Oracle® Communications Convergent Charging Controller

Control Plan Editor User's Guide

Release 6.0

May 2016

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Contents

Chapter 1

Introducing Control Plans 1

Chapter 2

Configuring Control Plan Editor...9

Chapter 3

Introducing the Control Plan Editor 15

Chapter 4

CPE Compiler Error Messages...21

Glossary of Terms...33

Index 35

About This Document

Scope

The scope of this document includes all functionality a user must know in order to effectively operate the Oracle Communications Convergent Charging Controller ACS Control Plan Editor application. It does not include detailed design of the service or feature nodes specific to other applications.

Audience

This guide is written primarily for CPE administrators. However, the overview sections of the document are useful to anyone requiring an introduction.

Prerequisites

Although there are no prerequisites for using this guide, familiarity with the target platform would be an advantage.

A solid understanding of Unix and a familiarity with IN concepts are an essential prerequisite for safely using the information contained in this technical guide. Attempting to install, remove, configure or otherwise alter the described system without the appropriate background skills, could cause damage to the system; including temporary or permanent incorrect operation, loss of service, and may render your system beyond recovery.

This manual describes system tasks that should only be carried out by suitably trained operators.

Related Documents

The following documents are related to this document:

- *Oracle Communications Convergent Charging Controller SMSC Technical Guide*
- *Oracle Communications Convergent Charging Controller ACS Technical Guide*
- *Oracle Communications Convergent Charging Controller Feature Nodes Reference Guide*
- *Oracle Communications Convergent Charging Controller ACS User's Guide*

Document Conventions

Typographical Conventions

The following terms and typographical conventions are used in the Oracle Communications Convergent Charging Controller documentation.

Formatting Convention	Type of Information
Special Bold	Items you must select, such as names of tabs. Names of database tables and fields.
Italics	Name of a document, chapter, topic or other publication. Emphasis within text.
Button	The name of a button to click or a key to press. **Example:** To close the window, either click **Close**, or press **Esc**.
Key+Key	Key combinations for which the user must press and hold down one key and then press another. Example: **Ctrl+P** or **Alt+F4**.
`Monospace`	Examples of code or standard output.
`Monospace Bold`	Text that you must enter.
variable	Used to indicate variables or text that should be replaced with an actual value.
menu option > menu option >	Used to indicate the cascading menu option to be selected. Example: **Operator Functions > Report Functions**
hypertext link	Used to indicate a hypertext link.

Specialized terms and acronyms are defined in the glossary at the end of this guide.

Introducing Control Plans

Overview

Introduction

This chapter describes what control plans are for and explains how you use control plans in Oracle Communications Convergent Charging Controller applications.

In this chapter

This chapter contains the following topics.

About Control Plans

Introduction to Control Plans

A control plan is a service-logic flowchart that defines how to perform service-logic, based on factors such as the type of service, geographic location, time of day, and so on. You can use control plans for routing calls, subscriptions and activations, sending notifications, charging for a voice or a data session, providing IVR and self-care logic, and so on.

A control plan consists of a collection of connected feature nodes. A feature node is a functional component that defines a particular decision point or action that occurs in the service-logic. You build control plans by using the ACS Control Plan Editor (CPE) user interface (UI), which is part of the Advanced Control Services (ACS) UI. You build a control plan by adding the feature nodes that provide the decisions and actions you need, to a work space, called the control plan canvas. You then connect the feature nodes in the canvas to define the service-logic work flow.

Feature nodes provide service functions such as playing announcements, sending notifications, and branching based on session data. For example, for a voice call, a Day Of Week feature node allows you to specify routing and service logic based on which day of the week a call is made. You might use this feature node, for example, if you set up special rates for holidays.

Each feature node has one or more exits. Exits branch to other feature nodes in the service logic work flow. The branching allows you to specify different actions based on the session data.

Each feature node exit has a number, and a label that identifies the general reason that exit would be taken. For example, the Account Status feature node has three exits: one labeled Success, which indicates the account status message has been successfully relayed to the caller; one labeled Abandon, which indicates the caller has abandoned the call; and one labeled Unsupported, which indicates either an error, a failure, or that the domain being used does not support the feature node. The session data determines which of these exits is taken. The next feature node in the service logic performs an action that is related to the exit taken. For example, if the exit taken is Abandon, the next feature node in that branch might be Disconnect Call.

You can also include feature nodes in control plans that collect data on the operations performed during service-logic processing. For example, you can use the Event Counting feature node to record the number of calls that were routed to a free phone service number. This may help the customer decide the number of telephone lines and customer service operators needed to manage the volume of incoming calls.

Convergent Charging Controller comes with a wide variety of feature nodes that you can use. Each of the Convergent Charging Controller applications are packaged with a set of feature nodes that are specific to the application and that provide actions and decisions that are commonly used by the service that the application provides. For example, you can use the Charging Control Services (CCS) Friends and Family Configuration feature node to update friends and family lists for subscribers. For more information about the feature nodes available with Convergent Charging Controller and its applications, see *Feature Nodes Reference Guide*.

About Control Plan Structures and Data

A control plan consists of a control plan structure and control plan data. The structure is the service-logic flowchart (the collection of feature nodes in the control plan and the connections between them). The data is the feature node configuration data that you set after you add feature nodes to a control plan.

You can create multiple control plans that use the same control plan structure, but different feature node configuration data. You might do this when you want to use the same control plan structure for similar services, but base the routing on different session criteria for each service.

When you save a control plan, you specify a name for both the structure and the data. You can save both using the same name. If you want to reuse the control plan structure with a different set of data, then save the control plan structure and data using a different name for each. The system identifies a control plan by the name you give to the control plan data.

About Public Control Plan Structures

When you create a control plan, you can define its structure as public. A public control plan structure is available and can be used by all customers. Customers can use the public structure as the basis for creating their own private control plans.

You specify that a control plan structure is public when you save the control plan. You must have system administrator level privileges to save a control plan structure as public.

About Control Plan Templates

A control plan template is a template that you can use to create control plans. A control plan template is similar to a control plan structure, except that it does not have any associated configuration data. It consists of the group of unconfigured feature nodes, and the feature node connections that define the service-logic for any control plans that are based on the template. You might want to create a control plan template for a group of control plans that use the same control plan structure, but that require different control plan data.

You use the Numbers window in the ACS user interface to create control plan templates and to create control plans from control plan templates. For more information about creating and using control plan templates, see the ACS Numbers section in *ACS User's Guide*.

About Sub-control Plans

About Sub-control Plans

A sub-control plan is a control plan that is run within another control plan. You use sub-control plans to define common service-logic that you want to reuse. You can reuse a sub-control plan in multiple control plans. You can also add multiple sub-control plans to a control plan. When you compile the main control plan, the compiler creates a single run-time control plan that includes the service-logic from each sub-control plan.

You add a sub-control plan to a control plan by using a Load Sub Control Plan feature node. For information about the Load Sub Control Plan feature node, see *Feature Nodes Reference Guide*.

You can use any successfully compiled control plan as a sub-control plan, subject to the following restrictions:

- A control plan can include up to 127 sub-control plans.
- A sub-control plan can have a maximum of 20 End feature nodes.
- A sub-control plan may not itself contain sub-control plans.

You use the ACS UI to configure the maximum number of feature nodes that a customer can use in a single control plan. This maximum includes the feature nodes in sub-control plans. You cannot exceed the maximum allocation by using sub-control plans. For more information, see the Customer Resource Limits section of *ACS User's Guide*.

About Global Control Plans

What is a Global Control Plan

A global control plan is a control plan that is associated with a specific service configured for use in Convergent Charging Controller, and applies to all customers who use that service. Global control plans enable you to apply global call-screening to calls for all customers. Global control plans are applied to calls before the customer's control plans are applied.

Global control plans are automatically assigned to the default operator customer, and can be owned only by the operator. You must have system administrator level privileges to save a control plan as a global control plan.

