

IPWorks Troubleshooting Guideline

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1 Introduction

This document describes how to perform the troubleshooting procedure in the Ericsson IPWorks product.

The purpose of this document is to provide information on how to troubleshoot and diagnose problems found in IPWorks. It also describes the available troubleshooting tools and how to use them.

The following procedures are **NOT** covered in this document:

- Installation and initial configuration instructions.
- Periodic maintenance tasks. For more information, refer to *IPWorks Manual Health Check*.
- Parameter configurations.

1.1 Prerequisites

This section describes the prerequisites for this document.

This guide is intended for system and network administrators working with Ericsson IPWorks. It is assumed that users of this document are familiar with performing operations within Operation and Maintenance (O&M) in general. The following prior knowledge is required:

- Intermediate Linux skills
- Ericsson Command-Line Interface (ECLI)
- Managed Object Model (MOM) related concepts
- Concepts, terminologies, and telecommunication abbreviations, such as TCP/IP, public data networks, and processor system (SC and PL)

1.1.1 Tools

This section lists the tools that can be used to troubleshoot the IPWorks.

For more information about these tools, see Section 2 on page 3.

1.1.2 Conditions

The following conditions must apply:

- An Ericsson Command-Line Interface (ECLI) session in Exec mode is in progress.



- Certain troubleshooting activities can have an impact on node performance. For example, trace or log activation can affect traffic throughput and is not recommended without first consulting Ericsson.

1.2 Related Information

Definition and explanation of acronyms and terminology, trademark information, and typographic conventions can be found in the following documents:

- Glossary of Terms and Acronyms
- Trademark Information
- Typographic Conventions



2 Tools

This section describes the tools that can be used to troubleshoot the IPWorks.

2.1 Toolbox

2.1.1 ps

Use the **ps** command to obtain information about a process:

```
# ps -ef | grep <name>
```

Table 1 lists the corresponding name for each IPWorks component. Select the appropriate name from the table. The "Node" column indicates on which node the command is executed.

Table 1 Process Names

Component	Name	Node
DNS Server	named	Payload
* DNS Server Manager	ipwdnssm	Payload
ASDNS Monitor	asdnsmon	Payload
* ASDNS Monitor Server Manager	ipwasdnsmonsm	Payload
ENUM Server	ipwenum	Payload
* ENUM FE Sync	ipwfesync	Payload
EPC AAA Server	ipwa3d	Payload
*AAA Server Manager	aaasm	Payload
* Storage Server	ipwss	System Controller
MySQL NDB Cluster Management Node	ndb_mgmd	System Controller
MySQL NDB Cluster Data Node	ndbmtd	System Controller
MySQL NDB Cluster SQL Node	mysqld	System Controller
DHCP Server	dhcpcd	Payload
* DHCP Server Manager	ipwdhcpv4sm	Payload

Note: * denotes a Java process

The appropriate line for the process shows the command (on the right) either starting with the name shown in Table 1 or, for Java processes, starting with `java` followed by `-DApp=<process name>` in the java arguments.

For example, to find the pid for the DNS Server Manager:

```
# ps -ef | grep ipwdnssm | grep -v grep
```



```

root 32479 1 0 Mar13 ? 00:53:51 java -DApp=ipwdnssm -mx128m
-DTCPSTARTPORT=9701 -DTCPENDPORT=9708 -Djboss.server.name=DNS15
-DMULTICASTAD
DRESS=224.0.0.1 -DMULTICASTPORT=15663 -DBIND_INTERFACE_ADDRESS=169
.254.43.15
-Djava.net.preferIPv4Stack=true -classpath /opt/ipworks/sm/script
s:/opt/ipworks
/common/java/ipwcommon.jar:/opt/ipworks/sm/java/ipwsm.jar:/opt/ipw
orks/common/ja
va/log4j-1.2.15.jar:/opt/ipworks/common/java/ipwse.jar:/opt/ipwor
ks/common/java
/dom4j-1.6.1.jar:/home/mmas/javaoam/lib/shoal-gms-impl-1.5.29.er
icsson.7.jar:/
home/mmas/javaoam/lib/javaoam-coremw-spi-R3E05.jar:/home/mmas/j
avaoam/lib/javaoam
-core-R3E05.jar:/home/mmas/javaoam/lib/grizzly-utils-1.9.24.jar:
/home/mmas/javaoam
/lib/grizzly-framework-1.9.24.jar:/opt/ipworks/common/java/Adve
ntNetSnp.jar:/opt
/ipworks/common/java/AdventNetSnpAgent.jar ericsson.ipworks.sm.Se
rverManager ServerType=DNS

```

The desired pid is 32479.

2.1.2 ipw-ctr

Users can use **ipw-ctr** to start, stop, or check the status of IPWorks services (such as SS, DNS, ASDNS, ENUM).

Usage:

```
ipw-ctr <option> <component> [<hostname>]
```

For more information about this tool, refer to the section Service Life Cycle Management in IPWorks Configuration Management.

If certain services cannot be stopped by **ipw-ctr**, use **kill** command to terminate the process.

2.1.3 kill

For the services that cannot be stopped by **ipw-ctr** smoothly, try to use the **kill** command to terminate the processes.

Note: Use **ipw-ctr** to stop the services after the **kill** command is executed, because the services are started by AMF automatically when the processes are terminated by the **kill** command.

Users can stop the process using the **kill** command as follows:



1. Use the `ps` command as described in Section 2.1.1 on page 3 to identify the `pid` of the process.
2. Use the `kill` command to send a `SIGTERM` signal to the process as follows:

```
# kill <pid>
or:
# kill -15 <pid>
or:
# kill -TERM <pid>
```

Each of these commands has the same effect, giving the process an opportunity to terminate gracefully.

3. Use the `ps` command again to check if the process has gone away.
4. If the process is still running, use the `kill` command to send a `SIGKILL` signal to the process as follows:

```
# kill -9 <pid>
or:
# kill -KILL <pid>
```

Each of these commands has the same effect, forcing the process to terminate.

2.1.4

rndc

The following table lists the **rndc** commands for DNS service.

The following commands are executed on the PL nodes on which DNS service is running.

Table 2 DNS Server Commands

Operation	Shell Command
Reload DNS Configuration	<code>rndc -s 0 reload</code>
Dump database	<code>rndc -s 0 dumpdb⁽¹⁾</code>
Dump statistics	<code>rndc -s 0 stats</code>
Toggle query logging	<code>rndc -s 0 querylog</code>
Set debugging level 0 debug-level	<code>rndc -s 0 notrace</code> <code>rndc -s 0 trace <debug-level>⁽²⁾</code>

(1) If the data size in cache is too large, it is possible the named process crashed after running “`rndc -s 0 dumpdb`”. This is a BUG of BIND. Before the bug is fixed, if the process is crashed, restart the DNS process.

(2) Where: <debug-level> is integer ranging from 1 to 99.



2.1.5 named-checkconf

named-checkconf is used to do validation for zone configuration file in path `/etc/ipworks/<host_name>/dns` on all PL nodes. The `<host_name>` is the host name of PL node, for example, PL-3.

Here is the example of using **named-checkconf** to validate the zone configuration file on PL-3 node:

1. Go to the location of DNS configuration DB file.

```
#cd /etc/ipworks/PL-3/dns
```

2. Generate the test report.

```
#named-checkconf -z named.conf > /tmp/report
```

3. Abstract error message.

```
#grep -i -e 'error' -e 'unexpected' -e 'unknown option' /tmp/report
```

Table 3 Example Message and Corresponding Actions

Error Message	Actions	Description
named.conf:22: unknown option '.'	<ol style="list-style-type: none">1. Clear the syntax error in the 22nd row of the file <code>named.conf</code>.2. Use named-checkconf to check if the error still exists.3. Reload the DNS configuration: <code>#rndc reload</code>	<p>Named file is located in the file path <code>/etc/ipworks/PL-3/dns</code>.</p> <p>Clear syntax error and check if it still exists. If it is cleared successfully, reload the DNS configuration dynamically.</p>
dns_rdata_fromtext: db.ims.etisalat.ae.Site1_NNIView:27: syntax error zone ims.etisalat.ae/IN: loading from master file db.ims.etisalat.ae.Site1_NNIView failed: syntax error zone ims.etisalat.ae/IN: not loaded due to errors.	<ol style="list-style-type: none">1. Clear the syntax error in the 27th row of the db file <code>db.ims.etisalat.ae.Site1_NNIView</code>.2. Use named-checkconf to check if the error still exists.3. Reload the DNS configuration: <code>#rndc reload</code>	<p>There are some syntax errors in the db file.</p> <p>Clear syntax error and check if it still exists. If it is cleared successfully, reload the DNS configuration dynamically.</p>

The command returns nothing if there is no error.

2.1.6 MySQL Benchmark Tool

MySQL Benchmark Tool is used to test the Storage Server provisioning rate. For example, see its use in Section 5.3.3 on page 48.

2.1.7 ifconfig

ifconfig is used to check the status of configured interfaces. For example, see its use in Section 5.7.3 on page 62.



2.1.8 netstat

netstat is used to check routing and router settings. For example, see its use in Section 5.7.3 on page 62.

2.1.9 dig

Attention!

User shall not dig from any SC to the VIP traffic address of PL to verify DNS/ENUM function. Because SC is in OAM subnet and PL is in signaling subnet, these 2 subnets are totally separated.

The Domain Information Groper (**dig**) is a tool for interrogating DNS servers. It performs DNS queries and displays the answers returned from the DNS servers queried. **dig** is useful to troubleshoot DNS problems because of its flexibility, ease of use and clarity of output. Other lookup tools tend to have less functionality than dig. Although dig is normally used with command line arguments, it also has a batch mode of operation for reading lookup requests from a file.

For more information, use **dig -h** command or go to dig man page <http://linux.die.net/man/1/dig>.

dig utility is commonly used to diagnose DNS problems.

Note: The IPWorks dig utility is installed in `/opt/ipworks/dns/usr/bin`. The OS provides a native dig utility in `/usr/bin`.

It is recommend that replacing the native utility as follows if this has not already been done:

```
# cd /usr/bin
```

```
# mv dig dig.orig
```

Example:

```
dig @10.0.0.3 rec1.example.com
```

The resulting dig output is as follows:

```
1 ; <<>> DiG 9.9.8-P2 <<>> @10.0.0.3 rec1.example.com
2 ;; global options: printcmd
3 ;; Got answer:
4 ;; ->>HEADER<<- opcode: QUERY,
    status: NOERROR, id: 175
5 ;; flags: qr aa rd ra; QUERY: 1, ANSWER: 1,
```



```

        AUTHORITY: 1, ADDITIONAL: 0
6
7  ;; QUESTION SECTION:
8  ;rec1.example.com.      IN    A
9
10 ;; ANSWER SECTION:
11 rec1.example.com.      300    IN    A    10.2.3.4
12
13 ;; AUTHORITY SECTION:
14 example.com.          86400 IN    NS    mydns.example.com.
15
16 ;; Query time: 13 msec
17 ;; SERVER: 10.0.0.3#53(10.0.0.3)
18 ;; WHEN: Thu Dec 29 22:37:43 2005
19 ;; MSG SIZE rcvd: 69
```

Starting with line 1, **dig** shows its version and the command arguments given.

