

Problem Determination Guide

CL/SUPERSESSION®
CL/GATEWAY™

Version 147

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Candle Corporation
2425 Olympic Boulevard
Santa Monica, California 90404

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Preface

About this document

This guide describes how to isolate and resolve problems that involve CL products. The manual presents procedures for using Candle-supplied tools to gather problem documentation and for transmitting this material to Candle Support Services. This guide assumes that you are familiar with the diagnostic and isolation aids available in your IBM® operating system environment.

Note: This document describes diagnostic approaches and diagnostic data gathering for CL products (CL/SUPERSESSION®, CL/GATEWAY® for MVS, and CL/GATEWAY for IMS) in MVS operating system environments.

IBM documents

Familiarity with IBM's *VTAM Diagnosis* manual is assumed. Familiarity with the following IBM documentation for your operating system environment is also recommended:

- IBM utilities
- IBM service aids
- 3270 Programmer's Reference

Customer Support

Introduction

Candle provides electronic support and telephone support to assist you when you have questions about Candle products. Customer support is available 24 hours a day, seven days a week.

Electronic support

Candle Electronic Customer Support® (CECSSM) enables you to search for existing questions, answers, problems, and fixes; review preventive service planning (PSP) information; and open incidents for Candle products. CECS is available through the Advantis™ network and by direct PC dial-up. For registration information, call your nearest Candle Support Services office.

Telephone support

If you have an urgent problem or need to talk to a Candle Support Services representative, contact the Support Services office nearest you.

Office	Telephone	Fax
North America		
Santa Monica	(800) 328-1811 (310) 829-5844	(310) 582-4204
Europe		
Antwerp	(32) (3) 272-3606	(32) (3) 272-3607
Breda	(31) (76) 520.19.09	(31) (76) 520.19.19
Duesseldorf	(49) (21) 193-6920	(49) (21) 193-69220
Manchester	(44) 161 499 3503	(44) 161 437 5225
Munich	(49) 89 54 5540	(49) 89 54 5541-19
Paris	(33) (1) 5361 6000	(33) (1) 5361 0515
Sollentuna	(46) 8 623 1235	(46) 8 623 1855
Asia Pacific		
Hong Kong	(852) 2528 6289	(852) 2865 0770
Kuala Lumpur	(603) 230 9930	(603) 230 9932
Singapore	(65) 220 50 92	(65) 226 35 79
Sydney	(61) 2 9954 1500	(61) 2 9954 1818
Tokyo	(81) 3 5562-6991	(81) 3 5562-6995

International customers

When your local support office is unavailable, you may contact Candle's North America support center. If USADirect® service is available in your country, use the 800 telephone number. If USADirect service is not available, ask your international operator for assistance in calling Candle's local (310) number.

Incident information

A Candle support representative may request the following information when you call to report a problem:

- your Candle personal ID (PID) number
- the release level of the Candle product
- the release level of IBM® or other vendor software
- identifying information and dates of recently applied maintenance to the Candle product
- a detailed description of the problem (including the error message) and what led up to the failure
- a description of any unusual events that occurred before the problem

Incident documentation

You may be asked to send incident documentation to Candle Support Services. On the outside of the package, please write the incident number given to you by the Candle Support Services representative. Send your documentation addressed as follows:

Candle Support Team
Candle Support Center, *incident number*
2425 Olympic Boulevard
Santa Monica, California 90404

Documentation Conventions

Introduction

Candle documentation adheres to accepted typographical conventions for command syntax. Conventions specific to Candle documentation are discussed in the following sections.

Panels and figures

The panels and figures in this document are representations. Actual product panels may differ.

Revision bars

Revision bars (|) may appear in the left margin to identify new or updated material.

Variables and literals

In examples of command syntax, uppercase letters are actual values (literals) that the user should type; lowercase letters are used for variables that represent data supplied by the user. Default values are underscored.

LOGON APPLID(cccccccc)

In the above example, you type **LOGON APPLID** followed by an application identifier (represented by *ccccccc*) within parentheses. The application identifier can have at most eight characters.

Note: In ordinary text, variable names appear in italics.

Symbols

The following symbols may appear in command syntax.

Symbol	Usage
	<p>The 'or' symbol is used to denote a choice. Either the argument on the left or the argument on the right may be used. Example:</p> <p>YES NO</p> <p>In this example, YES or NO may be specified.</p>
[]	<p>Denotes optional arguments. Those arguments not enclosed in square brackets are required. Example:</p> <p>APPLDEST DEST [ALTDEST]</p> <p>In this example, DEST is a required argument and ALTDEST is optional.</p>
{ }	<p>Some documents use braces to denote required arguments, or to group arguments for clarity. Example:</p> <p>COMPARE {workload} - REPORT={SUMMARY HISTOGRAM}</p> <p>The <i>workload</i> variable is required. The REPORT keyword must be specified with a value of SUMMARY or HISTOGRAM.</p>
-	<p>Default values are underscored. Example:</p> <p>COPY infile outfile - [COMPRESS={<u>YES</u> NO}]</p> <p>In this example, the COMPRESS keyword is optional. If specified, the only valid values are YES or NO. If omitted, the default is YES.</p>
␣	<p>The symbol ␣ indicates a blank space, when needed for clarity.</p>

Documentation Set

Introduction

Candle provides a complete set of documentation for CL/SUPERSESSSION and CL/GATEWAY. Each manual in this documentation set contains a specific type of information to help you use the product.

Candle welcomes your comments and suggestions for changes or additions to the documentation set. A user comment form, located at the back of each manual, provides simple instructions for communicating with Candle's Technical Documentation department.

Product documentation

The documentation listed in the following table is available for CL/SUPERSESSSION and CL/GATEWAY. To order additional product manuals, contact your Candle Support Services representative.

Document Number	Document Name	Description
LS60-3779	Version 147 Release Guide	Contains new information for this release.
LS99-3783	Program Directory	Provides installation instructions and details all other installation considerations.
LS55-3785	Basic Configuration Guide	Provides basic instructions for customizing CL/SUPERSESSSION and CL/GATEWAY to the specific needs of your network, system, and users.
LS51-3781	Customization Guide	Provides instructions and explanations for customizing CL/SUPERSESSSION and CL/GATEWAY to the needs of your network, system, and users.
LS54-3786	User's Guide	Contains brief instructions on how to operate CL/SUPERSESSSION and CL/GATEWAY.
LS99-3789	Operator's Guide	Describes the CT/Engine operator facility and commands used by CT/Engine, CL/SUPERSESSSION, and CL/GATEWAY.

Table 1 (Page 2 of 2). CL/SUPERSESSION and CL/GATEWAY Documentation		
Document Number	Document Name	Description
LS99-4225	Introduction to SSPL Dialogs	Introduces users to the Structured Session Procedure Language (SSPL); shows how to customize and use some simple dialogs written in SSPL.
LS99-3821	SSPL Programming Guide	Explains how to create your own dialogs with SSPL, using a sample application that creates and manages a table.
LS53-3787	Dialog Language Reference Manual	Contains comprehensive descriptions of all features of the SSPL dialog language.
LS57-3780	Problem Determination Guide	Contains instructions and documentation recommendations for locating and solving problems in CL products.
LS52-3788	Messages Manual	Lists and explains all CT/Engine, CL/SUPERSESSION, and CL/GATEWAY messages and suggests appropriate user actions.
LVM99-4103	Quick Reference Card	Pocket-sized document that contains step-by-step instructions for using CL/SUPERSESSION and CL/GATEWAY.
LS59-3801	Master Index	Contains a master index for all CL/SUPERSESSION and CL/GATEWAY manuals that contain indexes.

Chapter 1.

Problem Determination Overview

This guide helps you to identify and document system problems that result from, or are related to, CL products. The guide is not an all-inclusive problem diagnosis handbook, but instead is designed to help you to provide the staff of Candle Support Services with the documentation and materials they need to efficiently diagnose and resolve a problem for you.

This chapter outlines the basic problem determination process. (Refer to “Isolating the Problem” and the map for problem determination in this chapter.) In addition, it describes the procedure for reporting a problem to Candle Support Services, including documentation requirements and a sample Candle Problem Report (Figure 1 on page 28).

Isolating the Problem

IBM categorizes system problems into 7 types:

- abends
- waits
- loops
- messages
- incorrect output
- tuning
- documentation

These problem types are described in “Solving Problems” on page 33. For any problem, noting problem symptoms and saving documentation (for example, message text and any output) are important in assisting you and Candle Support Services in identifying the failing component.

To isolate a problem, first determine if a relationship exists between the CL/ENGINE™ products on your system and the occurrence of the problem. If the problem occurs when CL/SUPERSESSSION and/or CL/GATEWAY are first installed, try to recreate the problem outside of CL/SUPERSESSSION and CL/GATEWAY and note any symptom changes. As part of this initial diagnostic procedure:

1. Try to isolate the type of problem by considering any recent modifications to your system configuration.

2. Then, look at your CL product installation and/or customization procedures.
 - a. Was the product installed correctly?
 - b. Have you modified any Candle-supplied dialogs as part of installation or customization?
 Modifying Candle-supplied dialogs and introducing or modifying your own dialogs are common causes of installation/customization problems.
3. If you have added or modified a dialog or user exit and you suspect the modification is the source of the problem, try to isolate and resolve the problem before contacting Candle Support Services. Use the LOG statement to determine if a particular dialog or user exit is the source of the problem. (For a description of the LOG statement, refer to the *Dialog Language Reference Manual*.)

The steps to problem determination are presented in the next section.

Map for CL Problem Determination for MVS Environments

The problem determination map that follows outlines the general approach and actions to take to isolate and resolve system problems. Note that several actions need to be completed before contacting Candle Support Services, and that specific documentation must be provided for problem analysis. Refer to “Reporting a Problem to Candle Support Services” on page 24 for procedures and documentation requirements when reporting a problem to Candle Support Services.

001

Is the problem associated with a recently installed CL product?

Yes No

002

Continue at Step 010 on page 19.

003

– If possible, test the failing function outside the CL product environment. Continue at Step 004 on page 19. (Continue at Step 006 on page 19 if it is not possible to test the failing function without the CL product.)

004

Does the problem go away when the CL product is not used?

Yes No

005

The problem is not related to the CL product.
– Refer to appropriate IBM or vendor documentation to continue diagnosis.

006

The problem may be related to the CL product.
– Review the installation and customization procedures to ensure that the product is properly installed.
Continue at Step 007.

007

Are there any installation/customization problems?

Yes No

008

Continue at Step 036 on page 22.

009

– Correct the installation/customization problems and then retest the failing function.
Continue at Step 034 on page 22.

010

Have you recently installed maintenance (for example, PTFs, APARs, etc.) or parameter changes (for example, RLSPARM, RLSCMDS, or KLSSYSIN changes) for the CL product?

Yes No

011

Continue at Step 022 on page 21.

012

The problem may be related to the recently installed product maintenance changes.
– Review the maintenance installation and any product changes (for example, new initialization parameters) associated with the maintenance.
Continue at Step 013 on page 20.

(continued)

013

Are there any problems with the maintenance/change installation?

Yes No

014

Continue at Step 018.

015

– Correct the maintenance/change installation problems and then retest the failing function.

Continue at Step 016.

016

Did the problem recur?

Yes No

017

The problem was probably related to a maintenance/change installation error.

The problem is solved.

018

– Back out the maintenance and/or changes and retest the failing function.

Continue at Step 019.

019

Does the problem go away when the CL product is restored to the previous maintenance/change level?

Yes No

020

Continue at Step 022 on page 21.

021

The problem is related to the CL product maintenance and/or changes.

Continue at Step 041 on page 23.

022

Have you recently installed maintenance, tuning changes, network definition changes, or new product versions to the operating system or other system software (for example, VTAM®, RACF, ACF2®, DFP, NCP, CICS™, IMS, PC 3270 emulators, 3x74 microcode, etc)?

Yes No

023

Continue at Step 036 on page 22.

024

- Review the changes that were made to the other system software components. If necessary, contact other vendors to ensure that all appropriate maintenance is installed (for example, PTFs and/or APARs to resolve PEs).

Continue at Step 025.

025

Are there problems with the installation of other system software changes?

Yes No

026

Continue at Step 030.

027

- Correct the other system software changes and retest the failing function.

Continue at Step 028.

028

Did the problem recur?

Yes No

029

The problem was probably related to installation errors in the other system software.

The problem is solved.

030

- Back out the other system software changes and retest the failing function.

Continue at Step 031 on page 22.

