

# Decrease Capacity Manually

## OPERATING INSTRUCTIONS

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Decrease Capacity Manually



# 1 Description

This instruction describes how to decrease the Call Session Control Function (CSCF) cluster capacity by performing a graceful scale-in operation, which removes a Virtual Machine (VM) from the cluster.

This document always refers to horizontal scaling, where the scalability of the system is provided by multiple instances to distribute the load in parallel for having the capacity needed. Vertical scaling is not considered in this document.

The scaling function does not require a license.

**Note:** Even though the PL-3 and PL-4 Virtual Machines (VMs) are considered to be part of the scaling domain, they cannot be scaled in.

# 2 Procedure

## 2.1 Decrease Capacity Manually

### Prerequisites

- This instruction references the following documents:
  - [CSCF Health Check](#)
  - [Ericsson Command-Line Interface User Guide](#)
- No tools are required.
- The following conditions must apply:
  - The procedure must only be performed by support personnel with experience of Cloud and the CSCF.
  - No other upgrade or maintenance activity must be performed during the procedure.
  - Before starting these procedures, the user performing the operations must have access to the System Controller (SC) nodes.
  - Signaling Manager Command-Line Interface (CLI) or Graphical User Interface (GUI) must be closed before the start of the Scaling Operations. Manual updates of the configurations during Scaling Operations are not allowed.



- A Virtual Infrastructure Manager (VIM) is available.
- An Ericsson Command-Line Interface (ECLI) session in Exec mode is in progress.

### Steps

1. Prepare for scaling, see Section 2.2 Prepare for Scaling on page 2.
2. Select action based on the type of scale-in:
  - Decrease capacity through graceful scale-in, see Section 2.3 Configure Graceful Scale-In on page 2.
  - Decrease capacity through forceful scale-in, see Section 2.4 Configure Forceful Scale-In on page 5.

## 2.2 Prepare for Scaling

### Steps

1. Connect to one of the SC nodes:  
  
`ssh <user>@<system management IP address>`
2. Check the operational state of the scaling feature:  
  
`SC-1: ~ # cmw-configuration --status SCALING`

The following is an example output:

```
Disable
```

3. If the result is Enable, scaling is prepared. Exit this procedure.
4. If the result is Disable, enable scaling functionality:  
  
`SC-1: ~ # cmw-configuration --enable SCALING`
5. Before any scaling-related activities are performed, create a system backup.  
See [Create Backup](#).

## 2.3 Configure Graceful Scale-In

### Steps

1. Make sure that the scaling feature is enabled and a system backup is created.  
See Section 2.2 Prepare for Scaling on page 2.
2. Check that the cluster is in a healthy state, see [CSCF Health Check](#).
3. Navigate to the CrM MO, for example:



```
>dn ManagedElement=1,SystemFunctions=1,SysM=1,CrM=1
```

