

Peregrine

ServiceCenter

Distributed Services

Release 6

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Contents

	Introducing Distributed Services	7
	Knowledge requirements	8
	Sample screens and examples	8
	Need further assistance?	8
	Customer Support	8
	Documentation Web site	8
	Education Services Web site	9
Chapter 1	ServiceCenter Distributed Services	11
	SCD requirements	12
	Configuring ServiceCenter distributed binaries	12
	Enabling Distributed Ticketing	16
	Verifying that both servers are communicating	16
	Setting up the Incident Management environment	18
	Selecting the locking mechanism	28
	Setting up Conflict Resolution	28
	Setting up Global Locking	29
	Testing ServiceCenter Distributed	30
	Using the dtqueue form.	31
	Incident Management page history records.	32
	Call closure conflicts	33
Chapter 2	Establishing Remote Server Connections	35
	Using the remote server connection.	36
	Opening the scdsites file.	37

	Creating an scdsites record.	38
	Modifying the sc.ini file	39
	Implementing modifications	40
Chapter 3	Global Locking	43
	Understanding Global Locking	44
	Conflict Resolution vs. Global Locking	44
	The Global Locking process	45
	The owning site	45
	The life cycle of a Global Lock	45
	Accessing the Global Locking environment.	46
	Viewing Lock information.	46
	Calling Global Locking	47
Chapter 4	File Replication	49
	Understanding file replication	50
	Upgrading replicated systems	50
	Identifying replication candidates.	51
	Avoiding poor candidates	51
	Qualified candidates	53
	Calling the Replicate Function	53
	File replication	54
	Verifying file replication using dtshad	57
	Replicating additional files	58
	Viewing file update information	59
	Synchronizing files	60
Chapter 5	Master Site	61
	About the master site	62
	Setting up the master site	64
Chapter 6	Sample Implementation Flows and Parameters	65
	Common situations	66
	Owner updates ticket	66
	Non-owner updates ticket.	67
	Owner updates and reassigns ticket	67

	Non-owner updates and reassigns ticket	68
	Non-local secondary assignment groups	69
	ServiceCenter parameters	69
	Operational parameters	70
	Special parameters	76
	Help parameters	77
	SCD start-up commands	78
Chapter 7	Troubleshooting	81
	Considerations.	82
	Common problems.	82
	Connection not available with other sites	83
	Connecting with new server and reconnecting after network error	84
	Connecting with load manager.	84
	Shadow tickets not being updated	85
	Owning site not getting updates from shadow sites	86
	Incident ticket errors during updates	86
	Cannot check on or remove a Global Lock	87
	Distributed conflict resolution	88
	Schedule record description	88
	ServiceCenter log error messages and codes	89
	Log format	89
	Severity levels	90
	Error messages	90
	Index.	107

Introducing Distributed Services

The *Distributed Services* guide aids ServiceCenter administrators who are responsible for setting up Distributed Services. With Distributed Services, users can open tickets at one site and assign them to another site. Users can update tickets at either site, and review the results at both sites.

The following table shows you where to find more information about Distributed Services.

This section	Provides information about
<i>Chapter 1, ServiceCenter Distributed Services</i>	the quickest method to set up ServiceCenter Distributed Services (SCD).
<i>Chapter 2, Establishing Remote Server Connections</i>	how to establish the profile for each remote server connection using the <code>scdsites</code> file instead of <code>sc.ini</code> .
<i>Chapter 3, Global Locking</i>	helping administrators decide whether to choose global locking in their system.
<i>Chapter 4, File Replication</i>	how to set up and when to use file replication with SCD.
<i>Chapter 5, Master Site</i>	the Master Site option and how to set it up.
<i>Chapter 6, ServiceCenter parameters</i>	sample configuration scenarios and tables of the operational parameters.
<i>Chapter 7, Troubleshooting</i>	finding and correcting problems with the SCD system.

Knowledge requirements

You must have a working knowledge of Peregrine Systems ServiceCenter and its installation platform. Refer to the *Installation and Configuration Guide* and Technical Reference topics of *Administering ServiceCenter* online help for more detailed information about installing and configuring ServiceCenter.

Sample screens and examples

The sample screens and examples included in this guide are for illustration only, and may differ from those at your site.

Need further assistance?

For further information and assistance with this release, you can download documentation or schedule training.

Customer Support

For further information and assistance, contact Peregrine Systems Customer Support at support.peregrine.com.

If the KnowledgeBase does not contain an article that addresses your concerns, you can search for information by product; search discussion forums; and search for product downloads.

Documentation Web site

For a complete listing of current ServiceCenter documentation, see the Documentation pages on the Peregrine Customer Support Web.

You can view PDF files, including release notes using Adobe Reader™, which is available at www.adobe.com.

Education Services Web site

Peregrine Systems offers classroom training anywhere in the world, as well as “at your desk” training via the Internet. For a complete listing of Peregrine’s training courses, see www.peregrine.com/education. You can also contact Peregrine Systems Education Services at +1 858.794.5009.

1 ServiceCenter Distributed Services

CHAPTER

With Distributed Services, users can open tickets at one site and assign the tickets to another site. Users can update a ticket at either site and review the results at both sites.

This chapter describes the quickest method to set up ServiceCenter Distributed Services (SCD).

To learn more about SCD, read:

- *SCD requirements* on page 12
- *Configuring ServiceCenter distributed binaries* on page 12
- *Enabling Distributed Ticketing* on page 16
- *Selecting the locking mechanism* on page 28
- *Testing ServiceCenter Distributed* on page 30
- *Incident Management page history records* on page 32
- *Call closure conflicts* on page 33

SCD requirements

While you can perform the setup in several way, this document examines the most direct method. See *Sample Implementation Flows and Parameters* on page 65, and *Troubleshooting* on page 81, for more information about utilizing the SCD TCP connection.

You must install ServiceCenter Distributed on at least two servers. SCD supports ServiceCenter servers running on UNIX and Windows systems. SCD does not require the servers to be the same platform type.

Note: Contact Peregrine Systems Professional Services to assist with installation and configuration.

When using Load Manager, run SCD on only one of the systems in the Load Manager network. You can use either of the following:

- A system dedicated to SCD work (`scenter -scd`).
- A system that does SCD work and allows users to login (`scenter -listener` and `scenter -scd`).

Configuring ServiceCenter distributed binaries

The operating and setup procedures in this guide support UNIX and Windows platforms.

Note: The `scenter -scd` command replaces the `scdserve` command to start the SCD server. Issue it from the command line or a configuration file.

To set up the SCD configuration from the binary side

- 1 Identify the site and ServiceCenter server names for each computer running SCD.

Each computer using SCD must have a TCP host name with which you can verify the connection. This is the name of the Windows or UNIX system that is running the ServiceCenter server and express clients.

In the following example, the computer names are `scusa` and `scaus`.

- 2 Allocate a listening TCP port number that is different from the ServiceCenter system listening port; that is, not 3611.

In this example, assume that port number 3612 is available.

3 Modify the initialization file on each server.

Important: Modifying the `sc.ini` initialization file is only a temporary step. Replace the lines that you are adding with entries in the `scdsites` file. See *Establishing Remote Server Connections* on page 35, for more information.

When modifying the initialization file, you add the TCP port number and a ServiceCenter server name. Each computer must have a ServiceCenter server name. The name is arbitrary to any other names used for this server and can be the same as the host name. Their definition has some flexibility, allowing you to use more logical names as well.

Add the following to the `sc.ini` file.

```
localsc:server1 name,host name,port#,system
ID1,password1,lock.capable,lock.only
remotesc1:server2 name,host name,port#,system
ID2,password2,lock.capable,lock.only
```

where:

Parameter	Description
server1 name	The local computer's ServiceCenter server name.
server2 name	The remote computer's ServiceCenter server name. For example, name the <code>scaus</code> host <code>AUS</code> , and name the <code>scusa</code> computer <code>USA</code> .
host name	The TCP host name for the remote computer.
port#	The listening TCP port number for each computer.
system ID(1 or 2)	The Site Numeric Key Value(101, 102, 103 , and so on), which identifies the server in the network. Larger numbers avoid confusion because each system maintains separate internal number values for each remotesc site; that is, the <code>remotesc1</code> on one computer may not refer to the <code>remotesc</code> site assigned as 1 in the network.
password(1 or 2)	An arbitrary password used for this process on each computer.
Receive Password	The password needed to receive data from other sites.

Parameter	Description
lock.capable	Informs SCD that the computer can be a locking site. The value is either 0 or 1, where 0=false and 1=true.
lock.only	Prohibits SCD from starting a queue process because this site is only a locking site. The value is either 0 or 1, where 0=false and 1=true.

- Modify the sc.ini file on the first server (the USA server).

```
localsc:USA,*,3612,101,password1,1,0
remotesc1:AUS,scaus,3612,102,password2,0,0
remotesc2:UK,scuk,3612,103,password3,1,1
```

- Modify the sc.ini file on the second server (the AUS server).

```
localsc:AUS,*,3612,102,password2,0,0
remotesc1:USA,scusa,3612,101,password1,1,0
remotesc2:UK,scuk,3612,103,password3,1,1
```

- Modify the sc.ini file on the third server (the UK server).

```
localsc2:UK,*,3612,103,password3,1,1
remotescAUS,scaus,3612,102,password2,0,0
remotesc1:USA,scusa,3612,101,password1,1,0
```

Important: This is the quickest way to establish the connections before starting the ServiceCenter server. Entries in the scdsites file actually replace the lines added in this example. See *Establishing Remote Server Connections* on page 35 for more information about the scdsites file.

- 4 Depending on your environment, do one of the following:
 - In a Windows environment, add the following line at the end of the sc.cfg file:


```
scenter -scd
```

There is no `sc.cfg` file on a UNIX server. In UNIX, add the command to start the SCD server to the `scstart` procedure.

- For UNIX servers, open the `scstart` file and add `scenter -scd &` after the code block starting the ServiceCenter server.

```
echo "Starting ServiceCenter server(s)..."
scserver >${LOGDIR}/server.log 2>&1 &
sleep 1
```

```
scenter -scd &
```

- You can also issue `scenter -scd &` manually after you start the server on the UNIX.

5 Restart the ServiceCenter servers.

Go to the [Administering ServiceCenter](#) online help for instructions on starting and stopping a ServiceCenter server.

On UNIX servers, issue the `scstart` command followed by `scenter -scd &` if you did not modify `scstart`, then log onto the server as normal.

- 6 On UNIX servers, issue the `system.status` command to view the status of the regular server processes.
- 7 On each server, open the log file (`sc.log`) in either the base ServiceCenter directory or the `Logs` directory, and check for these messages:

- Distributed ServiceCenter Server Started

- Session Established with <*hostname*>

where <*hostname*> is the name of the other ServiceCenter server running distributed service.

In this example, the messages in the Windows log file read:

```
000202 02/26/02 13:17:54 SC001001: **** Distributed ServiceCenter Server Started ****
000145 02/26/02 13:18:51 SC001002: **** Session Established with AUS ****
```

The AUS system log file indicates the same messages when started, with the exception of establishing a connection with USA instead of AUS.

Enabling Distributed Ticketing

To use Distributed Ticketing, you must configure the Incident Management on each ServiceCenter server running SCD. Enable Distributed Ticketing to ensure that Incident Management uses the feature on all linked systems, and to add a site number to the assignment group table.

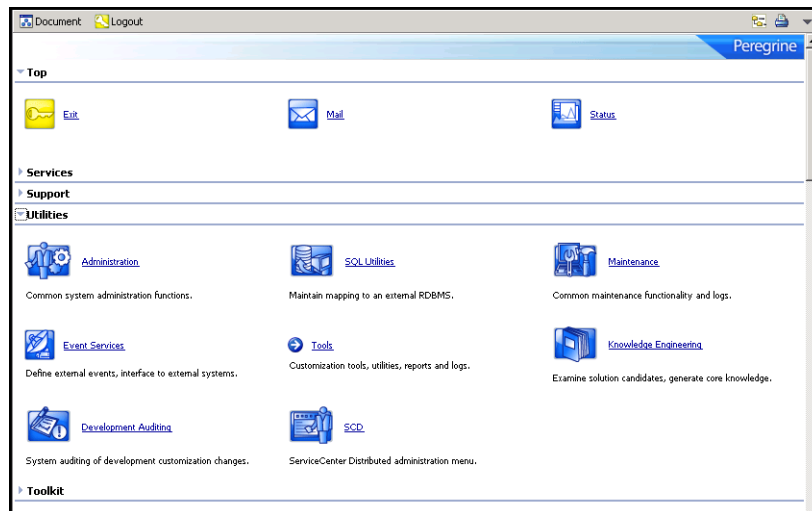
To configure Incident Management, take the following steps:

- Step 1** Verify that both servers are communicating (see next section).
- Step 2** Set up the Incident Management environment (see page 18).

Verifying that both servers are communicating

To make sure both servers are connected

- 1 Open a ServiceCenter client, logging on to the host `scuk` (both lock capable and lock only) as a system administrator.



- 2 From the **Top** menu, click **Status** to display the status of system background processes.

- When the system status screen opens, locate SCD-Listener and SCDQUE in the User Name column.

TOTAL USERS: 1 - use Refresh Display to refresh statistics

Command	User Name	PID	Device ID	Login Time
Refresh Display	CLIENT-1230	2320	SYSTEM	12/15/2003 15:19:03
Start Scheduler	CLIENT-12690	2132	SYSTEM	12/15/2003 15:19:04
Broadcast	SCD-Listener	2124	SYSTEM	12/15/2003 15:19:05
Show Locks	SCDQUE-UK	1468	SYSTEM	12/15/2003 15:19:07
Display Options	SCDQUE-AUS	1856	SYSTEM	12/15/2003 15:19:07
System Monitor	spool	1772	SYSTEM	12/15/2003 15:19:09
Command List	report	1664	SYSTEM	12/15/2003 15:19:10
Summary	problem	948	SYSTEM	12/15/2003 15:19:11
Execute Commands	change	2084	SYSTEM	12/15/2003 15:19:12
	sla	2052	SYSTEM	12/15/2003 15:19:13
	agent	2100	SYSTEM	12/15/2003 15:19:14
	marquee	1884	SYSTEM	12/15/2003 15:19:15
	lister	1980	SYSTEM	12/15/2003 15:19:16
	linker	1872	SYSTEM	12/15/2003 15:19:18
	event	1460	SYSTEM	12/15/2003 15:19:18
	availability	1984	SYSTEM	12/15/2003 15:19:20
	contract	1968	SYSTEM	12/15/2003 15:19:21
	ocm	1948	SYSTEM	12/15/2003 15:19:22
	alert	2156	SYSTEM	12/15/2003 15:19:23
	sync	564	SYSTEM	12/15/2003 15:19:24
	falcon	2076	Soap-Windows 2000 Server	12/15/2003 15:46:22

The list has one SCD-Listener and one SCDQUE for each connected site, not including the system you are currently on. If you are connected to two sites from your computer, as shown in this example, the column has one SCD-Listener and two SCDQUEs (one SCDQUE for each remote site). You make and break connections with the remote sites repeatedly during a session as the remote systems sleep, awaiting distribution activity.

Note: If you use a system only for global locking, you do not see an SCDQUE process.

- Click **Back** to return to the main menu.
- Repeat these steps for all servers that you connect for SCD.

Note: See *Implementing modifications* on page 40 for an alternative verification method.

Setting up the Incident Management environment

Use the Incident Management Security option to modify the environment and configure Assignment Groups.

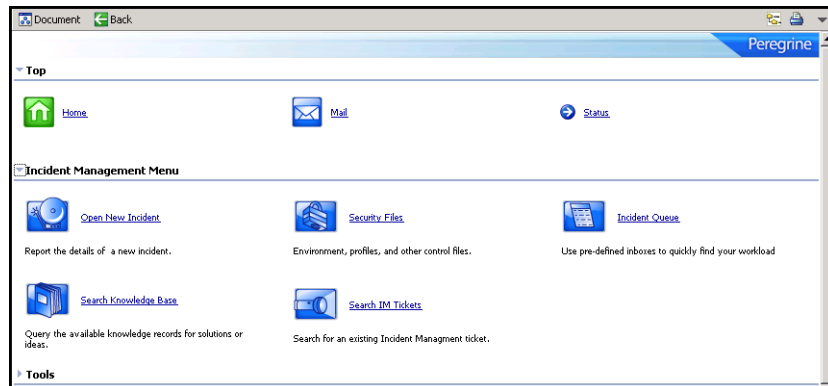
Environment setup

The **Use Paging?** check box is clear. Paging is active by default. Use paging to append progressive updates to an incident ticket as an associated page. This feature is available in SCD 3 SP2 and later releases. In earlier versions, you deactivated the systems paging by clearing the check box option on the Environment tab.

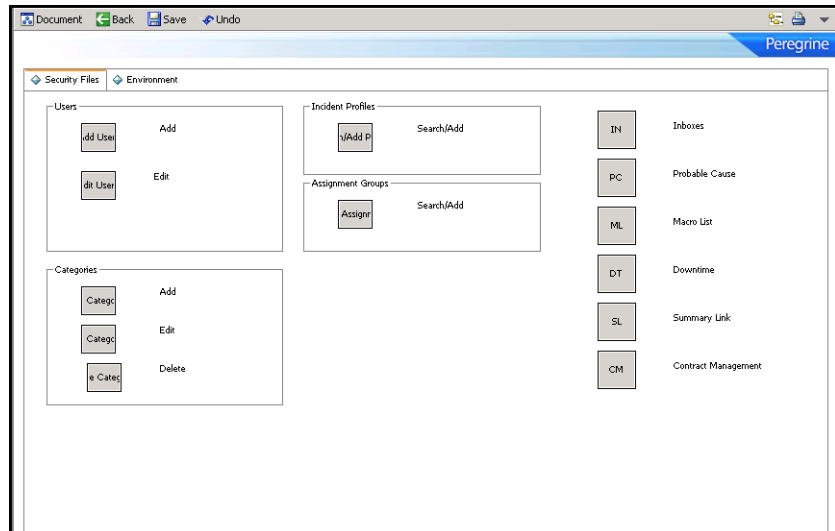
Go to *Administering ServiceCenter* online help for more details about this option.

