

SYBASE®

Eclipse Plug-In Guide

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**Sybase CEP Option R4**

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# Overview

Sybase® CEP Eclipse plug-in enables you to use Eclipse to develop and manage Sybase CEP applications.

Most of the information you need to develop a program with the Continuous Computation Language (CCL) is contained in the standard Sybase CEP documentation. These pages present information specific to the Sybase CEP Eclipse plug-in.

Specifically, you may also need to read the following documents:

- The *Sybase CEP Getting Started* tutorial guides you through exercises with Sybase CEP Studio to define basic concepts. Note that you cannot use files created with Sybase CEP Studio in Eclipse, nor can you use files created with Eclipse in Sybase CEP Studio.
- The *Sybase CEP CCL Reference* provides syntax and usage information for CCL statements not described in this document.
- The *Sybase CEP Programmer's Guide* covers basic CCL programming from a how-to perspective.
- The *Sybase CEP Studio Guide* covers the Sybase CEP Studio development application, but many of the concepts presented there are relevant to the Sybase CEP Eclipse plug-in.



# Installing the Sybase CEP Eclipse Plug-In

A description of steps required to install the Eclipse plug-in in Sybase CEP.

1. Locate the CEP Eclipse Plug-In file included in the root of the CD, titled `com.sybase.c8.eclipse.plugin.jar`. The file's name may be date stamped, for example, `com.sybase.c8.eclipse.plugin.3.0.0-20092522.1-release.jar`.
2. Copy the plug-in file to the `plugins` directory under your Eclipse installation directory.
3. Start (or restart) Eclipse.

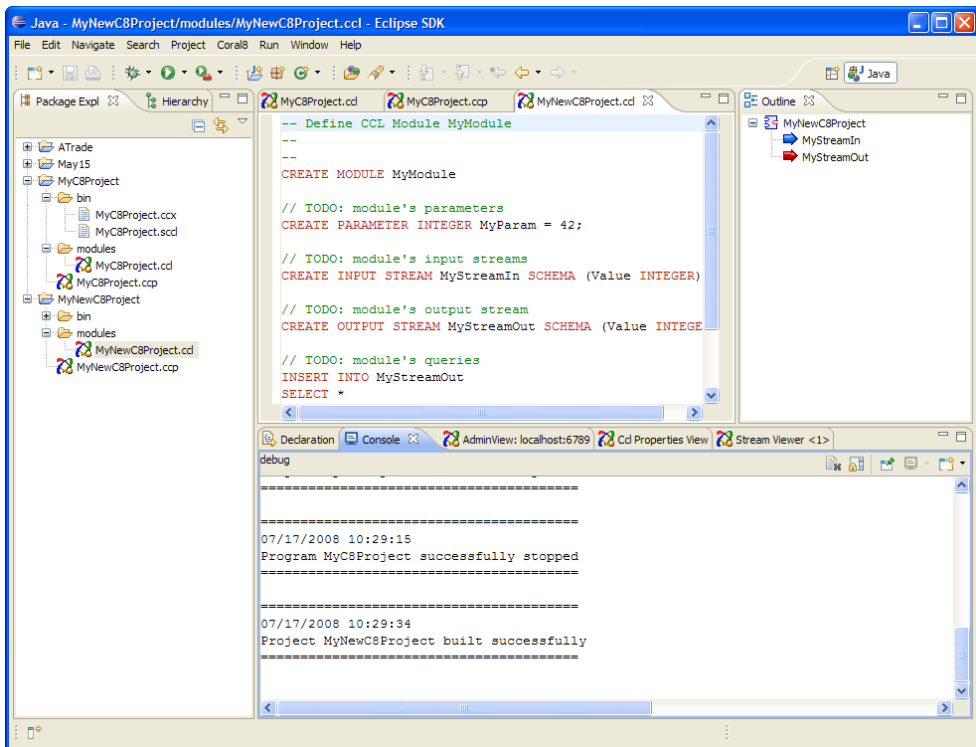




# Creating a Sybase CEP Project

Create new Sybase CEP projects in Eclipse.

1. On the File menu, click New and then click Project.
2. In the New Project window, click **Sybase CEP** and then **Sybase CEP Application** to specify the Sybase CEP Application wizard.
3. Click Next.
4. Specify the name of your project in the text box and, if you want it to be saved in a location other than the default, clear the checkbox and specify a location.
5. Click Finish.



The Package Explorer shows the components of your new Sybase CEP project:

- The bin directory contains compiled query modules with a .ccx extension. If automatic builds is turned on, your new project is already built and the corresponding .ccx file is placed here.
- The modules directory contains CCL query modules with a .ccl extension.

## Creating a Sybase CEP Project

- The file with a .ccp extension is the Sybase CEP project file.

Your new project includes a single module file that contains simple CCL code defining a typical module structure, as displayed in the editor. Notice that the text is color-coded based on CCL reserved words and comments. This is where you write your own CCL code.

Create an additional module by following these steps:

1. On the File menu, click New and then click Other.
2. In the New window, click the plus sign next to Sybase CEP and then click CCL File to specify the Sybase CEP CCL File wizard.
3. Click the modules folder under your existing project folder and then type the name of the module into the File name text box.
4. Click Finish.

### Next

Each new module contains the same starter CCL code.