Line 4 contains the following header information of the DNS packet that answers our query:

- opcode is the DNS operation. Generally with **dig** this is "QUERY".
- status is the status of the answer to our query. This can be as follows:
 - NOERROR – The DNS Server found no errors and was able to return an answer.
 - FORMERR – The DNS Server found an error in the format of the DNS query packet.
 - SERVFAIL – The DNS Server was unable to answer the query. This usually means that there is a configuration error. Most often this is because the DNS Server does not have a list of root servers.
 - NXDOMAIN – The DNS Server accepted the query but does not recognize the domain name given.
 - NOTIMP – The DNS Server does not implement the operation code in the DNS query.
 - REFUSED – The DNS Server received the packet but the client is not allowed query access.
 - NOTAUTH – The DNS Server found an error in the TSIG (Transaction Signature) section and refused to process the packet.
- id is the pseudo-random identification number assigned to the packet. This ID is sometimes helpful in tracking queries and their answers.
- flags in line 5 indicates the state of the flag bits in the response as follows:
 - qr – query response.



- aa – answer from an authoritative DNS Server.
 - rd – recursion desired bit is set in the query.
 - ra – recursion is available from the DNS Server.
- QUERY – Indicates how many queries were in the query section. This should always be 1.
 - ANSWER – Indicates how many answers were returned for the domain name and query type in the query. This number might be zero if the domain name exists but there are no matching records of the record type given. If there is a match of domain name and query type, this number should be 1 or more depending on the number of records matching the domain name and query type.
 - AUTHORITY – The authority section (if the AA bit was set) lists the DNS servers that are authoritative for the zone that contains the answer to the query.
 - ADDITIONAL – The additional section contains extra information that may be useful to the query client. In the example, the additional section contains the addresses of the DNS servers listed in the authority section. This avoids clients needing to make a second query if they need more information.

Lines 7 through 14 contain the data in the DNS sections as outlined in line 5.

Line 16 shows the round trip time for processing the query.

Line 17 shows the address of the DNS Server that was queried.

Line 18 shows the date and time of the query.

Line 19 shows the packet size of the DNS response.

2.1.10 mysql

The mysql utility is a command line utility that provides direct access to MySQL databases.

The full pathname of the utility is `/usr/local/mysql/bin/mysql`.

The user can use mysql to inspect the status and content of the IPWorks databases.

Note: Do **NOT** use unfamiliar commands or attempt to modify anything unless fully understand the consequences.

Use the following command to start mysql:

```
# /usr/local/mysql/bin/mysql -P 3307 --protocol=tcp
Welcome to the MySQL monitor. Commands end with ; or \g.
Your MySQL connection id is 15
Server version: 5.6.31-ndb-7.4.12-cluster-commercial-advanced-log \
```



MySQL Cluster Server - Advanced Edition (Commercial)
 Copyright (c) 2000, 2015, Oracle and/or its affiliates. All rights reserved.
 Oracle is a registered trademark of Oracle Corporation and/or its
 affiliates. Other names may be trademarks of their respective
 owners.
 Type 'help;' or '\h' for help. Type '\c' to clear the current input statement.

mysql>

Use the following command to select a database:

mysql> **use <database-name>**

For example, to select the Storage Server database:

mysql> **use ipworks**

Reading table information for completion

of table and column names

You can turn off this feature

to get a quicker startup with -A

Database changed

mysql>

Use the following command to close mysql and return to the shell prompt:

mysql> **exit**

Bye

#

2.1.11

df

Completed Backup and Restore handling requires large space for the directory /cluster/ipwbrf on the disk. The df tool can be used to check the disk space. It displays the amount of disk space occupied by mounted or unmounted file system, the amount of used and available space, and how much of the file system's total capacity has been used.

For example:

```
SC-1:~ # df -hl
Filesystem                Size      Used Avail Use% Mounted on
/dev/sdb2                  20G       2.3G   17G   13% /
devtmpfs                   32G       8.0K    32G    1% /dev
tmpfs                      32G       728K    32G    1% /dev/shm
tmpfs                      32G      339M    32G    2% /run
tmpfs                      32G        0    32G    0% /sys/fs/cgroup
/dev/sdb1                  2.0G      125M    1.7G    7% /boot
/dev/mapper/lde--cluster--vg-lde--cluster--lv 148G       24G   117G   17% /.cluster
/dev/md0p3                  99G       1.4G    92G    2% /local/ipworks
com_fuse_module            148G       24G   117G   17% /var/filem/nbi_root
SC-1:~ #
```

2.1.12 trace

The Trace provides the ability to perform subscriber tracing which helps troubleshoot the issues in IPWorks system.

For how to use trace in IPWorks, refer to [IPWorks Trace User Guide](#).

2.2 Alarm and Notification Viewer

- The operators can check active alarms by using ECLI. For example:

```
SC-1:~ # /opt/com/bin/cliss
```

```
ManagedElement=<Node Name>,SystemFunctions=1,Fm=1
```

```
(Fm-1) show
```

For more information about how to check the active alarms, refer to [Check Alarm Status](#).

- All alarms, including active and cleared alarms, are recorded in the alarm log files. The file location is `/cluster/storage/no-backup/nbi_root/AlarmLogs` of an active SC. To check alarms, the operators can search the keywords related to specific alarm.

For more information about alarm and notification, refer to [Fault Management and IPWorks Alarm List](#).

2.3 CM Attribute Viewer

There are two methods to view and modify the configuration parameters.

- For the configuration parameters in ECLI, the related MOs are displayed in the ECLI DN column. Operator can navigate to a specific MO to check the configuration parameters.
- For the configuration parameters that cannot be configured in ECLI, internal support or operator can configure them in the related configuration files. The files are listed in the `Configuration Files Directories` column.

Note: Since `/etc/ipworks` is a link to `/cluster/home/ipworks/etc`, you can view all the files in `/etc/ipworks` on any node.

Table 4 CM Attribute

Name	ECLI DN	Configuration Files Directories
Storage Server	ManagedElement=<Node Name>,IpworksFunction=1,IpworksCommonRoot=1,StorageServer=1	/etc/ipworks/ipworks_ss.conf



Name	ECLI DN	Configuration Files Directories
Server Manager	ManagedElement=<Node Name>,IpworksFunction=1,IpworksDnsRoot=1,DnsServer=1,DnsSm=1 ManagedElement=<Node Name>,IpworksFunction=1,IpworksDnsRoot=1,AsdnsServer=1,AsdnsSm=1 ManagedElement=<Node Name>,IpworksFunction=1,IPWorksAAARoot=1,IPWorksAAACommonRoot=1,AAAServerManager=1	/etc/ipworks/ipworks_dnssm.conf /etc/ipworks/ipworks_asdnsmonsm.conf /etc/ipworks/ipworks_aaasm.conf
DNS Server	ManagedElement=<Node Name>,IpworksFunction=1,IpworksDnsRoot=1,DnsServer=1,BindService=1	/etc/ipworks/<hostname>/ipworks_dns.conf
Active Select DNS Server	ManagedElement=<Node Name>,IpworksFunction=1,IpworksDnsRoot=1,AsdnsServer=1	/etc/ipworks/<hostname>/ipworks_asdnsmon.conf
ENUM Server	<ul style="list-style-type: none"> For ENUM server: ManagedElement=<Node Name>,IpworksFunction=1,IpworksDnsRoot=1, IpworksEnumRoot=1,EnumServer=1 For ENUM FE Sync: ManagedElement=<Node Name>,IpworksFunction=1,IpworksDnsRoot=1,IpworksEnumRoot=1,EnumFE=1 For CUDB connection pool with ENUM server: ManagedElement=<Node Name>,IpworksFunction=1,IpworksCommonRoot=1,DataBaseInfo=1,CudbManager=1,CudbServiceSite=ENUM For ERH module: ManagedElement=<Node Name>,IpworksFunction=1,IpworksDnsRoot=1, IpworksEnumRoot=1,EnumServer=1,Erh=1⁽¹⁾ For CUDB connection pool with ERH module: ManagedElement=<Node Name>,IpworksFunction=1,IpworksCommonRoot=1,DataBaseInfo=1,CudbManager=1,CudbServiceSite=NP 	For ENUM FE and ERH FE: /etc/ipworks/ldapschema/ldap_dictionary.xml
EPC AAA Server	ManagedElement=<Node Name>,IpworksFunction=1,IPWorksAAARoot=1	/etc/ipworks/aaa_diameter/*
MySQL NDB Cluster	Not Applicable	<ul style="list-style-type: none"> For the Management Node: /etc/ipworks/mysql/confs/ipworks_mgm_conf For the Data Node: /etc/ipworks/mysql/confs/ipworks_datanode_my.conf For the SQL Node: /etc/ipworks/mysql/confs/ipworks_sqlnode.conf

(1) For the ERH configuration in SS7 signaling manager, refer to **Configure SS7 for ENUM Number Portability**.

2.3.1 Storage Server

Following example shows how to check the configuration parameters of Storage Server by ECLI:



```
>show -v ManagedElement=<Node Name>,IpworksFunction=1,
IpworksCommonRoot=1,StorageServer=1
StorageServer=1
  directory="/cluster/storage/no-backup/ipworks/logs" <default>
  fileSize=1 <default>
  filesNumber=3 <default>
  level=LOG_LEVEL_DISABLE <default>
  passwordExpiryDays=45 <default>
  port=17071 <default>
  securityLog=false <default>
  storageServerId="1"
  timelyRotate=DISABLE <default>
```

Example 1 Check Configuration Parameters of Storage Server

For the other configuration parameters of Storage Server, they are stored in the file `/etc/ipworks/ipworks_ss.conf`.

Storage Server AMF wrapper configuration parameters are stored in the file `/opt/ipworks/ss/etc/ss_wrapper.conf`. The Storage Server AMF log directory, log name, log level can be configured here.

2.3.2

DNS Server Manager

Following examples show how to check the configuration parameters of DNS Server Manager by ECLI:

```
>show -v ManagedElement=<Node Name>,IpworksFunction=1,
IpworksDnsRoot=1,DnsServer=1,DnsSm=1
DnsSm=1
  dnsSmId="1"
  ssAddress="ipw_ss" <default>
  ssPassword="<Encrypted Password>"
  ssUserName="admin" <default>
  DnsSmLog=1
```

Example 2 Check Configuration Parameters of DNS Server Manager

For the other configuration parameters of Server Managers, they are stored in the files `/etc/ipworks/ipworks_*sm.conf`. The files contain the Server Manager properties that are used most often, where the `*` stands for `dns` or `asdnsmon`.

The file `/opt/ipworks/sm/confs/ipworks_sm_defaults.conf` contains the default values for properties used for all the Server Managers that are installed on a machine. It is stored on the board where the DNS is installed. This file is changed only rarely.

