Salesforce CPQ Developer Guide

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@salesforcedocs

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CONTENTS

CHAPTER 1 Salesforce CPQ Developer Guide

In this chapter ...

Start working with Salesforce CPQ API and plugins.

Get Started with Salesforce CPQ API

Want to start working with Salesforce CPQ API? Check out the CPQ data models, types of API, and quickstart guides.

EDITIONS

Available in: Salesforce CPQ Summer '16 and later

CPQ API Models

CPQ API references several CPQ data models. To use the Salesforce CPQ API, create classes for each data model in your org.

CPQ Quote API

Manage quotes and quoting actions with CPQ quote API.

CPQ Configuration API

Use the Salesforce CPQ Configuration API to configure and price product bundles.

CPQ Contract API

Use CPQ Contract API to amend and renew CPQ quotes.

Generate Quote Document API

Creates and saves a CPQ quote document.

Service Router

SBQQ.ServiceRouter is a global Apex class serving as a single entry point for all API calls. You can use it for calls made by Apex code, Visualforce Remoting, or REST callouts.

CPQ API Quickstart Guide

Review examples of integrating Salesforce CPQ API with your platform.

Disable CPQ Triggers in Apex

You can manually disable Salesforce CPQ and Salesforce Billing application logic when you update records. This process is helpful when you're updating your own custom field. It's also helpful when you update a record several times in one transaction and want triggers to run only on the last iteration.

Advanced Approvals API

Customize your approval process with the API from the Advanced Approvals package.

CPQ API Models

CPQ API references several CPQ data models. To use the Salesforce CPQ API, create classes for each data model in your org.

EDITIONS

Available in: Salesforce CPQ Spring '17 and later

CPQ API QuoteLineModel

The Quote Line model represents a quote line data model in Salesforce CPQ.

CPQ API QuoteLineGroupModel

The Quote Line Group model represents a quote line group data model in Salesforce CPQ.

CPQ API OptionModel

The Option model represents a product option data model in Salesforce CPQ.

CPQ API FeatureModel

The Feature model represents a product feature data model in Salesforce CPQ.

CPQ API ConfigAttributeModel

The ConfigAttribute model represents the configuration attribute object in Salesforce CPQ.

CPQ API ConfigurationModel

The Configuration model represents a bundle product in Salesforce CPQ.

CPQ API ConstraintModel

The Constraint model represents the option constraint object in Salesforce CPQ.

CPQ API ProductModel

The Product model represents a product data model in Salesforce CPQ.

CPQ API QuoteModel

The Quote model represents a CPQ quote data model in Salesforce CPQ.

CPQ API QuoteProposalModel

The QuoteProposal model represents a quote document in Salesforce CPQ.

CPQ API QuoteTermModel

The QuoteTerm model represents the quote term object in Salesforce CPQ.

CPQ API QuoteLineModel

The Quote Line model represents a quote line data model in Salesforce CPQ.

EDITIONS

Available in: Salesforce CPQ Summer '16 and later

Name	Type	Description
record	SBQQ__QuoteLine__c	The record that this model represents.
amountDiscountProrated	Boolean	Corresponds to SBQQ__QuoteLine__c.SBQQ__PriorAmountDiscount__c
parentGroupKey	Integer	The unique key of this line's group, if this line is part of a grouped quote.
parentItemKey	Integer	The unique key of this line's parent, if this line is part of a bundle.
key	Integer	Each quote line and group has a key that is unique amongst all other keys in the same quote.
upliftable	Boolean	True if this line is an MDQ segment that can be uplifted from a previous segment.
configurationType	String	Indicates the configuration type of the product that this line represents.

Name	Type	Description
configurationEvent	String	Indicates the configuration event of the product that this line represents.
reconfigurationDisabled	Boolean	If true, this line cannot be reconfigured.
descriptionLocked	Boolean	If true, this line's description cannot be changed.
productQuantityEditable	Boolean	If true, this line's quantity is editable.
productQuantityScale	Decimal	The number of decimal places used for rounding this line's quantity.
dimensionType	String	The type of MDQ dimension that this line represents.
productHasDimensions	Boolean	If true, the underlying product can be represented as a multidimensional line.
targetCustomerAmount	Decimal	The unit price forwhich this quote line is discounted.
targetCustomerTotal	Decimal	The customer amount for which this quote line is discounted.

```
public class QuoteLineModel {
    public SBQQ__QuoteLine__c record;
    public Boolean amountDiscountProrated;
    public Integer parentGroupKey;
    public Integer parentItemKey;
    public Integer key;
    public Boolean upliftable;
    public String configurationType;
    public String configurationEvent;
    public Boolean reconfigurationDisabled;
    public Boolean descriptionLocked;
    public Boolean productQuantityEditable;
    public Decimal productQuantityScale;
    public String dimensionType;
    public Boolean productHasDimensions;
    public Decimal targetCustomerAmount;
    public Decimal targetCustomerTotal;
}
```

CPQ API QuoteLineGroupModel

The Quote Line Group model represents a quote line group data model in Salesforce CPQ.

EDITIONS

Available in: Salesforce CPQ Summer '16 and later

Name	Type	Description
record	SBQQ__QuoteLineGroup__c	The record that this model represents.
netNonSegmentTotal	Decimal	The net total for all non-multidimensional quote lines.
key	Integer	Each quote line and group has a key that is unique amongst all other keys in the same quote.

```
public class QuoteLineGroupModel {
    public SBQQ__QuoteLineGroup__c record;
    public Decimal netNonSegmentTotal;
    public Integer key;
}
```

CPQ API OptionModel

The Option model represents a product option data model in Salesforce CPQ.

EDITIONS

Available in: Salesforce CPQ Summer '16 and later

Name	Type	Description
record	SBQQ__ProductOption__c	The record that this model represents.
externalConfigurationData	Map<String,String>	Internal property for the external configurator feature.
configurable	Boolean	Indicates whether the option is configurable.
configurationRequired	Boolean	Indicates whether the configuration of the option is required.
quantityEditable	Boolean	Indicates whether the quantity is editable. Editability is determined by the quantity and bundled fields on the option record.
priceEditable	Boolean	Indicates whether the price is editable. Editability is determined by the price editable field on the product record and the bundled field on the option record.
productQuantityScale	Decimal	Returns the value of the quantity scale field for the product being configured.

Name	Type	Description
priorOptionExists	Boolean	Checks if this option is an asset on the account that the quote is associated with.
dependentIds	Set<Id>	The option IDs that depend on this option.
controllingGroups	Map<String,Set<Id>>	The option IDs that this option depends on.
exclusionGroups	Map<String,Set<Id>>	The option IDs that this option is exclusive with.
reconfigureDimensionWarning	String	Reconfigures the warning label for an option with segments.
hasDimension	Boolean	Indicates whether this option has dimensions or segments.
isUpgrade	Boolean	Indicates whether the product option is related to an upgrade product.
dynamicOptionKey	String	Internal property for dynamic options.

```
public class OptionModel {
    public SBQQ__ProductOption__c record;
    public Map<String,String> externalConfigurationData;
    public Boolean configurable;
    public Boolean configurationRequired;
    public Boolean quantityEditable;
    public Boolean priceEditable;
    public Decimal productQuantityScale;
    public Boolean priorOptionExists;
    public Set<Id> dependentIds;
    public Map<String,Set<Id>> controllingGroups;
    public Map<String,Set<Id>> exclusionGroups;
    public String reconfigureDimensionWarning;
    public Boolean hasDimension;
    public Boolean isUpgrade;
    public String dynamicOptionKey;
}
```

CPQ API FeatureModel

The Feature model represents a product feature data model in Salesforce CPQ.

Name	Type	Description
record	SBQQ__ProductFeature__c	The record that this model represents.
instructionsText	String	Instruction label for the feature.

EDITIONS

Available in: Salesforce CPQ Summer '16 and later

Name	Type	Description
containsUpgrades	Boolean	This feature is related to an upgrade product.

```
public class FeatureModel {
    public SBQQ__ProductFeature__c record;
    public String instructionsText;
    public Boolean containsUpgrades;
}
```

CPQ API ConfigAttributeModel

The ConfigAttribute model represents the configuration attribute object in Salesforce CPQ.

EDITIONS

Available in: Salesforce CPQ Summer '16 and later

Name	Type	Description
name	String	Corresponds directly to SBQQ__ConfigurationAttribute__c.Name.
targetFieldName	String	Corresponds directly to SBQQ__ConfigurationAttribute__c.SBQQ__TargetField__c.
displayOrder	Decimal	Corresponds directly to SBQQ__ConfigurationAttribute__c.SBQQ__DisplayOrder__c.
columnOrder	String	Corresponds directly to SBQQ__ConfigurationAttribute__c.SBQQ__ColumnOrder__c.
required	Boolean	Corresponds directly to SBQQ__ConfigurationAttribute__c.SBQQ__Required__c.
featureId	Id	Corresponds directly to SBQQ__ConfigurationAttribute__c.SBQQ__Feature__c.
position	String	Corresponds directly to SBQQ__ConfigurationAttribute__c.SBQQ__Position__c.
appliedImmediately	Boolean	Corresponds directly to SBQQ__ConfigurationAttribute__c.SBQQ__AppliedImmediately__c.
applyToProductOptions	Boolean	Corresponds directly to SBQQ__ConfigurationAttribute__c.SBQQ__ApplyToProductOptions__c.
autoSelect	Boolean	Corresponds directly to SBQQ__ConfigurationAttribute__c.SBQQ__AutoSelect__c.
shownValues	String[]	Corresponds directly to SBQQ__ConfigurationAttribute__c.SBQQ__ShownValues__c.
hiddenValues	String[]	Corresponds directly to SBQQ__ConfigurationAttribute__c.SBQQ__HiddenValues__c.

Name	Type	Description
hidden	Boolean	Corresponds directly to SBQQ__ConfigurationAttribute__c.SBQQ__Hidden__c.
noSuchFieldName	String	If no field with the target name exists, the target name is stored here.
myId	String	Corresponds directly to SBQQ__ConfigurationAttribute__c.Id.

```
public class ConfigAttributeModel {
    public String name;
    public String targetFieldName;
    public Decimal displayOrder;
    public String colmnOrder;
    public Boolean required;
    public Id featureId;
    public String position;
    public Boolean appliedImmediately;
    public Boolean applyToProductOptions;
    public Boolean autoSelect;
    public String[] shownValues;
    public String[] hiddenValues;
    public Boolean hidden;
    public String noSuchFieldName;
    public Id myId;
}
```

CPQ API ConfigurationModel

The Configuration model represents a bundle product in Salesforce CPQ.

EDITIONS

Available in: Salesforce CPQ Summer '16 and later

Name	Type	Description
configuredProductId	Id	The Product2.Id.
optionId	Id	The SBQQ__ProductOption__c.Id.
optionData	SBQQ__ProductOption__c	Editable data about the option, such as quantity or discount.
configurationData	SBQQ__ProductOption__c	Stores the values of the configuration attributes.
inheritedConfigurationData	SBQQ__ProductOption__c	Stores the values of the inherited configuration attributes.
optionConfigurations	ConfigurationModel	Stores the options selected on this product.

Name	Type	Description
configured	Boolean	Indicates whether the product has been configured.
changedByProductActions	Boolean	Indicates whether a product action changed the configuration of this bundle.
isDynamicOption	Boolean	Indicates whether the product was configured using a dynamic lookup.
isUpgrade	Boolean	Queries whether this product is an upgrade.
disabledOptionIds	Set<Id>	The option IDs that are disabled.
hiddenOptionIds	Set<Id>	The option IDs that are hidden.
listPrice	Decimal	The list price.
priceEditable	Boolean	Indicates whether the price is editable.
validationMessages	String[]	Validation messages.
dynamicOptionKey	String	Internal property for dynamic options.

```
public class ConfigurationModel {
    public Id configuredProductId;
    public Id optionId;
   public SBQQ__ProductOption__c optionData; // Editable data about the option in question,
 such as quantity or discount
    public SBQQ__ProductOption__c configurationData;
    public SBQQ__ProductOption__c inheritedConfigurationData;
    public ConfigurationModel[] optionConfigurations;
    public Boolean configured;
    public Boolean changedByProductActions;
    public Boolean isDynamicOption;
    public Boolean isUpgrade;
    public Set<Id> disabledOptionIds;
    public Set<Id> hiddenOptionIds;
    public Decimal listPrice;
    public Boolean priceEditable;
    public String[] validationMessages;
    public String dynamicOptionKey;
}
```

CPQ API ConstraintModel

The Constraint model represents the option constraint object in Salesforce CPQ.

Name	Type	Description
record	SBQQ__OptionConstraint__c	The record that this model represents.

EDITIONS

Available in: Salesforce CPQ Summer '16 and later

Name	Type	Description
priorOptionExists	Boolean	Checks if this option is an asset on the account that the quote is associated with.

```
public class ConstraintModel {
    public SBQQ__OptionConstraint__c record;
    public Boolean priorOptionExists;
}
```

CPQ API ProductModel

The Product model represents a product data model in Salesforce CPQ.

EDITIONS

Available in: Salesforce CPQ Summer '16 and later

Name	Type	Description
record	Product2	The record that this model represents.
upgradedAssetId	Id	Provides a source for SBQQ__QuoteLine__c.SBQQ__UpgradedAsset__c
currencySymbol	String	The symbol for the currency in use.
currencyCode	String	The ISO code for the currency in use.
featureCategories	String[]	Allows users to sort product features by category.
options	OptionModel[]	A list of all available options for this product.
features	FeatureModel	All features available for this product
configuration	ConfigurationModel	An object representing this product's current configuration.
configurationAttributes	ConfigAttributeModel[]	All configuration attributes available for this product.
inheritedConfigurationAttributes	ConfigAttributeModel[]	All configuration attributes that this product inherits from ancestor products.

Name	Type	Description
constraints	ConstraintModel[]	Option constraints on this product.

```
public class ProductModel {
    public Product2 record;
    public Id upgradedAssetId;
    public String currencySymbol;
    public String currencyCode;
    public String[] featureCategories;
    public OptionModel[] options;
    public FeatureModel[] features;
    public ConfigurationModel configuration;
    public ConfigAttributeModel[] configurationAttributes;
    public ConfigAttributeModel[] inheritedConfigurationAttributes;
    public ConstraintModel[] constraints;
}
```

CPQ API QuoteModel

The Quote model represents a CPQ quote data model in Salesforce CPQ.

EDITIONS

Available in: Salesforce CPQ Summer '16 and later

Name	Type	Description
record	SBQQ__Quote__c	The record that this model represents.
lineItems	QuoteLineModel[]	The lines that this quote contains.
lineItemGroups	QuoteLineGroupModel[]	The groups that this quote contains.
nextKey	Integer	The next key to use for new groups or lines. To keep keys unique, do not lower this value.
applyAdditionalDiscountLast	Boolean	Corresponds to the field SBQQ__Quote__c.ApplyAdditionalDiscountLast__c.
applyPartnerDiscountFirst	Boolean	Corresponds to the field SBQQ__Quote__c.ApplyPartnerDiscountFirst__c.
channelDiscountsOffList	Boolean	Corresponds to the field SBQQ__Quote__c.ChannelDiscountsOffList__c.
customerTotal	Decimal	SBQQ__Quote__c.SBQQ__CustomerAmount__c is a roll-up summary field, so its accuracy is guaranteed only after a quote has been saved. In the meantime, its current

Name	Type	Description
		value is stored in customerTotal.
netTotal	Decimal	SBQQ__Quote__c.SBQQ__NetAmount__c is a roll-up summary field, so its accuracy is guaranteed only after a quote has been saved. In the meantime, its current value is stored in netTotal.
netNonSegmentTotal	Decimal	The net total for all non-multidimensional quote lines.

```
public class QuoteModel {
    public SBQQ__Quote__c record;
    public QuoteLineModel[] lineItems;
    public QuoteLineGroupModel[] lineItemGroups;
    public Integer nextKey;
    public Boolean applyAdditionalDiscountLast;
    public Boolean applyPartnerDiscountFirst;
    public Boolean channelDiscountsOffList;
    public Decimal customerTotal;
    public Decimal netTotal;
    public Decimal netNonSegmentTotal;
}
```

CPQ API QuoteProposalModel

The QuoteProposal model represents a quote document in Salesforce CPQ.

EDITIONS

Available in: Salesforce CPQ Summer '16 and later

Name	Type	Description
name	String	The document name.
paperSize	String	The paper size. Possible values are: • `Default` • `Letter` • `Legal` • `A4` Defaults to `Default`.
outputFormat	String	The output format. Possible values are: • `pdf` • `word` Defaults to `pdf`.
quoteId	Id	The ID of your quote.

Name	Type	Description
templateId	Id	The ID of your quote template.
language	String	The language code. Defaults to `en_US`.

```
public class QuoteProposalModel {
    public String name;
    public Id quoteId;
    public Id templateId;
    public String language;
    public String outputFormat;
    public String paperSize;
}
```

CPQ API QuoteTermModel

The QuoteTerm model represents the quote term object in Salesforce CPQ.

EDITIONS

Available in: Salesforce CPQ Summer '16 and later

Name	Type	Description
`id`	Id	ID for the quote term.
`label`	String	For quote templates with multiple quote terms, this field defines the order in which the terms appear on the quote document. Terms are ordered from the lowest to highest value.
`locked`	Boolean	Defines whether sales reps can edit the quote term. Corresponds directly to SBQQ__QuoteTerm__c.SBQQ__Locked__c.
`quoteId`	Id	Allows users to relate the quote term to a specific quote. Left blank if the term applies to multiple quotes. Corresponds directly to SBQQ__QuoteTerm__c.SBQQ__Quote__c.
`standardTermId`	Id	If the quote term was created by clicking Modify Terms on the quote, `standardTermId` shows the original quote term's ID. Corresponds directly to SBQQ__QuoteTerm__c.SBQQ__StandardTerm__c.

Name	Type	Description
`type`	String	Shows whether the term is standard, modified, or custom. Unmodified terms have a Type value of Standard. When a user clicks Modify Terms on a quote and changes the term, Salesforce CPQ creates a quote term with a Type value of Modified. Corresponds directly to SBQQ__QuoteTerm__c.SBQQ__Type__c.
`value`	String	Value of the quote term's Body field, or the translated value of the Body field when using CPQ translations. Quote Term Body field value or the translated value when using CPQ translations. Maximum 32,768 characters. Corresponds directly to SBQQ__QuoteTerm__c.SBQQ__Body__c.

```
public class QuoteTermModel {
    public String value;
    public String type;
    public Id standardTermId;
    public Id quoteId;
    public Boolean locked;
    public String label;
    public Id id;
}
```

CPQ Quote API

Manage quotes and quoting actions with CPQ quote API.

EDITIONS

Available in: Salesforce CPQ Summer '16 and later

Save Quote API

The Save Quote API saves a CPQ quote.

Calculate Quote API

The Calculate Quote API calculates the prices of a CPQ quote.

Read Quote API

The Read Quote API reads a quote from a CPQ quote ID.

Validate Quote API

Validate a CPQ quote and return any validation errors.

Add Products API

Receive a CPQ quote, product collection, and quote group key in a request, and return a Quote model with all provided products added as quote lines.

Read Product API

The Read Product API takes the request's product ID, pricebook ID, and currency code and returns a Product model. The Product model loads the product from your catalog when the user requests it.

Create and Save Quote Proposal API

Create and save a CPQ quote proposal.

Quote Term Reader API

Retrieve quote terms for a quote.

Save Quote API

The Save Quote API saves a CPQ quote.

EDITIONS

Available in: Salesforce CPQ Summer '16 and later

Formats

JSON, Apex

HTTP Method

POST

Authentication

Authorization: Bearer token

REQUEST

Name

quote

Type

QuoteModel

Required

Yes

Description

Representation of SBQQ__Quote__c data

RESPONSE

Type

QuoteModel

Description

Representation of SBQQ__Quote__c data

REST Examples

```
curl
     "https://yourInstance.salesforce.com/services/apexrest/SBQQ/ServiceRouter" -H
     "Content-Type: application/json" -H "Authorization: Bearer token" -X POST -d
     @quoteModel.json
```

This request body `quoteModel.json` file saves a quote. The context value is a JSON formatted string.

```
{"saver": "SBQQ.QuoteAPI.QuoteSaver", "model": "{\"record\":
{\"attributes\":{\"type\":\"SBQQ__Quote__c\",\"url\":\"/services/data/v41.0/sobjects/
SBQQ__Quote__c/a0l61000003kUlVAAU\"},
```

```
\"Name\":\"Q-00681\",\"Id\":\"a0l61000003kUlVAAU\"},\"nextKey\":2,\"netTotal\":0.00,\
"lineItems\":[],\"lineItemGroups\":[],\"customerTotal\":0.00}"}
```

An example response body after saving a quote. The actual response is a JSON formatted string.

```
{
    "record": {
      "attributes":{
         "type":"SBQQ__Quote__c",
         "url":"/services/data/v41.0/sobjects/SBQQ__Quote__c/a0l61000003kUlVAAU"
     },
     "Name":"Q-00681",
     "Id":"a0l61000003kUlVAAU"
  },
  "nextKey":2,
  "netTotal":0.00,
  "lineItems":[],
  "lineItemGroups":[],
  "customerTotal":0.00
}
```

APEX Examples

Before saving the QuoteSaver example class, make sure that the CPQ Model classes are added as individual Apex classes in your org.

```
public with sharing class QuoteSaver {
    public QuoteModel save(QuoteModel quote) {
        String quoteJSON = SBQQ.ServiceRouter.save('SBQQ.QuoteAPI.QuoteSaver',
JSON.serialize(quote));
        return (QuoteModel) JSON.deserialize(quoteJSON, QuoteModel.class);
    }
}
```

For an example of the QuoteSaver class, run the following code in anonymous Apex.

```
QuoteModel quoteModel; //Use Read, Add Products, or Calculate APIs to obtain a QuoteModel

QuoteSaver saver = new QuoteSaver();
QuoteModel savedQuote = saver.save(quoteModel);
System.debug(savedQuote);
```

Calculate Quote API

The Calculate Quote API calculates the prices of a CPQ quote.

Calculate Quote API performances handles calculations similarly to the speed of asynchronous calculations in Salesforce CPQ. We do not recommend using it for processes that require instant calculation.

The Calculate Quote API doesn't use batches when creating and calculating quotes. Performance may vary for quotes with large volumes of quote lines.

EDITIONS

Available in: Salesforce CPQ Summer '16 and later

Note: The Calculate Quote API requires callback when evaluating quote-scoped product rules.

Formats

JSON, Apex

HTTP Method

PATCH

Authentication

Authorization: Bearer token

REQUEST

Parameter 1

Name: quote

Type: QuoteModel

Required: Yes

Description: Representation of SBQQ__Quote__c data. See CPQ API QuoteModel

Parameter 2

Name: callbackClass

Type: String

Required: Required for Apex Trigger

Description: This Apex class implements the CPQ CalculateCallback interface.