You specify whether a control plan is global when you save the control plan by giving the control plan the name "Global Screening *service_name*" where *service_name* is the name of the service to which it applies. The service names are specified in the `ServiceEntry` parameter for each Convergent Charging Controller application in the **acs.conf** configuration file.

For example, the **acs.conf** file has the following entry for the ACS service:

```
ServiceEntry (ACS,libacsService.sl)
```
The syntax of the ServiceEntry parameter may vary, but the service name is always the first value within the parentheses. Therefore, to apply a global control plan to this ACS service, you would name the global control plan "Global Screening ACS".

If the service logic in a global control plan terminates a telephony call, the customer's control plan is never applied, because the global control plan is applied before the customer's control plan. Therefore, use caution when adding feature nodes that terminate calls to a global control plan.

Example of Using a Global Control Plan to Announce Promotions

An operator wishes to advertise the special offers available throughout the year for a specific customer named "Garden Center". The operator can achieve this by creating a global control plan to play promotions.

For example, if the operator creates a control plan called "Global Screening VPN_Originating" that plays an announcement advertising the garden center, then every control plan associated with `ServiceEntry (VPN_Originating,libvpnService.so)` will play the announcement. Callers will hear the announcement before being routed according to customer Garden Center's control plan.

Note: Because the global control plan is enabled at operator level and is invisible to the customer, it is not possible for the customer to choose whether or not the advertisement is heard by its callers. This gives the operator superior control over any selected call processing.

Example of Using a Global Control Plan to Restrict Calls

You can also use a global control plan to restrict certain calls at the operator level. For example, you may want to prevent prisoners from making calls to 0900 numbers. You restrict calls by using a Calling Party Category feature node in a global control plan to identify the category of the originating call. You create a restricted service for prisoners called, for example, ACS_Restricted. You associate the global control plan with the ACS_Restricted service by naming it "**Global Screening ACS_Restricted**".

About Managing Customer's Control Plans and Data

About Managing Customer's Control Plans and Data

As the operator, you can manage customers' control plans and data or allow one or more customers to manage their own control plans and data. You grant access to the ACS UI (and thus to the CPE) to those customers who are allowed to manage their own control plans and data. Customers whose control plans and data are managed by the operator may not access the ACS UI.

About Using the ACS Self Management Control Plan

The ACS Management control plan is a predefined control plan that is installed with ACS by default. This control plan enables operators to provide a dial-up service that customers can use to manage certain aspects of their control plans over the phone.

The operator enables the ACS Management control plan dial-up feature for a customer by connecting the ACS Management control plan to a service number. A service number is a number customers dial when they want to use the service, for example, to access and manage their control plans. The operator then allocates the service number to the customer. The customer dials this service number and uses a touch-tone phone to manage one or more of the following settings for their control plans:

- Activate a control plan
- Change the Switch feature node exit in an existing control plan. The Switch feature node acts as a switch in the control plan by routing all calls through the selected exit.
- Set the follow me number. The follow me number is the number to which calls will be routed if there is no answer from the dialed number.

For more information about the ACS self management control plan, see the discussion on dial-up control plan management in *ACS User's Guide*. For more information about control plan activation, see *About Control Plan Activation* (on page 7).

About Customer Resources

About Feature Node Sets

A feature node set defines the set of feature nodes that a customer can use in his or her control plans. You create feature node sets and then assign them to the customers who will be using them. You create and assign feature node sets by using the ACS UI. Each customer's feature node set is then displayed in the customer's feature node palette in the CPE. You can assign a customer more than one feature node set.

Customers who manage their own control plans will see only the feature nodes and feature node sets that are assigned to them. An administrator who manages multiple customers can see the feature nodes and sets of each customer.

Note: To create and assign feature node sets you must have ACS system administrator privileges.

For more information about configuring and assigning feature node sets, see *ACS User's Guide*.

About Resource Sets

Feature node configurations frequently use sets of data, called resource sets, that define holidays, announcements, and geographic regions. These resource sets can be public or private. Private resource sets belong to a specific customer and can only be used by that customer. Public resource sets are available and can be used by all customers.

For example, you can create a public holiday set that defines all the public holidays for the year. This will enable all customers to use this set of public holidays in their control plans (for example, to route calls to a messaging service when their businesses are closed) rather than having to set up their own holiday resource sets.

While it is not necessary to configure public data sets, by so doing you may reduce the number of resource sets that need to be created. You can configure the following data sets as public data sets:

- Holiday Sets
- Geography Sets
- Announcements

You specify whether a data set is public when you save the data set. To save a data set as public, you must have system administrator level privileges.

For more information on configuring public and private data sets, see ACS Configuration section in *ACS User's Guide*.

About Customer Resource Limits

Customer resource limits define the maximum number of resources that customers may use, such as the number of control plans, feature nodes, holiday sets, announcement sets, and so on. Customer resource limits also define the feature sets the customer can use and which public resource sets the customer can use. Public resource sets include, public holiday sets, public geography sets, and public announcement sets.

When you create a customer, the system automatically sets the customer's resource limits to default values. You should edit a customer's resource limits to specify the required values and to define which public resource sets they can use.

For more information on customer resource limits and editing customer resources, see Customer Resource Limits section in *ACS User's Guide*. All public resource sets are assigned to managed customers by default.

Note: To configure customer resource limits, you should have ACS system administrator level privileges.

About Control Plan Import and Export

About Importing and Exporting Control Plans

You export a control plan to a file to save the control plan so that you can import it for a customer on another platform, or for another customer on the same platform.

You export and import control plans by using the CPE. When you export a control plan, the CPE creates a **.cpl** text file. You can open and view a **.cpl** file using any plain text editor. A summary of the control plan is provided at the beginning of the file.

When you import a control plan for a customer, the customer's feature node set should include all the feature nodes in the imported control plan. Otherwise, the CPE displays a warning for each feature node that the customer does not have, informing you that the feature node is not available, and that the control plan may not be saved with that feature node in it.

You should save a control plan after importing it. Saving an imported control plan compiles the control plan and thus ensures that it is valid for the customer for whom it has been imported. For more information about validating control plans, see *About Control Plan Validation* (on page 6).

About Database IDs in Feature Nodes

When you export a control plan, some of the exported feature node data may refer to specific database ID values. During the export process, most database IDs used in feature nodes are translated to a plain text name. When you import the control plan from one SMS to another, these names are associated with a new database ID within the database on the new platform. The CPE imports these feature nodes without reporting any issues.

However, some feature nodes store database IDs inside profile tag selector objects. The exported form of these feature nodes cannot be made platform independent. When you import a control plan into another platform, the CPE issues warnings about each problematic feature node in the control plan, identifying the feature nodes by number and name. You must resolve all issues with the feature nodes in the imported control plan before saving and compiling it.

About Control Plan Validation

About Validating Control Plans

When you save a control plan, it is automatically validated and compiled. Consequently, you must have a control plan that can be compiled before you can save it. To successfully compile a control plan, all the feature nodes in the control plan must contain valid configuration data and all the feature node exits must be connected. A control plan can be compiled with errors if it contains either unconnected exits or if a feature node in the control plan has been configured with invalid data.

Only successfully compiled control plans that do not contain errors may be assigned to a service, and used to provide service-logic. Successfully compiled control plans have the status "S".