4. Verify that the VM to be scaled-in is scalable, for example:

```
(CrM=1)>show -r
```

```
CrM=1
autoRoleAssignment=ENABLED
ComputeResourceRole=PL-5
  adminState=UNLOCKED
  instantiationState=INSTANTIATED
  operationalState=ENABLED
  provides="ManagedElement=1,SystemFunctions=1,SysM=1,CrM=1,Role=Default-Role"
  uses="ManagedElement=1,Equipment=1,ComputeResource=PL-5"
ComputeResourceRole=PL-7
  adminState=UNLOCKED
  instantiationState=INSTANTIATED
  operationalState=ENABLED
  provides="ManagedElement=1,SystemFunctions=1,SysM=1,CrM=1,Role=Default-Role"
  uses="ManagedElement=1,Equipment=1,ComputeResource=PL-7"
ComputeResourceRole=PL-4
  adminState=UNLOCKED
  instantiationState=INSTANTIATED
  operationalState=ENABLED
  provides="ManagedElement=1,SystemFunctions=1,SysM=1,CrM=1,Role=Default-Role"
  uses="ManagedElement=1,Equipment=1,ComputeResource=PL-4"
ComputeResourceRole=PL-3
  adminState=UNLOCKED
  instantiationState=INSTANTIATED
  operationalState=ENABLED
  provides="ManagedElement=1,SystemFunctions=1,SysM=1,CrM=1,Role=Default-Role"
  uses="ManagedElement=1,Equipment=1,ComputeResource=PL-3"
ComputeResourceRole=SC-2
  adminState=UNLOCKED
  instantiationState=INSTANTIATED
  operationalState=ENABLED
  provides="ManagedElement=1,SystemFunctions=1,SysM=1,CrM=1,Role=SYSTEM"
  uses="ManagedElement=1,Equipment=1,ComputeResource=SC-2"
ComputeResourceRole=SC-1
  adminState=UNLOCKED
  instantiationState=INSTANTIATED
  operationalState=ENABLED
  provides="ManagedElement=1,SystemFunctions=1,SysM=1,CrM=1,Role=SYSTEM"
  uses="ManagedElement=1,Equipment=1,ComputeResource=SC-1"
ComputeResourceRole=PL-6
  adminState=UNLOCKED
  instantiationState=INSTANTIATED
  operationalState=ENABLED
  provides="ManagedElement=1,SystemFunctions=1,SysM=1,CrM=1,Role=Default-Role"
  uses="ManagedElement=1,Equipment=1,ComputeResource=PL-6"
Role=SYSTEM
isProvidedBy
  "ManagedElement=1,SystemFunctions=1,SysM=1,CrM=1,ComputeResourceRole=SC-1"
  "ManagedElement=1,SystemFunctions=1,SysM=1,CrM=1,ComputeResourceRole=SC-2"
scalability=NON_SCALABLE
Role=Default-Role
isProvidedBy
  "ManagedElement=1,SystemFunctions=1,SysM=1,CrM=1,ComputeResourceRole=PL-6"
  "ManagedElement=1,SystemFunctions=1,SysM=1,CrM=1,ComputeResourceRole=PL-3"
  "ManagedElement=1,SystemFunctions=1,SysM=1,CrM=1,ComputeResourceRole=PL-4"
  "ManagedElement=1,SystemFunctions=1,SysM=1,CrM=1,ComputeResourceRole=PL-5"
  "ManagedElement=1,SystemFunctions=1,SysM=1,CrM=1,ComputeResourceRole=PL-7"
scalability=SCALABLE
```

5. Retrieve the Universally Unique Identifier (UUID) for the VM to be scaled-in, for example:

```
(CrM=1)>show ManagedElement=1,Equipment=1,\
ComputeResource=PL-8
```



The following is an example output:

```
ComputeResource=PL-8
  macAddress
    "fa:16:3e:b7:d3:a3"
    "fa:16:3e:27:cb:90"
    "fa:16:3e:24:73:4a"
  uuid="a4dcda89-cf95-4bf6-81bd-99d47fde9eef"
```

6. Navigate to the `ComputeResourceRole` MO for the VM to be scaled-in, for example:

```
(CrM=1)>ComputeResourceRole=PL-8
```