For more information about CCL, see *CCL for the Plug-In* on page 7 and the *Sybase CEP CCL Reference*.

For more information about the components of the Sybase CEP Eclipse plug-in, see The User Interface.

# CCL for the Sybase CEP Eclipse Plug-In

Sybase CEP Eclipse plug-in enables users to write Sybase CEP applications in Continuous Computational Language (CCL).

This page provides information about two CCL statements not covered in other Sybase CEP documents: CREATE MODULE and LOAD MODULE.

Your application can contain any of the following statements, each of which is described in the *Sybase CEP CCL Reference*:

- IMPORT
- CREATE SCHEMA
- CREATE FUNCTION

## Syntax

In addition, your application must contain one or more module definitions, using the CREATE MODULE statement described here:

### CREATE MODULE

```

create_module_statement:
    CREATE MODULE
    module_name
        module_statements
    END MODULE ;

module_statements:
    { module_statement ; }

module_statement:
    create_stream_statement
    create_parameter_statement
    create_schema_statement
    create_function_statement
    create_variable_statement
    create_window_statement
    create_public_window_statement
    query_statement
    database_statement
    delete_statement
    set_variable_statement
    load_module_statement
    attach_adapter_statement

```

Note that module definitions (CREATE MODULE statements) cannot contain other module definitions. Module definitions can contain CREATE SCHEMA and CREATE FUNCTION statements. The scope of such statements is the current module. The *Sybase CEP CCL*

*Reference* describes each of the statements listed in the definition of `module_statement`, with the exception of the `LOAD MODULE` statement, which is described here:

## **LOAD MODULE**

```

load_module_statement:
    LOAD MODULE
module_name
    AS
load_name

[ STREAMS
    module_streams_bindings_list ]
[ PARAMETERS
    module_parameters_bindings_list ]
[ PROPERTIES
    module_properties_list ]
;

module_streams_bindings_list:
    stream_binding
    {, stream_binding }

stream_binding:

stream_name
    =
stream_value
module_parameters_bindings_list:
    parameter_binding
    {, parameter_binding }

parameter_binding:

parameter_name
    =
parameter_value
module_properties_list:
    module_property
    {, module_property }

module_property:
    module_property_name =
module_property_value

```

Note:

- Names (module, streams, parameters, and properties) are case-insensitive.
- *stream\_value* can either be the name of a stream in the loading module or a string containing a `ccl://` or `http://` stream URI.
- For more information about stream bindings, see the *Creating Data Stream Bindings* section of the *Sybase CEP Studio Guide*.

- Valid values for *module\_property\_value* depend on the specified property, as described below:

Property	Value
GUARANTEED DELIVERY	INHERIT   ENABLE   DISABLE
GUARANTEED DELIVERY MAXIMUM QUEUE SIZE	integer
GUARANTEED DELIVERY MAXIMUM AGE	interval
SYNCHRONIZATION	USE SERVER TIMESTAMP IN ORDER OUT OF ORDER INHERIT
OUT OF ORDER DELAY	interval
MAXIMUM DELAY	interval
PERSISTENCE	INHERIT   ENABLE   DISABLE
PERSISTENCE COMMIT INTERVAL	interval

For more information about these properties and values, as well as additional information about bindings, see the *Editing Query Module Properties* section of the *Sybase CEP Studio Guide*.

Note: Modules cannot be loaded recursively, either directly or indirectly.

### **Example**

The following code defines a simple module for calculating the CCI index:

```
// Define CCI module
CREATE MODULE CCI
  // Module interface
  CREATE INPUT STREAM Trades SCHEMA (Symbol STRING, Price FLOAT);
  CREATE OUTPUT STREAM Cci SCHEMA (Symbol STRING, CCI FLOAT);
  CREATE PARAMETER INTERVAL IntervalSize = 15 minutes;

  // Module implementation
  CREATE STREAM TypicalPrice;

  INSERT INTO TypicalPrice
  SELECT
    Price, Cci.CCI
  FROM
    Trades KEEP 24 HOURS, Cci
  WHERE
    Trades.Symbol = Cci.Symbol
  ;
END MODULE; // CCI
```

To instantiate the module, use the LOAD MODULE statement:

```
/// Load the module definition
///
IMPORT "Finance/CCI.ccl";

CREATE MODULE Main
  CREATE STREAM CciShortStream;
  CREATE STREAM CciLongStream;

  /// @name CciShort
  ///
  /// instantiate the module with "1 minute" interval
  ///
  LOAD MODULE CCI AS CCI_Short
  STREAMS
    Trades = "ccl://server:6789/Stream/Ws/Source/TradesStream",
    Cci    = CciShortStream
  PARAMETERS
    IntervalSize = 1 minute
  PROPERTIES
    PERSISTENCE           = INHERIT,
    GUARANTEED DELIVERY = INHERIT
  ;

  /// @name CciLong
  ///
  /// instantiate the module with "15 minutes" interval
  ///
  LOAD MODULE CCI AS CCI_Long
  STREAMS
    Trades = "ccl://server:6789/Stream/Ws/Source/TradesStream",
    Cci    = CciLongStream
  PARAMETERS
    IntervalSize = 15 minutes
  PROPERTIES
    PERSISTENCE           = INHERIT,
    GUARANTEED DELIVERY = INHERIT
  ;
END MODULE;
```

# Running a Sybase CEP Project

Begin a Sybase CEP project with a run configuration.