2.3.3

DNS Server

Following example shows how to check the configuration parameters of DNS by ECLI:



```
>show -v ManagedElement=<Node Name>,IpworksFunction=1,IpworksDnsRoot=1,
DnsServer=1,BindService=1
BindService=1
  asdnsGrpDiff=BIND_ASDNS_GRP_ENABLE_DIFF_1 <default>
  bindServiceId="1"
  debugLogLevel=1 <default>
  queryLogging=false <default>
  securityLog=false <default>
  DnsLog=1
  DnsTransLog=1
```

Example 3 Check Configuration Parameters of DNS Server

For the other configuration parameters of DNS server, they are stored in the file `/etc/ipworks/<hostname>/ipworks_dns.conf`.

2.3.4 ActiveSelect DNS Server

Verify the ActiveSelect DNS Server configuration files have been properly exported and are in the correct location. The default path of ActiveSelect DNS server configuration file is `/etc/ipworks/<hostname>/ipworks_asdnsmon.conf`.

Check the ActiveSelect DNS configuration file, `ipworks_asdnsmon.conf` for the DNS Server to ensure that the return counts for the ActiveSelect DNS Sites are not limiting the number of returned addresses. Also, confirm that the `Prefer Statements` are properly configured.

2.3.5 ENUM Server

Following example shows how to check the configuration parameters of ENUM by ECLI:

```
>ManagedElement=<Node Name>,IpworksFunction=1,IpworksDnsRoot=1,
IpworksEnumRoot=1,EnumServer=1
(EnumServer=1)>show -v
EnumServer=1
  dbConnectString="SC-1:1186" <default>
  dbConnectStringSecondary="SC-2:1186" <default>
  dnsResolver=true <default>
  dnsResolverIPAddress="127.0.0.1" <default> <read-only>
  dnsResolverPort=5300 <default>
  enumServerId="1"
  ipv4Address="0.0.0.0" <default>
  ipv6Address="::" <default>
  port=53 <default>
  securitylog=false <default>
  threadCount=50 <default>
  Erh=1
  Log=1
```

Example 4 Check Configuration Parameters of ENUM Server

Following example shows how to check the configuration parameters of ERH by ECLI:



```
>ManagedElement=<Node Name>,IpworksFunction=1,IpworksDnsRoot=1,
IpworksEnumRoot=1,EnumServer=1,Erh=1
(Erh=1)>show -v
Erh=1
  discardErhFailure=false <default>
  erhId="1"
  ldap=true
  MAPRespNumberFormat=COUNTRYCODEWITHDASHSEC <default>
  nxdomainForNonPortedNumber=true <default>
  rcseInterConnect=false <default>
  teTimer=30 <default>
  ErhLdap=1
  ErhSs7=1
```

Example 5 Check Configuration Parameters of ERH

Following example shows how to check the configuration parameters of ENUM FE by ECLI:

```
>ManagedElement=<Node Name>,IpworksFunction=1,IpworksDn
sRoot=1,IpworksEnumRoot=1,
EnumFE=1
(EnumFE=1)>show -v
EnumFE=1
  enableEnumDnSchedCache=false <default>
  enableEnumFE=true
  enumDnRangeExpiration=7 <default>
  enumDnSchedExpiration=7 <default>
  enumFEId="1"
  handleLDAPFailure=NXDOMAIN <default>
  EnumFELog=1
```

Example 6 Check Configuration Parameters of ENUM FE

Following example shows how to check the CUDB connection with ENUM server by ECLI:

```
>ManagedElement=<Node Name>,IpworksFunction=1,IpworksCommonRoot=1,
DataBaseInfo=1,CudbManager=1,CudbServiceSite=ENUM,CudbSiteManager=1,
CudbSite=<CudbSite Name>,CudbNode=<CudbNode Name>
(CudbNode=1)>show -v
CudbNode=<CudbNode Name>
  address="192.168.20.14"
  cudbNodeId="1" <default>
  distinguishedName="cudbUser=ENUMUser,ou=admin,dc=ericsson,dc=com"
  password="1:gliG5ALpb/AiV+h12cd89uNRnnnCZCR7"
  poolSize=400 <default>
  port=389 <default>
```

Example 7 Check CUDB Connection with ENUM Server

Following example shows how to check the CUDB connection with ERH module by ECLI:



```
>ManagedElement=<Node Name>,IpworksFunction=1,IpworksCommonRoot=1,
DataBaseInfo=1,CudbManager=1,CudbServiceSite=NP,CudbSiteManager=1,
CudbSite=<CudbSite Name>,CudbNode=<CudbNode Name>
(CudbNode=1)>show -v
CudbNode=<CudbNode Name>
address="192.168.20.14"
cudbNodeId="1" <default>
distinguishedName="cudbUser=ERHUser,ou=admin,dc=ericsson,dc=com"
password="1:gliG5ALpb/AiV+h12cd89uNRnnnCZCR7"
poolSize=400 <default>
port=389 <default>
```

Example 8 Check CUDB Connection with ERH Module

2.3.6 AAA Server

Following example shows how to check the configuration parameters of AAA by ECLI:

```
>show -v -r ManagedElement=<Node Name>,IpworksFunction=1,IPWorksAAARoot=1
IPWorksAAARoot=1
ipworksAAARootId="1" <default>
IPWorksAAACommonRoot=1
ipworksAAACommonRootId="1" <default>
AAAServer=PL-3
aaaServerId="PL-3"
...
```

Example 9 Check Configuration Parameters of AAA Server

2.3.7 AAA Server Manager

Following example shows how to check the configuration parameters of AAA Server Manager by ECLI:

```
>show -v ManagedElement=<Node Name>,IpworksFunction=1,IPWorksAAARoot=1,
IPWorksAAACommonRoot=1,AAAServerManager=1
AAAServerManager=1
aaaServerManagerId="1"
directory="/cluster/storage/no-backup/ipworks/logs" <default>
fileSize=10 <default>
filesNumber=10 <default>
level=LOG_LEVEL_DEBUG
timelyRotate=DISABLE <default>
```

Example 10 Check Configuration Parameters of AAA Server Manager

2.3.8 AAA Load Unbalanced in eVIP Scenario

Under normal situation, eVIP distributes the connection number to every PayLoad equally.

If one of the Payloads is down, all the connections will be automatically distributed to the other payload. Once the down Payload is recovered, the connection will



not recover automatically. You must manually disconnect and re-establish the connection to make the connection number in every payload is nearly equal.

Check if connection number of PL-3 and PL-4 is nearly equal.

— For connection over TCP, use below command to check connection number:

```
#netstat -apn|grep 3868
```

Example output:

tcp	0	0	10.175.161.115:50439	10.170.19.49:3868	ESTAB
tcp	0	0	10.175.161.115:50428	10.170.19.49:3868	ESTAB
tcp	0	0	10.175.161.115:50425	10.170.19.49:3868	ESTAB
tcp	0	0	10.175.161.115:50437	10.170.19.49:3868	ESTAB
tcp	0	0	10.175.161.115:50426	10.170.19.49:3868	ESTAB
tcp	0	0	10.175.161.115:50435	10.170.19.49:3868	ESTAB

If the connection number of PL-3 and PL-4 is not close to equal, rebalance connection number by disconnecting some connections or all connections on the Payload which have more connection number.

2.3.9

MySQL NDB Cluster

Management Node

Configuration parameters for the MySQL NDB Cluster Management Node are stored in the file `/etc/ipworks/mysql/confs/ipworks_mgm_conf`. Both NDB cluster Active-Active Management Nodes share the same `.conf` file.

Data Node

Configuration parameters for the MySQL NDB Cluster Data Node are stored in file `/etc/ipworks/mysql/confs/ipworks_datanode_my.conf`.

SQL Node

Configuration parameters for the MySQL NDB Cluster SQL Node are stored in file `/etc/ipworks/mysql/confs/ipworks_sqlnode.conf`. All SQL Nodes share the same `.conf` file.

2.4

Performance Management Viewer

For more information about how to check performance measurements, refer to [IPWorks Performance Measurements](#).





3 Troubleshooting Functions

This section describes the troubleshooting functions.

3.1 Alarm

ECLI is the tool for product that shows all active alarms.

```
# /opt/com/bin/cliss
>ManagedElement=<Node Name>,SystemFunctions=1,Fm=1
(Fm=1)>show FmAlarm=397
FmAlarm=397
  activeSeverity=MINOR
  additionalText="Agent 169.254.43.15 reports node 192.168.10.201 down"
  eventType=COMMUNICATIONSALARM
  lastEventTime="2015-03-03T01:54:22+01:00"
  majorType=193
  minorType=851974
  originalAdditionalText="Agent 169.254.43.15 reports node 192.168.10.201 down"
  originalEventTime="2015-03-03T01:54:22+01:00"
  originalSeverity=MINOR
  probableCause=342
  sequenceNumber=397
source="ManagedElement=<Node Name>,SystemFunctions=1,Fm=1,FmAlarmModel=ipworksDns,
FmAlarmType=ipworksDnsServASDNSNodeDown,HostName=PL-3,Node=192.168.10.201"
  specificProblem="DNS, ASDNS Node down"
```

Example 11 Show Active Alarms

Also, the operator can check the alarm status by referring to [Check Alarm Status](#).

All alarms, including active and cleared alarms, are recorded in alarm logs recorded in folder: `/cluster/storage/no-backup/nbi_root/AlarmLogs` on SC nodes.

For more information about the IPWorks alarms, refer to [IPWorks Alarm List](#).

3.2 Logging

This section describes the event logs for the product.

3.2.1 Error Log File Type

Not applicable.



3.2.2 Application-specific Logs

Table 5 Application-specific Logs

Log Directory	Description
/storage/no-backup/ipworks/logs/ ⁽¹⁾	IPWorks Service and AMF wrapper logs.
/storage/no-backup/coremw/var/log ⁽¹⁾	Core MW logs.
	AMF logs.
var/log/messages	Linux OS, kernel logs
	OpenSaf, CLM, COM, CMW, SMF, IMM, AMF, FM, JavaOam log, BRF, NTP, RPM, etc. logs
	IPWorks scripts logs (for example, amf, brf, tools, installation, initial configuration)
/local/ipworks/mysql-cluster/ ⁽²⁾	MySQL NDB Cluster logs

(1) /storage folder is a link to /cluster/storage, you can view the log files on any node.

(2) The log files under /local/ipworks/mysql-cluster are stored only on SC node.

3.2.3 Storage Server

The Storage Server writes logging information to the file /cluster/storage/no-backup/ipworks/logs/<hostname>/ipworks_ss_<hostname>.log.

The Storage Server appends logging information to the existing log file. When user checks log files, it is recommended to start from the end of the file.

3.2.3.1 File I/O Error

A File I/O Exception is thrown for log files, when user starts Storage Server as a non-root user:

```
File "logfile" I/O Error: /storage/no-backup/ipworks/logs/<hostname>/ipworks_ss_<hostname>.log (Permission denied)
```

File I/O Exception is thrown for audit log file when user logon to the CLI as a non-root user.

```
File "auditlogfile" I/O Error: /var/ipworks/logs/security/ipworks_ss_security Oct 05.audit (Permission denied)
```

Ensure that user is logon with root privileges to avoid these exceptions.