When you save a control plan, the compiler compiles the control plan structure first, and then the control plan data. If the compiler finds any errors in the control plan structure, then the control plan data will not compile. You must fix the errors and try again.
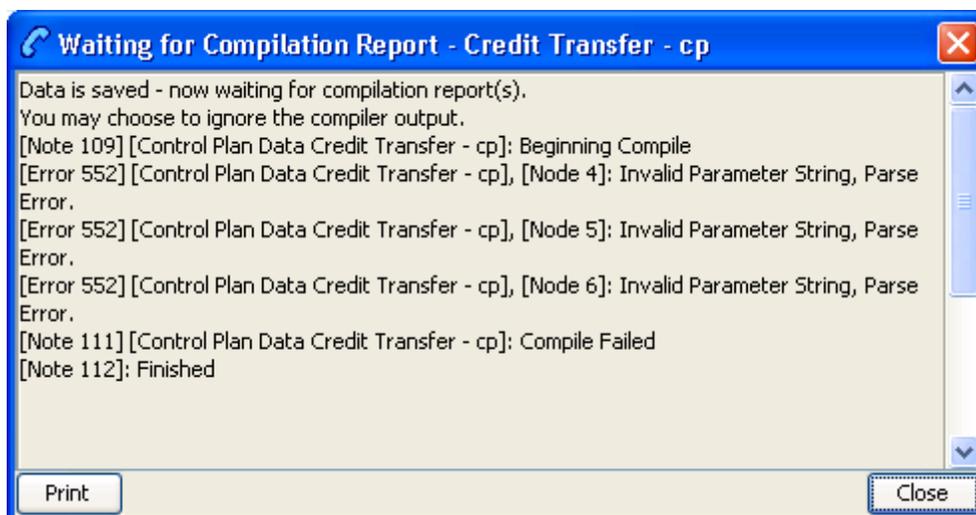
About the Compiler Report

The compiler generates a report that displays any errors that are found, with the numbers of the feature nodes that caused the errors. The report may include any of the following types of error:

- System errors that you should report to the system administrator
- Informational messages that may be related to an error elsewhere in the report

- Configuration errors that may be fixable by editing the control plan

The following figure shows a compilation report for a control plan that has been created from an existing structure. The errors shown indicate that some of the feature nodes are configured incorrectly.

For a list of possible messages in the compiler report, see *CPE Compiler Error Messages* (on page 21)

About Control Plan Activation

About Activating Control Plans

When you activate successfully compiled control plans, Convergent Charging Controller begins using them to process customers' service traffic. To activate a control plan you:

1 Attach the control plan to the customer's ACS service number or CLI.
2 Schedule when the control plan will become active.

You attach control plans to service numbers and CLIs, and schedule them, by using the ACS UI. For more information, see *ACS User's Guide.*

Activating New Control Plan Versions

When you update a control plan in the CPE, the CPE creates a new version of the control plan. If the previous version is scheduled for use with a service number or CLI, that service number or CLI remains attached to the old version by default. You can configure the CPE to update scheduled control plans to their new version by setting the `updateCPReferences` applet parameter in the **acs.jnlp** configuration file.

When the `updateCPReferences` parameter is set, you will be prompted to select the service numbers or CLIs you want to update to the new control plan version when you save the control plan.

For more information about `updateCPReferences` parameter, see *ACS Technical Guide.*

To specify which numbers should use the new control plan:

Step	Action
1	In the prompt dialog box that appears after saving the control plan, tick the check boxes for the numbers you want to change to the new control plan.
2	Click **Apply**.

Prerequisites to Creating Control Plans

Control Plan Prerequisites

Before you or your customers can create control plans, you must perform the following tasks in the ACS UI:

Stage	Action
1	Set up the resources that will be used by customers, such as resource sets, termination numbers, event counters, and so on.
2	Set up customers and their administration users.
3	Assign resources to customers.

For a detailed list of prerequisites, see the discussion on initial configuration in *ACS User's Guide.*

Configuring Control Plan Editor

Overview

Introduction

This chapter explains how you configure the Oracle Communications Convergent Charging Controller ACS Control Plan Editor (CPE).

In this chapter

This chapter contains the following topics.

About Control Plan Editor Configuration

Configuring Control Plan Editor View Preferences

You can configure the Control Plan Editor view preferences for individual SMS users and individual ACS users. A user's view preferences define which features initially display in the Control Plan Editor window each time the user accesses the CPE. For example, you can configure whether to display or hide the node inspector panel, and you can configure which feature node title style to use.

The default view preferences are used for each user whose view preferences have not been set. The default view preferences are those configured for the SU user. If view preferences for the SU user have not been set, then the following defaults are used:

- Display feature nodes in the canvas with all view options selected.
- Display the grid, and set the grid proportions to 20.
- Display the node inspector panel.

The CPE also displays the feature palette, and sets the zoom for the canvas to actual size, by default.

You configure view preferences for a user by setting the CPE parameter in:

- The ACS UI for an ACS user. For details, see *Configuring View Preferences for Individual ACS Users* (on page 10).
- The SMS UI for an SMS user. For details, see *Configuring View Preferences for Individual SMS Users* (on page 10).

CPE Parameter

The CPE parameter has the following format:

```
CPE=grid_size,node_title,grid_visibility,inspector_panel
```

Where:

Preference	Type	Description
grid_size	Integer	Sets the granularity of the grid.

Preference	Type	Description
node_title	Integer	Sets the title style to use for feature nodes in the canvas. Specify: • 0 – To display feature node name and number. • 1 – To display feature node name only. • 2 – To display feature node number only. • 3 – To display no title.
grid_visibility	0|1	Sets whether to display or hide the grid. Specify: • 0 – To hide the grid. • 1 – To display the grid.
inspector_panel	0|1	Sets whether to display or hide the node inspector panel and search results. Specify: • 0 – To hide the node inspector panel. • 1 – To display the node inspector panel.

Configuring View Preferences for Individual ACS Users

To configure the CPE view preferences for a specific ACS user:

Step	Action
1	Log in to the ACS UI.
2	From the **Advanced Calling Services** window, click **Customer**. The ACS Customer window opens.
3	Select the **Customer** from the list in the **Customer** field.
4	Select the **User** tab. The users that belong to the customer are listed in the table on the tab.
5	Select the user for whom you want to set CPE view preferences and click **Edit**. The Edit Users dialog box opens.
6	In the **Java Config** field, specify the view preferences for the user in the CPE parameter. For example: CPE=20,0,1,1 See *CPE Parameter* (on page 9) for more information. **Important:** The **Java Config** field may already contain a ';' separated list of configuration items. Ensure that you preserve this pre-existing configuration when you add the CPE parameter to the configuration.
7	Click **Save**. The User Details confirmation dialog box opens.
8	Click **OK**.

Configuring View Preferences for Individual SMS Users

To configure the CPE view preferences for a specific SMS user:

Step	Action
1	Log in to the SMS UI.

Step	Action
2	From the **Operator Functions** menu, select **User Management**.
	The User Management window opens.
3	Select the **User** tab and click **Find**.
	The Find User dialog box opens.
4	In the **User Name** field, enter the first few characters of the user's login ID and click **Search**.
	The user is listed in the table in the Find User dialog box.
5	Highlight the user in the table and click **Close**.
	The user's details appear in the **User** tab in the User Management window.
6	In the **Configuration** field, specify the view preferences for the user in the CPE parameter. For example:
	CPE=20,0,1,1
	See *CPE Parameter* (on page 9) for more information.
	Important: The **Configuration** field may already contain a ';' separated list of configuration items. Ensure that you preserve this pre-existing configuration when you add the CPE parameter to the configuration.
7	Click **Save**.
	The User Details confirmation dialog box opens.
8	Click **OK**.

Configuring the Type of Connector Line

You connect the feature nodes in control plans using connector lines. There are two types of feature node connector line:

- Angled connector lines bend around feature nodes where possible instead of crossing over them. This is the default. Angled connector lines are colored when highlighted.
- HV connector lines use a combination of horizontal and vertical lines to connect feature nodes and may cross over other feature nodes. HV connector lines can be black or colored when highlighted.

You can configure the type of connector line to use for SMS users, ACS users, and individual users.

Note: The control plan structure is not affected by the type of connector line.

Configuring Connector Type for All SMS Users

To configure the type of connector line for all users who log in to the CPE through the SMS application:

Step	Action
1	Using a text editor, open the **sms.jnlp** file located in the **/IN/html/** directory.