REST Examples

```
curl
"https://yourInstance.salesforce.com/services/apexrest/SBQQ/ServiceRouter?loader=SBQQ.QuoteAPI.QuoteCalculator"
 -H
"Content-Type: application/json" -H "Authorization: Bearer token" -X PATCH -d
"@quoteToCalculate.json"
```

This request body `quoteToCalculate.json` file calculates a quote. The context value is a JSON formatted string.

```
{"context":"{\"quote\":{\"record\":{\"attributes\":{\"type\":\"SBQQ__Quote__c\",
\"url\":\"/services/data/v41.0/sobjects/SBQQ__Quote__c/a0p61000002NUmoAAG\"},
\"SBQQ__PartnerDiscount__c\":null,\"SBQQ__GenerateContractedPrice__c\":null,
\"SBQQ__QuoteProcessId__c\":\"a0m61000005NYxO\",
\"SBQQ__NetAmount__c\":100.0,\"SBQQ__CustomerDiscount__c\":null,
\"SBQQ__CustomerAmount__c\":100.0,\"SBQQ__PaymentTerms__c\":\"Net30\",
\"SBQQ__RenewalUpliftRate__c\":null,\"Name\":\"Q-00822\",\"SBQQ__Type__c\":\"Quote\",
\"SBQQ__SubscriptionTerm__c\":null,\"SBQQ__MarkupRate__c\":null,
\"SBQQ__OrderGroupID__c\":null,\"SBQQ__DistributorDiscount__c\":null,
\"SBQQ__OrderByQuoteLineGroup__c\":false,\"SBQQ__OrderBy__c\":null,
\"SBQQ__PricebookId__c\":\"01s61000000LI67AAG\",\"SBQQ__EndDate__c\":null,
\"SBQQ__Account__c\":null,\"SBQQ__StartDate__c\":null,
\"SBQQ__FirstSegmentTermEndDate__c\":null,\"SBQQ__BillingFrequency__c\":null,
\"SBQQ__LineItemsGrouped__c\":false,\"SBQQ__ExpirationDate__c\":null,
\"SBQQ__Primary__c\":false,\"SBQQ__LineItemCount__c\":1.0,\"SBQQ__MasterContract__c\":null,
\"SBQQ__EditLinesFieldSetName__c\":null,
\"Id\":\"a0p61000002NUmoAAG\",\"SBQQ__Unopened__c\":false,\"SBQQ__RenewalTerm__c\":null},
\"nextKey\":2,\"netTotal\":100.00,
\"netNonSegmentTotal\":100.0000,\"lineItems\":[{\"upliftable\":false,
\"targetCustomerTotal\":null,\"targetCustomerAmount\":null,
```

```
\"record\":{\"attributes\":{\"type\":\"SBQQ__QuoteLine__c\",
\"url\":\"/services/data/v41.0/sobjects/SBQQ__QuoteLine__c/a0l610000061yHpAAI\"},
\"SBQQ__CarryoverLine__c\":false,\"SBQQ__TermDiscountTier__c\":null,
\"SBQQ__VolumeDiscount__c\":null,\"SBQQ__BillingType__c\":null,
\"SBQQ__Discount__c\":null,\"SBQQ__ListPrice__c\":100.0,\"SBQQ__Existing__c\":false,
\"SBQQ__ProductName__c\":\"Product1\",\"SBQQ__SegmentIndex__c\":null,
\"SBQQ__DiscountTier__c\":null,\"SBQQ__SBCustomLevel__c\":null,\"SBQQ__ComponentTotal__c\":null,
\"SBQQ__RenewedSubscription__c\":null,
\"SBQQ__SubscriptionTargetPrice__c\":null,\"SBQQ__AllowAssetRefund__c\":false,
\"SBQQ__Optional__c\":false,\"SBQQ__PriorQuantity__c\":null,
\"SBQQ__Source__c\":null,\"SBQQ__Quote__c\":\"a0p61000002NUmoAAG\",\"SBQQ__SBCustomEndDate__c\":null,
\"SBQQ__ProratedListPrice__c\":100.0,\"SBQQ__ChargeType__c\":null,
\"SBQQ__UpliftAmount__c\":0.0,\"SBQQ__ComponentSubscriptionScope__c\":null,
\"SBQQ__OptionLevel__c\":null,\"SBQQ__NetPrice__c\":100.0,\"SBQQ__SBCustomCity__c\":null,
\"Id\":\"a0l610000061yHpAAI\",\"SBQQ__OriginalQuoteLineId__c\":null,
\"SBQQ__RegularPrice__c\":100.0,\"SBQQ__EffectiveQuantity__c\":1.0,\"SBQQ__Quantity__c\":1.0,
\"SBQQ__TaxCode__c\":null,\"SBQQ__sbCustom_Number1__c\":null,\"SBQQ__ContractedPrice__c\":null,
\"SBQQ__CostEditable__c\":false,\"SBQQ__Dimension__c\":null,
\"SBQQ__DynamicOptionId__c\":null,\"SBQQ__SBCustomSupport__c\":null,
\"SBQQ__PreviousSegmentUplift__c\":null,\"SBQQ__EndDate__c\":null,\"SBQQ__PreviousSegmentPrice__c\":null,
\"SBQQ__UpgradedSubscription__c\":null,\"SBQQ__SpecialPriceType__c\":null,
\"SBQQ__SegmentKey__c\":null,\"SBQQ__OptionDiscount__c\":null,\"SBQQ__RequiredBy__c\":null,
\"SBQQ__UpgradedAsset__c\":null,\"SBQQ__Bundled__c\":false,\"SBQQ__SBCustomColor__c\":null,
\"SBQQ__OptionType__c\":null,\"SBQQ__Number__c\":1.0,\"SBQQ__SubscriptionPercent__c\":null,
\"SBQQ__ComponentListTotal__c\":null,\"SBQQ__TermDiscountSchedule__c\":null,
\"SBQQ__Taxable__c\":false,\"SBQQ__Description__c\":null,\"SBQQ__ProductCode__c\":\"P1\",
\"SBQQ__OriginalPrice__c\":100.0,\"SBQQ__GenerateContractedPrice__c\":null,
\"SBQQ__NetTotal__c\":100.0,\"SBQQ__UnitCost__c\":null,\"SBQQ__SubscriptionCategory__c\":null,
\"SBQQ__Hidden__c\":false,\"SBQQ__NonDiscountable__c\":false,\"SBQQ__Markup__c\":0.0,\"SBQQ__RenewedAsset__c\":null,
\"SBQQ__GrossProfit__c\":null,\"SBQQ__MinimumPrice__c\":null,
\"SBQQ__BundledQuantity__c\":null,\"SBQQ__BatchQuantity__c\":null,
\"SBQQ__ProrateMultiplier__c\":1.0,\"SBQQ__CustomerPrice__c\":100.0,\"SBQQ__SubscriptionTerm__c\":null,
\"SBQQ__MarkupRate__c\":null,\"SBQQ__DistributorDiscount__c\":null,
\"SBQQ__DefaultSubscriptionTerm__c\":null,\"SBQQ__PriceEditable__c\":false,
\"SBQQ__ProratedPrice__c\":100.0,
\"SBQQ__ComponentUpliftedByPackage__c\":false,\"SBQQ__StartDate__c\":null,
\"SBQQ__NonPartnerDiscountable__c\":false,\"SBQQ__BlockPrice__c\":null,\"SBQQ__MaximumPrice__c\":null,
\"SBQQ__SubscriptionPricing__c\":null,\"SBQQ__AdditionalDiscount__c\":0.0,\"SBQQ__Favorite__c\":null,
\"SBQQ__ProductOption__c\":null,\"SBQQ__OptionDiscountAmount__c\":null,
\"SBQQ__TermDiscount__c\":null,\"SBQQ__MarkupAmount__c\":null,\"SBQQ__PartnerDiscount__c\":null,
\"SBQQ__ComponentDiscountedByPackage__c\":false,\"SBQQ__Renewal__c\":false,
\"SBQQ__CompoundDiscountRate__c\":null,\"SBQQ__UpgradedQuantity__c\":null,
\"SBQQ__AdditionalDiscountAmount__c\":null,\"SBQQ__Cost__c\":null,
\"SBQQ__PackageProductDescription__c\":null,\"SBQQ__PartnerPrice__c\":100.0,\"SBQQ__DiscountSchedule__c\":null,
\"SBQQ__ComponentCost__c\":null,\"SBQQ__SubscribedAssetIds__c\":null,
\"SBQQ__SubscriptionScope__c\":\"Quote\",\"SBQQ__Product__r\":{\"attributes\":
{\"type\":\"Product2\",\"url\":\"/services/data/v41.0/sobjects/Product2/01t610000033JNPAA2\"},
\"SBQQ__ExternallyConfigurable__c\":false,\"SBQQ__CostEditable__c\":false,\
"SBQQ__QuantityEditable__c\":true,\"SBQQ__Hidden__c\":false,\"SBQQ__ExcludeFromOpportunity__c\":false,
\"SBQQ__NonDiscountable__c\":false,\"Name\":\"Product1\",\"PricebookEntries\":
{\"totalSize\":1,\"done\":true,\"records\":[{\"attributes\":{\"type\":\"PricebookEntry\",
\"url\":\"/services/data/v41.0/sobjects/PricebookEntry/01u610000055KTeAAM\"},\
"UnitPrice\":100.0,\"Product2Id\":\"01t610000033JNPAA2\",\"IsActive\":true,
\"Pricebook2Id\":\"01s61000000LI67AAG\",\"Id\":\"01u610000055KTeAAM\"}]},
```

```
\"SBQQ__AssetConversion__c\":\"Oneperquoteline\",\"SBQQ__IncludeInMaintenance__c\":false,
\"SBQQ__PriceEditable__c\":false,\"SBQQ__ReconfigurationDisabled__c\":false,
\"SBQQ__DescriptionLocked__c\":false,\"SBQQ__NewQuoteGroup__c\":false,\"SBQQ__Optional__c\":false,
\"SBQQ__ExcludeFromMaintenance__c\":false,
\"SBQQ__AssetAmendmentBehavior__c\":\"Default\",\"ProductCode\":\"P1\",\"SBQQ__OptionSelectionMethod__c\":\"Click\",
\"SBQQ__SubscriptionType__c\":\"Renewable\",\"SBQQ__SubscriptionBase__c\":
\"List\",\"SBQQ__CustomConfigurationRequired__c\":false,\"SBQQ__NonPartnerDiscountable__c\":false,
\"SBQQ__DefaultQuantity__c\":1.0,\"SBQQ__PricingMethodEditable__c\":false,\"SBQQ__BlockPricingField__c\
":\"Quantity\",\"SBQQ__HasConfigurationAttributes__c\":false,\"SBQQ__Taxable__c\":false,
\"SBQQ__PricingMethod__c\":\"List\",\"Id\":\"01t610000033JNPAA2\"},\"SBQQ__SubscriptionBase__c\
":\"List\",\"SBQQ__BillingFrequency__c\":null,\"SBQQ__OriginalUnitCost__c\":null,
\"SBQQ__sbcustom_TwinField__c\":null,\"SBQQ__Bundle__c\":false,\"SBQQ__Product__c\":\
"01t610000033JNPAA2\",\"SBQQ__SpecialPrice__c\":100.0,\"SBQQ__PricingMethodEditable__c\":false,
\"SBQQ__Uplift__c\":0.0,\"SBQQ__PackageProductCode__c\":null,\"SBQQ__PricingMethod__c\":\"List\",
\"SBQQ__SegmentLabel__c\":null,\"SBQQ__AdditionalQuantity__c\":null,
\"SBQQ__DiscountScheduleType__c\":null},\"reconfigurationDisabled\":false,\"productQuantityScale\"
:null,\"productQuantityEditable\":true,\"productHasDimensions\":false,
\"parentItemKey\":null,\"parentGroupKey\":null,\"key\":2,\"dimensionType\":null,\"descriptionLocked\":false,
\"configurationType\":null,\"configurationEvent\":null,
\"amountDiscountProrated\":null}],\"lineItemGroups\":[],\"customerTotal\":100.00,\"channelDiscountsOffList\":false,
\"applyPartnerDiscountFirst\":false,\"applyAdditionalDiscountLast\":false}}"}
```


An example response body after successfully calculating a product. The actual response is a JSON formatted string.


```
{
  "record": {
    "attributes": {
      "type": "SBQQ__Quote__c",
      "url": "/services/data/v41.0/sobjects/SBQQ__Quote__c/a0p610000040iumAAA"
    },
    "Id": "a0p61000002NUmoAAG",
    "Name": "Q-00822"
  },
  "nextKey": 2,
  "netTotal": 200,
  "netNonSegmentTotal": 200,
    "lineItems": [
      {
        "record": {
          "attributes": {
            "type": "SBQQ__QuoteLine__c",
            "url": "/services/data/v41.0/sobjects/SBQQ__QuoteLine__c/a0161000003u09UAAQ"
          },
          "Id": "a0l610000061yHpAAI",
          "SBQQ__NetTotal__c": 200
        }
      }
   "lineItemGroups": []
}
```

Apex Examples

When you execute the Calculate API with an Apex trigger, you also need to create a quote calculator callback class. This class must implement the CPQ CalculateCallback interface to save the quote after calculating it in the background.

```
global with sharing class MyCallback implements SBQQ.CalculateCallback {
  global void callback(String quoteJSON){
    SBQQ.ServiceRouter.save('SBQQ.QuoteAPI.QuoteSaver', quoteJSON);
  }
}
```

Before saving the QuoteCalculator example class, make sure that the CPQ model classes are added as individual Apex classes in your org.

```
public with sharing class QuoteCalculator {

  public void calculate(QuoteModel quote, String callbackClass) {
    QuoteCalculatorContext ctx = new QuoteCalculatorContext(quote, callbackClass);
    SBQQ.ServiceRouter.load('SBQQ.QuoteAPI.QuoteCalculator', null, JSON.serialize(ctx));

  }

  private class QuoteCalculatorContext {
    private QuoteModel quote;             //The quote and callbackClass properties are
called in the API code by the exact names seen here.
    private String callbackClass;         //Altering these property names will cause
calculator API calls to fail.

    private QuoteCalculatorContext(QuoteModel quote, String callbackClass) {
      this.quote = quote;
      this.callbackClass = callbackClass;
    }
  }
}
```

For an example of the QuoteCalculator class, run the following code in anonymous Apex.

```
QuoteModel quoteModel; // Use Read or Add Products APIs to obtain a QuoteModel

quoteModel.lineItems[0].record.SBQQ__Quantity__c = 2;
QuoteCalculator calculator = new QuoteCalculator();
calculator.calculate(quoteModel, 'MyCallback');
```

Read Quote API

The Read Quote API reads a quote from a CPQ quote ID.

EDITIONS

Available in: Salesforce CPQ Summer '16 and later

Formats

JSON, Apex

HTTP Method

GET

Authentication

Authorization: Bearer token

REQUEST

Parameter 1

Name: uid

Type: String

Required: Yes

Description: The ID of the quote to read

RESPONSE

Type

QuoteModel

Description

The representation of SBQQ__Quote__c data.

REST Examples

```
curl "https://yourInstance.salesforce.com/services/apexrest/SBQQ/
ServiceRouter?reader=SBQQ.QuoteAPI.QuoteReader&uid=a0p610000040iumAAA"
-H "Content-Type: application/json" -H "Authorization: Bearer token" -X GET
```

An example response body after reading a quote. The actual response is a JSON formatted string.

```
{
    "record": {
        "attributes": {
            "type": "SBQQ__Quote__c",
            "url": "/services/data/v41.0/sobjects/SBQQ__Quote__c/a0p610000040iumAAA"
        },
        "Id": "a0p610000040iumAAA",
        "Name": "Q-00880"
    },
    "nextKey": 5,
    "netTotal": 300,
    "netNonSegmentTotal": 300,
    "lineItems": [
        {
            "record": {
                "attributes": {
                    "type": "SBQQ__QuoteLine__c",
                    "url":
"/services/data/v41.0/sobjects/SBQQ__QuoteLine__c/a0l61000003u09UAAQ"
                },
                "Id": "a0l61000003u09UAAQ"
            }
        }
    "lineItemGroups": [ ]
}
```

Apex Examples

Before saving the QuoteReader example class, make sure that the CPQ model classes are as individual Apex classes in your org.

```
public with sharing class QuoteReader {

    public QuoteModel read(String quoteId) {
        String quoteJSON = SBQQ.ServiceRouter.read('SBQQ.QuoteAPI.QuoteReader', quoteId);

        return (QuoteModel) JSON.deserialize(quoteJSON, QuoteModel.class);
    }
}
```

For an example of the QuoteReader class, run the following code in anonymous Apex.

```
QuoteReader reader = new QuoteReader();
QuoteModel quote = reader.read('a0Wf100000J1vk1');
System.debug(quote);
```

Validate Quote API

Validate a CPQ quote and return any validation errors.

EDITIONS

Available in: Salesforce CPQ Winter '19 and later

Formats

JSON, Apex

HTTP Method

PATCH

Authentication

Authorization: Bearer token

REQUEST

Parameter 1

Name: quote

Type: QuoteModel

Required: Yes

Description: Representation of SBQQ__Quote__c data.

RESPONSE

Type

String[]

Description

If the quote is valid, the array is empty. Otherwise, the array contains an item for each validation error.

REST Examples

```
curl
"https://yourInstance.salesforce.com/services/apexrest/SBQQ/ServiceRouter?loader=QuoteAPI.QuoteValidator"
 -H
"Content-Type: application/json" -H "Authorization: Bearer token" -X PATCH -d
@quoteModel.json
```

The request body `quoteModel.json` file validates a quote. The context value is a JSON formatted string/serialization of a quote, the same as the CPQ Save Quote API.

```
{"context": "{\"record\":
{\"attributes\":{\"type\":\"SBQQ__Quote__c\",\"url\":\"/services/data/v41.0/sobjects/SBQQ__Quote__c/a0161000003kUlVAAU\"},
\"Name\":\"Q-00681\",\"Id\":\"a0161000003kUlVAAU\"},\"nextKey\":2,\"netTotal\":0.00,\"lineItems\":[],\"lineItemGroups\":[],\"customerTotal\":0.00}"}
```

An example response body after creating the Apex job for generating the quote proposal.

```
// valid quote
[]

// invalid quote
[
  "message 1",
  "message 2",
  "message 3"
]
```

Apex Examples

Before saving the Validator example class, make sure that the CPQ model classes are added as individual Apex classes in your org.

```
public with sharing class Validator {

   public List<String> validate(QuoteModel quote) {
      String res=SBQQ.ServiceRouter.load('SBQQ.QuoteAPI.QuoteValidator', null,
JSON.serialize(quote));
      return (List<String>) JSON.deserialize(res, List<String>.class);
   }
}
```

Run the following code in anonymous Apex to get Apex job ID for generating and saving the quote proposal.

```
QuoteModel quoteModel; //Use Read Quote API to obtain a QuoteModel

Validator validator = new Validator();
List<String> msgs = validator.validate(quoteModel);
System.debug(msgs);
```

Add Products API

Receive a CPQ quote, product collection, and quote group key in a request, and return a Quote model with all provided products added as quote lines.

EDITIONS

Available in: Salesforce CPQ Summer '16 and later

Formats

JSON, Apex

HTTP Method

PATCH

Authentication

Authorization: Bearer token

REQUEST

Parameter 1

Name: quote

Type: QuoteModel

Required: Yes

Description: A representation of SBQQ__Quote__c data

Parameter 2

Name: products

Type: ProductModel[]

Required: Yes

Description: An array of representations of product data

Parameter 3

Name: groupKey

Type: Integer

Required: Required only for grouped quotes

Description: An index of the existing quote line group where you're adding products (0 indexed by default)

Parameter 4

Name: ignoreCalculate

Type: Boolean

Required: Yes

Description: Always use true for this value

RESPONSE

Type

QuoteModel

Description

The representation of SBQQ__Quote__c data

REST Examples

```
curl
"https://yourInstance.salesforce.com/services/apexrest/SBQQ/ServiceRouter?loader=SBQQ.QuoteAPI.QuoteProductAdder"

-H "Content-Type: application/json" -H "Authorization: Bearer token" -X PATCH -d
"@adderContext.json"
```

This request body `adderContext.json` file reads a product. The context value is a JSON formatted string.

```
{"context":"{\"quote\":{\"record\":{\"attributes\":{\"type\":\"SBQQ__Quote__c\",\"url\":\"/services/data/v41.0/sobjects/SBQQ__Quote__c/a0p61000004IpR8AAK\"},
\"Name\":\"Q-00905\",\"Id\":\"a0p61000004IpR8AAK\"},\"nextKey\":2,\"netTotal\":0.00,\"lineItems\":[],\"lineItemGroups\":[],
\"customerTotal\":0.00},\"products\":[],\"groupKey\":0, \"ignoreCalculate\": true}"}
```

An example response body after adding a product. The actual response is a JSON formatted string.

```
{
  "record": {
    "attributes": {
```

```
    "type": "SBQQ__Quote__c",
    "url": "/services/data/v41.0/sobjects/SBQQ__Quote__c/a0p61000004IpR8AAK"
  }
},
"nextKey": 4,
"netTotal": 0.00,
"lineItems": [
  {
    "record": {
      "attributes": {
        "type": "SBQQ__QuoteLine__c"
      },
      "SBQQ__Product__c": "01t610000033JNtAAM"
    },
    "productQuantityEditable": true,
    "productHasDimensions": false,
    "key": 3,
    "descriptionLocked": false
  },
  {
    "record": {
      "attributes": {
        "type": "SBQQ__QuoteLine__c"
      },
      "SBQQ__Product__c": "01t610000033JNUAA2",
      "SBQQ__Product__r": {
        "attributes": {
          "type": "Product2",
          "url": "/services/data/v41.0/sobjects/Product2/01t610000033JNUAA2"
        },
        "Id": "01t610000033JNUAA2",
        "Name": "Product 2",
        "ProductCode": "P2"
      }
    }
  }
],
"lineItemGroups": [
  {
    "record": {
      "attributes": {
        "type": "SBQQ__QuoteLineGroup__c",
       "url": "/services/data/v41.0/sobjects/SBQQ__QuoteLineGroup__c/a0k61000008WIF1AAO"

      },
      "SBQQ__Quote__c": "a0p61000004IpR8AAK",
      "Id": "a0k61000008WIF1AAO",
      "SBQQ__Number__c": 1.0,
      "SBQQ__SeparateContract__c": false,
      "Name": "Group1"
    },
    "key": 2,
    "hasMultiSegmentLines": false
  }
```

```
  ],
  "customerTotal": 0.00
}
```

Apex Examples

Before saving the ProductAdder example class, make sure that the CPQ model classes are added as individual Apex classes in your org.

```
public with sharing class ProductAdder {

    public QuoteModel add(QuoteModel quote, ProductModel[] products, Integer groupKey) {
        AddProductsContext ctx = new AddProductsContext(quote, products, groupKey);
       String quoteJSON = SBQQ.ServiceRouter.load('SBQQ.QuoteAPI.QuoteProductAdder', null,
 JSON.serialize(ctx));
        return (QuoteModel) JSON.deserialize(quoteJSON, QuoteModel.class);
    }

    private class AddProductsContext {
        private QuoteModel quote;
        private ProductModel[] products;
        private Integer groupKey;
        private final Boolean ignoreCalculate = true; //Must be hardcoded to true

        private AddProductsContext(QuoteModel quote, ProductModel[] products, Integer
groupKey) {
            this.quote = quote;
            this.products = products;
            this.groupKey = groupKey;
        }
    }
}
```

For an example of the ProductAdder, run the following code in anonymous Apex.

```
QuoteModel quoteModel; //Use Read Quote API to obtain a QuoteModelProductModel
productModel; //Use Read Product API to obtain a ProductModel

List<ProductModel> productModels = new List<ProductModel>();
productModels.add(productModel);
ProductAdder adder = new ProductAdder();
QuoteModel quoteWithProducts = adder.add(quoteModel, productModels, 0);
System.debug(quoteWithProducts);
```

Read Product API

The Read Product API takes the request's product ID, pricebook ID, and currency code and returns a Product model. The Product model loads the product from your catalog when the user requests it.

Formats

JSON, Apex

HTTP Method

PATCH

EDITIONS

Available in: Salesforce CPQ Summer '16 and later

Special Access Rules: Users must have read access to the product2 object.

Authentication

Authorization: Bearer token

REQUEST

Parameter 1

Name: productId

Type: ID

Required: Yes

Description: The ID of the product record to load

Parameter 2

Name: pricebookId

Type: ID

Required: Yes

Description: The ID of the pricebook that contains the product record to load

Parameter 3

Name: currencyCode

Type: String

Required: Required only for multi-currency orgs

Description: The ISO code of a Salesforce currency where the product's price is loaded

RESPONSE

Type

ProductModel

Description

The representation of product data

REST Examples

```
curl
"https://yourInstance.salesforce.com/services/apexrest/SBQQ/ServiceRouter?loader=SBQQ.ProductAPI.ProductLoader&uid=01t610000033JNt"
 -H "Content-Type: application/json" -H "Authorization: Bearer token" -X PATCH -d
"@loaderContext.json"
```

This request body `loaderContext.json` file reads a product. The context value is a JSON formatted string.

```
{"context" : "{\"pricebookId\": \"01sA0000000wuhg\", \"currencyCode\":\"USD\"}"}
```

An example response body after reading a product. The actual response is a JSON formatted string.

```
{
  "record": {
    "attributes": {
      "type": "Product2",
      "url": "/services/data/v42.0/sobjects/Product2/01tA0000005uzfZ"
    },
    "Id": "01tA0000005uzfZ",
    "Name": "Apple"
  }
```

```
  "options": [],
  "features": [],
  "configuration": {}
}
```

Apex Examples

Before saving the ProductReader example class, make sure that the CPQ model classes are added as individual Apex classes in your org.

```
public with sharing class ProductReader {

    public ProductModel read(Id productId, Id pricebookId, String currencyCode) {
        ProductReaderContext ctx = new ProductReaderContext(pricebookId, currencyCode);
        String productJSON = SBQQ.ServiceRouter.load('SBQQ.ProductAPI.ProductLoader',
productId, JSON.serialize(ctx));
        return (ProductModel) JSON.deserialize(productJSON, ProductModel.class);
    }

    private class ProductReaderContext {
        private Id pricebookId;
        private String currencyCode;

        private ProductReaderContext(Id pricebookId, String currencyCode) {
            this.pricebookId = pricebookId;
            this.currencyCode = currencyCode;
        }
    }
}
```

For an example of the ProductReader class, run the following code in anonymous Apex.

```
ProductReader reader = new ProductReader();
ProductModel product = reader.read('01tj0000003P1SN','01sj0000003THhKAAW','USD');
System.debug(product);
```

Create and Save Quote Proposal API

Create and save a CPQ quote proposal.

