldName)
        {
            // Testing for not null or empty
            Assert.ArgumentNotNullOrEmpty(searchTreelistFieldName,
            "searchTreelistFieldName");
            // Assigning to local variable
            this.searchTreelistFieldName = searchTreelistFieldName;
        }
        // <summary>
        // Overridden method for building the search query for searching the Lucene index
        // </summary>
        // <param name="catalogItem">the catalog item we are resolving from (product
           catalog)</param>
        // <returns>The query we build for searching</returns>
        protected override Query BuildSearchQuery(Item catalogItem)
        {
            // Let's resolve the actual field on the current catalog item
            string searchTreelistFieldText =
                   catalogItem[this.searchTreelistFieldName];
            // If nothing defined, returning "error in setup" on template
            if (string.IsNullOrEmpty(searchTreelistFieldText))
            {
                return default(Query);
            }
            // Calling the base class for getting all the query fields defined in the
               base class
            Query query = base.BuildSearchQuery(catalogItem);
            // Getting the configuration from SES
            BusinessCatalogSettings businessCatalogSettings =
            Context.Entity.GetConfiguration<BusinessCatalogSettings>();
            // Testing if configuration is set - if not, fail in setup by user.
            Assert.IsNotNull(businessCatalogSettings, GetType(), "Business Catalog
            settings not found.", new object[0]);
            // Getting the root from where products are located (product repository)
            Item productRepositoryRootItem =
                  catalogItem.Database.GetItem(businessCatalogSettings.ProductsLink);
            // Testing if the root is set - if not, this is a failure from the user.
            Assert.IsNotNull(productRepositoryRootItem, "Product Repository Root Item
            is null.");
            // If the query is empty, we need to add some stuff to it
            if (query == default(Query))
            {
                query = new Query { SearchRoot =
                        productRepositoryRootItem.ID.ToString() };
            }

            // Let´s parse the field from the current catalog items
            if (!string.IsNullOrEmpty(searchTreelistFieldText))
            {
                this.ParseTreelistField(searchTreelistFieldText, ref query);
            }

            return query;
        }

        // <summary>
        // Function for parsing TreeList to query on the catalog item
        // </summary>
        // <param name="ids">string with | separated list of categoryfolder
           Ids</param>
        // <param name="query">the query to append to</param>
        protected virtual void ParseTreelistField(string ids, ref Query query)
        {
            // Creating a list if more than one folder is defined
            List<string> folders = new List<string>();
            if (ids.Contains("|"))
            {
                folders.AddRange(ids.Split('|'));
            }
            else
            {
                folders.Add(ids);
            }
            Query sub = new Query();
```

```
            int count = 0;
            // Iterating through each folder where there's a Sitecore ID
            foreach (string s in folders.Where(ID.IsID))
            {
                // Appending the value of the folder to the query and telling the
                   query to search for the field _parent in the product Lucene index
                sub.AppendField("_parent", ShortID.Encode(s), MatchVariant.Exactly);
                // If more than one - we must add an "Or" to the query
                if (count < (folders.Count - 1))
                {
                    sub.AppendCondition(QueryCondition.Or);
                }
                count++;
            }
            // Appending the built query to the main query
            query.AppendSubquery(sub);
        }
    }
}
```

Configuring SES and Lucene

To register the newly created database crawler and the resolve strategy, you must configure the search in two files — `Sitecore.Ecommerce.config` and `Unity.config`.

1. In the `Sitecore.Ecommerce.config` file, under the `indexes` element, in the `Configuration` element, add the following index:

```
          <!-- Products index - Used by SES for resolving products - should not be
               used on frontend for searching-->
          <index id="products" type="Sitecore.Search.Index, Sitecore.Kernel">
            <param desc="name">$(id)</param>
            <param desc="folder">__products</param>
            <Analyzer type="Sitecore.Ecommerce.Search.LuceneAnalyzer,
             Sitecore.Ecommerce.Kernel" />
            <locations hint="list:AddCrawler">
              <master type="Sample1.Kernel.Search.SampleDatabaseCrawler, Sample1">
                <Database hints="master">master</Database>
                <!-- Repository root where products are stored-->
                <!--<Root>{054AEC0D-9D92-4C3A-80AC-A0E78773EAB7}</Root>-->
                <!-- Repository root where SES products are stored-->
                <Root hints="masterRoot">{502EA9FA-19E7-4DA5-8EA4-56C374AED45B}</Root>
                <Tags hint="master products">master products</Tags>
              </master>
              <web type="Sample1.Kernel.Search.SampleDatabaseCrawler, Sample1">
                <Database hints="web">web</Database>
                <!-- Repository root where products are stored-->
                <!--<Root>{054AEC0D-9D92-4C3A-80AC-A0E78773EAB7}</Root>-->
                <!-- Repository root where SES products are stored-->
                <Root hints="webRoot">{502EA9FA-19E7-4DA5-8EA4-56C374AED45B}</Root>
                <Tags>web products</Tags>
              </web>
            </locations>
          </index>
```

2. In the `Unity` configuration file, add the following alias.

```
<alias alias="SampleQueryCatalogProductResolveStrategy" ´
 type="Sample1.Kernel.Catalogs.SampleQueryCatalogProductResolveStrategy, Sample1"/>
```

3. In the `Unity configuration` file, add the following registration:

```
<register type="ICatalogProductResolveStrategy"
 mapTo="SampleQueryCatalogProductResolveStrategy" name="My product Repository query">
        <lifetime type="singleton" />
        <constructor>
          <param name="searchTextBoxesFieldName">
            <value value="Search Text Boxes"/>
          </param>
          <param name="searchChecklistsFieldName">
            <value value="Search Checklists"/>
          </param>
          <param name="searchTreelistFieldName">
```

```
            <value value="Search Treelist"/>
          </param>
        </constructor>
      </register>
```

3.4 Extending the Product Search Catalog

This section describes how to extend the *Product Search Catalog* to accommodate the product search extension in the backend. In other words, it describes how to make the search results visible in the Content Editor.

To extend the Product Search Catalog, you must:

- Extend the `CatalogQueryBuilder`.
- Create a products source.
- Reference this source in the Content Editor.

Extending the CatalogQueryBuilder Class

The `CatalogQueryBuilder` class builds the search query that is used by SES when querying the product repository.

Note
You can only use the `CatalogQueryBuilder` in the product catalog.

To extend the `CatalogQueryBuilder` class to reflect the search result in the backend:

1. In Visual Studio, open the project called `Sample1` that you created earlier.
2. Add the following class to the project and name it `CatalogQueryBuilder`.

```
namespace Sample1.Shell.Applications.Catalogs.Models.Search
{
    using System.Linq;
    using Sitecore.Ecommerce.Search;
    using Sitecore.Ecommerce.Shell.Applications.Catalogs.Models.Search;
    using Sitecore.Ecommerce.Configurations;
    using Sitecore.Ecommerce;
    using Sitecore.Diagnostics;
    using System.Collections.Generic;
    using Sitecore.Data;

    // <summary>
    // CatalogQueryBuilder inheriting from
      Sitecore.Ecommerce.Shell.Applications.Catalogs.Models.Search.CatalogQueryBuilder
    // Class is used for implementing functionality for resolving our result on the product
       page in the sitecore content editor.
    // </summary>
    public class CatalogQueryBuilder :
      Sitecore.Ecommerce.Shell.Applications.Catalogs.Models.Search.CatalogQueryBuilder
    {
        // <summary>
        // Buildquery function overridden - used for building the actual query for
           searching
        // </summary>
        // <param name="options">Seachoptions</param>
        // <returns>The query to be used for search</returns>
        public override Query BuildQuery(SearchOptions options)
        {
            // Get the base query - we still need the functionality from there
            var query = base.BuildQuery(options);
            // Requesting the id of the item we are resolving from in the content editor
            var id = Sitecore.Context.Request.QueryString.Get("id");
            // Getting the catalog item from the DB
            var catalogItem = Database.GetDatabase("master").GetItem(new ID(id));
            // Let's resolve the actual field on the current catalog item
            var searchTreelistFieldText = catalogItem["Search Treelist"];
            // Returning (error in set up)on the template, if nothing is defined
            if (string.IsNullOrEmpty(searchTreelistFieldText))
            {
                return query;
            }
            // Getting the configuration from SES
```