3.2.4 Server Manager

The Server Manager can be configured to use debug logging. By default, Server Manager log is disabled, it can be enabled by using ECLI. For details, see Section 3.6 on page 28.

The Server Manager logs are stored in the file `/storage/no-backup/ipworks/logs/<host-name>/<*>sm.log`.

Where:<*> is the dns , asdnsmon, or aaasm.

3.2.5 DNS Server

To help resolve problems with the DNS Server, inspect the log files of server, either directly on the server system or through the IPWorks CLI.

The DNS Server log events use the syslog utility and can log events to log files. By default, major events are written through the syslog utility, though other events can be added. The default path is `/var/log/messages`.

Following example shows how to enable the debug logging for DNS server:

```
#/opt/com/bin/cliss
#config
(config)>ManagedElement=<Node Name>,IpworksFunction=1,
IpworksDnsRoot=1,DnsServer=1,BindService=1,debugLogLevel=<number>
(config)>ManagedElement=<Node Name>,IpworksFunction=1,
IpworksDnsRoot=1,DnsServer=1,BindService=1,
DnsLog=1,level=DNS_LOG_LEVEL_DEBUG
(config-DnsLog=1)>commit
```

Example 12 Enable Debug Logging for DNS Server

Where: <number> represents the granularity of debug logging information. Refer to the attribute `debugLogLevel` in the MO `BindService` for details.

Note: By default, DNS transaction log is enabled.

The DNS server opens a log file, `ipworks_dns.log`, in the configured log directory (`/cluster/storage/no-backup/ipworks/logs/`), if the debug level is `DNS_LOG_LEVEL_DEBUG`. The log directory is read-only.

There are also `amf wrapper` and `coremw` related logs recorded in `/cluster/storage/no-backup/coremw/var/log/`. In default, the logs are enabled.

3.2.6 ActiveSelect DNS Server

Check the ActiveSelect DNS (ASDNS) Monitor log file, `ipworks_asdnsmon.log` for errors. The default path is `/cluster/storage/no-backup/ipworks/logs/`.

Check the status for a given address using the `ipworks_asdnsmon.log` file.



Check the `ipworks_asdnsmon_trans.log` that tracks the transaction events regarding ASDNS monitor.

coremw related log is enabled by default. It is located in `/cluster/storage/no-backup/coremw/var/log/`.

Check the DNS Server log file, `ipworks_dns.log` for the following two messages:

```
datagram from [ASDNS Monitor IP Address].port
ns_req: TSIG verify failed - BADSIG (16)
```

If this message is displayed, there is a mismatch in the TSIG key being used and thus messages from the ASDNS Monitor are not being processed. Use the IPWorks CLI to correct the configuration.

3.2.6.1 ActiveSelect DNS Monitor Log Files

To help resolve problems with the ASDNS Monitor, trace the activity by inspecting the monitor log files.

The IPWorks ASDNS Monitor logs events to the `syslog` utility and log files. By default, major events are written to the `syslog` utility. For details about the `syslog` utility, see the `syslog(3C)` manual page.

By default, the ASDNS Monitor log is disabled as logging consumes CPI and disk resources.

Following example shows how to enable the logging for ASDNS Monitor:

```
#/opt/com/bin/cliss
#config
(config)>ManagedElement=<Node Name>,IpworksFunction=1,IpworksDnsRoot=1,
AsdnsServer=1,asdnsMonitor=1,AsdnsMonLog=1,level=LOG_LEVEL_DEBUG
(config-AsdnsMonLog=1)>commit
```

Example 13 Enable Logging for ASDNS Monitor

Note: The ASDNS transaction log is enabled by default.

The ASDNS Monitor opens a file, `ipworks_asdnsmon.log`, in the log directory (`/cluster/storage/no-backup/ipworks/logs`).

For more information about the ASDNS Monitor Log and ASDNS Monitor Transaction Log, refer to `AsdnsMonLog` and `AsdnsMonTransLog` in Managed Object Model (MOM).

3.2.6.2 ActiveSelect DNS Monitor System Logs

The system log is the primary location where operational problems with the ASDNS Monitor are logged. It is important to monitor the system log (on the host



where the monitor is running) for errors or problems. The path of the system log file is `/var/log/messages`.

For logs generated by `coremw` that is related to ASDNS Monitor, is recorded in the directory `/cluster/storage/no-backup/coremw/var/log/<PL hostname>/asdns_coremw.log`. It is enabled in default.

When errors are displayed, the messages in general describe the error and most prevents the monitor from running. The monitor may run with a partially successful configuration file, so it is important to check the log messages and not simply assume that the configuration is correct if the monitor is running.

Note: In the log file, the ASDNS Monitor identifies itself as `dagent`. For example:

```
Feb 28 09:46:35 dagent started -
this version compiled 01:14:27 Apr 21 2003
```

The following table lists the error messages generated by the `asdnsmon` daemon:

Table 6 ActiveSelect DNS Monitor Error Messages

Error	Description
<code>exec failed for script:error-message</code>	This error indicates that the monitor failed to start the script and the error message should provide information as to why it failed.
<code>can't send to dns: error</code>	An error was encountered while trying to send load information to a DNS Server.
<code>exec failed for command: error</code>	An error was encountered when trying to run the command configured for a monitor script.
<code>unable to locate target for fd number,pid</code>	A temporary error condition when processing the exit status of a monitor command. If this often occurs, review the scripts used.
<code>target name failed to complete</code>	A previous monitor load sample had failed to complete by the time the next sample was measured. It may be the service is down or that the interval specified is too short.
<code>too many processes for name</code>	Too many monitoring processes have been created. This may be because they are not completing because of the short interval between checks, or they are not able to detect an error condition quickly enough and return the error condition.
<code>can't fork in create_child: error can't dup errno: error</code>	These are errors in creating monitoring processes. Contact product support.
<code>unable to open pidfile file: error</code>	The file where the monitor process ID is maintained cannot be created. Typically this is because the monitor process has not been started as root.
<code>select error: error</code>	This is a fatal runtime error that can be caused by problems with the network layer.
<code>error setting priority: error</code>	The monitor was unable to change its priority, typically because it was not run as root.
<code>can't malloc entity can't get mem in function</code>	These are fatal runtime error messages that indicate there is no more memory is available. Perhaps too many resources are being monitored by this monitor.



3.2.7 ENUM Server

The error log file of ENUM server (including ERH over LDAP), ERH over SS7, and ENUM FE Sync are stored in `/cluster/storage/no-backup/ipworks/logs/<hostname>`, the log file is named as `ipwenum.log.x` and `ipworks_fesync.log.x` respectively.

The ENUM server, the ERH module, and ENUM FE Sync automatically start a new error log file after a configurable period or when the current file reaches a configurable size. Take ENUM error log file as an example, it retains a configurable number of previous versions of the file with names `ipwenum.log.<n>`, where `n` is the number of the log file. The user can configure the number of files retained, and the size and time limits except the directory path using the ECLI.

3.2.8 AAA Server

The AAA Server writes logging information under the directory `/cluster/storage/no-backup/ipworks/logs/<PL hostname>/aaa_diameter_server.log`.

To help resolve problems with the AAA Server, inspect the server's log files, refer to the Section EPC AAA in [Data Collection Guideline for IPWorks](#).

3.2.9 MySQL NDB Cluster

The MySQL NDB Cluster writes logging information under the directory `/local/ipworks/mysql-cluster/`.

3.2.10 Backup and Restore

The Backup and Restore handling writes logging information under the directory `/cluster/storage/no-backup/ipworks/logs/<hostname>/ipwbrf.log`.

3.2.11 Scaling

IPWorks application scaling writes logging information under SC-1/SC-2 log file `/var/log/message`.

LDE scaling writes logging information under SC-1/SC-2 log file `/var/log/message`.

CoreMW scaling writes logging information under SC-1/SC-2 folder `/var/opt/coremw/clustermonitor` files `clustermonitor.log*`.

SS7CAF scaling writes logging information under SC-1/SC-2 folder `/opt/sign/log` files `ss7caf_scaling.log*`.



3.3 Core Dumps

This section describes how to troubleshoot with core dump.

A **core dump** is a file containing a process's address space (memory) when the process terminates unexpectedly. Core dumps may be produced on-demand (such as by a **debugger**), or automatically upon termination. Core dumps are triggered by the kernel in response to program crashes, and may be passed to a helper program (such as **systemd-coredump**) for further processing. Core dumps may be useful for developers to debug program crashes, however they are practically useless to the average user, and have been largely obsoleted by modern debuggers.

3.3.1 Locating Core File

Normally the core dump files are stored in the directory `/cluster/dumps/`.

3.3.2 Core Dump Limitation

By default, there is no limitation for core dump files. This limitation can be checked by `ulimit -c`. If the operator wants to set the limitation, use `ulimit -c 1024k`, and change it back to default by using `ulimit -c unlimited`.

3.3.3 Defining Name of Core Dump File

To define name of core dump files, do the following:

1. In the configuration file `/etc/sysctl.conf`, navigate to the parameter `kernel.core_pattern`, and define a template that is used to name core dump files.

The template can contain % specifiers which are substituted by the following values when a core file is created:

```
%% a single % character
%p PID of dumped process
%u (numeric) real UID of dumped process
%g (numeric) real GID of dumped process
%s number of signal causing dump
%t time of dump, expressed as seconds since the Epoch, 1970-01-01
    00:00:00 +0000 (UTC)
%h hostname
%e executable filename (without path prefix)
%c core file size soft resource limit of crashing process (since Linux
```

The default value is `kernel.core_pattern = /cluster/dumps/%e.%p.%h.core`.



2. Execute the command `sysctl -p` to take effect without rebooting.

3.3.4 Analyzing Core Dump File

Analyze the core dump file to find the cause of abnormal crash. Before performing the following steps, users must install the tool `gdb` first.

For example, if a core dump file `CoreDumpFile` is found under `/cluster/dumps`.

1. Find which service crashed and which specific binary file generates the core dump files.

- a Go to the directory `/cluster/dumps`.

Example:

```
SC-1:~ # cd /cluster/dumps
```

- b List the core dump files.

Example:

```
SC-1:~ # ls -lrt *.core*
```

```
-rw----- 1 root root 140431360 Mar 20 03:00  
named.12161.PL-3.core
```

Where: the `named.12161.PL-3.core` is the core dump file.

- c Based on the dump file, determine what process or service (such as DNS) crashed and what binary file generates the core dump file accordingly.

Example:

```
SC-1:~ # file named.12161.PL-3.core
```

```
named.12161.PL-3.core: ELF 64-bit LSB core file x86-64,  
version 1 (SYSV), SVR4-style, from '/opt/ipworks/dns/usr/b  
in/named -f'
```

From the command output, the segment `dns` indicates that the DNS server crashed and the binary file named in the directory `/opt/ipworks/dns/usr/bin` generates the core dump file.