Note: Salesforce CPQ doesn't support attaching Additional Document records through API.

EDITIONS

Available in: Salesforce CPQ Winter '19 and later

Formats

JSON, Apex

HTTP Method

POST

Authentication

Authorization: Bearer token

REQUEST

Parameter 1

Name: name

Type: String

Required: No

Description: The document name

Parameter 2

Name: paperSize

Type: String

Required: No

Description: Options: Default, Letter, Legal, A4

Parameter 3

Name: outputFormat

Type: String

Required: No

Description: Options: pdf, word. Defaults to pdf.

Parameter 4

Name: quoteID

Type: Id

Required: Yes

Description: The quote ID

Parameter 5

Name: templateId

Type: Id

Required: Yes

Description: The quote template ID

Parameter 6

Name: language

Type: String

Required: No

Description: Defaults to en_US

RESPONSE

Type

jobId

Description

Apex queueable job Id

REST Examples

```
curl
"https://yourInstance.salesforce.com/services/apexrest/SBQQ/ServiceRouter?saver=QuoteDocumentAPI.SaveProposal"
 -H "Content-Type: application/json" -H
    "Authorization: Bearer token" -X PATCH -d @data.json
```

The request body `data.json` file generates and saves a quote proposal.

```
"{\"saver\":\"SBQQ.QuoteDocumentAPI.Save\",\"model\":\"{\\\"name\\\":\\\"test\\\",\\\
"quoteId\\\":\\\"a0n0R000000jhVC\\\",\\\"templateId\\\":\\\"a0l0R000000vahe\\\",
\\\"outputFormat\\\":\\\"PDF\\\",\\\"language\\\":\\\"en_US\\\",\\\"paperSize\\\":\\\"Default\\\"}\"}"
```

An example response body after creating the Apex job for generating the quote proposal.

```
"7070R00000Nj8mjQAB"
```

Apex Examples

Before saving the GenerateQuoteProposal example class, make sure that the CPQ model classes are added as individual Apex classes in your org.

```
public with sharing class GenerateQuoteProposal {

    public String save(QuoteProposalModel context) {
        return SBQQ.ServiceRouter.save('SBQQ.QuoteDocumentAPI.Save',
JSON.serialize(context));
    }
}
```

Run the following code in anonymous Apex to get Apex job ID for generating and saving the quote proposal.

```
QuoteProposalModel model = new QuoteProposalModel();
model.quoteId = 'a0n0R000000jhVC';
model.templateId = 'a0l0R000000vahe';
GenerateQuoteProposal proposalGenerator = new GenerateQuoteProposal();
String jobId = proposalGenerator.save(model);
System.debug(jobId);
```

Quote Term Reader API

Retrieve quote terms for a quote.

EDITIONS

Available in: Salesforce CPQ Summer '19 and later

Formats

JSON, Apex

HTTP Method

PATCH

Authentication

Authorization: Bearer token

REQUEST

Parameter 1

Name: quoteId

Type: Id

Required: Yes

Description: The quote record's ID

Parameter 2

Name: templateId

Type: Id

Required: Optional

Description: The quote template record's ID. If you don't include the templateId parameter, the quote terms associated with the template contents don't return.

Parameter 3

Name: language

Type: String

Required: Optional

Description: Language code when using CPQ translations.

RESPONSE

Type

QuoteTermModel

Description

The representation of SBQQ__QuoteTerm__c data

REST Examples

```
curl "https://yourInstance.salesforce.com/services/apexrest/SBQQ/
ServiceRouter?loader=SBQQ.QuoteTermAPI.Load&uid=a0x5C000000G1CV"
-H "Content-Type: application/json" -H "Authorization: Bearer token" -X PATCH -d
"@termContext.json"
```

Example request body termContext.json file for reading quote terms. The context value is a JSON-formatted string.

```
{"context":"{\"templateId\": \"a0v5C000000jTgr\", \"language\": \"es\"}"}
```

An example response body returning two quote terms. The actual response is a JSON-formatted string.

```
[
    {
        "value": "Hasta 10 sesiones concurrentes incluidas.",
        "type": "Standard",
        "standardTermId": null,
        "quoteId": null,
        "locked": false,
        "label": "1",
        "id": "a0w5C000000cbaFQAQ"
    },
    {
        "value": "$ 50USD / por mes por licencia de sesión adicional.",
        "type": "Standard",
        "standardTermId": null,
        "quoteId": null,
        "locked": false,
        "label": "1.1",
        "id": "a0w5C000000cbaKQAQ"
    }
]
```

Apex Examples

Before saving the QuoteTermReader example class, make sure that the CPQ model classes are added as individual Apex classes in your org.

```
public with sharing class QuoteTermReader {

    public List<QuoteTermModel> load(Id quoteId, Id templateId, String language) {
        TermContext ctx = new TermContext(templateId, language);
       String quoteTermsJSON = SBQQ.ServiceRouter.load('SBQQ.QuoteTermAPI.Load', quoteId,
 JSON.serialize(ctx));
        return (List<QuoteTermModel>) JSON.deserialize(quoteTermsJSON,
List<QuoteTermModel>.class);
    }

    private class TermContext {
        private Id templateId;
        private String language;

        private TermContext(Id templateId, String language) {
            this.templateId = templateId;
            this.language = language;
        }
    }
}
```

For an example of the QuoteTermReader class, run this code in anonymous Apex.

```
QuoteTermReader quoteTermReader = new QuoteTermReader();
List<QuoteTermModel> quoteTerms = quoteTermReader.load('a0x5C000000G1CV', 'a0v5C000000jTgr',
 'es');
System.debug(quoteTerms);
```

CPQ Configuration API

Use the Salesforce CPQ Configuration API to configure and price product bundles.

EDITIONS

Available in: Salesforce CPQ Spring'17 and later

Configuration Loader API

The Configuration Loader API returns all the data for the product, including its product options and configuration model. When configuring a nested bundle, set the `parentProduct`property to the parent product to inherit configuration attributes on the nested bundle.

Configuration Load Rule Executor API

The Configuration Load Rule Executor API invokes all the load event product rules for the specified product. When configuring a nested bundle, set the `parentProduct` property to the parent product to inherit configuration attributes on the nested bundle.

Configuration Validator API

The Configuration Validator API runs selection, validation, and alert product rules and configurator-scoped price rules against the input configuration model and returns an updated configuration model.

Configuration Loader API

The Configuration Loader API returns all the data for the product, including its product options and configuration model. When configuring a nested bundle, set the `parentProduct`property to the parent product to inherit configuration attributes on the nested bundle.

EDITIONS

Available in: Salesforce CPQ Spring '17 and later

Formats

JSON, Apex

HTTP Method

PATCH

Authentication

Authorization: Bearer token

REQUEST

Name	Type		Description
uid	String	Required	ID of the Product2 record.
quote	QuoteModel	Required	Corresponds directly to SBQQ__Quote__c.
parentProduct	ProductModel	Optional	The parent product for a nested bundle. Used to inherit configuration attributes from the parent product.

RESPONSE

Type	Description
ProductModel	Representation of product data. See CPQ Models.

REST Examples

```
curl
"https://*yourInstance*.salesforce.com/services/apexrest/SBQQ/ServiceRouter?loader=SBQQ.ConfigAPI.ConfigLoader&uid=a0x5C000000G1CV"
 \
     -H  "Content-Type: application/json" \
     -H  "Authorization: Bearer  yourAuthorizationToken" \
     -X   PATCH  \
     -d  "@configLoaderContext.json”
```

The example request body `configLoaderContext.json` file for loading product data. This example context value is a JSON formatted string of the quote model.

```
{"context":"{\"quote\":{\"record\":{\"attributes\":{\"type\":\"SBQQ__Quote__c\",
    \"url\":\"/services/data/v48.0/sobjects/SBQQ__Quote__c/a0p61000004IpR8AAK\"},
    \"Name\":\"Q-00905\",
    \"Id\":\"a0p61000004IpR8AAK\"},
    \"nextKey\":2,
```

```
    \"netTotal\":0.00,
    \"lineItems\":[],
    \"lineItemGroups\":[],
    \"customerTotal\":0.00},
    \"products\":[],
    \"groupKey\":0,
    \"ignoreCalculate\": true}"}
```

Example response body returning product data. The actual response is a JSON formatted string.

```
{
  "record": {
    "attributes": {
      "type": "Product2",
      "url": "/services/data/v42.0/sobjects/Product2/01tA0000005uzfZ"
    },
    "Id": "01tA0000005uzfZ",
    "Name": "Apple"
  }
  "options": [],
  "features": [],
  "configuration": {}
}
```

APEX Examples

Before saving the `ConfigLoader` example class, make sure that the CPQ Modelsclasses are added as individual Apex classes in your org.

```
public with sharing class ConfigLoader {
    public ProductModel load(Id productId, QuoteModel quote, ProductModel parentProduct)
{
        ConfigLoadContext ctx = new ConfigLoadContext(quote, parentProduct);
        String productJSON = SBQQ.ServiceRouter.load('SBQQ.ConfigAPI.ConfigLoader',
productId, JSON.serialize(ctx));
        return (ProductModel) JSON.deserialize(productJSON, ProductModel.class);
    }

    private class ConfigLoadContext {
        private QuoteModel quote;
        private ProductModel parentProduct;

        private ConfigLoadContext(QuoteModel quote, ProductModel parentProduct) {
            this.quote = quote;
            this.parentProduct = parentProduct;
        }
    }
}
```

To demonstrate usage of the `ConfigLoader` class, run the following code in anonymous Apex.

```
QuoteModel quote; //Use Read, Add Products, or Calculate APIs to obtain a QuoteModel

ConfigLoader loader = new ConfigLoader();
```

```
ProductModel product = loader.load('a0x5C000000G1CV', quote, null);
System.debug(product);
```

Configuration Load Rule Executor API

The Configuration Load Rule Executor API invokes all the load event product rules for the specified product. When configuring a nested bundle, set the `parentProduct` property to the parent product to inherit configuration attributes on the nested bundle.

EDITIONS

Available in: Salesforce CPQ Spring '17 and later

Formats

JSON, Apex

HTTP Method

PATCH

Authentication

Authorization: Bearer token

REQUEST

Name	Type		Description
uid	String	Required	ID of the Product2 record .
quote	QuoteModel	Required	Corresponds directly to SBQQ__Quote__c .
configuration	ConfigurationModel	Optional	The product's configuration data. Only required if you have an existing configuration from product actions or a previous run-through.
lineItemKey	Integer	Optional	Used to identify upgrade options in amendment flows.
dynamicOptionSkus	List<String>	Optional	A list of dynamic option SKUs. Sourced from product options selected in dynamic features.
parentProduct	ProductModel	Optional	The parent product for a nested bundle. Used to inherit configuration attributes from the parent product.

RESPONSE

Type	Description
ProductModel	Representation of product data.See CPQ Models.

REST Examples

```
curl
"https://*yourInstance*.salesforce.com/services/apexrest/SBQQ/ServiceRouter?loader=SBQQ.ConfigAPI.LoadRuleExecutor&uid=a0x5C000000G1CV"
 \
    -H "Content-Type: application/json" \
    -H "Authorization: Bearer yourAuthorizationToken" \
    -X PATCH \
    -d "@loadRuleContext.json"
```

The example request body `loadRuleContext.json` file for running load product rules. This example context value is a JSON-formatted string of the quote model and the configuration model.

```
{"context":"{\"quote\":{\"record\":{\"attributes\":{\"type\":\"SBQQ__Quote__c\"},
     \"Account__c\":\"0014M00001mfEYT\",
     \"Id\":\"a0c4M00000eE9SgQAK\",
     \"PricebookId__c\":\"01s61000002xO1h\",
     \"CurrencyIsoCode\":\"USD\"}},
     \"configuration\":{\"validationMessages\":[],
     \"priceEditable\":false,
     \"optionData\":{\"attributes\":{\"type\":\"SBQQ__ProductOption__c\"}},
     \"optionConfigurations\":[{\"validationMessages\":[],
     \"priceEditable\":false,
     \"optionId\":\"a0U4M00000GJagGUAT\",
     \"optionData\":{\"attributes\":{\"type\":\"SBQQ__ProductOption__c\",
    \"url\":\"\/services\/data\/v48.0\/sobjects\/ProductOption__c\/a0U4M00000GJagGUAT\"},

     \"ConfiguredSKU__c\":\"01t4M000003ru2OQAQ\",
     \"Id\":\"a0U4M00000GJagGUAT\",
     \"OwnerId\":\"00561000000148O6AAI\",
     \"IsDeleted\":false,
     \"CurrencyIsoCode\":\"USD\",
     \"SystemModstamp\":\"2020-03-10T20:47:39.000+0000\",
     \"AppliedImmediately__c\":false,
     \"Bundled__c\":false,
     \"DiscountedByPackage__c\":false,
     \"Number__c\":1,
     \"OptionalSKU__c\":\"01t4M000003ru2PQAQ\",
     \"PriceEditable__c\":\"No\",
     \"ProductConfigurationType__c\":\"Allowed\",
     \"ProductName__c\":\"W-7145106 Bundle - Nested Option - Level 1 Product #1\",
     \"QuantityEditable__c\":true,
     \"Quantity__c\":1,
     \"Required__c\":false,
     \"Selected__c\":true,
     \"System__c\":false,
     \"Type__c\":\"Component\",
     \"UpliftedByPackage__c\":false,
     \"CanOrderSeparately__c\":false},
     \"optionConfigurations\":[],
     \"isUpgrade\":false,
     \"isDynamicOption\":false,
     \"configuredProductId\":\"01t4M000003ru2PQAQ\",
     \"configured\":false,
     \"configurationEntered\":false,
```

```
     \"configurationData\":{\"attributes\":{\"type\":\"SBQQ__ProductOption__c\"}},
     \"changedByProductActions\":false}],
     \"isUpgrade\":false,
     \"isDynamicOption\":false,
     \"configuredProductId\":\"01t4M000003ru2OQAQ\",
     \"configured\":false,
     \"configurationEntered\":false,
     \"configurationData\":{\"attributes\":{\"type\":\"SBQQ__ProductOption__c\"}},
     \"changedByProductActions\":false}}"}
```

Example response body returning product data. The actual response is a JSON formatted string.

```
{
  "record": {
    "attributes": {
      "type": "Product2",
      "url": "/services/data/v42.0/sobjects/Product2/01tA0000005uzfZ"
    },
    "Id": "01tA0000005uzfZ",
    "Name": "Apple"
  }
  "options": [],
  "features": [],
  "configuration": {}
}
```

APEX Examples

Before saving the LoadRuleRunner example class, make sure that the CPQ Models classes are added as individual Apex classes in your Salesforce org.

```
public with sharing class LoadRuleRunner {
    public ProductModel load(
        Id productId,
        QuoteModel quote,
        Integer lineItemKey,
        List<String> dynamicOptionSkus,
        ConfigurationModel configuration,
        ProductModel parentProduct) {

        LoadRuleRunnerContext ctx = new LoadRuleRunnerContext(
            quote,
            lineItemKey,
            dynamicOptionSkus,
            configuration,
            parentProduct);
        String productJSON = SBQQ.ServiceRouter.load('SBQQ.ConfigAPI.LoadRuleExecutor',
productId, JSON.serialize(ctx));
        return (ProductModel) JSON.deserialize(productJSON, ProductModel.class);
    }

    private class LoadRuleRunnerContext {
        private QuoteModel quote;
        private ProductModel parentProduct;
```

```
        private Integer lineItemKey;
        private List<String> dynamicOptionSkus;
        public ConfigurationModel configuration;

        public LoadRuleRunnerContext(
            QuoteModel quote,
            Integer lineItemKey,
            List<String> dynamicOptionSkus,
            ConfigurationModel configuration,
            ProductModel parentProduct) {

            this.quote = quote;
            this.parentProduct = parentProduct;
            this.lineItemKey = lineItemKey;
            this.dynamicOptionSkus = dynamicOptionSkus;
            this.configuration = configuration;
        }
    }
}
```

To demonstrate usage of the `LoadRuleRunner` class, run the following code in anonymous Apex.

```
QuoteModel quote; //Use Read, Add Products, or Calculate APIs to obtain a QuoteModel
ProductModel product; //Use Read Product or Configuration Loader API to obtain a ProductModel

LoadRuleRunner runner = new LoadRuleRunner();
ProductModel product = runner.load('a0x5C000000G1CV', quote, null, null,
product.configuration, null);
System.debug(product);
```

Configuration Validator API

The Configuration Validator API runs selection, validation, and alert product rules and configurator-scoped price rules against the input configuration model and returns an updated configuration model.

EDITIONS

Available in: Salesforce CPQ Spring '17 and later

Formats
JSON, Apex

HTTP Method
PATCH

Authentication
Authorization: Bearer token

REQUEST

Name	Type		Description
uid	String	Required	ID of the Product2 record
quote	QuoteModel	Required	Corresponds directly to SBQQ__Quote__c.
configuration	ConfigurationModel	Required	The product's configuration data.

Name	Type		Description
event	String	Required	Event type of product and price rules to run. Options are "Load", "Save", "Edit", and "Always".
upgradedAssetId	String	Optional	Asset ID when upgrading a bundle.

RESPONSE

Type	Description
ConfigurationModel	The product's configuration data. This is the same Configuration Model that was passed in the request, but the data will be changed based on Product Actions from Product and Price Rules that ran. See CPQ Models.

REST Examples

```
curl
"https://yourInstance.salesforce.com/services/apexrest/SBQQ/ServiceRouter?loader=SBQQ.ConfigAPI.ConfigurationValidator&uid=a0x5000000G1CV
 \
     -H  "Content-Type: application/json" \
     -H "Authorization: Bearer  yourAuthorizationToken" \
     -X PATCH  \
     -d "@configValidatorContext.json”
```

The example request body `configValidatorContext.json` file for running product and price rules. This example context value is a JSON-formatted string of the quote model, configuration model, and event type.

```
{"context":"{\"quote\":{\"record\":{\"attributes\":{\"type\":\"SBQQ__Quote__c\"},
    \"Account__c\":\"0012F00000ayBPwQAM\",
    \"Id\":\"a0z2F000000xGLpQAM\",
    \"PricebookId__c\":\"01s2F0000011yApQAI\",
    \"CurrencyIsoCode\":\"USD\"}},
    \"configuration\":{\"validationMessages\":[],
    \"priceEditable\":false,
    \"optionData\":{\"attributes\":{\"type\":\"SBQQ__ProductOption__c\"}},
    \"optionConfigurations\":[{\"validationMessages\":[],
    \"priceEditable\":false,
    \"optionId\":\"a0o2F000001Yi4JQAS\",
    \"optionData\":{\"attributes\":{\"type\":\"SBQQ__ProductOption__c\",
    \"url\":\"\/services\/data\/v48.0\/sobjects\/ProductOption__c\/a0o2F000001Yi4JQAS\"},

    \"ConfiguredSKU__c\":\"01t2F000004XoPLQA0\",
    \"Id\":\"a0o2F000001Yi4JQAS\",
    \"OwnerId\":\"0056100000148O6AAI\",
    \"IsDeleted\":false,
    \"CurrencyIsoCode\":\"USD\",
    \"SystemModstamp\":\"2020-03-10T20:47:39.000+0000\",
```

```
    \"AppliedImmediately__c\":false,
    \"Bundled__c\":false,
    \"DiscountedByPackage__c\":false,
    \"Number__c\":1,
    \"OptionalSKU__c\":\"01t4M000003ru2PQAQ\",
    \"PriceEditable__c\":\"No\",
    \"ProductConfigurationType__c\":\"Allowed\",
    \"ProductName__c\":\"Nested Option Product #1\",
    \"QuantityEditable__c\":true,
    \"Quantity__c\":1,
    \"Required__c\":false,
    \"Selected__c\":true,
    \"System__c\":false,
    \"Type__c\":\"Component\",
    \"UpliftedByPackage__c\":false,
    \"CanOrderSeparately__c\":false},
    \"optionConfigurations\":[],
    \"isUpgrade\":false,
    \"isDynamicOption\":false,
    \"configuredProductId\":\"01t2F000004XoPLQA0\",
    \"configured\":false,
    \"configurationEntered\":false,
    \"configurationData\":{\"attributes\":{\"type\":\"SBQQ__ProductOption__c\"}},
    \"changedByProductActions\":false}],
    \"isUpgrade\":false,
    \"isDynamicOption\":false,
    \"configuredProductId\":\"01t2F000004XoPLQA0\",
    \"configured\":false,
    \"configurationEntered\":false,
    \"configurationData\":{\"attributes\":{\"type\":\"SBQQ__ProductOption__c\"}},
    \"changedByProductActions\":false},
    \"event\":\"Edit\"}"}
```

Example response body returning product configuration data. The actual response is a JSON formatted string.

```
{
    "validationMessages": ["Incorrect quantity for Product A"],
    "priceEditable": false,
    "optionId": null,
    "optionData": {
         "attributes": {
             "type": "SBQQ_ProductOption_c"
         }
    },
    "optionConfigurations": [],
    "listPrice": null,
    "isUpgrade": false,
    "isDynamicOption": false,
    "inheritedConfigurationData": null,
    "hiddenOptionIds": null,
    "dynamicOptionKey": null,
    "disabledOptionIds": null,
    "configuredProductId": "01t3D000005Th8oQAC",
    "configured": false,
    "configurationData": {
```

```
        "attributes": {
            "type": "SBQQ_ProductOption_c"
        },
        "SBQQ_UnitPrice_c": null
    },
    "changedByProductActions": false
}
```

APEX Examples

Before saving the `ConfigValidator` example class, make sure that the CPQ Modelsclasses are added as individual Apex classes in your org.

```
public with sharing class ConfigValidator {
    public ConfigurationModel load(
        Id productId,
        QuoteModel quote,
        ConfigurationModel configuration,
        String event,
        String upgradedAssetId) {

        ValidatorContext ctx = new ValidatorContext(
            quote,
            configuration,
            event,
            upgradedAssetId);
       String configJSON = SBQQ.ServiceRouter.load('SBQQ.ConfigAPI.ConfigurationValidator',
 productId, JSON.serialize(ctx));
       return (ConfigurationModel) JSON.deserialize(configJSON, ConfigurationModel.class);

    }

    private class ValidatorContext {
        private QuoteModel quote;
        private ConfigurationModel configuration;
        private String event;
        private String upgradedAssetId;

        public ValidatorContext(
            QuoteModel quote,
            ConfigurationModel configuration,
            String event,
            String upgradedAssetId) {

            this.quote = quote;
            this.configuration = configuration;
            this.event = event;
            this.upgradedAssetId = upgradedAssetId;
        }
    }
}
```

To demonstrate usage of the `ConfigValidator` class, run the following code in anonymous Apex.

```
QuoteModel quote; //Use Read, Add Products, or Calculate APIs to obtain a QuoteModel
     ProductModel product; //Use Read Product or Configuration Loader API to obtain a
ProductModel

     ConfigValidator validator = new ConfigValidator();
     ConfigurationModel config = validator.load('01t2F000004XoPLQA0', quote,
product.configuration, 'Edit', null);
     System.debug(config);
```

CPQ Contract API

Use CPQ Contract API to amend and renew CPQ quotes.