To create a new run configuration, follow these steps:

1. On the Run menu, click Run Configurations.
2. Click Sybase CEP Application and then click the New launch configuration button.
3. Specify a name for the run configuration and then choose the project from the Project list.
4. Change the default values for Server URI (connection information for the server that you want to run your project), Workspace (a Sybase CEP workspace), and Compiler Arguments, if desired.
5. Click Apply.
6. Click Run.

## Next

More information about URIs, workspaces, and compiler arguments can be found in the *Sybase CEP Integration Guide*.

The Console displays debug information and, assuming the program is successfully compiled and loaded, the message "Program was successfully started."

Note: if your Sybase CEP compiler is not in the default installation location (`C:\Program Files\Sybase CEP\Server\bin\c8_compiler.exe`), you must specify the correct location by clicking Preferences on the Window menu and then typing the path into the Sybase CEP Compiler Path text box in the Sybase CEP Preferences area.

Also note that the Sybase CEP Eclipse plug-in does not support debugging CCL on the server, so you cannot create debug configurations for Sybase CEP projects.

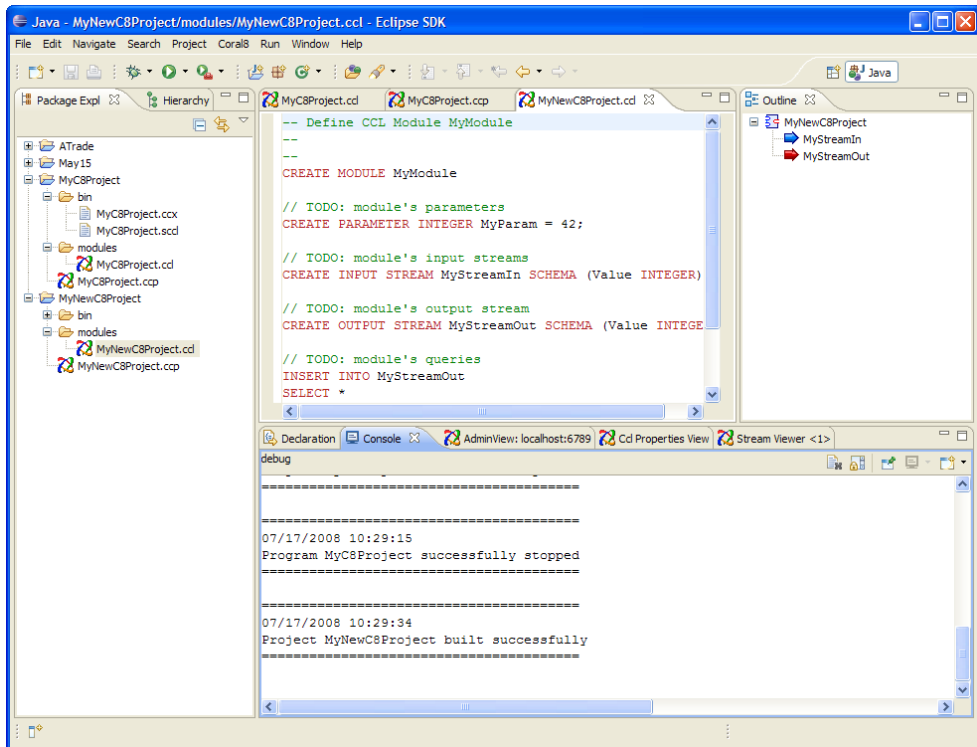
You can restart or stop a running Sybase CEP project with *The Admin View* on page 18.





# The User Interface

A description of Sybase CEP Eclipse plug-in interface components.



- The Package Explorer shows the files comprising your Sybase CEP project. These files are discussed briefly in *Creating a Sybase CEP Project* on page 5.
- The editor enables you to view and modify the contents of the individual files in your project. See *The Editor* on page 14 for more information about this component.
- The Outline view displays the components of your project, including streams, adapters, and windows. See *The Outline View* on page 16 for more information about this component.
- The Console displays messages, including errors, about actions you take with the plug-in, such as compiling, starting, and stopping projects.

Other components appear when you take specific actions:

- The Properties View displays schema and property information about a specific project component. See *The Properties View* on page 16 for more information about this component.

- The Admin View allows you to manage running projects. See *The Admin View* on page 18 for more information about this component.
- Stream Viewers show you the rows passing through the streams and windows in your project. See *Stream Viewers* on page 19 for more information about these components.