To set up the environment

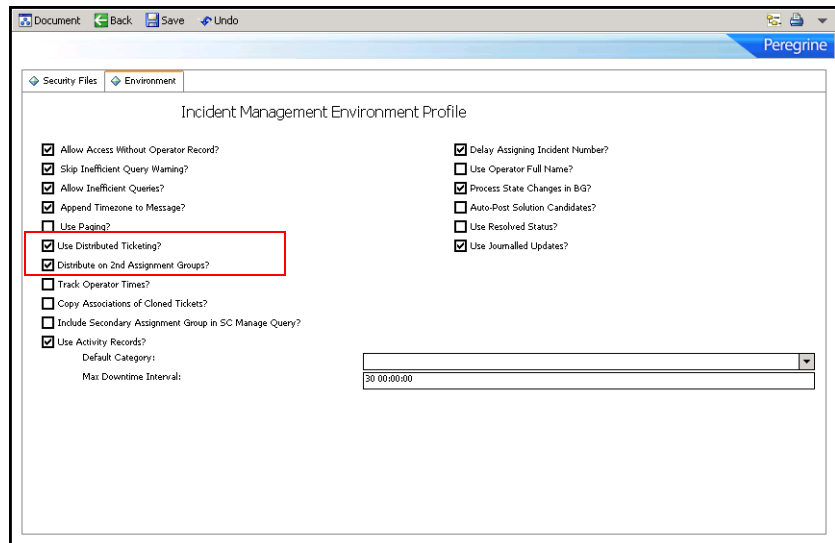
- 1 From the ServiceCenter main menu, click **Incident Management** to open the **Incident Management** menu.



- Click Security Files to open the ServiceCenter Incident Management Security Administration Utility menu.



- From the Environment tab, select the Use Distributed Ticketing check box.



- If you want secondary distributing, select the Distribute on 2nd Assignment Groups check box.

Use secondary distributing to send copies of tickets to the secondary assignment group defined on the incident ticket. This differs from regular distributed ticketing because the secondary assignment group does not own the ticket, but receives a copy for modifying and updating and can receive future updates from the ticket's owner (primary assignment group).

Note: You must manually configure the global list to build the SCD sites at start-up. For instructions on configuring global lists, see *Building the global list*, next.

- 5 Click **Save** to record the environment changes.

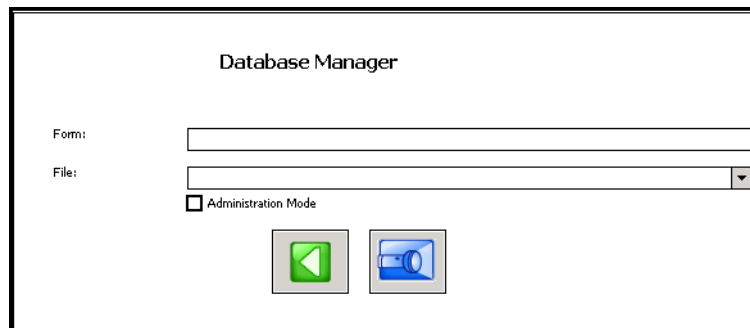
Building the global list

The **Startup Lists** global list stores all the global lists where the **build.startup** field equals true. The global list is in the **listrepository** file. During login, the system checks the **listrepository** entry and builds all global lists in this file. If the global list file changes, the **Startup Lists** global list is marked as expired and rebuilds the next time the **lister** background process runs. This updates the **listrepository** record.

Note: Since the **lister** background process does not run continually, there may be a slight delay between the time a global list changes and when it appears in the **listrepository** record.

To build the global list

- 1 From the ServiceCenter main menu, click **Toolkit > Database Manager**.



2 Enter `apm` in the `Form` field, and click `Search` to open a QBE list.

Format Name	File Name	Last Updated	Updated By	Language
apm.anubis.control.g	anubiscontrol	04/23/99 11:38:20	lisa	en
apm.anubis.log	anubiseventlog	05/13/97 17:20:38	pcasey	en
apm.anubis.stats.g	anubisstats	04/23/99 11:40:47	lisa	en
apm.anubis.system.state.g	anubissystemstate	04/23/99 11:40:01	lisa	en
apm.category	category	01/12/01 10:47:40	kasey	en
apm.clocks	clocks	01/15/98 21:29:56	pcasey	en
apm.edit.inbox.basic	inbox	03/02/98 15:16:00	sanderson	en
apm.edit.inbox.form	inbox	01/08/01 13:29:19	sanderson	en
apm.front.screen	environment	06/02/00 15:54:05	lisa	en
apm.global.list.entry	globalists	09/18/98 09:18:36	sanderson	en
apm.inbox.edit	inbox	10/25/01 15:26:48	pbudic	en
apm.problem.update	problem	01/08/01 14:01:16	sanderson	en
apm.quick	problem	08/20/01 15:52:21	pbudic	en
apm.search.problem	problem	11/01/02 13:12:21	joeh	en
apm.search.probsummary	probsummary	03/07/01 12:06:55	lisa	en
apm.search.probsummary2	probsummary	08/09/00 15:09:03	joeh	en
apm.status	pmstatus	02/23/98 13:37:30	sanderson	en
apm.tbd.g	problem	01/08/01 14:21:08	sanderson	en
apm.upgrade.fmt.stockroom	stockroom	05/23/00 15:48:03	pbudic	en
apm.upgrade.log.reader	upgradepseudolog	06/29/98 17:03:10	ksparrow	en
apm.upgrade.patch	patches	07/24/98 09:32:02	pcasey	en
apm.upgrade.results.g	upgraderesults	04/26/99 11:55:28	lisa	en
apm.upgrade.systables	upgradesystables	11/05/96 09:06:54	falcon	en
apm.upgradestatus	upgradestatus	02/06/97 16:50:00	mikep	en
apm.web	problem	12/23/98 09:44:09	sanderson	en
apm.web.g	problem	04/26/99 11:58:12	lisa	en

3 Select the `apm.global.list.entry` from the list to open the form.

The screenshot shows the Peregrine software interface with the following form fields:

- List Name:** [Text input field]
- Regen Every:** [Dropdown menu]
- Times Updated:** [Text input field]
- Expiration:** [Text input field]
- Build List on Startup?**
- List Variable:** [Text input field]
- Guard Against Duplicates?**
- Display Variable:** [Text input field]
- List Field:** [Text input field]
- Display Field:** [Text input field]

- Enter sites in the **List Name** field, and click **Search** to retrieve the sites global list record showing the field values.

The screenshot shows the Peregrine configuration window with the following fields and values:

- List Name: sites
- Regen Every: 1 00:00:00
- Times Updated: [empty]
- Expiration: 01/01/1990 00:00:00
- Build List on Startup?
- List Variable: \${G.scd.site.names}
- Display Variable: \${G.scd.site.names}
- List Field: sitename
- Display Field: sitename
- Filename: scdsites
- Limiting SQL: true
- Sort By: sitename
- Application: aprn.build.site.list
- Server App.: [empty]
- Guard Against Duplicates?
- User Defined List?
- Value List: [empty]
- Display List: [empty]

- Select the **Build List on Startup** check box and provide missing field values.

Field	Definition
List Name	The unique name of this global list, sites in this case.
Times updated	A value that the system automatically generates, indicating number of times during this session the list regenerates.
Regen Every	The frequency of how to rebuild this list. If the data in this table is highly volatile, pick a quick regen time. If the data rarely changes, pick a larger regen interval so the system does not waste resources regenerating unnecessary lists.
Expiration	The next point in time to regenerate the list. This value defaults to the current time and date. Set this value in the past to set automatic regeneration at the interval specified in the Regen Every field.

Field	Definition
Build List on Startup?	A true value in this field builds this global list at login and adds it to the Startup Lists global list that feed into the lister at startup. This field must be true for the SCD sites list to generate in ServiceCenter 3.0 SP3 and later.
List Variable	The name of the variable to store the ValueList value.
Guard Against Duplicates?	A true value in this field checks for duplicates of this form.
Display Variable	The name of the variable where you store the DisplayList value.
List Field	The name of the field in the target file to be stored in the ValueList.
Display Field	The name of the field in the target file to store in the DisplayList.
Filename	The name of the file to build the list.
Limiting SQL	A valid query that determines which records in the target file include the list. A true value indicates that you use all records from the file. You can also use a conditional statement.
Sort By	Indicates the sorting field of the list data in the DisplayList.
Application	Specifies the list generation application that compiles the retrieved file data.
Server App	If using the <code>apm.</code> application, leave the field blank (<i>NULL</i>).
User Defined List?	Check the value (true) in this field to indicate that the user defined this list. Otherwise, leave this check box clear (false).
Value List	If SCD sites have data, this list populates with SCD key values.
Display List	If SCD sites have data, this list populates with SCD site names.

The **List** and **Display** variables are in other applications in the system already. When you activate this global list record, those applications that use these variables pick up the SCD sites information.

Note: If you decide to change the name of the **List** or **Display** variable from those used on this form, certain search functions, for example, Incident Search form (`apm.search.probsummary`), may not retrieve SCD sites information.

When the system starts up, the **Startup Lists** global list adds the sites list.

When the server generates the sites list, the system:

- Queries all records from the `scdsites` file; that is, a true query. For more information, see *Establishing Remote Server Connections* on page 35.
- Builds a display list by adding the `sitename` field from each returned record to an array.
- Builds a value list by adding the `sitename` field from each returned record to a different array.
- Saves both lists.
- When a client requests this list by name (for example, using an incident Search form `apm.search.probsummary`), the following occurs:
 - The client displays a variable `$G.scd.site.names` which holds the `sitename` DisplayList.
 - The client displays a variable `$G.scd.site.names` which holds the `sitename` ValueList.

Note: Your DisplayList and ValueList properties can be the same. For example, you want to store what the user sees in the combo box. If this is the case, use the same values for each list.

Advanced users can benefit from the flexibility of global variables (variables beginning with `$G`) by sharing lists between multiple threads.

- 6 After providing the necessary information, click **Save**.

The screen refreshes. You see the message Global List Definition record updated at the bottom of your screen.

For more information about global lists, lister, and advanced issues related to list generation, go to the *Administering ServiceCenter* online help.

Defining Assignment Groups

The next step involves defining at least one Incident Management assignment group with shared or distributed incident ticket records between the servers connected with SCD. For detailed information about Assignment Groups, go to the *Administering ServiceCenter* online help.

To define a distributed Assignment Group

- 1 From the Service Menu main menu, click **Services > Incident Management > Security Files** to open the **ServiceCenter Incident Management Security Administration Utility** menu.

- Click **Search/Add** under **Assignment Groups** to open a blank assignment profile.

The screenshot shows a web browser window with the title 'Peregrine'. The main content area is a form titled 'Assignment Group:'. At the top, there is a search bar. Below it, there are two tabs: 'Group' and 'Operators'. The form contains several fields: 'Calendar Name', 'Printer Name', 'Stage 2 Alert Group', 'Stage 3 Alert Group', 'Reassignment Alert Group', 'Manager Name' (with a dropdown arrow), 'Route Tickets to This Site', and 'If this is true:'. There is also a checkbox labeled 'Reset Assignment Group' which is currently unchecked.

- Search for or enter an Assignment Group.

For example, enter **FACILITIES** as the Assignment Group, and click **Search** to open the **Facilities Assignment Group** record.

The screenshot shows the same web browser window as before, but now the 'Assignment Group:' field contains the text 'FACILITIES'. The 'Reassignment Alert Group' field now contains 'HELPDESK'. The 'Reset Assignment Group' checkbox is now checked. The 'Manager Name' dropdown menu is open, showing 'MANAGER COB' as the selected option.

In the **Route Tickets to This Site** field, enter the site number for the other location where you want to distribute the incident tickets. If there is more than one site, then separate the site numbers by spaces.

Using the example created in *Configuring ServiceCenter distributed binaries* on page 12, from the USA site (site 101), designate the AUS site (site 102) as the destination. Enter 102 in the **Route Tickets to This Site** field.

- In the **If this is True** field, enter a condition statement defining when to distribute this Assignment Groups incident tickets.

For example, if you always want to distribute the tickets automatically every time someone adds a new incident on either server, enter true.

For this example, enter true to distribute all assigned USA (site 101) facilities group incident tickets to AUS (site 102).

Assignment Group: FACILITIES

Group Operators

Calendar Name:

Printer Name:

Stage 2 Alert Group:

Stage 3 Alert Group:

Reassignment Alert Group:

Manager Name:

Route Tickets to This Site:

If this is true:

Reset Assignment Group

- 5 Click **Save**.
- 6 From the File menu, click **Close** to return to the Incident Management menu.
- 7 Repeat these steps to modify any other assignment groups that utilize Distributed Services, for example, **development, engineering, communications**.
- 8 Click **Back** to return to the Incident Management menu when you complete modifications to the assignment groups.

Return to Database Manager to update the **Sequential Number** file for Incident Management in the next phase of the configuration.

Changing the incident number prefix

Incident Management adds a default prefix of **IM** to incident ticket numbers and to activity record numbers. This prefix is set in the **number** file.

When using SCD, prevent duplicate ticket numbering at different locations by making each incident ticket and activity record numbering prefix (or suffix) unique to each site; for example, **SC**, **CA**, and so on. Use the Database Manager application to make this change. The following steps require system administrator permissions.

To change the incident and activity number prefixes

- 1 From the ServiceCenter main menu, click **Toolkit > Database Manager** to open the Database Manager dialog box (see page 20).
- 2 Enter number in the **Form** field, and click **Search** to open the **Sequential Number File** form.
- 3 Enter problem management in the **Class** field, and click **Search**.

You see the **Sequential Number** record for Problem Management (the activity form). The **Last Number** field contains the number of the last saved ticket or record. Only newer numbers contain the new prefix or suffix.

- 4 Enter the prefix, suffix, or both for the site where the incident tickets (activity record) originate.

The screenshot shows a dialog box titled "Sequential Number File" with the following fields and values:

- Class:** problem management
- Last Number:** 10000
- Description:** (empty)
- Reset Point:** (empty)
- Increment/Decrement By:** (empty)
- Length:** (empty)
- Prefix:** SD
- Suffix:** (empty)

Following the example, enter **SD** for a San Diego site.

- 5 Click **Save**.
A message in the status bar reads:
Number record updated.
- 6 Click **OK** to exit the current **Sequential Number** record.

- 7 Repeat step 3 on page 27 through step 6 on page 27 for each server, giving each server a unique prefix, suffix, or both.

Important: You must **restart** all servers now before opened tickets can move from one site to another.

- 8 Shut down all involved servers and clients, then restart the ServiceCenter servers you configured.

Selecting the locking mechanism

ServiceCenter 4.0 and later offers two methods for resolving conflicts: Global Locking and Conflict Resolution. Earlier versions use Conflict Resolution only. If your version of ServiceCenter is earlier than 4.0, you do not need to select a locking mechanism.

For more information about Global Locking and Conflict Resolution, see *Global Locking* on page 43.

Use `dlocksc` to view the list of the computers for distributed locking. Enter this parameter at initialization in the `sc.ini` file. The format for the `dlocksc` parameter is:

```
dlocksc:<system name>,<system name>,<system name>,...
```

where `<system name>` represents the system name that the `localsc` and `remotesc` definitions specify. Any system listed in `dlocksc` must have a corresponding `localsc` or `remotesc` entry.

Setting up Conflict Resolution

Conflict Resolution is the system default. To use SCD Conflict Resolution, remove or comment out any reference to `dlocksc` from your initialization file (by default, located in the `Run` directory). If you do not include this parameter in the initialization file, the system defaults to Conflict Resolution.

Setting up Global Locking

Though SCD Global Locking works with both lock-only and SCD sites, use a dedicated 24x7 computer for primary locking site. Performing lock and unlock operations can be processor-intensive. Using a dedicated 24x7 server to control the lock and unlock operations provides continuity and ensures that you do not compromise current SCD operations.

The following entry in the initialization file establishes the AUS system as the primary distributed locking computer.

```
dlocksc:AUS,USA,UK
```

USA and UK are secondary computers in the order provided. A secondary distributed locking computer immediately takes over if something happens to the current lock site.

The following entries in the `sc.ini` file establish an SCD network on the computer USA. In this example, USA is the locking and distributed processing site, the AUS site is for locking only, and the UK site is for distributed processing only.

```
dlocksc:AUS,USA
localsc:USA,255.255.255.1,3612,101,password1,1,0
remotesc1:AUS,255.255.255.2,3613,102,password2,0,1
remotesc2:UK,255.255.255.3,3614,103,password3,0,0
```

At initialization, `ServiceCenter` uses the first system listed in the `dlocksc` parameter for distributed locking. When it needs to distribute a ticket, if this system is down or unable to cooperate, `ServiceCenter` uses the next system listed, and so on, until there are no systems available.

To set up SCD Global Locking

- 1 Specify distributed locking sites with the `dlocksc` parameter in the `sc.ini` file (by default, located in the `Run` directory).

If you do not include this parameter in the `sc.ini` file, the system defaults to Conflict Resolution. Each site in the distributed network must have the same `dlocksc` parameter. The order of the locking sites must be the same on all computers. See *Configuring ServiceCenter distributed binaries* on page 12 for more information about setting up `sc.ini`.

- Specify the distributed locking sites in either the `scdsites` file or through the `localsc/remotesc` parameters.