```
            var businessCatalogSettings =
            Context.Entity.GetConfiguration<BusinessCatalogSettings>();
            // Testing if configuration is set - if not, fail in setup by user
            Assert.IsNotNull(businessCatalogSettings, GetType(), "Business Catalog
            settings not found.", new object[0]);
            // Getting the root from where products are located (product repository)
            var productRepositoryRootItem =
            catalogItem.Database.GetItem(businessCatalogSettings.ProductsLink);
            // Testing if the root is set - if not this is a fail from the user
            Assert.IsNotNull(productRepositoryRootItem, "Product Repository Root Item
            is null.");
            // If the query is empty - we need to add some stuff to it
            if (query == default(Query))
            {
                query = new Query { SearchRoot =
                productRepositoryRootItem.ID.ToString() };
            }
            // let's parse the treelist field from the current catalog items
            if (!string.IsNullOrEmpty(searchTreelistFieldText))
            {
                ParseTreelistField(searchTreelistFieldText, ref query);
            }
            return query;
        }
        // <summary>
        // Function for parsing treelist to query on the catalog item
        // </summary>
        // <param name="ids">string with | separated list of category folder
           Ids</param>
        // <param name="query">the query to append to</param>
        protected virtual void ParseTreelistField(string ids, ref Query query)
        {
            // Creating a list if more than one folder is defined
            var folders = new List<string>();
            if (ids.Contains("|"))
            {
                folders.AddRange(ids.Split('|'));
            }
            else
            {
                folders.Add(ids);
            }
            var sub = new Query();
            var count = 0;
            // Iterating through each folder where there is a Sitecore ID
            foreach (var s in folders.Where(ID.IsID))
            {
            // Appending the value of the folder to the query and telling the query to search
              for the field _parent in the product Lucene index
                sub.AppendField("_parent", ShortID.Encode(s), MatchVariant.Exactly);
                // If more than one, we of course need to add a or to the query
                if (count < (folders.Count - 1))
                {
                    sub.AppendCondition(QueryCondition.Or);
                }
                count++;
            }
            // If the query is not empty, we need to be sure to add a AND condition.
            if (!query.IsEmpty())
            {
                query.AppendCondition(QueryCondition.And);
            }
            // Appending the built query to the main query
            query.AppendSubquery(sub);
        }
    }
}
```

Creating a Products Source

The main class that you should use in this scenario is the `ProductsSource` class. You can use the methods in this class to initialize the search, build the query using the `CatalogQueryBuilder` mentioned earlier, and return the result.

To create a products source, extend the `ProductsSource` — `Sitecore.Ecommerce.Shell.Applications.Catalogs.Models.Search.ProductsSource` class:

1. In Visual Studio, open the project named `Sample1` that you created earlier.
2. Add the following class to the project and name it `ProductsSource`:

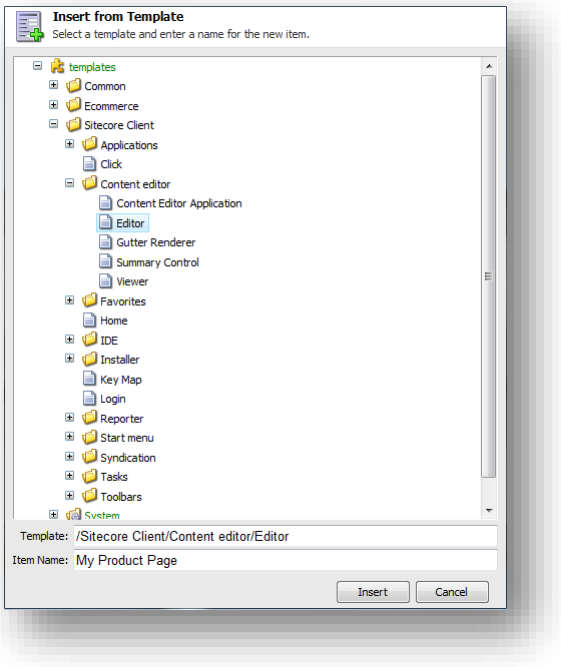
```
namespace Sample1.Shell.Applications.Catalogs.Models.Search
{
    using System.Linq;
    using System.Collections.Generic;
    using Sitecore.Ecommerce.DomainModel.Products;
    using Sitecore.Ecommerce.Search;
    using Sitecore.Ecommerce.Utils;
    using Sitecore.Ecommerce;
    using Sitecore.Ecommerce.Shell.Applications.Catalogs.Models.Search;
    using Sitecore.Ecommerce.Shell.Applications.Catalogs.Models;