## Opening the Editor view

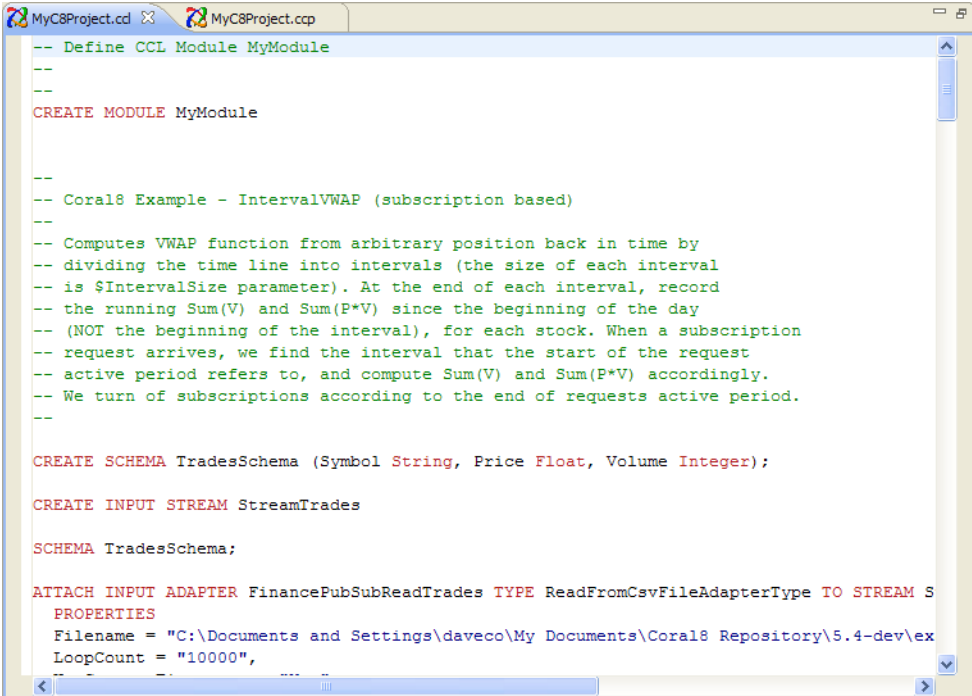
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The editor view enables users to view the content of an opened file. Users can also make modifications through the editor view.

## Query Module Files

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When you create a new query module file, the Sybase CEP Eclipse plug-in automatically opens it in the editor. Query module files contain the CCL code defining your project.



```
-- Define CCL Module MyModule
--
--
CREATE MODULE MyModule

--
-- Coral8 Example - IntervalVWAP (subscription based)
--
-- Computes VWAP function from arbitrary position back in time by
-- dividing the time line into intervals (the size of each interval
-- is $IntervalSize parameter). At the end of each interval, record
-- the running Sum(V) and Sum(P*V) since the beginning of the day
-- (NOT the beginning of the interval), for each stock. When a subscription
-- request arrives, we find the interval that the start of the request
-- active period refers to, and compute Sum(V) and Sum(P*V) accordingly.
-- We turn of subscriptions according to the end of requests active period.
--
--
CREATE SCHEMA TradesSchema (Symbol String, Price Float, Volume Integer);

CREATE INPUT STREAM StreamTrades

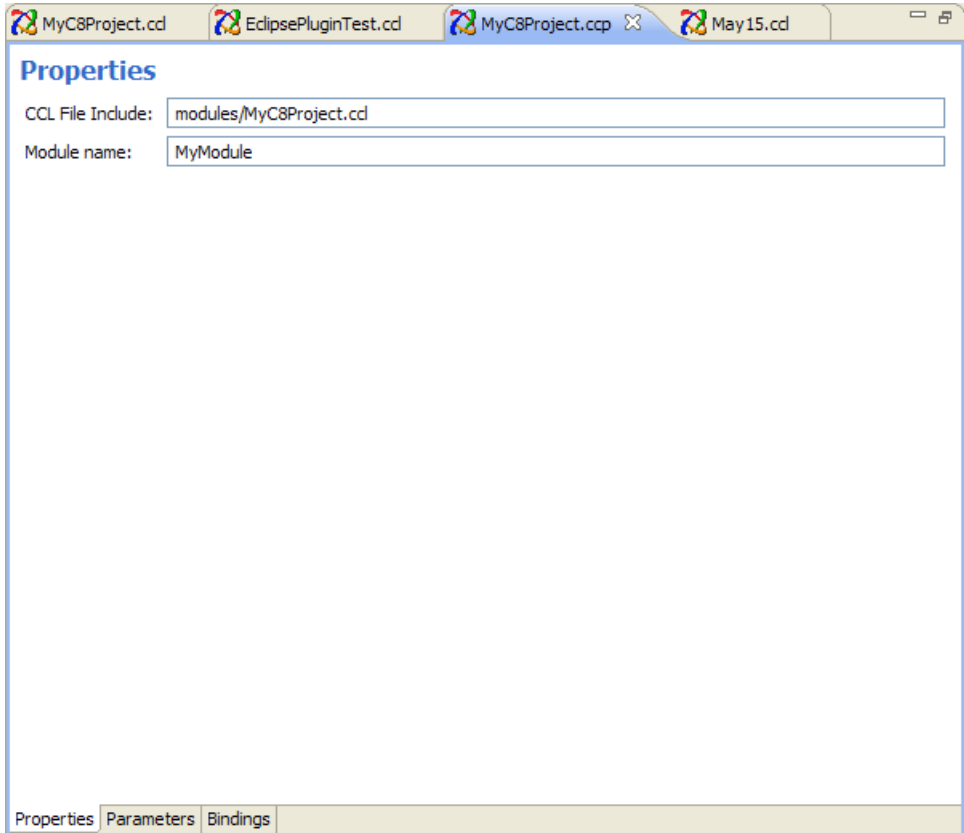
SCHEMA TradesSchema;

ATTACH INPUT ADAPTER FinancePubSubReadTrades TYPE ReadFromCsvFileAdapterType TO STREAM S
PROPERTIES
  Filename = "C:\Documents and Settings\daveco\My Documents\Coral8 Repository\5.4-dev\ex
  LoopCount = "10000",
```

## Project Files

---

When you open a Sybase CEP project file with a .ccp file name extension, the editor displays information about the project as a whole:



The three tabs are:

- Properties: displays high-level information about the project.
- Parameters: enables you to specify override values for parameters already defined within a module.
- Bindings: enables you to specify bindings between streams in different projects.