031

(Step **031** continues)

(continued)

031 (continued)

Does the problem go away when the other system software is restored to the previous maintenance/change level?

Yes No

032

Continue at Step 036.

033

The problem may be with the other system software.

– or –

The problem may be related to the interaction between the other system software and the CL product.

Continue at Step 041 on page 23.

034

Did the problem recur?

Yes No

035

The problem was probably related to an initial installation error.
The problem is solved.

036

Did you modify any CL product dialogs or user exits?

Yes No

037

Continue at Step 041 on page 23.

038

The problem is possibly related to the modification:

- Use the SSPL LOG statement in one or more modified dialogs to locate the problem.
- Back out the modified dialog.
- Reinstall the previous working version.
- Review and correct your modifications.
- Retest the product using the modified dialog.

Continue at Step 039 on page 23.

039

Did the problem recur?

Yes No

040

The problem is solved.

041

You need to contact Candle Support Services for assistance.

- Determine the problem type (see “Solving Problems” on page 33).
- Begin to generate the required documentation (see “Documentation Requirements Summary” on page 26 and “Producing Documentation for Candle” on page 41).

Continue at Step 042.

042

Is trace documentation required? (Refer to “Using Trace Facilities” on page 53.)

Yes No

043

Continue at Step 048 on page 24.

044

Is the problem with CL/SUPERSESSION? (Refer to “Determining Which Trace Facility to Use” on page 54.)

Yes No

045

- Use the GTRACE command to invoke the Candle General Trace Facility.

Continue at Step 047 on page 24.

046

- Use the VSSTRACE command to invoke the Candle General Trace Facility.

Continue at Step 047 on page 24.

047

Can you locate the problem on the trace? (Refer to “Sample Traces” on page 61.)

Yes No

048

- Call Candle Support Services for further assistance.
- If Candle Support Services cannot solve the problem over the telephone, they will request your documentation. Candle Support Services will contact you to report on problem resolution.

049

Does analysis of the trace indicate that the CL product is the cause of the problem?

Yes No

050

- The problem is not related to the CL product.
- Refer to appropriate IBM or vendor documentation to continue diagnosis.

051

- Call Candle Support Services for further assistance.
 - If Candle Support Services cannot solve the problem over the telephone, they will request your documentation. Candle Support Services will contact you to report on problem resolution.
-

Reporting a Problem to Candle Support Services

If you are unable to isolate a problem or resolve it yourself, the problem may be with the CL product. You need to report the problem to Candle Support Services. Before submitting a problem to Candle:

1. Gather as much information and documentation as you can about the problem. Refer to Table 2 on page 26 and the appropriate chapters in this manual.
2. Complete the Candle Problem Report shown in Figure 1 on page 28. This form gives Candle staff the information they need to resolve a CL product problem and also serves as a checklist of actions for you to take before calling Candle Support Services.
3. Call Candle Support Services and report the problem. If they are unable to resolve the problem over the telephone, they will ask you to send them the Candle Problem Report and supporting documentation.

Note: Please do not forward problem diagnosis documentation to Candle until Candle Support Services requests that you do so.

Documentation Requirements Summary

The following table lists the documentation that Candle Support Services needs to diagnose and resolve a problem.

Table 2. Documentation Requirements by Problem Type						
	Abend	Wait/Loop	Msg.	Output	Tuning	Doc.
SMP/E SYSMOD listing	•	•	•	•	•	
Ten Minutes of System Log	•	•	•	•	•	
Job Log	•	•	•	•	•	
Original Dialog Name		•		•		
Modified Dialog		•		•		
Unformatted Dump	•	•				
User exits	•	•				
Message Number and Text			•			•
Panel ID			*			
Trace				•		
Screen Print				•		
Terminal Definitions				•		
User initialization library	•	•	•	•	•	
User command library					•	
User panel library		•			•	
VTAMLST				•	•	
Tuning Data					•	
Manual Number and Pages						•
* User panel if created. Candle strongly recommends that you create SMP/E USERMODs to install customer modifications to <i>-rhilev-.RLSPNLS</i> . See the skeleton TLSSAMP(KLSUSRMD). The SMP/E SYSMOD listing is sufficient if USERMODs are used.						

Completing the Candle Problem Report

To report a problem to Candle Support Services, use the Candle Problem Report. A sample completed form is shown in Figure 1 on page 28. Fill out the Candle Problem Report as fully as possible. To facilitate Candle's diagnosis, be sure to list and include all requested documentation. Information to complete the form is usually available at your location except the Incident Number, which is assigned by Candle Support Services when you call to report a problem.

Note: A blank Candle Problem Report is at the end of this chapter. You can make copies of this form or request additional forms from your Candle Field Representative.

Follow these instructions to file a problem report:

1. Complete the portion of the form that identifies you, your company, and your environment to Candle Support Services. Your environment includes your operating system environment and maintenance level, subsystems and maintenance level, security system (if any), and the CL products and CL product maintenance you have installed.
2. Complete the portion of the form that describes the problem and what you have done to resolve it.
 - a. Identify the problem type.
 - b. Specify the reason for failure (if known) and the conditions and parameter settings at the time of failure.
 - c. Provide any information about the terminals in use.
 - d. Describe actions taken to recover from the failure.
 - e. List the documentation accompanying the report.
3. The Candle Support Services representative will give you an Incident Number.

Important

Write this number at the top of the form in the space provided and on all accompanying documentation (for example, on the tape label or any printed output).

4. Forward the report and accompanying documentation to:

Customer Support Representative
Candle Support Services, *Incident Number*
2425 West Olympic Boulevard
Santa Monica, California 90404

Candle Problem Report

General Information

Incident Number: IM999999 Date: 12-31-99
 (Assigned by Candle)
 Company Name: ACNE INDUSTRIES Site ID: 99999
 Submitted by: E. JOHNSON PID: 99999
 Telephone No.: (800) 555-1212 Ext. _____
 Fax No.: () - - Ext. _____

Operating Environment

MVS / SP / XA (ESA) ver n rel n mod n put level yy mm
 VM / SP / HPO / XA ver _____ rel _____ mod _____ put level _____
 VTAM ver n rel n mod n put level yy mm

Subsystem Environment

CICS ver n rel n mod n put level yy mm
 IMS ver _____ rel _____ mod _____ put level _____
 Security Package: NAM (ACF2) / RACF / TS / other: _____
 ver n rel n mod n put level yy mm

CL Products

CL/SUPERSESSION (LSM) CL/MENU (LM) _____
 CL/CONFERENCE (LCM) _____
 CL/GATEWAY for IMS (LGI)
 Version: Vann
 Maintenance level: yy mm
 Are selected (since last maintenance level) sysmods applied? YES / NO
 If so, then list: QLSnnnn and all of its prereqs

Problem Description

Problem type: ABEND / WAIT / LOOP / MESSAGE / OUTPUT / TUNING / DOC.
 Is problem recreatable? YES / NO
 If not recreatable, frequency of occurrence: _____
 When did problem first occur? After application of QLSnnnn
 Description and recreation information (attach additional pages if necessary):
ABEND0C4 in module KLVxxxx + 2BC when user
logs on
 What was done to recover from the problem?
Back off QLSnnnn

GN98-4125-0

Figure 1 (Part 1 of 2). Candle Problem Report

Candle Problem Report

Incident Number: IM999999

Date: 12-31-99

Failure Time Information

Number of users: 1150 Could active users continue? YES / NO
Could new users sign on? YES NO Could new sessions start? YES / NO
Average number of sessions per user: 3
Region size from JCL: OM

Device and Session Characteristics

Failing device: SDLC / BI-SYNC / LOCAL / REMOTE / GRAPHICS
Make IBM Model 3192 G

Emulation type, if any: _____
Physical terminal logmode: D4B32784
Virtual terminal logmode: SNX32704

Virtual terminal pool characteristics: DEFER / DEDICATE / PASS

Was virtual session: SINGLE DOMAIN / CROSS DOMAIN / CROSS NETWORK
Was physical session: SINGLE DOMAIN / CROSS DOMAIN / CROSS NETWORK

CL/SUPERSESSION options: (use dialog KLSVTOPT to display)

Outbound compression	<u>Y</u>
Inbound compression	<u>Y</u>
CL/Supersession reply mode	<u>N</u>
Read buffer mode	<u>N</u>
RTM interface (all sessions)	<u>Y</u>
Query passthru	<u>Y</u>
Read-modified for PA keys	<u>Y</u>
Read-modified for ATTN key	<u>Y</u>
Fullread mode	<u>N</u>

Accompanying Documentation

Dumps: SVC / TLVSNAP (no paper dump output please; tape only)
Logs and Lists: SYSTEM (console) JOB / SMP/E SYSMOD (required)
Traces: CANDLE GENERAL TRACE / VSSTRACE / IBM GTF
Libraries: RLSPARM / RLSCMDS / RLSPNLS / OTHER (please specify) RLSLOAD
Have dialogs been customized? YES / NO
If so, then list See RLSPNLS
Have user exits been customized? YES / NO
If so, then list See RLSLOAD
Other problem documentation: _____

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Figure 1 (Part 2 of 2). Candle Problem Report

Candle Problem Report Form

A blank Candle Problem Report Form follows. You can make copies of this form for your use or obtain additional copies from your Candle Field Representative.

Candle Problem Report

General Information

Incident Number: _____ Date: _____
(Assigned by Candle)
Company Name: _____ Site ID: _____
Submitted by: _____ PID: _____
Telephone No.: (____) _____ - _____ Ext. _____
Fax No.: (____) _____ - _____ Ext. _____

Operating Environment

MVS / SP / XA / ESA ver _____ rel _____ mod _____ put level _____
VM / SP / HPO / XA ver _____ rel _____ mod _____ put level _____
VTAM ver _____ rel _____ mod _____ put level _____

Subsystem Environment

CICS ver _____ rel _____ mod _____ put level _____
IMS ver _____ rel _____ mod _____ put level _____
Security Package: NAM / ACF2 / RACF / TS / other: _____
ver _____ rel _____ mod _____ put level _____

CL Products

CL/SUPERSESSION (LSM) _____ CL/MENU (LM) _____
CL/CONFERENCE (LCM) _____
CL/GATEWAY for IMS (LGI) _____
Version: _____
Maintenance level: _____
Are selected (since last maintenance level) sysmods applied? YES / NO
If so, then list: _____

Problem Description

Problem type: ABEND / WAIT / LOOP / MESSAGE / OUTPUT / TUNING / DOC.
Is problem recreatable? YES / NO
If not recreatable, frequency of occurrence: _____
When did problem first occur? _____
Description and recreation information (attach additional pages if necessary):

What was done to recover from the problem?

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Candle Problem Report

Incident Number: _____

Date: _____

Failure Time Information

Number of users: _____ Could active users continue? YES / NO
Could new users sign on? YES / NO Could new sessions start? YES / NO
Average number of sessions per user: _____
Region size from JCL: _____

Device and Session Characteristics

Failing device: SDLC / HI-SYNC / LOCAL / REMOTE / GRAPHICS
Make _____ Model _____

Emulation type, if any: _____
Physical terminal logmode: _____
Virtual terminal logmode: _____

Virtual terminal pool characteristics: DEFER / DEDICATE / PASS

Was virtual session: SINGLE DOMAIN / CROSS DOMAIN / CROSS NETWORK
Was physical session: SINGLE DOMAIN / CROSS DOMAIN / CROSS NETWORK

CL/SUPERSESSION options: (use dialog KLSVTOPT to display)
Outbound compression _____
Inbound compression _____
CL/Supersession reply mode _____
Read buffer mode _____
RTM interface (all sessions) _____
Query passthru _____
Read-modified for PA keys _____
Read-modified for ATTN key _____
Fullread mode _____

Accompanying Documentation

Dumps: SVC / TLVSNAP (no paper dump output please; tape only)
Logs and Lists: SYSTEM (console) / JOB / SMP/E SYSMOD (required)
Traces: CANDLE GENERAL TRACE / VSSTRACE / IBM GTF
Libraries: RLSPARM / RLSCMDS / RLSPNLS / OTHER (please specify) _____
Have dialogs been customized? YES / NO
If so, then list _____
Have user exits been customized? YES / NO
If so, then list _____
Other problem documentation: _____

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This chapter provides procedures for identifying a problem and classifying it according to the seven problem types defined by IBM: abend, wait, loop, message, output, application tuning, or documentation. In addition, the chapter describes system problems associated with CL product installation and customization and gives suggestions for resolving them. The system problems are noted by internal system diagnostics. Be sure to note exactly which message, return code, abend code, or tuning symptom occurs. This information is crucial in first classifying and then isolating and resolving the problem.