Depending on your environment, you can add these fields to the `localsc/remotesc` parameters or update the `scdsites` file. See [Establishing Remote Server Connections](#) on page 35 for more information about the `scdsites` file and modifying it.

Testing ServiceCenter Distributed

To test SCD, open an incident ticket using one of the assignment groups you designated for Distributed Services (in this example use FACILITIES).

The new prefix is at the beginning of the Incident ID (number). Go to the [Using ServiceCenter](#) online help for instructions about opening an incident ticket.

Following this example, open an incident ticket at the USA site under the FACILITIES Assignment Group.

The screenshot shows a web-based form for creating an incident ticket. The window title is "Peregrine". The incident ID is "SD10002" and the ticket status is "Open". The incident title is "User cannot connect to the Network". The form is divided into several sections:

- Alert Status:** Category: network, Subcategory: remote communications, Product Type: remote communications, Problem Type: modem/terminal adapter, Manufacturer: (empty), Class: (empty), Contact Time: (empty), Elapsed Time: (empty), Contract: (empty), Company: PRGN, Contact: HELPDESK, BOB.
- Owner:** falcon
- Assignment Groups:** Primary Asgn Group: FACILITIES, Assignee Name: (empty), Second Asgn Group: TELCOM SUPPORT.
- Other Fields:** Hot Ticket: (unchecked), Total Loss of Service: (unchecked), Severity: 4 - Low, User Priority: Low, Site Category: A - Critical Site, Cause Code: (empty), Phone / extension: (619) 465-7654.
- Incident Description:** User cannot connect to Network.

- The Incident ID begins with SD, for example, SD10002.

- The ticket, opened under the FACILITIES Assignment Group, is set up for SCD distribution; therefore, the incident ticket transfers to the AUS site.

The incident ticket is on both systems under the FACILITIES assignment group.

The image shows two screenshots of the Incident Queue interface, one for the AUS server and one for the USA server. Both screenshots display a table of incidents. The table has the following columns: Incident..., Category, Problem Type, Se..., St..., SDU, Assignee, and Brief Description. The table contains one row of data:

Incident...	Category	Problem Type	Se...	St...	SDU	Assignee	Brief Description
SD10002	network	modem/terminal adapter	4	open	FACILITIES		User cannot connect to the Network

The interface also includes a sidebar with buttons for 'New', 'Search', 'Switch Inbox', 'Starting Lists', 'By Owner', 'By Assignment Group', 'Refresh List', 'Count Records', and 'Back'. The top of the interface shows navigation buttons for 'List', 'back', and 'Refresh', and the 'Peregrine' logo.

Using the dtqueue form

The `dtqueue` maintains a list of all replicated and distributed ticketing processes as they are set to occur. You can view this record queue in Database Manager by opening the `dtqueue` form, then querying on the blank form. The record list displays all SCD replication and distributed ticketing processes set to occur. For more information about the `dtqueue`, see [Viewing file update information](#) on page 59.

Incident Management page history records

Distributed Ticketing supports standard ServiceCenter ticket paging. When ServiceCenter updates a distributed ticket on one server, the updated information page transmits to the remote site associated with the assignment group. This page contains all previous ticket information and the ticket update.

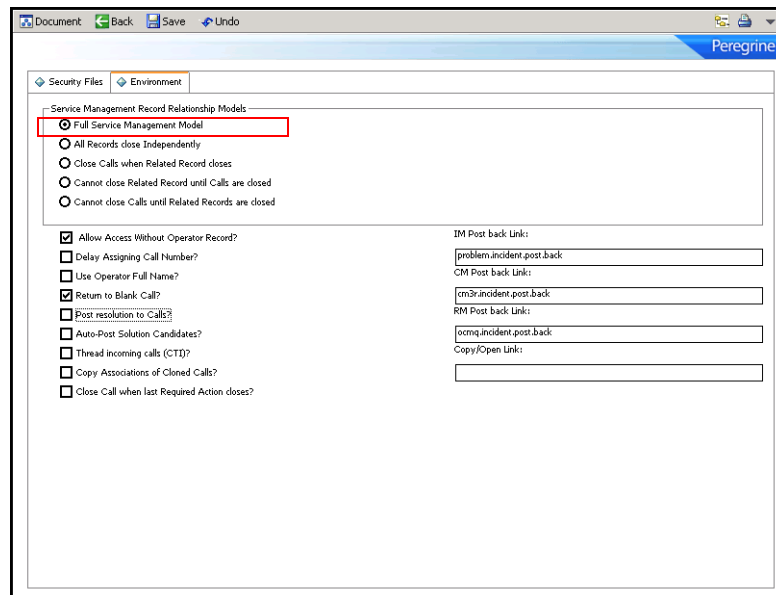
The page attaches to the distributed ticket at the remote site. In this way, all sites holding that ticket have a complete history of updates to that ticket, sorted by pages.

Note: To use paging across an SCD network, all ServiceCenter servers in the network must select the **Use Paging?** option (set to true) on the Incident Management Environment Profile form (see page 19).

Go to the *Administering ServiceCenter* online help topics for more information.

Call closure conflicts

Distributing an incident ticket might compromise the ServiceCenter integration between Service Management and Incident Management. When a Service Management call record generates an incident ticket, the records are connected within ServiceCenter. Service Management call closure rules can specify that the closure of a related incident ticket causes the closure of the associated call reports. You establish these settings in Service Management Security (Service Management > Security Files > Environment).



If an incident ticket is distributed to a remote site and is then closed on that remote site, the tie between the initiating call report and the related incident ticket is severed, and the call closure rules cannot be followed. Related call records are not closed when incident tickets are closed on sites other than the originating site of the incident ticket. Calls related to the incident ticket must then be manually closed on the originating site.

See *Sample Implementation Flows and Parameters* on page 65 for examples of incident ticket distribution and remote closure examples that may compromise the call closure settings. Go to the *ServiceCenter* online help for information about Service Management and call closure settings.

2 Establishing Remote Server Connections

CHAPTER

You can set up remote server connections through the `scdsites` file or the `sc.ini` initialization file for Windows and UNIX.

Use the `scdsites` file when you establish remote server connections to reduce initial set up time and maximize performance.

This chapter explains how to establish the profile for each remote server connection using the `scdsites` file.

To learn more about remote server connections, read:

- *Using the remote server connection* on page 36
- *Opening the `scdsites` file* on page 37
- *Creating an `scdsites` record* on page 38
- *Implementing modifications* on page 40

Using the remote server connection

If you use the initialization file to establish the connection to SCD remote sites, you must list every remote site in the initialization file of each server to connect to all the others in the network. This often requires a long list of `remotesc*` notations in the initialization file.

A preferable alternative is to establish the profile for each remote server connection through the `scdsites` file, rather than continued additions to the initialization file. When you use the `scdsites` file to define the network, then SCD file replication can duplicate the file to all sites across the network. You make updates to the `scdsites` file at a single location, and ServiceCenter automatically propagates the changes to all locations.

The `scdsites` profiles replace additional lines in the system initialization file. If you use the `scdsites` file, then the initialization file only needs to contain a single simplified `localsc` parameter to identify the local site. The system reads all other sites in the `scdsites` file as remote sites.

Note: The `scdsites` file takes precedence over the initialization file.

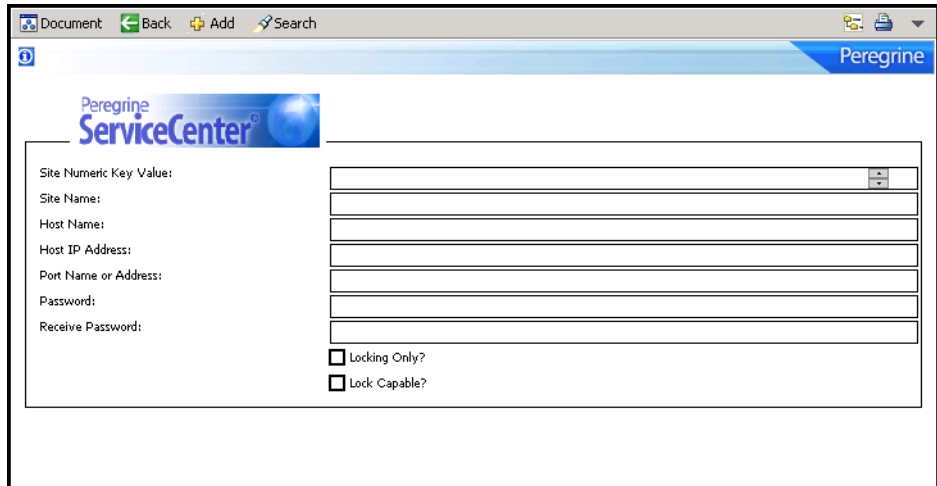
Converting to the `scdsites` file instead of extending the initialization file text makes maintenance of SCD server connection profiles quick and accessible within the ServiceCenter suite without having to shutdown or restart the connected servers.

Opening the *scdsites* file

The *scdsites* file is a database file within ServiceCenter where you enter the profiles for remote SCD site connections. Each connection receives its own record within the file.

To reach the record form and records in the file

- 1 From the ServiceCenter main menu, click **Utilities > SCD > SCD Sites** to access the *scdsites* form.



The screenshot shows a web browser window with the title bar containing 'Document', 'Back', 'Add', and 'Search' buttons. The browser address bar shows 'Peregrine'. The main content area features the 'Peregrine ServiceCenter' logo. Below the logo is a form with the following fields and options:

- Site Numeric Key Value: [Text input field]
- Site Name: [Text input field]
- Host Name: [Text input field]
- Host IP Address: [Text input field]
- Port Name or Address: [Text input field]
- Password: [Text input field]
- Receive Password: [Text input field]
- Locking Only?
- Lock Capable?

- 2 Click **Search** to pass a true query and call up a record list of all current records in the file.

Creating an *scdsites* record

When accessing the file from within Database Manager or the SCD control menu, the procedures for creating a new SCD remote site connection are the same.

To create an *scdsites* record

- 1 Open the *scdsites* form (see page 37).
- 2 Enter the desired parameters.

Field	Definition
Site Numeric Key Value	The number (9-digit maximum) that identifies the specific site, for example, 101, 102, or 103.
Site Name	The name of the connecting site, for example, USA, AUS, or UK.
Host Name	The host name of the specific computer to connect with. Either this value or the Host IP Address are needed, not both. If you provide both, the Host Name takes precedence over the IP Address.
Host IP Address	The IP address of the remote host server. If you do not know this value, contact your server administrator. Either this value or the Host Name are needed, not both. If you provide both, the Host Name takes precedence over the IP Address.
Port name or Address	The port name with which the remote server listens.
Password	The password to access the remote server.
Receive Password	The password needed to receive data from another site.
Lock Only	Prohibits SCD from starting a queue process at this site because this site is only used for locking purposes.
Lock Capable	Gives this site lock capability.

- 3 Click **Add** to record this profile.

The profile uses the same values in the *sc.ini* file if this profile is for an SCD remote site set up in *Chapter 1, ServiceCenter Distributed Services*. Ultimately, ServiceCenter uses the *scdsites* records and removes the values from the *sc.ini* file.

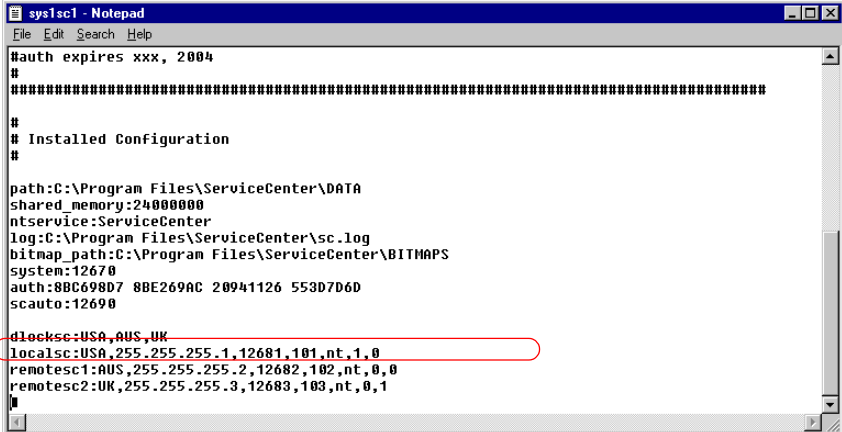
- 4 Repeat step 1 through step 3 to create a unique `scdsites` record for each SCD remote server, including the server on which you are working.
- 5 Exit ServiceCenter and shut down the server.
- 6 Do one of the following:
 - Repeat these steps on each ServiceCenter server, creating records for all remote SCD sites on all servers.
 - Create and test the `scdsites` file, unload it, then load it at each remote site. The system replicates the `scdsites` file, and keeps all files identical at each remote site. Go to the *Administering ServiceCenter* online help for more information about unloading and loading system files.

Modifying the `sc.ini` file

After you include the information in the `scdsites` file, you must update `sc.ini`.

To update `sc.ini`

- 1 Using a text editor, open the `sc.ini` file.
- 2 Locate the line containing `localsc`.



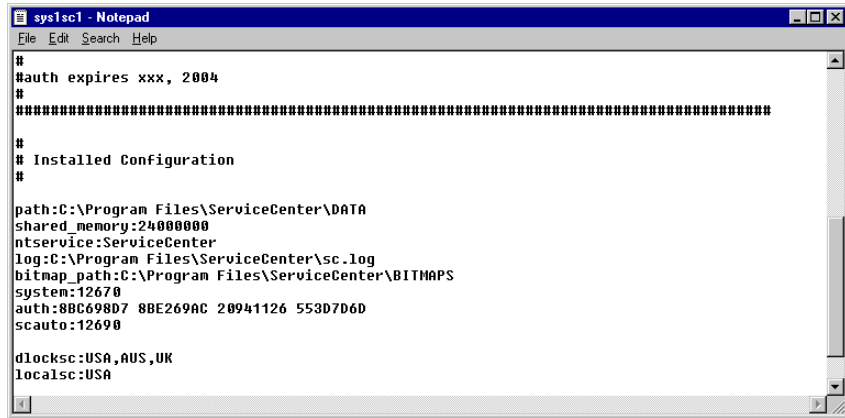
```

sys1sc1 - Notepad
File Edit Search Help
#auth expires xxx, 2004
#
#####
#
# Installed Configuration
#
path:C:\Program Files\ServiceCenter\DATA
shared_memory:24000000
ntservice:ServiceCenter
log:C:\Program Files\ServiceCenter\sc.log
bitmap_path:C:\Program Files\ServiceCenter\BITMAPS
system:12670
auth:8BC698D7 8BE269AC 20941126 55307D6D
scauto:12690
dlocksc:USA,AUS,UK
localsc:USA,255.255.255.1,12681,101,nt,1,0
renotesc1:AUS,255.255.255.2,12682,102,nt,0,0
renotesc2:UK,255.255.255.3,12683,103,nt,0,1

```

- 3 Remove all values after `localsc` except the site name. For example, USA, AUS or UK.

- Remove all remotesc* listings entirely, as shown in the following example.



```

#
#auth expires xxx, 2004
#
#####
#
# Installed Configuration
#
path:C:\Program Files\ServiceCenter\DATA
shared_memory:24000000
ntservice:ServiceCenter
log:C:\Program Files\ServiceCenter\sc.log
bitmap_path:C:\Program Files\ServiceCenter\BITMAPS
system:12670
auth:8BC698D7 8BE269AC 20941126 553D7D6D
scauto:12690

dlocksc:USA,AUS,UK
localsc:USA

```

- Save the modified sc.ini file.
- Repeat step 1 through step 5 on every ServiceCenter server where you modified the sc.ini file.

Implementing modifications

To use the new scdsites profiles

- Restart all ServiceCenter servers connected through SCD, but do not open a client.
- Open a command window.
For example, from a Windows system, use a DOS window and from a UNIX system, use an Xterm window.
- Navigate to the directory where ServiceCenter is running.
- Issue the command `scenter -reportscd`.
- Press **Enter**.

- If the connection is successful, you see the Waiting for QUEUE record message following the listing of each remote site.

```

MS-DOS Prompt
C:\Program Files\ServiceCenter\RUN>scnter -reportscd

      --- SCD Current Status ---

Site      Site  Files  Que
Name      Key   Opened Process
UK         103    0      270 Waiting for QUEUE record (255.255.255.3.12683 - 2)
AUS        102    0      285 Waiting for QUEUE record (255.255.255.2.12682 - 2)
USA        101    0      313 Local (255.255.255.1.12681 - 0)

File "probsummary" has the following relationships
  Child      with "problem" via the following keys
              probsummary,number = problem,header,number
File "problem" has the following relationships
  Parent     with "probsummary" via the following keys
              problem,header,number = probsummary,number

C:\Program Files\ServiceCenter\RUN>

```

- If you do not receive the Waiting for QUEUE record message:
 - Verify that you have a scdsites record for this site with accurate profile, IP address, and Port name values.
 - Verify that the same profile exists on all systems in the connection network.
 - Repeat step 1 through step 5.
- 6 When you receive the message, open a client and begin using SCD.

3 Global Locking

CHAPTER

Global Locking is an option that locks an object across the entire ServiceCenter network when a user is updating it.

This chapter describes the Global Locking process and compares it with Conflict Resolution, the default mechanism for handling conflicts between updates.

To learn more about Global Locking, read:

- *Understanding Global Locking* on page 44
- *Conflict Resolution vs. Global Locking* on page 44
- *The Global Locking process* on page 45
- *Accessing the Global Locking environment* on page 46

Note: To set up Global Locking on your distributed system, see *Selecting the locking mechanism* on page 28.