See the *Sybase CEP CCL Reference*, the *Sybase CEP Studio Guide*, and the *Sybase CEP Integration Guide* for more information about parameters and bindings.

## Other Files

---

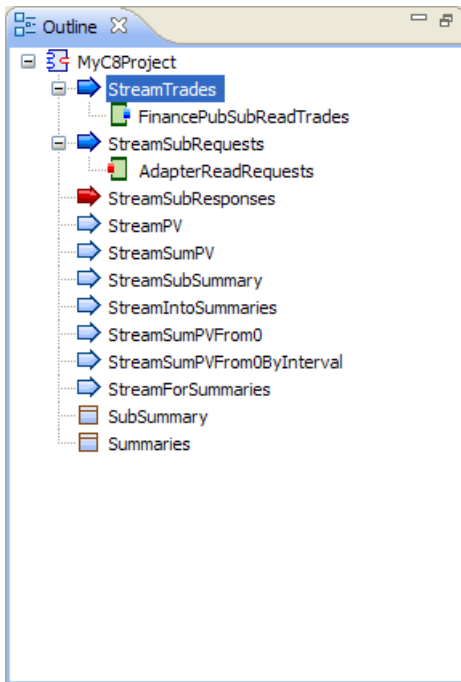
While you can display Sybase CEP files from your project's bin directory in the editor, you should not edit these directly. Enable the compiler to build those files from your CCL code.

## The Outline View

---

The Outline view displays icons representing the different components of a Sybase CEP project.

Components include streams, adapters, and windows. Right-clicking an item enables you to open the *CCL Properties View* on page 16 with information about that specific component.

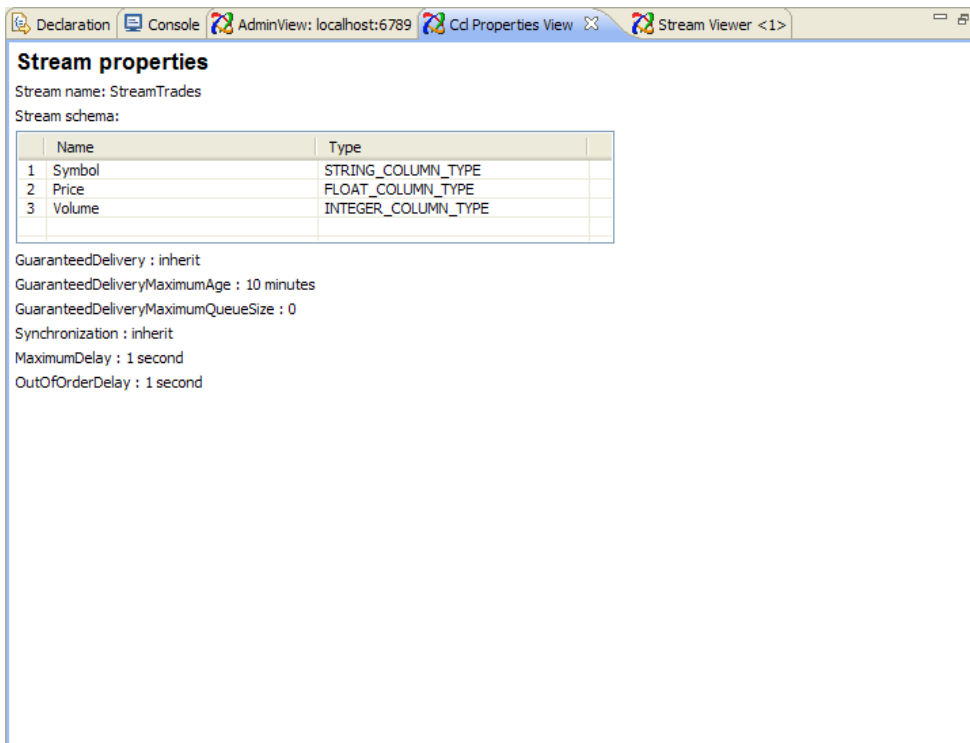


## Viewing CCL properties

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The CCL property enables users to view read only information.

Open the Ccl Properties View by right-clicking an item in the Outline view and then choosing Properties.