EDITIONS

Available in: Salesforce CPQ Summer '16 and later

Contract Amender API

Receive a CPQ contract ID in a request, and return quote data for an amendment quote.

Contract Renewer API

Receive a CPQ contract in a request, and return quote information for one or more renewal quotes.

Contract Amender API

Receive a CPQ contract ID in a request, and return quote data for an amendment quote.

EDITIONS

Available in: Salesforce CPQ Summer '16 and later

Special Access Rules: All of these user permissions are required.

- Create on Opportunity
- Read on Quote, Opportunity, and Product2
- Insert and update on Quote and Opportunity
- Delete on Quote and Opportunity

Important: Without full access on Opportunity, an error results, and contract amendment fails.

Service Provider Name

SBQQ.ContractManipulationAPI.ContractAmender

Formats

JSON, Apex

HTTP Method

PATCH

Authentication

Authorization: Bearer token

REQUEST

Parameter 1

Name: uid

Type: String

Required: Yes

Description: 15-character case sensitive or 18-character case insensitive Salesforce Contract ID to amend.

Parameter 2

Available in: Salesforce CPQ Winter '21 and later

Name: AmendmentContext

Type: AmendmentContext

Required: No

Description: Context for the contract to amend.

RESPONSE

Type
QuoteModel

Description
Representation of SBQQ__Quote__c data for an amendment quote

REST Examples

```
curl
"https://yourInstance.salesforce.com/services/apexrest/SBQQ/ServiceRouter?loader=SBQQ.ContractManipulationAPI.ContractAmender&uid=800R0000000X4g"

    -H  "Content-Type: application/json" -H "Authorization: Bearer token" -X PATCH
```

An example response body after amending a quote. The actual response is a JSON formatted string.

```
{
    "record": {
        "attributes": {
            "type": "SBQQ__Quote__c",
            "url": "/services/data/v41.0/sobjects/SBQQ__Quote__c/a0p610000040iumAAA"
        },
        "Id": "a0p610000040iumAAA",
        "Name": "Q-00880"
    },
    "nextKey": 5,
    "netTotal": 300,
    "netNonSegmentTotal": 300,
    "lineItems": [
        {
            "record": {
                "attributes": {
                    "type": "SBQQ__QuoteLine__c",
                    "url":
"/services/data/v41.0/sobjects/SBQQ__QuoteLine__c/a0l61000003u09UAAQ"
                },
                "Id": "a0l61000003u09UAAQ"
            }
        }
    "lineItemGroups": [ ]
}
```

An example response body after amending a quote. The actual response is a JSON formatted string.

```
{
  "record": {
    "attributes": {
      "type": "SBQQ__Quote__c",
      "url": "/services/data/v41.0/sobjects/SBQQ__Quote__c/a0p61000004IpR8AAK"
    }
  },
  "nextKey": 4,
  "netTotal": 0.00,
  "lineItems": [
```

```
    {
      "record": {
        "attributes": {
          "type": "SBQQ__QuoteLine__c"
        },
        "SBQQ__Product__c": "01t610000033JNtAAM"
      },
      "productQuantityEditable": true,
      "productHasDimensions": false,
      "key": 3,
      "descriptionLocked": false
    },
    {
      "record": {
        "attributes": {
          "type": "SBQQ__QuoteLine__c"
        },
        "SBQQ__Product__c": "01t610000033JNUAA2",
        "SBQQ__Product__r": {
          "attributes": {
            "type": "Product2",
            "url": "/services/data/v41.0/sobjects/Product2/01t610000033JNUAA2"
          },
          "Id": "01t610000033JNUAA2",
          "Name": "Product 2",
          "ProductCode": "P2"
        }
      }
    }
  ],
  "lineItemGroups": [
    {
      "record": {
        "attributes": {
          "type": "SBQQ__QuoteLineGroup__c",
         "url": "/services/data/v41.0/sobjects/SBQQ__QuoteLineGroup__c/a0k61000008WIF1AAO"

        },
        "SBQQ__Quote__c": "a0p61000004IpR8AAK",
        "Id": "a0k61000008WIF1AAO",
        "SBQQ__Number__c": 1.0,
        "SBQQ__SeparateContract__c": false,
        "Name": "Group1"
      },
      "key": 2,
      "hasMultiSegmentLines": false
    }
  ],
  "customerTotal": 0.00
}
```

Apex Examples

Note: Before saving the ContractAmender example class, make sure that the CPQ model classes are added as individual Apex classes in your org.

In this example, the amendment context isn't used.

```
public with sharing class ContractAmender {
    public QuoteModel load(String contractId) {
        String quoteJSON =
SBQQ.ServiceRouter.load('SBQQ.ContractManipulationAPI.ContractAmender', contractId, null);

        return (QuoteModel) JSON.deserialize(quoteJSON, QuoteModel.class);
    }
}

ContractAmender amender = new ContractAmender();
QuoteModel quote = amender.load('8001D000000AUlg'); // example id
System.debug(quote);
```

In this example, the amendment context is used.

```
public with sharing class ContractAmenderTest {

    public QuoteModel load(String contractId, String context) {

        String quoteJSON =
SBQQ.ServiceRouter.load('SBQQ.ContractManipulationAPI.ContractAmender', contractId, context);

        return (QuoteModel) JSON.deserialize(quoteJSON, QuoteModel.class);
    }
}

// Create an amendment context
private with sharing class AmendmentContextTest {
    public Boolean returnOnlyQuoteId;
}

AmendmentContextTest context = new AmendmentContextTest();
context.returnOnlyQuoteId = true;

// Invoke the ContractAmender API
String contextJson = JSON.serialize(context);
ContractAmenderTest amender = new ContractAmenderTest();
QuoteModel quote = amender.load('CONTRACT_ID', contextJson);
```

Example response body for `returnOnlyQuoteId = true`:

```
{"attributes":{"type":"SBQQ__Quote__c","url":"/services/data/v50.0/sobjects/SBQQ__Quote__c/12345"},"Id":"12345"}
```

Contract Renewer API

Receive a CPQ contract in a request, and return quote information for one or more renewal quotes.

Important: Where possible, we changed noninclusive terms to align with our company value of Equality. Because changing terms in our code can break current implementations, we maintained this metadata type's name.

EDITIONS

Available in: Salesforce CPQ Summer '16 and later

Special Access Rules: All of these user permissions are required.

- Insert and update on quote and opportunity objects
- Read on quote, opportunity, and product2 objects
- Delete on quote object

Service Provider Name

SBQQ.ContractManipulationAPI.ContractRenewer

Formats

JSON, Apex

HTTP Method

PATCH

Authentication

Authorization: Bearer token

REQUEST

Parameter 1

Name: context

Type: RenewalContext

Required: Yes

Description: JSON object containing the contracts to renew. Include the IDs of each contract to renew. If there's more than one contract, include the ID of the contract to use as the main contract.

Attribute 1

Name: masterContractId

Type: Id

Required: No

Description: If you're renewing multiple contracts, specify the ID of the main contract.

Attribute 2

Name: renewedContracts

Type: ContractModel[]

Required: Yes

Description: One or more ContractModels to renew.

Attribute 3

Available in: Salesforce CPQ Winter '21 and later

Name: returnOnlyQuoteId

Type: boolean

Required: No

Description: If `true`, return the ID of the renewed quotes. If `false` or `null`, return the information for the renewed quotes.

Default value is `false`.

RESPONSE

If returnOnlyQuoteId is `false` or `null`:

Type
QuoteModel[]

Description
Representation of one or more SBQQ__Quote__c data for renewal quotes.

RESPONSE

If returnOnlyQuoteId is `true`:

Type
integer

Description
The ID of the SBQQ__Quote__c record.

REST Examples

```
curl

"https://yourInstance.salesforce.com/services/apexrest/SBQQ/ServiceRouter?loader=SBQQ.ContractManipulationAPI.ContractRenewer"
 -H
     "Content-Type: application/json" -H "Authorization: Bearer token" -X POST -d
     @context.json
```

This request body context.json file renews one or more Contracts. The context value is a JSON formatted string.

```
{"context": "{\"masterContractId\": null, \"renewedContracts\":
[{\"attributes\":{\"type\":\"Contract\"},\"Id\":\"800540000006LLVAA2\"}]}"}
```

An example response body after renewing a quote. The actual response is a JSON formatted string.

```
[{
    "record": {
        "attributes": {
            "type": "SBQQ__Quote__c",
            "url": "/services/data/v41.0/sobjects/SBQQ__Quote__c/a0p610000040iumAAA"
        },
        "Id": "a0p610000040iumAAA",
        "Name": "Q-00880"
    },
    "nextKey": 5,
    "netTotal": 300,
    "netNonSegmentTotal": 300,
    "lineItems": [
        {
            "record": {
                "attributes": {
                    "type": "SBQQ__QuoteLine__c",
                    "url":
"/services/data/v41.0/sobjects/SBQQ__QuoteLine__c/a0l61000003u09UAAQ"
                },
                "Id": "a0l61000003u09UAAQ"
            }
        }
    "lineItemGroups": [ ]
}]
```

Apex Examples

Before saving the ContractRenewer example class, ensure that you've created individual Apex classes for your CPQ models.

```
// Define a class to hold information about the contracts to renew
private with sharing class CreateRenewalContext {
    public Id masterContractId;
    public Contract[] renewedContracts;
public Boolean returnOnlyQuoteId;
}

//define a class to hold the serialized context and the returned quote information
public with sharing class ContractRenewer {
    public QuoteModel[] load(String masterContractId, String serializedContext) {
        String quotesJSON =
SBQQ.ServiceRouter.load('SBQQ.ContractManipulationAPI.ContractRenewer', masterContractId,
 serializedContext);
        return (QuoteModel[]) JSON.deserialize(quotesJSON, List<QuoteModel>.class);
    }
}

// populate the renewal context
CreateRenewalContext context = new CreateRenewalContext();
context.masterContractId = '4567';
context.renewedContracts = [SELECT Id FROM Contract WHERE Id IN ('4567', '8910')];
// Set returnOnlyQuoteId to true if you only want the Quote ID and not the entire Quote
model.
context.returnOnlyQuoteId = true;


// Serialized the renewal context
// For example, context = '{"masterContractId": "8001D000000AUlg", "renewedContracts":
//[{"attributes":{"type":"Contract"},"Id":"8001D000000AUlg"},
// {"attributes":{"type":"Contract"},"Id":"8001D000000AVGt"}]}';
String jsonContext = JSON.serialize(context);

// renew the two contracts
ContractRenewer renewer = new ContractRenewer();
QuoteModel[] quotes = renewer.load(null, jsonContext);
```

Example response body for `returnOnlyQuoteId = true`:

```
{"attributes":{"type":"SBQQ__Quote__c","url":"/services/data/v50.0/sobjects/SBQQ__Quote__c/123456"},"Id":"56789"}
```

Generate Quote Document API

Creates and saves a CPQ quote document.

Name

QuoteDocumentAPI.SaveProposal

Note: "Proposal" refers to Salesforce CPQ's Quote Document object.

EDITIONS

Available in: Salesforce CPQ Winter '19 and later

Formats
JSON, Apex

HTTP Method
POST

Authentication
Authorization: Bearer token

Request

Table 1: Parameters

Name	Type	Required	Definition
Name	String	No	The document name
paperSize	String	No	Values are Default, Letter, Legal, A4. Defaults to "Default."
outputFormat	String	No	Values are PDF, Word. Defaults to "PDF."
quoteId	ID	Yes	The quote's ID
templateId	ID	Yes	The quote template's ID
language	String	No	Defaults to "en_US."

Response

Table 2: Parameters

Name	Type	Description
jobID	ID	Apex queueable job ID

REST Examples

```
curl
"https://yourInstance.salesforce.com/services/apexrest/SBQQ/ServiceRouter?saver=QuoteDocumentAPI.SaveProposal"

-H "Content-Type: application/json" -H "Authorization: Bearer token" -X PATCH -d @data.json
```

Example request body `data.json` file for generating and saving a quote document.

```
"{\"saver\":\"SBQQ.QuoteDocumentAPI.Save\",\"model\":\"{\\\"name\\\":\\\"test\\\",\\\"quoteId\\\"
:\\\"a0n0R000000jhVC\\\",\\\"templateId\\\":\\\"a0l0R000000vahe\\\",\\\"outputFormat\\\":
\\\"PDF\\\",\\\"language\\\":\\\"en_US\\\",\\\"paperSize\\\":\\\"Default\\\"}\"}"
```

Example response body after creating APEX job for creating the quote document.

```
"7070R00000Nj8mjQAB"
```

APEX Examples

Before saving the GenerateQuoteProposal example class, make sure that the CPQ model classes are added as individual APEX classes in your org.

```
public with sharing class GenerateQuoteProposal {

    public String save(QuoteProposalModel context) {
        return SBQQ.ServiceRouter.save('SBQQ.QuoteDocumentAPI.Save',
JSON.serialize(context));
    }
}
```

Run the following code in anonymous Apex to get Apex job ID for generating and saving the quote proposal.

```
QuoteProposalModel model = new QuoteProposalModel();
model.quoteId = 'a0n0R000000jhVC';
model.templateId = 'a0l0R000000vahe';
GenerateQuoteProposal proposalGenerator = new GenerateQuoteProposal();
String jobId = proposalGenerator.save(model);
System.debug(jobId);
```

Note:

- Attachments marked Required are ignored when you're using the API. In contrast, when you're using the Preview and Generate document buttons, the attachments are automatically generated as part of the document.
- An attachment in the Template section is always included regardless of whether it's marked Required. This behavior is also observed when you're using Preview and Generate document buttons.
- Guest users can't create quote documents in the Documents folder. See *Salesforce Help* and *SOAP API Developer Guide* for details.

SEE ALSO:

Salesforce Help: Guest User Security Policies and Timelines

SOAP API Developer Guide: Folder

Service Router

SBQQ.ServiceRouter is a global Apex class serving as a single entry point for all API calls. You can use it for calls made by Apex code, Visualforce Remoting, or REST callouts.

EDITIONS

Available in: Salesforce CPQ Summer '16 and later

SBQQ.ServiceRouter contains three global methods.

- global static String read(String reader, String uid)
- global static String load(String loader, String uid, String context)
- global static String save(String saver, String model)

Each method accepts the name of a service provider, such as SBQQ.ProductAPI.ProductLoader as its first parameter. This lets Salesforce CPQ route the API request to the appropriate internal handler. The internal handler isn't global and can't be called directly by code outside the Salesforce CPQ package.

Use the `read()` method only when it needs a simple unique ID as input. For example, you could use `read()` when querying for a quote from the database. Provide the quote's ID as the request and, and `read()` returns the QuoteModel object.

Use the `load()` method when you need more input information than a simple unique ID, but don't need to change anything in the database. For example, you could use `load()` if you wanted to load products for a given currency code and pricebook ID. The `load()`

method passes the unique ID as the second parameter. It then passes the extra information as a serialized JSON string in the third parameter.

Use the `save()` method when you save a model to the database, such as when you save a quote. The `save()` method passes the model as a serialized JSON string in the second parameter.

CPQ API Quickstart Guide

Review examples of integrating Salesforce CPQ API with your platform.

EDITIONS

Available in: Salesforce CPQ Summer '16 and later

Anonymous Apex

This example reads a quote, adds a product, and saves the quote.

```
/**
 * Note: this doesn't perform a calculatation. Reference the calculate API to see how to
calculate a quote.
 */

//the Id of the quote
String quoteId = 'a0Wf100000J1vk1';

//the Id of the product to add to the quote
String productId = '01tj0000003P1SN';

//the Id of the pricebook for the quote and product being added
String pricebookId = '01sj0000003THhKAAW';

//the currency code
String currencyCode = 'USD';

//the JSON formatted String representing the quote model to add a product to
String quoteModel = SBQQ.ServiceRouter.read('SBQQ.QuoteAPI.QuoteReader', quoteId);

//the JSON formatted String representing the product to be added to the quote
String productModel = SBQQ.ServiceRouter.load('SBQQ.ProductAPI.ProductLoader', productId,
 '{"pricebookId" : "' + pricebookId + '", "currencyCode" : "' + currencyCode + '"}');

//the JSON formatted String representing the quote with the product added to it
String updatedQuoteModel = SBQQ.ServiceRouter.load('SBQQ.QuoteAPI.QuoteProductAdder', null,
 '{"quote" : ' + quoteModel + ', "products" : [' + productModel + '], "ignoreCalculate" :
 true}');

//the JSON formatted String represeting the saved quote
String savedQuoteModel = SBQQ.ServiceRouter.save('SBQQ.QuoteAPI.QuoteSaver',
updatedQuoteModel);
```

NODEJS

This example reads a quote, adds a product, calculates the quote, and saves it.

```
// 3rd party library to call into a Salesforce org
var jsforce = require('jsforce');
```

```
// login credentials to the org
var loginUrl = 'https://MyDomainName.my.salesforce.com'; // Your org's My Domain login
URL is listed on the My Domain Setup page.
var username = 'admin.user@company.com';
var password = 'password';

// quote and product details
var quoteId = 'a0bA000000FW2o4';
var productId = '01tA0000005NsiA';
var pricebookId = '01tA0000005NsiA';
var currencyCode = 'USD';

// log in to the org with with a valid username and password using jsforce
var conn = new jsforce.Connection({loginUrl: loginUrl});
conn.login(username, password).then(function () {
    return Promise.resolve(conn);
})

.then(function (conn) {
  // read both the quote and the product to add
  var quotePromise =
conn.apex.get('/SBQQ/ServiceRouter?reader=SBQQ.QuoteAPI.QuoteReader&uid=' + quoteId);

  var productPromise =
conn.apex.patch('/SBQQ/ServiceRouter?loader=SBQQ.ProductAPI.ProductLoader&uid=' + productId,
 {
    context: JSON.stringify({
      pricebookId: pricebookId,
      currencyCode: currencyCode
    })
  });
  return Promise.all([quotePromise, productPromise]);
})

.then(function (models) {
    // add the retrieved product to the retrieved quote in the first group
    var quoteModel = JSON.parse(models[0]);
    var productModel = JSON.parse(models[1]);
    return conn.apex.patch('/SBQQ/ServiceRouter?loader=SBQQ.QuoteAPI.QuoteProductAdder',
{
        context: JSON.stringify({
            quote: quoteModel,
            products: [productModel],
            groupKey: 0,
            ignoreCalculate: true
        })
    });
})
.then(function (quoteWithProduct) {
    var quote = JSON.parse(quoteWithProduct);
    // cacluate the quote with the added product
    return conn.apex.patch('/SBQQ/ServiceRouter?loader=SBQQ.QuoteAPI.QuoteCalculator', {
        context: JSON.stringify({
```

```
            quote: quote
        })
    });
})
.then(function (calculatedQuote) {
    var quote = JSON.parse(calculatedQuote);
    // save the calucated quote
    return conn.apex.post('/SBQQ/ServiceRouter', {
        saver: 'SBQQ.QuoteAPI.QuoteSaver',
        model: JSON.stringify(quote)
    });
})
.then(function (savedQuoted) {
    // log the quote has been saved
    console.log('Quote finished processing', savedQuoted);
});
```

Disable CPQ Triggers in Apex

EDITIONS

Available in: Salesforce CPQ Summer '16 and later

You can manually disable Salesforce CPQ and Salesforce Billing application logic when you update records. This process is helpful when you're updating your own custom field. It's also helpful when you update a record several times in one transaction and want triggers to run only on the last iteration.

To ensure that operational issues don't affect your org when triggers are disabled, test thoroughly. Use the global Apex API TriggerControl—the same mechanism that Salesforce CPQ uses internally—to manually disable triggers for the CPQ and Billing and the Service Cloud for CPQ packages.

Note: TriggerControl disables only triggers in CPQ and Billing and in the Service Cloud for CPQ package. Other triggers or Salesforce logic, or your own triggers, validations, workflow rules, or processes, are unaffected.

Methods

global static void disable();
Disables built-in CPQ triggers within the current transaction.

global static void enable();
Enables built-in CPQ triggers if they had previously been disabled.

global static Boolean isEnabled()
Returns true if CPQ triggers are currently enabled. Otherwise, returns false.

Example:

```
SBQQ.TriggerControl.disable();
try {
 // Do something simple and interesting without
 // running triggers.
 quote.MyStatus__c = 'Red';
 update quote;
} finally {
SBQQ.TriggerControl.enable();
}
```

Example:

```
if (SBQQ.TriggerControl.isEnabled()) {
 // Only run our logic if CPQ trigger logic is also enabled.
 myRelatedObject.Quote__c = quote.Id;
 insert myRelatedObject;
}
```

Advanced Approvals API

Customize your approval process with the API from the Advanced Approvals package.

Note: Advanced Approvals API labels are available only in English

EDITIONS

Available in: Advanced Approvals Spring '21 and later

Approval API

Call the Advanced Approvals approval resource from an outside source.

Reject Approval API

Call the Advanced Approvals reject approval service from an outside source.

Approval API

Call the Advanced Approvals approval resource from an outside source.

EDITIONS

Available in: Advanced Approvals Spring '21 and later

Invoke the approval API using the following service router call, replacing `class` with your class name and `method` with your method name.

`ServiceRouter?saver=AA.{class}.{method}`

Use the following endpoint.

`/services/apexrest/sbaa/ServiceRouter`

The approval service accepts the following parameters.

Parameter	Required	Description
`approvalID`	Required	ID of the approval record in Salesforce.
`comments`	Optional	Comments about the approval.

Sample Request

Include a saver in the request body model. When you send the approval request, the CPQ service router evaluates the model and finds the saver attribute. It then takes the value of the saver attribute - in this case, `Approve` - and maps that to the corresponding Advanced Approvals Apex class.

Header

Content type: application/json

Authorization: Bearer [Access token or session ID]

Body

```
{
"model":
"{\"approvalId\":\"a4H7Y000001makkUAA\",\"comments\":\"I approve!\"}",
"saver":"SBAA.ApprovalRestApiProvider.Approve"
}
```

Sample CURL Request

```
curl -X POST
https://velocity-efficiency-9575-dev-ed.cs79.my.salesforce.com/services/apexrest/sbaa/ServiceRouter
-H 'Authorization: Bearer
00D1h0000008LeO!ARIAQL4Aj0OVYWIIcROefe8SYP1579EMEAngBFgql7woUddDbz090f_UBaJ1AjCi3kkHoUvpmTwlCV_hb5w8518ZqbDlSCsl'
-H 'Content-Type: application/json'
-d '{"model":"{\"approvalId\":\"a061h000002pIlTAAU\",\"comments\":\"I
approve!\"}",saver":"SBAA.ApprovalRestApiProvider.Approve"}'
```

Example: This example shows a basic JavaScript function for calling the Approval Service API from Google Sheets.

```
function reject() {
  var sheet = SpreadsheetApp.getActiveSheet();
  var data = sheet.getDataRange().getValues();
  // Make a POST request with a JSON payload.
  var model = {
 "approvalId": data[1][0],
 "comments": data[1][1]
  };
  var data = {
    'saver': 'SBAA.ApprovalRestApiProvider.Approve',
    'model': JSON.stringify(model)
  };
  var header = {
       'authorization' : 'Bearer 00Dx0000000IiXXXXX.IshlpUqRUQo3FXXXXXXXXXXXXX'
  };
  var options = {
    'method' : 'post',
    'contentType': 'application/json',
    'headers': header,
    'muteHttpExceptions': false,
    // Convert the JavaScript object to a JSON string.
    'payload' : JSON.stringify(data)
  };
 var response = UrlFetchApp.fetch('https://server/services/apexrest/SBAA/ServiceRouter',
 options);
  var responseText = response.getContentText();
```

Reject Approval API

Call the Advanced Approvals reject approval service from an outside source.

Invoke the approval API using the following service router call, replacing `class` with your class name and `method` with your method name.

`ServiceRouter?saver=AA.{class}.{method}`

Use the following endpoint, replacing `server` with your server address.

`<server>/services/apexrest/SBAA/ServiceRouter`

The approval service accepts the following parameters.

EDITIONS

Available in: Advanced Approvals Spring '21 and later

Table 3: Approval Service Parameters

Parameter	Required	Description
`approvalID`	Required	ID of the approval record in Salesforce.
`comments`	Optional	Comments about the approval.