Step	Action

2	Add the following applet parameter line to the file:
	`<param name="cpeLineDrawingMechanism" value="connection_type" />`
	
	Where connection_type is one of the following:
	    `ColouredNodeConnectionDrawer` sets the connector type to angled. `ColouredHVNodeConnectionDrawer` sets the connector type to horizontal and vertical lines that are colored when highlighted. `HVNodeConnectionDrawer` sets the connector type to horizontal and vertical lines that are black. For example:
	`<param name="cpeLineDrawingMechanism" value="HVNodeConnectionDrawer" />`

3	Save and close the file.

Configuring Connector Type for All ACS Users

To configure the type of connector line for all users who log in to the CPE through the ACS application:

Step	Action
1	Using a text editor, open the **acs.jnlp** file located in the **/IN/html/** directory.

2	Add the following applet parameter line to the file:
	`<param name="cpeLineDrawingMechanism" value="connection_type" />`
	
	Where connection_type is one of the following:
	    `ColouredNodeConnectionDrawer` sets the connector type to angled. `ColouredHVNodeConnectionDrawer` sets the connector type to horizontal and vertical lines that are colored when highlighted. `HVNodeConnectionDrawer` sets the connector type to horizontal and vertical lines that are black. For example:
	`<param name="cpeLineDrawingMechanism" value="HVNodeConnectionDrawer" />`

3	Save and close the file.

Configuring Connector Type for Individual SMS Users

To configure the type of connector line for a specific user:

Step	Action
1	Log in to the SMS UI.
2	From the **Operator Functions** menu, select **User Management**. The User Management window opens.
3	Select the **User** tab and click **Find**. The Find User dialog box opens.
4	In the **User Name** field, enter the first few characters of the user's login ID and click **Search**. The user is listed in the table in the Find User dialog box.
5	Highlight the user in the table and click **Close**. The user's details appear in the **User** tab in the User Management window.

Step	Action
6	In the **Configuration** field, enter the following text: `cpeLineDrawingMechanism=`*`connection_type`* Where *`connection_type`* is one of the following: • `ColouredNodeConnectionDrawer` sets the connector type to angled. • `ColouredHVNodeConnectionDrawer` sets the connector type to horizontal and vertical lines that are colored when highlighted. • `HVNodeConnectionDrawer` sets the connector type to horizontal and vertical lines that are black. For example: `cpeLineDrawingMechanism=HVNodeConnectionDrawer`
7	Click **Save**. The User Details confirmation dialog box opens.
8	Click **OK**.

About Configuring the Feature Palette

You can configure the style used to display the feature palette in the Control Plan Editor window. There are two possible feature palette styles:

- The floating panel style feature palette displays feature group names in a list, and the feature nodes within a selected group in a floating panel. This is the default. The floating panel style feature palette enables you to quickly locate a feature node in the palette by using the Search Palette feature to filter the available feature nodes.
- The static panel style feature palette displays an expandable list of feature node groups from which you select individual feature nodes in a static panel. The Search Palette feature is not available with this style.

You configure the Control Plan Editor to use the static panel style feature palette by setting the `paletteStyle` applet parameter in the **acs.jnlp** configuration file. For more information, see *ACS Technical Guide*.

Introducing the Control Plan Editor

Overview

Introduction

This chapter describes the main features of the Oracle Communications Convergent Charging Controller ACS Control Plan Editor (CPE) user interface (UI).
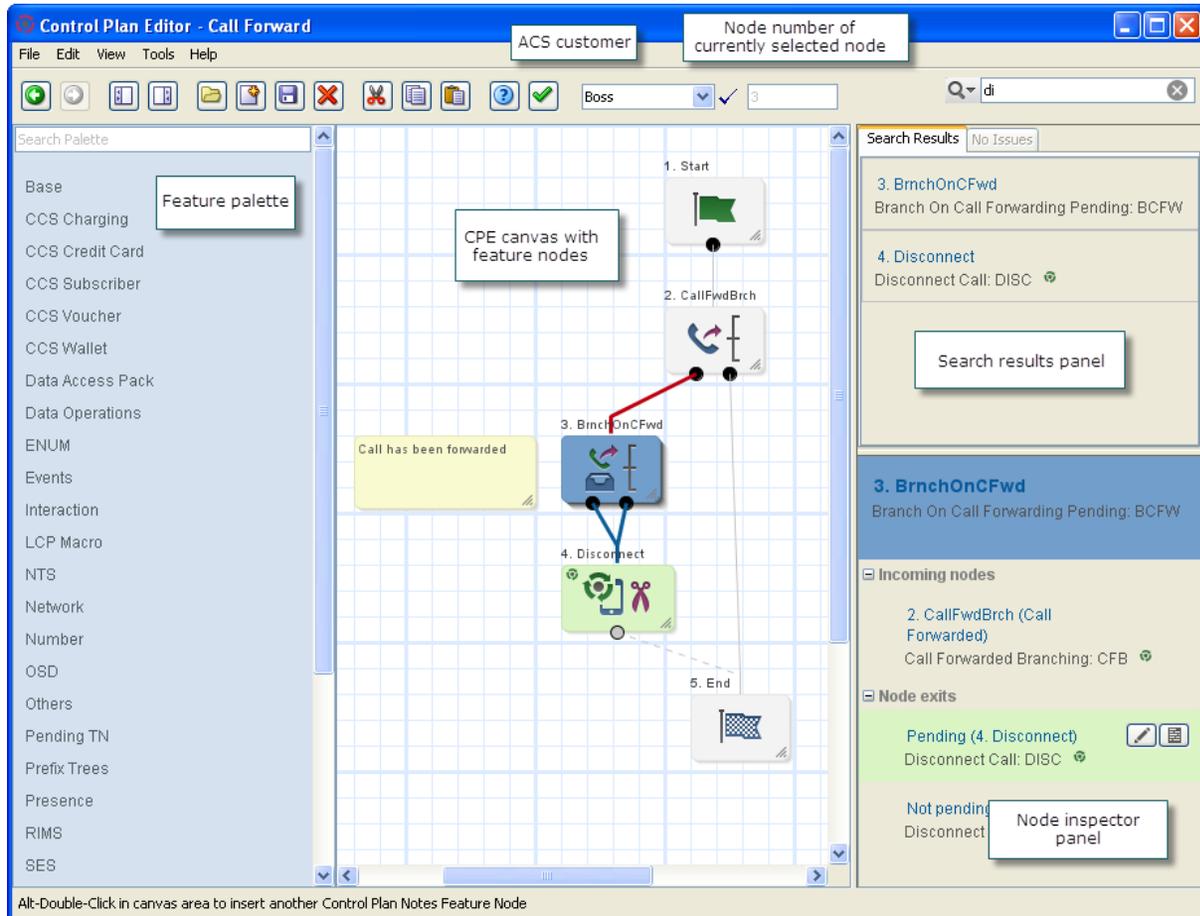
In this chapter

This chapter contains the following topics.

About the Control Plan Editor User Interface

About the CPE User Interface

The following figure shows the Control Plan Editor (CPE) user interface (UI):

The CPE is divided into four main areas:

- On the left of the UI is the feature palette, which contains the names of feature groups. A feature group is a set of feature nodes that are related to a common function. Float your cursor over the feature group name to display the feature nodes in the group. You can filter which feature nodes are displayed by using the Search Palette box at the top of the feature palette panel. For information about filtering the feature palette, see *About Searching for Feature Nodes in the Feature Palette* (on page 17).

- In the center is the CPE canvas where you build your control plans. You drag feature nodes from the feature groups to the control plan canvas. All control plans begin with a Start feature node. Each path in a control plan must end with an End feature node.

- On the right of the UI is the search results panel containing the **Search Results** tab and the **Issues** tab:

  - The search results lists the feature nodes found in the canvas when you perform a search. For more information about searching the canvas, see *About Searching for Feature Nodes in the CPE Canvas* (on page 17).
  - The **Issues** tab displays information about any unresolved issues that may prevent the control plan in the canvas from compiling. It displays the number of issues, a list of the feature nodes that have unresolved issues, and a description of each issue. The list updates automatically as you resolve the issues in the control plan. For more information about control plan validation, see *About Control Plan Validation* (on page 6).