If, after identifying the problem, you are unable to solve it with the suggestions you find here, you may find a solution through Candle Electronic Customer Support (CECS). CECS is an online database that contains problems encountered by other users. You can search the database by problem type or symptom and find solutions that have worked at other sites. You may want to review this database first before you generate documentation and call Candle Support Services. You can register to use the database through Candle Support Services. As a CECS user, you can use CECS to report problems as well as research them.

Abend Problems

When an abend occurs, an operating system abend message, including an abend code, is usually issued. Possible abend codes are:

Code	Description
U0000	After CL/ENGINE termination is requested and confirmed, a program timer is set limiting the shutdown to 30 seconds. If the timer expires, user abend 0 is invoked to purge CL/ENGINE from the system. The unexpected halt of a component usually causes U0000. If the problem persists, contact Candle Support Services.
U0004	This is an initialization error. The CL/ENGINE load library could not be opened. This is usually the result of an invalid TLVLOAD DD statement in the supplied procedure KLS. MVS messages in the system log indicate a specific reason that the library was not opened.

U0008 This is an initialization error. During startup, CL/ENGINE detected an exception condition and tried to issue a WTO to indicate the source of the error. However, the integrity of the CL/ENGINE address space was found to be corrupted. Contact Candle Support Services.

U0012 This is an initialization error. During startup, CL/ENGINE detected an exception condition. A message indicating the source of the error is written to the system and job logs. Refer to the error message to determine your course of action.

U0100 Invoked by the product and accompanied by a message written to the system and job logs. The reason for the abend is explained in the message. After a system dump is taken, the product attempts to recover from this failure automatically. Successful recovery is indicated by the message KLVVER011.

Note: After receiving this abend code, you should:

1. bring down CL/SUPERSESSION.
2. inactivate the ACB major node.
3. activate the ACB major node.
4. start CL/SUPERSESSION.

Although recovery may be successful, the address space may be damaged.

U0200 Invoked by the product and accompanied by a message written to the system and job logs. The reason for the abend is explained in the message. These abends are generally caused by storage exhaustion or storage overlays and cannot be retried. If U0200 occurs, CL/ENGINE terminates after a system dump is taken. This abend can also be forced by the SHUTDOWN ABEND operator command.

Review the abend code and system logs. If you are unable to locate and resolve the problem, generate the documents described in Table 2 on page 26 and call Candle Support Services. An abend can also be caused by storage creep. Message KLVGM005 is issued when storage creep is the problem. Refer to “Producing Documentation for Candle” on page 41 for instructions on diagnosing the problem and producing documentation to send to Candle Support Services.

Wait and Loop Problems

Wait problems and loop problems have similar symptoms and causes.

The symptoms of a wait problem might include:

- CT/Engine does not respond to an operator command.
- Terminal traffic or a subset of terminal traffic stops.
- CL/ENGINE cannot be terminated normally.
- Terminals and application programs are not communicating. (This symptom may also indicate a loop problem.)

The symptoms of a loop problem might include:

- CPU utilization is high.
- A CL/ENGINE-based product does not respond to operator commands.
- A dialog repeats the same commands over and over.
- A dialog may have exceeded the loop counter.
- Commands or data cannot be entered at a terminal location.
- An application accessed under the CL products is in error or has a runaway condition.

A primary suspect for a wait or loop problem is user modification to a dialog. If you suspect a modified dialog is causing the problem, back out the change and reinitialize the system with an earlier, working version of the dialog. If this change resolves the problem, review and correct the modification. If the problem continues, call Candle Support Services and then generate the documentation summarized in Table 2 on page 26.

Message Problems

Messages unique to CL products inform you of system status and possible problems. The message prefix (the alphabetic characters preceding the message number) indicates which CL product encountered the problem or condition. CL-generated messages have the following prefixes:

Prefix	Message Type
CESC	CT/Engine SSPL Conversion Utility message
CG	CL/GATEWAY for MVS panel message

CL	CL/SUPERSESSION and CL/GATEWAY user interface panel message
CS	CL/SUPERSESSION panel message
CT	CL/SUPERSESSION and CL/GATEWAY user interface table message
CLG	CL/GATEWAY message
KLS	CL/SUPERSESSION message
KLU	CL/SUPERSESSION virtual session support message
KLV	CT/Engine message
MIGR	Migration message

Refer to the *Messages Manual* for specific message descriptions and appropriate responses. If you are unable to resolve a problem identified by a system message, generate the documentation described in Table 2 on page 26, and then call Candle Support Services for assistance.

Incorrect Output Problems

The symptoms of an incorrect output problem are the following:

- An application works differently under CL/SUPERSESSION than it does without CL/SUPERSESSION.
- An application program message reports an unexpected result from a CL product, such as a return code, sense code, or both.
- A terminal user cannot enter data to an application.
- A terminal user reports wrong or missing data at the terminal.
- The cursor is positioned incorrectly on the screen.
- A terminal user gets an unexpected response to a transaction.
- The output data is formatted incorrectly.

Note: The above symptoms can also result from an error in a host-based application program such as TSO or IMS.

Incorrect output problems are caused by:

Communication definition problems

A terminal definition problem is the most common cause of incorrect output. Within a VTAM network, mode entry

definitions (MODEENTs) define terminal characteristics, parameters and protocols. If these definitions are incorrect, they cause unexpected results at the terminal, including corrupted screens. Refer to the appropriate IBM documentation for help in resolving incorrect output problems relating to mode entry definitions.

CL product installation and customization problems

Incorrect output and wait problems are frequently associated with incorrectly installed or customized CL products. Be sure to follow the instructions in the *Candle Program Directory* and the *Basic Configuration Guide* for IMS data communications definitions to help resolve terminal definition problems.

File transfer Incorrect output problems can occur during file transfer. The file transfer problem may be caused by immediate broadcast which interrupts file transfer. To solve the problem, disable immediate broadcast with the dialog function VIGIBC (1). When the file transfer is complete, enable immediate broadcast with dialog function VIGIBC (0).

Note: If you are a CL/SUPERSESSION user and have the file transfer dialog available (usually through the trigger, \ft), immediate broadcast is disabled and enabled automatically. If you are a CL/GATEWAY user, the file transfer dialog is not available, and immediate broadcast must be enabled and disabled as described above.

If the problem is not caused by immediate broadcast, check logmodes to ensure that the bind images for the physical and virtual session are the same, and that the binds match the bind that was used on the PC for the native file transfer.

Also check session options as described in *User's Guide* for the correct settings for file transfer. The session options are set automatically by the file transfer dialog.

If file transfer problems persist, get a trace of the file transfer without CL/SUPERSESSION and a trace of the physical and virtual CL/SUPERSESSION terminals during file transfer to the point when the problem occurs. Include the bind and the names and uses of logical units with the trace.

Compression problems

Compression problems can cause incorrect output. To correct the problem, try running the application in single-window display. (Running in single-window display allows the CL product to automatically disable compression for file transfer and graphics output and other 3270 data stream facilities that do not work with data compression.)

If an incorrect output problem occurs, generate and review the documentation described in Table 2 on page 26. Refer to “Using Trace Facilities” on page 53 when generating and reviewing trace documentation. When CL/SUPERSESSION is involved, you may wish to obtain a trace of the application running without CL/SUPERSESSION for comparison. If you are unable to locate the problem, call Candle Support Services for assistance.

Tuning Problems

Tuning problems are generally defined as problems involving job, network, and resource performance.

The symptoms of an application tuning problem include:

- Slow terminal response time
- Slow CT/Engine operator command execution
- Slow logon processing

Tuning problems can result from other operating system and subsystem components, such as MVS, CICS, or IMS. Access methods and their resources, such as VTAM and VSAM, can also introduce tuning problems. Performance measurement and tuning within your environment can substantially minimize or even eliminate such problems.

Another source of tuning problems can be dialogs that are implemented incorrectly. In such cases, looping uses valuable system resources, and the result is poor performance.

See the *Customization Guide* for more information on performance and tuning.

To pinpoint a CL product tuning problem, obtain the documentation listed in Table 2 on page 26. Review the documentation. If you are unable to resolve the problem, call Candle Support Services for assistance.

Documentation Problems

The symptoms of a documentation problem are:

- A CL product does not perform as described in the manual.
- Information essential for installing, operating, or servicing a CL product is missing from the manual.
- Information in the manual is ambiguous and you cannot use the CL product effectively.

- Information in one CL manual does not agree with information in another CL manual.

To resolve a documentation problem, call Candle Support Services with the following information:

- Number of the manual containing the error
- Description of the error

If the problem has not been reported, Candle Support Services will create an incident record and ask you to send a copy of the page containing the error.

Installation and Customization Problems

Many problems are caused by incorrect installation and customization. You can reduce the chances of introducing errors and make error isolation and resolution easier if you follow these simple guidelines:

1. Install products without customizing them, following the installation procedure described in the *Program Directory*.
2. When the products are installed, use the installation verification tests to ensure that products *as delivered* are working. As part of installation testing of the products, you initialize them and log on and log off under installation verification tests. The *Program Directory* describes the steps for testing CL product installation.
3. Perform the appropriate customization on the installed products for your site. Candle strongly recommends that you copy Candle-supplied library members to user libraries before you perform any customization, and that you make no changes to the original Candle-supplied data.

The following paragraphs explain how to avoid installation errors. If you do make an error in your installation, back out the product or sysmod and install it again.

SMP/E Installation Errors

The *Program Directory* details the step-by-step procedure for installing with SMP/E. The following list identifies common errors that occur while performing an SMP/E installation. In general, the most likely errors occur in your JCL. If an SMP/E install fails, be sure to check these probable causes:

- Errors in substituting symbolics
- A prefix of more than 8 characters
- Errors in typing the Candle tape volser or target disk allocation volser
- Insufficient disk space
- Mismatch between the DSN in the JCL and the DSN on the volume

- Attempt to receive an empty file

Customization Errors

To determine if a problem is a customization error, review any recent changes to dialogs or to your system environment. Consider the following areas:

Processing environment

For example, was a new host processor or communication controller introduced?

Operating system

For example, was the operating system modified or was a new release installed?

VTAM network Were new terminals defined? If so, were their attributes and/or parameters set correctly?

Security system Were new CL products defined to the security system or were CL products redefined to a new security system?

The *Customization Guide* contains information that is useful if the problem symptom is poor network performance or main storage utilization.

Ensure that the JCL REGION parameter is coded to create a larger enough region for your environment. Sites that use CA-ACF2®, RACF®, or CA-TOP SECRET® and have large numbers of users should review the RESERVE parameter in RLV Parm(KLSSYSIN). RESERVE storage in these environments must be below the 16-megabyte line. (Refer to the *Customization Guide*.)

If you suspect that a modification to a dialog is the problem:

1. Back out the modified dialog and replace it with an earlier, working version.
2. Check to see if the problem is resolved.
3. If removing the suspect dialog solves the problem, you can then use the LOG statement to locate and debug the dialog error problem. (Refer to the *Customization Guide* and the *Dialog Language Reference Manual*.)
4. If dialog modification is not the problem or if the problem persists, verify your installation procedures. (Refer to the *Program Directory* and the *Basic Configuration Guide*.)

If you are unable to isolate the problem or resolve it yourself, the problem may be with the CL product. In that case, report the problem to Candle Support Services.

Chapter 3. Producing Documentation for Candle

If you are unable to locate and resolve a problem associated with a CL product, contact Candle Support Services for assistance. You will be asked for a detailed description of the problem and any steps you have taken to resolve it. You will also be asked for the documentation described in this chapter and any documentation you produced in your initial problem isolation efforts. (See “Solving Problems” on page 33.) Documentation requirements for each IBM-defined problem type are summarized in Table 2 on page 26. Be sure to forward required documentation to Candle in the form specified.

This chapter provides instructions for copying dumps to tape and forwarding both tape and documentation to Candle Support Services.

Note: Trace procedures are described in “Using Trace Facilities” on page 53.