Understanding Global Locking

In a distributed environment, there are often two or more users making updates to an object. This creates an opportunity for conflict to arise between two updates. If both users try to update the same field, then the system rejects one of the updates. Beginning with ServiceCenter 4.0 and later, there are two methods to resolve these conflicts: Global Locking and Conflict Resolution. Releases earlier than ServiceCenter 4.0 use Conflict Resolution only.

Conflict Resolution vs. Global Locking

With Conflict Resolution, users attached to a local system lock an object (incident ticket, inventory item, and so on), while users on different systems can update the same distributed object at the same time. An update cannot occur if the user updates a field that another user is updating. An update can occur if the user updates a field that another user is NOT updating. Conflict Resolution can only work when the users that are updating an object are working on different attributes or fields within the object.

Most objects have fields that programmatically maintain status and workflow information. Even when users are updating different fields, these common attributes can cause conflicts. Global Locking is a better choice when you have several people who are trying to update the same object simultaneously.

With Global Locking, when updating an object, a user locks the object across the entire ServiceCenter network. Users on other systems receive notifications about the updated object when they attempt to update the same object. They must make their updates later.

- Use Global Locking in a distributed environment where several people are actively updating the same objects. In such an environment, conflicts are likely to occur where users lose updates.
- Use Conflict Resolution in a distributed environment where only a single person is updating an object at one time, but the person and location change based on time of day or resource availability.

The Global Locking process

Using Global Locking during an update prevents dual updates across a Distributed environment.

A Global Lock continues for the least amount of time possible. As soon as the owning site finishes processing an update request, the Global Lock stops. Individual site locks remain until the site acknowledges the processing of the update to the object.

The owning site

In ServiceCenter, all distributed objects have an owning site. The owning site controls the update process and the distribution of updates. In addition, the owning site:

- Maintains the workflow for the object.
- Has all updates flow into it and distributes to all other sites that have a copy of the object.
- Maintains the list of sites that have copies of the object and forwards all updates to all interested sites.
- Tracks the progress of the update in shadow sites so that the Global Lock can be removed.
- Is responsible for Conflict Resolution for an object, and for maintaining and releasing the Global Lock when an update is processed.

The life cycle of a Global Lock

The Global Lock process is:

- 1 The user displays an object.
- 2 As soon as the user modifies any field within the object, the client software notifies the application program.
- 3 The locking system requests a Global Lock if the object is distributed.
- 4 The application attempts to place a lock on the object.
- 5 If another user currently holds the lock, the current user receives notification about the user and system that currently is locking the object. The user cannot update the record and must try again at a later time.

If the lock is granted and the user actually updates the record, then the record updates locally and a request queues to the owning site to update the record. At this point the local application unlocks the object *but* the global lock is not actually released until the owning site processes the update request.

- 6 Once the owning site processes the update, the Global Lock is removed. However, other locks are placed that are related to each site that has a shadow copy. These locks remain in effect and prevent updates to the object from that particular shadow until the shadow site acknowledges that it processed the update to the object. This gives each site access to the record at the earliest possible time. No site has to wait for other sites to acknowledge the update.
- 7 Once the owning site receives notification that all shadow sites received the updated object, then all evidence of the Global Lock is removed.

Accessing the Global Locking environment

You can view or call Global Lock information. The global lock events are in the `scdislock` table.

Viewing Lock information

Issue the `scenter -reportscdlocks` command or view the `scdislock` table for any available online lock site.

To view the `scdislock` file

- 1 From the System Navigator menu, click **Toolkit > Database Manager** to open the Database Manager window.
- 2 Type `scdislock` in the Form text box and click **Search** to open the `scdislock` file.

You manually unlock an object by issuing the `scenter -dlockclear` command at the command line. The `dlockclear` command removes all SCD Global Locks. Use `scenter -dlockclear` to clear any dead locks that can occur when an SCD site goes down or offline for an extended period of time.

Command	Definition
<code>scenter -dlockclear</code>	Clears all SCD locks in the system.
<code>scenter -reportscdlocks</code>	Generates a list of all SCD locks in the system. The current distributed locking site is listed along with the characteristics of each lock.

Warning: Conflicts and loss of data may occur if a lock is removed prematurely.

Calling Global Locking

The commands in this section are for RAD programmers to include Global Locking in a ServiceCenter form. Global Lock processing takes place once a ServiceCenter application requests a Global Lock on a distributed object using the lock panel.

The application must use the `tag` panel to format the parameter for the lock request. If the parameter is not in the proper format, SCD does not issue a Global Lock. The `tagquery` panel allows the application to parse a previously formatted tag parameter. Go to the *Administering ServiceCenter* online help for more information about using these panels.

Panel	Definition
<code>lock</code>	Requests a Global Lock on a distributed object.
<code>tag</code>	Formats the parameter for the lock request (required by application).
<code>tagquery</code>	Allows the application to parse a previously formatted tag parameter.

4 File Replication

CHAPTER

Besides sharing incident ticket information, ServiceCenter allows you to share other system files and replicate them across disparate systems through SCD connections. Files replicated from a remote system replace existing files with the same name on the local system, updating and removing previous information simultaneously.

This chapter explains when and how to set up and use ServiceCenter file replication.

To learn more about file replication, read:

- *Understanding file replication* on page 50
- *Identifying replication candidates* on page 51
- *Calling the Replicate Function* on page 53
- *Synchronizing files* on page 60

Understanding file replication

You can replicate any ServiceCenter system file into another SCD system except for the following:

- number
- counter
- schedule

Do not replicate these files because they must be unique to each system's configuration and identity. For more information, see *Avoiding poor candidates* on page 51.

File replication uses the same communication profiles that you set up in *Chapter 2, Establishing Remote Server Connections*. You must be familiar with ServiceCenter RAD operations and internal application calls from the command line.

Replication and distribution use the same technology. The difference is that replication occurs to *all* records in the file, and distribution only occurs to *specific* records within a file. When you set up ticket distributing, you activate the Incident Management Security Distributed Ticketing option, which File Replication requires (see *Enabling Distributed Ticketing* on page 16 for more information).

Each site in the replication network must have a unique prefix (or suffix) specified in the `number` file for Incident Management. Without a unique prefix (suffix or both), sites within the replication network may create the same ticket (for example, key value of IM1) rather than creating separate tickets (for example, SD1, CA1, and so on).

Upgrading replicated systems

You cannot upgrade a single system and have replication take care of upgrading the rest of the systems. This is because an upgrade modifies and adds Database Dictionary entries that you cannot replicate. The best way to perform any upgrade on replicated systems is to copy the `dtshad` file out of the way during the upgrade process, and then copy `dtshad` back when the upgrade is complete. Without the `dtshad` file contents, the system does not know about any replication and therefore the upgrade only affects a single system.

Identifying replication candidates

This section explains how to identify good file replication candidates. It includes:

- *Avoiding poor candidates*
- *Qualified candidates* on page 53

Avoiding poor candidates

File Replication is a very powerful tool, allowing files to update automatically on disparate systems. Not every file in a ServiceCenter system is a candidate for replication.

Use the following criteria and examples to determine which files NOT to replicate.

Warning: Do not replicate dbdict files. The dbdict records contain internal pointers into the file system and transferring that data to another system may cause corruption.

Avoid replicating any file containing data specific to a site.

File	Contains
dtshad	Distribution information specific to a site.
dtqueue	Distribution activity for specific sites from the current site.
errorlog	Runtime error information.
info	Information about the site such as name and timezone.
msglog	Messages for specific users of a system.
spool	Data to be printed.
spoolhdr	Data to be printed.
syslog	Records for each user login and logoff.

Avoid replicating any file that maintains logical consistency or unique keys.

File	Contains
counter	Numbers that create unique keys for other files.
number	Numbers that create unique keys for other files.

Avoid replicating any file that contains events that are specific to a site.

File	Contains
schedule	Scheduled events for the current system.
eventin	Incoming events for a specific system.
eventout	Outgoing events or responses from a specific system.

Avoid replicating any file that contains system-generated or scheduling information.

File	Contains
listrepository	System-generated information specific to the site.
anubis....	Tracking the status of schedulers.
audit	Audit changes to files on the system.

Avoid replicating any file that contains information relative to any process flow that takes place on all systems that have the files involved in the flow replicated.

File	Function
work	Used by Incident Management.
clocks	Records time spent at various points in the work flow.
downtime	Records the amount of downtime.
outage	Records the number of outages.

Avoid replicating any file that is part of the upgrade process.

- signatures
- signaturemake
- upgrade....
- upg.....

Qualified candidates

You can replicate almost any other file not specified in *Avoiding poor candidates* or included as a unique system file. The company and contacts files in the following examples test and verify that the replication process is functioning properly.

Calling the Replicate Function

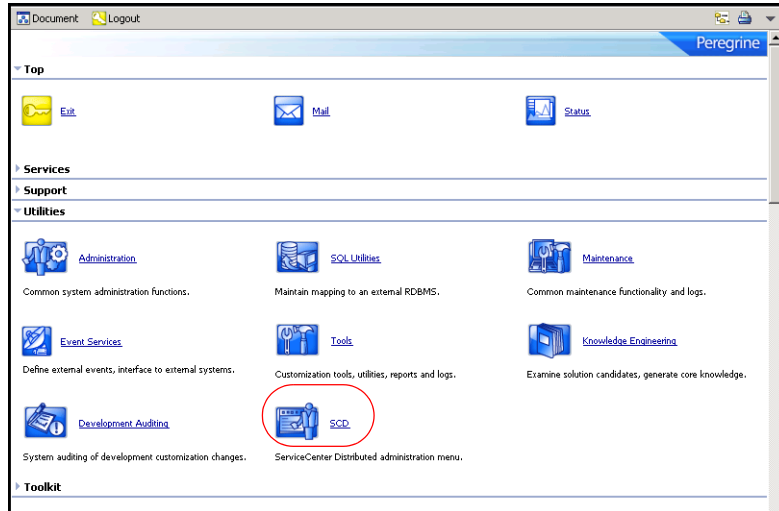
This section explains how to replicate files, including

- *File replication*
- *Verifying file replication using dtshad* on page 57
- *Replicating additional files* on page 58
- *Viewing file update information* on page 59
- *Synchronizing files* on page 60

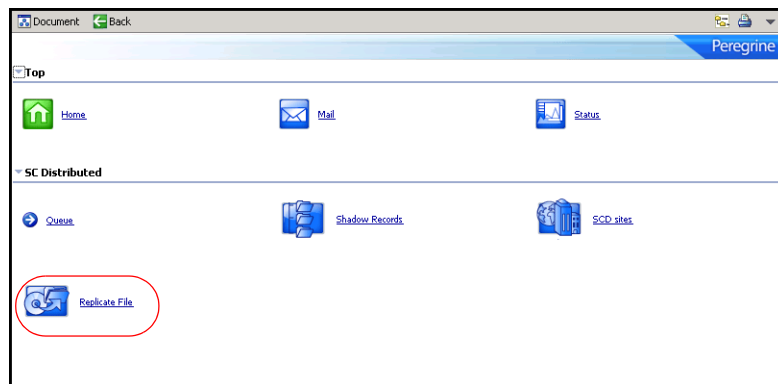
File replication

To replicate files

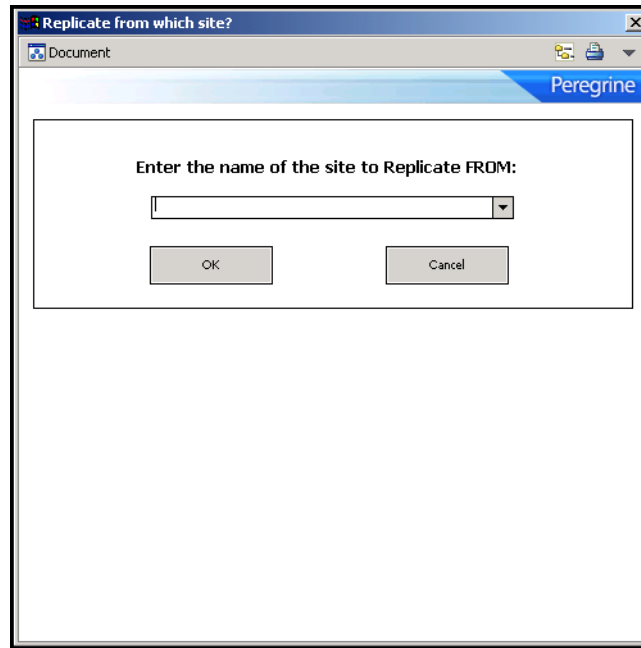
- 1 From the ServiceCenter main menu, click **Utilities**.



- 2 Click **SCD** to open the SCD Control menu.



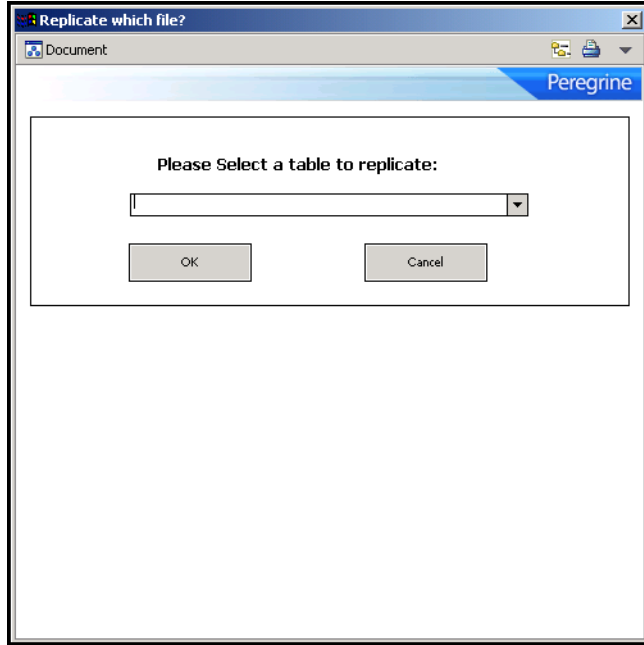
- 3 Click Replicate File to open the Replicate from which site? dialog box.



This must be in the scdsites file and previously established for SCD transactions.

- 4 Enter the name of the site you want to replicate from, and then click OK.
The prompt asks you to specify the file you want to replicate from the owning site.

- 5 Type the name of the file, or select a name from the drop-down list of available files at that site, and then click **OK**.



The replication occurs immediately in the foreground. You must wait for the processing to complete. You then return to the SCD control menu.

Verifying file replication using dtshad

Use the dtshad form to view the replicated files in the shadow site. If the file is not on this form, the connection or action failed.

To view the file replication record

- 1 From the ServiceCenter main menu, click **Utilities >SCD > Shadow Records** to open the dtshad form.

The screenshot shows a web browser window with the title 'Search dtshad Records'. The browser's address bar shows 'Welcome' and 'Search dtshad Records'. The browser's navigation bar includes 'Document', 'Back', 'Add', and 'Search'. The main content area displays the 'Peregrine ServiceCenter' logo and a form with the following fields:

- File Name:
- Key Value:
- Replicated:
- Shadow Sites:

- 2 Press **Enter** to search.

The dialog box contains a record list of current processes on the system, including the new replication process you just initiated.

The screenshot shows the same web browser window as the previous one, but with the following data entered into the form:

- File Name:
- Key Value:
- Replicated:
- Shadow Sites:

101

- 3 Locate the name of the file previously specified for the replication.
Note: If you do not see the file, the connection or action failed.
- 4 When you see the item on the list, click it to display that record.

You see the name of the file to replicate. The **Replicated** field indicates y (yes/true) to indicate that the file replicated from the site indexed. On the owning site, the same record indicates n (no/false) in this field because it did not replicate the file. Only the site replicating the file (shadow site) has the y value.

The numeric value of the shadow site matches the numeric value given to each site in the SCD network, as shown in the `scdsites` file.

Any updates to the replicated file automatically return to the owning site. The owning site then distributes the update to all other shadow sites. In this fashion, even though the shadow site has replicated the original data, it receives all updates from the owning site.

If more than two systems are going to replicate a file, then all of the systems replicate the file from the same owning site. For example, if you have three systems, A, B, and C, then choose one as the owning site, and the other two replicate from this site. If A is the owning site, then replicate B replicate from A and replicate C from A.

Note: Do not attempt to cascade replication. Do not replicate from A to B and then from B to C.

Replicating additional files

To replicate additional files from the owning site, repeat the entire process until you replicate all the files on the shadow site.

Viewing file update information

The `dtqueue` form displays information relevant to the file replication and distributed ticketing process. This form shows which files contain updated records from either the shadow site or owning site and what information changed in the process.

To display `dtqueue` records

- 1 From the ServiceCenter main menu, click **Utilities > SCD > Queue** to open the empty `dtqueue` form.
- 2 Press **Enter** to search and return a list of all queue records for this SCD site.

The screenshot shows a window titled 'Document' with a menu bar containing 'OK', 'Cancel', 'Add', 'Save', and 'Delete'. The application name 'Peregrine' is visible in the top right corner. The main content area displays the 'Peregrine ServiceCenter' logo and a form with the following fields:

- Site Name: USA
- Page: 0
- Hold: False
- Key: 1059931207.3501
- User Name: Falcon
- File Name: scdsites
- File key: sitekey=10
- Reason: Net Change Add

The `dtqueue` file opens.

Records from the queue delete automatically as soon as they process. Therefore, you do not necessarily view all records before the system removes them. If there is a processing lag however, the updates remain visible until all records before them in the queue are processed. The `dtqueue` file contains the following fields.

Field	Definition
Site Name	The name of the SCD site that issues the queued command.
Page	The record page number of the item that is being processed.
Hold	0 in this field indicates the record was processed; 1 indicates the record is on hold.
Key	The key value of the record that is being processed.
User Name	The name of user that issued the queued command.
File Name	The file that is being processed.