- Below the search results panel is the node inspector panel. This displays information about the feature node currently selected in the canvas and lists its connections to other feature nodes. Buttons are displayed for the selected feature node that let you quickly access the feature node's configuration and add or edit comments for the feature node.
- In the toolbar area is the **Customer** list. This list displays the user name at the top and the names of the other ACS customer accounts you have permission to access. To the right of the **Customer** list is the **Node** field, which displays the number of the feature node that is currently selected in the control plan canvas. Each feature node is assigned a sequential number when you add it to the canvas.

About Control Plan Editor Search Features

About Searching for Feature Nodes in the Feature Palette

You can filter the feature nodes that are displayed in the CPE feature palette so that it is easier to find the feature nodes you want to add to a control plan. The CPE filters the feature palette by matching the text you enter in the **Search Palette** text box against the following data:

- Feature node name
- Feature node fast key: Fast keys are abbreviations for feature nodes and are displayed after the feature node name in the search results and the node inspector.
- Feature node configuration parameter names
- Feature node exits

For example, if you enter "en" in the search field, the feature palette displays every feature node that contains "en" in either its name, fast key, configuration parameter, or node exits.

About Searching for Feature Nodes in the CPE Canvas

You can search the CPE canvas for feature nodes that you have added to a control plan. You enter the search criteria in the canvas search field. The search criteria can be:

- Feature node properties, such as the feature node's name or type
- Unconfigured feature nodes
- The names of feature node configuration parameters
- Number prefixes used in geographic routing. This is useful for finding feature nodes that may have been configured to route calls to the wrong number. For more information, see *About the Geo-Routing Search Feature* (on page 17).

The search results are displayed in the CPE search results panel. You can select a feature node in the search results to display information about it in the node inspector. For example, you can find out:

- Which incoming feature nodes it is connected to.
- Which outgoing feature nodes it is connected to.
- Whether it has any unconnected exits.

About the Geo-Routing Search Feature

Geographical routing is implemented by the Geographical Routing feature node. You can search control plans for Geographical Routing feature nodes that route calls based on a specific number prefix. This will help you to find Geographical Routing feature nodes that have been configured to route to the wrong number.

When you search the CPE canvas for geo-routing number prefixes the CPE only looks for Geographical Routing feature nodes that route the specified number prefix through a non-default exit of the feature node. You designate which exit will be the default exit in the Geographical Routing feature node's configuration. The default exit will be taken if the call does not use one of the configured number prefixes.

Example Scenario for Using a Geo-routing Search

In this example, you, as the operator, have a pizza retailer customer who owns a pizza chain. The customer provides toll free numbers to the chain's pizza shops. The customer has a large control plan consisting of hundreds of feature nodes. The control plan structure uses:

- A series of Geographical Routing feature nodes that branch to different collection areas. Each collection area defines the geographic area that a particular pizza shop is responsible for, and the group of fixed line number prefixes for that area. You configure these prefixes in the geography sets assigned to the Geographical Routing feature nodes.
- Unconditional Termination feature nodes that connect calls from pizza customers to the appropriate pizza shop based on the collection area.

After the control plan is activated, a pizza shop customer attempts to call his local pizza shop and is instead connected to a pizza shop in a different area. The customer contacts the pizza retailer to complain. The pizza retailer contacts you about the issue and provides the number that the pizza customer dialed. You use the prefix of the dialed number in a geo-routing search of the control plan to find the Geographical Routing feature node that is routing that prefix. You then correct the configuration for that feature node so that it routes calls to the correct pizza shop.

About Troubleshooting Control Plans Using Control Plan Tracing

About Control Plan Tracing

A control plan trace is a type of CPE canvas search that finds which feature nodes in a control plan are referenced during a session by the service-logic processing. You enter control plan trace data in the canvas search field. This can make it easier to locate control plan errors.

The search criteria for a control plan trace is one or more feature nodes. You enter the search criteria in the canvas search field. The search criteria syntax matches the syntax that is used in CDRs to identify which feature nodes were referenced during the session. This makes it easy for you to copy data from a CDR into the search field without having to modify the data.

The search string must have the following syntax:

fastkey-number,fastkey-number,...

Where:

- *fastkey* is the short code used by the CPE for the feature node. For example, AT is the Attempt Termination feature node fast key.
- *number* is the number assigned to the feature node in the control plan.

The CPE performs the following actions to trace a session:

- Searches the control plan in the CPE canvas for all the feature nodes listed in the search string.
- If the CPE finds all the listed feature nodes and they are connected in the order listed in the search string, then the CPE highlights the feature nodes and the connections between them in the canvas. Otherwise the CPE returns no nodes found.
- Lists each feature node it finds in the search results.

In the search results you can step through the feature nodes found by the control plan trace and make any changes that are needed.

If you include a feature node in the search criteria that is not part of the service logic for the session you are tracing, then the CPE returns no feature nodes found.

Control Plan Trace Example

This example shows the feature nodes highlighted in the ACS Management control plan after entering the following control plan trace search string:

```
ST-36,ALP-68,PINA-3,SD-4,ALP-38,CDST-13,CDPT-14,STTP-15,PLAY-16,END-17
```
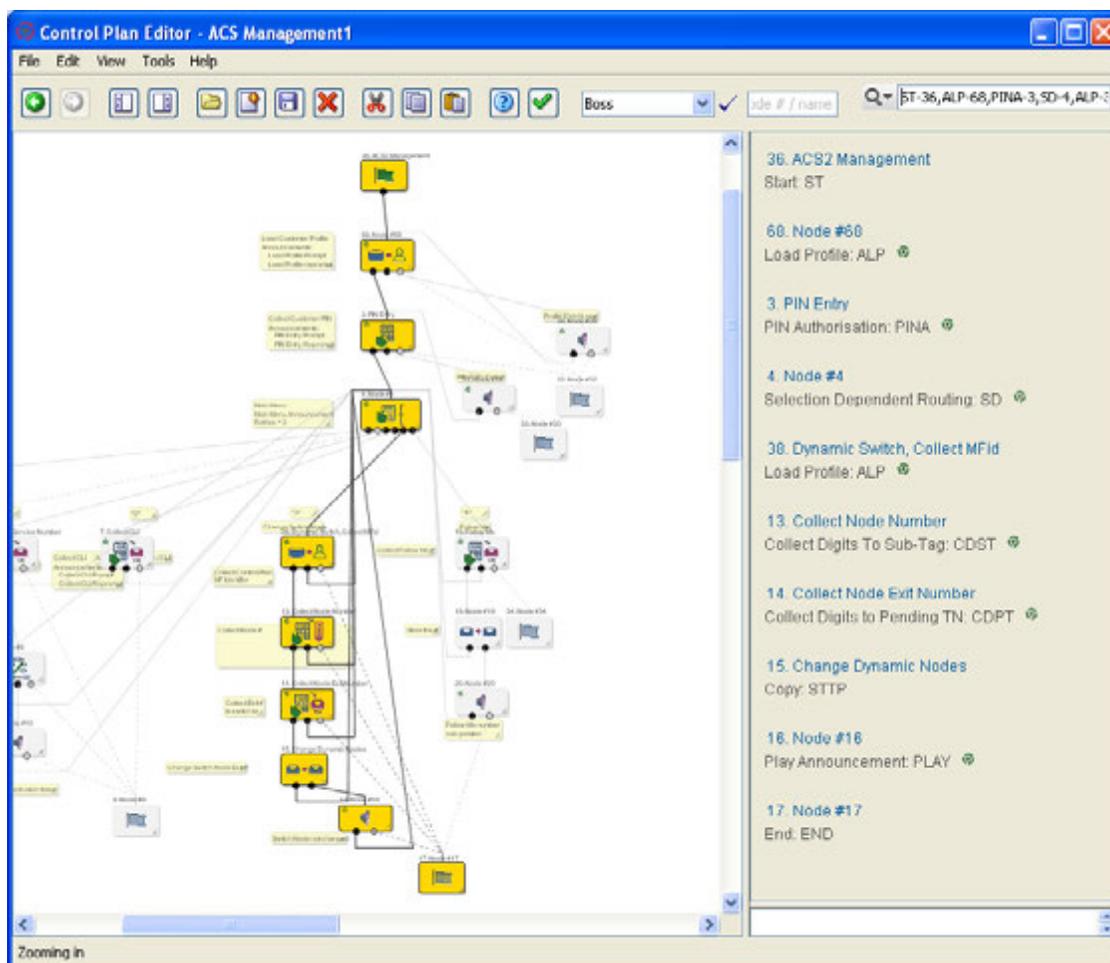

Accessing the Control Plan Editor

Accessing the CPE

You access the CPE from the Advanced Control Services (ACS) user interface. You can open the ACS UI either directly from a Web browser or from the Service Management System (SMS) user interface.