Problem Documentation Guidelines

Consider the following when creating problem documentation to be forwarded to Candle:

- Send standard IBM unformatted dumps for the following reasons:
 - An internal formatter is used to analyze dump data. If the data is already formatted, the Candle data formatter cannot process the data correctly.
 - Creating formatted dumps can require considerable system resources.
- Submit problem documentation on a *standard label* tape accompanied by a printed copy of the JCL used to create the tape.
- Use Candle-supplied JCL to generate required documentation.
- CL products support creation of SVC dumps and traces. If you modify the installed product, you need to verify that your system is set up to produce the requested problem documentation.
- If ABEND-AID™ is installed, it must be disabled to produce usable, CL problem documentation. To disable ABEND-AID, add the following data definition statement to the job procedure:

```
//ABNLIGNR DD DUMMY
```

The remainder of this chapter:

1. Defines the types of documentation (both Candle and IBM) that Candle Support Services will request.
2. Describes how to create and format output created through Candle service aids.
3. Summarizes procedures for creating documentation media (for example, copying documentation to tape and creating printed copies of dialogs).
4. Provides sample JCL for generating required documentation and for copying the documentation to tape.

Documentation Requirements

Regardless of the problem type, Candle Support Services always requests a completed Candle Problem Report and the following documentation:

- SMP/E SYSMOD listing
- System log for 10 minutes before the error occurred
- Candle JES job log
- Candle TLVLOG

These documents are described in the following paragraphs.

SMP/E SYSMOD Listing

This listing shows the CL product level and the maintenance that was applied. See “Creating the SMP List” on page 46 for instructions on producing the listing.

System Log

The IBM system log is frequently referred to as the console log. This log is written to by all system and subsystem programs. For several problem types, a partial system log is requested.

When you supply a system log, be sure to supply *the 10 minutes immediately before the occurrence of the error*.

Candle JES Job Log

The job log contains all messages issued by a job (that is, a started task, a TSO user, or a batch job). Most operating system, JCL substitution, and allocation/deallocation messages appear only in the job log. The job log is always requested. A complete job log should always accompany a dump.

Candle TLVLOG

The Candle TLVLOG contains CL product information. As shipped, the TLVLOG is part of the job log because a data definition (DD) statement in the started task command procedure assigns the TLVLOG to SYSOUT. However, if this default assignment is changed to another destination (through the DSN parameter), the TLVLOG is created as a separate dataset. All product messages are output to the TLVLOG DD.

Enabling Dumps

The startup JCL for any CL/ENGINE-based system contains dump-enabling DD statements. As currently shipped, the started task JCL provided by member KLS in the supplementary library (RLSSAMP) contains dump-enabling statements.

Figure 2 on page 44 illustrates the JCL that enables dumps.

```

//KLS      PROC PFX='-thilev-'
//          MEMORY=OM,
//          SYSIN=KLSSYSIN,
//          SOUT=A
//*
//IEFPROC EXEC PGM=KLV,REGION=&MEMORY,TIME=1440
//STEPLIB DD DISP=SHR,DSN=&PFX..LOADLIB
//TLVLOAD DD DISP=SHR,DSN=&PFX..LOADLIB
//TLVCMDS DD DISP=SHR,DSN=&PFX..RLSCMDS
//          DD DISP=SHR,DSN=&PFX..TLSCMDS
//          DD DISP=SHR,DSN=&PFX..TLVCMDS
//TLVPNLS DD DISP=SHR,DSN=&PFX..RLSPNLS
//          DD DISP=SHR,DSN=&PFX..TLSPNLS
//          DD DISP=SHR,DSN=&PFX..TLVPNLS
//TLVPARM DD DISP=SHR,DSN=&PFX..RLSPARM
//          DD DISP=SHR,DSN=&PFX..TLSPARM
//          DD DISP=SHR,DSN=&PFX..TLVPARM
//TLSSAMP DD DISP=SHR,DSN=&PFX..TLVPNENU
//TLVHØENU DD DISP=SHR,DSN=&PFX..TLVPNENU
//TLVLOG DD SYSOUT=&SOUT
//ABNLIGNR DD DUMMY
//TLVSNAP DD SYSOUT=&SOUT <-- Enables Candle TLV SNAP dumps
//TLVSYIN DD DISP=SHR,DSN=&PFX..RLSPARM(&SYSIN),FREE=CLOSE
//*
//

```

Figure 2. Enabling Dumps In MVS

Note the following:

- Candle prefers that you provide SVC dumps if APF-authorized and TLVSNAP dumps if not APF-authorized. SVC dump is the default for systems that are APF-authorized. Candle encourages you to APF-authorize your job step to obtain an SVC dump. Refer to the *Customization Guide* for information on the SDUMP option.
- When SVC dump support is used, be sure to allocate sufficient DASD. Specify 50 cylinders of 3380 for every 32 megabytes of storage specified above the line and 25 cylinders for 15 megabytes specified below the line.
- When SVC dumps are not enabled, dump output is directed to SYSOUT CLASS A in the TLVSNAP dataset as provided in the sample JCL. You may optionally create a DASD dataset to receive the TLVSNAP dump output resulting from an abend.
- Do not add a SYSUDUMP or SYSMDUMP to the provided JCL. The resulting dump processing introduces unnecessary overhead.

The TLSPARM(KLSSYSIN) member contains the CL/ENGINE for MVS startup parameters. KLSSYSIN contents and parameters are fully documented in the *Customization Guide*.

DEBUG and the Internal Trace Table

In certain cases, you may need to provide Candle Support Services with an internal trace table included as part of the dump. This table reflects the flow of information through the system. For example, this data is crucial in isolating a problem involving a recurring abend.

The trace table is enabled by:

1. Adding parameter DEBUG (Y) to the KLSSYSIN parameters.
2. Setting TRACE on by issuing the command in the CT/Engine operator or coding it in KLSSTART in TLSCMDS.

Call Candle Support Services if you need assistance with the trace table. Once enabled, the trace table is automatically included in dumps. Trace table enabling remains in effect for the duration of a CT/Engine execution. It is disabled by resetting the KLSSYSIN parameter to DEBUG (N) and recycling the product.

Note: Creating a trace table may affect system performance.

Sending Problem Documentation to Candle

Problem documentation should be sent on a *standard label* tape. If you are initializing a new tape, include the Candle-supplied incident number as the 5- or 6- digit volume serial number (volser) of the tape. Include the JCL used to create the tape with all problem documentation submitted. The CL/ENGINE supplementary library (TLSSAMP) created during product installation contains sample JCL to copy documentation to tape. Also, be sure to include the incident number on all correspondence and printed documentation sent to Candle Support Services. (See “Completing the Candle Problem Report” on page 27.)

For copying different types of documentation, see the specified sections for procedures and JCL.

- Generate the list of current maintenance installed on your system: See “Creating the SMP List” on page 46.
- Copy a SYSOUT dataset to tape: See “Copying SYSOUT Datasets to Tape” on page 47.
- Copy an SVC dump to tape: See “Copying an SVC Dump and Other Sequential Datasets to Tape” on page 48.
- Copy the TLV Parm dataset to tape: See “Copying TLV Parm and Other Partitioned Datasets to Tape” on page 49.

- Copy any VSAM dataset: See “Copying the Table Database and Other VSAM Datasets to Tape” on page 50.
- Copy a GTF trace to tape: See “Copying a Trace to Tape” on page 61.
- Generate Storage Creep Data: See “Generating Storage Creep Data” on page 51.

In addition, “Printed Copies of Dialogs” on page 51 provides procedures for printing dialogs so that Candle Support Services can analyze them for you.

Creating the SMP List

To accurately diagnose a problem, Candle Support Services must know the CL product level you are running and the maintenance you have applied. The JCL in Figure 3 creates a list of any maintenance applied. This JCL is contained in supplementary library TLSSAMP member KLS@CPYM. You should copy the JCL to a user library and modify it appropriately.

```
//JOB CARD JOB (XXXXX), 'NAME',
// MSGCLASS=X, CLASS=A
/*
//LIST1 EXEC PGM=GIMSMP, REGION=2048K
//SMPCSI DD DSN=csidsn, DISP=SHR
//SMPLIST DD DSN=tapedsn, UNIT=tunit, VOL=SER=tvol,
// DCB=(RECFM=FB, LRECL=133, BLKSIZE=13300),
// LABEL=(filenum, SL, EXPDT=98000), DISP=(NEW, KEEP)
//SMPCNTL DD *
SET BDY(CANTZ1) .
LIST SYSMODS MOD MAC XREF.
/*
```

Figure 3. JCL to Create an SMPLIST

Modify the JCL as follows:

1. Change the job statement appropriately.
2. Change **csidsn** to the correct CSI dataset name.
3. Change **tapedsn** to the name of the destination dataset on the tape, for example, CANDLE.SMPELIST
4. Change **tunit** to the tape device type, for example, 3480 for a tape cartridge.
5. Change **tvol** to the volser of the tape, for example, xxxxxx, the Candle-assigned incident number.
6. Change **filenum** to the file number on the tape for this dataset. (If Candle requests multiple output files, this allows you to place them on a single tape.)

Then submit the job.

Copying SYSOUT Datasets to Tape

Before copying a log or list to tape, you must allocate a print dataset to hold the output. The following procedure assumes that the job log, TLVSNAP, and TLVLOG are available on the JES2 spool and that you have access to SDSF®. Alternately, you can use the TSO OUTPUT command or the IBM-supplied XWTR procedure to move the SYSOUT data to a cataloged sequential dataset and skip to step 5 of the procedure.

1. Allocate a sequential dataset (for example, CANDLE.JOB). Specify the following parameters:

Record format

FB

Block size 13200

Record length 132

2. Access the SDSF output or held output screen and type:

```
PRT ODSN CANDLE.JOB * MOD
```

The dataset that you allocated in step 1 will be opened.

3. Type the following in the command line:

```
PRT 1 xxxxx
```

where xxxxx is the last line of the job log and job SYSOUT. Your job log and job SYSOUT output are copied to the print file.

4. To complete the print command and close the print dataset, type the following:

```
PRT CLOSE
```

5. Use the procedure described in “Copying an SVC Dump and Other Sequential Datasets to Tape” on page 48 and copy the dataset you have created to tape.

Copying an SVC Dump and Other Sequential Datasets to Tape

The KLS@CPYS member of the supplementary library (TLSSAMP) contains JCL to use when copying any cataloged sequential DASD dataset to tape for shipment to Candle. You should copy the JCL to a user library and modify appropriately.

The procedure below describes how to copy a system SVC dump to tape. It can be used to copy other sequential datasets by changing the FROMDSN, TAPEDSN, and FILENUM variables to the appropriate values. Other datasets that may be copied using this procedure include:

- SYSOUT that was moved to a sequential dataset
- GTF trace dataset
- CL/ENGINE NAF dataset
- CL/ENGINE TLVSNAP dataset that was allocated on DASD

Figure 4 contains sample JCL.

```
//JOB CARD JOB (XXXXXX), 'NAME',  
// MSGCLASS=X, CLASS=A  
//*  
//COPYSEQ EXEC PGM=IEBGENER, REGION=1024K  
//SYS PRINT DD SYSOUT= sclass  
//SYSUT1 DD DISP=SHR, DSN= fromdsn  
//SYSUT2 DD DSN= tapedsn, UNIT= tunit, VOL=SER= tvol,  
// LABEL=( filenum, SL, EXPDT=98000), DISP=(NEW, KEEP)  
//SYSIN DD DUMMY
```

Figure 4. JCL to Copy an SVC Dump to Tape

Modify the JCL as follows:

1. Change **sclass** to the SYSOUT class for the utility program output, for example, A.
2. Change **fromdsn** to the name of the system dataset containing the SVC dump, for example, SYS1.DUMP00.
3. Change **tapedsn** to the name of the destination dataset on the tape, for example, CANDLE.SVCDUMP.
4. Change **tunit** to the tape device type, for example, 3480.
5. Change **tvol** to the volser of the tape, for example, xxxxxx, the Candle-assigned incident number.
6. Change **filenum** to the file number on the tape for this dataset, for example, 2. (If Candle requests multiple output files, this allows you to place them on a single tape.)

Then submit the job.

Copying TLVPARM and Other Partitioned Datasets to Tape

The KLS@CPYP member of the supplementary library (TLSSAMP) contains JCL to use when copying any partitioned dataset to tape for shipment to Candle. You should copy the JCL to a user library and modify appropriately. Figure 5 contains sample JCL.