Field	Definition
File key	The key value of the file being processed.
Reason	The reason for the queued item (update, delete, transfer ownership, and so on).

Synchronizing files

All systems must be running for files to remain synchronized. Replications cannot occur if the owning site is not running. Update actions that are processed at shadow sites are held in queue until the owning site receives them.

The shadow sites need to replicate the files from the owning site only once, then all future updates at the owning site are sent to all shadow sites that replicated that file. Any updates at the shadow sites are also automatically returned to the owning site.

5 Master Site

CHAPTER

The master site option provides a sophisticated type of ticket information sharing within a distributed network of sites. This option establishes a single site that retains a local copy of all tickets from all other sites. This chapter explains the master site option, and describes how to set it up.

To learn more about the master site option, read:

- *About the master site* on page 62
- *Setting up the master site* on page 64

About the master site

Using a distributed network of four sites (USA, UK, AUS, and FR) where USA is the master site, any ticket entered at the UK, AUS or FR site automatically shadows at the USA site.

The master site option is not the same as file replication.

In a replication scenario, the USA, UK, AUS, and FR databases are identical. A master site has a copy of all tickets from all sites, but each database at each site still holds only tickets opened by or assigned to it. The master site's database contains all tickets in the distributed network, while the other sites hold site-specific database records only. See [File Replication](#) on page 49 for more information about file replication.

The master site option is not the same as simple distributed ticketing. In a regular distributing ticketing scenario, a ticket entered at the UK site and assigned to the AUS site only exists at those two sites through distributed ticketing. The master site, once defined, also holds a copy of the ticket created in this example.

The master site enables access to all tickets in the network from one local site. Users logged into the master site location can locally view and update all tickets in the network.

SCD recognizes three site types.

Site type Definition

Owning site	The site that currently owns the workflow for a distributed incident. The owning site is the only site with the information of which site has a copy of the record. Other sites that have a copy of a record are shadow sites. When an update occurs on the owning site or is received from a shadow site, the owning site sends the update to all of the shadow sites.
-------------	-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

Site type **Definition**

Shadow site A site that has a copy of a record but does not control the workflow for that record. The owning site controls the workflow. When a shadow updates the record, the owning site receives the update and then forwards the update to all other shadow sites.

Master site This is a site that receives a copy of all distributed records. It is a special site that receives a complementary copy of each record. A master site, if defined, receives a copy of all records no matter where the records are created.

For example, your three sites are USA, UK, AUS, with USA defined as the master site. A ticket opened in UK also gets copied to the USA. A ticket opened in AUS also gets copied to the USA. A ticket opened in AUS for UK also gets copied to the USA. The master site has a copy of all tickets, some that it owns (owning site) and some that are copies (shadow site).

Setting up the master site

You establish a master site by adding the `mastersc` parameter to each `sc.ini` file. In the previous example, the `sc.ini` file of the AUS server contains the following code.

```
# Installed Configuration
#

path:C:\Program Files\ServiceCenter\DATA
shared_memory:48000000
log:C:\Program Files\ServiceCenter\sc.log
bitmap_path:C:\Program
Files\ServiceCenter\BITMAPS
system:12670
language:English
auth:2ca1539e 2418c543 7f478188 a7a77686

localsc:AUS
mastersc:USA
```

Note: Both the `mastersc` line and the `localsc` line are part of the code. Define `remotesc` sites through the `scdsites` file (see *Chapter 2, Establishing Remote Server Connections*).

This single line in the ServiceCenter initialization file at each site initiates shadow ticket distribution to the master site from those sites. These tickets flow up to the master site, creating a network archive at the master location.

For more information about establishing shadow sites and using them with ServiceCenter, see *File Replication* on page 49.

6 Sample Implementation Flows and Parameters

CHAPTER

This chapter provides sample configuration scenarios and tables of the operational parameters that you can use to tailor the distribution process.

To view these examples, see:

- *Common situations* on page 66
- *ServiceCenter parameters* on page 69

Common situations

The sample flows that follow represent common situations that can occur when implementing multiple sites across a SCD network. Distributed Services uses parameters to achieve the results indicated in the sample configurations and to control additional aspects of the data distribution process across your linked network.

The following examples illustrate the flow of data within the distributed environment. The examples use a network with three sites called SanDiego, Germany, and France.

- *Owner updates ticket*
- *Non-owner updates ticket* on page 67
- *Owner updates and reassigns ticket* on page 67
- *Non-owner updates and reassigns ticket* on page 68
- *Non-local secondary assignment groups* on page 69

Owner updates ticket

The following example begins with a ticket that exists on all three sites that SanDiego owns. SanDiego updates the ticket.

Because SanDiego owns the ticket, the updates are applied directly to the database. As the owner, SanDiego knows that Germany and France have a copy of the ticket through an entry in the `dtshad` file. The updated records (`problem` and `probsummary`), queued to both Germany and France, are queued in the `dtqueue` file. For each remote site there is an `SCDSVQT` process that monitors the `dtqueue` file for that site. The `SCDSVQT` process pulls records from the queue and sends them to the desired site. As the German and French site receive the updates, the `problem` and `probsummary` records are updated. Any local data at the German and French sites is preserved.

Non-owner updates ticket

The following example begins with a ticket that exists on all three sites that SanDiego owns. Germany updates the ticket.

The update is made to the local database in Germany and a record is queued (the `dtqueue` file) for the SanDiego site. When SanDiego receives the updates (through the SCDSVQT process in Germany), it passes the data through conflict-resolution to make sure the updates made in Germany do not conflict with updates from other sites. The SanDiego database is then updated and SanDiego creates a `dtqueue` entry for France. The SCDSVQT process reads the queue and sends the updates to France, which applies them directly to the database without destroying any local data that exists at the site.

Note: When an incident ticket is closed on a remote site, call closure connectivity between the ticket and any originating Service Management calls on the owner site are affected. See *Call closure conflicts* on page 33.

Owner updates and reassigns ticket

The following example begins with a ticket that exists on all three sites that SanDiego owns. SanDiego updates the ticket and reassigns the ticket to Germany.

The update is made to the local database in SanDiego. A `dtqueue` record is written for Germany, indicating that Germany assumes responsibility for the record. When Germany receives the `assume responsibility request` (through the SCDSVQT process in SanDiego), it requests the current list of shadow sites from SanDiego. SanDiego responds with the `dtshad` record that indicates Germany and France are shadow sites. Germany is removed from the list and SanDiego is added. Germany then requests the complete record from the SanDiego site. The complete record is written to the database in Germany and records are written to the `dtqueue` file for France.

When all the records are received and written in Germany, the `dtshad` file at SanDiego is removed. Germany is now the owner of the record. The SCDSVQT process in Germany processes the records in the `dtqueue` file and sends the updates to France. Local data is preserved at all sites.

Non-owner updates and reassigns ticket

The following example begins with a ticket that exists on all three sites that SanDiego owns. Germany updates the ticket and assigns the ticket to France.

The updates are made to the local database in Germany and a **dtqueue** record is written for the SanDiego site. Germany sends nothing to France since Germany does not own the ticket.

The SCDSVQT process at Germany processes the **dtqueue** record and sends the update request to SanDiego. SanDiego does conflict-resolution on the update and writes the updated records to the database in SanDiego. SanDiego notices that the ownership of the record changed and writes a **dtqueue** record for the France site to assume responsibility for the record. When France receives the **assume responsibility request** (through the SCDSVQT process in SanDiego), it requests the current list of shadow sites from SanDiego. SanDiego responds with the **dtshad** record that indicates Germany and France are shadow sites. France is removed from the list and SanDiego is added. France then requests the complete record from the SanDiego site. The complete record is written to the database in France and records are written to the **dtqueue** file for Germany.

Once all the records are received and written in France, the **dtshad** file at SanDiego is removed. France is now the owner of the record. The SCDSVQT process in France processes the records in the **dtqueue** file and sends the updates to Germany. Local data is preserved at all sites.

Note: When an incident ticket is closed on a remote site, call closure connectivity between the ticket and any originating Service Management calls on the owner site are affected. See *Call closure conflicts* on page 33.

Non-local secondary assignment groups

The following example begins when a ticket is created in SanDiego. The primary assignment group for the ticket is SanDiego. The ticket also has France and Germany as secondary assignment groups.

The ticket is added to the SanDiego database. The application processes the secondary assignment groups and issues a request to share the ticket with Germany and France. A share request is written to the `dtqueue` file for both France and Germany. The SCDSVQT process in SanDiego reads the `dtqueue` record and sends notification to Germany that sharing is requested. Germany requests the complete record from SanDiego and writes the data to its local database. SanDiego creates or updates a `dtshad` record indicating that Germany is a shadow site. The SCDSVQT process in SanDiego reads the `dtqueue` record and sends notification to France that sharing is requested. France requests the complete record from SanDiego and writes the data to its local database. SanDiego creates or updates a `dtshad` record indicating that France is a shadow site. The SCDSVQT processes are independent tasks. Processing at Germany and France can occur at the same time.

ServiceCenter parameters

You can specify ServiceCenter parameters to maximize use of the ServiceCenter functions. Distributed ServiceCenter parameters provide system-level customization options. For more information, go to the *Technical Reference* topics of *Administering ServiceCenter* online help.

ServiceCenter parameter categories include:

- *Operational parameters* on page 70
- *Special parameters* on page 76
- *Help parameters* on page 77
- *SCD start-up commands* on page 78

Operational parameters

Specify these five parameters in the `sc.ini` file using one parameter per line without dashes.

- `localsc:london`
- `scsitesdef:newyork`
- `erdsite:newyork`
- `mastersc:london`
- `locksc:newyork`

Specify the following parameters in `sc.ini` or on the command line.

Syntax	Description
<code>dlocksc: sitename, sitename, ...</code>	<p>This parameter defines the list of the computers used for distributed locking. This parameter is entered at initialization through the <code>sc.ini</code> file. Any system listed in this parameter must have a corresponding <code>localsc</code> or <code>remotesc</code> entry.</p> <p><code>sitename</code> The system name that the <code>localsc</code> and <code>remotesc</code> definitions specify.</p>
<code>dt_allornone:n</code>	<p>This parameter is significant only if <code>dt_daterules</code> is set to 0. It controls whether the entire record is rejected because one field is found to be in conflict as follows:</p> <p><code>dt_allornone:1</code> Any field in conflict causes the entire record to be rejected.</p> <p><code>dt_allornone:0</code> Conflicts are handled on a field-by-field basis and, therefore, a partial update of the record is possible. This is the default.</p> <p>See <i>Enabling Distributed Ticketing</i> on page 16 for additional information.</p>

Syntax	Description
dt_async:n	<p>This parameter controls whether remote ticket submissions and updates are processed synchronously or asynchronously as follows:</p> <p>dt_async:1 Remote ticket submissions and updates are queued for an asynchronous process that submits the change as soon as possible.</p> <p>dt_async:0 Remote ticket submissions and updates are submitted, if possible, directly by the ServiceCenter user's process. If the change cannot be processed at that time, it is queued for an asynchronous process as in dt_async:1. This is the default.</p> <p>Use dt_async:0 for optimal performance. Setting this parameter to 1 reduces the system resources (file descriptors, sockets, buffers, and so on) required to perform remote services and improve the response time for the ServiceCenter user. One disadvantage with setting this parameter to 1 is that the user does not get immediate general feedback whether the remote update was successful.</p>
dt_daterules:n	<p>This parameter controls whether to use the date and time as the sole factor to resolve update conflicts.</p> <p>dt_daterules:1 The modification date/time resolves all conflicts.</p> <p>dt_daterules:0 Conflict resolution depends on the value of individual fields. This is the default.</p> <p>See <i>Enabling Distributed Ticketing</i> on page 16 for more information about conflict resolution.</p>
dt_maintain:n	<p>This parameter is significant only if dt_async is set to 0. It controls whether the connection to the remote site is maintained over several transactions or reestablished for each transaction as follows:</p> <p>dt_maintain:1 The remote connection is maintained across several transactions.</p> <p>dt_maintain:0 The remote connection is established for each transaction and terminated at transaction end. This is the default.</p>

Syntax	Description
dt_shadowdel:n	This parameter controls whether deleting a shadow record also deletes the master copy of that record and all other shadow copies.
dt_shadowdel:1	Deleting a shadow copy also deletes the master copy and all other shadows.
dt_shadowdel:0	Deleting the shadow copy has no effect on the master copy or any other shadow. This is the default.
erdsite:sitename	This parameter defines the ServiceCenter site where the erddef file resides. If the local system contains the erddef file, you can omit this parameter.
sitename	The logical name of the site where erddef file resides; for example, chicago .

Syntax	Description
localsc: sitename, *, port, sitekey, password, lock.capable, lock.only	<p>You must have this parameter to enable Distributed Services. It defines the local ServiceCenter site as follows:</p> <p>sitename The logical name of this site; for example, <i>chicago</i>. This name is the value that users see when asked to choose what site owns a record or what site a distributed query targets.</p> <p>* An asterisk. You can omit this argument if you use an <i>scdsites</i> file to define the network.</p> <p>port The port number or servicename associated with Distributed Services at this site. See <i>Configuring ServiceCenter distributed binaries</i> on page 12 for details on allocating a TCP/IP servicename. You can omit this argument if you use an <i>scdsites</i> file to define the network.</p> <p>1=true 0=false sitekey The unique numeric value assigned to this particular site within the ServiceCenter Environment. You can omit this argument if you use an <i>scdsites</i> file to define the network.</p> <p>password The password used by other sites when communicating with this site. You can omit this argument if you use an <i>scdsites</i> file to define the network.</p> <p>lock.capable Informs SCD that the computer can be a locking site. You can omit this argument if you use an <i>scdsites</i> file to define the network.</p> <p>lock.only Prohibits SCD from starting a queue process. You can omit this argument if you use an <i>scdsites</i> file to define the network.</p>

Syntax	Description
mastersc: sitename	<p>This parameter defines the master or main ServiceCenter site. This site automatically receives a copy (shadow) of all incident tickets created. If you want a master site (that is, a site that has a copy of all tickets in the distributed network), then all sites must have an <code>sc.ini</code> entry to define this master site.</p> <p>sitename The logical name of the central site that automatically creates a network archive.</p>
remotescnn: sitename, hostname, port, sitekey, password, lock.capable, lock.only	<p>Use these parameters in place of the <code>scdsites</code> file to define the individual sites in the ServiceCenter Network. You can omit these parameters if you use an <code>scdsites</code> file. If you have both an <code>scdsites</code> file and <code>remotescnn</code> parameters, the information in the <code>scdsites</code> file takes precedence.</p> <p>nn A two-digit number (01 - 32) indicating the remote site number being defined. This number has no significance other than to uniquely identify the definitions.</p> <p>sitename The logical name of the site being defined.</p> <p>hostname The TCP/IP host name of the site being defined.</p> <p>port The port number or service name associated with Distributed Services at the site being defined.</p> <p>sitekey The unique numeric value assigned to the site being defined.</p> <p>password The password required to establish a session with the site being defined.</p> <p>lock.capable Informs SCD that the computer can be a locking site.</p> <p>lock.only Prohibits SCD from starting a queue process because this site is only for locking purposes.</p>
1=true 0=false	

Syntax	Description	
scdconsole:n	scdconsole:1	The Distributed Services server issues informative messages to the console. Specify this if you start the server in foreground mode with a console attached.
	scdconsole:0	The Distributed Services server does not issue any messages to the console. This is the default.
scsitedef: sitename, hostname, port, sitekey, password	This parameter defines the ServiceCenter site where the scdsites file resides. If the local system contains the scdsites file or if the scdsites file does not define the ServiceCenter Services Network, you can omit this parameter.	
	sitename	The logical name of the site where the scdsites file resides.
	hostname	The TCP/IP host name of the site where the scdsites file resides.
	port	The port number or service name associated with Distributed Services at the site where the scdsites file resides.
	sitekey	The unique numeric value assigned to the site where the scdsites file resides.
	password	The password required to establish a session with the site where the scdsites file resides.

Special parameters

Syntax	Description
<code>cstrace:n</code>	<p>This parameter controls the Distributed Services client/server trace as follows:</p> <p><code>cstrace:1</code> Enables the dump of all client/server activity into the current Distributed Services Log.</p> <p><code>cstrace:0</code> Disables the client/server Trace. This is the default.</p>
<code>debugdtevents</code>	This parameter puts an entry in the log for each major distributed event that occurs.
<code>debugdtrecords</code>	This parameter puts a display in the log of records that are receiving distributed attention.
<code>debugdtworld</code>	This parameter puts an entry in the log of the entry and exit points of functions within distributed processing.
<code>debugdttrace</code>	This parameter puts entries in the log of the details of various events such as distributed queries and Conflict Resolution.
<code>eraselog:n</code>	<p>Use this parameter to erase the Distributed Services log as follows.</p> <p><code>eraselog:1</code> Erases the Distributed Services log at startup.</p> <p><code>eraselog:0</code> Does not erase the Distributed Services log. This is the default.</p> <p>You must specify <code>logfile</code> when using this parameter. Use <code>eraselog</code> cautiously to avoid deleting important information.</p>
<code>labufsize:nnnn</code>	Use this parameter to set the size of the Distributed Services Logical Array buffers. The default value is 4096 bytes.
<code>lmaxbuffers:nnn</code>	Use this parameter to set the maximum number of Distributed Services Logical Array buffers. The default value is 50.

Syntax	Description
<code>logfile:fileid</code>	Use this parameter to set the path and field of an alternate ServiceCenter error log. If not specified, the error messages writes to the standard ServiceCenter log along with the ServiceCenter error messages. If specified, the Distributed Services messages are logged separately in the specified log.
<code>logflsw:n</code>	This parameter controls the flush of the Distributed Services log.
<code>logflsw:1</code>	Forces the Distributed Services log to close and reopen after every log entry.
<code>logflsw:0</code>	Bypasses the closing and reopening action. This is the default.
	You must specify <code>logfile</code> when using this parameter. It is not available on UNIX systems.