7. Enter Config mode:

```
(ComputeResourceRole=PL-8)>configure
```

8. Prepare the scale-in operation, for example:

```
(config-ComputeResourceRole=PL-8)>no provides
```

9. Navigate to the `CrM` MO:

```
(config-ComputeResourceRole=PL-8)>up
```

10. Perform the scale-in:

```
(config-CrM=1)>commit
```

**Note:** To cancel the scale-in, run **abort**.

11. Verify that the scale-in process has started, for example:

```
(CrM=1)>show -r
```

12. If a failure occurs during the scale-in, see [CSCF Troubleshooting Guideline](#).

13. Verify that the VM is scaled-in:

```
(CrM=1)>show -r
```

The following is an example output showing that the VM `ComputeResourceRole=PL-8` is no longer running:





```
CrM=1
autoRoleAssignment=ENABLED
ComputeResourceRole=PL-3
  adminState=UNLOCKED
  instantiationState=INSTANTIATED
  operationalState=ENABLED
  provides="ManagedElement=1, SystemFunctions=1, SysM=1, CrM=1, Role=SYSTEM"
  uses="ManagedElement=1, Equipment=1, ComputeResource=PL-3"
ComputeResourceRole=PL-4
  adminState=UNLOCKED
  instantiationState=INSTANTIATED
  operationalState=ENABLED
  provides="ManagedElement=1, SystemFunctions=1, SysM=1, CrM=1, Role=Default-Role"
  uses="ManagedElement=1, Equipment=1, ComputeResource=PL-4"
ComputeResourceRole=SC-1
  adminState=UNLOCKED
  instantiationState=INSTANTIATED
  operationalState=ENABLED
  provides="ManagedElement=1, SystemFunctions=1, SysM=1, CrM=1, Role=SYSTEM"
  uses="ManagedElement=1, Equipment=1, ComputeResource=SC-1"
ComputeResourceRole=SC-2
  adminState=UNLOCKED
  instantiationState=INSTANTIATED
  operationalState=ENABLED
  provides="ManagedElement=1, SystemFunctions=1, SysM=1, CrM=1, Role=SYSTEM"
  uses="ManagedElement=1, Equipment=1, ComputeResource=SC-2"
ComputeResourceRole=PL-5
  adminState=UNLOCKED
  instantiationState=INSTANTIATED
  operationalState=ENABLED
  provides="ManagedElement=1, SystemFunctions=1, SysM=1, CrM=1, Role=Default-Role"
  uses="ManagedElement=1, Equipment=1, ComputeResource=PL-5"
ComputeResourceRole=PL-6
  adminState=UNLOCKED
  instantiationState=INSTANTIATED
  operationalState=ENABLED
  provides="ManagedElement=1, SystemFunctions=1, SysM=1, CrM=1, Role=Default-Role"
  uses="ManagedElement=1, Equipment=1, ComputeResource=PL-6"
ComputeResourceRole=PL-7
  adminState=UNLOCKED
  instantiationState=INSTANTIATED
  operationalState=ENABLED
  provides="ManagedElement=1, SystemFunctions=1, SysM=1, CrM=1, Role=Default-Role"
  uses="ManagedElement=1, Equipment=1, ComputeResource=PL-7"
Role=Default-Role
  isProvidedBy
    "ManagedElement=1, SystemFunctions=1, SysM=1, CrM=1, ComputeResourceRole=PL-4"
    "ManagedElement=1, SystemFunctions=1, SysM=1, CrM=1, ComputeResourceRole=PL-5"
    "ManagedElement=1, SystemFunctions=1, SysM=1, CrM=1, ComputeResourceRole=PL-6"
    "ManagedElement=1, SystemFunctions=1, SysM=1, CrM=1, ComputeResourceRole=PL-7"
  scalability=SCALABLE
Role=SYSTEM
  isProvidedBy
    "ManagedElement=1, SystemFunctions=1, SysM=1, CrM=1, ComputeResourceRole=PL-3"
    "ManagedElement=1, SystemFunctions=1, SysM=1, CrM=1, ComputeResourceRole=SC-1"
    "ManagedElement=1, SystemFunctions=1, SysM=1, CrM=1, ComputeResourceRole=SC-2"
  scalability=NON_SCALABLE
```

14. Remove the VM with the UUID that is retrieved in Step 5 from the VIM. See the VIM documentation.

15. Perform a health check, see [CSCF Health Check](#).

## 2.4 Configure Forceful Scale-In

### Steps

1. Check that the cluster is in a healthy state, see [CSCF Health Check](#).
2. Remove one of the scalable VMs from the VIM.



**Note:** Do NOT delete any of the VMs named SC-1, SC-2, PL-3, or PL-4.

3. Navigate to the **CrM** MO, for example:

```
>dn ManagedElement=1,SystemFunctions=1,SysM=1,CrM=1
```

4. Identify the **ComputeResourceRole** where the **adminState** is **LOCKED** and **operationalState** is **DISABLED**, for example:

```
(CrM=1)>show -r
```

```
ComputeResourceRole=PL-8
  adminState=LOCKED
  instantiationState=INSTANTIATED
  operationalState=DISABLED
  provides="ManagedElement=1, SystemFunctions=1, SysM=1, CrM=1, Role=Default-Role"
  uses="ManagedElement=1, Equipment=1, ComputeResource=PL-8"
```

