



# Session Recovery

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## Feature Summary and Revision History

### Summary Data

|  |                             |
|--|-----------------------------|
| Applicable Product(s) or Functional Area | 5G-UPF                      |
| Applicable Platform(s)                   | VPC-SI                      |
| Feature Default Setting                  | Disabled – License Required |
| Related Changes in this Release          | Not Applicable              |
| Related Documentation                    | Not Applicable              |

### Revision History

| Revision Details  | Release   |
|-------------------|-----------|
| First introduced. | 2020.02.0 |

## Feature Description

With robust hardware failover and redundancy protection, any hardware or software failures on the system can quickly be corrected. However, software failures can occur for numerous reasons, often without prior indication.

This chapter describes the Session Recovery feature that provides seamless failover and reconstruction of subscriber session information in the event of a hardware or software fault.

**Important**

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Session Recovery is a licensed Cisco feature. A separate feature license may be required. Contact your Cisco Account representative for detailed information on specific licensing requirements.

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## How it Works

This section provides an overview of how this feature is implemented and the recovery process.

The Session Recovery feature provides seamless failover and reconstruction of subscriber session information in the event of a hardware or software fault within the system preventing a fully connected user session from being disconnected.

Session recovery is performed by mirroring key software processes (for example, session manager and AAA manager) within the system. These mirrored processes remain in an idle state (standby-mode) wherein they perform no processing, until they may be needed in the event of a software failure (for example, a session manager task aborts).

There are some situations wherein session recovery may not operate properly. Additional software or hardware failures occur during the session recovery operation. For example, an AAA manager fails while the state information it contained was being used to populate the newly activated session manager task.

**Important**

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After a session recovery operation, some statistics, such as those collected and maintained on a per manager basis (AAA Manager, Session Manager, etc.) are in general not recovered, only accounting and billing related information is checkpointed and recovered.

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## Configuring the System to Support Session Recovery

The following procedures allow you to configure the session recovery feature for either an operational system that is currently in-service (able to accept incoming calls) or a system that is out-of-service (not part of your production network and, therefore, not processing any live subscriber/customer data).

**Important**

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The session recovery feature, even when the feature use key is present, is disabled by default on the system.

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## Enabling Session Recovery

As noted earlier, session recovery can be enabled on a system that is out-of-service (OOS) and does not yet have any contexts configured, or on an in-service system that is currently capable of processing calls. However, if the system is in-service, it must be restarted before the session recovery feature takes effect.

### Enabling Session Recovery on an Out-of-Service System

The following procedure is for a system that does not have any contexts configured.

To enable the session recovery feature on an out-of-service system, follow the procedure below. This procedure assumes that you begin at the Exec mode prompt.

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- Step 1** At the Exec mode prompt, verify that the session recovery feature is enabled via the session and feature use licenses on the system by running the **show license info** command.
- If the current status of the Session Recovery feature is Disabled, you cannot enable this feature until a license key is installed in the system.
- Step 2** Use the following configuration example to enable session recovery.
- ```
configure
  require session recovery
end
```
- Note** After you configure this command, you must save the configuration and then reload the chassis for the command to take effect. For information on saving the configuration file and reloading the chassis, refer to the System Administration Guide for your deployment.
- Step 3** Save your configuration as described in *Verifying and Saving Your Configuration*.
- The system, when started, enables session recovery, creates all mirrored "standby-mode" tasks, and performs packet processing card reservations and other operations automatically.
- Step 4** After the system has been configured and placed in-service, you should verify the preparedness of the system to support this feature as described in *Viewing Session Recovery Status* section.
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## Enabling Session Recovery on an In-Service System

When enabling session recovery on a system that already has a saved configuration, the session recovery commands are automatically placed before any service configuration commands in the configuration file.

To enable the session recovery feature on an in-service system, follow the procedure below. This procedure assumes that you begin at the Exec mode prompt.

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- Step 1** At the Exec mode prompt, verify that the session recovery feature is enabled via the session and feature use licenses on the system by running the **show license info** command:
- If the current status of the Session Recovery feature is Disabled, You cannot enable this feature until a license key is installed in the system.
- Step 2** Use the following configuration example to enable session recovery.
- ```
configure
  require session recovery
end
```
- This feature does not take effect until after the system has been restarted.
- Step 3** Save your configuration as described in *Verifying and Saving Your Configuration*.
- Step 4** Perform a system restart by entering the **reload** command:
- The following prompt appears:

Are you sure? [Yes|No]:

Confirm your desire to perform a system restart by entering **yes**.

The system, when restarted, enables session recovery and creates all mirrored "standby-mode" tasks, performs packet processing card reservations, and other operations automatically.

**Step 5** After the system has been restarted, you should verify the preparedness of the system to support this feature as described in *Viewing Session Recovery Status* section.

More advanced users may opt to simply insert the **require session recovery** command syntax into an existing configuration file using a text editor or other means, and then applying the configuration file manually. Exercise caution when doing this to ensure that this command is placed among the first few lines of any existing configuration file; it must appear before the creation of any non-local context.

## Disabling the Session Recovery Feature

To disable the session recovery feature on a system, enter the **no require session recovery** command from the Global Configuration mode prompt.



### Important

If this command is issued on an in-service system, then the system must be restarted by issuing the **reload** command.

## Viewing Session Recovery Status

To determine if the system is capable of performing session recovery, when enabled, enter the **show session recovery status verbose** command from the Exec mode prompt.