2. Save or back up the following proof files:
 - The core dump file like `named.12161.PL-3.core` in the directory `/cluster/dumps`.
 - The binary file like named in the directory `/opt/ipworks/dns/usr/bin`.
 - The log files in the directory `/cluster/storage/no-backup/ipworks/logs`.



3. Use the tool gdb to analyze the reason why the process crashed.

Example:

```
PL-3:~ # gdb /opt/ipworks/dns/usr/bin/named named.12161.PL-3.c
ore
```

- a Use command bt or where in GDB to view the called and calling stack of the thread that caused the crash.

```
(gdb) bt
```

Or

```
(gdb) where
```

Example:

```
#12 0x00007fdd0bfa3563 in LmServerProxy::connectToLmServer() () from /usr/lib64/liblmc
#13 0x00007fdd0bfa3616 in LmServerProxy::handleConnectionLoss() () from /usr/lib64/lib
#14 0x00007fdd0bfa48f6 in LmServerProxy::connectionLossThreadFunction(void*) () from /
#15 0x00007fdd0bd687f6 in start_thread () from /lib64/libpthread.so.0
#16 0x00007fdd0b84b09d in clone () from /lib64/libc.so.6
```

- b Use the following command to view status of all threads in the same process.

```
(gdb) thread apply all bt
```

Example:

```
Thread 17 (Thread 0x7fdd0e007720 (LWP 12161)):
#0 0x00007fdd0b7a2f6b in sigsuspend () from /lib64/libc.so.6
#1 0x0000000000640ad1 in isc__app_ctxrun ()
#2 0x0000000000640b89 in isc__app_run ()
#3 0x0000000000424770 in main ()

Thread 16 (Thread 0x7fdd0793c700 (LWP 12170)):
#0 0x00007fdd0bd6c65c in pthread_cond_wait@@GLIBC_2.3.2 () from /lib64/libpthread.so.0
#1 0x000000000066e55b in timer_thread_handler (arg=<optimized out>) at
/vobs/ims/ipworks/src/common/c_common/c_common_scc/src/ipworks_timer.c:177
#2 0x00007fdd0bd687f6 in start_thread () from /lib64/libpthread.so.0
#3 0x00007fdd0b84b09d in clone () from /lib64/libc.so.6
#4 0x0000000000000000 in ?? ()

Thread 15 (Thread 0x7fdd0450f700 (LWP 12176)):
#0 0x00007fdd0bd6c65c in pthread_cond_wait@@GLIBC_2.3.2 () from /lib64/libpthread.so.0
#1 0x0000000000672403 in PmUploaderThread::run (this=0xac2410) at
/vobs/ims/ipworks/src/common/coremw_adaptor/pm_adaptor_scc/src/PmUploaderThread.cpp:71
#2 0x00007fdd0d3b6213 in ipworks::Thread::loop (this=0xac2410) at
/vobs/ims/ipworks/src/common/cpp_common/cpp_common_scc/src/Thread.cpp:56
#3 0x00007fdd0c82e5e3 in thread_proxy () from /opt/ipworks/common/usr/lib/libboost_th
#4 0x00007fdd0bd687f6 in start_thread () from /lib64/libpthread.so.0
#5 0x00007fdd0b84b09d in clone () from /lib64/libc.so.6
#6 0x0000000000000000 in ?? ()
```

Note: If users have not installed the GDB, install it first. Or users can ask for support to analyze the core dump files, binary files, and logs. The most important thing is that these proof files must be taken care of.



3.4 Performance Measurements

Generation of the performance measurements by the IPWorks is another way to get useful information when troubleshooting a problem.

The performance management report files are generated in 3GPP compliant XML format and can be transferred outside the system for post processing.

For more information about file format, refer to [Performance Management Report File Format](#).

For more information about the performance measurements, refer to [IPWorks Measurement List](#).

3.5 Software Version Checks

Check the software version on IPWorks. For details, refer to [View Software Information](#).

3.6 Log Level Changes

Table 7

Server Name	Operation	Comments
Storage Server	<pre>#/opt/com/bin/cliss #config (config)>ManagedElement=<Node Name>,IpworksFunction=1, IpworksCommonRoot=1,StorageServer=1,level=<Log level></pre>	<p>Where: <Log Level> specifies the log level for Storage Server. For more information, refer to level in Managed Object Model (MOM).</p> <p>Note: Changing log level of Storage Server to higher levels of detail might result in large log file that affects the performance of the server. Therefore, it needs to be changed only when there is a problem, and to be changed back once the problem is resolved.</p>
DNS Server	Change DNS Debug Log Level: <pre>#/opt/com/bin/cliss #config (config)>ManagedElement=<Node Name>,IpworksFunction=1, IpworksDnsRoot=1,DnsServer=1,BindService=1,debugLogLevel=90 (config)>commit</pre>	Where: debugLogLevel can be any value of 1-99. For more information, refer to the attribute debugLogLevel in Managed Object Model (MOM).
	Change DNS Log Level: <pre>#/opt/com/bin/cliss #config (config)>ManagedElement=<Node Name>,IpworksFunction=1, IpworksDnsRoot=1,DnsServer=1,BindService=1,DnsLog=1, level=<Log level> (config-DnsLog=1)>commit</pre>	Where: <Log Level> specifies the log level for DNS server. It can be DNS_LOG_LEVEL_DEBUG or DNS_LOG_LEVEL_DISABLE. For more information, refer to the attribute level in the class DnsLog in Managed Object Model (MOM).



Table 7

Server Name	Operation	Comments
ASDNS Monitor	<pre> # /opt/com/bin/cliss # config (config)>ManagedElement=<Node Name>,IpworksFunction=1, IpworksDnsRoot=1,AsdnsServer=1,AsdnsMonitor=1, AsdnsMonLog=1,level=<Log Level> (config-AsdnsMonLog=1)>commit </pre>	Where: <Log Level> specifies the log level for ASDNS Monitor. For more information, refer to <code>level</code> in class <code>AsdnsMonLog</code> in Managed Object Model (MOM).
DNS/ASDNS SM	<pre> # /opt/com/bin/cliss >ManagedElement=<Node Name>,IpworksFunction=1, IpworksDnsRoot=1,**Server=1, **Sm=1, **SmLog=1 (**SmLog=1)> config (config-**SmLog=1)>level=<Log level> (config-**SmLog=1)>timelyRotate=<Timely rotation> (config-**SmLog=1)>commit </pre>	Where: <ul style="list-style-type: none"> • <code>**</code> stands for Dns or Asdns. It is case-sensitive. • <Log Level> specifies the log level for DNS or ASDNS SM. For more information about logging level, refer to <code>IpworksLogLevel</code> in Managed Object Model (MOM). • <timely rotation> specifies the frequency of creating a log. For more information, refer to <code>IpworksLogTimelyRotate</code> in Managed Object Model (MOM).
ENUM Server	<pre> # /opt/com/bin/cliss >ManagedElement=<Node Name>,IpworksFunction=1, IpworksDnsRoot=1,IpworksEnumRoot=1,EnumServer=1,Log=1 (Log=1)>configure (config-Log=1)>level=<Log Level> (config-Log=1)>commit </pre>	Where: <p><Log Level> specifies the log level for ENUM server. For more information about logging level, refer to <code>IpworksLogLevel</code> in Managed Object Model (MOM).</p>
ENUM FE Sync	<pre> # /opt/com/bin/cliss >ManagedElement=<Node Name>,IpworksFunction=1, IpworksDnsRoot=1,IpworksEnumRoot=1,EnumFE=1,EnumFELog=1 (EnumFELog=1)>configure (config-EnumFELog=1)>level=<Log Level> (config-EnumFELog=1)>commit </pre>	The changes dynamically take effect.
ERH LDAP	<pre> # /opt/com/bin/cliss >ManagedElement=<Node Name>,IpworksFunction=1, IpworksDnsRoot=1,IpworksEnumRoot=1,EnumServer=1,Erh=1, ErhLdap=1,Log=1 (EnumFELog=1)>configure (config-EnumFELog=1)>level=<Log Level> (config-EnumFELog=1)>commit </pre> <p>Note: The log configuration of ERH over LDAP is obsoleted, it is merged into <code>EnumServer</code> log configuration.</p>	
ERH SS7	<pre> # /opt/com/bin/cliss >ManagedElement=<Node Name>,IpworksFunction=1, IpworksDnsRoot=1,IpworksEnumRoot=1,EnumServer=1,Erh=1, ErhSs7=1,Log=1 (EnumFELog=1)>configure (config-EnumFELog=1)>level=<Log Level> (config-EnumFELog=1)>commit </pre>	



Table 7

Server Name	Operation	Comments
EPC AAA Server	<pre> # /opt/com/bin/cliss >ManagedElement=<Node Name>,IpworksFunction=1, IPWorksAAARoot=1,IPWorksAAACCommonRoot=1, AAAServer=<PL hostname>,LogManagement=1, IPWorksLog=AAA_DIAMETER_SERVER (IPWorksLog=AAA_DIAMETER_SERVER)>configure (config-IPWorksLog=AAA_DIAMETER_SERVER)>level=<Log Level> (config-IPWorksLog=AAA_DIAMETER_SERVER)>commit </pre>	<p>Where:</p> <p><Log Level> specifies the log level for EPC AAA Server. For more information about logging level, refer to <i>IpworksLogLevel</i> in Managed Object Model (MOM).</p> <p>The changes dynamically take effect.</p>
AAA Server Manager	<pre> # /opt/com/bin/cliss >ManagedElement=<Node Name>,IpworksFunction=1, IPWorksAAARoot=1,IPWorksAAACCommonRoot=1, AAAServerManager=1 (AAAServerManager=1)>configure (config-AAAServerManager=1)>level=<Log Level> (config-AAAServerManager=1)>commit </pre>	
MySQL NDB Cluster	Not Applicable.	For changing the log level for MySQL NDB Cluster, refer to MySQL online reference .

3.7 Restart

Use the command **ipw-ctr restart <component>** to restart IPWorks components. For more information, refer to the section Service Life Cycle Management in IPWorks Configuration Management.

3.8 Server Status Checks

Table 8 lists which methods can be used to check the server status:

Table 8 Server Status Checks

Server	Methods					
	ipw-ctr ⁽¹⁾	ipwcli ⁽²⁾	ps ⁽³⁾	rndc ⁽⁴⁾	dig ⁽⁵⁾	Script ⁽⁶⁾
Storage Server	√		√			
MySQL NDB Cluster			√			√
DNS	√	√	√	√	√	
DNS SM ⁽⁷⁾	√		√			
ASDNS	√	√	√			
ASDNS SM ⁽⁸⁾	√		√			
ENUM	√		√		√	
ENUM FE Sync	√		√			



Table 8 Server Status Checks

Server	Methods					
AAA	✓		✓			
AAA SM ⁽⁹⁾	✓		✓			

(1) Use `ipw-ctrl status <component> <hostname>`. For details, see Section 2.1.2 on page 4.