For instructions on how to log in to the SMS UI, see the discussion on signing on to SMS in *SMS User's Guide*.

For instructions on how to open the ACS UI, see the discussion on accessing ACS in *ACS User's Guide*.

To access the ACS user interface, you need to obtain the following from a system administrator:

- Your customer name

- Your user name
- Your password
- The URL of the SMS or the server host name of the SMS.

Your user ID will be associated with access permissions that determine which parts of the ACS and CPE you can see and which actions you can take. All of the actions described in this guide may not be available to you. For more information about access permission levels, see *About Access Permission Levels* (on page 20).

From the ACS UI main window, you can open the CPE in the following ways:

- Click **Control Plans**. This action directly opens the CPE where you can create or modify control plans.
- Click **Numbers**. This action opens the ACS Numbers window from which you can open the CPE. You use the Numbers window when you want to create or modify control plan templates or create control plans from an existing control plan template. You can also open the CPE from the Numbers window to create new control plans. For information about control plan templates, see *About Control Plan Templates* (on page 2). For information about creating control plan templates, see the discussion of templates in the ACS Numbers section of *ACS User's Guide.*

About Access Permission Levels

Your ACS user access permission level determines whether you have permission to view, edit or create control plans. ACS user access permissions are configured by the System Administrator who sets up customers.

This table lists the control plan options available in the CPE for the different ACS permission levels.

Control Plan Options	Permission Levels
Open public and private control plans as read only to view the control plan structures and data.	1 and 2
Open public and private control plan structures as read only, and create and edit the control plan data.	3
Open, create, and edit private control plan structures and data. Open public control plan structures as read only.	4, 5 and 6
Open, create, and edit private control plan structures and data. Open, create, and edit public control plan structures.	7

For more information about access permissions, see the discussion on defining security levels in *ACS User's Guide.*

CPE Compiler Error Messages

Overview

Introduction

This chapter describes possible errors reported by the Oracle Communications Convergent Charging Controller ACS Control Plan Editor (CPE) compiler.

In this chapter

This chapter contains the following topics.

Error Messages in the CPE Compiler Report

About Messages in the Compiler Report

The compiler report may include any of the following types of messages:

- System errors that you should report to the system administrator. For more information, see *System Errors in the CPE Compiler Report* (on page 21).
- Informational messages that may indicate another error elsewhere in the report. For more information, see *Informational Messages in the Compiler Report* (on page 22).
- Configuration errors that may be fixable by editing the control plan. For more information, see *Configuration Errors in the Compiler Report* (on page 22).

System Errors in the CPE Compiler Report

This table lists system errors that may appear in the CPE compiler report. You should contact your system administrator for advise if you get a system error. Your system administrator may contact Oracle for more information or assistance.

Error Message	Reported For
Got *actual _number* structure nodes, expected *expected_number*. Structure compile failed? Where: • *actual _number* is the actual number of feature nodes compiled • *expected_number* is the expected number of feature nodes	Control plan data
Offset Calculation Error	Control plan data
Buffer Production Error	Control plan data
Duplicate Data Node ID	Control plan data
Invalid Compiled Size	Control plan data
Invalid Compiled Buffer	Control plan data

Error Message	Reported For
Invalid Start Node Loops	Control plan data
Compiler Bug, Map sizes don't match	Control plan data

Informational Messages in the Compiler Report

This table lists informational messages that may appear in the CPE compiler report. Informational messages may alert you to a problem. The actual detail of the error causing the problem will be displayed elsewhere in the compiler report.

Error Message	Reported For
Node Processing Error	Control plan data
Continuing with compilation	Control plan data

Configuration Errors in the Compiler Report

This table lists configuration errors that may appear in the CPE compiler report and the actions you can take that may correct the errors.

Error Message	Reported For	Action
Empty Control Plan	Control plan data	Add feature nodes to the control plan and update the configuration data in the feature nodes.
Empty Control Plan	Control plan structure	Add feature nodes to the control plan.
Invalid Node Type	Control plan structure or data	The feature node type is missing from your feature set. This may be because the required application has not been installed on your system.

You should contact your system administrator for assistance. |
| Invalid Parameter String, Missing/ Invalid TN | Feature node configuration | The termination number configured for the feature node is either empty, not a number, or longer than 32 digits.

You should edit the termination number in the feature node configuration. |
| Not allowed to terminate to this number | Feature node configuration | Ensure the termination number configured in the feature node is valid for the customer by editing the customer's configuration or by editing the feature node. |
| Period node without periods | Time of Day feature node configuration | There are no periods configured for the feature node.

You should configure the periods for the feature node. |
| Invalid number of periods | Time of Day feature node configuration | Either there are no periods or a negative number of periods configured for the feature node.

You should edit the configured periods for the feature node. |

Error Message	Reported For	Action
Invalid start of period	Time of Day feature node configuration	Either the start period for the feature node is not configured, or it is not a number, or the configured end period is greater than the cycle end date. You should edit the start or end period configured for the feature node.
Invalid end of period	Time of Day feature node configuration	Either the end period for the feature node is not configured, or it is not a number, or the configured end period is greater than the cycle end date. You should edit the end period configured for the feature node.
Invalid branch, %s, period %u	Time of Day feature node configuration	There are no branches configured, or the reported branch is outside the range of branches for the feature node. You should edit the range data configured for the feature node.
Duplicate range	Time of Day feature node configuration	Two or more ranges have been configured for the feature node with the same start and end dates You should edit the range data configured for the feature node.
Overlapping range	Time of Day feature node configuration	One range for the feature node overlaps another one. You should edit the range data configured for the feature node.
Unspecified default branch	Time of Day feature node configuration	The default branch for the feature node is empty or not a number. You should edit the default branch configured for the feature node.
Invalid or Missing Unix TZ Specifier	Time Of Day feature node configuration	The time zone configured for the feature node is either empty or not recognized. You should edit the time zone configured for the feature node.
Invalid Holiday Default Branch	Day Of Year feature node configuration	The default branch for the feature node is not within the range of one to the number of available exits for the feature node. You should edit the configuration for the feature node.
Invalid Holiday Any Holiday Branch	Day Of Year feature node configuration	AFAICS not triggered. You should edit the feature node configuration.
Invalid Holiday Number of Periods	Day Of Year feature node configuration	The number of configured periods is greater than 366. You should edit the period data configured for the feature node.
Invalid Holiday Entry	Day Of Year feature node configuration	The compiler couldn't find a configured holiday for this date range. You should edit the feature node configuration.