Help parameters

When entered at the command prompt with any of the ServiceCenter executables, the following parameters display the indicated help information.

Syntax	Description
<code>-help</code>	Help for general topics.
<code>-helpalert</code>	Help on alert parameters.
<code>-helpall</code>	Help for all topics.
<code>-helpgui</code>	Help for GUI startup options.
<code>-helpir</code>	Help for IR Expert.
<code>-helplocale</code>	Help for international locale options.
<code>-helplogging</code>	Help for 24X7 backup options.
<code>-helpp4</code>	Help for P4 options.

SCD start-up commands

The following commands are available when you enter `SCENTER -HELPSCD` from the command prompt when starting the SCD server.

Command	Definition
<code>-forceque</code>	Force queue processor to be installed.
<code>-cstrace:1</code>	Client Server Trace Flag.
<code>-dlockclear</code>	Clear all SCD locks in the system.
<code>-dlocksc</code>	List computers used for distributed locking.
<code>-dt_allornone:1</code>	Any conflicts reject the record
<code>-dt_async:0</code>	Asynchronous Distribution.
<code>-dt_daterules:1</code>	Modification date resolves conflicts.
<code>-dt_maintain:0</code>	Maintain site connection.
<code>-dt_shadowdel:0</code>	Propagate shadow deletions to all sites.
<code>-eraseslog:0</code>	Erase the log.
<code>-erdsite:</code>	SCD Entity Relationship Maintenance Site.
<code>-errdb:</code>	Error database to use.
<code>-ifstrace:0</code>	Trace IFS processing.
<code>-labufsize:4096</code>	Size of buffers.
<code>-lamaxbuffers:200</code>	Number of buffers before paging begins.
<code>-localsc:</code>	Site identification for local site.
<code>-logfile:</code>	Name of file for logging errors.
<code>-logflsw:</code>	Flush log with each write.
<code>-mastersc:</code>	Master site name where all distributed data goes.
<code>-que:</code>	Name of the site to connect, if <code>-que:sql</code> starts <code>scsqlqt</code> .
<code>-remotesc1:</code>	Remote site location.
<code>-remotesc2:</code>	Remote site location.
...	...
<code>-remotesc31:</code>	Remote site location.
<code>-remotesc32:</code>	Remote site location.

Command	Definition
-reportscdlocks	Generate a list of all SCD locks in the system.
-scd	Start Distributed Services server.
-scdconsole:0	Issue messages to the console.
-scsitedef:	SCD Name Maintenance Site.

7 Troubleshooting

CHAPTER

This section helps ServiceCenter Administrators troubleshoot ServiceCenter Distributed Services.

To learn more about troubleshooting, read:

- *Considerations* on page 82
- *Common problems* on page 82
- *Distributed conflict resolution* on page 88
- *ServiceCenter log error messages and codes* on page 89

Considerations

Consider the following issues when troubleshooting your ServiceCenter systems connected using SCD:

- You can specify the `debugdtevents` parameter in the `sc.ini` file to place information in the ServiceCenter log about distributed ticketing events. This log is the `sc.log` file, not the `scdserve.log` file.
- The `probsummary.g` format shows the `syshomesite` value in the upper-left corner.
- Distributed ticketing creates schedule records when conflicts occur.
- The queue processor polls every 60 seconds. A ticket scheduled for another site shows up between 1 to 60 seconds after it is opened or updated.
- When using Load Manager, run SCD on only one of the systems in the Load Manager network. You can use either of the following:
 - A system dedicated to SCD work (`scenter -scd`), or
 - A system that does SCD work and allows users to log on (`scenter -listener` and `scenter -scd`).

Common problems

The following scenarios cover the most common setup and connection errors, and the solutions for each.

- *Connection not available with other sites* on page 83
- *Connecting with new server and reconnecting after network error* on page 84
- *Connecting with load manager* on page 84
- *Shadow tickets not being updated* on page 85
- *Owning site not getting updates from shadow sites* on page 86
- *Incident ticket errors during updates* on page 86
- *Cannot check on or remove a Global Lock* on page 87

Connection not available with other sites

If a connection is not available from one site to another:

- 1 From both sites, enter the `scenter -reportscd` command.
This command displays all the sites in the network and the status of each connection.
- 2 Using the output from both sites, verify that the **name of the site**, the **host name** for the sites, and the **port address** for the sites are consistent. The names are case sensitive, so `SanDiego` is different from `sandiego`.
- 3 The local definition on one system must agree with the remote definition on the other system.
- 4 You must verify the passwords by looking at the `sc.ini` file or the `scdsites` file at both sites.

If a connection cannot occur because of a password change, a log entry indicates that an attempted connection failed with an invalid password.

- 5 If the data seems to be consistent, check the System Status on each system to make sure that there is a queue handler `SCDQUE` started for the remote site (PID value in the display). If there is no PID value, then a queue handler has not been started or has terminated.

You can attempt to restart the queue handler with the following command:
`scenter -que:sitename &` (on UNIX), or `start /bg scenter -que:sitename` (on Windows).

After issuing the command to start the queue handler, enter the `scenter -reportscd` command to see if the queue handler has been started (PID value in the display and a status of `ACTIVE` or `WAITING FOR A QUEUE RECORD`). If there is no PID or the status is `TERMINATED` or `WAITING FOR A CONNECTION`, then the problem still exists.

- 6 Check the log on both systems for any `SC000300` through `SC000399` messages. These messages indicate potential errors in the definition between the systems or with the port specified (perhaps in use by someone else).
- 7 If nothing appears in the log, recycle both systems to see if the queue handler starts.
- 8 If nothing happens, add the line `cstrace:1` to the `sc.ini` file on both systems and recycle both system. Then save and send the `sc.log` file from both systems to Peregrine Customer Support.

The `cstrace:1` specification forces a trace of all client/server traffic between the systems. If nothing appears in the log, then the systems are not communicating and the problem lies somewhere in TCP/IP in either the hostname or the port specification.

Connecting with new server and reconnecting after network error

If a new SCD site is added to the network after the other network servers have been started, the connected servers do not recognize the new server. The same situation occurs when a connection with a server is lost due to network error; that is, the dropped server is no longer recognized. You can recycle the queue processors on each server. Then, the new or dropped servers are recognized and connected to the SCD network without the need to restart any of the servers.

To reconnect a dropped site or connect to a new site without restarting the network servers

- 1 Update the `scdsites` files of all SCD network servers, including the new site.
- 2 From the command line or DOS prompt, issue the following command:

```
scenter-que:SITENAME
```

where *SITENAME* the logical name of the site where you want to connect.

Note: This process is passed internally every time you restart the server, but is invisible to the user.

You can also issue this command to recycle the queue processor for any other reason.

- 3 Check your `sc.log` file to verify the connection is established and note any errors during connection.

Connecting with load manager

If a user connection fails, use the following procedure to reconnect a dropped site or connect to a new site without restarting the network servers.

- ▶ Update the `scdsites` files of all SCD network servers, including the new site.

Shadow tickets not being updated

If the owning site is not updating a shadow site, then the problem is in the owning site. All updates to a ticket are sent to the owning site and it is the owning site's responsibility to propagate the updates to all shadow sites. The shadow sites for a particular record are in the `dtshad` file of the shadow site.

To update the `dtshad` file

- 1 Use the **Database Manager** Utility to view the `dtshad` file and locate the entry for the ticket in question.

The `dtshad` file has a key value equal to the file that is being distributed and the key value of the record being distributed. You can easily see the `dtshad` record from the record list of a true query against `dtshad`.

- 2 View the details of the `dtshad` record and verify that the site that not being updated is contained in the list of shadow sites for the record.
 - If it is NOT, then the system is not aware that the site is a shadow site.
 - If the site exists in the `dtshad` file, check the `dtqueue` file to see if entries exist in the queue for the site.

If entries exist and are not being processed, then there is a problem with the connection to the site. Either the SCDSVQT process for the local site has terminated or the listener at the remote site has terminated. See *Connection not available with other sites* on page 83 to determine the problem.

It is possible for entries to exist in the `dtqueue` file and not be processed. An entry that has a `held` field value of `true` indicates that the entry is either part of a transaction, or there was a failure processing the entry. If an entry in the queue cannot be processed, then it goes into the `held` state waiting for someone to solve the problem.

The log files from both systems contain error messages that indicate problems while attempting to process the data. For example, file corruption at the remote site may prevent the entry from being processed. After the file corruption is corrected, the entry in the queue can be changed to have a `held` value of `false` and the system can attempt to process the entry again.

Owning site not getting updates from shadow sites

If the owning site is not getting updates from the shadow sites:

- 1 Verify that the connection to the owning site is active by issuing the `scenter -reportscd` command.
The output from this command shows that a connection to the owning site is either in the ACTIVE or WAITING FOR A QUEUE RECORD state.
- 2 If the state is TERMINATED or WAITING FOR A CONNECTION, see *Connection not available with other sites* on page 83 to determine the problem.
- 3 Use the **Database Manager** to verify that no records exist in the `dtqueue` file for the owning site.
- 4 If you have a connection with no queue records, then the home site rejected the record. View the `schedule` record to determine the reason for the rejection. This record contains the value of each updated field, the previous value, the updated value, and the current value for the field at the owning site. Use this record to reapply changes.

Incident ticket errors during updates

Primary causes of incident ticket errors during updates include:

- Duplicate ticket numbering
- Incorrect `syshomesite` values

Duplicate ticket numbering

If your system uses the default IM incident ticket numbering, you may encounter tickets on remote SCD sites with the same incident ticket numbers as those on your local system. This can create incident ticket errors during an update procedure because the system may update both the local and the remote files. This only occurs with incident tickets. See *Changing the incident number prefix* on page 26 to generate a unique prefix for remote sites.

Initializing the syshomesite value

The `syshomesite` (Site Numeric Key Value of the created ticket) field for the existing tickets either has not been initialized to a value, or has been initialized to a value of 0. While this is not an issue for `probsummary` records, it may cause confusion for `problem` records. The system does not recognize the value 0 as local, relative to the local system that performs the update as if it were an owning site. Since 0 is not recognized, the system sends the update elsewhere through a distributed query. The update then is sent back to the site initiating the update, updating the local file.

To resolve this situation, do one of the following:

- Mass update all `probsummary` records so the `syshomesite` value is set to the local site.
- Modify the incident ticket number on the local system (see in *Enabling Distributed Ticketing* on page 16).

Cannot check on or remove a Global Lock

There are a number of areas where Global Locking can be interrupted. Any of these areas may cause a component to be unavailable.

Potential Global Lock interruptions include:

- The network is down and a request to globally lock a record cannot be made.
- The network is down and the record remains locked for extended period of time.
- The owning site goes down for an extended period of time with the record locked.
- One of the shadows is not responding and therefore the shadow lock cannot be removed.

Important: If a distributed locking computer goes down, do not connect it to the SCD network until you can synchronize it with the current locking computer.

If you cannot check on a Global Lock, you can wait, or, you can let Conflict Resolution resolve issues if multiple updates occur. To reduce problems, assign one computer that is available 24x7 to handle Global Locks.

If you cannot remove a Global Lock, you can wait, or, you can remove the lock manually using the `scenter dlockclear` command. The `dlockclear` command removes all SCD Global Locks. Use this command cautiously to avoid conflicts and loss of data when removing a lock prematurely.

Distributed conflict resolution

If a distributed ticket fails for any reason, the system writes a record to the `schedule` file with a class of `distributed`. You can open this file with Database Manager. The `schedule` record, `strings`, and `strings1` array give a description of why the ticket failed.

Schedule record description

The schedule record written for a conflict resolution has the following format.

Strings array

- The user that updated the record
- The name of the file that was updated
- The unique key for the file that was updated
- The site that owns the record
- The site that attempted to update the record
- The result of the attempted update:
 - Partial Accept Some of the updates were accepted. Details about fields rejected are in the `strings2` array.
 - Rejected in Full The complete update was rejected. Details about the fields that had changed values (whose updates were rejected) are in the `strings2` array.
 - Accepted in Full All updates were accepted, but there are some questionable field updates detailed in the `string2` array.
- Entries 7 and beyond might contain error messages from the site that attempted the update.

Strings2 array

- The name of the field whose update is being questioned
- The value of the field before the user updated it

- The updated value of the field
- The current value of the field at the home site
- The reason the update is being questioned:
 - Questionable Old NE Current but Earlier Date—The update was applied but it had an earlier date.
 - Rejected Old NE Current and Later Date—The update was rejected because the current value had a later date.
 - Accepted Old EQ Current—Accepted because the current value matches the updated value already.

ServiceCenter log error messages and codes

This section includes:

- *Log format* on page 89
- *Severity levels* on page 90
- *Error messages* on page 90 section

Log format

A ServiceCenter log entry has the following format:

```
processid date time SCnnnnnn ***** Error Message Text *****
```

The following table describes possible error messages.

Parameter	Definition
processid	The process ID of the process that logged the message.
date	The date that the system logged the message.
time	The time that the system logged the message.
nnnnnn	The Error Number from <i>Error messages</i> on page 90.
Error Message Text	The Error Message Text from <i>Error messages</i> on page 90

Severity levels

In addition to the Error Number and Error Message Text, the following table contains the error severity and error description that provides additional information about the nature and potential causes of the error, and, where appropriate, suggestions on how to correct the problem. The four levels of incident severity are:

Severity	Description
information	The message is informational in nature. It does not indicate an error; it usually indicates the successful completion of an operation.
warning	A minor error occurred that may or may not affect the operation of the system. Correct the cause of the error, if possible, to ensure that there are no negative effects.
error	A serious error occurred that prevents the successful completion of an operation.
severe	A serious error occurred that may affect the continued operation of the system.

Error messages

The following table contains a description of ServiceCenter error messages.

Error Number	Severity	Error Message Text and Description
00101	Warning	Unable to Open SCD Profile - <i>sci.ini</i> The system cannot open the <i>sc.ini</i> file. If an <i>sc.ini</i> file is present, check its location. It is in the directory where the distributed server (<i>scdserve</i>) starts.
00102	Warning	Invalid Profile Section - <i>parameter</i> A ServiceCenter parameter begins with a left bracket character ([), making it appear to be the beginning of a new section. Check specified parameter.
00104	Warning	Invalid Profile Variable - <i>parameter</i> Internal Error scanning <i>sc.ini</i> parameters. Report this error to Peregrine Customer Support.
00105	Error	Invalid Profile Table Entry for Variable - <i>parameter name</i> Internal Error scanning <i>sc.ini</i> parameters. Report this error to Peregrine Customer Support.

Error Number	Severity	Error Message Text and Description
00106	Warning	Invalid Character in Profile Value <i>parameter:value</i> - Character Ignored ServiceCenter detected an invalid character in a numeric value and ignored it. Check the specified parameter.
00107	Error	Profile Value Out of Range - <i>parameter:value</i> A numeric value was too large. Check the specified parameter.
00108	Error	Invalid Profile Value - <i>parameter:value</i> A dotted decimal value (ddd.ddd.ddd.ddd) was specified incorrectly. Check the specified parameter.
00200	Severe	Error Allocating Storage for ini Parameters Storage is not available for 4K buffer to store parameters specified on the command line.
00202	Warning	Unable to Open SCD Log File - <i>filename</i> The system cannot open the SCD log file. Check the specified file name.
00300	Severe	Error Allocating Client/Server Control Blocks Storage is not available for the SCD client/server control blocks.
00301	Severe	Unable to Initialize Windows Socket Support - Errno - <i>errno</i> This error does not occur on UNIX. Report this error to Peregrine Customer Support.
00302	Error	Local Host Name Not Defined - Distributed Data Base Support Terminated The <i>localsc</i> parameter does not specify a local host name. You must specify this name before ServiceCenter can enable distributed database support.
00303	Warning	<i>sitename</i> Host Name - <i>hostname</i> - Not Found The system does not recognize the <i>hostname</i> for the indicated <i>sitename</i> , as specified in the <i>scdsites</i> file (or on the <i>remotescnn</i> parameter) as a valid host. Correct the specification, add the name to the local name server list of host names, or use the IP address of the desired <i>hostname</i> .
00304	Error	Unable to Establish Port Address for <i>sitename</i> Host The system does not recognize the service name for the indicated <i>sitename</i> , as specified in the <i>scdsites</i> file (or on the <i>remotescnn</i> parameter) as a valid service name. Correct the specification, add the name to the local name server list of service names, or use the Port address of the desired service.
00305	Warning	Error Opening Distributed Name Server Data Base -- Server - <i>sitename</i> The system cannot open the <i>scdsites</i> file on the indicated <i>sitename</i> (or local site if <i>sitename</i> is blank). The only defined sites are in the <i>remotescnn</i> parameters. To specify a ServiceCenter name server for centralized network definitions, use the <i>scsitedef</i> parameter.