    // <summary>
    // ProductsSource inheriting from
       Sitecore.Ecommerce.Shell.Applications.Catalogs.Models.Search.ProductsSource
    // this class is created so we can call the new query functionality we need for showing
       the result in the Sitecore content editor.
    // this class is also referred to on the copy made in Sitecore based on
       /sitecore/system/Modules/Ecommerce/Catalogs/Product Catalog
    // </summary>
    class ProductsSource :
          Sitecore.Ecommerce.Shell.Applications.Catalogs.Models.Search.ProductsSource
    {
        // <summary>
        // Gets the entries.
        // </summary>
        // <param name="pageIndex">Index of the page.</param>
        // <param name="pageSize">Size of the page.</param>
        // <returns>Returns Entries</returns>
        public override IEnumerable<List<string>> GetEntries(int pageIndex, int
                        pageSize)
        {
            // Let's get the query
            var builder = new CatalogQueryBuilder();
            var query = builder.BuildQuery(SearchOptions);
            // Let's resolve the product repository
            var productRepository = Context.Entity.Resolve<IProductRepository>();
            // Let's do the search
            var products = productRepository.Get<ProductBaseData, Query>(query,
            pageIndex, pageSize);
            // Let's return the result
            return !products.IsNullOrEmpty() ? new
                   EntityResultDataConverter<ProductBaseData>().Convert(products,
                   SearchOptions.GridColumns).Rows : new GridData().Rows;
        }
        // <summary>
        // Gets the entry count
        // </summary>
        // <returns>Returns enties count.</returns>
        public override int GetEntryCount()
        {
            // Let's get the query
            var builder = new CatalogQueryBuilder();
            var query = builder.BuildQuery(SearchOptions);
            // Let's resolve the product repository
            var productRepository = Context.Entity.Resolve<IProductRepository>();
            return productRepository.Get<ProductBaseData, Query>(query).Count();
        }
    }
}
```

Defining a New Editor in the Core Database

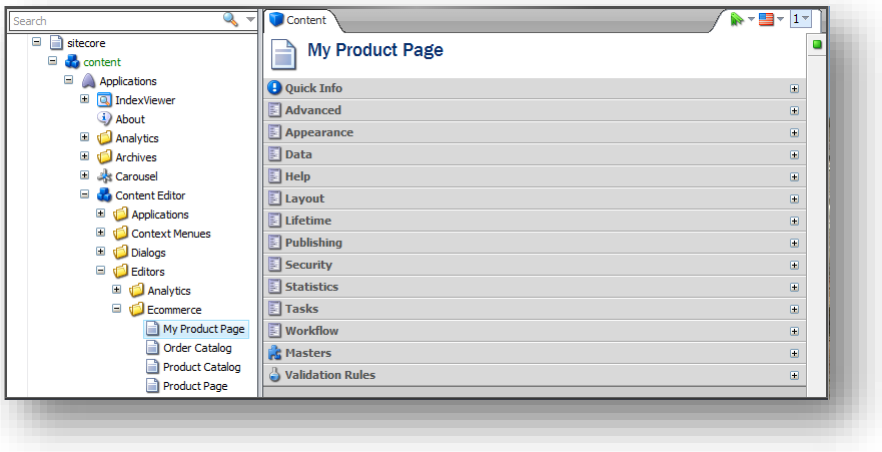
When you create a product catalog, you must also define a new editor in the *Core* database. You place the search catalog in the editor.

To create the editor:

1. Switch to the *Core* database.
2. Log in to the **Content Editor**.
3. Browse to the *My Product Page* item (`Sitecore/content/Applications/Content Editor/Editors/Ecommerce/My Product Page`) and insert from template.
4. Select *Editor* as the template (`/Sitecore Client/Content editor/Editor`).



You should now be able to see the new editor created under Ecommerce.



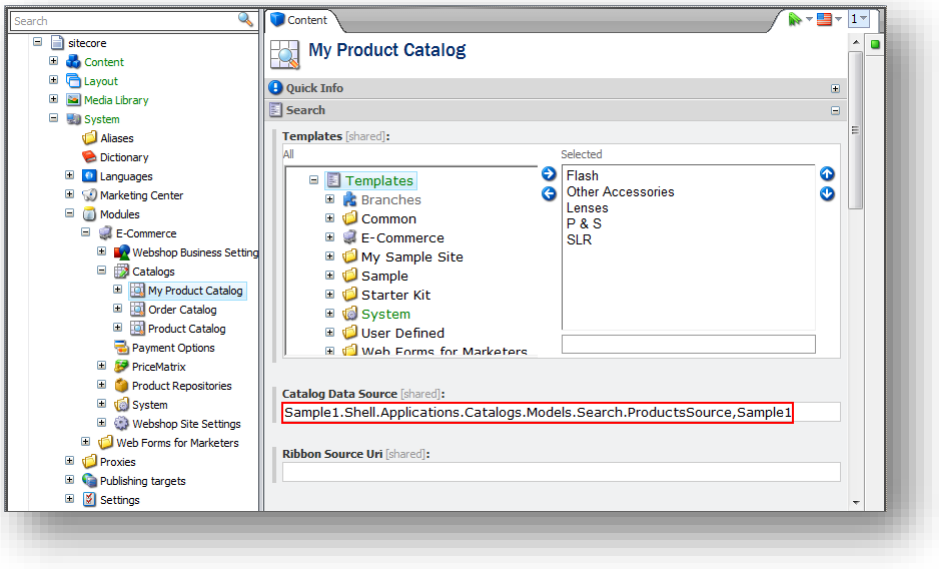
Creating a Product Catalog

The last part of this task is to create a product catalog. You should also reference the product source and the editor defined in the core database.

To create a product catalog:

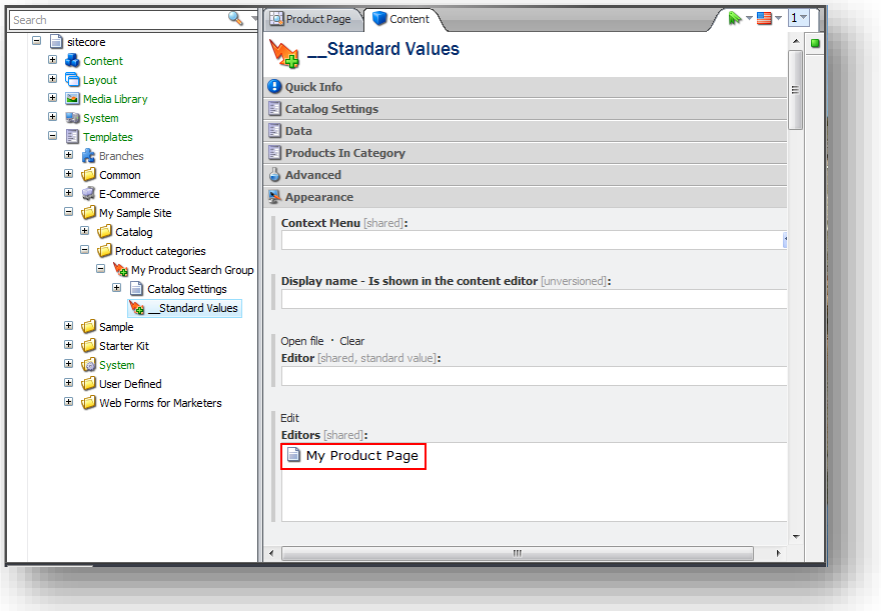
1. Switch to the *Master* database.
2. Under `Sitecore/System/Modules/E-Commerce/Catalogs`, create a new catalog and call it *My Product Catalog*.

3. In the *My Product Catalog* item, in the **Catalog Data Source** field, enter the products source reference.



4. Browse to the standard values of the *My Product Search Group* template — `Sitecore/Templates/My Sample Site/Products categories/ My Product Search Group /_Standard Values`.

5. On the **Content** tab, in the **Editors** field, click **Edit** and select the editor you defined in the last section — *My Product Page*.



Chapter 4

SES Core Configuration

There are two important configuration files in Sitecore SES:

- `Unity.config`
- `Sitecore.Ecommerce.config`

This chapter focuses on the `Sitecore.Ecommerce.config` file because it contains the configuration settings that do not exist in the content tree. SES uses the `/App_Config/Include/Sitecore.Ecommerce.config` file to extend the `Web.config` file.

For information about the `Unity.config`, see the section *Unity Application Block Overview*.

This chapter contains the following sections:

- Commands
- Events.
- XSLExtensions
- Settings
- Pipelines
- Search
- Multisite Configuration

4.1 Commands

This section describes the Ecommerce specific commands that are used in the Sitecore shell. These commands are used to define the business logic for each of the UI controls in SES.

Note
The commands described in this section are obsolete. In SES 2.2, you should use the new Order Manager application to manage orders. The old commands have only been kept for backwards compatibility.

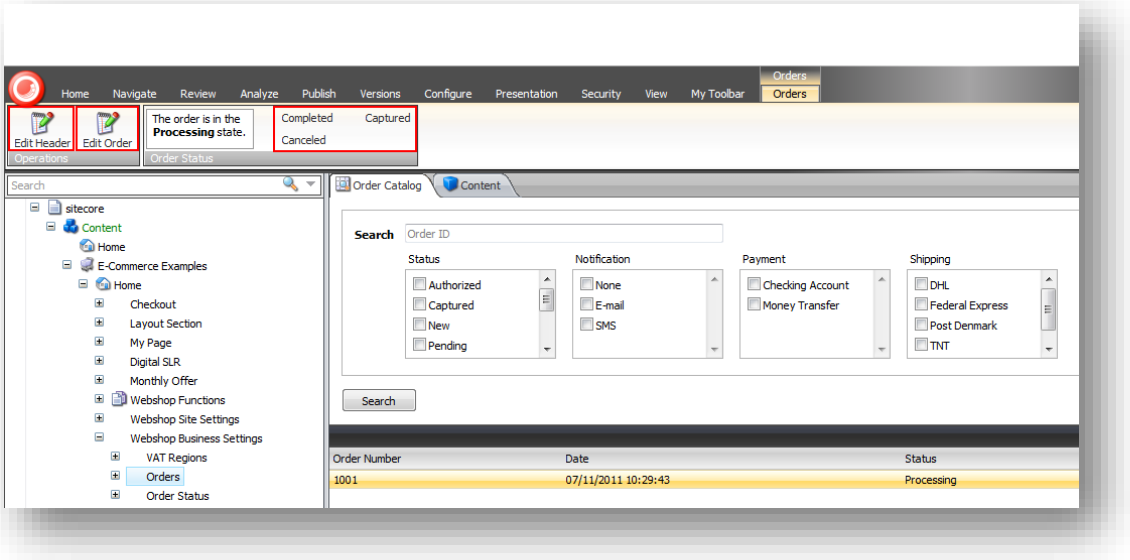
The following snippet contains the commands that are registered in the `Sitecore.Ecommerce.config` file:

```
<commands>
      <command name="ordercatalog:changeorderstatus"
        type="Sitecore.Ecommerce.Shell.Applications.OrderCatalog.Commands.
        ChangeOrderStatus,Sitecore.Ecommerce.Shell"/>
      <command name="ordercatalog:editorder"
       type="Sitecore.Ecommerce.Shell.Applications.OrderCatalog.Commands.
       EditOrder,Sitecore.Ecommerce.Shell"/>
      <command name="ordercatalog:editorderlines"
       type="Sitecore.Ecommerce.Shell.Applications.OrderCatalog.Commands.
       EditOrderLines,Sitecore.Ecommerce.Shell"/>
</commands>
```

The following table describes the commands in the `Sitecore.Ecommerce.config` file:

Command Name	Command Type	Description
`Ordercatalog:changeorderstatus`	`Sitecore.Ecommerce.Shell.Applications.OrderCatalog.Commands.ChangeOrderStatus,Sitecore.Ecommerce.Shell`	Calls the `execute` method of the `ChangeOrderStatus` class. This command changes the status of an order to one of the following: • `Authorized` • `Captured` • `New` • `Pending` • `Processing` • `Completed` • `Canceled` • `Closed` • `Held` It changes the status according to the rules defined for each state. In the following image, you can see where you can change the status of an order. On the **Order** tab, in **the Order Status** group, you select the status for the order.

Command Name	Command Type	Description
`Ordercatalog:editororder`	`Sitecore.Ecommerce.Shell.Applications.OrderCatalog.Commands.EditOrder,Sitecore.Ecommerce.Shell`	Calls the `execute` method of the `EditOrder` class. This command launches the **Field Editor** dialog box where you can change the content of the order based on the fields in the order template. To edit an order, in the **Operations** group, click **Edit Order** or **Edit Header**.
`Ordercatalog:editororderlines`	`Sitecore.Ecommerce.Shell.Applications.OrderCatalog.Commands.EditOrderLines,Sitecore.Ecommerce.Shell`	Calls the `execute` method of the `EditOrderLines` class. This command moves the focus of the Content Editor to the selected order allowing you to modify the order line that is located under the *Order* item. In the **Operations** group, click **Edit Orde**r.



4.2 Events

You can associate your Sitecore instance to a number of events in Sitecore. You can see the list of predefined events in the `<events>` section of the `Web.config` file.

The following snippet contains the events that are registered in the `Sitecore.Ecommerce.config` file:

```
<events>
      <event name="item:moved">
        <handler type="Sitecore.Ecommerce.StructuredData.EnableStructuredDataModule,
         Sitecore.Ecommerce.Kernel" method="OnItemSaved" />
      </event>
      <event name="item:saved">
        <handler type="Sitecore.Ecommerce.StructuredData.EnableStructuredDataModule,
         Sitecore.Ecommerce.Kernel" method="OnItemSaved" />
        <handler type="Sitecore.Ecommerce.Unity.ClearSiteSettingsCacheEventHandler,
         Sitecore.Ecommerce.Kernel" method="OnItemSaved" />
        <handler type="Sitecore.Ecommerce.Catalogs.VirtualProductResolverCleaner,
         Sitecore.Ecommerce.Kernel" method="OnItemSaved" />
      </event>
</events>
```

The following table describes the `<events>` elements in the `Sitecore.Ecommerce.config` file:

Event Name	Event Type	Description
`item:moved`	`Sitecore.Ecommerce.StructuredData.EnableStructuredDataModule, Sitecore.Ecommerce.Kernel`	Used to move an order from one location to another. It executes the `OnItemSaved` method that ensures that the item which is based on the order template is saved below the order repository. It creates the structured tree on the fly.
`item:saved`	`Sitecore.Ecommerce.StructuredData.EnableStructuredDataModule, Sitecore.Ecommerce.Kernel`	Used to save an order in a location. It executes the `OnItemSaved` method that ensures that the item which is based on the order template is saved below the order repository. It creates the structured tree on the fly.
	`Sitecore.Ecommerce.Unity.ClearSiteSettingsCacheEventHandler, Sitecore.Ecommerce.Kernel`	
	`Sitecore.Ecommerce.Catalogs.VirtualProductResolverCleaner, Sitecore.Ecommerce.Kernel`	

Note
In SES OM 2.2 you should use the Visitor Order Management or Merchant Order Management API. The `EnableStructuredDataModule` event handler has only been kept for backwards compatibility.

4.3 XSLExtensions

XSLT is a technology that can be used to output HTML from XML. XSLT can be used instead of sublayouts, whenever there is no need for complex logic. However sometimes you need to perform a little chunk of logic or execute a simple operation in your XSLT. XSL allows you to call some C# / VB methods from your XSLT.

Note
The `xslExtensions` methods could also be called directly.

The following are the XSL extensions in the SES core module:

```
<xslExtensions>
      <extension mode="on"
       type="Sitecore.Ecommerce.Analytics.Components.Xsl.XslExtensions,
       Sitecore.Ecommerce.Analytics"
       namespace="http://www.sitecore.net/ecommerceanalytics" singleInstance="true" />
</xslExtensions>
```

XSLT Method Name	Description
`AddToShoppingCart`	This method is used when a visitor adds a product to the shopping cart. It triggers the `AddToShoppingCart` event. Parameters: • `ProductCode` • `ProductName` • `Quantity` • `Price`
`ShoppingCartEmptied`	This method is used when a visitor decides to empty the shopping cart. It triggers the `ShoppingCartEmptied` event. Parameters: • `ShoppingCartContent` • `ItemsinShoppingCart`
`ShoppingCartContinueShopping`	This method is used when a visitor decides to continue shopping. It triggers the event called `ShoppingCartContinueShopping`.
`ShoppingCartUpdated`	This method is used when a visitor decides to update the shopping cart. It triggers the `ShoppingCartUpdated` event.
`GoToShoppingCart`	This method is used when a visitor decides to view the shopping cart. It triggers the `GoToShoppingCart` event.
`ShoppingCartItemRemoved`	This method is used when a visitor decides to remove an item from a specific product in the shopping cart. It triggers the `ShoppingCartItemRemoved` event. Parameters: • `ProductCode` • `ProdcutName` • `Amount`

XSLT Method Name	Description
`ShoppingCartItemUpdated`	This method is used when a visitor decides to update a shopping cart item. It triggers the `ShoppingCartItemUpdated` event. Parameters: • `ProductCode` • `ProductName` • `Amount`
`ShoppingCartProductRemoved`	This method is used when a visitor decides to remove a product from the shopping cart. It triggers the `ShoppingCartProductRemoved` event. Parameters: • `ProductCode` • `ProductName` • `Amount`
`ShoppingCartViewed`	This method is used when a visitor decides to view shopping cart. It triggers the `ShoppingCartViewed` event.
`GoToCheckOut`	This method is used when a visitor decides to checkout. It triggers the `GoToCheckOut` event.
`CheckoutDeliveryNext`	This method is used when the visitor clicks **Next** on the delivery page in the checkout process. It triggers the `CheckoutDeliveryNext` event. Parameters: • `DeliveryAlternativeOption` • `NotificationOption` • `NotificationText`
`CheckoutDeliveryOptionSelected`	This method is used when a visitor selects a checkout delivery option. It triggers the `CheckoutDeliveryOptionSelected` event. Parameter: • `DeliveryAlternativeOption`
`CheckoutPaymentMethodSelected`	This method is used when a visitor selects a checkout payment method. It triggers the `CheckoutPaymentMethodSelected` event. Parameters: • `OptionTitle` • `OptionCode`
`CheckoutNext`	This method is used when a visitor clicks **Next** on any page in the checkout process. It triggers the `CheckoutNext` event.
`CheckoutPaymentNext`	This method is used when a visitor clicks **Next** on the payment page in the checkout process. It triggers the `CheckoutPaymentNext` event.
`CheckoutNotificationOptionSelected`	This method is used when a visitor selects a checkout notification option. It triggers the `CheckoutNotificationOptionSelected` event. Parameter: • `DeliveryNotificationOption`

XSLT Method Name	Description
CheckoutPrevious	This method is used when a visitor clicks **Previous** during the checkout process. It triggers the CheckoutPrevious event.
AuthentificationClickedLoginButton	This method is used when a visitor clicks the login button. It triggers the AuthentificationClickedLoginButton event.
AuthentificationClickedLoginLink	This method is used when a visitor clicks the login link. It triggers the AuthentificationClickedLoginLink event.
AuthentificationUserLoggedOut	This method is used when a visitor logs out. It triggers the AuthentificationUserLoggedOut event. Parameter: • UserName
AuthentificationUserLoginSucceeded	This method is used when a visitor logs in successfully. It triggers the AuthentificationUserLoginSucceeded event. Parameter: • UserName
AuthentificationUserLoginFailed	This method is used when a visitor's login fails. It triggers the AuthentificationUserLoginFailed event. Parameter: • UserName
AuthentificationAccountCreationFailed	This method is used when a visitor's attempt to create an account fails. It triggers the AuthentificationAccountCreationFailed event.
AuthentificationAccountCreated	This method is used when a visitor creates an account. It triggers the AuthentificationAccountCreated event.
NavigationTabSelected	This method is used when a visitor clicks a navigation tab. It triggers the NavigationTabSelected event. Parameter: • TabName
NavigationProductReviewed	This method is used when a visitor chooses to review a product. It triggers the NavigationProductReviewed event. Parameters: • Code • Name • Title • Text • Rate
NavigationFollowListHit	This method is used when a visitor hits the follow list. It triggers the NavigationFollowListHit event.

XSLT Method Name	Description
`Search`	This method is used when a visitor searches for items on the front end. It enters a record about this search in the *Analytics* database. Parameters: • `Query` — the query used for the search. • `Hits` — the number of found items.
`AddFollowListToQueryString`	This method is used to return the URL concatenated with the parameters that are read from the `Ecommerce.Analytics.EventQueryStringKey` setting. Paramters: • `URL` • `ListName`
`AddFollowHitToQueryString`	This method is used to call the method named `AddFollowHitToQueryString` in the namespace `Sitecore.Analytics.Extensions.AnalyticsPageExtensions`. Parameters: • `URL` • `Search`
`AddTriggerEventStringToQueryString`	This method is used when a visitor clicks a link. It adds the trigger event — `EventName` parameter — to the query string. Parameters: • `URL` – the link that the user selects. • `EventName` – the trigger event name to be added to the query string.
`GetVirtualProductUrlWithAnaliticsQueryString`	This method is used when a visitor gets a virtual product's URL with an Analytics query parameter. It triggers the `GetVirtualProductUrlWithAnaliticsQueryString` event. Parameters: • `FolderNi` • `ProductNi`
`GetVirtualProductUrlWithAnaliticsQueryString`	This method is used when a visitor gets a virtual product's URL using an Analytics query. It triggers the `GetVirtualProductUrlWithAnaliticsQueryString` event. Parameter: • `ProsductItem`
`GetItem`	This method is used when a visitor user gets an item. It triggers the `GetItem` event. Prameter: • `Iterator`

4.4 Settings

This section lists the miscellaneous value pair settings in SES.

The following snippet presents these miscellaneous settings that can be configured in the `Sitecore.Ecommerce.config` file:

```
<settings>
      <!--  Ecommerce.Product.BaseTemplateId-->
      <setting name="Ecommerce.Product.BaseTemplateId" value="{02870C17-4273-4242-
       89A4-E973C3CF8EC0}" />
      <!--  Ecommerce.Order.OrderItemTempalteID-->
      <setting name="Ecommerce.Order.OrderItemTempalteId" value="{2769D69F-E217-4C0A-
       A41F-2083EC165218}" />
      <!--  Ecommerce.Order.OrderLineItemTempalteID-->
      <setting name="Ecommerce.Order.OrderLineItemTempalteId" value="{9A0E680B-B84E-
       42F6-9E48-68878591705B}" />
      <!--  Ecommerce.Settings.SettingsRootTemplateId-->
      <setting name="Ecommerce.Settings.SettingsRootTemplateId" value="{AC4841C3-9B0E-
       4AFD-B14B-5F280E34FBD5}" />
      <!--  Ecommerce.Analytics.EventQueryStringKey-->
      <setting name="Ecommerce.Analytics.EventQueryStringKey" value="ec_trk" />
      <!--  Ecommerce.EnableStructuredDataModule-->
      <setting name="Ecommerce.EnableStructuredDataModule" value="true" />
      <!--  Query.MaxItems specifies the max number of items in a query result set.
            If the number is 0, all items are returned. This may affect system performance if
            a large query result is returned. This also controls the number of items in
            Lookup, Multilist and Valuelookup fields.
            Default value: 100-->
      <setting name="Query.MaxItems" value="0" />
      <!-- Orders.OpenInNewWindow specifies whether a new content editor window must
           be open when editing orders-->
      <setting name="Orders.OpenInNewWindow" value="false"/>
      <setting name="Products.OpenInNewWindow" value="false"/>
      <setting name="GridPageSize">
        <patch:attribute name="value">10</patch:attribute>
      </setting>
</settings>
```

The following table describes the `<Settings>` elements in the SES core:

Setting	Description
`Ecommerce.Product.BaseTemplateId`	Defines the ID of the product base template used in the domain model.
`Ecommerce.Order.OrderItemTempalteId`	Defines the ID of the order item template used in the domain model. This setting relates to the obsolete order management functionality and has only been retained for backwards compatibility.
`Ecommerce.Order.OrderLineItemTempalteId`	Defines the ID of the order line item template used in the domain model. This setting relates to the obsolete order management functionality and has only been retained for backwards compatibility.
`Ecommerce.Settings.SettingsRootTemplateId`	Defines the ID in Sitecore for the settings root template used in the domain model.
`Ecommerce.Analytics.EventQueryStringKey`	Defines the variable that is assigned to a string that represents a query.
`Ecommerce.EnableStructuredDataModule`	This setting is checked within the `OnItemSaved` method. If this setting is set *true*, the system puts the saved item according to the unified tree structure in Sitecore. This setting relates to the obsolete order management functionality and has only been retained for backwards compatibility.

Setting	Description
`Query.MaxItems`	Specifies the maximum number of items that should be shown in the results of a query. If the value is 0, all the items are returned. This may affect system performance, if a large query result is returned. This also controls the number of items in *Lookup*, *Multilist* and *Valuelookup* fields. The default value is 100.
`Orders.OpenInNewWindow`	Specifies whether a new Content Editor window should open when you edit orders.
`Products.OpenInNewWindow`	Specifies whether a new Content Editor window should open when you edit products.
`GridPageSize`	Defines the number of rows in a user interface grid.

4.5 Pipelines

Two groups of pipelines exist in the `Sitecore.Ecommerce.config` file:

- The first group is defined within the `/configuration/sitecore/pipelines` element.
- The second group is defined within the /`configuration/sitecore/processors` element.

4.5.1 The <pipelines> Element

These are the pipelines that are grouped within the `/configuration/sitecore/pipelines` element. They define system processes.

```
<pipelines>
      <initialize>
        <!-- Processor initialize the Unity container configuration on the first
             start. -->
        <processor type="Sitecore.Ecommerce.Pipelines.Loader.ConfigureEntities,
                  Sitecore.Ecommerce.Kernel"
                  patch:after="processor[@type='Sitecore.Pipelines.Loader.
                  EnsureAnonymousUsers, Sitecore.Kernel']">
         <UnityConfigSource>/App Config/Unity.config</UnityConfigSource>
        </processor>
        <processor
          type="Sitecore.Ecommerce.Pipelines.Loader.ConfigureShopContainers,
          Sitecore.Ecommerce.Kernel"
          patch:after="processor[@type='Sitecore.Ecommerce.Pipelines.Loader.ConfigureEntities,
          Sitecore.Ecommerce.Kernel']" />
        <processor type="Sitecore.Ecommerce.Pipelines.Loader.
                  RegisterEcommerceProviders,
                  Sitecore.Ecommerce.Kernel"
                  patch:after="processor[@type='Sitecore.Ecommerce.Pipelines.Loader.
                  ConfigureEntities, Sitecore.Ecommerce.Kernel']"
                  method="InitializePaymentSystemProvider"/>
        <processor type="Sitecore.Ecommerce.Pipelines.Loader.
                  RegisterEcommerceProviders, Sitecore.Ecommerce.Kernel"
                  patch:after="processor[@type='Sitecore.Ecommerce.Pipelines.Loader.
                  ConfigureEntities, Sitecore.Ecommerce.Kernel']"
                  method="InitializeShippingSystemProvider"/>
        <processor type="Sitecore.Ecommerce.Pipelines.Loader.
                  RegisterEcommerceProviders, Sitecore.Ecommerce.Kernel"
                  patch:after="processor[@type='Sitecore.Ecommerce.Pipelines.Loader.
                  ConfigureEntities, Sitecore.Ecommerce.Kernel']"
                  method="InitializeNotificationOptionProvider"/>
        <processor type="Sitecore.Ecommerce.Pipelines.Loader.
                  RegisterEcommerceProviders, Sitecore.Ecommerce.Kernel"
                  patch:after="processor[@type='Sitecore.Ecommerce.Pipelines.Loader.
                         ConfigureEntities, Sitecore.Ecommerce.Kernel']"
                  method="InitializeCountryProvider"/>
        <processor type="Sitecore.Ecommerce.Pipelines.Loader.
                  RegisterEcommerceProviders, Sitecore.Ecommerce.Kernel"
                  patch:after="processor[@type='Sitecore.Ecommerce.Pipelines.Loader.
                  ConfigureEntities, Sitecore.Ecommerce.Kernel']"
                  method="InitializeCurrencyProvider"/>
        <processor type="Sitecore.Ecommerce.Pipelines.Loader.
                  RegisterEcommerceProviders, Sitecore.Ecommerce.Kernel"
                  patch:after="processor[@type='Sitecore.Ecommerce.Pipelines.Loader.
                  ConfigureEntities, Sitecore.Ecommerce.Kernel']"
                  method="InitializeVatRegionProvider"/>
              <processor type="Sitecore.Ecommerce.Pipelines.Loader.
                  RegisterEcommerceProviders, Sitecore.Ecommerce.Kernel"
                  patch:after="processor[@type='Sitecore.Ecommerce.Pipelines.Loader.
                  ConfigureEntities, Sitecore.Ecommerce.Kernel']"
                  method="InitializeOrderStatusProvider"/>
        <processor type="Sitecore.Ecommerce.Pipelines.Loader.
                  RegisterEcommerceProviders, Sitecore.Ecommerce.Kernel"
                  patch:after="processor[@type='Sitecore.Ecommerce.Pipelines.Loader.
                  ConfigureEntities, Sitecore.Ecommerce.Kernel']"
                  method="InitializeBusinessCatalogProviders"/>
      </initialize>
```