Sample Request

Include a saver in the request body model. When you send the approval request, the CPQ service router evaluates the model and finds the saver attribute. It then takes the value of the saver attribute - in this case, `Reject` - and maps that to the corresponding Advanced Approvals Apex class.

Header

Content type: application/json

Authorization: Bearer [Access token or session ID]

Body

```
model:{
approvalId: "a1Sx000000000gF",
comments: "ok then"},
saver: "SBAA.ApprovalRestApiProvider.Reject"
}
```

Sample CURL Request

```
curl -X POST
https://velocity-efficiency-9575-dev-ed.cs79.my.salesforce.com/services/apexrest/sbaa/ServiceRouter
-H 'Authorization: Bearer
00D1h0000008LeO!ARIAQL4Aj0OVYWIIcROefe8SYP1579EMEAnXXXXXXXXXXXXXX'
-H 'Content-Type: application/json'
-d
'{"model":"{\"approvalId\":\"a061h000002pIlTAAU\",\"comments\":\"Rejected\"}","saver":"SBAA.ApprovalRestApiProvider.Reject"}'
```

Example: This example shows a basic Javscript function for calling the Reject Service API from Google Sheets.

```
function reject() {
  var sheet = SpreadsheetApp.getActiveSheet();
  var data = sheet.getDataRange().getValues();
  // Make a POST request with a JSON payload.
```

```
  var model = {
 "approvalId": data[1][0],
 "comments": data[1][1]
  };
  var data = {
    'saver': 'SBAA.ApprovalRestApiProvider.Reject',
    'model': JSON.stringify(model)
  };
  var header = {
       'authorization' : 'Bearer
00Dx0000000IiSD!ARoAQAiD7e.IshlpUqRUQo3Fu6MSox3y1ToMNdEl8MqXXXXXXXXXXXX'
  };
  var options = {
    'method' : 'post',
    'contentType': 'application/json',
    'headers': header,
    'muteHttpExceptions': false,
    // Convert the JavaScript object to a JSON string.
    'payload' : JSON.stringify(data)
  };
  var response = UrlFetchApp.fetch('server/services/apexrest/SBAA/ServiceRouter',
options);
  var responseText = response.getContentText();
```

Salesforce CPQ Plugins

Salesforce CPQ plugins let you add customized functionality to features within the Salesforce CPQ package.

EDITIONS

Available in: All Salesforce CPQ Editions

Javascript Quote Calculator Plugin

Add extra functionality to the quote line editor in Salesforce CPQ with custom JavaScript code. Seven available methods allow you to change how calculations are performed and manage page-level security such as field visibility.

Product Search Plugin

The Salesforce CPQ product search plugin is an interface that you can implement to customize product search results in the Product Search page and the Guided Selling page. The plugin methods vary slightly between Product Search and Guided Selling implementations.

Recommended Products Plugin

Use the Recommended Products plugin to recommend related products based on the existing products on a quote.

External Configurator Plugins

Enable sales reps to create quotes that incorporate your product's unique attributes, bundle configuration, and other information. A CPQ external configurator replaces the CPQ product configurator for the specified products, while still allowing you to use other Salesforce CPQ features such as price calculations and product rules.

Legacy Quote Calculator Plugin

Use Apex code to perform calculations within the CPQ quote line editor.

Product Configuration Initializer for Guided Selling

The product configuration initializer uses a custom user-provided APEX page to select options and set field values based on the results of guided selling prompts. It works only for standard product option fields and not for configuration attributes or custom product option fields.

Product Search Executor for Guided Selling

A Product Search Executor plugin filters the results of a guided selling prompt after a sales rep's input. It consists of a Visualforce controller and Visualforce page, which you can associate with a specific quote process within a guided selling configuration. It's useful if you want to add an extra level of guided selling product filtering beyond what sales reps can control.

Document Store Plugin

Use a CPQ document store plugin to store your quote documents as custom objects or in third-party integrations.

Custom Action Plugin

A custom action plugin lets you run code before or after custom actions in Salesforce CPQ. Currently, custom action plugins support only cloning actions.

Salesforce CPQ Electronic Signature Plugin

An electronic signature plugin lets developers add electronic signature functionality to their orgs. This is useful for organizations who wish to streamline processes involving signatures, such as finalizing purchases and contracts.

Javascript Quote Calculator Plugin

Add extra functionality to the quote line editor in Salesforce CPQ with custom JavaScript code. Seven available methods allow you to change how calculations are performed and manage page-level security such as field visibility.

JavaScript code is saved in Salesforce CPQ as custom scripts.

EDITIONS

Available in: Salesforce CPQ Winter '16 and later

Quote Calculator Plugin Guidelines

Consider these key guidelines when planning scripts for the Javascript Quote Calculator Plugin.

Quote Calculator Plugin Methods

The Quote Calculator Plugin can reference these seven methods. You can export any, all, or none of them to achieve your desired behavior.

Calculating True End Date and Subscription Term

Use JavaScript to make a Quote Line Calculator plugin that calculates values and stores maximum values for the custom quote line fields True Effective End Date and True Effective Term.

Custom Package Total Calculation

The sample JavaScript script can be used in the Quote Line Calculator to calculate the total price for all components in a quote line and then store that value in a custom field.

Find Lookup Records

The sample JavaScript script can be used in the Quote Line Calculator to query records within the plugin and use fields from those records to set each quote line's Description field.

Insert Records

The sample JavaScript script can be used in the Quote Line Calculator to insert records.

Javascript Page Security Plugin

Use Javascript functions to control field visibility and editability on your CPQ quotes.

Legacy Page Security Plugin (Apex)

The Salesforce CPQ Apex page security plugins let developers control field-level visibility or data entry mode in Salesforce CPQ VisualForce pages.

Guidelines for Heroku in Quote Calculator Plugins

Salesforce CPQ quote calculator plugins call Heroku to perform asynchronous calculations. When you write a quote calculator plugin, review important guidelines for working with the Heroku service.

Quote Calculator Plugin Guidelines

Consider these key guidelines when planning scripts for the Javascript Quote Calculator Plugin.

EDITIONS

Available in: Salesforce CPQ Winter '16 and later

Promises

A Promise is a built-in JavaScript object that allows for asynchronous programming in the browser. Promises let you delay a certain action until another one has completed. Promises support a `.then(success, failure)` method, where success is a function called when the promise resolves successfully, and failure is a function called when the promise is rejected. If you want to do any asynchronous programming in the plugin, such as a server callout, you must return a promise that resolves once that action is completed. This guarantees that calculation steps occur in the proper order. If a method doesn't require asynchronous behavior, you can return a promise that resolves immediately as `return Promise.resolve();`. Promises can resolve to a value, which passes as a parameter to the `.then()` callbacks. You can use this fact in your own code, but remember that the promises that these methods return don't need to resolve to a value. Always directly modify the quote and line models provided in the parameters.

QuoteModel and QuoteLineModel Types

The JavaScript calculator represents Quote__c and QuoteLine__c objects as QuoteModel and QuoteLineModel objects respectively. You can access the underlying SObject through the `.record` property on both objects, which lets you reference fields by using their API name. For example, you can reference a custom field SBQQ__MyCustomField__c on a given QuoteLineModel by accessing the attribute record ["SBQQ__MyCustomField__c"]. You can also reference fields on related records. For example, if you want to reference the field MyField__c on an account associated with a quote, access the record ["Account__r"]["MyField__c"].

External fields aren't loaded by default. To use an external field, such as one from an opportunity or account, create a custom quote formula field that pulls in the value of the desired field. Then include the custom quote field in your custom script. You can also reference this external field in a price action formula to preload and then include it in your custom script.

Salesforce Field Types

You can change records stored in JavaScript Object Notation, or JSON. These records are serialized from your org. Number, Text, and Boolean fields are all stored without any conversion, but you can convert any other type. For example, dates are represented as strings of the format "YYYY-MM-DD." If you reference or change a field containing a date, you have to preserve that format.

JSForce

JSForce is a third-party library that provides a unified way to perform queries, execute Apex REST calls, use theMetadata API, or make HTTP requests remotely. Methods access jsforce through the optional parameter `conn`.

Note:

- The JSQCP is an ES6 module. It is transpiled via Babel and module-scoped by default. You can use any elements of the ES6 language or syntax. However, the plugin must be able to run in both browser and node environments. Global browser variables such as window may not be available.
- With plugins, callouts (requests) to non-Salesforce endpoints aren't supported for asynchronous calculations. For example, `requestGet` fails in asynchronous calculations.

Field Availability

Javascript Quote Calculator plugins don't support custom fields on consumption rates and consumption schedules.

Quote Calculator Plugin Methods

The Quote Calculator Plugin can reference these seven methods. You can export any, all, or none of them to achieve your desired behavior.

EDITIONS

Available in: Salesforce CPQ Winter '16 and later

API Version Management

In general, Salesforce CPQ uses Salesforce API that's one version behind the newest Salesforce API. For example, Salesforce Summer '21 uses Salesforce API version 52.0, so Salesforce CPQ Summer '21 uses Salesforce API version 51.0.

If you need to reference entities or fields Salesforce API version that's newer than what you're using in Salesforce CPQ, use the JSforce property assignment `conn.version='x';`, replacing `x` with the version that you want to use. For example, the following method shows how to overwrite the default API version to version 52.0.

```
export function onInit(quote, conn) {
   conn.version = '52.0';
   return conn.query("SELECT Name FROM ConsumptionSchedule")
      .then(function (results) {
         console.log(results);
         return Promise.resolve();
      })
}
```

onInit

Param	Type	Description
{QuoteLineModel[]}	quoteLineModels	An array containing Javascript representations of all lines in a quote.

The calculator calls this method before formula fields are evaluated. Returns `{promise}`.

```
export function onInit(quoteLineModels) {
return Promise.resolve();
};
```

onBeforeCalculate

Param	Type	Description
{QuoteModel}	quoteModel	Javascript representation of the quote you're evaluating
(QuoteLineModel[]}	quoteLineModels	An array containing Javascript representations of all lines in the quote

The calculator calls this method before calculation begins, but after formula fields have been evaluated. Returns `{promise}`.

```
export function onBeforeCalculate(quoteModel, quoteLineModels) {
return Promise.resolve();
};
```

onBeforePriceRules

Param	Type	Description
{QuoteModel}	quoteModel	Javascript representation of the quote you're evaluating
(QuoteLineModel[]}	quoteLineModels	An array containing Javascript representations of all lines in the quote

The calculator calls this method before it evaluates price rules. Returns `{promise}`.

```
export function onBeforePriceRules(quoteModel, quoteLineModels) {
return Promise.resolve();
};
```

onAfterPriceRules

Param	Type	Description
{QuoteModel}	quoteModel	Javascript representation of the quote you're evaluating
(QuoteLineModel[]}	quoteLineModels	An array containing Javascript representations of all lines in the quote

The calculator calls this method after it evaluates price rules. Returns `{promise}`.

```
export function onAfterPriceRules(quoteModel, quoteLineModels) {
return Promise.resolve();
};
```

onAfterCalculate

Param	Type	Description
{QuoteModel}	quoteModel	Javascript representation of the quote you're evaluating
(QuoteLineModel[]}	quoteLineModels	An array containing Javascript representations of all lines in the quote

The calculator calls this method after it completes a calculation, but before re-evaluating formula fields. Returns `{promise}`

```
export function onAfterCalculate(quoteModel, quoteLineModels) {
return Promise.resolve();
};
```

isFieldVisible

Note: This method can't be used to alter data.

Param	Type	Description
{FieldName}	String	Name of the field that will be hidden or made visible
(QuoteLineModelRecord}	quoteLineModelRecord	Javascript representation of the SObject record of line you're evaluating

The calculator calls this method after it completes a calculation. Returns `{Boolean}`

```
    export function isFieldVisible(fieldName, quoteLineModelRecord) {

    if (fieldName == 'SBQQ__Description__c') {
    return false;
    }

    return true;

    };
```

isFieldEditable

Note: This method can't be used to alter data.

Param	Type	Description
{FieldName}	String	Name of the field that will be made read-only or editable
(QuoteLineModelRecord}	quoteLineModelRecord	Javascript representation of the SObject record of line you're evaluating

The calculator calls this method after it completes a calculation. Returns `{Boolean}`

```
export function isFieldEditable(fieldName, quoteLineModelRecord) {

if (fieldName == 'SBQQ__Description__c') {
return false;
}

return true;

};
```

Calculating True End Date and Subscription Term

Use JavaScript to make a Quote Line Calculator plugin that calculates values and stores maximum values for the custom quote line fields True Effective End Date and True Effective Term.

EDITIONS

Available in: Salesforce CPQ Winter '16 and later

1. On the quote line object, create the following custom fields.
   a. A date field with the API name True_Effective_End_Date__c
   b. A number field with the API name True_Effective_Term__c
2. Create a custom script record with a name of your choosing.
   a. In the Quote Line Fields field, add *`True_Effective_End_Date__c`* and *`True_Effective_Term__c`*.
   b. In the Code field, provide Javascript code that exports all of the methods that the calculator looks for and documents their parameters and return types. Save your custom script and add its name to the Quote Calculator Plugin field in the Plugins tab of Salesforce CPQ package settings. We've provided a sample custom script below.

```
export function onAfterCalculate(quote, lineModels) {

    var maxEffectiveEndDate = null;
    var maxEffectiveTerm = 0;
    if (lineModels != null) {
        lineModels.forEach(function (line) {
            var trueEndDate = calculateEndDate(quote, line);
            var trueTerm = getEffectiveSubscriptionTerm(quote, line);
            if (maxEffectiveEndDate == null || (maxEffectiveEndDate < trueEndDate))
{
                maxEffectiveEndDate = trueEndDate;
            }
            if (maxEffectiveTerm < trueTerm) {
                maxEffectiveTerm = trueTerm;
            }
            line.record["True_Effective_End_Date__c"] = toApexDate(trueEndDate);
            line.record["True_Effective_Term__c"] = trueTerm;
        });
       quote.record["True_Effective_End_Date__c"] = toApexDate(maxEffectiveEndDate);

        quote.record["True_Effective_Term__c"] = maxEffectiveTerm;
    }
    return Promise.resolve()
```

```
}

function calculateEndDate(quote, line) {
    var sd = new Date(line.record["SBQQ__EffectiveStartDate__c"]);
    var ed = new Date(line.record["SBQQ__EffectiveEndDate__c"]);
    if (sd != null && ed != null ) {
        ed = sd;
       ed.setUTCMonth(ed.getUTCMonth() + getEffectiveSubscriptionTerm(quote, line));

        ed.setUTCDate(ed.getUTCDate() - 1);
    }
    return ed;
}

function getEffectiveSubscriptionTerm(quote, line) {
   if (line.record["SBQQ__EffectiveStartDate__c"] != null){
        var sd = new Date(line.record["SBQQ__EffectiveStartDate__c"]);
   }
    if (line.record["SBQQ__EffectiveEndDate__c"] != null){
       var ed = new Date(line.record["SBQQ__EffectiveEndDate__c"]);
   }
    if (sd != null && ed != null ) {
        ed.setUTCDate(ed.getUTCDate() + 1);
        return monthsBetween(sd, ed);
    } else if (line.SubscriptionTerm__c != null) {
        return line.SubscriptionTerm__c;
    } else if (quote.SubscriptionTerm__c != null) {
        return quote.SubscriptionTerm__c;
    } else {
        return line.DefaultSubscriptionTerm__c;
    }
}

/**
 * Takes a JS Date object and turns it into a string of the type 'YYYY-MM-DD', which
 is what Apex is expecting.
 * @param {Date} date The date to be stringified
 * @returns {string}
 */
function toApexDate(/*Date*/ date) {
    if (date == null) {
        return null;
    }
    // Get the ISO formatted date string.
    // This will be formatted: YYYY-MM-DDTHH:mm:ss.sssZ
    var dateIso = date.toISOString();

    // Replace everything after the T with an empty string
    return dateIso.replace(new RegExp('[Tt].*'), "");
}

function monthsBetween(/*Date*/ startDate, /*Date*/ endDate) {
    if(startDate != null && endDate != null ){
    // If the start date is actually after the end date, reverse the arguments and
```

```
multiply the result by -1
    if (startDate  > endDate) {
        return -1 * this.monthsBetween(endDate, startDate);
    }
    var result = 0;
    // Add the difference in years * 12
    result += ((endDate.getUTCFullYear() - startDate.getUTCFullYear()) * 12);
    // Add the difference in months. Note: If startDate was later in the year than
endDate, this value will be
    // subtracted.
    result += (endDate.getUTCMonth() - startDate.getUTCMonth());
    return result;
    }
    return 0;
}
```

Custom Package Total Calculation

The sample JavaScript script can be used in the Quote Line Calculator to calculate the total price for all components in a quote line and then store that value in a custom field.

This sample JavaScript code exports all of the methods that the calculator looks for, and documents their parameters and return types.

Note: The sample script assumes the Salesforce admin created a custom field `Component Custom Total` on the Quote Line object.

EDITIONS

Available in: Salesforce CPQ Winter '16 and later

Javascript

```
export function onInit(lines) {
    if (lines != null) {
        lines.forEach(function (line) {
            line.record["Component_Custom_Total__c"] = 0;
        });
    }
};

export function onAfterCalculate(quoteModel, quoteLines) {
    if (quoteLines != null) {
        quoteLines.forEach(function (line) {
            var parent = line.parentItem;
            if (parent != null) {
                var pComponentCustomTotal = parent.record["Component_Custom_Total__c"] ||
 0;
                var cListPrice = line.ProratedListPrice__c || 0;
                var cQuantity = line.Quantity__c == null ? 1 : line.Quantity__c;
                var cPriorQuantity = line.PriorQuantity__c || 0;
                var cPricingMethod = line.PricingMethod__c == null ? "List" :
line.PricingMethod__c;
                var cDiscountScheduleType = line.DiscountScheduleType__c || '';
                var cRenewal = line.Renewal__c || false;
                var cExisting = line.Existing__c || false;
```

```
                var cSubscriptionPricing = line.SubscriptionPricing__c || '';

                var cTotalPrice = getTotal(cListPrice, cQuantity, cPriorQuantity,
cPricingMethod, cDiscountScheduleType, cRenewal, cExisting, cSubscriptionPricing,
cListPrice);
                pComponentCustomTotal += cTotalPrice;

                parent.record["Component_Custom_Total__c"] = pComponentCustomTotal;
            }
        });
    }
};

function getTotal(price, qty, priorQty, pMethod, dsType, isRen, isExist, subPricing,
listPrice) {
    if ((isRen === true) && (isExist === false) && (priorQty == null)) {
       // Personal note: In onAfterCalculate, we specifically make sure that priorQuantity
 can't be null.
        // So isn't this loop pointless?
        return 0;
    } else {
       return price * getEffectiveQuantity(qty, priorQty, pMethod, dsType, isRen, isExist,
 subPricing, listPrice);
    }
}

function getEffectiveQuantity(qty, priorQty, pMethod, dsType, isRen, exists, subPricing,
listPrice) {
    var delta = qty - priorQty;

    if (pMethod == 'Block' && delta == 0) {
        return 0;
    } else if (pMethod == 'Block') {
        return 1;
    } else if (dsType == 'Slab' && (delta == 0 || (qty == 0 && isRen == true))) {
        return 0;
    } else if (dsType == 'Slab') {
        return 1;
    } else if (exists == true && subPricing == '' && delta < 0) {
        return 0;
    } else if (exists == true && subPricing == 'Percent Of Total' && listPrice != 0 &&
delta >= 0) {
        return qty;
    } else if (exists == true) {
        return delta;
    } else {
        return qty;
    }
}
```

Find Lookup Records

The sample JavaScript script can be used in the Quote Line Calculator to query records within the plugin and use fields from those records to set each quote line's Description field.

Each version of the JavaScript code samples exports all of the methods that the calculator will look for, and documents their parameters and return types.

EDITIONS

Available in: Salesforce CPQ Winter '16 and later

Javascript

```
export function onAfterCalculate(quote, lines, conn) {
 if (lines.length > 0) {
  var productCodes = [];
  lines.forEach(function(line) {
   if (line.record['SBQQ__ProductCode__c']) {
    productCodes.push(line.record['SBQQ__ProductCode__c']);
   }
  });
  if (productCodes.length) {
   var codeList = "('" + productCodes.join("', '") + "')";
   /*
    * conn.query() returns a Promise that resolves when the query completes.
    */
   return conn.query('SELECT Id, SBQQ__Category__c, SBQQ__Value__c FROM SBQQ__LookupData__c
 WHERE SBQQ__Category__C IN ' + codeList)
    .then(function(results) {
     /*
      * conn.query()'s Promise resolves to an object with three attributes:
      * - totalSize: an integer indicating how many records were returned
      * - done: a boolean indicating whether the query has completed
      * - records: a list of all records returned
      */
     if (results.totalSize) {
      var valuesByCategory = {};
      results.records.forEach(function(record) {
       valuesByCategory[record.SBQQ__Category__c] = record.SBQQ__Value__c;
      });
      lines.forEach(function(line) {
       if (line.record['SBQQ__ProductCode__c']) {
        line.record['SBQQ__Description__c'] =
valuesByCategory[line.record['SBQQ__ProductCode__c']] || '';
       }
      });
     }
    });
  }
 }
 return Promise.resolve();
}
```

Javascript Using Method-Chaining

This plugin uses method-chaining style to construct the query, which is useful when you want to dynamically construct your queries.

```
/**
 * Created by jfeingold on 9/27/16.
 */
export function onAfterCalculate(quote, lines, conn) {
 if (lines.length) {
  var codes = [];
  lines.forEach(function(line) {
   var code = line.record['SBQQ__ProductCode__c'];
   if (code) {
    codes.push(code);
   }
  });
  if (codes.length) {
   var conditions = {
    SBQQ__Category__c: {$in: codes}
   };
   var fields = ['Id', 'Name', 'SBQQ__Category__c', 'SBQQ__Value__c'];
   /*
    * Queries can also be constructed in a method-chaining style.
    */
   return conn.sobject('SBQQ__LookupData__c')
    .find(conditions, fields)
    .execute(function(err, records) {
     if (err) {
      return Promise.reject(err);
     } else {
      var valuesByCategory = {};
      records.forEach(function(record) {
       valuesByCategory[record.SBQQ__Category__c] = record.SBQQ__Value__c;
      });
      lines.forEach(function(line) {
       if (line.record['SBQQ__ProductCode__c']) {
        line.record['SBQQ__Description__c'] =
valuesByCategory[line.record['SBQQ__ProductCode__c']] || '';
       }
      });
     }
    });
  }
 }
 return Promise.resolve();
}
```

Insert Records

The sample JavaScript script can be used in the Quote Line Calculator to insert records.

EDITIONS

Available in: Salesforce CPQ Winter '16 and later

This sample JavaSciprt code exports all of the methods that the calculator looks for, and documents their parameters and return types.

```
export function onAfterCalculate(quote, lines, conn) {
 if (lines.length) {
  var codes = [];
  lines.forEach(function(line) {
   var code = line.record['SBQQ__ProductCode__c'];
   if (code) {
    codes.push(code);
   }
  });
  if (codes.length) {
   var conditions = {
    SBQQ__Category__c: {$in: codes}
   };
   var fields = ['Id', 'Name', 'SBQQ__Category__c', 'SBQQ__Value__c'];
   return conn.sobject('SBQQ__LookupData__c')
    .find(conditions, fields)
    .execute(function(err, records) {
     console.log(records);
     if (err) {
      return Promise.reject(err);
     } else {
      var valuesByCategory = {};
      records.forEach(function(record) {
       valuesByCategory[record.SBQQ__Category__c] = record.SBQQ__Value__c;
      });
      var newRecords = [];
      lines.forEach(function(line) {
       var code = line.record['SBQQ__ProductCode__c'];
       var desc = line.record['SBQQ__Description__c'];
       if (code && desc && !valuesByCategory[code]) {
        newRecords.push({
         SBQQ__Category__c: code,
         SBQQ__Value__c: line.record['SBQQ__Description__c']
        });
       }
      });
      if (newRecords.length) {
       return conn.sobject('SBQQ__LookupData__c')
        .create(newRecords, function(err, ret) {
         console.log(ret);
        });
       }
      }
    });
  }
 }
 return Promise.resolve();
}
```

Javascript Page Security Plugin

Use Javascript functions to control field visibility and editability on your CPQ quotes.