(2) Use `show status` in the IPWorks CLI. For more information, refer to [Command Line Interface User Guide for IPWorks SS](#).

(3) Use `ps -ef | grep <process name>` to check if the Server process is running. Check Section 2.1.1 on page 3 for details.

(4) Use the `rndc status` command for more detailed status.

(5) Use `dig` or another query utility to send a query to the server to monitor that each configured zone is loaded. For more information, see Section 2.1.9 on page 7.

(6) For details, refer to the section [Showing Status of MySQL NDB Cluster in Configure MySQL NDB Cluster](#).

(7) If DNS SM is not running, DNS server cannot be updated from IPWCLI. After IPWorks is installed, DNS SM is not started.

(8) If ASDNS SM is not running, ASDNS monitor cannot be updated from IPWCLI. After IPWorks is installed, ASDNS SM is not started.

(9) If AAA SM is not running, AAA server status cannot be received from IPWCLI. After IPWorks is installed, AAA SM is not started.

3.9 IPWorks Common Component

Table 9 lists the links to the Common Components troubleshooting. These Common Components are used by IPWorks software and are provided by Ericsson middleware department. The related detail troubleshooting guides can be found in their own CPI document.

Table 9 Links of IPWorks Common Component

IPWorks Common Component	Troubleshooting Guide Link
COM	COM Advanced Troubleshooting Guideline
Core MW	Core MW Troubleshooting Guideline
eVIP	eVIP Advanced Troubleshooting Guideline
JavaOam	JavaOam Troubleshooting Guideline
LM (License Management)	LM Troubleshooting Guideline
SS7 CAF	SS7 CAF Troubleshooting Guideline

Note: The common components without troubleshooting guide are not listed here.





4 Troubleshooting Procedure

Troubleshooting a problem might require the use of one or more functions described in Section 3 on page 19. To assure an efficient location of the fault, user can do the following:

1. Check the alarms and notifications.
2. Check licenses.
3. Check the performance management measurements.
4. Check the logs.
5. Check the server status.
6. Check the configuration files.
7. Start tracing.
8. Check available information owing to capsule abortion/core dumps.
9. Collect information.
10. Check already reported troubles (CSRs).
11. If writing a CSR, check software version and level.
12. Consult the next level of maintenance support.

A troubleshooting workflow is shown in Figure 1.

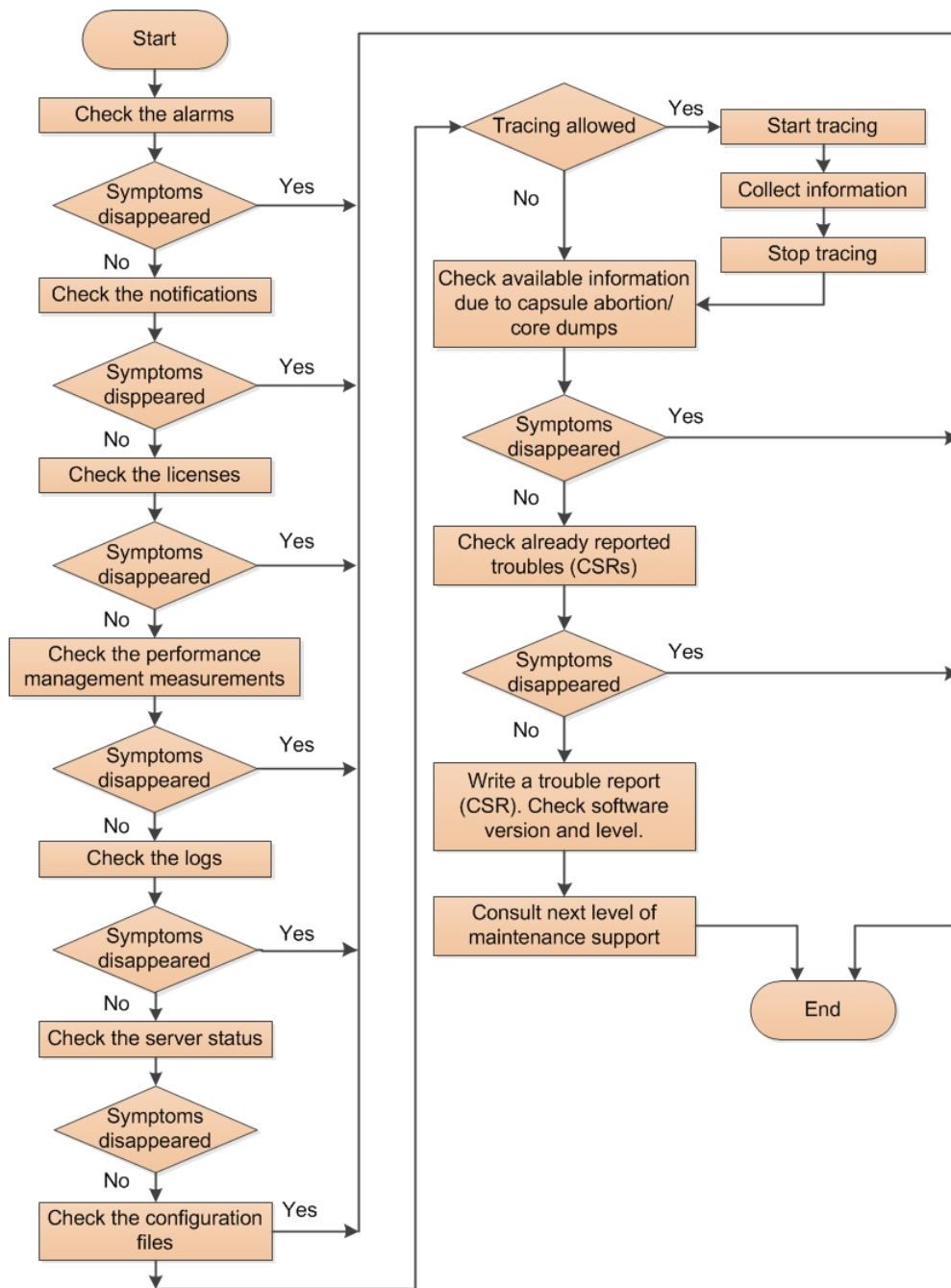


Figure 1 Troubleshooting Workflow



5 Problem-Solving Procedure

5.1 IPWorks VNF Stack Deployment

This section provides information on resolving problems during IPWorks VNF stack deployment.

For more information about CEE related troubleshooting, refer to CEE Troubleshooting Guideline.

5.1.1 Server Groups Forbidden

5.1.1.1 Trouble Symptoms

When you try to launch IPWorks VNF HEAT stack, it fails with the "CREATE_FAILED" stack status, and the reason is "Quota exceeded, too many server groups."

```
$openstack stack show <Stack Name or ID>
```

For example:

```
$openstack stack show ipw6a
```

```
....
| parent                | None
| stack_name            | ipw6a
| stack_owner           | admin
| stack_status          | CREATE_FAILED
| stack_status_reason   | Resource CREATE failed: Forbidden:
|                       | resources.pl34_server_group: Quota exceeded, too m
|                       | server groups. (HTTP 403) (Request-ID: req-acd057d
|                       | 83b1-44e1-84c8-a55e7021b1c8)
|
| stack_user_project_id | 3f8143c8366e45e09083edf4e6845791
| template_description  | IPWorks Stack for CEE HEAT (08-01-2016)
| timeout_mins          | None
| updated_time          | None
+-----+-----+
```

5.1.1.2 Locating Fault

For the default Atlas configuration, the Quota info may not be enough to deploy the IPWorks. In this case, users must increase the resource limitation in quota to make sure that the IPWorks resource can be created successfully:

1. Log on to the Atlas with the tenant user with admin role.



2. Source tenant user environment.

```
$source openrc
```

Note: If you use the new created tenant user, create a new openrc (refer to the format in /home/atlasadm/openrc) for the new user, and then source it.

3. Verify if the tenant user environment is correct.

```
$nova list
```

```
$nova quota-show
```

```
$neutron quota-show
```

4. Get the tenant ID from tenant list output.

```
$openstack project list
```

5. Update Server Groups limitation.

```
$nova quota-update --server-groups <Server groups Limitation>  
<tenant-id>
```

For example:

```
$nova quota-update --server-groups 20 5a49b043d9ea4666ac4adf  
6bc821942e
```

5.1.1.3 Confirming Solution

Check whether the IPWorks VNF stack can be deployed successfully. If the problem persists, contact next level of Ericsson support.

5.1.2 VLAN Conflicts

5.1.2.1 Trouble Symptoms

When you try to launch IPWorks VNF HEAT stack, it fails with the "CREATE_FAILED" stack status, and the reason is "Unable to create the network. The VLAN xxx on physical network default in use."

```
$openstack stack show <Stack Name or ID>
```

For example:

```
$openstack stack show ipw6a
```

```
...  
| parent                | None  
| stack_name            | sub12-release-vnf
```



```

| stack_owner          | admin
| stack_status         | CREATE_FAILED
| stack_status_reason  | Resource CREATE failed: Conflict: resources.ipw_si
|                      | Unable to create the network. The VLAN 213 on phys
|                      | network default is in use.
| stack_user_project_id | 3f8143c8366e45e09083edf4e6845791
| template_description | IPWorks Stack for CEE HEAT (08-01-2016)
| timeout_mins         | None
| updated_time         | None
+-----+-----+

```

5.1.2.2

Locating Fault

To detect which network occupies the VLAN ID and the reason for why the VLAN is used, execute the following command in Atlas server:

1. Check VLAN ID is used by which CEE neutron network.

```
$vid=<VLAN_ID>
```

```

$for i in $(neutron net-list -F name -D -f value);do
j=$(neutron net-show -F provider:segmentation_id -f value $i);
[[ $j == "$vid" ]] && echo "Occupy vlan $vid by network $i" &&
break ; done

```

According to the above example, execute the following commands:

```
$vid=213
```

```

$for i in $(neutron net-list -F name -D -f value);do
j=$(neutron net-show -F provider:segmentation_id -f value $i);
[[ $j == "$vid" ]] && echo "Occupy vlan $vid by network $i" &&
break ; done

```

The command output shows like below:

```
Occupy vlan 213 by network network ipw6a_sig_sp
```

2. Check whether the VLAN ID is duplicated with other network. If the network data is dirty or the VLAN ID is occupied by other VNF application, delete the network manually in Atlas server:

```
$neutron net-delete <NET_NAME>
```

According to the above example, execute the following command:

```
$neutron net-delete ipw6a_sig_sp
```



5.1.2.3 Confirming Solution

Check whether the IPWorks VNF stack can be deployed successfully. If the problem persists, contact next level of Ericsson support.