The procedure below describes how to copy the TLVPARM Initialization Library to tape. It can be used to copy other partitioned datasets by changing the *frompds*, *tapedsn*, and *filenum* variables to the appropriate values. Datasets that may be copied (that is, unloaded to tape) using this procedure include:

- CL/ENGINE RLSPNLS panel library (or user panel library)
- CL/ENGINE RLSCMDS command library (or user command library)
- CL/ENGINE RLSLOAD load module library

```
-rhilev-.RLSPARM to Tape
//JOB CARD JOB (XXXXXX),'NAME',
// MSGCLASS=X,CLASS=A
/**
//COPYPDS EXEC PGM=IEBCOPY
//SYSPRINT DD SYSOUT=sclass
//DISKPDS DD DISP=SHR,DSN=frompds
//TAPEOUT DD DSN=tapedsn,UNIT=tunit,VOL=SER=tvol,
// LABEL=(filenum,SL,EXPDT=98000),DISP=(NEW,KEEP)
COPY INDD=DISKPDS,OUTDD=TAPEOUT
```

Figure 5. JCL to Copy

Modify the JCL as follows:

1. Change **sclass** to the SYSOUT class for the utility program output, for example, A.
2. Change **frompds** to the name of your dataset containing initialization parameters, for example, *-rhilev-.RLSPARM*.
3. Change **tapedsn** to the name of the destination dataset on the tape, for example, *CANDLE.TLSPARM*.
4. Change **tunit** to the tape device type, for example, 3480.
5. Change **tvol** to the volser of the tape, for example, *xxxxxx*, the Candle-assigned incident number.
6. Change **filenum** to the file number on the tape for this dataset, for example, 3. (If Candle requests multiple output files, this allows you to place them on a single tape.)

Then submit the job.

Copying the Table Database and Other VSAM Datasets to Tape

The KLS@CPYV member of the supplementary library (TLSSAMP) contains JCL to use when copying any VSAM dataset to tape for shipment to Candle. You should copy the JCL to a user library and modify appropriately. Figure 6 contains sample JCL.

The procedure below describes how to copy the CL table database VSAM dataset to tape. It can be used to copy other VSAM datasets by changing the *fromvsam*, *tapedsn*, and *filenum* variables to the appropriate values. Datasets that may be copied (that is, unloaded to tape) using this procedure include:

- CL/ENGINE NAM database
- CL/ENGINE VIEWLOG dataset
- CL/ENGINE SMP/E CSI dataset

```
//JOB CARD JOB (XXXXXX), 'NAME',
// MSGCLASS=X, CLASS=A
//LISTCAT EXEC PGM=IDCAMS
//SYSPRINT DD DSN= tapedsn .LISTCAT,
//          UNIT= tunit ,VOL=(,RETAIN,SER= tvol ),
//          LABEL=( filenuma ,SL,EXPDT=98000),DISP=(NEW,KEEP)
//          LISTCAT ENTRIES( fromvsam ) ALL
//*
//EXPORT EXEC PGM=IDCAMS
//SYSPRINT DD SYSOUT= sclass
//RECEIVE DD DSN= tapedsn .EXPORT,
//          UNIT= tunit ,VOL=SER= tvol ,
//          LABEL=( filenumb ,SL,EXPDT=98000),DISP=(NEW,KEEP)
//          EXPORT fromvsam -
//          TEMPORARY OUTFILE(RECEIVE)
```

Figure 6. JCL to Copy the Table Database to Tape

Modify the JCL as follows:

1. Change **sclass** to the SYSOUT class for the utility program output, for example, A.
2. Change **fromvsam** to the name of the VSAM table database dataset, for example, USER.TABLEDB.
3. Change **tapedsn** to the name prefix for the destination datasets on the tape, for example, CANDLE.TABLEDB.
4. Change **tunit** to the tape device type, for example, 3480.
5. Change **tvol** to the volser of the tape, for example, xxxxxx, the Candle-assigned problem number.
6. Change **filenuma** to the file number on the tape to be used for the LISTCAT output associated with the VSAM dataset, for example, 4. (If Candle requests multiple output files, this allows you to place them on a single tape.)

7. Change **filenumb** to the file number on the tape to be used for the EXPORTed copy of the VSAM dataset, for example, 5.

Note: **filenumb** must be one greater than **filenuma** for the job to work properly.

Then submit the job.

Generating Storage Creep Data

You may suspect a storage creep problem if free storage decreases over a period of time. The STORAGE command can show such decreases. To provide the information for Candle Support Services to analyze the problem, do the following:

1. Run CL/SUPERSESSION for at least one day.
2. Then, have all users log off CL/SUPERSESSION.
3. Close all hostgate ACBs:

```
F k1v,CLOSE hostgateacb
```

4. Create a dump:

```
DUMP COMM=(SS STORAGE CREEP)  
R xx,JOBNAME=k1v,SDATA=(RGN,CSA,PSA,TRT,SWA,LSQA,SUM,SQA),END
```

In the above example, *xx* is the reply number from the DUMP command.

5. Copy the dump to tape.
6. Copy TLVLOG to tape.

Printed Copies of Dialogs

Whenever you furnish a printed copy of a dialog, include a description of the dialog (what it is intended to do, any unusual coding, etc.), the dialog name, and all relevant notes.

Create the printed copy using an IBM-supplied copy formatting utility, such as IEBGENER or ISPF 3.1.

This chapter describes:

- Candle General Trace Facility and VSSTRACE, two service aids used to generate the documentation that Candle requires to analyze CL product problems
- Procedures for using the trace facilities
- Procedures and sample JCL to format, print or copy trace output to tape

Note: This JCL resides in the TLSSAMP supplementary library dataset.

This chapter also provides examples and detailed descriptions of trace output. Use these examples as a reference when analyzing your own trace data.

Candle startup JCL enables both the standard IBM service aids used to gather problem documentation and the Candle service aids. The following paragraphs explain how to determine which service aid to use.

Note: For detailed explanations and procedures when using the standard IBM service aids, refer to the appropriate IBM documentation.

Candle General Trace Facility

CT/Engine incorporates an interface to the standard MVS system trace capability provided by the IBM Generalized Trace Facility (GTF). Candle's General Trace Facility:

- Eliminates potential diagnostic data loss that can be caused by the wrapping action of the CL/ENGINE internal trace table.
- Enables the full Request Unit (RU) to be seen (ACF/VTAM™ buffer trace facilities provide a maximum of approximately 200 bytes of RU data) when tracing session data.
- Provides operator commands to activate and deactivate buffer tracing on specified physical and virtual sessions.

Figure 7 on page 54 contains sample JCL to run GTF as a started task. Modify the JCL as needed, then store the modified procedure in a system procedure library (for example, SYS1.PROCLIB).

```

//GTF      PROC
//IEFPROC EXEC PGM=AHLGTF, PARM='MODE=EXT,DEBUG=NO,TIME=YES',
//          REGION=2000K,DPRTY=(15,15)
//IEFRDER DD  DSNNAME= tracedsn ,UNIT=SYSDA,
//          VOL=SER= tvol ,SPACE=(TRK,(30)),
//          DISP=(NEW,CATLG)

```

Figure 7. Sample GTF Started Task JCL

Modify the JCL as follows:

1. Change **tracedsn** to the dataset name for the trace dataset.
2. Change **tvol** to the volume serial (volser) number for the trace dataset.

The CL/ENGINE GTRACE command can activate tracing for a single physical or virtual session. The physical terminal node name or the virtual terminal APPL name is specified in the GTRACE command.

Candle VSSTRACE Facility

The Candle VSSTRACE facility traces all physical and virtual session activity for all CL/SUPERSESSION user IDs or specified groups of user IDs.

A single VSSTRACE command can initiate tracing for all sessions associated with a user or group of users. There is no need to know the physical terminal node name or virtual terminal APPL name. Only the user ID is specified in the VSSTRACE command. Trace command processing identifies the appropriate sessions to be traced.

Determining Which Trace Facility to Use

The trace facility you use depends on the product component being used, that is, CL/SUPERSESSION or CL/GATEWAY.

For recreatable CL/SUPERSESSION problems where an application acts differently under CL/SUPERSESSION than it did without CL/SUPERSESSION, include an ACF/VTAM buffer trace of the application functioning correctly (without CL/SUPERSESSION) in addition to the appropriate CL/SUPERSESSION trace of the failure.

To determine if an application is running under CL/SUPERSESSION or CL/GATEWAY, enter the **i** action code next to the problem session ID on your CL/SUPERSESSION menu. The resulting pop-up window indicates the session type:

- MULTI indicates that the application is running under CL/SUPERSESSION. Refer to “Tracing CL/SUPERSESSION Multi-Session Problems” on page 57.
- SINGLE indicate that the application is running under CL/GATEWAY only. Refer to “Tracing CL/GATEWAY Single Session Problems” on page 56.
- PASS indicate that the application is accessed through CL/GATEWAY, but has passed control to the application. Refer to “Tracing CL/GATEWAY Pass Session Problems.”

CT/Engine issues trace records (called USR records) to the GTF dataset. GTF must be started with the USR option for trace records to be recorded. You can then format the USR records for printing using the procedure described in “Formatting Trace Records for Printing (KLSUSR20 Formatter)” on page 58.

CT/Engine recording uses GTF in the same way that the ACF/VTAM TYPE=BUF trace does.

Note: In all cases, a trace that includes a VTAM Bind is required.

Starting and Stopping VTAM TRACES

To start a buffer trace, enter the following:

```
F procname,TRACE,TYPE=BUF,ID=termid
```

In the example above, *procname* identifies the procedure name for VTAM. Procedure name differs for each operating system.

To stop a buffer trace, enter the following:

```
F procname,NOTRACE,TYPE=BUF,ID=termid
```

Tracing CL/GATEWAY Pass Session Problems

If the problem occurs before the selected application writes any data to the screen, obtain a trace as described in “Tracing CL/GATEWAY Single Session Problems” on page 56.

If the problem occurs after the selected application writes data to the screen, obtain a VTAM buffer trace.

Tracing CL/GATEWAY Single Session Problems

Use the following procedure to generate a Candle General Trace. (In the procedure, user entries and system responses are labeled appropriately.)

1. Enter the following commands at your system console:

Enter: S GTF.GTF

Response: xx AHL100A SPECIFY TRACE OPTIONS

Enter: R xx,TRACE=USR

Response AHL103I TRACE OPTIONS SELECTED --USR
yy AHL125A RESPECIFY TRACE OPTIONS OR REPLY U

Enter: R yy,U

Response: AHL031I GTF INITIALIZATION COMPLETE

where **XX** is the numerical response required by MVS.

2. Initiate the Candle General Trace Facility, as follows:

Enter: F KLS,GTF ON

Response: KLVOP971 GTF INTERFACE ENABLED GTRACEID: xxxx
(3E8)
INTERNAL: NO

3. Initiate GTRACE, as follows:

Enter: F KLS,GTRACE pterm CLASS=TERM ON

Response: KLVOP128 TRACE TERM(pterm) QUEUED

where *pterm* is the LU name of the physical terminal. In this example *pterm* would be L615A70.

4. Recreate the problem at this point. Make sure that the user initiates a login to CL/GATEWAY at this point so BINDs can be recorded.
5. Turn off tracing, as follows:

Enter: F KLS,GTRACE pterm CLASS=TERM OFF

Response. KLVOP128 TRACE TERM(pterm) DISABLED

Enter: F KLS,GTF OFF

Response: KLVOP972 GTF INTERFACE DISABLED
Enter: P GTF
Response: AHL006I GTF ACKNOWLEDGES STOP COMMAND

Tracing CL/SUPERSESSION Multi-Session Problems

The VSSTRACE procedure uses the CT/Engine operator commands GTF and VSSTRACE to activate the required trace(s). In the following procedure, information about the virtual and physical sessions for one user is written to GTF.

1. Start the trace by issuing the following commands. (In the procedure, user entries and system responses are labeled.)

Enter: S GTF.GTF
Response: xx AHL100A SPECIFY TRACE OPTIONS
Enter: R xx,TRACE=USR
Response: AHL103I TRACE OPTIONS SELECTED --USR
yy AHL125A RESPECIFY TRACE OPTIONS OR REPLY U
Enter: R yy,U
Response: AHL031I GTF INITIALIZATION COMPLETE

2. Initiate Candle GTF tracing as follows:

Enter: F KLS,GTF ON
Response: KLVOP971 GTF INTERFACE ENABLED GTRACEID: xxxx
(3E8) INTERNAL: NO

3. Initiate the CANDLER VSSTRACE facility as follows:

Enter: F KLS,VSSTRACE userid ON
Response: KLUOP202 TRACE USER(userid) QUEUED

4. Recreate the problem at this point. Make sure that the user initiates a logon to CL/SUPERSESSION at this point so BIND images can be recorded.