Error Message	Reported For	Action
Invalid Holiday Start *MMDD* Where *MMDD* is the month and day of the holiday end date.	Day Of Year feature node configuration	Either the period start date is empty, not a number, later than the cycle end date, or earlier than the cycle start date. You should edit the feature node configuration.
Invalid Holiday End *MMDD* Where *MMDD* is the month and day of the holiday end date.	Day Of Year feature node configuration	Either the period end date is empty, not a number, later than the cycle end date, or earlier than the cycle start date. You should edit the feature node configuration.
Invalid Holiday Branch	Day Of Year feature node configuration	Either the branch is empty or not a number. You should edit the feature node configuration.
Invalid Holiday End *MMDD* in Holiday Period Where *MMDD* is the month and day of the holiday end date.	Day Of Year feature node configuration	The end date for the holiday period is incorrectly configured. You should edit the feature node configuration.
No entries in Day of year node	Day Of Year feature node configuration	The compiler couldn't find any entries in the holiday set and no manual entries are defined. You should edit the feature node configuration or the holiday set configuration.
Prefix node without prefixes	Feature node configuration	The prefix string configured for the feature node is either empty or not a number. You should edit the feature node configuration.
Invalid number of prefixes	Feature node configuration	The number of prefixes configured for the feature node is less than or equal to zero. You should edit the feature node configuration.
Duplicate prefix, prefix *prefix_number* Where *prefix_number* is the duplicate prefix number.	Feature node configuration	The reported prefix is already configured in the prefix tree. You should edit the feature node configuration.
Invalid branch, prefix *prefix_number* Where *prefix_number* is the invalid prefix number.	Feature node configuration	The branch for the reported prefix is either empty, not a number, or outside the range of exits for this feature node. You should edit the feature node configuration.
PD node without proportions	Proportional Distribution feature node configuration	The number of proportions configured in the feature node is either empty or not a number. You should edit the feature node configuration.
Invalid number of proportions	Proportional Distribution feature node configuration	The number of proportions configured in the feature node is less than or equal to zero. Specify a number of proportions that is greater than zero in the feature node configuration.

Error Message	Reported For	Action
Invalid proportion, proportion *proportion_number* Where *proportion_number* is the invalid proportion number.	Proportional Distribution feature node configuration	The proportion is not within the range of 1 to 100. You should edit the proportion in the feature node configuration.
Invalid branch, proportion *proportion_number* Where *proportion_number* is the invalid branch proportion number.	Proportional Distribution feature node configuration	The invalid branch of the feature node is either empty, not a number, or outside the range of exits for this feature node. You should edit the feature node configuration.
Proportions sum to more than 100	Proportional Distribution feature node configuration	The sum of the proportions in the feature node configuration is greater than 100. You should edit the feature node configuration.
EC node with invalid Stat ID Perm	Event Counting feature node configuration	The feature node configuration contains an empty or invalid statistic ID. You should edit the feature node configuration.
EC node without delta	Event Counting feature node configuration	The feature node configuration contains an empty or non numeric delta value. You should edit the feature node configuration.
EC node with invalid Counter Name	Event Counting feature node configuration	The counter name has not been configured for the feature node. You should edit the feature node configuration.
ES node with invalid Stat ID Perm	Event Setting feature node configuration	The feature node configuration contains an empty or invalid statistic ID. You should edit the feature node configuration.
ES node without value	Event Setting feature node configuration	The feature node configuration contains an empty or non numeric value. You should edit the feature node configuration.
ES node with invalid Counter Name	Event Setting feature node configuration	The counter name has not been configured for the feature node. You should edit the feature node configuration.
EB node with invalid Counter Name	Event Branching feature node configuration	The counter name has not been configured for the feature node. You should edit the feature node configuration.
EB node with invalid test	Event Branching feature node configuration	The test type configured in the feature node is either less than the minimum value of zero (0) or greater than maximum value of seven (7). You should edit the feature node configuration.
EB node with both Constant and Counter Name 2	Event Branching feature node configuration	The feature node cannot test for both a constant value and the value of a counter simultaneously. You should edit the feature node configuration.

Error Message	Reported For	Action
EB node with invalid Stat1 ID Perm	Event Branching feature node configuration	The feature node configuration contains an empty or invalid statistic ID. You should edit the feature node configuration.
EB node with invalid Stat2 ID Perm	Event Branching feature node configuration	The feature node configuration contains an empty or invalid statistic ID. You should edit the feature node configuration.
AT node with invalid TN	Attempt Termination feature node configuration	The termination number configured in the feature node is either empty, not a hex number, or greater than 32 digits long. You should edit the feature node configuration.
Invalid Timeout	Attempt Termination feature node configuration	The time out field in the feature node configuration is either empty or not a number. You should edit the feature node configuration.
Invalid Parameter String, Not a Disconnect Call node	Disconnect feature node configuration	The cause field in the feature node configuration is empty. You should edit the feature node configuration.
Invalid SDR Main Announcement Set	Selection Dependent Routing feature node configuration	The announcement set is not configured for the feature node. You should edit the feature node configuration.
Invalid SDR Main Announcement Entry	Selection Dependent Routing feature node configuration	The announcement entry is not configured for the feature node. You should edit the feature node configuration.
Invalid SDR Max Iterations	Selection Dependent Routing feature node configuration	The iterations field configured in the feature node is either empty or not a number. You should edit the feature node configuration.
Invalid SDR Number of Digits	Selection Dependent Routing feature node configuration	The number of digits configured in the feature node is either empty, not a number, or its value is greater than 12. You should edit the feature node configuration.
Invalid SDR Digit	Selection Dependent Routing feature node configuration	The digit length configured in the feature node is incorrect. Edit the digit length in the feature node configuration to be either one, a hex digit, asterisk (*), or hash (#).
Invalid SDR Branch	Selection Dependent Routing feature node configuration	A branch configured in the feature node is either empty, not a number, or it is outside the exit range for the feature node. You should edit the feature node configuration.

Error Message	Reported For	Action
Invalid SDR *Announcement* VAID Where *Announcement* is one of: • Main • Timeout • Bad Digit	Selection Dependent Routing feature node configuration	The compiler couldn't find the virtual announcement ID (VAID) for the reported announcement set and entry. You should edit the feature node configuration.
Invalid PA Announcement Set	Play Announcement feature node configuration	The compiler couldn't retrieve the announcement set. You should edit the feature node configuration.
Invalid PA Announcement Entry	Play Announcement feature node configuration	The compiler couldn't retrieve the announcement entry. You should edit the feature node configuration.
Invalid PA Announcement VAID	Play Announcement feature node configuration	The compiler couldn't retrieve the virtual announcement ID (VAID). You should edit the feature node configuration.
Invalid Service Handover New Service	Service Handover feature node configuration	No service handle specified, so the compiler attempted to use the enumerator to get the new service ID. However, the new service ID is either empty, not a number, or not in the range of 1 to 6. You should edit the feature node configuration.
Invalid AccountCodeEntry Announcement Set Name/Entry	Account Code Entry feature node configuration	The announcement set name or the announcement entry is empty. You should edit the feature node configuration.
Invalid AccountCodeEntry Reprompt Set Name/Entry	Account Code Entry feature node configuration	The reprompt announcement set or announcement entry is empty. You should edit the feature node configuration.
Invalid Max Iterations Count	Account Code Entry feature node configuration	The iterations configured for the feature node is either empty, not a number, or it is less than or equal to zero. You should edit the feature node configuration.
Invalid Announcement VAID	Account Code Entry feature node configuration	The compiler couldn't retrieve the announcement VAID from the database. You should edit the feature node configuration.
Invalid Reprompt VAID	Account Code Entry feature node configuration	The compiler couldn't retrieve the reprompt announcement VAID from the database. You should edit the feature node configuration.