5.1.3 Failed to Create Network

5.1.3.1 Trouble Symptoms

When you try to launch IPWorks VNF HEAT stack, it fails with the “CREATE_FAILED” stack status and the reason is “create_network_postcommit failed”.

```
$openstack stack show <Stack Name or ID>
```

For example:

```
$openstack stack show ipw6a
```

```
...
| parent                | None
| stack_name            | ipw6a
| stack_owner           | ipwvnf
| stack_status          | CREATE_FAILED
| stack_status_reason   | Resource CREATE failed: InternalServerError:
|                       | resources.ipw_oam_sp: create_network_postcommit failed
| stack_user_project_id | 2326bf1070a94112bb4daf4a6a9e81cd
| template_description  | IPWorks Stack for CEE HEAT (08-01-2016)
| timeout_mins          | 60
| updated_time          | None
+-----+-----+
```

5.1.3.2 Locating Fault

Detect which network occupies the VLAN ID in BSP DMX. In DMX COM CLI, check whether the VLAN ID exists, if yes, make sure that the VLAN ID is not used by other network like other application VNF. First, confirm this by IP plan or with CEE administrator.

1. Navigate to the VirtualBridge MO.

```
>ManagedElement=1,DmxcFunction=1,Trm=1,VirtualBridge=CEE
```

```
>show Vlanid=<VLAN_ID>
```

2. If the VLAN ID is already there, delete it in configuration mode as below:

```
>configure
```

```
>no Vlan=<VLAN_ID>
```



According to the above example, execute the following command:

```
>no Vlan=<ipw_oam_sp VLAN_ID>
```

5.1.3.3 Confirming Solution

Check if the IPWorks VNF stack can be deployed successfully. If the problem persists, contact next level of Ericsson support.

5.1.4 Policy Problem

5.1.4.1 Trouble Symptoms

When you try to launch IPWorks VNF HEAT stack, it fails with "CREATE_FAILED" stack status and the reason shows that policy does not allow several actions to be performed.

```
$openstack stack show <Stack Name or ID>
```

For example:

```
$openstack stack show ipw6a
```

```
...
| parent                | None
| stack_name            | ipw6a
| stack_owner           | ipwdemo
| stack_status          | CREATE_FAILED
| stack_status_reason   | Resource CREATE failed: Forbidden:
|                       | resources.ipw_sig_sp: Policy doesn't allow
|                       | (((rule:create_network and
|                       | rule:create_network:provider:physical_network) and
|                       | rule:create_network:shared) and
|                       | rule:create_network:provider:network_type) and
|                       | rule:create_network:provider:segmentation_id) to b
|                       | performed.
| stack_user_project_id | 42322a142af24b9a821475b434ea8152
| template_description  | IPWorks Stack for CEE HEAT (08-01-2016)
| timeout_mins          | 60
| updated_time          | None
+-----+-----+
```

5.1.4.2 Locating Fault

This issue is caused by trying to launch IPWorks VNF stack by using a user without "admin" role.

Show the user info in Atlas server:

```
$ openstack role list --user <USER_NAME> --project <TENANT_NAME>
```



For example, the following user “ipwvnf” has admin role.

```
$ openstack role list --user ipwvnf --project ipwvnf
```

id	name	user_id	tenant_id
9fe2ff9ee4384b1894a90878d3e92bab	_member_	50f8c42336d347dbbd1a506428b1fdc6	6e4c612850914c7
3e86a80ffab44fd6b489c2d9d2ccaf13	admin	50f8c42336d347dbbd1a506428b1fdc6	6e4c612850914c7

If the IPWorks VNF tenant user does not have “admin” role, contact CEE administrator to add “admin” role to the user first.

5.1.4.3 Confirming Solution

After adding “admin” role to the IPWorks tenant user, check if the IPWorks VNF stack can be deployed successfully. If the problem persists, contact next level of Ericsson support.

5.1.5 Failed to Delete HEAT Stack

5.1.5.1 Trouble Symptoms

When you try to delete a HEAT stack for IPWorks VNF, it fails with the “DELETE_FAILED” stack status.

Execute the following command in Atlas server:

```
$ openstack stack show <Stack Name or ID>
```

For example:

```
$ openstack stack show ipw6a
...
| parent                | None
| stack_name            | ipw6a
| stack_owner           | admin
| stack_status          | DELETE_FAILED
| stack_status_reason   | Resource DELETE failed: Error: resources.ipw_SC-1:
|                       | Server ipw6a_SC-1 delete failed: (400) Cannot pin/unpin
|                       | cpus [8, 16, 18, 6] from the following pinned set [9,
|                       | 3, 4, 5, 17]
| stack_user_project_id | d7920b81148944ba9a8a6400a0d3b593
| template_description  | IPWorks Stack for CEE HEAT (08-01-2016)
| timeout_mins          | None
| updated_time          | None
+-----+-----+
```




5.1.5.2 Locating Fault

To delete the stack, stop the VM (SC-1 here) first by using nova command, and then delete the HEAT stack in Atlas server:

```
$nova stop <VM_NAME>
```

```
$heat stack-delete <STACK_NAME>
```

According to the above example, execute the following commands:

```
$nova stop ipw6a_SC-1
```

```
$heat stack-delete ipw6a
```

5.1.5.3 Confirming Solution

Execute the following command to check whether the IPWorks VNF stack can be deleted successfully.

```
$openstack stack show <Stack Name or ID>
```

If the problem still remains, contact next level of Ericsson support.

5.2 IPWorks Upgrade

This section provides information on resolving problems during IPWorks Upgrade.

5.2.1 Error: Could Not Find Local Upgrade Package

5.2.1.1 Trouble Symptoms

When user tries to create IPWorks Upgrade Package (UP) by executing the command `createUpgradePackage` in ECLI, it fails with "Could not find local upgrade package".

```
SC-X:~ #ls /cluster/UP/
```

5.2.1.2 Locating Fault

Check the folder `/cluster/UP` to see whether other files, in addition to the file `ERIC-IPW_UP.tar.gz`, exist in this folder. If yes, remove the files except for the `ERIC-IPW_UP.tar.gz` and then try the action again.



5.2.1.3 Confirming Solution

Check whether the IPWorks UP can be created successfully. If the problem still remains, contact next level of Ericsson support with ECIM logs and `/var/log/messages`.

To generate the ECIM logs, do the following:

1. Find which SC is active for ECIM process.

```
#cmw-status -v csiass | grep -i ecimswm -A 2
```

2. Enable ECIM trace log (assume that ECIM is active in SC-1).

For example:

```
SC-1:~ # ps -ef | grep ecim
```

```
cmw-swm 7788 1 0 Dec07 ? 00:00:01 /opt/coremw/lib/ecimswm  
instantiate
```

```
SC-1:~ # kill -SIGUSR2 7788
```

3. View the log under the following folder:

```
/var/opt/coremw/ecimswm
```

5.2.2 Error: Failed to Remove Upgrade Package

5.2.2.1 Trouble Symptoms

When user tries to remove IPWorks Upgrade Package (UP) by executing the command `removePackageUpgrade UpgradePackage=<UP Name>` in ECLI, it fails with "Failed to remove upgrade package".

5.2.2.2 Locating Fault

Check folder `/cluster/UP` to find if there is any file (for example, `ERIC-IPW_UP.tar.gz`) in this folder. If yes, do the following:

1. Remove all files under the folder.

```
SC-X:~ #rm /cluster/UP/*
```

2. Try to remove the IPWorks UP again.

For details, refer to [Delete Upgrade Package](#).



5.2.2.3 Confirming Solution

Check whether the IPWorks UP can be removed successfully. If the problem still remains, contact next level of Ericsson support with ECIM log and /var/log/messages.

To generate the ECIM logs, do the following:

1. Find which SC is active for ECIM process.

```
#cmw-status -v csiass | grep -i ecimswm -A 2 | grep ACTIVE -B 1
```

2. Enable ECIM trace log (assume that ECIM is active in SC-1).

For example:

```
SC-1:~ # ps -ef | grep ecim
```

```
cmw-swm 7788 1 0 Dec07 ? 00:00:01 /opt/coremw/lib/ecimswm
instantiate
```

```
SC-1:~ # kill -SIGUSR2 7788
```

3. View the log under the following folder:

```
/var/opt/coremw/ecimswm
```

5.2.3 Failed to Restore System Data after Upgrade Failure

5.2.3.1 Trouble Symptoms

After upgrade failure, user cannot restore System Data by using ECLI. When this issue occurs, users receive the information resembles the following:

```
actionName="RESTORE" <read-only>
additionalInfo <read-only>
"Restore Backup for SystemData_BKP_preUGLSV16_2017-03-09: Initialized"
"No active result is reported for one or more groups. BRFC is cancelling Current Request"
"Restore Backup for SystemData_BKP_preUGLSV16_2017-03-09: Failed"
```

5.2.3.2 Locating Fault

This issue occurs when upgrade fails and the DRBD is running on SC-2.

To resolve this issue:

1. Confirm that drbd is running on SC-2. Execute the following command on SC-1:

```
SC-1:~ # drbd-overview
```

For example:



```
0:drbd0/0 Connected Secondary/Primary UpToDate/UpToDate C
r-----
```

The output shows that SC-1 is secondary, this means that drbd is running on SC-2.

2. Reboot SC-2 to switch drbd to SC-1.

```
SC-2:~ # reboot
```

3. After reboot SC-2, execute the command again to see whether DRBD is switched to SC-1 successfully.

```
SC-1:~ # drbd-overview
```

For example:

```
0:drbd0/0 Connected Primary/Secondary UpToDate/UpToDate C
r----- lvm-pv: lde-cluster-vg 100.00g 50.06g
```

The output shows that the SC-1 is primary, now DRBD is running on SC-1.

4. Perform System Data backup restore again.

For more information, refer to the section [Restore System Data Backup in Restore Backup](#).

5.2.3.3 Confirming Solution

Check whether the operation is successful, if not, contact next level of Ericsson support.

5.2.4 Error: Campaign Failed Verification

5.2.4.1 Trouble Symptoms

When user verifies the result of preparation of IPWorks Upgrade Package in ECLI, the result shows that the verification is failed.