Error Number	Severity	Error Message Text and Description
00306	Error	Error Reading Record from Name Server Data Base -- Return Code - <i>errcode</i> The system detected an error while trying to read a record from the ServiceCenter name server data base.
00307	Error	Error Getting Field Value from Name Server Data Base -- Field - <i>fieldname</i> The system detected an error while trying to read the <i>fieldname</i> field from the ServiceCenter name server data base. Check the field definitions for the name server data base.
00310	Information	Program Terminated by Operator Request An operator request terminated the ServiceCenter server; for example, the SCSTOP command.
00311	Error	Error Binding <i>sitename</i> Socket to Port Address -- Errno - <i>errno</i> The ServiceCenter server cannot bind the port address defined for the local site. Either the port address is invalid or is already in use by another component in the system. In some cases, an abnormal termination of ServiceCenter may cause TCP/IP to recognize that the port address is in use when, in fact, it is not. Change the port address in the ServiceCenter name server database (or in the <i>localsc</i> parameter) if it is invalid or already in use. Otherwise, reset TCP/IP. The TCP/IP <i>errno</i> in the error message may help solve the problem.
00312	Error	Error Getting Socket Name - <i>sitename</i> TCP/IP indicates an error while trying to get the local IP address. Check TCP/IP for potential problems.
00313	Error	Error Establishing Connection Queue - <i>localsc</i> Error received executing the TCP/IP listen operation.
00314	Error	Error Accepting Connection - <i>localsc</i> -- Errno - <i>errno</i> Error received executing the TCP/IP accept operation. The TCP/IP error number (<i>errno</i>) indicates the error.
00315	Error	Error Attempting to Read Logon - <i>localsc</i> An error occurred while trying to read a logon record from a remote system.
00316	Error	System Name <i>sitename</i> Not Recognized - <i>localsc</i> - Logon Rejected The <i>sitename</i> trying to establish a connection does not match any of the <i>sitenames</i> specified in the <i>scdsites</i> file (or on the <i>remotescnn</i> parameter). Check the names specified in the data base and on the <i>localsc</i> parameter of the system trying to connect.
00317	Error	Invalid System Index - <i>nn</i> - Returned - Logon Rejected - <i>localsc</i> An internal error occurs while trying to process logon record. Report this error to Peregrine Customer Support.

Error Number	Severity	Error Message Text and Description
00318	Error	Invalid Password - <i>password</i> - on <i>remotescnn (sitename)</i> - Logon Rejected The password from the <i>remotescnn (sitename)</i> does not match the password specified in the <i>scdsites</i> file (or on the <i>remotescnn</i> parameter). Check the passwords specified in the data base and on the <i>localsc</i> parameter of the system trying to connect.
00319	Error	Error Sending Logon Response - <i>sitename</i> An error occurs while trying to send a positive response to a logon from the specified sitename.
00322	Error	Invalid Open Count [<i>nn</i>] on <i>remotescnn</i> Socket [<i>index</i>] An internal error occurs while trying to open a connection to the SCD server. Report this error to Peregrine Customer Support.
00323	Error	Invalid Session Status [<i>nn</i>] on <i>remotescnn</i> Socket [<i>index</i>] An internal error occurs while trying to open a connection to the SCD server. Report this error to Peregrine Customer Support.
00325	Error	Send Error Attempting to Logon to <i>sitename</i> A TCP/IP send error occurs while trying to send the logon record to the SCD server at the specified sitename. This error only occurs in conjunction with other errors. Check the system logs at both the client and server sites for more information.
00326	Error	Receive Error Attempting to Logon to <i>sitename</i> A TCP/IP receive error occurred attempting to read the response to a logon record from the specified sitename. This error only occurs in conjunction with other errors. Check the system logs at both the client and server sites for more information.
00331	Error	Error Attempting to Send on <i>remotescnn</i> Socket [<i>index</i>] -- Socket Not Open An internal error occurs while trying to send on the specified connection. Report this error to Peregrine Customer Support.
00332	Error	Error Attempting to Send on <i>remotescnn</i> Socket [<i>index</i>] -- Length - <i>nn</i> - Too Short An internal error occurs while trying to send data on the specified connection. Report this error to Peregrine Customer Support.
00333	Error	Setsocket Error on <i>remotescnn</i> Socket [<i>index</i>] -- Errno - <i>errno</i> An error occurs while trying to execute a TCP/IP setsocket operation on the socket indicated. The TCP/IP error number (<i>errno</i>) indicates the error.
00334	Error	Error Attempting to Send on <i>remotescnn</i> Socket [<i>index</i>] -- Errno - <i>errno</i> An error occurs while trying to send data on the socket indicated. The TCP/IP error number (<i>errno</i>) indicates the error.

Error Number	Severity	Error Message Text and Description
00335	Error	Select Error on remotescnn Socket [<i>index</i>] -- Errno - <i>errno</i> An error occurs while trying to execute a TCP/IP select operation on the socket indicated. The TCP/IP error number (errno) indicates the error.
00341	Error	Error Attempting to Receive on remotescnn Socket [<i>index</i>] -- Socket Not Open An internal error occurs while trying to receive data on the specified connection. Report this error to Peregrine Customer Support.
00342	Error	Error Attempting to Receive on remotescnn Socket [<i>index</i>] -- Buffer Length (11111) Less Than Record Length (11111) An internal error occurs while trying to receive data on the specified connection. Report this error to Peregrine Customer Support.
00343	Error	Select Error on remotescnn Socket [<i>index</i>] -- Errno - <i>errno</i> An error occurs while trying to execute a TCP/IP select operation on the socket indicated. The TCP/IP error number (errno) indicates the error.
00345	Error	Error Attempting to Receive on remotescnn Socket [<i>index</i>] -- Errno - <i>errno</i> An error occurs while trying to receive data on the socket indicated. The TCP/IP error number (errno) indicates the error.
00371	Error	Illegal Server Specification - <i>index</i> An internal error occurs while trying to reference a client/server socket. Report this error to Peregrine Customer Support.
00372	Severe	Error Creating Primary Client/Server Socket An error occurs while trying to create a client/server socket. Verify that: <ul style="list-style-type: none"> ■ You do not exceed the maximum number of file descriptors. ■ You have sufficient storage available for buffers for this socket.
00373	Error	Error Attempting to Block/Un-Block remotescnn Socket An error occurs while executing an <code>ioctl</code> (or <code>fnctl</code>) operation to set the specified socket in blocking or non-blocking mode.
00399	Error	Connection on remotescnn Socket [<i>index</i>] has been Closed TCP/IP determines that the specified connection is shut down at the remote side of the connection.
00400	Severe	Error Allocating Storage for Compress Buffer - Size = <i>nnnnn</i> Bytes You do not have available storage for the buffer to store the compressed record segments. The error message indicates the requested size of the storage.
00401	Severe	Invalid LAI Displacement upon Entry to Compress An internal error occurs while trying to compress a data segment. Report this error to Peregrine Customer Support.

Error Number	Severity	Error Message Text and Description
00402	Error	Decompressed Text Exceeds Decompressed Buffer Size An internal error occurs while trying to decompress a data segment. Report this error to Peregrine Customer Support.
00403	Error	Invalid Compressed Data String Received An internal error occurs while trying to decompress a data segment. Report this error to Peregrine Customer Support.
00404	Error	Data Compression/Decompression Error Detected An internal error occurs while trying to decompress a data segment. Report this error to Peregrine Customer Support.
00500	Severe	Error Attempting to Fork Process An error occurs while trying to create a new process for an SCD server. This indicates you exceeded the system-wide limit on the number of processes or that you exceeded the limit on the number of processes that the SCD server can create.
00501	Error	Error Attempting to Invoke Program - <i>progname</i> An error occurs while trying to execute the specified program. The most common reason for this error is that the program is not in one of the directories or sub-directories specified in the SCD server PATH environment variable.
00601	Severe	Error attempting to DEFINE shared memory for buffer pool with a key of <i>kkkkkkkk</i> and size of <i>lllllll</i> An SCD utility cannot define shared memory with the specified key and length. This indicates that the specified key is already defined for another user or group, or that you exceeded the system-wide limit on shared memory.
00602	Severe	Error attempting to MAP shared memory for buffer pool with a key of <i>kkkkkkkk</i> and an ID of <i>nnnnnnnn</i> An SCD utility cannot map the shared memory with the specified key and ID.
00603	Severe	Error attempting to EXTEND shared memory for buffer pool with a key of <i>kkkkkkkk</i> and size of <i>lllllll</i> An SCD utility is unable to extend the shared memory with the specified key and length. This can indicate that the system-wide limit on shared memory has been exceeded.
00604	Severe	Error attempting to DEFINE shared memory for file control with a key of <i>kkkkkkkk</i> and size of <i>lllllll</i> An SCD utility cannot define shared memory with the specified key and length. This indicates that the specified key is already defined for another user or group, or that you exceeded the system-wide limit on shared memory.
00605	Severe	Error attempting to MAP shared memory for file control with a key of <i>kkkkkkkk</i> and an ID of <i>nnnnnnnn</i> An SCD utility cannot map the shared memory with the specified key and ID.

Error Number	Severity	Error Message Text and Description
00606	Severe	Error attempting to EXTEND shared memory for file control with a key of <i>kkkkkkkk</i> and size of <i>lllllll</i> An SCD utility cannot extend the shared memory with the specified key and length. This indicates that you exceeded the system-wide limit on shared memory.
00607	Severe	Buffer pool has exceeded the maximum allowed size with <i>nn</i> extensions. An SCD utility exceeded the maximum allowed size of the buffer pool.
00701	Severe	Error <i>errcode</i> attempting to open the DTSHAD file. SCD cannot open the DTSHAD file. The errcode indicates the error.
00702	Severe	Error <i>errcode</i> attempting to create the SHADOWING control file SCD cannot create the shadowing control file. The errcode indicates the error.
00703	Severe	Error <i>errcode</i> attempting to initialize the DTSHAD file SCD cannot initialize the shadowing control file. The errcode indicates the error.
00704	Severe	Error attempting to extract the key from record <i>keyvalue</i> SCD cannot extract the key from the record indicated.
00705	Severe	Error <i>errcode</i> attempting to add a DTSHAD record for record <i>keyvalue</i> SCD cannot add the indicated record to the DTSHAD file. The errcode indicates the error.
00706	Severe	Error <i>errcode</i> attempting to change a DTSHAD control record for record <i>keyvalue</i> SCD was unable to update the indicated record to the DTSHAD control file. The errcode indicates the error.
00707	Severe	Error <i>errcode</i> attempting to get a DTSHAD control record for record <i>keyvalue</i> SCD was unable to read the indicated record to the DTSHAD file. The errcode indicates the error.
00708	Severe	Error <i>errcode</i> attempting to delete DTSHAD control record for record <i>keyvalue</i> SCD cannot delete the indicated record to the DTSHAD control file. The errcode indicates the error.
00801	Severe	Error <i>errcode</i> attempting to open the QUEUEING file SCD cannot open the distributed ticketing queueing file. The errcode indicates the error.
00802	Severe	Error <i>errcode</i> attempting to create the QUEUEING file SCD cannot create the distributed ticketing queueing file. The errcode indicates the error.

Error Number	Severity	Error Message Text and Description
00803	Severe	Error <i>errcode</i> attempting to initialize the QUEUEING file SCD cannot initialize the distributed ticketing queueing file. The <i>errcode</i> indicates the error.
00804	Severe	Error attempting to get <i>nnnnnn</i> bytes of virtual storage The amount of virtual storage (<i>nnnnnn</i> bytes) is not available for a transaction to be queued.
00805	Error	Error <i>errcode</i> attempting to add a new record to the queue for site <i>sitename</i> SCD cannot add a new record for the specified <i>sitename</i> to the distributed ticketing queueing file. The <i>errcode</i> indicates the error.
00806	Error	Error <i>errcode</i> attempting to retrieve record from the queue for site <i>sitename</i> SCD cannot retrieve a record for the specified <i>sitename</i> from the distributed ticketing queueing file. The <i>errcode</i> indicates the error.
00807	Error	Error <i>errcode</i> attempting to retrieve queued record length for site <i>sitename</i> SCD cannot retrieve the length of a record for the specified <i>sitename</i> from the distributed ticketing queueing file. The <i>errcode</i> indicates the error.
00808	Error	Error <i>errcode</i> attempting to remove queued transaction SCD cannot delete a record from the distributed ticketing queueing file. The <i>errcode</i> indicates the error.
01001	Information	Distributed ServiceCenter Server Started The Distributed ServiceCenter server successfully started.
01002	Information	Session Established with <i>sitename</i> A client on the specified <i>sitename</i> successfully established a session with the Distributed ServiceCenter server.
01003	Severe	Internal Error - Request Length Less Than 8 The Distributed ServiceCenter server receives an invalid request. All requests must be a minimum of 8 bytes long. Report this error to Peregrine Customer Support.
01004	Information	Session Ended with <i>sitename</i> A client on the specified <i>sitename</i> terminated the Distributed ServiceCenter server session.
01005	Information	SCD Server Terminated by Command An <i>scstop</i> or equivalent command stopped the Distributed ServiceCenter server.
01100	Error	Invalid System Name Specified - <i>sitename</i> An internal error occurs while starting the Distributed ServiceCenter server queued transaction processor. Report this error to Peregrine Customer Support.

Error Number	Severity	Error Message Text and Description
01101	Error	Invalid System Index (<i>nn</i>) Specified for System Name <i>sitename</i> An internal error occurs while starting the Distributed ServiceCenter server queued transaction processor. Report this error to Peregrine Customer Support.
01102	Error	Error <i>retcode</i> Attempting to Delete Queued Transaction for <i>sitename</i> SCD cannot delete a record from the distributed ticketing queueing file for the specified <i>sitename</i> .
01201	Error	Error Parsing Input Data from <i>sitename</i> - Return Code = <i>retcode</i> An internal error occurs while parsing a distributed ticketing request to the Distributed ServiceCenter server from the specified <i>sitename</i> . Report this error to Peregrine Customer Support.
01202	Severe	Error Processing Open Request from <i>sitename</i> - Filename = <i>filename</i> The Distributed ServiceCenter server cannot open the specified <i>filename</i> while trying to execute a request from the specified <i>sitename</i> .
01203	Error	Error Converting Record from <i>sitename</i> to Local Format - Filename = <i>filename</i> The Distributed ServiceCenter server receives an error while trying to convert a record received from <i>sitename</i> to the <i>filename</i> format of the local site.
01204	Severe	Error Copying DATUM from <i>sitename</i> - Filename = <i>filename</i> The Distributed ServiceCenter server receives an error while trying to copy a DATUM received from the specified <i>sitename</i> to a DATUM associated with the specified <i>filename</i> .
01206	Severe	Error Inserting Record from <i>sitename</i> - Filename = <i>filename</i> The Distributed ServiceCenter server receives an error while trying to insert a record received from the specified <i>sitename</i> into the specified <i>filename</i> .
01207	Severe	Error Updating Record from <i>sitename</i> - Filename = <i>filename</i> The Distributed ServiceCenter server receives an error while trying to update a record in the specified <i>filename</i> from a request received from the specified <i>sitename</i> .
01208	Error	Error Performing Conflict Resolution - Client = <i>sitename</i> - Filename = <i>filename</i> The Distributed ServiceCenter server receives an error while trying to perform conflict resolution when updating a record in the specified <i>filename</i> from a request received from the specified <i>sitename</i> . The associated record was not updated.
01209	Severe	Error Processing Delete Request from <i>sitename</i> - Filename = <i>filename</i> The Distributed ServiceCenter server receives an error while trying to insert a record received from the specified <i>sitename</i> into the specified <i>filename</i> .

Error Number	Severity	Error Message Text and Description
01210	Severe	Error Sending Parent to <i>sitename</i> The Distributed ServiceCenter server receives an error trying to send the parent record while sending a complete shadow to the specified <i>sitename</i> .
01211	Severe	Error Sending Children to <i>sitename</i> The Distributed ServiceCenter server receives an error trying to send a child record while sending a complete shadow to the specified <i>sitename</i> .
01212	Severe	Error Adding <i>sitename</i> shadow site The Distributed ServiceCenter server receives an error trying to add the specified <i>sitename</i> to the list of shadows.
01213	Severe	Error Sharing Record as Requested from <i>sitename</i> - Filename = <i>filename</i> Trying to share a record with another site causes errors. Previous messages in the log indicate the exact nature of the error.
01301	Error	Error Parsing Input Data from <i>sitename</i> - Return Code = <i>retcode</i> An internal error occurs parsing a distributed query request to the Distributed ServiceCenter server from the specified <i>sitename</i> . Report this error to Peregrine Customer Support.
01302	Severe	Error Building Transmission String for Client <i>sitename</i> The Distributed ServiceCenter server receives an error while trying to build a distributed query transmission string for the specified <i>sitename</i> .
01303	Severe	Error Building Response for Client <i>sitename</i> The Distributed ServiceCenter server receives an error while trying to build a distributed query response for the specified <i>sitename</i> .
01304	Severe	Error Allocating File Information Block - Client = <i>sitename</i> The Distributed ServiceCenter server cannot obtain virtual storage for a File Information Block for the specified <i>sitename</i> .
01305	Severe	Error Processing Open Request from <i>sitename</i> - Filename = <i>filename</i> - Return Code = <i>retcode</i> The Distributed ServiceCenter server cannot satisfy a request from a client at the specified <i>sitename</i> to open the specified <i>filename</i> .
01306	Severe	Error Opening Cursor for Client <i>sitename</i> - Return Code = <i>retcode</i> The Distributed ServiceCenter server cannot satisfy a request from a client at the specified <i>sitename</i> to open a cursor.
01307	Severe	Error Fetching Records for Client <i>sitename</i> - Return Code <i>retcode</i> The Distributed ServiceCenter server cannot satisfy a request from a client at the specified <i>sitename</i> to fetch a record.
01308	Severe	Specified File Handle Not Found - Client <i>sitename</i> A client at the specified <i>sitename</i> requested an operation on a file that is not open.