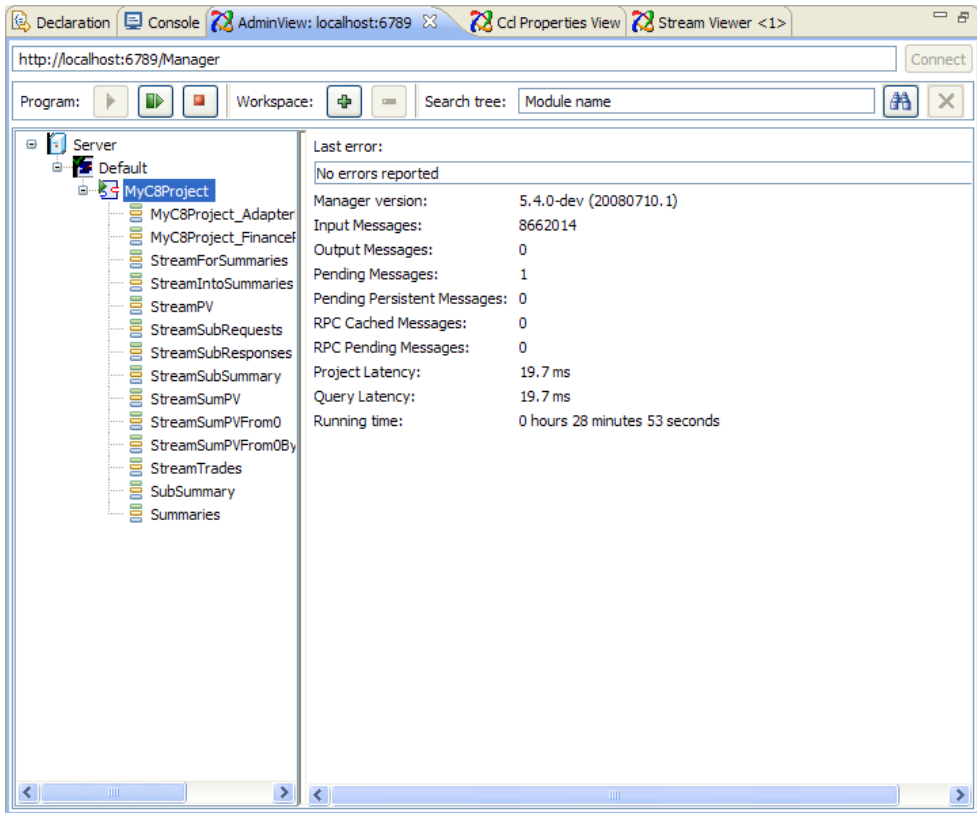
As you click different items in the Outline view, the Ccl Properties View changes to show the schema definition and property values of the selected component.

You can copy the information from this view by right-clicking in an area outside the schema definition table, and then choosing Copy. Pasting the results of such a copy operation looks similar to this:

```
Stream name: StreamTrades
Stream schema:
1, Symbol, STRING_COLUMN_TYPE
2, Price, FLOAT_COLUMN_TYPE
3, Volume, INTEGER_COLUMN_TYPE
GuaranteedDelivery : inherit
GuaranteedDeliveryMaximumAge : 10 minutes
GuaranteedDeliveryMaximumQueueSize : 0
Synchronization : inherit
MaximumDelay : 1 second
OutOfOrderDelay : 1 second
```

## The Admin view

Open the Admin View from the Sybase CEP menu to monitor and manage running Sybase CEP projects.



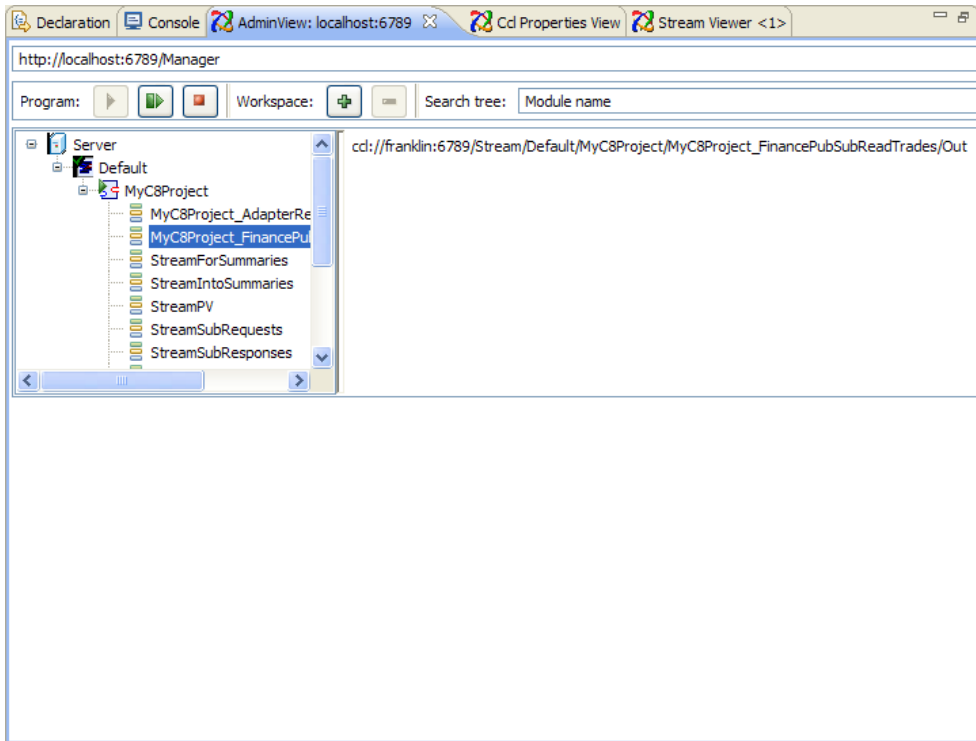
The top area of the view provides access to the following functions:

- The text box contains the default server URI, as specified in your *Sybase CEP Preferences* on page 21. Change the information here if you want to connect to a server other than the default. Click Connect to connect to the specified server. Once connected, the bottom area of the view displays the workspaces and running projects on the server. Any messages related to connecting to the server appear in the Console view.
- Use the Program buttons to restart or stop the running project selected in the bottom area of the view.
- Use the Workspace buttons to create a new workspace or delete an existing one (which must be empty).