The output of this command should be similar to the examples shown below.

```
[local]host_name# show session recovery status
Session Recovery Status:
  Overall Status           : SESSMGR Not Ready For Recovery
  Last Status Update      : 1 second ago
```

```
[local]host_name# show session recovery status
Session Recovery Status:
  Overall Status           : Ready For Recovery
  Last Status Update      : 8 seconds ago
```

```
[local]host_name# show session recovery status verbose
Session Recovery Status:
  Overall Status           : Ready For Recovery
  Last Status Update      : 2 seconds ago
```

```

-----sessmgr-----      -----aaamgr-----      demux
cpu state   active   standby   active   standby   active   status
-----
1/0 Active   7         1         7         1         7         Good
[local]host_name#
```

## Viewing Recreated Session Information

To view session state information and any session recreation status, enter the following command:

```
show subscriber debug-info callid id
```

The following example shows the output of this command both before and after a session recovery operation has been performed. The "Redundancy Status" fields in this example have been bold-faced for clarity.

```
username: user1                callid: 01callb1                msid: 0000100003
Card/Cpu: 4/2
Sessmgr Instance: 7
Primary callline:
Redundancy Status: Original Session
  Checkpoints      Attempts      Success      Last-Attempt      Last-Success
  Full:            69           68           29800ms           29800ms
  Micro:           206          206          20100ms           20100ms
Current state: SMGR_STATE_CONNECTED
FSM Event trace:
  State                Event
  SMGR_STATE_OPEN      SMGR_EVT_NEWCALL
  SMGR_STATE_NEWCALL_ARRIVED SMGR_EVT_ANSWER_CALL
  SMGR_STATE_NEWCALL_ANSWERED SMGR_EVT_LINE_CONNECTED
  SMGR_STATE_LINE_CONNECTED SMGR_EVT_LINK_CONTROL_UP
  SMGR_STATE_LINE_CONNECTED SMGR_EVT_AUTH_REQ
  SMGR_STATE_LINE_CONNECTED SMGR_EVT_IPADDR_ALLOC_SUCCESS
  SMGR_STATE_LINE_CONNECTED SMGR_EVT_AUTH_SUCCESS
  SMGR_STATE_LINE_CONNECTED SMGR_EVT_UPDATE_SESS_CONFIG
  SMGR_STATE_LINE_CONNECTED SMGR_EVT_LOWER_LAYER_UP
Data Reorder statistics
Total timer expiry: 0          Total flush (tmr expiry): 0
Total no buffers: 0          Total flush (no buffers): 0
Total flush (queue full): 0  Total flush (out of range): 0
Total flush (svc change): 0  Total out-of-seq pkt drop: 0
Total out-of-seq arrived: 0
IPv4 Reassembly Statistics:
  Success: 0          In Progress: 0
  Failure (timeout): 0  Failure (no buffers): 0
  Failure (other reasons): 0
Redirected Session Entries:      Allowed:
2000      Current: 0
          Added: 0          Deleted:
          0
          Revoked for use by different subscriber: 0
Peer callline:
Redundancy Status: Recreated Session
  Checkpoints      Attempts      Success      Last-Attempt      Last-Success
  Full:            0            0            0ms               0ms
  Micro:           0            0            0ms               0ms
Current state: SMGR_STATE_CONNECTED
FSM Event trace:
  State                Event
  SMGR_STATE_LINE_CONNECTED SMGR_EVT_LOWER_LAYER_UP
  SMGR_STATE_CONNECTED     SMGR_EVT_AUTH_REQ
  SMGR_STATE_CONNECTED     SMGR_EVT_AUTH_SUCCESS
  SMGR_STATE_CONNECTED     SMGR_EVT_REQ_SUB_SESSION
  SMGR_STATE_CONNECTED     SMGR_EVT_RSP_SUB_SESSION
  SMGR_STATE_CONNECTED     SMGR_EVT_ADD_SUB_SESSION
  SMGR_STATE_CONNECTED     SMGR_EVT_AUTH_REQ
  SMGR_STATE_CONNECTED     SMGR_EVT_AUTH_SUCCESS
  SMGR_STATE_CONNECTED     SMGR_EVT_AUTH_REQ
  SMGR_STATE_CONNECTED     SMGR_EVT_AUTH_SUCCESS
  SMGR_STATE_CONNECTED     SMGR_EVT_AUTH_REQ
```

```

SMGR_STATE_CONNECTED          SMGR_EVT_AUTH_SUCCESS
SMGR_STATE_CONNECTED          SMGR_EVT_AUTH_REQ
SMGR_STATE_CONNECTED          SMGR_EVT_AUTH_SUCCESS
SMGR_STATE_CONNECTED          SMGR_EVT_AUTH_REQ
SMGR_STATE_CONNECTED          SMGR_EVT_AUTH_SUCCESS
Data Reorder statistics
  Total timer expiry:          0          Total flush (tmr expiry): 0
  Total no buffers:            0          Total flush (no buffers): 0
  Total flush (queue full):    0          Total flush (out of range):0
  Total flush (svc change):    0          Total out-of-seq pkt drop: 0
  Total out-of-seq arrived:    0
IPv4 Reassembly Statistics:
  Success:                     0          In Progress:                0
  Failure (timeout):           0          Failure (no buffers):       0
  Failure (other reasons):     0
Redirected Session Entries:
  Allowed:                     2000        Current:                     0
  Added:                       0          Deleted:                     0
  Revoked for use by different subscriber: 0

```