5. Turn off tracing, as follows:

Enter: F KLS,VSSTRACE userid OFF

Response: KLUOP202 TRACE USER(userid) DISABLED

Enter: F KLS,GTF OFF

Response: KLVOP972 GTF INTERFACE DISABLED

Enter: P GTF

Response: AHL006I GTF ACKNOWLEDGES STOP COMMAND

Note the following:

- The command VSSTRACE can be followed by a *userid* or *userids*. If it is, trace activity is limited to physical and virtual session activity related to the specified user IDs.
- Specifying ON starts the trace. (Specifying OFF stops it.)
- The trace facility can also be started automatically as part of the CL/ENGINE initialization by incorporating the GTF and VSSTRACE commands in a startup command list.
- The user should not be logged on when the VSSTRACE command is issued. If the user is not logged on, the command is treated as a pending trace request; tracing begins when the user logs on. (Pending trace requests are discarded when the system is brought down.)

Once the trace is recorded, use the appropriate procedure in “Formatting Trace Records for Printing (KLSUSR20 Formatter)” to format the data for printing. You can then print the data and analyze it yourself using the sample traces in “Sample Traces” on page 61, or you can copy the unformatted data to tape and ship it to Candle for analysis. (Refer to “Copying a Trace to Tape” on page 61 for procedures.)

Formatting Trace Records for Printing (KLSUSR20 Formatter)

This section describes using the Candle trace facilities to perform your own analysis of communications problems.

The current release of CT/Engine uses the GTF trace record format identifiers (FIDs) X'20' through X'4F'. All current CT/Engine records are formatted by a single module named KLSUSR20. Due to the limited number of alias names that may be assigned to a load module, KLSUSR20 is replicated twice in the load library as KLSUSR30 and KLSUSR40. Each copy of the module is assigned fifteen alias names as follows:

KLSUSR20 alias KLSUSR21-KLSUSR2F
 KLSUSR30 alias KLSUSR31-KLSUSR3F
 KLSUSR40 alias KLSUSR41-KLSUSR4F

The load module and alias names were selected to meet IBM-specified naming requirements for AMDPRDMP and IPCS format appendages. The formatting routine is distributed as an assembler language source module in member KLSUSR20 of the supplementary library (TLSSAMP).

MVS/370 and MVS/XA AMDPRDMP Requirements

KLSUSR20 and its alias names must be available to AMDPRDMP when CT/Engine GTF trace records are to be formatted. You can accomplish this by using the sample JCL in the TLSSAMP member KLSUSR20 to assemble and link-edit the source module.

The JCL and AMDPRDMP control statements needed to print CT/Engine trace records are demonstrated in Figure 8. A similar version is distributed in the supplementary library member KLV@ADMP.

```

//KLV@ADMP JOB (ACCOUNTING),'CL/ENGINE GTFPRINT'
//*****
//* XA AMDPRDMP - PRINT CL/ENGINE GTF TRACE RECORDS
//*
//* 3E8 = CL/ENGINE TRACE RECORD DEFAULT ID (GTRACEID=1000)
//*
//* FE1 = VTAM INTERNAL TRACE
//* FE2 = TSO/VTAM TGET/TPUT
//* FEF = VTAM BUFFER
//* FF1 = USER BUFFER
//* FF0 = SMS
//* FF2 = NCP LINE
//*
//* EXAMPLE:  EDIT DDNAME=TRACE,USR=(3E8,FEF)
//*
//*****
//PRDMP   EXEC PGM=IKJEFT01,PARM='AMDPRDMP'
//STEPLIB DD DSN=loadlib,DISP=SHR
//SYSPRINT DD SYSOUT=*
//SYSUDUMP DD SYSOUT=*
//INDEX   DD SYSOUT=*
//PRINTER DD SYSOUT=*
//SYSTSPRT DD DUMMY
//SYSTSIN DD DUMMY,DCB=(RECFM=F,LRECL=80,BLKSIZE=80)
//SYSUT1  DD UNIT=SYSDA,SPACE=(4104,(1027,191))
//TRACE   DD DSN=tracedsn,DISP=SHR
          TITLE GTF PRINT FOR CANDLE PROBLEM #99999
          EDIT DDNAME=TRACE,USR=(3E8)
          END
  
```

Figure 8. Sample KLV@ADMP JCL for MVS/XA Systems

To use the JCL, change **loadlib** to your CL system target load library name. Change **tracedsn** to the name of the dataset containing the unformatted trace data.

MVS/ESA IPCS Requirements

In MVS/ESA™ systems, the AMDPRDMP service aid is no longer available; most AMDPRDMP functions are now provided by IPCS. The IPCS GTFTRACE command replaces the AMDPRDMP EDIT function for formatting GTF trace data. GTFTRACE supports the existing AMDPRDMP format appendage interface for GTF trace record processing. This allows existing MVS/370 and MVS/XA™ AMDPRDMP format appendages to be used without modification on MVS/ESA systems.

KLSUSR20 and its alias names must be available to IPCS when CT/Engine GTF trace records are to be formatted. This can be accomplished by using sample JCL in TLSSAMP member KLS@AS20 to assemble and link-edit the source module, KLSUSR20. The JCL and IPCS control statements needed to print CT/Engine trace records are demonstrated in Figure 9. A similar version is distributed in the supplemental library as member KLS@IPCS.

```
//KLS@IPCS JOB (ACCOUNTING),'CL/ENGINE GTFPRINT'  
//*****  
//* ESA IPCS BATCH - PRINT CL/ENGINE GTF TRACE RECORDS  
//*  
//* 3E8 = CL/ENGINE TRACE RECORD DEFAULT ID (GRACEID=1000)  
//*  
//* FEF = VTAM BUFFER  
//* FF1 = USER BUFFER  
//* FF0 = SMS  
//* FF2 = NCP LINE  
//* FE1 = VTAM INTERNAL TRACE  
//* FE2 = TSO/VTAM TGET/TPUT  
//* EXAMPLE: GTFTRACE DDNAME(TRACE),USR(FF2,FEF)  
//*           GTFTRACE DDNAME(TRACE),RNIO,USR(ALL)  
//*****  
//IPCSBAT EXEC PGM=IKJEFT01,DYNAMNBR=20,REGION=1500K  
//STEPLIB DD DSN=loadlib,DISP=SHR  
//IPCSDDIR DD DSN=dumpdir,DISP=SHR  
//IPCSPRNT DD SYSOUT=*  
//TRACE DD DSN=tracedsn,DISP=SHR  
//SYSUDUMP DD SYSOUT=*  
//SYSTSPRT DD SYSOUT=*  
//SYSTSIN DD *  
IPCS  
DROPDUMP DDNAME(TRACE)  
SETDEF DDNAME(TRACE),NOCONFIRM  
GTFTRACE DDNAME(TRACE),USR(3E8),TERMINAL,NOPRINT  
END
```

Figure 9. Sample KLS@IPCS JCL for MVS/ESA Systems

To use the JCL, change **loadlib** to the CL system target load library name. Change **dumpdir** to the IPCS dump directory name that conforms to your environment's IPCS dump datasets. Change **tracedsn** to the name of the dataset containing the unformatted trace data.

Copying a Trace to Tape

The GTF trace dataset is a standard sequential dataset. Use the procedure documented in “Copying an SVC Dump and Other Sequential Datasets to Tape” on page 48 to copy the GTF trace dataset.

Sample Traces

This section provides three sample traces with detailed explanations. For ease of reference, each trace is divided into segments. Use the examples when analyzing your own trace records.

Note: These traces are examples only and will not match your trace data.

Sample Trace of CL/SUPERSESSION Main Menu

Each CT/Engine GTF record has a GTRACEID of 3E8. Look for this identifier when locating the beginning of a record. Each record contains a GTF format appendage identifier, or FID (for example, USR4F), ASCB address (for example, 00F92900), and job name (for example, KLV). A record has associated sequence and segment numbers. Sequence numbers begin with SQ; segment numbers begin with SG. The first field of every CT/Engine trace record is labeled SQxxx and is a sequential counter of GTF recording requests within CT/Engine. It should not be confused with the SNA transmission sequence number that is also labeled SQxxx. The SNA transmission sequence number appears later on the same line, immediately after the Return/Feedback field RFxxx.

Many trace records consist of only a single segment, SG0000. Additional segments for a particular record sequence number are numbered sequentially and are only used for message data (3270 data streams or SNA RU data) that could not fit within a single GTF record. GTF limits the record size to 256 bytes.

However, there is no limit to the number of Request Unit (RU) bytes provided by a CT/Engine buffer trace. In Figure 10 on page 62, the Main Menu consists of 928 bytes. This data resides in two CT/Engine buffers in memory. The first buffer has an address of 338F1A0 and length of hexadecimal 1F8 (decimal 504) bytes. The second buffer has an address of 338F3A8 and length of hexadecimal 1A8 (decimal 424) bytes. Each GTF record has an associated time stamp (TIME:).

```

USR4F 3E8 ASCB 00F92900          JOBN KLV
SQ008E SG0000 KLVVTAPI PTERM/GATEWAY SEND DATA REQ RF0000 SQ001E SN00000000 OC DRI CD
DAT 00000000 00000000 0338F1A0 000001F8 00000000 00000000 0338F3A8 00001A8 *.....1....8.....3Y...Y*
                                TIME: A1A92907 C3EF4743 06:42:38.715636

```

Figure 10. CL/SUPERSESSION Main Menu Sent to the Physical Terminal

The following is an item-by-item description of the first (header) segment.

- USR4F is the GTF Format ID (FID).
- 3E8 is the GTRACEID.
- ASCB 00F92900 is the ASCB address.
- KLV is the job name.
- SQ008E, SG0000 identifies CL/ENGINE trace record X'008E', segment 0. This first line contains the SNA Transmission header and the Request/Response header related to the Main Menu RU data sent from the gateway to the physical terminal.
- The name KLVVTAPI identifies the CL/ENGINE module that created the record.
- PTERM/GATEWAY identifies the destination/origin VTAM LU names participating in this session. In this case, application GATEWAY originates the Main Menu RU, and the physical terminal PTERM receives the message.
- SEND identifies the VTAM macro that CT/Engine issues. Some other commonly used VTAM macros are RECEIVE and OPENSEC. Most SEND data and all RECEIVE data are contained within a single trace record sequence number. (There may be multiple segments.) CT/Engine uses VTAM's LMPEO to send large messages that are contained in multiple buffer areas. The first trace record of an LMPEO send contains the addresses and byte counts of each buffer that is part of the message. A subsequent trace record (there may be multiple segments) is created for each buffer that is part of the message. This particular trace record is for a SEND using LMPEO.
- DATA identifies the RU as a data request or response. For RUs which contain network commands (command requests) or responses to command requests, you see such things as BIND, SDT, BID, and UNBIND.
- REQ identifies this RU as an SNA request. In Figure 16 on page 64, item RSP identifies that particular Path Information Unit (PIU) as a response.
- RF0000 describes the Return Code (R) and Feedback (F) that VTAM returns in response to the SEND macro.
- SQ001E is the SNA sequence number that would appear in the SNA transmission header when the RU is in the network. Figure 16 on

page 64 shows a sequence number of X'1E' for the response PIU. This PIU is a response to the Main Menu request RU sent by CL/GATEWAY.

- SN00000000 is the Sense Code field. Figure 16 on page 64 also shows a value of SN00000000. When an SNA Exception Response or Exception Request is received, the sense code field contains the associated SNA sense information.
- OC identifies the chaining bits from the SNA Request/Response header. This Main Menu RU is an Only in Chain (OC) element. Other values could be MC (Middle in Chain), LC (Last in Chain), or FC (First in Chain).
- DR1 identifies the response type as carried in the second byte of the SNA Request/Response Header. In this case, GATEWAY requires a Definite Response Type 1 (DR1) from the terminal to the Main Menu PIU.
- CD indicates that GATEWAY set the Change Direction indicator for this RU. This, in conjunction with the keyboard reset indication in the 3270 data stream, frees the terminal for input.