EDITIONS

Available in: Salesforce CPQ Summer '15 and later

The Javascript Page Security plugin supports four functions. The functions `isFieldVisible` and `isFieldEditable` are available starting in Salesforce CPQ Summer '15 and control quote line field visibility and editability. The functions `isFieldVisibleForObject` and `isFieldEditableForObject` are available starting in Salesforce CPQ Summer '19 and can control field visibility and editability for both quote fields and quote line fields. When a method using one of these functions returns False, Salesforce CPQ locks or hides the chosen fields. The fields are unchanged if the method returns Null or True.

Because `isFieldVisibleForObject` and `isFieldEditableForObject` can accept a quote or quote line, we recommend naming your object parameter `quoteOrLine`.

Note:

- Salesforce CPQ prioritizes field-level security over page security plugins. If a field is read-only and an editability function for that field returns True, the field remains read-only.
- Use the page security plugin only for hiding, showing, and adjusting the editability of fields. If you want change field values, use the Javascript Quote Calculator Plugin.
- The quote line editor shows blank empty spaces for quote line drawer fields hidden by the page security plugin. To remove these spaces, go to Salesforce CPQ line editor package settings and select **Enable Compact Mode**.

To create a page security plugin, define your code in a custom script record and then reference that record's name in the Quote Calculator Plugin field within Salesforce CPQ Plugin package settings. If you're already using a quote calculator plugin in that field, you can add your page security plugin code to the calculator plugin's custom script record.

Table 4: isFieldVisible (Summer '15)

Parameter	Type	Definition
`fieldname`	string	If `isFieldVisible` returns False, this quote line field is hidden.
`line`	SObject	The quote line object
`conn`	Object	Methods access jsforce through the optional parameter `conn`.

Table 5: isFieldEditable (Summer '15)

Parameter	Type	Definition
`fieldname`	string	If `isFieldEditable` returns False, this quote line field is locked from edits.
`line`	SObject	The quote line object
`conn`	Object	Methods access jsforce through the optional parameter `conn`.

Table 6: isFieldVisibleForObject (Summer '19)

Parameter	Type	Definition
`fieldName`	String	A field on the quote or quote line. If `isFieldVisibleForObject` returns False, this field is hidden.
`quoteOrLine`	SObject	The object containing the field that you're evaluating to determine whether `fieldName` is visible. Can be a quote or a quote line.
`conn`	Object	Methods access jsforce through the optional parameter `conn`.
`objectName`	String	The object that contains `fieldName`. If `quoteOrLine` is evaluating a quote, use *`Quote__c`*. If `quoteOrLine` is evaluating a quote line, use *`QuoteLine__c`*. Leave this parameter undefined to target the same field on the quote and the quote line.

Table 7: isFieldEditableForObject (Summer '19)

Parameter	Type	Definition
`fieldName`	String	A field on the quote or quote line. If `isFieldEditableForObject` returns False, this field is locked from edits.
`quoteOrLine`	SObject	The object containing the field that you're evaluating to determine whether `fieldName` is editable. Can be a quote or a quote line.
`conn`	Object	Methods access jsforce through the optional parameter `conn`.
`objectName`	String	The object that contains `fieldName`. If `quoteOrLine` is evaluating a quote, use *`Quote__c`*. If `quoteOrLine` is evaluating a quote line, use *`QuoteLine__c`*. Leave this parameter undefined to target the same field on the quote and the quote line.

We strongly recommend that users on Salesforce CPQ Summer '19 and later use the new functions given their improved flexibility. If your plugin uses pre-Summer '19 functions with `isFieldEditableForObject` or `isFieldVisibleForObject` functions that use the `line` parameter, Salesforce CPQ ignores the new functions and uses the old functions instead.

To specify whether your changes apply to a field on the quote or on the quote line, use an `if` statement for your `objectName` in the `isFieldVisibleForObject` or `isFieldEditableForObject` code block. For example, in the following code segment, we're targeting the Markup Rate field on the quote.

```
export function isFieldEditableForObject(fieldName, quoteOrLine, conn, objectName){
  if (objectName === 'Quote__c' && fieldName === 'SBQQ__MarkupRate__c')
```

However, the following code segment targets Markup Rate on both the quote and the quote line.

```
export function isFieldEditableForObject(fieldName, quoteOrLine, conn, objectName){
  if fieldName === 'SBQQ__MarkupRate__c'
```

Example: In this example, if a quote's Customer Discount is greater than 10%, we lock the quote's Markup Rate field from edits.

```
export function isFieldEditableForObject(fieldName, quoteOrLine, conn, objectName){
  if (objectName === 'Quote__c' && fieldName === 'SBQQ__MarkupRate__c') {
     if (quoteOrLine.SBQQ__CustomerDiscount__c > 10) {
       return false;
  }
 }
}
```

Example: In this example, if a quote line's Distributor Discount is greater than 10%, we hide the quote line's Markup Rate field.

```
export function isFieldVisibleForObject(fieldName, quoteOrline, conn, objectName){
  if (objectName === 'QuoteLine__c' && fieldName === 'SBQQ__MarkupRate__c') {
     if (quoteOrLine.SBQQ__CustomerDiscount__c > 10) {
       return false;
   }
 }
}
```

Example: One function can also evaluate and act on quote and quote line fields at the same time, including twin fields. In this example, if a quote's Customer Discount is greater than 10%, we lock the quote's Markup Rate field from edits. If the quote line's Distributor Discount is greater than 10%, we hide the quote line's Markup Rate field.

Example:

```
export function isFieldEditableForObject(fieldName, quoteOrLine, conn, objectName){
  if (objectName === 'Quote__c' && fieldName === 'SBQQ__MarkupRate__c') {
    if (quoteOrLine.SBQQ__CustomerDiscount__c > 10) {
       return false;
  }
}

if (objectName === 'QuoteLine__c' && fieldName === 'SBQQ__MarkupRate__c') {
  if (quoteOrLine.SBQQ__DistributorDiscount__c > 10) {

       return false;
  }
 }
}
```

Legacy Page Security Plugin (Apex)

The Salesforce CPQ Apex page security plugins let developers control field-level visibility or data entry mode in Salesforce CPQ VisualForce pages.

EDITIONS

Available in: All Salesforce CPQ Editions

Note: Salesforce CPQ has deprecated support for Apex page security plugins. Review Javascript Page Security Plugin for information on the currently-supported version.

The Legacy Page Security Plugin handles two types of use cases.

Show or hide fields on each quote line

For example, you're selling training classes and you want to capture how many students are participating in the class. Use the page security plugin to hide a student number field.

Make quote line fields read-only or writable

For example, you allow your users to specify the subscription term on each quote line, but you have some products that can only be quoted on a 12-month basis. Use the page security plugin to make the Subscription Term field read-only for such products, while keeping it writable for the other products.

To use the Legacy Page Security Plugin, first create an Apex class. Then enter the Apex class name in the Legacy Page Security Plugin setting in the Salesforce CPQ package settings. You can call only one Apex class at a time in the Legacy Page Security Plugin.

Example:

```
global class MyPageSecurityPlugin implements SBQQ.PageSecurityPlugin2 {
    public Boolean isFieldEditable(String pageName, Schema.SObjectField field) {
        return null;
    }

   public Boolean isFieldEditable(String pageName, Schema.SObjectField field, SObject
 record) {
        return null;
    }

    public Boolean isFieldVisible(String pageName, Schema.SObjectField field) {
        return null;
    }

    public Boolean isFieldVisible(String pageName, Schema.SObjectField field, SObject
 record) {
        if ((pageName == 'EditLines') && (record instanceof SBQQ__QuoteLine__c)) {
            SBQQ__QuoteLine__c line = (SBQQ__QuoteLine__c)record;
            if ((line.SBQQ__Bundle__c == true) && (field !=
SBQQ__QuoteLine__c.SBQQ__ProductName__c)) {
                return false;
            }
        }
        return null;
    }
}
```

Guidelines for Heroku in Quote Calculator Plugins

Salesforce CPQ quote calculator plugins call Heroku to perform asynchronous calculations. When you write a quote calculator plugin, review important guidelines for working with the Heroku service.

- Quote calculator plugins perform synchronous calculations in the quote line editor UI, within a standard web browser with all expected platform and browser information available. However, asynchronous calculations occur within a Heroku application outside of the web browser. If your plugin must reference the state of the platform running the calculation, make sure to account for whether the quote line editor or Heroku is handling the calculation.
- If your plugin makes callouts to an endpoint that you own, make sure that both the local Salesforce host and your external Heroku host can access the endpoint URI.
- The total time for a calculation plus the time for a callout to Heroku from your system can't be longer than 30 seconds. Otherwise, Heroku will terminate the calculation.

Product Search Plugin

The Salesforce CPQ product search plugin is an interface that you can implement to customize product search results in the Product Search page and the Guided Selling page. The plugin methods vary slightly between Product Search and Guided Selling implementations.

EDITIONS

Available in: All Salesforce CPQ Editions

Product Search Plugin - Product Search Interface
Use implemented SBQQ.ProductSearchPlugin methods to further filter a product search on the Product Search page after users enter their own search queries.

SBQQ.ProductSearchPlugin - Guided Selling Interface
Use implemented SBQQ.ProductSearchPlugin methods to further filter a prompt on the Guided Selling UI.

Product Search Plugin - Product Search Interface

Use implemented SBQQ.ProductSearchPlugin methods to further filter a product search on the Product Search page after users enter their own search queries.

Namespace

SBQQ

Usage

For example, in Product Search, you could configure the plugin to return all search results in descending order from the most recent Last Ordered Date. If a sales rep enters "Tablets," the search results show tablets starting from the most recent Last Ordered Date field value. Users can then further filter through the Product Search filter panel, if necessary.

Product search plugins can use only a subset of CPQ quote fields by default. If you can't pass a field to your product search, or if it passes as null, you must instead pull it with a SOQL query using the ID passed with the quote model.

Note: Date fields are returned as strings in the yyyy-mm-dd format.

Method Order of Execution

Salesforce CPQ uses the following order to execute the SBQQ.ProductSearchPlugin implemented methods for a Product Search.

```
//**The constructor is optional**//
* 1.0 Constructor()
 * 2.0 FOREACH(Search Field){
 *   2.1 isFilterHidden()
```

```
*   2.1 getFilterDefaultValue()
* }
* 3.0 isSearchCustom (CUSTOM vs ENHANCED)
* IF(isCustom){
*  4.0 search()
* }
* ELSE{
*   4.0 getAdditionalSearchFilters()
* }
```

1. The Constructor can be called first, but it's not required for implementation.
2. Salesforce CPQ calls the following two methods for each search input.
   - isFilterHidden: Determines whether to hide the search input from the quote line editor
   - getFilterDefaultValue: Sets the field value for the initial search
3. Salesforce CPQ calls isSearchCustom to determine whether you're using Custom or Enhanced searching.
4. If isSearchCustom returned True, Salesforce CPQ calls search(). This method gives you full control of the search query - you'll build the Select Clause and Where Clause manually, then build and perform the query.
5. If isSearchCustom returned False, Salesforce CPQ calls getAdditionalSearchFilters. This method appends a WHERE clause to the existing SOQL query.

SBQQ.ProductSearchPlugin Product Search Methods

SBQQ.Product Search Plugin - Product Search Example Implementation

SBQQ.ProductSearchPlugin Product Search Methods

The following are methods for a Product Search implementation of `SBQQ.ProductSearchPlugin`.

getAdditionalSearchFilters(quote, fieldValuesMap)

Appends a WHERE clause to the SOQL query used for the product search, so that you can further refine a user's search input. Salesforce CPQ calls this method only when `isSearchCustom` returns FALSE.

getFilterDefaultValue(quote, fieldName)

Determines the value for the initial search. Salesforce CPQ calls this implemented method for each input field.

isFilterHidden(quote, fieldName)

Determines the visibility of a filter in the UI. Return `True` to hide the filter and `False` to let users see the filter. Salesforce CPQ calls this implemented method for each search input field.

isSearchCustom(quote, fieldValuesMap)

Called after `isFilterHidden` and `getFilterDefaulValue`. Returns `True` if the plugin uses custom searching or `False` if the plugin uses enhanced searching.

search(quote, fieldValuesMap)

Overrides the entire user search input. Salesforce CPQ calls this method only when `isSearchCustom` returns TRUE.

`getAdditionalSearchFilters(quote, fieldValuesMap)`

Appends a WHERE clause to the SOQL query used for the product search, so that you can further refine a user's search input. Salesforce CPQ calls this method only when `isSearchCustom` returns FALSE.

Signature

```
global String getAdditionalSearchFilters(SObject quote, Map<String,Object>
fieldValuesMap)
```

Parameters

quote
Type: SObject

The current quote.

fieldValuesMap
Type: Map<String,Object>

A map of the search criteria. The Key is a Product2 API name and the value is the desired search value.

Return Value

Type: String

The additional search filter, as a SOQL query formatted as a string. For example, `'AND Product2.Inventory_Level__c > 3'`

Example

In this method, we take an existing filter for products in a Hardware family, and append an additional filter for inventory levels greater than 3.

```
global String getAdditionalSearchFilters(SObject quote, Map<String, Object> fieldValuesMap)
 {
  String additionalFilter = NULL;
  if(fieldValuesMap.get('Family') == 'Hardware') {
    additionalFilter = 'AND Product2.Inventory_Level__c > 3';
  }
  return additionalFilter;
}
```

getFilterDefaultValue(quote, fieldName)

Determines the value for the initial search. Salesforce CPQ calls this implemented method for each input field.

Signature

```
global String getFilterDefaultValue(SObject quote, String fieldName)
```

Parameters

quote
Type: SObject

The current quote.

fieldName
Type: String

Quote field used in evaluations to determine the method's output.

Return Value

Type: String

Returns the string value used as the filter's initial search input.

Example

In this example, the method sets the product family filter's value to Service if the quote has a type of Quote.

```
global String getFilterDefaultValue(SObject quote, String fieldName) {
  // This would set Product Family filter to Service if Quote Type is Quote
  return (fieldName == 'Family' && quote.SBQQ__Type__c. == 'Quote') ? 'Service' : null;
}
```

`isFilterHidden(quote, fieldName)`

Determines the visibility of a filter in the UI. Return `True` to hide the filter and `False` to let users see the filter. Salesforce CPQ calls this implemented method for each search input field.

Signature

```
global Boolean isFilterHidden(SObject quote, String fieldName)
```

Parameters

`quote`
Type: SObject

The quote object containing the field used to determine whether the method returns true or false.

`fieldName`
Type: String

The field tested to determine whether the method returns true or false.

Return Value

Type: Boolean

Return `True` to hide the filter and `False` to let users see the filter.

Example

This example shows a method that returns `True` and hides the filter if the quote's status has a value of `Approved`.

```
global Boolean isFilterHidden(SObject quote, String fieldName) {
  // This would hide Product Code filter if Quote Status is Approved
  return fieldName == 'ProductCode' && quote.SBQQ__Status__c. == 'Approved';
}
```

isSearchCustom(quote, fieldValuesMap)

Called after `isFilterHidden` and `getFilterDefaulValue`. Returns `True` if the plugin uses custom searching or `False` if the plugin uses enhanced searching.

Signature

```
global Boolean isSearchCustom(SObject quote, Map<String,Object> fieldValuesMap)
```

Parameters

quote
Type: SObject

The current quote.

fieldValuesMap
Type: Map<String,Object>

A map of the search criteria. The map key is a Product2 API name and the value is the desired search value.

Return Value

Type: Boolean

Return `True` to use custom searching or `False` to use enhanced searching.

If you use custom searching, Salesforce CPQ calls `search` for search execution. The `search()` method lets you build the SOQL query's SELECT and WHERE clauses manually before you perform your query.

If you use enhanced searching, Salesforce CPQ calls `getAdditionalSearchFilters` for search execution. The `getAdditionalSearchFilters` method appends a WHERE clause to the existing SOQL query.

Example

In this example, we want a method that returns `True` if the original search criteria defined and used a Search field for sorting.

```
global Boolean isSearchCustom(SObject quote, Map<String,Object> fieldValuesMap) {
  // This would use CUSTOM mode if a Search field for sorting was defined and used
  return fieldValuesMap.get('Sort_By__c') != '';
}
```

search(quote, fieldValuesMap)

Overrides the entire user search input. Salesforce CPQ calls this method only when `isSearchCustom` returns TRUE.

Signature

```
global List<PricebookEntry> search(SObject quote, Map<String,Object> fieldValuesMap)
```

Parameters

quote
Type: SObject

The current quote.

fieldValuesMap
Type: Map<String,Object>

A map of the search criteria. The map key is a Product2 API name and the value is the desired search value. Contains only keys for non-null values.

Return Value

Type: List<PricebookEntry>

Example

This example builds and returns a list of price book entries.

```
global List<PricebookEntry> search(SObject quote, Map<String,Object> fieldValuesMap){
  // Get all possible filter fields from the search filter field set
  List<Schema.FieldSetMember> searchFilterFieldSetFields =
SObjectType.Product2.FieldSets.SBQQ__SearchFilters.getFields();
  // Get all possible fields from the search result field set
  List<Schema.FieldSetMember> searchResultFieldSetFields =
SObjectType.Product2.FieldSets.SBQQ__SearchResults.getFields();
  // Build the Select string
  String selectClause = 'SELECT ';
  for(Schema.FieldSetMember field : searchResultFieldSetFields) {
    selectClause += 'Product2.' + field.getFieldPath() + ', ';
  }
  selectClause += 'Id, UnitPrice, Pricebook2Id, Product2Id, Product2.Id';
  // Build the Where clause
  String whereClause = '';
  for(Schema.FieldSetMember field : searchFilterFieldSetFields) {
    if(!fieldValuesMap.containsKey(field.getFieldPath())) {
      continue;
    }
    if(field.getType() == Schema.DisplayType.String || field.getType() ==
Schema.DisplayType.Picklist) {
      whereClause += 'Product2.' + field.getFieldPath() + ' LIKE \'%' +
fieldValuesMap.get(field.getFieldPath()) + '%\' AND ';
    }
  }
  whereClause += 'Pricebook2Id = \'' + quote.get('SBQQ__Pricebook__c') + '\'';
  // Build the query
  String query = selectClause + ' FROM PricebookEntry WHERE ' + whereClause;
  // Perform the query
  List<PricebookEntry> pbes = new List<PricebookEntry>();
  pbes = Database.query(query);
  return pbes;
}
```

SBQQ.Product Search Plugin - Product Search Example Implementation

This is an example implementation of the `SBQQ.ProductSearchPlugin` interface.

```
global class ExampleProductSearchPlugin implements SBQQ.ProductSearchPlugin{
```

```
/**Constructor. Not required for implementation**/
global ExampleProductSearchPlugin(){
}

/**Product Search Methods**/
// if isSearchCustom returns True, the plugin uses search(), otherwise it uses
getAdditionalSearchFilters()
global Boolean isSearchCustom(SObject quote, Map<String,Object> fieldValuesMap){ return
true; }
global Boolean isFilterHidden(SObject quote, String fieldName){ return false; }
global String getFilterDefaultValue(SObject quote, String fieldName){ return NULL; }
global String getAdditionalSearchFilters(SObject quote, Map<String,Object> fieldValuesMap){
 return NULL; }
global List<PricebookEntry> search(SObject quote, Map<String,Object> fieldValuesMap){
return NULL; }
```

SBQQ.ProductSearchPlugin - Guided Selling Interface

Use implemented SBQQ.ProductSearchPlugin methods to further filter a prompt on the Guided Selling UI.

Namespace

SBQQ

Usage

You can configure the Product Search plugin to filter a guided selling prompt based on certain parameters when users enter a value. For example, in a guided selling prompt, you could configure the plugin to return all search results in descending order from the most recent Last Ordered Date. When the user chooses their input, the products returned in the search results are shown starting from the most recent Last Ordered Date field value.

Product search plugins can use only a subset of CPQ quote fields by default. If you can't pass a field to your guided selling input, or if it passes as null, you must retrieve it with a SOQL query.

Note: Date fields are returned as strings in the format yyyy-mm-dd.

Order of Execution

For a Guided Selling prompt, Salesforce CPQ executes the implemented SBQQ.ProductSearchPlugin methods in the following order.

```
//**The constructor is optional**//
* 1.0 Constructor()
 * 2.0 FOREACH(Search Field){
 *   2.1 isInputHidden()
 *   2.1 getInputDefaultValue()
 * }
 * 3.0 isSuggestCustom (CUSTOM vs ENHANCED)
 * IF(isCustom){
 *  4.0 suggest()
 * }
 * ELSE{
```

```
*    4.0 getAdditionalSuggestFilters()
* }
```

1. The constructor can be called first, but it's not required.
2. Salesforce CPQ calls the following two methods for each guided selling input.
   - `isInputHidden`: Determines whether to hide the guided selling input from the guided selling prompt
   - `getInputDefaultValue`: Sets the field value for the initial input
3. Salesforce CPQ calls `isSuggestCustom` to determine whether you're using custom or enhanced searching.
4. If `isInputCustom` returned TRUE, Salesforce CPQ calls `suggest`. This method gives you full control of the search query - you'll build the SELECT Clause and WHERE Clause manually, then build and perform the query.
5. If `isInputCustom` returned FALSE, Salesforce CPQ calls `getAdditionalSuggestFilters`. This method appends a WHERE clause to the existing SOQL query.

SBQQ.ProductSearchPlugin GuidedSelling Methods

SBQQ.ProductSearchPlugin - Guided Selling Example Implementation

SBQQ.ProductSearchPlugin GuidedSelling Methods

The following are methods for a guided selling implementation of `SBQQ.ProductSearchPlugin`.

getAdditionalSuggestFilters(quote, fieldValuesMap)
Appends a WHERE clause to the SOQL query used for a guided selling prompt. Salesforce CPQ Calls this method only when `isSuggestCustom` returns FALSE.

getInputDefaultValue(quote, fieldName)
Determines the input for the initial guided selling prompt.

isInputHidden(quote, fieldName)
Determines the visibility of an input in the Guided Selling UI. Return `True` to hide the input and `False` to let users see the input. Salesforce CPQ calls this method for each input.

isSuggestCustom(quote, fieldValuesMap)
Called after `isInputHidden` and `getInputDefaulValue`. Returns `True` for Salesforce CPQ to use Custom searching or `False` for Salesforce CPQ to use Enhanced searching.

suggest(quote, fieldValuesMap)
Overrides the user suggestion input. Salesforce CPQ calls this method only when `isSuggestCustom` returns TRUE.

`getAdditionalSuggestFilters(quote, fieldValuesMap)`

Appends a WHERE clause to the SOQL query used for a guided selling prompt. Salesforce CPQ Calls this method only when `isSuggestCustom` returns FALSE.

Signature

```
global String getAdditionalSuggestFilters(SObject quote, Map<String,Object>
fieldValuesMap)
```

Parameters

quote
Type: SObject

The current quote.

fieldValuesMap
Type: Map<String,Object>

A map of the guided selling suggestion criteria. The Key is a Product2 API name and the value is the desired suggest value.

Return Value

Type: String

The additional suggestion filter, as a WHERE clause. For example, `'AND Product2.Inventory_Level__c > 3'`

Example

```
    global String getAdditionalSuggestFilters(SObject quote, Map<String, Object>
inputValuesMap) {
        System.debug('METHOD CALLED: getAdditionalSuggestFilters');
        /**Adds an inventory check in an input = 'Yes' for an urgent shipment**/
        String additionalFilter = NULL;
        String isUrgent = 'No'
        if(inputValuesMap.containsKey('Urgent Shipment')){
            isUrgent = (String) inputValuesMap.get('Urgent Shipment');
        }
        if(isUrgent == 'Yes'){
            additionalFilter = 'AND Product2.Inventory_Level__c > 3';
        }
        return additionalFilter;
}
```

getInputDefaultValue(quote, fieldName)

Determines the input for the initial guided selling prompt.

Signature

```
global String getInputDefaultValue(SObject quote, String fieldName)
```

Parameters

quote
Type: SObject

The current quote.

fieldName
Type: String

Quote field used in evaluations to determine the method's output.

Return Value

Type: String

Returns the string value used as the guided selling prompt's initial input.