- Enter a character string in the Filter projects text box, followed by clicking the binoculars button, will limit the display to projects with names that match the specified string. Clicking the "X" button removes the filter.

Click a project name in the bottom area of the view to review status information about the running project.

Click the name of a stream or window in the bottom area of the view to review the URI of that component. Right-click a component to open a *Stream Viewer* on page 19 for that component.



## Stream viewers

The Stream Viewer displays rows that are passing through a specific stream.

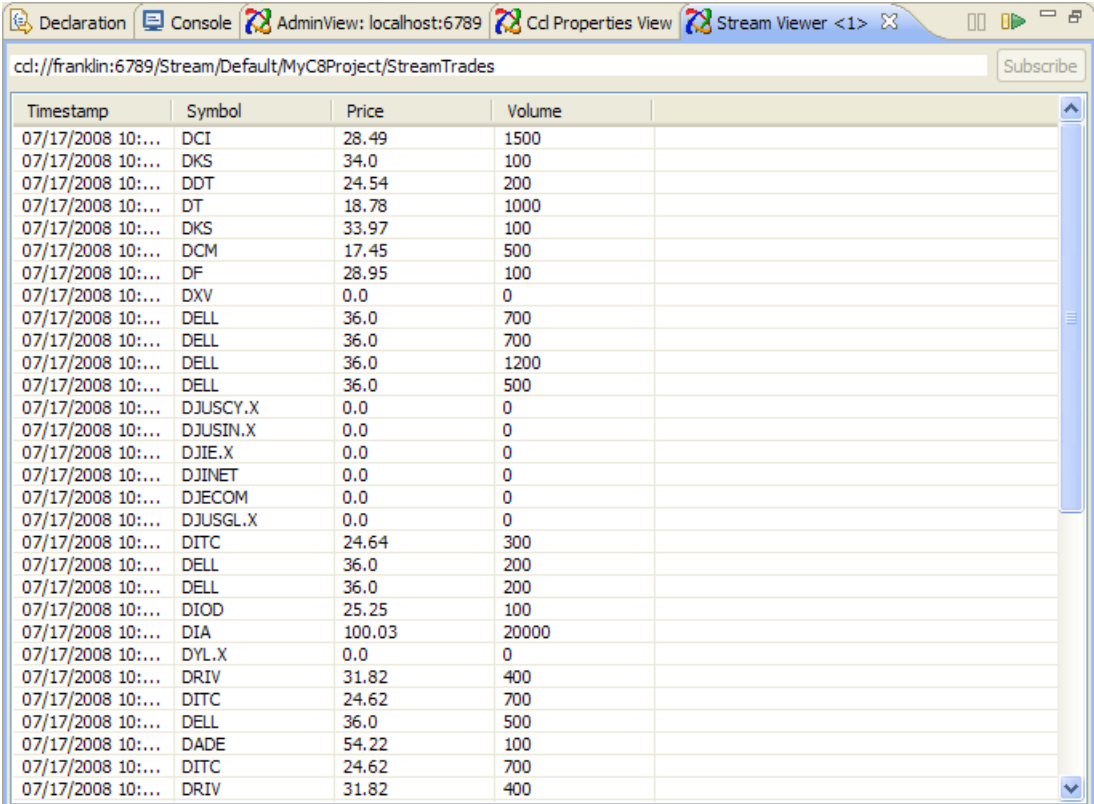
Access the Stream Viewer by clicking Open Stream Viewer on the Sybase CEP menu. You then type or paste the URI of the stream in the text box and then click Subscribe. Alternatively, right-click the name of a stream in the Admin View and then choose View stream. This opens a Stream Viewer with the URI of the selected stream already placed in the text box. Simply click Subscribe.

Use the pause and resume buttons to control the display of rows.

## The User Interface

You can re-use the same Stream Viewer to view the data in a different stream by replacing the URI and clicking Subscribe again.

You can have multiple Stream Viewers open simultaneously.



The screenshot shows a web browser window with several tabs: Declaration, Console, AdminView: localhost:6789, Cd Properties View, and Stream Viewer <1>. The Stream Viewer tab is active and displays a table of stock trade data. The table has four columns: Timestamp, Symbol, Price, and Volume. The data is sorted by timestamp, showing trades from 07/17/2008 10:00:00 to 10:00:00. The symbols include DCI, DKS, DDT, DT, DKS, DCM, DF, DXV, DELL, DJUSCY.X, DJUSIN.X, DJIE.X, DJINET, DJECOM, DJUSGL.X, DITC, DIOD, DIA, DYL.X, DRIV, DADE, and DRIV. The prices and volumes vary, with DIA having the highest volume at 20000.