The first buffer is divided into three segments: SG0000 (Figure 11), SG0001 (Figure 12), and SG0002 (Figure 13 on page 64).

```

USR4E 3E8 ASCB 00F92900          JOBN KLV
SQ008F SG0000 KLVVTAPI PTERM/GATEWAY
BUF 0338F1A0 000001F8
DAT 7EC31140 401D406D 6D6D1DC8 40C183A3 899695A2 1DC840D6 97A3 8996 95A21DC8 *?.1...8 *
40C39694 94819584 A21DC840 C1849489 954DD45D 1DC840C5 A789 A34D E75D1DC8 *C. . . .H ACTIONS.H OPTIONS.H*
40C88593 971DE83C C150401D E8606060 60606060 60606060 6060 6060 60606060 * COMMANDS.H ADMIN(M).H EXIT(X).H*
60606060 60606060 60606060 60606060 60606060 60606060 6060 6060 60606060 * HELP.Y.A& .Y-----*
60606060 60606060 60606060 60606060 60606060 60606060 6060 6000 1D60E2E5 *-----KLS*
E2C5D3C5 D53CC2F9 001DE8C3 D361E2E4 D7C5D9E2 C5E2E2C9 D6D5 40D4 81899540 *VSEL1.B9..YCL/SUPERSESSON MAIN *
D48595A4 3CC36100 1D60D496 99857A00 404E3CC3 *MENU.C/...MORE:. .+C
TIME: A1A92907 C3F2D943 06:42:38.715693

```

Figure 11. Main Menu First Buffer Segment SG0000

```

USR4E 3E8 ASCB 00F92900          JOBN KLV
SQ008F SG0001
DAT 6F001D60 3CC65000 1D60E285 938583A3 00A285A2 A2899695 A200 A689 A3880081 *?....F&..-SELECT.SESSIONS.WITH.A*
1DE87F61 7F1D6096 99008195 008183A3 89969500 83968485 4B3C C8F0 001DE800 *.Y"/".-OR.AN.ACTION.CODE..HO..Y.*
0000E285 A2A28996 9500C9C4 0000C485 A2839989 97A38996 953C C960 00E3A897 *..SESSION.ID..DESCRIPTION.I-.TYP*
853CC9E9 00E2A381 A3A4A23C 4A40001D 60000000 3C4A4E60 0000 3C4A 6E600000 *E.IZ.STATUS. .-....+...>...*
3C4AF660 00003C4B C1603C4B 50001D40 6D1DE800 C1D4E2C3 C9D4 E23C 4B6000C3 *.6-...A-..&.._Y.AMSCIMS...C*
C9D4E23C 4BE9404D D7C1E2E2 E3C8D9E4 61D4E4D3 E3E2C5E2 E25D 3C4C 4000D4A4 *IMS..Z (SINGLE/MULTSESS).<.MU*
93A3893C 4C60001D 406D1DE8 00C1D4E2 D5C5E3E5 C13C4CF0 00D5 C5E3 E5C9C5E6 *LT1.<..._Y.AMSNETVA.<0.NETVIEW*
C1404DD7 C1E2E2E3 C8D9E461 D4E4D3E3 E2C5E2E2 5D3C4D50 00D4 A493 *A (SINGLE/MULTSESS).(&.MUL *
TIME: A1A92907 C3F7BA43 06:42:38.715771

```

Figure 12. Main Menu First Buffer Segment SG0001

```

USR4E 3E8 ASCB 00F92900          JOBN KLV
SQ008F SG0002
DAT A3893C4D F0001D40 6D1DE800 C1D4E2D5 C5E3E5C2 3C4E4000 D5C5 E3E5 C9C5E6C2 *TI.(0.._Y.AMSNETVB.+ .NETVIEWB*
404DD7C1 E2E2E3C8                * (PASSTH
TIME: A1A92907 C3F99643 06:42:38.715801

```

Figure 13. Main Menu First Buffer Segment SG0002

The second buffer has a sequence number of SQ0090 and is divided into two segments: SG0000 (Figure 14) and SG0001 (Figure 15).

```

USR4E 3E8 ASCB 00F92900          JOBN KLV
SQ0090 SG0000 KLVVTAPI PTERM /GATEWAY
BUF 0338F3A8 000001A8
DAT D9E461D4 E4D3E3E2 C5E2E25D 3C4E6000 D4A493A3 893C4F40 001D 406D 1DE800C1 *.3Y...Y *
D4E2D6D7 C5D93C4F 5000D6D7 C5D9C1E3 D6D9404D D7C1E2E2 E3C8 D9E4 61D4E4D3 *RU/MULTSESS).+-.MULTI.| .._Y.A*
E3E2C5E2 E25D3C4F F000D4A4 93A3893C 5050001D 406D1DE8 00C1 D4E2 E3E2D6C1 *MSOPER.|&.OPERATOR (SINGLE/MUL*
3C506000 E3E2D6C1 3C50E940 4DD7C1E2 E2E3C8D9 E461D4E4 D3E3 E2C5 E2E25D3C *TSESS).|0.MULTI.&&.._Y.AMSTSOA*
D14000D4 A493A389 3CD16000 1D406D1D E800C1D4 E2E3E2D6 C73C D1F0 00E3E2D6 *.&-.TSAO.&Z (SINGLE/MULTSESS).*
C73CD1F9 404DD7C1 E2E2E3C8 D9E461D4 E4D3E3E2 C5E2E25D 3CD2 5000 D4A493A3 *J .MULTI.J-.._Y.AMSTSOG.J0.TSO*
893CD2F0 001D406D 1DE800C1 D4E2E3E2 D6C23CD3 *G.J9 (SINGLE/MULTSESS).K&.MULT*
TIME: A1A92907 C3FC7043 06:42:38.715847 *I.K0.._Y.AMSTSOB.L *

```

Figure 14. Main Menu Second Buffer Segment SG0000

```

USR4E 3E8 ASCB 00F92900          JOBN KLV
SQ0090 SG0001
DAT 4000A285 40A3A296 3CD36000 D4A493A3 893CD440 001D406D 1DE8 00C1 D4E2E5E3 *.SE TSO.L-.MULTI.M .._Y.AMSVT*
C1D4C13C D45000D6 D4E5E3C1 D4C14040 4DD7C1E2 E2E3C8D9 E461 D4E4 D3E3E2C5 *AMA.M&.OMVTAMA (SINGLE/MULTSE*
E2E25D3C D4F000D4 A493A389 3CD55000 1DE8403C F0F0001D E83C F350 001D60C3 *SS).M0.MULTI.N&..Y .00..Y.3&.-C*
96949481 9584407E 7E7E6E1D 403CF44E 001D603C F4D340E2 E8E2 C761 D9F2F0F1 *OMMAND ==+.4+..-4L SYSG/R201*
C2F0F240 1D60C595 A3859940 40C6F17E C8859397 4040C6F3 7EC5 A789 A34040C6 *B02.-ENTER F1=HELP F3=EXIT F*
F57ED985 869985A2 884040C6 F87EC6A6 844040C6 F97ED985 A399 8985 A5854040 *5=REFRESH F8=FWD F9=RETRIEVE *
C6F1F07E C183A389 96954040 3C404000 114BD113 *F10=ACTION . ...J. *
TIME: A1A92907 C3FE6C43 06:42:38.715878

```

Figure 15. Main Menu Second Buffer Segment SG0001

The next trace entry, shown in Figure 16, records the physical terminal's response to the Main Menu data.

```

USR4E 3E8 ASCB 00F92900          JOBN KLV
SQ0091 SG0000 KLVVTXRP GATEWAY /PTERM READONLY DATA RSP RF00 00 SQ001E SN00000000 DR1
TIME: A1A92909 0E31AF43 06:42:40.068378

```

Figure 16. Physical Terminal Response to Main Menu

Sample Trace of a Virtual Session Logon

This record traces the first SNA command that an application sends to the terminal during session initiation. This is a BIND from application VTAMPLUS to virtual terminal VTERM000 (this establishes a virtual session). In the example that follows, VTAMPLUS is the CT/Engine operator facility application. There is a concurrent session between GATEWAY and the physical terminal, PTERM (see “Sample Trace of CL/SUPERSESSION Main Menu” on page 61). Applications like the CT/Engine operator facility (and TSO, CICS, IMS, etc.) send screens to the virtual terminal on the virtual session. The CL product then makes sure that these messages are delivered to the physical terminal on the physical session. The physical session is the session between GATEWAY and the physical terminal. The virtual session is the session between the host application (that is, CICS, TSO, etc.) and the virtual terminal.

Note: Candle Support Services requires BIND RUs containing bind images for the physical and virtual sessions in order to analyze VTAM-related problems. Make sure that you have captured BIND information in the trace data before you send it in. BINDs contain critical session rules that the virtual and physical sessions require in order to communicate.

Figure 17 has a sequence number of 000E and a segment number of 0000.

```

USR4E 3E8 ASCB 00F5B600          JOBN KLV
SQ000E SG0000 KLVVTXSC VTERM000/VTAMPLUS READONLY BIND REQ RF0000 SQ0000 SN00000000 OC DR1
RU 31010303 B1903080 008087C7 80000200 00000000 18502B50 7F000000 7 E5E3C1D4 *.....gG.....&.&...VTAM*
D7D3E400 05000003 002308E5 E3C5D9D4 F0F0F060 1AD72B41 DB50CE9 E CB11D5C5 *PLUS.....VTERM000-.P...&....NE*
E3C9C4F0 F0F14BE7 E7E7C4D9 D4F2F50E 11F3D5C5 E3C9C4F0 F0F14BE 5 E3C1D4D7 *TID001.XXXDRM25..3NETID001.VTAMP*
D3E42C0A 01084040 40404040          *LUS...
TIME: A1AA74D3 345A0143 07:27:04.172960
    
```

Figure 17. Application Sends BIND to Virtual Terminal

Figure 18 is a continuation of the first GTF record. It is segment 0001 of sequence number 000E. It contains the last 13 bytes of data that completes the BIND RU started in the previous record segment.

```

USR4E 3E8 ASCB 00F5B600          JOBN KLV
SQ000E SG0001
DAT 40402D09 08C4F4C1 F3F2F7F8 F4          * ...D4A32784
TIME: A1AA74D3 34645E43 07:27:04.173125
    
```

Figure 18. Application Sends BIND to Virtual Terminal (continued)

In Figure 19 on page 66, VTERM000 issues VTAM macro OPNSEC to accept the BIND. VTAM processes the OPNSEC request by creating an SNA positive response (+RSP) to the BIND.

```
USR4E 3E8 ASCB 00F5B600          JOBN KLV
SQ000F SG0000 KLVVTAPI VTAMPLUS/VTERM000 OPNSEC DATA REQ RF0000 SQ0000 SN00000000 OC DR1
TIME: A1AA74D3 368FBA43 07:27:04.182011
```

Figure 19. Virtual Terminal Accepts BIND and Starts Session

This record contains another common SNA command, Start Data Traffic (SDT), which the application sends after establishing the session. VTAM automatically issues an SNA +RSP to the SDT; no action by VTERM000 is necessary.

```
USR4E 3E8 ASCB 00F5B600          JOBN KLV
SQ0010 SG0000 KLVVTXSC VTERM000/VTAMPLUS READONLY SDT REQ RF0000 SQ0000 SN00000000 DR1
TIME: A1AA74D3 38682641 07:27:04.189570
```

Figure 20. Application Sends Start Data Traffic

The BIND request (Figure 17 on page 65) specified bracket protocol. Figure 21 indicates that application VTAMPLUS sent a BID command requesting permission to begin a bracket. This RU carries an SNA sequence number of SQ0001.

```
USR4E 3E8 ASCB 00F5B600          JOBN KLV
SQ0011 SG0000 KLVVTAPI VTERM000/VTAMPLUS RECEIVE BID REQ RF0000 SQ0001 SN00000000 OC DR1
TIME: A1AA74D3 413FEA43 07:27:04.225790
```

Figure 21. Application BIDs to Begin a Bracket

VTERM000 sends a positive response (+RSP) to the BID RU. (SNA sequence number SQ0001, which matches the sequence number in Figure 22 on page 67, identifies this as a response to the BID.) Essentially, VTERM000 is saying to VTAMPLUS, “OK, you can talk to me.”

```

USR4E 3E8 ASCB 00F5B600          JOBN KLV
SQ0012 SG0000 KLVVTAPI VTAMPLUS/VTERM000 SEND  BID RSP RF0000 SQ0001 SN00000000 OC DR1
TIME: A1AA74D3 645C7A43 07:27:04.369607

```

Figure 22. Virtual Terminal Accepts BID

Figure 23 is a three-segment (SQ0013-SG0000, SQ0013-SG0001, SQ0013-SG0002) data message that VTAMPLUS is sending to the virtual terminal. The request (REQ) has an SNA sequence number of SQ0002. It contains the Entry Validation panel, which asks the user to enter a user ID and password. This message is not forwarded to the physical terminal because the initial dialog for APPLDEF VTAMPLUS is in effect.