Error Number	Severity	Error Message Text and Description
01309	Severe	Error Getting Record Key for Client <i>sitename</i> The Distributed ServiceCenter server cannot obtain the record key for a record that a client requests at the specified <i>sitename</i> .
01310	Severe	Error Converting Record from <i>sitename</i> to Local Format - Filename = <i>filename</i> You must convert records to the format that the dbdict on the local site defines. This message occurs if there is an error trying that conversion.
01311	Severe	Error Copying DATUM from <i>sitename</i> - Filename = <i>filename</i> This is a very low level error that indicates a shortage of memory.
01312	Severe	Error errcode Retrieving Record for <i>sitename</i> - Filename = <i>filename</i> A remote site receives a request to retrieve a record at this site. If the remote site cannot retrieve the record, this error message occurs. Verify that the record still exists.
01313	Severe	Error errcode Updating Record from <i>sitename</i> - Filename = <i>filename</i> A remote site receives a request to update a record at this site. If the remote site cannot update the record, this error message occurs. Verify that the record still exists and has not changed in value since being retrieved. Other messages indicate the exact cause of the failure.
01314	Severe	Error errcode Deleting Record from <i>sitename</i> - Filename = <i>filename</i> A remote site receives a request to delete a record at this site. If the remote site cannot delete the record, this error message occurs. Verify that the record still exists and has not changed in value since being retrieved. Other messages indicate the exact cause of the failure.
01315	Severe	Error errcode Inserting Record from <i>sitename</i> - Filename = <i>filename</i> A remote site receives a request to add a record at this site. If the remote site cannot insert the record, this error message occurs. The likely cause is that the record already exists. Other messages indicate the exact cause of the failure.
01316	Severe	Unlock request for <i>resource</i> name received from <i>sitename</i> but the resource was never locked The system receives a distributed unlock request, but the resource is not locked.
02001	Severe	Local HOMESITE value has not been defined. Update sc.ini to provide LOCALSC value The localsc parameter does not specify a local host name. You must specify this name before you enable distributed database support.
02002	Warning	The 'syshomesite' field must be defined as a numeric field in file <i>filename</i> You must define the syshomesite field as a numeric field. Update the local DBDICT to define this field as numeric.

Error Number	Severity	Error Message Text and Description
02003	Error	The <i>sitename</i> site is not defined. The specified <i>sitename</i> is not defined. Change the name to an existing sitename, or define a new sitename. You can define a name in the <i>scdsites</i> files or update <i>sc.ini</i> to provide <i>remotescnn</i> parameters for this site.
02004	Severe	Internal error within Distributed Client. Attempt to send unknown data type <i>datatype</i> . An internal error occurs while trying to send data to another site. Report this error to Peregrine Customer Support.
02005	Severe	Error initializing the Distributed environment One or more errors occur while trying to initialize the Distributed ServiceCenter environment. See other error messages for the nature of the errors.
02006	Error	Error code <i>errcode</i> attempting to establish a connection with <i>sitename</i> Distributed Services receives an error while trying to establish a connection with the specified <i>sitename</i> . The <i>errcode</i> indicates the nature of the error.
02007	Error	Error code <i>errcode</i> attempting to send data to site <i>sitename</i> Distributed Services receives an error while trying to send data to the specified <i>sitename</i> . The <i>errcode</i> indicates the nature of the error.
02008	Error	Error code <i>errcode</i> attempting to receive data from site <i>sitename</i> Distributed Services receives an error while trying to receive data from the specified <i>sitename</i> . The <i>errcode</i> indicates the nature of the error.
02009	Error	Error attempting to create a NULL record for file <i>filename</i> during conversion of a record from site <i>sitename</i> Distributed Services receives an error while trying to create a NULL record during the conversion of the file <i>filename</i> from the site <i>sitename</i> .
02010	Error	Error return by <i>-dacopy-</i> function creating local record for file <i>filename</i> from site <i>sitename</i> Distributed Services receives an error while trying to copy a structure from the file <i>filename</i> on the site <i>sitename</i> to a structure for the same file on the local site
02014	Error	Invalid queue record <i>command</i> against file <i>filename</i> for partner <i>sitename</i> . Change made by user <i>username</i> You receive an invalid command (<i>command</i>) while trying to process a queue record for file <i>filename</i> on site <i>sitename</i> for user <i>username</i> .
02015	Error	An error occurs trying to open the specified file while processing a queue record for the specified site.
02016	Error	Error attempting to transfer record in file <i>filename</i> to partner <i>sitename</i> . Change made by user <i>username</i> An error occurs while trying to transfer a record in the specified file to the indicated site. The specified user requests the transfer.

Error Number	Severity	Error Message Text and Description
02017	Error	Error <i>errcode</i> attempting to get shadow records for file <i>filename</i> to return to <i>sitename</i> An error occurs while trying to get the list of shadows for the specified file to transfer to the specified site. The errcode indicates the nature of the error.
02018	Error	Error exporting the dictionary definition for file <i>filename</i> to return to <i>sitename</i> An error occurs while trying to transfer the data dictionary for the specified file to the specified site.
02019	Error	Error <i>errnumber</i> returned from site <i>sitename</i> The Distributed ServiceCenter server at the specified site receives the error. Check the ServiceCenter log at the server site for additional information about the error.
02020	Error	Error <i>errcode</i> exporting file <i>filename</i> to send to site <i>sitename</i> An error occurs while trying to transfer the specified file to the specified site. The errcode indicates the nature of the error.
02021	Severe	Error getting storage required to send data to site <i>sitename</i> Storage is not available to store the data sent to the specified site.
02022	Severe	Error allocating virtual storage while processing data from site <i>sitename</i> Storage is not available to process the data received from the specified site.
02023	Severe	Error attempting to import data received from site <i>sitename</i> An internal error occurs while importing data from the specified site. Report this error to Peregrine Customer Support.
02024	Severe	Error attempting to read key field <i>fieldname</i> in file <i>filename</i> . Data originated from site <i>sitename</i> . An error occurs while trying to extract the specified key field from a record in the indicated file. The specified site received the data.
02025	Error	No primary key is defined for file <i>filename</i> . Data originated from site <i>sitename</i> . The database dictionary definition for the specified filename does not contain a primary key. Modify the database dictionary for that file to include a primary key. The indicated site received the data that triggered this problem.
02026	Error	Key field <i>fieldname</i> has a null key value in file <i>filename</i> . Data originated from site <i>sitename</i> . A site received a record for the specified file with a null key field value. Correct the data so that the primary key field is not null.
02027	Severe	Error converting key field <i>fieldname</i> in file <i>filename</i> to a STRING value. Data originated from site <i>sitename</i> . An internal error occurs while trying to convert the specified key to a string structure. Report this error to Peregrine Customer Support.

Error Number	Severity	Error Message Text and Description
02028	Severe	Error merging key field <i>fieldname</i> to a STRING value. Data originated from site <i>sitename</i> An internal error occurs while trying to merge the specified key to a string structure. Report this error to Peregrine Customer Support.
02039	Error	The site with a key value of <i>sitename</i> has not been defined The system is trying to update shadows, but the sitenames in the shadow database are no longer defined to the system. Look at your <i>scdsites</i> file or <i>remotesc</i> definitions in the <i>sc.ini</i> file.
02030	Severe	Error opening file <i>filename</i> . Data originated from site <i>sitename</i> . Target record was <i>keyvalue</i> . An error occurs while trying to open the specified file to access the indicated record received from the specified site.
02031	Severe	Error opening cursor for file <i>filename</i> . Data originated from site <i>sitename</i> . Target record was <i>keyvalue</i> . An error occurs while trying to open the cursor for the specified file to access the indicated record received from the specified site.
02032	Severe	Error retrieving record <i>keyvalue</i> from file <i>filename</i> . Data originated from site <i>sitename</i> . An error occurs while trying to read the specified record from the indicated file to satisfy a request from the specified site.
02033	Error	A 'sysmodtime' field not defined in file <i>filename</i> . Data originated from site <i>sitename</i> . Target record was <i>keyvalue</i> . The system cannot resolve a data conflict in the specified file because the file does not contain a <i>sysmodtime</i> field. Update the data dictionary for that file to contain a <i>sysmodtime</i> field.
02034	Warning	Data in record <i>keyvalue</i> within file <i>filename</i> coming from site <i>sitename</i> is out of date and is being ignored. Current record time is <i>timevalue</i> and received records time was <i>timevalue</i> . A data conflict occurs while trying to update a record. The update request has a date/time value that is less than the last update, and the <i>dt_datarules</i> parameter is set to <i>y</i> . The system ignores the update request.
02035	Severe	Error during copy of field <i>fieldname</i> from file <i>filename</i> . Data originated from site <i>sitename</i> . Target record was <i>keyvalue</i> . An internal error occurred attempting to copy the specified field in the indicated record in the specified file. The request was from the indicated site.
02036	Error	Record rejected because of mismatch in field <i>fieldname</i> within file <i>filename</i> . Data originated from site <i>sitename</i> . Target record was <i>keyvalue</i> . A data conflict occurs while trying to update a record. The old value of the field being updated does not match its present value, the <i>dt_datarules</i> parameter is set to <i>n</i> , and the <i>dt_allornone</i> parameter is set to <i>y</i> .

Error Number	Severity	Error Message Text and Description
02037	Error	Error <i>errcode</i> attempting to add a record to file <i>filename</i> An error occurs while trying to add a record to the specified file. The <i>errcode</i> indicates the nature of the error.
02038	Information	Error text from site <i>sitename</i> : <i>errmsg</i> The specified error message is logged at the Distributed ServiceCenter server at the site indicated in the error text.
03001	Severe	Not able to allocate <i>nnnnnn</i> bytes of memory for SCD processing The system cannot satisfy a request for <i>nnnnnn</i> bytes of storage for distributed query client processing.
03002	Error	Error <i>errcode</i> attempting to Initialize processing on file <i>filename</i> The distributed query client receives an error while trying to open the specified file. The <i>errcode</i> indicates the nature of the error.
03003	Error	File <i>filename</i> does not contain a <i>syshomesite</i> field and therefore a SHADOW update is not allowed The system receives a request for a shadow copy of the record and the local data dictionary for the associated file does not contain a <i>syshomesite</i> field. The system cannot honor the request. Update the local data dictionary for the specified file to include a <i>syshomesite</i> field and try again.
03004	Error	Error <i>errcode</i> attempting to add or update a record within file <i>filename</i> during SHADOW creation A request for a shadow is processing and an error occurs while trying to update or add a shadow record to the specified file. The <i>errcode</i> indicates the nature of the error.
03005	Error	Error <i>errcode</i> attempting to export a record within file <i>filename</i> during SHADOW creation An error occurs while trying to send a request for a shadow to the Distributed ServiceCenter server. The <i>errcode</i> indicates the nature of the error.
03006	Error	Error attempting to extract the <i>sysmodtime</i> field from file <i>filename</i> . Key value for record is <i>keyvalue</i> An error occurs while trying to extract the date/time value from a specified record in the indicated file.
03007	Error	Error attempting to convert a Cached record to a DATUM. File is <i>filename</i> and key value for record is <i>keyvalue</i> An error occurs while trying to processes the specified record from the cache.
03008	Severe	Error <i>errcode</i> attempting to reinstalled file <i>filename</i> during a replication The system receives a replication request, but the file cannot be reset at the current site. Other messages in the log indicate the exact failure.

Error Number	Severity	Error Message Text and Description
03009	Severe	Error errcode attempting to open file <i>filename</i> during a replication The system receives a replication request, but the file cannot be opened at the current site. Make sure a DBDICT entry for the file exists at the local site.
03010	Severe	Error errcode attempting to open file <i>filename</i> at site <i>sitename</i> during a replication The system receives a replication request, but the file cannot be opened at the remote site. Make sure the file exists at the remote site. Check the log entries at the remote site indicating the specific error.
03011	Severe	The system receives a distributed query request, but a connection cannot be established with the remote site. Make sure the remote site has its distributed servers started. Look for other messages in the log that might indicate the type of communications failure that occurred.
99999	Error	SCD Error Message Not Found - <i>msgno</i> SCD cannot locate the specified message in the SCD message data base. The reason might be: <ul style="list-style-type: none"> ■ The SCD error message database (scmsgtab.mtb) is not in the current directory when the distributed server (scdserve) is started. All message numbers are undefined. ■ The error message database is back-level and does not contain the error message being referenced. ■ An internal error occurred that causes an invalid message number to be generated.

Index

A

anubis 52
assignment groups
 distributed ticketing 24–26
 modifying 25
audit 52

B

build.startup global list 20

C

clocks 52
command line parameters 77
commands
 scenter -reportscd 40, 83, 86
 scenter-que 84
 scenter-scd 15
 sctest 15
 system.status 15
company file 53
conflict resolution
 for SCD 28
 global locking 44
contacts 53
counter 52
cstrace 76, 78
cstrace:1 83
Customer Support 8

D

Database Manager 27, 85

debugdtevents 76, 82
debugdrecords 76
debugdtworld 76
distributed ticketing 19
 assignment groups 24–26
 call closure conflicts 33
 changing incident number prefix 26–28
 enabling 16, 50
 file replication information 59–60
 global lists 20
 global locking 29
 identifying replication candidates 51
 Incident Management environment 18
 secondary distributing 19
 ticket paging 32
 verifying server communication 16–17
-dlockclear 46
dlockclear 78
dlocksc 28, 70, 78
downtime 52
dt_allornone 70, 78
dt_async 71, 78
dt_daterules 71, 78
dt_maintain 71, 78
dt_shadowdel 72, 78
dtqueue 51, 59–60
dtshad 51, 85

E

environment record, setting 19
eraselog 76

eraselogl 78
 erdsite 72, 78
 errdb 78
 error messages
 Distributed Services 89
 incident severity 90
 errorlog 51
 eventin 52
 eventout records 52

F

files
 non-replicable 51, 59–60
 sc.cfg 14
 sc.ini 13, 83
 shadow sites 60
 synchronizing for replication 60
 verifying replication in shadow sites 57
 forceque 78

G

global lists
 build.startup 20
 building 20
 global locking
 conflict resolution 44
 lock mechanism 28
 owning site 45
 Process 45
 setup 29
 shadow sites 45
 viewing lock information 46

H

help parameters
 help 77
 helpalert 77
 helpir 77
 helplocale 77
 helplogging 77
 helpp4 77
 parameter table 77
 host name, set-up 13

I

ifstrace 78
 incident
 error messages 90
 severity 90
 severity levels 90
 Incident Management
 call closure conflicts 33
 distributed ticketing 16, 50
 distributed ticketing paging 32
 environment 18, 19
 number file 26, 50
 security 19
 incident tickets
 number prefix for distributed ticketing 26–28
 opening 30
 routing 25
 info data 51

L

labufsize 76, 78
 lamaxbuffers 76, 78
 listening TCP port number 12
 listrepository 52
 localsc 39, 73, 78
 locking, distributed ticketing 28
 log files, messages 89
 logfile 77, 78
 logflsw 77, 78

M

master site
 description 63
 owning site 62
 shadow sites 61, 63
 mastersc 74, 78
 msglog 51

N

non-replicable file, upgrade process 53
 number 26, 50, 52
 numeric value, set-up 13

O

operational parameters

- dlocksc 70
- dt_allornone 70
- dt_async 71
- dt_daterules 71
- dt_maintain 71
- dt_shadowdel 72
- erdsite 72
- localsc 73
- mastersc 74
- remotescnn 74
- scdconsole 75
- scsitedef 75
- outages 52
- owning site
 - global locking 45
 - master site 62
 - not getting updated 86

P

- paging 18
- parameters
 - command line 77
 - debugdtevents 82
 - help 77
 - helpall 77
- password, set-up 13
- Peregrine Systems
 - Customer Support 8
- port numbers 13
- probsummary.g 82
- processid 89

Q

- que 78

R

- remotesc
 - commands 78
 - modifying 40
- remotescnn 74
- replicable files
 - company 53
 - contacts 53
- replication 55
- reportscdlocks 46, 79

S

- sc.cfg file 14
- sc.ini file 13, 83
- SCD
 - see ServiceCenter Distributed Services
- scd 79
- scdconsole 75, 79
- SCDQUE 17
- scdserve 12
- scdserve.log 15
- scdsites 37, 41
- scenter commands
 - que 84
 - reportscd 40, 83, 86
 - scd 12, 14, 15
- scenter -reportscd 83
- schedule 52
- scsitedef 75, 79
- scstart 15
- sequential number file 27
- server name 13
- server1 name 13
- server2 name 13
- Service Management call closure conflicts 33
- ServiceCenter Distributed Services
 - conflict resolution 28
 - distributed ticketing 19, 51
 - global locking setup 29
 - reconnecting with site after network error 84
 - restarting queue handler 83
 - SCD-Listener 17
 - synchronizing files 60
 - testing 30–31
 - ticket paging 32
- setup, scdsites 37, 41
- severity levels, incidents 90
- shadow sites
 - file replication 57
 - global locking 45
 - master site 61, 63
 - not getting updated 85
 - synchronizing files 60
 - viewing file update information 59–60
- signaturemake 53
- signatures 53

- special parameters
 - cstrace 76
 - debugdtevents 76
 - debugdtrecords 76
 - debugdtworld 76
 - eraselog 76
 - labufsize 76
 - lamaxbuffers 76
 - logfile 77
 - logflsw 77
- spool 51
- spoolhdr 51
- startup
 - confirmation, SCDQUE 17
 - scenter-scd 15
 - scstart 15
 - system.status 15
- startup commands
 - ctrace 78
 - dlockclear 78
 - dlocksc 78
 - dt_allornone 78
 - dt_async 78
 - dt_daterules 78
 - dt_maintain 78
 - dt_shadowdel 78
 - eraselogl 78
 - erdsite 78
 - errdb 78
 - forceque 78
 - ifstrace 78
 - iftrace 78
 - labufsize 78
 - lamaxbuffers 78
 - localsc 78
 - logfile 78
 - logflsw 78
 - mastersc 78
 - que 78
 - remotesc 78
 - reportscdlocks 79
 - scd 79
 - scdconsole 79
 - scsitedef 79
- syshomesite field 87
- syslog 51
- system.status 15

T

- TCP host name 12
- technical support 8

U

- upg 53
- upgrade file 53

W

- work 52



June 18, 2004