Error Message	Reported For	Action
Invalid *feature_node* Announcement Set Name/Entry Where *feature_node* is one of: • CollectDigitsTo PendingTn • CollectDigitsTo Buffer	Configuration for the reported Collect Digits to Pending TN feature node or Collect Digits to Buffer feature node	The announcement set name or entry is empty. You should edit the feature node configuration.
Invalid *feature_node* Reprompt Set Name/Entry Where *feature_node* is one of: • CollectDigitsTo PendingTn • CollectDigitsTo Buffer	Configuration for the reported Collect Digits to Pending TN feature node or Collect Digits to Buffer feature node	The reprompt announcement set name or entry is not configured. You should edit the feature node configuration.
Invalid *feature_node* Max Iterations Where *feature_node* is one of: • CollectDigitsTo PendingTn • CollectDigitsTo Buffer	Configuration for the reported Collect Digits to Pending TN feature node or Collect Digits to Buffer feature node	The iterations field is either empty or not a number. You should edit the feature node configuration.
Invalid *feature_node* Min Digits Where *feature_node* is one of: • CollectDigitsTo PendingTn • CollectDigitsTo Buffer	Configuration for the reported Collect Digits to Pending TN feature node or Collect Digits to Buffer feature node	Minimum digits is incorrectly configured. You should specify a numeric value that is greater than zero (0).
Invalid *feature_node* Max Digits Where *feature_node* is one of: • CollectDigitsTo PendingTn • CollectDigitsTo Buffer	Configuration for the reported Collect Digits to Pending TN feature node or Collect Digits to Buffer feature node	Maximum digits is incorrectly configured. You should specify a numeric value that is greater than zero (0).

Error Message	Reported For	Action
Invalid *feature_node* Prefix Where *feature_node* is one of: • CollectDigitsTo PendingTn • CollectDigitsTo Buffer	Configuration for the reported Collect Digits to Pending TN feature node or Collect Digits to Buffer feature node	The prefix field is more than 32 digits long. You should edit the feature node configuration.
Invalid Announcement VAID	Configuration for the reported Collect Digits to Pending TN feature node or Collect Digits to Buffer feature node	The compiler couldn't find the virtual announcement ID (VAID) for the configured announcement. You should edit the feature node configuration.
Invalid Reprompt VAID	Configuration for the reported Collect Digits to Pending TN feature node or Collect Digits to Buffer feature node	The compiler couldn't find the virtual announcement ID (VAID) for the configured reprompt announcement. You should edit the feature node configuration.
Invalid number of digits (MinDigits > MaxDigits)	Configuration for the reported Collect Digits to Pending TN feature node or Collect Digits to Buffer feature node	Minimum and maximum values are incorrectly configured. You should configure a minimum value that is less than the configured maximum value.

Error Messages in the CPE Compiler Log File

CPE Compiler Errors Written to the Log File

This table lists CPE compiler errors that are logged to the **acsCompilerDaemon.log** file located in the **/IN/service_packages/ACS/tmp** directory.

Error Text	Function	Reason	Advice
`Compiled Structure too large, Max 65535 bytes`	updateCompiledCallPlanStructure, updateCompiledCallPlanData	The compiler has reached the internal limit on the compiled size of a control plan.	Contact Technical Support.
`connect_flag: Cannot read config file.`	connect_flag	The compiler was unable to read the configuration file during a connection attempt.	The permissions on the configuration file or the ACS tree may be incorrect. Verify that it is readable by the ACS compiler account. Contact Technical Support.
`Data in ACS_COMPILE_LIST is invalid`	compileCallPlans	The compiler found an invalid row in the compile list.	This is a non-fatal error. However, it may signal a deeper problem. Contact Technical Support.

Error Text	Function	Reason	Advice
`Data selected from Oracle was shortened`	getFNMapping, getRegion, getHoliday, getCallPlanStructureNode, getCompiledCallPlanStructure, getCallPlanDataNode, getCompiledCallPlanData, getAnnouncementInformation String, findStructure, findCPDID,	The compiler had difficulty retrieving information from the database.	Contact Technical Support.
`Failed to connect to ORACLE as user: X.`	connect_flag	The compiler was unable to connect to the database as the specified user.	The Oracle username/password is incorrect, the Oracle environment variables are incorrect or the database is not running. Verify these using SQL*Plus and fix or contact Technical Support.
`Invalid data was selected from the database`	compileCallPlans	The compiler has had difficulty selecting information from the database.	Contact Technical Support.
`Startup Successful`	main	The compiler daemon process started successfully and is ready to process compilation requests.	This a notification message only.
`Unable to catch SIGABRT`	set_catch	The process was not allowed to set up a signal handler for SIGABRT signals.	This is not a fatal error. However, it will result in the compiler being unable to shut down cleanly upon receiving a SIGABRT. Contact Technical Support.
`Unable to catch SIGHUP`	set_catch	The process was not allowed to set up a signal handler for SIGHUP signals.	This is not a fatal error. However, it will result in the compiler being unable to re-read its configuration file upon receiving a SIGHUP. Contact Technical Support.
`Unable to catch SIGTERM`	set_catch	The process was not allowed to set up a signal handler for SIGTERM signals.	This is not a fatal error. However, it will result in the compiler being unable to shut down cleanly upon receiving a SIGTERM. Contact Technical Support.

Error Text	Function	Reason	Advice
Unable to Connect to Oracle	main	The compiler was unable to login to Oracle using the supplied username/password.	The Oracle username/password is incorrect, the Oracle environment variables are incorrect or the database is not running. Verify these using SQL*Plus and fix or contact Technical Support.
Unable to connect to Oracle	acsCompilerDBConnection	The compiler was unable to login to Oracle using the supplied username/password.	The Oracle username/password is incorrect, the Oracle environment variables are incorrect or the database is not running. Verify these using SQL*Plus and fix or contact Technical Support.
Unable to fork child process	main	The compiler was unable to start up in Daemon mode. The fork attempt failed.	Contact Technical Support.
Unable to handle Signal	cleanup, restart	The process attempted to handle a signal it does not expect to handle.	Contact Technical Support.
Unable to mask Signals	maskSignals	The compiler was unable to mask signals before executing Oracle commands.	This is not a fatal error. However it may result in failed compiles because of signal interference. Contact Technical Support.
Unable to unmask Signals	unmaskSignals	The compiler was unable to unmask signals after executing Oracle commands.	This is not a fatal error, however it may result in the compiler ignoring signals (that is, unable to shut down cleanly, or re-read its configuration file). Contact Technical Support.

Glossary of Terms

ACS

Advanced Control Services configuration platform.

ANI

Automatic Number Identification - Term used in the USA by long-distance carriers for CLI.

CCS

1) Charging Control Services (or Prepaid Charging) component.

2) Common Channel Signalling. A signalling system used in telephone networks that separates signalling information from user data.

CDR

Call Data Record

Note: The industry standard for CDR is EDR (Event Detail Record).

CLI

Calling Line Identification - the telephone number of the caller. Also referred to as ANI.

Convergent

Also "convergent billing". Describes the scenario where post-paid and pre-paid calls are handed by the same service platform and the same billing system. Under strict converged billing, post-paid subscribers are essentially treated as "limited credit pre-paid".

CPE

Control Plan Editor (previously Call Plan Editor) - software used to define the logic and data associated with a call -for example, "if the subscriber calls 0800 *nnnnnn* from a phone at location *xxx* then put the call through to *bb bbb bbbb*".

DTMF

Dual Tone Multi-Frequency - system used by touch tone telephones where one high and one low frequency, or tone, is assigned to each touch tone button on the phone.

IN

Intelligent Network

IVR

Interactive Voice Response - systems that provide information in the form of recorded messages over telephone lines in response to user input in the form of spoken words or, more commonly, DTMF signalling.

SMS

Depending on context, can be:

- Service Management System hardware platform
- Short Message Service
- Service Management System platform
- Convergent Charging Controller Service Management System application

SMSC

Short Message Service Centre - stores and forwards a short message to the indicated destination subscriber number.

SQL

Structured Query Language - a database query language.

System Administrator

The person(s) responsible for the overall set-up and maintenance of the IN.

URL

Uniform Resource Locator. A standard way of specifying the location of an object, typically a web page, on the Internet.

VPN

The Virtual Private Network product is an enhanced services capability enabling private network facilities across a public telephony network.

Index