Note: Initial dialogs are specified in the APPLDEF commands; see commands library member(KLSCAPLD). One of their functions is to simulate certain user tasks, such as typing a user ID and password.

```

USR4E 3E8 ASCB 00F5B600          JOBN KLV
SQ0013 SG0000 KLVVTAPI VTERM000/VTAMPLUS RECEIVE DATA REQ RF0000 SQ0002 SN00000000 OC DR1 BB CD
DAT 7EC31D60 60606060 60606060 60606060 60606060 60606060 60606060 60606060 *C.-----*
601DE800 C595A399 A800E581 93898481 A3899695 001D6060 60606060 60606060 *-Y.Entry.Validation.-----*
60606060 60606060 60606060 60606060 60606060 00000000 C896A2A3 7A00E2E8 *-----Host:SY*
TIME: A1AA74D3 6619EA43 07:27:04.376734
*
*

USR4E 3E8 ASCB 00F5B600          JOBN KLV
SQ0013 SG0001
DAT E2C711C2 D1C481A3 857A00F0 F261F1F5 61F9F000 00C485A5 8983857A 00D9C7C5 *SG.BJDate:.02/15/90..Device:.RGE*
D5F6F0F0 F111C361 E3899485 7A00F0F7 7AF2F77A F0F411D4 4DC98485 95A38986 *N6001.C/Time:.07:27:04.M(Identif*
898381A3 8996957A 11D55011 D5E5E4A2 85998984 1DE87E7E 7E6E1DC8 11D5F91D *ication:.N&.NVUserid.Y====>.H.N9.*
6011D660 11D6F3D7 81A2A2A6 9699841D E87E7E7E 6E1D4C11 D7C91D60 11D750D5 *-0-.03Password.Y====>.<.PI.-.P&N*
85A600D7 81A2A2A6 9699841D E87E7E7E 6E1D4C11 D76A1D60 11D94011 D9C5C184 *ew.Password.Y====>.<.P|.R .REAd*
8489A389 96958193 00C99586 96999481 A3899695 7A115A50 115AE6C7 9996A497 *ditional.Information:!.&.IWGroup*
1DE87E7E 7E6E1DC8 115AF91D 60115B60 115BF7C1 8383A31D E87E7E7E 6E1DC811 *.Y====>.H.!9.-.$7Acct.Y====>.H.*
5C6A1D60 115CF011 5DC7D799 96831DE8 7E7E7E6E 1DC8115D D91D6011 **|..*0.)GProc.Y====>.H.)R.-. *
TIME: A1AA74D3 661C8043 07:27:04.376776

USR4E 3E8 ASCB 00F5B600          JOBN KLV
SQ0013 SG0002
DAT 60601D60 11F2C111 F3501D60 C3969494 8195841D 607E7E7E 6E1D4011 F4601D60 *--.-.2A.3.-Command.====>.4-.-*
C595A385 994040C6 F37EC5A7 89A34040 11D5F113 *Enter F3=Exit .N1.
TIME: A1AA74D3 661E7843 07:27:04.376807

```

Figure 23. Logon Entry Validation Panel Sent by Application to Virtual Terminal

Figure 24 on page 68 is a +RSP from VTERM000 to VTAMPLUS. It carries an SNA sequence number of SQ0002, which matches the message in Figure 23. This is a positive response to the Entry Validation panel.

```
USR4E 3E8 ASCB 00F5B600          JOBK KLV  
SQ0014 SG0000 KLVVTAPI VTAMPLUS/VTERM000 SEND DATA RSP RF0000 SQ0002 SN00000000 OC DR1 BB  
TIME: A1AA74D3 667AF943 07:27:04.378287
```

Figure 24. Virtual Terminal Acknowledges Receipt of Panel

Figure 25 is a data request from VTERM000 to VTAMPLUS. It contains the user ID USER00 and password PSSWD1. The user at the terminal made no entries; the initial SSPL dialog issued a VSSTYPE command with USER00 and PSSWD1. The Change Direction (CD) bit is ON. This means that VTERM000 is locked for input until application VTAMPLUS unlocks it with another CD or End Bracket (EB).

```

USR4E 3E8 ASCB 00F5B600          JOBN KLV
SQ0015 SG0000 KLVVTAPI VTAMPLUS/VTERM000 SEND DATA REQ RF0000 SQ0001 SN00000000 OC XDR1 CD
DAT 7DD7C711 D5F1E4E2 C5D9F0F0 11D7C1D7 E2E2E6C4 F1          *'PG.N1USER00.PAPSSWD1
TIME: A1AA74D3 76DBAA43 07:27:04.445370

```

Figure 25. User ID and Password Sent to Application by Virtual Terminal

At this point, the initial dialog ends and messages from VTAMPLUS to VTERM000 must be delivered to the physical terminal. Figure 26 contains a message from VTAMPLUS to the virtual terminal. The RU contains Only in Chain (OC) and End Bracket (EB) indications, and requests a positive response.

```

USR4E 3E8 ASCB 00F5B600          JOBN KLV
SQ001A SG0000 KLVVTAPI VTERM000/VTAMPLUS RECEIVE DATAREQ RF0000 SQ0003 SN00000000 OC DR1 EB
DAT F1C311F5 E51DE8C1 60E5E3C5 D9D4F0F0 F0          *'C.5V.YA-VTERM000
TIME: A1AA74D4 92835643 07:27:05.607221

```

Figure 26. Logon Message From Application Received by Virtual Terminal

Figure 27 indicates that VTERM000 sends a positive response to CT/Engine.

```

USR4E 3E8 ASCB 00F5B600          JOBN KLV
SQ001C SG0000 KLVVTAPI VTAMPLUS/VTERM000 SEND DATA RSP RF0000 SQ0003 SN00000000 OC DR1 EB
TIME: A1AA74D5 A2930441 07:27:06.721584

```

Figure 27. Virtual Terminal Acknowledges Logon Message

In Figure 28 on page 70, the virtual terminal issues VTAM macro RESETSR to change the RECEIVE mode. The RESETSR entries that appear frequently in the traces are a VTAM application program interface convention and are not related to SNA data traffic in the network.

```

USR4E 3E8 ASCB 00F5B600          JOBN KLV
SQ0022 SG0000 KLVVTAPI VTAMPLUS/VTERM000 RESETSR NEXT 00000000 00000000
TIME: A1AA74D5 ACB0A141 07:27:06.763018

```

Figure 28. Receive Mode Change

Figure 29 indicates that GATEWAY is preparing to send an output message to the PTERM. At this time, the PTERM's keyboard is unlocked and PTERM owns the SNA direction indicator. GATEWAY sends an SNA SIGNAL request to ask PTERM to relinquish the SNA direction indicator.

```

USR4E 3E8 ASCB 00F5B600          JOBN KLV
SQ0023 SG0000 KLVVTAPI PTERM/GATEWAY SEND SIGNAL REQ RF0000 SQ0000 SN00000000 OC DRI
TIME: A1AA74D6 F41D8141 07:27:08.104152

```

Figure 29. GATEWAY SIGNALs for Send Direction

Figure 30 indicates that the physical terminal sends a null RU (that is, no data) with the Change Direction (CD) indication, allowing GATEWAY to start sending data.

```

USR4E 3E8 ASCB 00F5B600          JOBN KLV
SQ0024 SG0000 KLVVTAPI GATEWAY/PTERM RECEIVE DATA REQ RF0000 SQ0003 SN00000000 OC XDR1 CD
TIME: A1AA74D6 F42A8C41 07:27:08.104360

```

Figure 30. Physical Terminal Relinquishes Send Direction with Null RU

In Figure 31, GATEWAY delivers the logon message received on the virtual session (Figure 26 on page 69) to the physical terminal.

```

USR4E 3E8 ASCB 00F5B600          JOBN KLV
SQ0025 SG0000 KLVVTAPI PTERM/GATEWAY SEND DATA REQ RF0000 SQ0008 SN00000000 OC DRI CD
DAT F1C311F5 E51DE8C1 60E5E3C5 D9D4F0F0 F0          *1C.5V.YA-VTERM000
TIME: A1AA74D6 F6F87041 07:27:08.115847

```

Figure 31. GATEWAY SENDs Logon Message to Physical Terminal

Sample Trace of a Virtual Session Logoff

In Figure 32, the user types LOGOFF at the terminal to terminate the session with application VTAMPLUS. This is an Only in Chain (OC) RU with exception response (XDR1) requested and Change Direction (CD) indications. It originated at the physical terminal and its destination is GATEWAY (the physical terminal is always in session with a host PLU application in the CT/Engine address space, GATEWAY in this example).

```
USR4E 3E8 ASCB 00F5B600          JOBN KLV
SQ0037 SG0000 KLVVTAPI GATEWAY/PTERM RECEIVE DATA REQ RF00 00 SQ0007 SN00000000 OC XDR1 CD
DAT 7DF2C711 F2C19396 87968686          *'2G.2A1ogoff *
      TIME: A1AA74E0 6CF97E41 07:27:18.036375
```

Figure 32. User Enters Logoff Request from Physical Terminal

In Figure 33, GATEWAY issues VTAM macro RESETSR to change the RECEIVE mode.

```
USR4E 3E8 ASCB 00F5B600          JOBN KLV
SQ0038 SG0000 KLVVTAPI PTERM/GATEWAY RESETSR NEXT 00000000 00000000
      TIME: A1AA74E0 6E504C41 07:27:18.041871
```

Figure 33. Receive Mode Change

Figure 34 shows the LOGOFF message being forwarded from the virtual terminal to the application. It requests an exception response (XDR1), along with Only in Chain (OC), Change Direction (CD), and Begin Bracket (BB) indications.

```
USR4E 3E8 ASCB 00F5B600          JOBN KLV
SQ0039 SG0000 KLVVTAPI VTAMPLUS/VTERM000 SEND DATA REQ RF000 0 SQ0002 SN00000000 OC XDR1 BB CD
DAT 7DF2C711 F2C19396 87968686          *'2G.2A1ogoff *
      TIME: A1AA74E0 7E994D43 07:27:18.108564
```

Figure 34. Logoff Request Sent to Application by Virtual Terminal

In Figure 35 on page 72, VTAMPLUS is sending the last message from its buffers to VTERM000 with Definite Response (DR1), End Bracket (EB), and Only in Chain (OC) indications.

```

USR4E 3E8 ASCB 00F5B600          JOBN KLV
SQ003A SG0000 KLVVTAPI VTERM000/VTAMPLUS RECEIVE DATA REQ RF0 000 SQ0008 SN00000000 OC DR1 EB
DAT F1C311F2 401DC813 12F5E5          *1C.2 .H..5V *
TIME: A1AA74E0 972D0343 07:27:18.209232

```

Figure 35. Final Application Message Received by Virtual Terminal

In Figure 36, VTERM000 issues a positive response to the previous RU.

```

USR4E 3E8 ASCB 00F5B600          JOBN KLV
SQ003B SG0000 KLVVTAPI VTAMPLUS/VTERM000 SEND DATA RSP RF0000 SQ0008 SN00000000 OC DR1 EB
TIME: A1AA74E0 A7A65C43 07:27:18.276709

```

Figure 36. Virtual Terminal Positive Response

In Figure 37, GATEWAY delivers the last message received by VTERM000 to the terminal. This RU carries the Change Direction (CD), and the keyboard reset indications which unlock the keyboard and remove the X-CLOCK/X-SYSTEM message from the display.

```

USR4E 3E8 ASCB 00F5B600          JOBN KLV
SQ003C SG0000 KLVVTAPI PTERM/GATEWAY SEND DATA REQ RF0000 SQ000C SN00000000 OC DR1 CD
DAT F1C311F2 401DC813 12F5E5          *1C.2 .H..5V *
TIME: A1AA74E0 A8E30A43 07:27:18.281776

```

Figure 37. Final Application Message Sent to the Physical Terminal

In Figure 38, VTAMPLUS sends the UNBIND request to VTERM000, which terminates the virtual session.

```

USR4E 3E8 ASCB 00F5B600          JOBN KLV
SQ003D SG0000 KLVVTXSC VTERM000/VTAMPLUS READONLY UNBIND REQ RF0000 SQ0000 SN00000000 OC DR1
RU 32010000 0000601A D72B41DB 50CE9ECB 11E4E2C3 C1C3D6F0 F14B C3C3 C3C4D9D4 *.....-P...&.....USCAC001.CCCDRM*
F2F5          *25
TIME: A1AA74E0 D2FAA943 07:27:18.454186

```

Figure 38. Virtual Session Termination

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