5. Enter **Config** mode:

```
(ComputeResourceRole=PL-8)>configure
```

6. Prepare the scale-in operation, for example:

```
(config-ComputeResourceRole=PL-8)>no provides
```

7. Navigate to the **CrM** MO:

```
(config-ComputeResourceRole=PL-8)>up
```

8. Perform the scale-in:

```
(config-CrM=1)>commit
```

9. Verify that the scaling-in process has started, for example:

```
(CrM=1)>show -r
```

The following is an example output:

```
ComputeResourceRole=PL-8
  adminState=LOCKED
  instantiationState=INSTANTIATED
  operationalState=DISABLED
  provides="ManagedElement=1, SystemFunctions=1, SysM=1, CrM=1, Role=Default-Role"
  uses="ManagedElement=1, Equipment=1, ComputeResource=PL-8"
```

10. If a failure occurs during the scale-in, see [CSCF Troubleshooting Guideline](#).

11. Verify that the VM is scaled-in:

```
(CrM=1)>show -r
```

The following is an example output showing that the VM **ComputeResourceRole=PL-8** is no longer running:



```

CrM=1
autoRoleAssignment=ENABLED
ComputeResourceRole=PL-3
  adminState=UNLOCKED
  instantiationState=INSTANTIATED
  operationalState=ENABLED
  provides="ManagedElement=1,SystemFunctions=1,SysM=1,CrM=1,Role=SYSTEM"
  uses="ManagedElement=1,Equipment=1,ComputeResource=PL-3"
ComputeResourceRole=PL-4
  adminState=UNLOCKED
  instantiationState=INSTANTIATED
  operationalState=ENABLED
  provides="ManagedElement=1,SystemFunctions=1,SysM=1,CrM=1,Role=Default-Role"
  uses="ManagedElement=1,Equipment=1,ComputeResource=PL-4"
ComputeResourceRole=SC-1
  adminState=UNLOCKED
  instantiationState=INSTANTIATED
  operationalState=ENABLED
  provides="ManagedElement=1,SystemFunctions=1,SysM=1,CrM=1,Role=SYSTEM"
  uses="ManagedElement=1,Equipment=1,ComputeResource=SC-1"
ComputeResourceRole=SC-2
  adminState=UNLOCKED
  instantiationState=INSTANTIATED
  operationalState=ENABLED
  provides="ManagedElement=1,SystemFunctions=1,SysM=1,CrM=1,Role=SYSTEM"
  uses="ManagedElement=1,Equipment=1,ComputeResource=SC-2"
ComputeResourceRole=PL-5
  adminState=UNLOCKED
  instantiationState=INSTANTIATED
  operationalState=ENABLED
  provides="ManagedElement=1,SystemFunctions=1,SysM=1,CrM=1,Role=Default-Role"
  uses="ManagedElement=1,Equipment=1,ComputeResource=PL-5"
ComputeResourceRole=PL-6
  adminState=UNLOCKED
  instantiationState=INSTANTIATED
  operationalState=ENABLED
  provides="ManagedElement=1,SystemFunctions=1,SysM=1,CrM=1,Role=Default-Role"
  uses="ManagedElement=1,Equipment=1,ComputeResource=PL-6"
ComputeResourceRole=PL-7
  adminState=UNLOCKED
  instantiationState=INSTANTIATED
  operationalState=ENABLED
  provides="ManagedElement=1,SystemFunctions=1,SysM=1,CrM=1,Role=Default-Role"
  uses="ManagedElement=1,Equipment=1,ComputeResource=PL-7"
Role=Default-Role
  isProvidedBy
    "ManagedElement=1,SystemFunctions=1,SysM=1,CrM=1,ComputeResourceRole=PL-4"
    "ManagedElement=1,SystemFunctions=1,SysM=1,CrM=1,ComputeResourceRole=PL-5"
    "ManagedElement=1,SystemFunctions=1,SysM=1,CrM=1,ComputeResourceRole=PL-6"
    "ManagedElement=1,SystemFunctions=1,SysM=1,CrM=1,ComputeResourceRole=PL-7"
  scalability=SCALABLE
Role=SYSTEM
  isProvidedBy
    "ManagedElement=1,SystemFunctions=1,SysM=1,CrM=1,ComputeResourceRole=PL-3"
    "ManagedElement=1,SystemFunctions=1,SysM=1,CrM=1,ComputeResourceRole=SC-1"
    "ManagedElement=1,SystemFunctions=1,SysM=1,CrM=1,ComputeResourceRole=SC-2"
  scalability=NON_SCALABLE

```

## 12. Perform a health check, see CSCF Health Check.