```
      <preprocessRequest>
        <processor type="Sitecore.Pipelines.PreprocessRequest.FilterUrlExtensions,
                  Sitecore.Kernel">
                  <param desc="Allowed extensions (comma separated)">aspx, ashx,
                  asmx, svc</param>
        </processor>
      </preprocessRequest>
      <httpRequestBegin>
        <processor type="Sitecore.Ecommerce.Pipelines.HttpRequest.ProductResolver,
          Sitecore.Ecommerce.Kernel"
          patch:after="*[@type='Sitecore.Pipelines.HttpRequest.ItemResolver,
          Sitecore.Kernel']"  />
        <processor type="Sitecore.Ecommerce.Pipelines.HttpRequest.CreateRequestContainer,
          Sitecore.Ecommerce.Kernel"
          patch:after="*[@type='Sitecore.Pipelines.HttpRequest.SiteResolver,
          Sitecore.Kernel']" />
        <processor type="Sitecore.Ecommerce.Shell.Pipelines.HttpRequest.ShellShopResolver,
          Sitecore.Ecommerce.Shell"
        patch:after="
        [@type='Sitecore.Ecommerce.Pipelines.HttpRequest.CreateRequestContainer,
        Sitecore.Ecommerce.Kernel']" />
      </httpRequestBegin>
      <httpRequestEnd>
        <processor type="Sitecore.Ecommerce.Pipelines.HttpRequest.DisposeRequestContainer,
        Sitecore.Ecommerce.Kernel" />
      </httpRequestEnd>
      <getConfiguration>
        <processor type="Sitecore.Ecommerce.Pipelines.GetConfiguration.
                        GetFromContextSite, Sitecore.Ecommerce.Kernel" />
        <processor type="Sitecore.Ecommerce.Pipelines.GetConfiguration.GetFromWebSite,
                  Sitecore.Ecommerce.Kernel" />
        <processor type="Sitecore.Ecommerce.Pipelines.GetConfiguration.
                  GetFromLinkManager, Sitecore.Ecommerce.Kernel" />
        <processor type="Sitecore.Ecommerce.Pipelines.GetConfiguration.
                  GetFromResolver, Sitecore.Ecommerce.Kernel" />
      </getConfiguration>
      <startTracking>
        <processor patch:after="*[@type='Sitecore.Analytics.Pipelines.StartTracking.
                  ProcessQueryString,Sitecore.Analytics']"
                  type="Sitecore.Ecommerce.Analytics.Pipelines.StartTracking.
                  ProcessQueryString, Sitecore.Ecommerce.Analytics"/>
      </startTracking>
      <orderCreated>
        <processor type="Sitecore.Ecommerce.Visitor.Pipelines.OrderCreated.NotifyCustomer,
        Sitecore.Ecommerce.Visitor"/>
      </orderCreated>
      <customerCreated>
        <processor type="Sitecore.Ecommerce.Pipelines.CustomerCreated.
                        ConfigureSecurity, Sitecore.Ecommerce.Kernel"/>
        <processor type="Sitecore.Ecommerce.Pipelines.CustomerCreated.LogIn,
                  Sitecore.Ecommerce.Kernel"/>
        <processor type="Sitecore.Ecommerce.Pipelines.CustomerCreated.
                  SendNotification, Sitecore.Ecommerce.Kernel"/>
      </customerCreated>
      <paymentStarted>
        <processor type="Sitecore.Ecommerce.Pipelines.PaymentStarted.StartPayment,
                  Sitecore.Ecommerce.Kernel"/>
      </paymentStarted>
      <renderLayout>
        <processor type="Sitecore.Pipelines.RenderLayout.InsertRenderings,
                  Sitecore.Kernel">
          <patch:attribute name="type">Sitecore.Ecommerce.Pipelines.RenderLayout.
                              ProcessProductPresentation, Sitecore.Ecommerce.Kernel
                </patch:attribute>
        </processor>
      </renderLayout>
      <getContentEditorFields>
        <processor type="Sitecore.Shell.Applications.ContentEditor.Pipelines.
                        GetContentEditorFields.GetFields, Sitecore.Client" >
          <patch:attribute name="type">Sitecore.Ecommerce.Shell.Applications.
                        ContentEditor.Pipelines.GetContentEditorFields.GetFields,
                        Sitecore.Ecommerce.Shell
          </patch:attribute>
          <HiddenFields>{81AD5AA7-316C-4F79-9DFF-8FEBFCFBFB4E}|{4423D09D-E95A-4827-
```

```
                                B12D-E682BE2DE834}|{39BB71D9-E6B4-4F50-BFAC-1C586724D3B9}|
                                {4200DA93-E824-4FA0-B93B-5F9AB662E3DC}
                </HiddenFields>
            </processor>
        </getContentEditorFields>
</pipelines>
```

<initialize>

This pipeline initializes the Sitecore application.

The processor methods that start with *initialize*:

- Instantiate an instance of the provider.
- Create a name-value collection for this instance with the following attributes:
  - description
  - settings name
  - default container name
  - containers item template ID
- Register this provider instance.

Processor Method	Processor Type	Description
`Process` — Default method	`ConfigureEntities`	This is the default method for this pipeline. It initializes the `Unity.config`.
`Process` – Default method	`ConfigureShopContainers`	This is the default method for this pipeline. It configures Unity for a specific webshop.
`InitializePaymentSystemProvider`	`RegisterEcommerceProviders`	Initializes the payment system provider.
`InitializeShippingSystemProvider`	`RegisterEcommerceProviders`	Initializes the shipping system provider.
`InitializeNotificationOptionProvider`	`CustomerCreated.SendNotification`	Initializes the notification option provider.
`InitializeCountryProvider`	`RegisterEcommerceProviders`	Initializes the country provider.
`InitializeCurrencyProvider`	`RegisterEcommerceProviders`	Initializes the currency provider.
`InitializeVatRegionProvider`	`RegisterEcommerceProviders`	Initializes the VAT region provider.
`InitializeOrderStatusProvider`	`RegisterEcommerceProviders`	Initializes the order status provider.
`InitializeBusinessCatalogProviders`	`RegisterEcommerceProviders`	Initializes the business catalog provider.

All these processors are located in the `Sitecore.Ecommerce.Pipelines.Loader.` namespace in the `Sitecore.Ecommerce.Kernel` assembly.

<preprocessRequest>

This pipeline is invoked for each HTTP request that is managed by ASP.Net, but aborted for some requests. It is more common to use the `<httpRequestBegin>` pipeline for request processing

logic, but the `preprocessRequest` pipeline is mentioned because a processor within this pipeline may prevent Sitecore from processing requests with specific extensions other than `.aspx`.

Processor Method	Processor Type	Description
`Process` — Default method	`FilterUrlExtensions`	This is the default pipeline that Sitecore uses to support different web pages extensions. SES uses this to present virtual products with an extension.

This processor is located in the `Sitecore.Pipelines.PreprocessRequest.` namespace in the `Sitecore.Kernel` assembly.

<httpRequestBegin>

This pipeline defines the context of Sitecore. It is invoked for each HTTP request that is not directed to ASP.NET by the `preprocessRequest` pipeline.

Processor Method	Processor Type	Description
`Process` – Default method	`ProductResolver`	This processor contains the implemented logic for resolving a product by its URL. See the section *SES Product Management*.
`Process` – Default method	`CreateRequestContainer`	Creates a copy of the configured Unity container for each web request. This guarantees that the Unity containers are isolated for every request and that any changes made to the Unity configuration for one request do not affect any other requests.
`Process` – Default method	`ShellShopResolver`	Resolves the webshop for catalog applications in the Sitecore backend.

All these processors are located in the `Sitecore.Ecommerce.Pipelines.HttpRequest.` namespace in the `Sitecore.Ecommerce.Kernel` assembly.

Except the `ShellShopResolver,` processor which is located in the `Sitecore.Ecommerce.Shell.Pipelines.HttpRequest.` in the namespace in the `Sitecore.Ecommerce.Shell` assembly.

<httpRequestEnd >

This pipeline usually performs cleanup of Sitecore context objects after each request.

Processor Method	Processor Type	Description
`Process` – Default method	`DisposeRequestContainer`	Disposes of the copy of the Unity container created by the `CreateRequestContainer` processor at the beginning of request.

This processor is located in the `Sitecore.Ecommerce.Pipelines.HttpRequest.` namespace in the `Sitecore.Ecommerce.Kernel` assembly.

<getConfiguration>

This pipeline is executed when Sitecore initializes the basic SES components configured in Unity.

Processor Method	Processor Type	Description
`Process` — Default method	`GetFromContextSite`	Uses the context item to search for the site settings.
`Process` — Default method	`GetFromWebSite`	Uses the context item to search for the site settings trying to resolve a website.
`Process` — Default method	`GetFromLinkManager`	Uses the Link database to Search for the site settings.
`Process` — Default method	`GetFromResolver`	Resolves the configuration in the Unity configuration file.

All these processors are located in the `Sitecore.Ecommerce.Pipelines. GetConfiguration.` namespace in the `Sitecore.Ecommerce.Kernel` assembly.

<startTracking>

Processor Method	Processor Type	Description
`Process` — Default method	`ProcessQueryString`	This processor is used to trigger the `FollowList`, and the `FollowHit` events.

This processor is located in the `Sitecore.Ecommerce.Analytics.Pipelines.StartTracking.` namespace in the `Sitecore.Ecommerce.Analytics` assembly.

<orderCreated>

This pipeline is executed after an order has been created by the webshop. Currently, it contains two processors that are responsible for sending out confirmation emails to the customers and the

webshop owner.

Processor Method	Processor Type	Description
`Process` — Default method	`NotifyCustomer`	Sends a confirmation e-mail to the customer.

This processor is located in the `Sitecore.Ecommerce.Visitor.Pipelines.OrderCreated.` namespace in the `Sitecore.Ecommerce.Visitor` assembly.

<customerCreated>

This pipeline is executed after a visitor creates a new account on the webshop.

Processor Method	Processor Type	Description
`Process` — Default method	`ConfigureSecurity`	Configures the visitor's security settings.
`Process` — Default method	`LogIn`	Logs a customer in to the website.
`Process` — Default method	`SendNotification`	Sends notification to the customer.

All these processors are located in the `Sitecore.Ecommerce.Pipelines.CustomerCreated.` namespace in the `Sitecore.Ecommerce.Kernel` assembly.

<paymentStarted>

This pipeline starts during the checkout process after a visitor clicks Confirm as part of the Payment step. The processor calls the selected Payment provider.

Processor Method	Processor Type	Description
`Process` — Default method	`StartPayment`	Invokes the capture method on the payment provider interface.

This processor is located in the `Sitecore.Ecommerce.Pipelines.PaymentStarted.` namespace in the `Sitecore.Ecommerce. Kernel` assembly.

<renderLayout>

This pipeline is used by the CMS layout engine to resolve the layout, sub-layout, XSLT and web controls to render the current page based on the given URL.

Processor Method	Processor Type	Description
`Process` — Default method	`InsertRenderings`	Renders the layout that is defined in **Product Detail Presentation Storage** field.

This processor is located in the `Sitecore.Pipelines.RenderLayout` namespace in the `Sitecore. Kernel` assembly.

<getContentEditorFields>

This pipeline defines the fields to display in the **Content Editor**.

<orderCaptured>

This pipeline allows additional actions to be performed when an order is captured from the Order Management application.

4.5.2 The <Processors> Element

These are the pipelines that are grouped within the `/configuration/sitecore/processors` element. These pipelines operate for UI requests and interact with the user.