`isInputHidden(quote, fieldName)`

Determines the visibility of an input in the Guided Selling UI. Return `True` to hide the input and `False` to let users see the input. Salesforce CPQ calls this method for each input.

Signature

```
global Boolean isInputHidden(SObject quote, String fieldName)
```

Parameters

`quote`
Type: SObject

The current quote.

`fieldName`
Type: String

The field tested to determine whether the method returns true or false.

Return Value

Type: Boolean

Return `True` to hide the input and `False` to let users see the input.

Example

This example hides an input called "Urgent Shipment" on Fridays.

```
global Boolean isInputHidden(SObject quote, String input){
  /**Hides an input called 'Urgent Shipment' on Fridays**/
  return input == 'Urgent Shipment' && Datetime.now().format('F') == 5;
  }
```

`isSuggestCustom(quote, fieldValuesMap)`

Called after `isInputHidden` and `getInputDefaulValue`. Returns `True` for Salesforce CPQ to use Custom searching or `False` for Salesforce CPQ to use Enhanced searching.

Signature

```
global boolean isSuggestCustom(SObject quote, Map<String,Object> fieldValuesMap)
```

Parameters

`quote`
Type: SObject

The current quote.

fieldValuesMap
Type: Map<String,Object>

A map of the suggestion criteria. The map key is a Product2 API name and the value is the desired search value.

Return Value

Type: Boolean

Return `True` to use Custom searching or `False` to use Enhanced searching.

If you use Custom searching, Salesforce CPQ calls `search` for search execution. The `search()` method lets you build the SOQL query's SELECT and WHERE clauses manually before you perform your query.

If you use Enhanced searching, Salesforce CPQ calls `getAdditionalSearchFilters` for search execution. The `getAdditionalSearchFilters` method appends a WHERE clause to the existing SOQL query.

suggest(quote, fieldValuesMap)

Overrides the user suggestion input. Salesforce CPQ calls this method only when `isSuggestCustom` returns TRUE.

Signature

```
global List<PricebookEntry> suggest(SObject quote, Map<String,Object> fieldValuesMap)
```

Parameters

quote
Type: SObject

The current quote.

fieldValuesMap
Type: Map<String,Object>

A map of the search criteria. The map key is a Product2 API name and the value is the desired search value. Contains only keys for non-null values.

Return Value

Type: List<PricebookEntry>

Example

```
    /**
     * When Using Guided Selling in CUSTOM mode, Over-Ride entire search
     * Product2 Fields in the Search Results Field Set should be Set.
     */
    global List<PricebookEntry> suggest(SObject quote, Map<String, Object> inputValuesMap)
 {
        System.debug('METHOD CALLED: suggest');
        //GET ALL POSSIBLE FIELDS FROM THE SEARCH RESULTS FIELD SET
        List<Schema.FieldSetMember> searchResultFieldSetFields =
SObjectType.Product2.fieldSets.SBQQ__SearchResults.getFields();
```

```
        //BUILD THE SELECT STRING
        String selectClause = 'SELECT ';

        for (Schema.FieldSetMember field : searchResultFieldSetFields) {
            selectClause += 'Product2.' + field.getFieldPath() + ', ';
        }
        selectClause += 'Id, UnitPrice, Pricebook2Id, Product2Id, Product2.Id';

        //BUILD THE WHERE CLAUSE
        String whereClause = '';

        whereClause += 'Pricebook2Id = \'' + quote.get('SBQQ__Pricebook__c') + '\'';

        //BUILD THE QUERY
        String query = selectClause + ' FROM PricebookEntry WHERE ' + whereClause;

        //DO THE QUERY
        List<PricebookEntry> pbes = new List<PricebookEntry>();
        pbes = Database.query(query);

        return pbes;
    }
}
```

SBQQ.ProductSearchPlugin - Guided Selling Example Implementation

This is an example implementation of the `System.ProductSearchPlugin_GuidedSelling` interface.

```
global class ExampleProductSearchPlugin implements SBQQ.ProductSearchPlugin{

/**Constructor. Not required for implementation**/
global ExampleProductSearchPlugin(){
}

/**Guided Selling Methods**/
// if isSuggestCustom returns True, the plugin uses suggest(), otherwise it uses
getAdditionalSuggestFilters()
global Boolean isSuggestCustom(SObject quote, Map<String,Object> inputValuesMap){ return
true; }
global Boolean isInputHidden(SObject quote, String input){ return false; }
global String getInputDefaultValue(SObject quote, String input){ return NULL; }
global List<PriceBookEntry> suggest(SObject quote, Map<String,Object> fieldValuesMap){
return null; }
global String getAdditionalSuggestFilters(SObject quote, Map<String,Object> inputValuesMap){
 return null; }
```

Recommended Products Plugin

Use the Recommended Products plugin to recommend related products based on the existing products on a quote.

The Recommended Products plugin lets customers use their own product recommendation service in Salesforce CPQ, together with product search, search filters, favorites, and guided selling.

With the Recommended Products plugin, sales reps can see a list of recommended products while they are creating their quote. By making relevant products easier to find, the quoting process is more efficient, and sales reps can sell more products.

EDITIONS

Available in: Salesforce CPQ Winter '21 and later

Sample use cases of the Recommended Products plugin include:

- You can help sales reps close more deals by enabling them to create quotes with the ideal mix of products that anticipate their customers' needs.
- Sales reps can upsell more products by adding recommended products that are frequently sold with the products on their quotes.

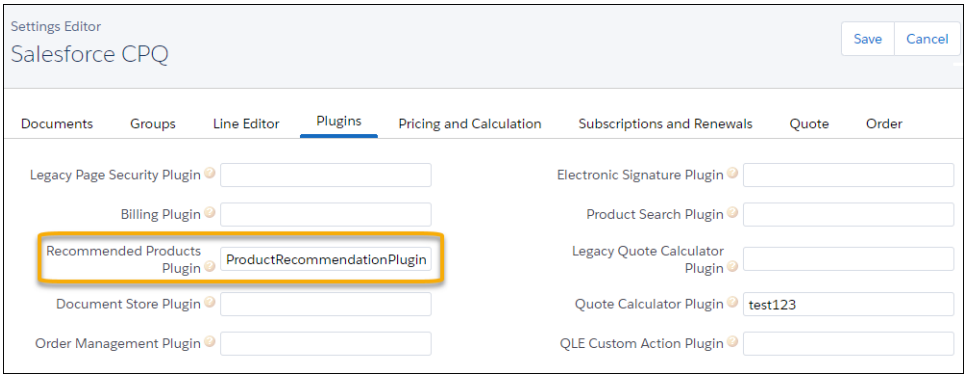
Complete these steps to implement the Recommended Products plugin:

- On the **Plugins** tab in the **Settings Editor**, enable the Recommended Products Plugin.
- To add the **Add Recommendations** button to the quote line editor, activate the Add Recommendations custom action record. See Custom Actions.
- To fully enable the Recommended Products feature, you must provide your own implementation of the plugin interface. You can use your recommendation engine or a third-party service. Your plugin interface must implement the recommend() method in the global ProductRecommendationPlugin interface:

```
global interface ProductRecommendationPlugin {
    PricebookEntry[] recommend(SObject quote, List<SObject> quoteLines);
}
```

This method takes quote and quote lines as arguments, and it outputs an ordered list of recommended price book entries. If at runtime the plugin input is missing a field required for your implementation, add it to the `ReferencedFields` field set on the corresponding object.

Add your plugin's class name on the Plugins tab in **Settings**.



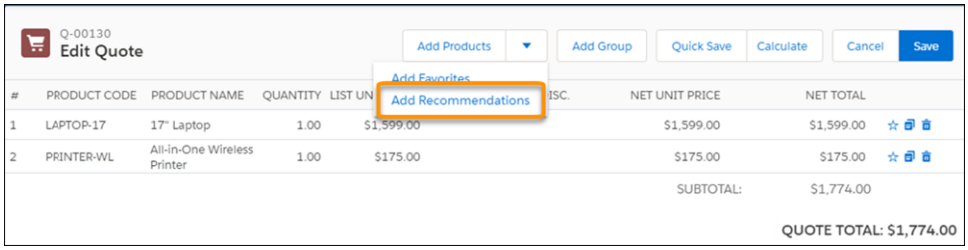
Note:

- A maximum of 2,000 price book entries are shown on the Recommended Products page, similar to the limit on the Product Lookup page. Your implementation class can return up to your top 2,000 recommendations. If you have more, you can use a recommendation score to sort and choose your top 2,000 products.
- The Recommended Products plugin doesn't support the Large Quote Threshold setting.

- Salesforce CPQ prioritizes field-level security over Recommended Product plugins. If your plugin includes fields that your users don't have permission to view, those fields aren't displayed on the Recommended Products page.
- The Product Recommendation page uses the same field set as the Product Lookup page.

Walkthrough

1. Add products to a quote and click the **Add Recommendations** custom action.



2. Salesforce calls your plugin implementation class and obtains an ordered list of PricebookEntry sObjects. These sObjects are then displayed on the Recommended Products page.

Methods

recommend()

Description

Returns the product recommendations.

Parameters

Param	Type	Description
quote	SBQQ__Quote__c	Current quote object
quoteLines	List<SBQQ__QuoteLine__c>	Current quote lines of the quote.

Return Values

PricebookEntry[ ] : Ordered list of PricebookEntry SObjects.

Error Scenarios

If your plugin throws an exception, the error shows on the Recommendations Lookup page. To show that the plugin implementation throws the error, the error message shows "Plugin Error:" as a prefix followed by the message from the exception.

Sample Implementation

When you implement the Recommended Products plugin, you can create your own recommendation engine or use a third-party recommendation service. Store the product recommendations in your org in a custom object. Then, query the recommendations in the custom object from in the recommend() method of your plugin.

In this example, the name of the custom object that stores recommendations is ProductRecommendation__c.

```
// Create your own Custom Object to store your product recommendations
ProductRecommendation__c {
    Id Product2Id__c,
    Id RecommendedProduct2Id__c,
}
```

```
global class ProductRecommendationPluginJH implements SBQQ.ProductRecommendationPlugin{
global PricebookEntry[] recommend(SObject quote, List<SObject> quoteLines) {
    System.debug('ProductRecommendationPluginJH');
    // Get the price book Id of the quote
    Id pricebookId = (Id)quote.get('SBQQ__PriceBookId__c');
    String quoteCurrency=(String)quote.get('CurrencyIsoCode');
    // Get Ids of all products in the quote
    Id[] productIdsInQuote = new Id[0];
    for (SObject quoteLine : quoteLines) {
        Id productId = (Id)quoteLine.get('SBQQ__Product__c');
        productIdsInQuote.add(productId);
    }

    // Query the recommendation custom object records of all products in quote.
   ProductRecommendation__c[] recommendations = [
        SELECT RecommendedProduct2Id__c
        FROM ProductRecommendation__c
        WHERE Product2Id__c IN :productIdsInQuote];

    // Get Ids of all recommended products
    Id[] recommendedProductIds = new Id[0];
    for(ProductRecommendation__c recommendation : recommendations) {
        recommendedProductIds.add(recommendation.RecommendedProduct2Id__c);
    }
    System.debug('>>>>>>>>>>>>'+recommendedProductIds);
    // Query the price book entries of the above recommended products
    PricebookEntry[] priceBookEntries = [
       SELECT Id, UnitPrice, Pricebook2Id, Product2Id, Product2.Name, Product2.ProductCode

        FROM PricebookEntry
        WHERE Product2Id IN :recommendedProductIds AND Pricebook2Id = :pricebookId AND
CurrencyIsoCode=:quoteCurrency];

    return priceBookEntries;
}
}
```

External Configurator Plugins

EDITIONS

Available in: Salesforce CPQ Winter '16 and later

Enable sales reps to create quotes that incorporate your product's unique attributes, bundle configuration, and other information. A CPQ external configurator replaces the CPQ product configurator for the specified products, while still allowing you to use other Salesforce CPQ features such as price calculations and product rules.

You can develop your configurator in a Visualforce page or host it in an external web application. Salesforce sends the product information payload to your external configurator, where you can create and modify its attributes, configure bundles, and perform other tasks specific to your organization's needs. Then, you send the updated payload back to Salesforce CPQ so it can build a quote line for the product with the attributes you've configured. If the sales rep reconfigures the product, the payload is sent back to your custom configurator.

Set Up an External Configurator to Launch from a Custom Action

Create a custom action that launches a non-Salesforce CPQ configurator.

Create an External Configurator

Host your configurator in Salesforce using Visualforce pages, or in an external web application such as Heroku. Use the easyXDM library to transfer data between your configurator and Salesforce CPQ.

Configure Salesforce CPQ to Use the External Configurator

Configure the Salesforce CPQ package to launch your custom configurator from the quote line editor. Indicate which products are configured externally by setting the product's **Externally Configurable** field to `true`.

Set Up an External Configurator to Launch from a Custom Action

EDITIONS

Available in: Salesforce CPQ Winter '16 and later

Create a custom action that launches a non-Salesforce CPQ configurator.

You may have to add the following layouts and values.

- Add the Page and URL Target fields to the custom action page layout.
- Add the Popup value to the custom action's URL Target field.
- Add a label that represents your external configurator's name to the custom action's Label field.

1. From your Custom Actions tab, click **New**.
2. From the Label field, choose GIS.
3. From the Page field, choose Product Configurator.
4. From the URL Target field, choose Popup.
5. In the URL field, add a URL for a custom website that uses a secure https protocol.
6. Save your changes.

Important: We strongly recommend that you choose Dialog Window for the value of URL Target. Replace Window causes users to lose all their work when the external configurator loads.

Create an External Configurator

EDITIONS

Available in: Salesforce CPQ Winter '18 and later

Host your configurator in Salesforce using Visualforce pages, or in an external web application such as Heroku. Use the easyXDM library to transfer data between your configurator and Salesforce CPQ.

1. The easiest way to include the easyDM library in your web application is to include the CDN library (hosted by CloudFlare).

```
<!-- easyXDM.min.js compiled and minified JavaScript to communicate with Salesforce
CPQ-->
<script type="text/javascript"
src="https://cdnjs.cloudflare.com/ajax/libs/easyXDM/2.4.20/easyXDM.min.js"
crossorigin="anonymous">
</script>
```

   You can also download the library then upload it to your org as a static resource.

2. Initialize the easyXDM library. Use this library to send information between your configurator and Salesforce CPQ. This example uses the variable `configObj` to store the information sent from Salesforce CPQ.

```
// Initialize the EasyXDM connection to Salesforce CPQ
var rpc = new easyXDM.Rpc({}, {

      //method defined in Salesforce CPQ
      remote: {
          postMessage: {}
      },

      // method for receiving configuration JSON from Salesforce CPQ
      local: {
        postMessage: function (message) { // parse the incoming information, for example:

              var configObj = JSON.parse(message);
        }
      }
    });
```

3. Perform the configuration, such as enforcing rules or adding new product attributes that will appear in the quote line editor. For example, set the value of a configuration option called "Special Code" to 12345. This example assumes that you've parsed the incoming JSON into the variable `configObj`.

```
configObj.product.optionConfigurations["Special Code"] = '12345';
```

4. Send the configuration information back to Salesforce CPQ as a JSON string.

```
rpc.postMessage(JSON.stringify(configObj));
```

Configure Product Bundles

Use the `optionConfigurations` parameter to create product bundles. You can nest bundles up to four levels deep, including the top-level product.

External Configurator Parameters

Salesforce CPQ passes configuration information to your custom configurator in JSON format. Modify the and return the information to Salesforce CPQ.

External Configurator Example

This example shows how to initialize the easyXML library and create **Send** and **Cancel** buttons. It then displays the configuration data sent from Salesforce CPQ.

Configure Product Bundles

Use the `optionConfigurations` parameter to create product bundles. You can nest bundles up to four levels deep, including the top-level product.

EDITIONS

Available in: Salesforce CPQ Winter '16 and later

Enable Nested Bundles

1. From Setup, enter `Installed Packages`, and then select Installed Packages.
2. Find the Salesforce CPQ package and click **Configure**.
3. Navigate to the **Additional Settings** tab and select **Nested Bundles for External Configurator.**.
4. Click **Save**.

Note: This setting can't be disabled.

Create Nested Bundles

Use the `optionConfigurations` parameter to define a nested product in a bundle.

Example: **Create a Work Anywhere Software Bundle**

For example, suppose that a sales rep quotes a Work Anywhere software product. The Work Anywhere product can include VPN access as a nested option. The VPN access can include the Ultra High-Speed option, and the Ultra HighSpeed option can include the Ad Blocker:

```
Work Anywhere
    VPN Access
        Ultra High Speed
           Ad Blocker
```

Use the following payload to configure the Work Anywhere bundle .

```
{
  "quote": {},
  "product": {
    "configuredProductId": "<Product2 Id>"  // ID of the WorkAnywhere Product,
    "lineItemId": null,
    "lineKey": null,
    "configurationAttributes": {
      "SBQQ__UnitPrice__c": null,
      "attributes": {
        "type": "SBQQ__ProductOption__c"
      }
    },
    "optionConfigurations": {
      "Other Options": [
        {
          "optionId": "<SBQQ__ProductOption__c Id>",
          "selected": true,
          "ProductName": "VPN Access",
          "Quantity": 1,
          "configurationData": {},
          "readOnly": {},
          "optionConfigurations": {
```

```
            "Other Options": [
              {
                "optionId": "<SBQQ__ProductOption__c Id>",
                "selected": true,
                "ProductName": "Ultra High Speed",
                "Quantity": 1,
                "configurationData": {},
                "readOnly": {},
                "optionConfigurations": {
                  "Other Options": [
                    {
                      "optionId": "<SBQQ__ProductOption__c Id>",
                      "selected": true,
                      "ProductName": "Ad Blocker",
                      "Quantity": 1,
                      "configurationData": {},
                      "readOnly": {}
                    }
                  ]
                }
              }
            ]
          }
        }
      ]
    },
    "configurationData": {}
  },
  "products": [],
  "readOnly": {},
  "redirect": {
    "save": true
  }
}
```

Considerations for Nested Bundles

Consider the following when configuring nested bundles with the external configurator.

- You can configure up to four levels of nested bundles, including the top-level product. If you reconfigure a bundle containing five levels, only four levels are sent to the external configurator. Deselect the fifth level by deselecting the top-level product.
- We don't support the auto property with bundles, so users can't return to the Salesforce CPQ configurator and continue configuring the product. Instead, users are redirected back to the quote line editor.
- Default configurations aren't supported. When returning the payload, you must explicitly select each nested option, even for reconfiguration payloads.
- Nested bundles are assumed configured. Nested bundles with the product's Configuration Type set to `Required` are considered configured if they're part of the payload.
- Min/Max options aren't supported with the external configurator. Min/Max options are directed to the Salesforce CPQ configurator. Attempting to set min/max options with the external configurator can result in errors.
- Duplicate dynamic options are supported. That is, you can add the same option to a bundle multiple times.

External Configurator Parameters

Salesforce CPQ passes configuration information to your custom configurator in JSON format. Modify the and return the information to Salesforce CPQ.

EDITIONS

Available in: Salesforce CPQ Winter '16 and later

The following parameters are required unless otherwise indicated.

quote
Object. The `SBQQ__Quote__c` record.

product
Object. The product being configured.

configuredProductId
String. Read-only. The ID of the Product2 record.

lineItemId
String. Read-only. The ID of the corresponding quote line. Populated on reconfigure when the quote line is saved.

lineKey
Number. Read-only. Salesforce CPQ uses this field to identify the corresponding quote line for this product.

configurationAttributes
Object. Required, but can be empty. If you use configuration attributes, this parameter contains the attribute field values.

optionConfigurations
Object. Indicates the options for a nested bundle.

optionId
String. Required for static options. The ID of the SBQQ__ProductOption__c record.

productId
String. Required for dynamic options. The ID of the SBQQ__Product2__c record. Available in API version 57.0 and later.

selected
Boolean. Required for static options but optional for dynamic options. `true` if the product option is selected; otherwise `false`.

ProductName
String. Read-only. Name of the product.

Quantity
Number. The line item's quantity.

configurationData
Object. Required, but can be empty. Use this parameter to set editable SBQQ__ProductOption__c fields, which can be used with rules or twin field mapping.

readOnly
Object. The quote line that corresponds to the selected option. Salesforce CPQ populates this field on reconfigure requests.

index
Number. Required when the SBQQ__ProductFeature__c record's Option Selection Method field is `Add`. When you add the same product to a feature multiple time, use this parameter to uniquely identify each instance of the same product.

optionConfigurations
Object. Available when Nested Bundles for External Configurator is enabled. Available in API version 56.0 and later. Use this object to include options for a nested bundle

configurationData
Object. Required, but can be empty. Field - value pair that sets twin field values on the quote line for the product being configured.

products
Array. Optional. Use this parameter to clone the product that is being configured.

readOnly
Object. The quote line that corresponds to the product being configured. Salesforce CPQ populates this field on reconfigure requests.

redirect
Object. Contains properties that specify the save and redirect behavior.

save
Boolean. To save the configuration, set this parameter to `true`. To cancel the configuration, set this value to `false`.

auto
Boolean. To redirect the user to the quote line editor, set this value to `true`. To redirect the user to the CPQ Configurator, set this value to `false`. This parameter isn't available when `Nested Bundles for External Configurator` is enabled.

External Configurator Example

This example shows how to initialize the easyXML library and create **Send** and **Cancel** buttons. It then displays the configuration data sent from Salesforce CPQ.

EDITIONS

Available in: Salesforce CPQ Winter '16 and later

```
<apex:page doctype="html-5.0" standardstylesheets="false" showHeader="false">
 <html>
    <head>
<!-- easyXDM.min.js compiled and minified JavaScript to communicate with Salesforce CPQ-->
<script type="text/javascript"
src="https://cdnjs.cloudflare.com/ajax/libs/easyXDM/2.4.20/easyXDM.min.js"
crossorigin="anonymous">
</script>
    </head>
    <body>
        <div>
            <button onclick="broadcastSend()">Send</button>
           <button onclick="broadcastCancel()">Cancel (Customer's Cancel Button)</button>

            <br></br>
          <textarea id="output" type="text" style="width:1400px; height:700px"></textarea>

        </div>
        <script type="text/javascript">
            // Set up the EasyXDM connection to Salesforce CPQ
            var rpc = new easyXDM.Rpc({},{
                remote: {
                    postMessage: {}
                },
                local: {
                    //Method that receives the configuration information.
                    postMessage: function(message) {
                        // Display the JSON received from Salesforce CPQ.
                        document.getElementById('output').value =
```

```
JSON.stringify(JSON.parse(message), null, 4);
                    }
                }
            });
            function broadcastSend() {
                //Return the configuration information to Salesforce CPQ
                rpc.postMessage(document.getElementById('output').value);
            }
            function broadcastCancel() {
                rpc.postMessage(null);
            }
        </script>
    </body>
</html>
</apex:page>
```

Configure Salesforce CPQ to Use the External Configurator

Configure the Salesforce CPQ package to launch your custom configurator from the quote line editor. Indicate which products are configured externally by setting the product's **Externally Configurable** field to `true`.

EDITIONS

Available in: Salesforce CPQ Winter '18 and later

1. From Setup, in the Quick Find box, *`Installed Packages`*, and then select **Installed Packages**.
2. Find the Salesforce CPQ package and click **Configure**.
3. Select the **Additional Settings** tab.
4. In the External Configurator URL field, enter the URL for your external configurator.

   To get the URL of a Visualforce page, click `preview`. You can use either an absolute or a relative URL. To use the custom configurator with Experience Cloud, you must use a relative URL, because the URL format of Salesforce Lightning and externally-hosted web applications are different.
5. Optional: On the Additional Settings page, you can also select the **Third Party Configurator** field. When active, Salesforce CPQ launches the external configurator so it takes up your entire screen. Any action that closes the external configurator, such as clicking cancel or save, redirects to the page that launched the external configurator.
6. Find the products to configure with the external configurator.
   a. Select the **Externally Configurable** field on each product record.
   b. Make sure each product's **Configuration Type** field is set to `Required`.

      The external configurator launches when a user clicks the wrench next to a configurable bundle, or when the user adds a product where a configuration event is required. If you set the configuration type to `Allowed`, the external configurator launches only when a sales rep selects the wrench icon next to a configurable bundle.