Timestamp	Symbol	Price	Volume
07/17/2008 10:...	DCI	28.49	1500
07/17/2008 10:...	DKS	34.0	100
07/17/2008 10:...	DDT	24.54	200
07/17/2008 10:...	DT	18.78	1000
07/17/2008 10:...	DKS	33.97	100
07/17/2008 10:...	DCM	17.45	500
07/17/2008 10:...	DF	28.95	100
07/17/2008 10:...	DXV	0.0	0
07/17/2008 10:...	DELL	36.0	700
07/17/2008 10:...	DELL	36.0	700
07/17/2008 10:...	DELL	36.0	1200
07/17/2008 10:...	DELL	36.0	500
07/17/2008 10:...	DJUSCY.X	0.0	0
07/17/2008 10:...	DJUSIN.X	0.0	0
07/17/2008 10:...	DJIE.X	0.0	0
07/17/2008 10:...	DJINET	0.0	0
07/17/2008 10:...	DJECOM	0.0	0
07/17/2008 10:...	DJUSGL.X	0.0	0
07/17/2008 10:...	DITC	24.64	300
07/17/2008 10:...	DELL	36.0	200
07/17/2008 10:...	DELL	36.0	200
07/17/2008 10:...	DIOD	25.25	100
07/17/2008 10:...	DIA	100.03	20000
07/17/2008 10:...	DYL.X	0.0	0
07/17/2008 10:...	DRIV	31.82	400
07/17/2008 10:...	DITC	24.62	700
07/17/2008 10:...	DELL	36.0	500
07/17/2008 10:...	DADE	54.22	100
07/17/2008 10:...	DITC	24.62	700
07/17/2008 10:...	DRIV	31.82	400

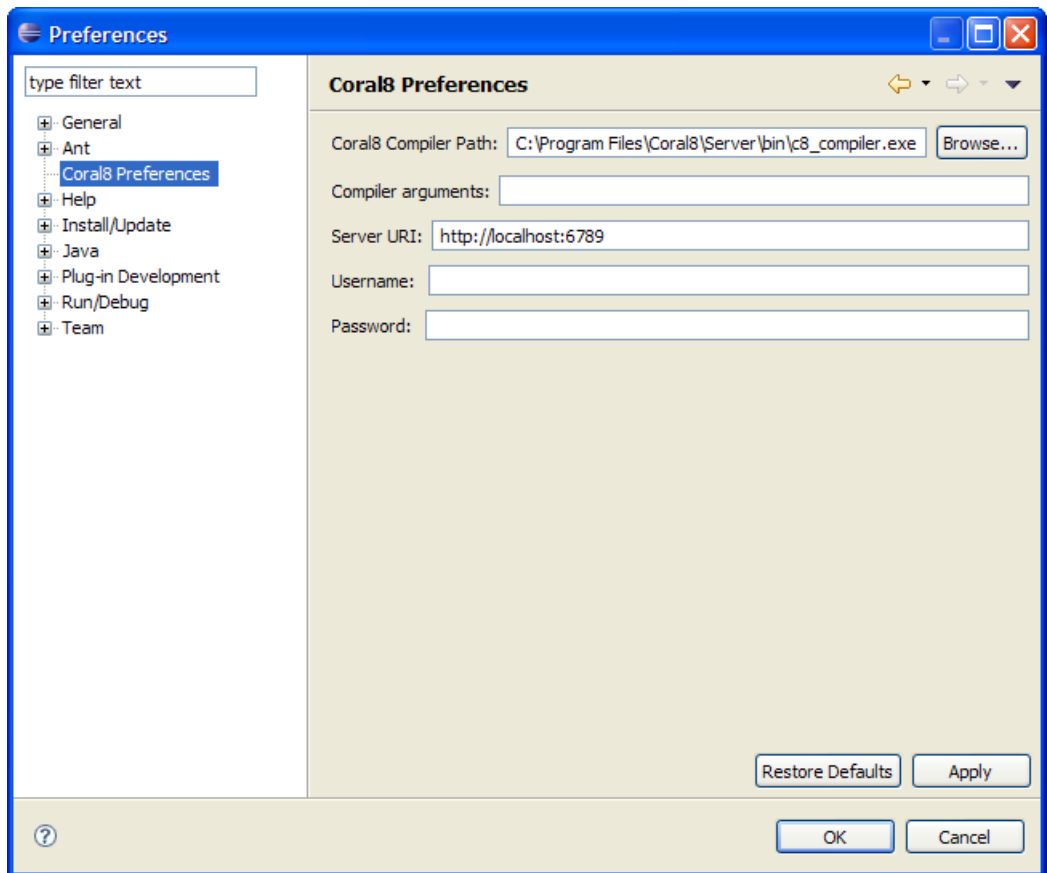


## Setting Sybase CEP preferences

Sybase CEP Preferences enables users to specify the defaults for Run Configuration, the Admin view, and other plug-in functions.

Access Sybase CEP Preferences by clicking Preferences on the Window menu. In the Preferences window, click Sybase CEP Preferences.

Here you identify the name of and path to the Sybase CEP compiler, arguments to pass to the compiler when building your Sybase CEP modules, the URI of a Sybase CEP Server, and the name and password of a user, if the Sybase CEP Server is configured to require user authentication.





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