```
<processors>
      <uiDeleteItems>
        <processor mode="on" type="Sitecore.Ecommerce.Orders.OrderItemEventHandler,
                   Sitecore.Ecommerce.Kernel"
                   patch:before="processor[@type='Sitecore.Shell.Framework.Pipelines.
                   DeleteItems,Sitecore.Kernel' and @method='Execute']"
                   method="OnItemDeleted" />
      </uiDeleteItems>
      <saveUI>
        <processor mode="on" type="Sitecore.Ecommerce.Orders.OrderItemEventHandler,
                   Sitecore.Ecommerce.Kernel" patch:after="processor[@type=
                          'Sitecore.Pipelines.Save.Save, Sitecore.Kernel']"
                          method="OnItemSaved"/>
      </saveUI>
      <uiDuplicateItem>
         <processor mode="on" type="Sitecore.Ecommerce.Orders.OrderItemEventHandler,
                    Sitecore.Ecommerce.Kernel" patch:after="processor[@type='Sitecore.
                    Shell.Framework.Pipelines.DuplicateItem, Sitecore.Kernel'
                    and @method='Execute']" method="OnItemDuplicated"/>
      </uiDuplicateItem>
      <uiCopyItems>
        <processor mode="on" type="Sitecore.Ecommerce.Orders.OrderItemEventHandler,
                   Sitecore.Ecommerce.Kernel"
                   patch:after="processor[@type='Sitecore.Shell.Framework.
                          Pipelines.CopyItems,Sitecore.Kernel' and @method='Execute']"
                          method="OnItemCopied" />
      </uiCopyItems>
</processors>
```

The following table describes the pipelines in the `/configuration/sitecore/processors` element:

Processor	Description
`<uiDeleteItems>`	Deletes an item and its descendants.
`<saveUI>`	Saves an item.
`<uiDuplicateItem>`	Duplicates an item.
`<uiCopyItems>`	Copies an item and its descendants.

Note
In SES 2.2, orders should not be stored in items. The processors described in the previous table are retained for backwards compatibility only.

4.6 Search

SES comes with 3 search providers by default. For more information about these search providers, see the *SES Configuration Guide*.

Both `FastQuerySearchProvider` and `SitecoreSearchProvider` work without any index because they query the Sitecore API and Sitecore handles the indexing and searching. If you use the `LuceneSearchProvider`, Lucene must build and maintain an index.

If you use the Lucene Search Provider, the default configuration of the product catalog is:

```
<search>
      <configuration>
        <indexes>
          <index id="products" type="Sitecore.Search.Index, Sitecore.Kernel">
            <param desc="name">$(id)</param>
            <param desc="folder">  products</param>
            <Analyzer type="Sitecore.Ecommerce.Search.LuceneAnalyzer,
                      Sitecore.Ecommerce.Kernel"/>
            <locations hint="list:AddCrawler">
              <master type="Sitecore.Ecommerce.Search.DatabaseCrawler,
                      Sitecore.Ecommerce.Kernel">
                <Database>master</Database>
                <Root>{0A702337-81CD-45B9-8A72-EC15D2BE1635}</Root>
                <Tags>master products</Tags>
              </master>
              <web type="Sitecore.Ecommerce.Search.DatabaseCrawler,
                   Sitecore.Ecommerce.Kernel">
                <Database>web</Database>
                <Root>{0A702337-81CD-45B9-8A72-EC15D2BE1635}</Root>
                <Tags>web products</Tags>
              </web>
            </locations>
          </index>
        </indexes>
      </configuration>
</search>
```

To use a custom index, use the *IndexName* property of the Lucene Search provider. This approach is particularly useful when you want different webshops to use different product repositories with different Lucene indexes.

For more information about configuring a multi-shop installation, see the section *Multisite Configuration*.

If you want different webshops to use different indexes, you should configure a new index with a unique name as described earlier and register the *LuceneSearchProvider* as the implementation of the *ISearchProvider* and set the *IndexName* property to the index for the corresponding website.

Here is an example of the configuration:

```
<register type="ISearchProvider" mapTo="LuceneSearchProvider">
  <property name="IndexName" value="mystore_products" />
</register>
```

Note
If you are not using the default configuration, you must change the Root identification to refer to your products repository. For more information, see the section *Extending the Resolve Strategy*.

4.7 Multisite Configuration

To configure a multisite solution in the Sitecore E-commerce module, you must:

- Create a definition for each webshop.
- Configure the order and log databases for each webshop.
- Register the business objects for each webshop.
- Configure the Lucene product repository for each webshop.

4.7.1 Creating Webshop Definitions

To create a multisite solution, you should register a list of the sites in the configuration files.

Use the *EcommerceSiteSettings* attribute to distinguish webshops from general site registrations

For example, the following configuration is for two different webshops that point to the same root on the back-end:

```
<sitecore>
  <sites>
    <site name="example" hostName="ecommerce" virtualFolder="/" physicalFolder="/"
    content="master" rootPath="/sitecore/content/E-Commerce Examples" startItem="/home"
    database="web" domain="extranet" allowDebug="true" cacheHtml="false" htmlCacheSize="10MB"
    EcommerceSiteSettings="/Site Settings" browserTitle="Example" registryCacheSize="0"
    viewStateCacheSize="0" xslCacheSize="5MB" filteredItemsCacheSize="2MB"
    enablePreview="true" enableWebEdit="true" enableDebugger="true" disableClientData="false"
    patch:before="site[@name='website']"/>
    <site name="secondwebstore" hostName="ecommerce2" virtualFolder="/" physicalFolder="/"
    content="master" rootPath="/sitecore/content/E-Commerce Examples" startItem="/home"
    database="web" domain="extranet" allowDebug="true" cacheHtml="false" htmlCacheSize="10MB"
    EcommerceSiteSettings="/Site Settings" browserTitle="Second Web Store"
    registryCacheSize="0" viewStateCacheSize="0" xslCacheSize="5MB"
    filteredItemsCacheSize="2MB" enablePreview="true" enableWebEdit="true"
    enableDebugger="true" disableClientData="false" patch:before="site[@name='website']"/>
  </sites>
<sitecore>
```

Open the browser with the `http://ecommerce` URL to open the *example* webshop.

The `http://ecommerce2` URL opens the *secondwebstore*.

Note
It is best practice to have an include file per webshop, for example a `web.config` include file. The `/App_Config/include/Sitecore.Ecommerce.Examples.config` file is an example.

4.7.2 Configuring Separate/Common Order and Log Databases for Multiple Webshops

SES allows installations that have a single webshop and installations that have multiple webshops to store both orders and log data in a single database.

When you configure multiple webshops, you might want to store their orders (and their log data) in separate databases instead of in the single default database.

Each website that you register can receive new attributes:

- `orderDatabase` — the name of the database where you want to store orders.
- `actionLogDatabase` — the name of the database where you want to store log files.

For example:

```
<site name="secondwebstore" hostName="" virtualFolder="/" physicalFolder="/" content="master"
… ordersDatabase="secondorders" actionLogDatabase="secondlogging" />
```

```
<site name="thirdwebstore" hostName="" virtualFolder="/" physicalFolder="/" content="master" …
ordersDatabase="orders" actionLogDatabase="logging" />
```

You must remember to include the connection strings in the configuration:

```
<add name="secondorders" connectionString="user id=sa;password=12345;Data
Source=(local);Database=ecommerce_SecondOrders;MultipleActiveResultSets=true;"
providerName="System.Data.SqlClient" />

<add name="secondlogging" connectionString="user id=sa;password=12345;Data
Source=(local);Database=ecommerce_SecondActionLog;MultipleActiveResultSets=true;"
providerName="System.Data.SqlClient" />
```

You can quickly create the additional databases by copying the existing ones from the fresh SES installation.

The *ShopContext* type tells the API which webshop to work with. The *ShopContext* type stores information about the order and log databases, the settings, and the related website.

You should not explicitly create instances of the *ShopContext* type. SES defines the `VisitorShopResolver`, `MerchantShopResolver`, and `ShellShopResolver` processors for the front-end, the `OrderManager` and the catalog applications respectively. These processors automatically create corresponding instances of the *ShopContext* type and register them in the IoCContainer. If a class is resolved from the Unity container and one of its constructor arguments is the *ShopContext* type, the registered instance of *ShopContext* is automatically provided as the argument. There is usually no reason to use the *ShopContext* type in common scenarios — the *ShopContext* type is generally needed when you create a new business entity like `MerchantOrderManager` or when you extend an existing business entity.

When a customer passes the checkout, Sitecore creates new order for that webshop. The information about the site name of the webshop for which the order has been created is stored in the order database thereby allowing multiple webshops to share the same order database.

4.7.3 Registering Different Business Objects for Different Webshops

SES allows you to configure application wide and site-specific IoC containers. For more information about configuring IoC containers, see sections *The Unity Configuration Files* and *The initialize Pipeline.*

To learn about the application wide configuration, see the `\App_Config\Unity.config` file. To configure the business objects for a particular website, create a file with the required registrations in the `\App_Config\<Site name>.Unity.config` file. Both types of file have the same format, so the configuration process is identical for both.

Here is an example of how to override the application registration of `ISearchProvider` with the `LuceneSearchProvider` for a specific webshop that shows you how to associate a specific Lucene index with a webshop:

```
<?xml version="1.0" encoding="utf-8"?>
<configuration>
  <configSections>
    <section name="unity"
    type="Microsoft.Practices.Unity.Configuration.UnityConfigurationSection,
    Microsoft.Practices.Unity.Configuration" />
  </configSections>
  <unity xmlns="http://schemas.microsoft.com/practices/2010/unity">
    <alias alias="ISearchProvider" type="Sitecore.Ecommerce.Search.ISearchProvider,
    Sitecore.Ecommerce.Kernel" />
    <alias alias="LuceneSearchProvider" type="Sitecore.Ecommerce.Search.LuceneSearchProvider,
    Sitecore.Ecommerce.Kernel" />
    <container>
      <register type="ISearchProvider" mapTo="LuceneSearchProvider">
        <property name="IndexName" value="mystore_products" />
      </register>
    </container>
  </unity>
</configuration>
```

Note
If multiple webshops have their product repositories located under the same root folder in the content tree, you do not need to define multiple Lucene indexes. If the repositories are located in different areas of the content tree, you must define multiple Lucene indexes.

For more information about configuring multiple Lucene indexes, see the section *Configuring the Lucene Product Repository for a Specific Webshop.*

In scenarios, where dynamic configuration is required or configuration files are just not an option, you can add processors to the *initialize* pipeline that perform the necessary configurations for both the application and the site IoC containers.

You can access the application IoC container through the `CustomData["UnityContainer"]` property of the pipeline argument.

You can access the webshop container through the `CustomData["UnityContainer_<Site name>"]` property.

The corresponding properties are accessible after the `ConfigureEntities` and `ConfigureShopContainers` processors have been invoked.

If you want to change how the webshop IoC containers are configured by default, alter the default implementation of the `ShopIoCConfigurationProvider`.

All of these details are only important for configuration scenarios. From a business perspective, access to the IoC containers can be gained through the `Entity` property of the `Sitecore.Ecommerce.Context` class just as it was in previous versions of SES.

4.7.4 Configuring the Lucene Product Repository for a Specific Webshop

To configure separate Lucene indexes for webshops that store their respective product repositories under different root folders:

1. Add a configuration section for the new Lucene index to each individual webshop configuration file:

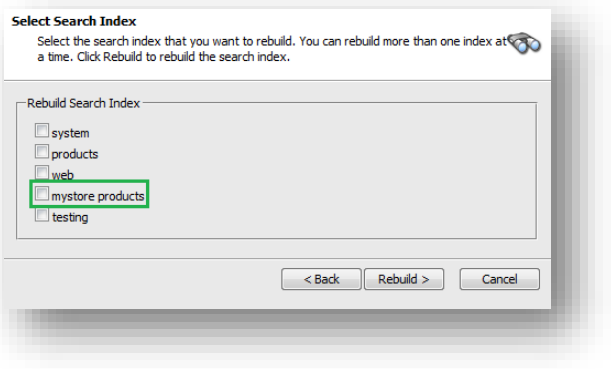
```
<search>
  <configuration>
    <indexes>
      <index id="mystore products" type="Sitecore.Search.Index, Sitecore.Kernel">
        <param desc="name">$(id)</param>
        <param desc="folder">__mystore_products_folder</param>
        <Analyzer type="Sitecore.Ecommerce.Search.LuceneAnalyzer, Sitecore.Ecommerce.Kernel"/>
        <locations hint="list:AddCrawler">
      <master type="Sitecore.Ecommerce.Search.DatabaseCrawler, Sitecore.Ecommerce.Kernel">
            <Database>master</Database>
            <!-- Please specify the product repository root item ID here -->
            <Root>{00000000-0000-0000-0000-000000000000}</Root>
            <Tags>master products</Tags>
      </master>
          <web type="Sitecore.Ecommerce.Search.DatabaseCrawler, Sitecore.Ecommerce.Kernel">
            <Database>web</Database>
            <!-- Please specify the product repository root item ID here -->
            <Root>{00000000-0000-0000-0000-000000000000}</Root>
            <Tags>web products</Tags>
          </web>
        </locations>
      </index>
    </indexes>
  </configuration>
</search>
```

In this example, you must specify the following settings:

- Index name — the id attribute of index node.
- Index folder name — the `param` node with the folder value in `desc` attribute.

- Product repository root item id — for both the master and web databases.

2. Run the Index Wizard and rebuild the index that you created in step 1.



3. Register the Lucene search provider in the Unity configuration file for the additional webshop:

```
<alias alias="ISearchProvider" type="Sitecore.Ecommerce.Search.ISearchProvider,
Sitecore.Ecommerce.Kernel" />
<alias alias="LuceneSearchProvider" type="Sitecore.Ecommerce.Search.LuceneSearchProvider,
Sitecore.Ecommerce.Kernel" />
<container>
  <register type="ISearchProvider" mapTo="LuceneSearchProvider">
    <property name="IndexName" value="mystore products" />
  </register>
</container>
```

4. Make sure that the index name that you configured in step 1 is set in the `IndexName` property.

4.8 Switching Between the Visitor and the Remote API in the Unity.config File

If you have a distributed environment with separate CM and CD instances, you must use remoting to communicate between the two instances. SES does not use remoting by default.

The default registration of the following business entities `VisitorOrderProcessorBase`, `VisitorOrderRepositoryBase`, `OrderIDGenerator`, `IProductPriceManager`, `IProductStockManager` and `IOrderManager` look like this:

```
<register type="IOrderManager" mapTo="TransientOrderManager">
   <lifetime type="hierarchical" />
</register>
<register type="OrderIDGenerator" mapTo="ItemBasedOrderIDGenerator">
  <lifetime type="hierarchical" />
</register>
<register type="IProductStockManager" mapTo="ProductStockManager">
  <lifetime type="hierarchical" />
</register>
<register type="IProductPriceManager" mapTo="ProductPriceManager">
  <lifetime type="hierarchical" />
</register>
<register type="VisitorOrderProcessorBase" mapTo="VisitorOrderProcessor">
  <lifetime type="hierarchical" />
  <interceptor type="VirtualMethodInterceptor" />
  <policyInjection />
</register>
<register type="VisitorOrderRepositoryBase" mapTo="VisitorOrderRepository">
  <lifetime type="hierarchical" />
  <interceptor type="VirtualMethodInterceptor" />
  <policyInjection />
</register>
```

The `IOrderManager` registration should not be changed when using remoting, because `TransientOrderManager` is just an adapter which ensures backwards compatibility with the previous item-based approach of storing orders as items in Sitecore and uses `VisitorOrderRepositoryBase` internally to gain access to orders. Therefore, if as in the previous example, `VisitorOrderRepositoryBase` is changed to point to a remote order repository, `TransientOrderManager` works in remote mode automatically, and you do not need to change the `IOrderManager` registration.

The remote versions of the business entities look almost the same. The usage is simplified and unified. There are currently no dependencies that are injected via properties. You *must* specify the remote versions of the business entities in the `mapTo` attributes.

The remote registration looks like this:

```
<register type=" OrderIDGenerator" mapTo="RemoteOrderIDGenerator">
  <lifetime type="hierarchical" />
</register>
<register type=" IProductStockManager" mapTo="RemoteProductStockManager">
  <lifetime type="hierarchical" />
</register>
<register type=" IProductPriceManager" mapTo="RemoteProductPriceManager">
  <lifetime type="hierarchical" />
</register>
<register type=" VisitorOrderProcessorBase" mapTo="RemoteOrderProcessor">
  <lifetime type="hierarchical" />
  <interceptor type="VirtualMethodInterceptor" />
  <policyInjection />
</register>
<register type=" VisitorOrderRepositoryBase " mapTo="RemoteOrderRepository">
  <lifetime type="hierarchical" />
  <interceptor type="VirtualMethodInterceptor" />
  <policyInjection />
</register>
```

4.9 Optimizing the Product Stock Manager

You can configure the maximum number of concurrent write requests that can be handled by the product stock manager.

By default, the maximum number of concurrent write requests for different products that can be handled by the product stock manager is the same as the number of processors.

If this default value does not suit your needs, you can use the `Ecommerce.Stock.MaxConcurrentRequests` setting in the `web.config` file to specify another value:

```
<setting name="Ecommerce.Stock.MaxConcurrentRequests" value="16" />
```