Legacy Quote Calculator Plugin

Use Apex code to perform calculations within the CPQ quote line editor.

EDITIONS

Available in: All Salesforce CPQ Editions

Important: As of Winter '17, Salesforce CPQ isn't developing new features for the Legacy Quote Calculator Plugin. Salesforce CPQ continues to support admin-related configuration cases for legacy calculator features. Salesforce Customer Support responds to bugs only for regressions from existing legacy calculator features. For current quote calculator plugin documentation, review Javascript Quote Calculator Plugin.

To use the Legacy Page Security Plugin, first create an Apex class. Then enter the Apex class name in the Legacy Page Security Plugin setting in the Salesforce CPQ package settings. You can call only one Apex class at a time in the Legacy Page Security Plugin.

Calculating True End Date and Subscription Term
The sample JavaScript script can be used in the Quote Line Calculator to calculate values and store maximum values for the custom quote line fields True Effective End Date and True Effective Term.

Custom Package Total Calculation
The sample Apex class calculates the total price for all components in a quote line and then stores that value in a custom field.

Find Lookup Records
The sample Apex class can be used in the Legacy Quote Line Calculator to query records within the plugin and use fields from those records to set each quote line's Description field.

Calculating True End Date and Subscription Term

The sample JavaScript script can be used in the Quote Line Calculator to calculate values and store maximum values for the custom quote line fields True Effective End Date and True Effective Term.

EDITIONS

Available in: Salesforce CPQ Winter '16 and later

Note: Salesforce CPQ no longer provides support for Legacy Quote Calculator plugins. Check out the Javascript Quote Calculator Plugin for support and improved features.

Note: The sample script assumes the Salesforce admin created custom fields `True Effective End Date` and `True Effective Term` on the Quote Line object.

Example:

```
global class QCPWinter16Legacy2 implements SBQQ.QuoteCalculatorPlugin,
SBQQ.QuoteCalculatorPlugin2 {

/* This QCP examples calculates and stores the effective end date on each quote line,
 as well as the effective term.
   It also stores the max(effective end date) and max(effective term) on the Quote
object
*/


    /* NOTE: the getReferencedFields method is no longer required if you use the
ReferencedFields field set on
 the Quote Line object.
             This field set must be created as it's not a managed one.
       NOTE: if you need to access Quote fields, you can create the ReferencedFields
field set on the Quote object as well.
       NOTE: if you do not use the getReferencedFields method, you can remove
SBQQ.QuoteCalculatorPlugin2 from the class declaration.
    */
    global Set<String> getReferencedFields() {
        return new Set<String>{
           /* Note: add fields using the following format - Only add fields referenced
```

```
               by the plugin and not in the Line Editor field set on the Quote Line
object
            String.valueOf(SBQQ__QuoteLine__c.My_Field_API_Name__c)
            */
            String.valueOf(SBQQ__QuoteLine__c.True_Effective_End_Date__c),
            String.valueOf(SBQQ__QuoteLine__c.True_Effective_Term__c),

            String.valueOf(SBQQ__Quote__c.True_Effective_End_Date__c),
            String.valueOf(SBQQ__Quote__c.True_Effective_Term__c),

            String.valueOf(SBQQ__QuoteLine__c.SBQQ__EffectiveStartDate__c),
            String.valueOf(SBQQ__QuoteLine__c.SBQQ__EffectiveEndDate__c),
            String.valueOf(SBQQ__QuoteLine__c.SBQQ__SubscriptionTerm__c),
            String.valueOf(SBQQ__QuoteLine__c.SBQQ__DefaultSubscriptionTerm__c),

            String.valueOf(SBQQ__Quote__c.SBQQ__SubscriptionTerm__c)
        };
    }

    global void onBeforePriceRules(SObject quote, SObject[] lines) {
    }

    global void onAfterPriceRules(SObject quote, SObject[] lines) {
    }

    global void onBeforeCalculate(SObject quote, SObject[] lines) {
    }

    global void onAfterCalculate(SObject quote, SObject[] lines) {
        Date maxEffectiveEndDate = null;
        Decimal maxEffectiveTerm = 0;
        for(SObject line : lines) {
            Date trueEndDate = calculateEndDate(quote, line);
            Decimal trueTerm = getEffectiveSubscriptionTerm(quote, line);
            if(maxEffectiveEndDate == null || maxEffectiveEndDate < trueEndDate) {
                maxEffectiveEndDate = trueEndDate;
            }
            if(maxEffectiveTerm < trueTerm) {
                maxEffectiveTerm = trueTerm;
            }
            line.put(SBQQ__QuoteLine__c.True_Effective_End_Date__c, trueEndDate);
            line.put(SBQQ__QuoteLine__c.True_Effective_Term__c, trueTerm);
        }
        quote.put(SBQQ__Quote__c.True_Effective_End_Date__c, maxEffectiveEndDate);
        quote.put(SBQQ__Quote__c.True_Effective_Term__c, maxEffectiveTerm);
    }

    global void onInit(SObject[] lines) {
    }

    private Date calculateEndDate(SObject quote, SObject line) {
        Date startDate =
```

```
(Date)line.get(String.valueOf(SBQQ__QuoteLine__c.SBQQ__EffectiveStartDate__c));
        Date endDate =
(Date)line.get(String.valueOf(SBQQ__QuoteLine__c.SBQQ__EffectiveEndDate__c));
        if ((startDate != null) && (endDate == null)) {
           /* Note: we are assuming that Subscription Term Unit is Month in the package
 settings */
            endDate = startDate.addMonths(getEffectiveSubscriptionTerm(quote,
line).intValue()).addDays(-1);
           /* Note: we are assuming that Subscription Term Unit is Day in the package
 settings */
//          endDate = startDate.addDays(getEffectiveSubscriptionTerm(line).intValue()
 - 1);
        }
        return endDate;
    }

    private Decimal getEffectiveSubscriptionTerm(SObject quote, SObject line) {
        Decimal lineTerm = null;
        Date startDate =
(Date)line.get(String.valueOf(SBQQ__QuoteLine__c.SBQQ__EffectiveStartDate__c));
        Date endDate =
(Date)line.get(String.valueOf(SBQQ__QuoteLine__c.SBQQ__EffectiveEndDate__c));
        if ((startDate != null) && (endDate != null)) {
           /* Note: we are assuming that Subscription Term Unit is Month in the package
 settings */
            lineTerm = startDate.monthsBetween(endDate.addDays(1));
           /* Note: we are assuming that Subscription Term Unit is Day in the package
 settings */
//            lineTerm = startDate.daysBetween(endDate.addDays(1));
        } else {
            lineTerm =
(Decimal)line.get(String.valueOf(SBQQ__QuoteLine__c.SBQQ__SubscriptionTerm__c));
            if (lineTerm == null) {
                lineterm =
(Decimal)quote.get(String.valueOf(SBQQ__Quote__c.SBQQ__SubscriptionTerm__c));
                if (lineTerm == null) {
                    return
(Decimal)line.get(String.valueOf(SBQQ__QuoteLine__c.SBQQ__DefaultSubscriptionTerm__c));

                }
            }
        }
        return lineTerm;
    }

}
```

Custom Package Total Calculation

The sample Apex class calculates the total price for all components in a quote line and then stores that value in a custom field.

EDITIONS

Available in: Salesforce CPQ Winter '16 and later

Note: Salesforce CPQ no longer provides support for Legacy Quote Calculator plugins. Check out the Javascript Quote Calculator Plugin for support and improved features.

Note: The sample script assumes the Salesforce admin created a custom field `Component Custom Total` on the Quote Line object.

Example:

```
global class QCPWinter16Legacy implements SBQQ.QuoteCalculatorPlugin,
SBQQ.QuoteCalculatorPlugin2 {

    /* NOTE: the getReferencedFields method is no longer required if you use the
ReferencedFields field set on
 the Quote Line object.
             This field set must be created as it's not a managed one.
       NOTE: if you need to access Quote fields, you can create the ReferencedFields
field set on the Quote object as well.
       NOTE: if you do not use the getReferencedFields method, you can remove
SBQQ.QuoteCalculatorPlugin2 from the class declaration.
    */
    global Set<String> getReferencedFields() {
        return new Set<String>{
           /* Note: add fields using the following format - Only add fields referenced


              by the plugin and not in the Line Editor field set on the Quote Line
object
            String.valueOf(SBQQ__QuoteLine__c.My_Field_API_Name__c)
            */
            String.valueOf(SBQQ__QuoteLine__c.Component_Custom_Total__c),

            String.valueOf(SBQQ__QuoteLine__c.SBQQ__ProratedListPrice__c),
            String.valueOf(SBQQ__QuoteLine__c.SBQQ__PriorQuantity__c),
            String.valueOf(SBQQ__QuoteLine__c.SBQQ__PricingMethod__c),
            String.valueOf(SBQQ__QuoteLine__c.SBQQ__DiscountScheduleType__c),
            String.valueOf(SBQQ__QuoteLine__c.SBQQ__Renewal__c),
            String.valueOf(SBQQ__QuoteLine__c.SBQQ__Existing__c),
            String.valueOf(SBQQ__QuoteLine__c.SBQQ__SubscriptionPricing__c)
        };
    }

    global void onBeforePriceRules(SObject quote, SObject[] lines) {
    }

    global void onAfterPriceRules(SObject quote, SObject[] lines) {
    }

    global void onBeforeCalculate(SObject quote, SObject[] lines) {
    }
```

```
    global void onAfterCalculate(SObject quote, SObject[] lines) {
        for(SObject line : lines) {
            SObject parent =
line.getSObject(SBQQ__QuoteLine__c.SBQQ__RequiredBy__c.getDescribe().getRelationshipName());

            if(parent != null) {
              Decimal pComponentCustomTotal =
(Decimal)parent.get(String.valueOf(SBQQ__QuoteLine__c.Component_Custom_Total__c));

              Decimal cListPrice =
(Decimal)line.get(String.valueOf(SBQQ__QuoteLine__c.SBQQ__ProratedListPrice__c));
              Decimal cQuantity =
(Decimal)line.get(String.valueOf(SBQQ__QuoteLine__c.SBQQ__Quantity__c));
              Decimal cPriorQuantity =
(Decimal)line.get(String.valueOf(SBQQ__QuoteLine__c.SBQQ__PriorQuantity__c));
              String cPricingMethod =
(String)line.get(String.valueOf(SBQQ__QuoteLine__c.SBQQ__PricingMethod__c));
              String cDiscountScheduleType =
(String)line.get(String.valueOf(SBQQ__QuoteLine__c.SBQQ__DiscountScheduleType__c));
              Boolean cRenewal =
(Boolean)line.get(String.valueOf(SBQQ__QuoteLine__c.SBQQ__Renewal__c));
              Boolean cExisting =
(Boolean)line.get(String.valueOf(SBQQ__QuoteLine__c.SBQQ__Existing__c));
              String cSubscriptionPricing =
(String)line.get(String.valueOf(SBQQ__QuoteLine__c.SBQQ__SubscriptionPricing__c));

              pComponentCustomTotal = (pComponentCustomTotal == null) ? 0 :
pComponentCustomTotal;

              cListPrice = (cListPrice == null) ? 0 : cListPrice;
              cQuantity = (cQuantity == null) ? 1 : cQuantity;
              cPriorQuantity = (cPriorQuantity == null) ? 0 : cPriorQuantity;
              cPricingMethod = (cPricingMethod == null) ? 'List' : cPricingMethod;
              cDiscountSCheduleType = (cDiscountSCheduleType == null) ? '' :
cDiscountSCheduleType;
              cRenewal = (cRenewal == null) ? false : cRenewal;
              cExisting = (cExisting == null) ? false : cExisting;
              cSubscriptionPricing = (cSubscriptionPricing == null) ? '' :
cSubscriptionPricing;

              Decimal cTotalPrice = getTotal(cListPrice, cQuantity, cPriorQuantity,
cPricingMethod, cDiscountScheduleType, cRenewal, cExisting, cSubscriptionPricing,
cListPrice);
              pComponentCustomTotal += cTotalPrice;

              parent.put(SBQQ__QuoteLine__c.Component_Custom_Total__c,
pComponentCustomTotal);

            }
        }
    }

    global void onInit(SObject[] lines) {
        for(SObject line : lines) {
```

```
            line.put(SBQQ__QuoteLine__c.Component_Custom_Total__c, 0);
        }
    }

    private Decimal getTotal(Decimal price, Decimal quantity, Decimal priorQuantity,
String pricingMethod, String discountScheduleType, Boolean renewal, Boolean existing,
 String subscriptionPricing, Decimal ListPrice) {
        price = (price == null) ? 0 : price;
        renewal = (renewal == null) ? false : renewal;
        existing = (existing == null) ? false : existing;

        if(renewal == true && existing == false && priorQuantity == null) {
            return 0;
        } else {
           return price * getEffectiveQuantity(quantity, priorQuantity, pricingMethod,
 discountScheduleType, renewal, existing, subscriptionPricing, listPrice);
        }

    }

    private Decimal getEffectiveQuantity(Decimal quantity, Decimal priorQuantity,
String pricingMethod, String discountScheduleType, Boolean renewal, Boolean existing,
 String subscriptionPricing, Decimal ListPrice) {
        Decimal result = 0;
        Decimal deltaQuantity = 0;

        quantity = (quantity == null) ? 0 : quantity;
        priorQuantity = (priorQuantity == null) ? 0 : priorQuantity;
        pricingMethod = (pricingMethod == null) ? '' : pricingMethod;
        discountScheduleType = (discountScheduleType == null) ? '' :
discountScheduleType;
       subscriptionPricing = (subscriptionPricing == null) ? '' : subscriptionPricing;

        renewal = (renewal == null) ? false : renewal;
        existing = (existing == null) ? false : existing;
        listPrice = (listPrice == null) ? 0 : listPrice;

        deltaQuantity = quantity - priorQuantity;

        if(pricingMethod == 'Block' && deltaQuantity == 0) {
            result = 0;
        } else {
            if(pricingMethod == 'Block') {
                result = 1;
            } else {
                if(discountScheduleType == 'Slab' && (deltaQuantity == 0 || (quantity
 == 0 && renewal == true))) {
                    result = 0;
                } else {
                    if(discountScheduleType == 'Slab') {
                        result = 1;
                    } else {
                     if(existing == true && subscriptionPricing == '' && deltaQuantity
 < 0) {
```

```
                            result = 0;
                        } else {
                            if(existing == true && subscriptionPricing == 'Percent Of
 Total' && listPrice != 0 && deltaQuantity >= 0) {
                                result = quantity;
                            } else {
                                if(existing == true) {
                                    result = deltaQuantity;
                                } else {
                                    result = quantity;
                                }
                            }
                        }
                    }
                }
            }

            return result;
        }

}
```

Find Lookup Records

The sample Apex class can be used in the Legacy Quote Line Calculator to query records within the plugin and use fields from those records to set each quote line's Description field.

EDITIONS

Available in: Salesforce CPQ Winter '16 and later

Note: Salesforce CPQ no longer provides support for Legacy Quote Calculator plugins. Check out the Javascript Quote Calculator Plugin for support and improved features.

Example:

```
global class QCPForFindingLookupRecords implements
SBQQ.QuoteCalculatorPlugin, SBQQ.QuoteCalculatorPlugin2 {
 global set<String> getReferencedFields() {
 return new Set<String> {
 String.valueOf(SBQQ__QuoteLine__c.SBQQ__ProductCode__c),
 String.valueOf(SBQQ__QuoteLine__c.SBQQ__Description__c)
 };
 }

 global void onInit(SObject[] lines) {}

 global void onBeforeCalculate(SObject quote, SObject[] lines)
 {}

 global void onBeforePriceRules(SObject quote, SObject[] lines)
 {}

 global void onAfterPriceRules(SObject quote, SObject[] lines)
 {}
```

```
 global void onAfterCalculate(SObject quote, SObject[] lines) {
 if (!lines.isEmpty()) {
 String[] productCodes = new String[0];
 for (SObject line : lines) {
 String productCode =
(String)line.get(String.valueOf(SBQQ__QuoteLine__c.SBQQ__ProductCode__c));
 if (productCode != null && !productCode.isWhitespace()) {
 productCodes.add(productCode);
 }
 }
 SBQQ__LookupData__c[] ds = [SELECT Id, SBQQ__Category__c, SBQQ__Value__c FROM
SBQQ__LookupData__c WHERE SBQQ__Category__c IN :productCodes];
 if (!ds.isEmpty()) {
 Map<String,String> valuesByCategory = new Map<String,String>();
 for (SBQQ__LookupData__c d : ds) {
 valuesByCategory.put(d.SBQQ__Category__c, d.SBQQ__Value__c);
 }
 for (SObject line : lines) {
 String productCode =
(String)line.get(String.valueOf(SBQQ__QuoteLine__c.SBQQ__ProductCode__c));
 if (productCode != null && !productCode.isWhitespace()) {
 line.put(String.valueOf(SBQQ__QuoteLine__c.SBQQ__Description__c),
valuesByCategory.get(productCode));
 }
 }
 }
 }
 }
}
```

Product Configuration Initializer for Guided Selling

The product configuration initializer uses a custom user-provided APEX page to select options and set field values based on the results of guided selling prompts. It works only for standard product option fields and not for configuration attributes or custom product option fields.

A product configuration initializer consists of a Visualforce controller and Visualforce page. To use the initializer on all of your org's quote processes, go to the Product Configuration Initializer field in Salesforce CPQ line editor package settings and enter *c__* followed by the Visualforce page's name. To use an initializer on a specific quote process, go to the quote process's Product Configuration Initializer field and enter *c__* followed by the Visualforce page's name. Product configuration initializers on quote process records override the package-level product configuration initializer.

Example: Sample Visualforce controller:

```
public with sharing class LF_ProductInitializerController {
    public Product2[] products {get; set;}
    public Boolean skip {get; set;}
    Map<String,SBQQ__ProductOption__c> optionsByCode = new
Map<String,SBQQ__ProductOption__c>();

    public LF_ProductInitializerController() {
```

```
        // Set "skip" to true to bypass the configuration page, or to false to on the
 config page after the initializer has completed
        skip = true;

        // Retrieve product (bundle)
        String pidsStr = ApexPages.currentPage().getParameters().get('pids');
        String[] pids = pidsStr.split(',');
        products = [SELECT Id, Family, (SELECT SBQQ__OptionalSKU__r.ProductCode,
SBQQ__Quantity__c, SBQQ__Selected__c FROM SBQQ__Options__r) FROM Product2 WHERE Id IN
 :pids];
        for (SBQQ__ProductOption__c opt : products[0].SBQQ__Options__r) {
            optionsByCode.put(opt.SBQQ__OptionalSKU__r.ProductCode, opt);
        }

        String  myInput1 = ApexPages.currentPage().getParameters().get('Process Input
 1');
      Decimal myInput2 = toInteger(ApexPages.currentPage().getParameters().get('Process
 Input 2'));

        // Perform any logic you want here

        // Then select options in the bundle, for example:
        if (myInput1 == 'ABC') {
            selectOption('MyProductOption1', myInput2);
        } else {
            selectOption('MyProductOption2', 1)
        }
    }

    private Decimal toInteger(String value) {
        return String.isBlank(value) ? 0 : Decimal.valueOf(value);
    }

    private void selectOption(String code, Decimal qty) {
        optionsByCode.get(code).SBQQ__Selected__c = (qty > 0);
        optionsByCode.get(code).SBQQ__Quantity__c = qty;
    }
}
```

Example: Sample Visualforce page:

```
<apex:page controller="LF_ProductInitializerController" contentType="text/xml"
showHeader="false" sidebar="false">
    <products skipConfiguration="{!skip}">
    <apex:repeat var="product" value="{!products}">
```

```
        <product id="{!product.Id}">
            <apex:repeat var="opt" value="{!product.SBQQ__Options__r}">
                <option id="{!opt.Id}"
                    selected="{!opt.SBQQ__Selected__c}"
                    quantity="{!ROUND(opt.SBQQ__Quantity__c, 0)}"/>
            </apex:repeat>
        </product>
    </apex:repeat>
    </products>
</apex:page>
```

Product Search Executor for Guided Selling

A Product Search Executor plugin filters the results of a guided selling prompt after a sales rep's input. It consists of a Visualforce controller and Visualforce page, which you can associate with a specific quote process within a guided selling configuration. It's useful if you want to add an extra level of guided selling product filtering beyond what sales reps can control.

To use an executor with a quote process, go to the quote process's Product Search Executor field and enter `c__` followed by the Visualforce page's name.

Example: Your organization sells laptop workstations. A guided selling prompt lets sales reps filter your product catalog by memory, screen size, and type of processor. You could also make a simple product search executor plugin that further filters their results by active products and products that aren't bundle components.

Here's a sample APEX controller for your plugin.

```
public with sharing class TWProductSearchController {
    public Product2[] products {get; set;}
    public String error {get; set;}
    public TWProductSearchController() {
       products = [SELECT Id FROM Product2 WHERE IsActive = true AND SBQQ__Component__c
 = false];
    }
}
```

And here's a sample Visualforce page.

```
<apex:page controller="TWProductSearchController" contentType="text/xml"
showHeader="false" sidebar="false">
    <products error="{!error}">
    <apex:repeat var="product" value="{!products}">
        <product id="{!product.Id}"/>
    </apex:repeat>
    </products>
</apex:page>
```

Document Store Plugin

Use a CPQ document store plugin to store your quote documents as custom objects or in third-party integrations.

EDITIONS

Available in: All Salesforce CPQ Editions

Table 8: storeDocument Method

Param	Type	Description
quote	SObject (SBQQ__Quote__c)	Quote record information from the Salesforce CPQ quote.
document	SObject (SBQQ__QuoteDocument__c)	The quote document record from Salesforce CPQ.
content	Blob	Represents the actual PDF or Word file contents.

Example: Here's a sample document store plugin.

```
public class TestDocumentStorePlugin implements SBQQ.DocumentStorePlugin {

   public void storeDocument(SObject quote, SObject document, Blob content) {
       // Custom document saving logic goes here.
   }

   // Reserved for future use
   public Boolean isQuoteDocumentSaved() {
      return true;
   }

   // Reserved for future use
   public SObject[] listDocuments(SObject quote) {
      return null;
   }

}
```

Custom Action Plugin

A custom action plugin lets you run code before or after custom actions in Salesforce CPQ. Currently, custom action plugins support only cloning actions.

A custom action plugin can call either the `onBeforeCloneLine` method or the `onAfterCloneLine` method so that you can evaluate and modify a quote line before or immediately after the cloning process. These methods accept the following parameters.

Table 9: Parameters for onBeforeCloneLine and onAfterCloneLine

Parameter	Type	Definition
quote	QuoteModel	A representation of the quote object.
clonedLines	Object	Properties: **clonedLines** Available with onAfterCloneLine. An array of new QuoteLineModels created from the clone action. When using

Parameter	Type	Definition
		onBeforeCloneLine, this property is undefined. **originalLines** Available with onBeforeCloneLine and onAfterCloneLine. An array of QuoteLineModels for the original quote lines that the user is cloning. You can use the cloneLines parameter to change fields on the old and new quote lines.
conn	Object	A jsforce connection.

To create a custom action plugin, create a custom script record and enter your code in the Code field. Then, go to Salesforce CPQ package settings an open the plugins tab. Enter the name of your custom script in the Custom Action Plugin field and save your changes.

Here's a basic template for the plugin, without any additional code. You can use onBeforeCloneLine or onAfterCloneLine as needed.

```
export function onBeforeCloneLine(quote, clonedLines) {
   return Promise.resolve();
}
```

Salesforce CPQ Electronic Signature Plugin

An electronic signature plugin lets developers add electronic signature functionality to their orgs. This is useful for organizations who wish to streamline processes involving signatures, such as finalizing purchases and contracts.

EDITIONS

Available in: All Salesforce CPQ Editions

Example:

```
global virtual interface ElectronicSignaturePlugin {
 void send(QuoteDocument__c[] documents);

 void updateStatus(QuoteDocument__c[] documents);

 void revoke(QuoteDocument__c[] documents);

 String getSendButtonLabel();
}


global interface ElectronicSignaturePlugin2 extends
ElectronicSignaturePlugin {
 Boolean isSendButtonEnabled();
}
```

INDEX