For example:

```
(UpgradePackage=IPWORKS.base-AVA90133-3.0.0-2)>show -v
UpgradePackage=IPWORKS.base-AVA90133-3.0.0-2
activationFallbackTimer=0 <read-only>
created="2018-03-04T11:56:44" <read-only>
creatorActionId=4 <read-only>
execMethod=ONE_STEP
ignoreBreakPoints=true <default>
password=[] <empty>
state=PREPARE_COMPLETED <read-only>
upgradePackageId="IPWORKS.base-AVA90133-3.0.0-2"
```



```

uri="sftp://root@10.170.57.148:/cluster/UP"
userLabel=[] <empty>
activationStep[@1] <read-only>
    description="not yet supported" <read-only>
    name="not yet supported" <read-only>
    serialNumber=1 <read-only>
administrativeData[@1] <read-only>
    description="" <read-only>
    productionDate="2018-03-04" <read-only>
    productName="IPWORKS.base" <read-only>
    productNumber="AVA90133" <read-only>
    productRevision="3.0.0-2" <read-only>
    type="OTHER" <read-only>
reportProgress
    actionId=4
    actionName="Verify"
    additionalInfo ""
    progressInfo="Prepare UpgradePackage"
    progressPercentage=100
    result=FAILURE
    resultInfo="Campaign failed verification"
    state=FINISHED step=1 stepProgressPercentage=0

```

5.2.4.2 Locating Fault

On SC nodes, check whether the following error log exists in /var/log/messages:

For example:

```

Mar  4 12:05:31 SC-1 CMW: ERROR (cmw-campaign-verify): ERROR: Verify timeout
Mar  4 12:05:31 SC-1 ecimswm: Campaigned failed verification for ERIC-CSM-Me
Mar  4 12:05:31 SC-1 ecimswm: Calling immutil_saImmOmAdminOwnerInitialize wi
Mar  4 12:05:31 SC-1 osafimmnd[7760]: NO Ccb 11464 COMMITTED (CoreMwEcimSwM_

```

If similar error log exists, on all nodes (SC and PL), check whether the following error log exists in /var/log/messages:

For example:

```

On PL-3: Mar  4 12:03:51 PL-3 osafsmfnd[6743]: NO Failed to send
mds message, rc = 2, SMFD DEST 0

```

```

On PL-4: Mar  4 12:03:51 PL-4 osafsmfnd[6750]: NO Failed to send
mds message, rc = 2, SMFD DEST 0

```

This example shows that PL-3 and PL-4 have the problem, execute the following commands to fix the problem for PL-3 and PL-4:

```

# amf-adm restart safComp=SMFND,safSu=PL-3,safSg=NoRed,safApp=OpenSAF

```



```
# amf-adm restart safComp=SMFND,safSu=PL-4,safSg=NoRed,safApp=OpenSAF
```

Get and reboot ACTIVE controller node on SC-X:

```
# immllist -a saAmfSUNumCurrActiveSIs safSu=SC-1,safSg=2N,safApp=OpenSAF | cut -d = -f 2
```

If the result is 1, the ACTIVE controller is on SC-1. Then reboot SC-1. Otherwise, reboot SC-2.

```
# reboot
```

5.2.4.3 Confirming Solution

Try again to verify the preparation of IPWorks Upgrade Package in ECLI. If the issue remains, contact next level of Ericsson support.

5.2.5 Login Fails during Rebooting SC

5.2.5.1 Trouble Symptoms

Login to IPWCLI provision system fails when you shut down the SC which SS and SqlmgmNode is running by the command shutdown. After about 100 s, you can log on to the IPWCLI system successfully.

5.2.5.2 Locating Fault

It is not recommended to shut down the OS system. It can cause time consuming for switching resource from one SC to another.

If shutting down system is required, use the command shutdown -h now. This can reduce the time from about 100 s to 35 s.

5.2.5.3 Confirming Solution

Not Applicable.

5.2.6 Health Check Hang

5.2.6.1 Trouble Symptoms

The operation of health check on IPWorks system fails during the upgrade procedure. The operation will stop at some point and will not proceed.



5.2.6.2 Locating Fault

Part of health check operation is to check whether any error exists in IPWorks application logs. If there are too many errors, the health check script could not handle them in this situation and will hang at the moment.

Execute below steps to confirm solution:

1. Backup all the logs in /storage/no-backup/ipworks/logs/SC-X/* and /storage/no-backup/ipworks/logs/PL-X/* and delete them.
2. Stop health check process in SC-1 and SC-2.

- a. Execute the command to clear related log.

```
# for log in $(find /storage/no-backup/ipworks/logs
-mtime -1 -name '*.log*');do > $log;done
```

- b. Record the process id of hcfd.

```
# ps -ef | grep hcfd | grep -v grep
```

- c. Kill the process.

```
# kill -9 <process id>
```

3. Perform the health check operation again.

5.2.6.3 Confirming Solution

Check whether the health check operates successfully. If the problem persists, contact next level of Ericsson support.

5.3 IPWCLI

5.3.1 Network Issues

5.3.1.1 Trouble Symptoms

The Storage Server cannot be started.

Also, when the Storage Server is not running and the IPWorks CLI is started, the CLI gets an Error "Network I/O Error: Opening socket: reason: Connection refused: connect" as CLI tries to send a logon request to the SS on Server port.

5.3.1.2 Locating Fault

Check the SS status by using `ipw-ctr status ss` command.



Ensure that there are no other processes on the system that uses the TCP/IP port used by the Storage Server. The default TCP/IP port for the Storage Server is 17071.

5.3.1.3 Confirming Solution

After the port of Storage Server is changed, check whether Storage Server can be started successfully.

5.3.2 Provisioning Issues

5.3.2.1 Trouble Symptoms

When user selects a range of resource records to delete (for example, the command `select naptrrecord` and `delete`), and it contains one or more resource records marked for deletion, the command `delete` fails.

5.3.2.2 Locating Fault

This issue occurs because records in the range are already marked for deletion.

To avoid this issue, users must execute the command `update dnserver` to remove such resource records that are marked for deletion from the MySQL database, then execute the command `select naptrrecord` and `delete` to delete the range of resource records.

When an object (Resource) is in processing state (for example, in transaction state) the object is locked by the Storage Server to prevent the other users to modify or delete the same object. If the users send any requests related to the locked object, the SS sends “Locked By Admin” Exception to IPWorks CLI.

5.3.2.3 Confirming Solution

Check whether the delete operation can be performed successfully after executing the command `update dnserver`.

5.3.3 Provisioning Rate Too Low

5.3.3.1 Trouble Symptoms

The provisioning through the IPWorks CLI is too slow.

5.3.3.2 Locating Fault

Use the MySQL Benchmark Tool to test the provisioning rate.



For example, test 10,000 queries and the average number of seconds falls in the range of 20 seconds - 30 seconds.

```
# /usr/local/mysql/bin/mysqlslap --engine=ndbcluster
--socket=/cluster/ipworks/mysql-cluster/sqlnode/sqlnode.sock
-a --auto-generate-sql-load-type=write --number-char-cols =4
--number-of-queries=10000 Benchmark
```

```
Average number of seconds to run all queries: 24.565 seconds
Minimum number of seconds to run all queries: 24.565 seconds
Maximum number of seconds to run all queries: 24.565 seconds
Number of clients running queries: 1
Average number of queries per client: 10000
```

5.3.3.3 Confirming Solution

Not applicable.

5.4 ECLI

This section provides information on resolving problems with ECLI (COM CLI).

5.4.1 ERROR: Transaction validation failed with error code: ComFailure

5.4.1.1 Trouble Symptoms

When user tries to commit configurations in ECLI, it fails with "ERROR: Transaction validation failed with error code: ComFailure".

5.4.1.2 Locating Fault

Check the DN error log file in /var/log/messages. The fault can be caused by DNS service or DHCPv4 service.

— Fault caused by DNS service

For example:

```
Oct 12 10:04:18 SC-1 com: COM_SA Error string number 0: IMM:
ERR_NOT_EXIST: object 'dnsLogId=1,bindServiceId=1,dnsServer
Id=1,ipworksDnsRootId=1' exist but no implementer (which is
required)
```

```
Oct 12 10:04:18 SC-1 com: COM_SA OamSAImmBridge::OamSAPprepare(
) ModifiedObjects: failed to Modify DN
```



This output shows the DN error is caused by DNS configurations in COM CLI. Follow the procedure in Restart DNS Service to resolve this problem.

— Fault caused by DHCPv4 service

For example:

```
Jan 29 15:28:49 SC-1 com: COM_SA Error string number 0: IMM:
ERR_NOT_EXIST: object 'dhcpv4LogId=1,dhcpServerId=PL-4,ipworksD
HCPRootId=1' exist but no implementer (which is required)
```

```
Jan 29 15:28:49 SC-1 com: COM_SA OamSAImmBridge::OamSAPprepare(
) ModifiedObjects: failed to Modify DN(dhcpv4LogId=1,dhcpServe
rId=PL-4,ipworksDHCPRootId=1),error(IMM: SA_AIS_ERR_NOT_EXIST)
```

This output shows the DN error is caused by DHCPv4 configurations in COM CLI. Follow the procedure in Clean DHCPv4 Implementer to resolve this problem.

5.4.1.3

Confirming Fault

— Restart DNS service

Restart relevant service with the command:

```
ipw-ctr restart <service name> <PL Name>
```

According to the output shown in Fault caused by DNS service, restart DNS service:

```
ipw-ctr restart dns <PL Name>
```

If the issue occurs on the PL-3, restart the DNS service on the PL-3:

```
ipw-ctr restart dns pl-3
```

After the service restarts, try to commit the configurations again. If the issue remains, contact next level of Ericsson support.

— Clean DHCPv4 implementer

Clean DHCPv4 implementer with the command:

```
/opt/ipworks/dhcp/scripts/ipworks.dhcpv4 cleanup
```

According to the output shown in Fault caused by DHCPv4 service, execute the command on PL-4:

```
# ssh PL-4
```

```
# /opt/ipworks/dhcp/scripts/ipworks.dhcpv4 cleanup
```

If the issue occurs on the PL-3, execute this command on PL-3.



Then, try to commit the configurations again. If the issue remains, contact next level of Ericsson support.

5.4.2 ECLI Login Failed

5.4.2.1 Trouble Symptoms

When user tries to log in to ECLI, it fails with "Connection to COM failed. (Connection refused)" on SC-1 and SC-2.

5.4.2.2 Locating Fault

Log on to SC-X, and check the status of COM, for example:

```
SC-X:~#cmw-status -v su|grep -i com.oam -A4
safSu=SC-2,safSg=2N,safApp=ERIC-com.oam.access.aggregation
  AdminState=UNLOCKED(1)
  OperState=DISABLED(2)
  PresenceState=INSTANTIATED(3)
  ReadinessState=OUT-OF-SERVICE(1)

safSu=SC-1,safSg=2N,safApp=ERIC-com.oam.access.aggregation
  AdminState=UNLOCKED(1)
  OperState=DISABLED(2)
  PresenceState=INSTANTIATED(3)
  ReadinessState=OUT-OF-SERVICE(1)
```

The preceding output shows COM works abnormally.

5.4.2.3 Confirming Fault

Log on to SC-X and execute the following commands to recover COM manually:

```
SC-X:~#amf-adm lock safSu=SC-1,safSg=2N,safApp=ERIC-com.oam.access.aggregation
SC-X:~#amf-adm lock-in safSu=SC-1,safSg=2N,safApp=ERIC-com.oam.access.aggregation
SC-X:~#amf-adm repaired safSu=SC-1,safSg=2N,safApp=ERIC-com.oam.access.aggregation
SC-X:~#amf-adm unlock-in safSu=SC-1,safSg=2N,safApp=ERIC-com.oam.access.aggregation
SC-X:~#amf-adm unlock safSu=SC-1,safSg=2N,safApp=ERIC-com.oam.access.aggregation

SC-X:~#amf-adm lock safSu=SC-2,safSg=2N,safApp=ERIC-com.oam.access.aggregation
SC-X:~#amf-adm lock-in safSu=SC-2,safSg=2N,safApp=ERIC-com.oam.access.aggregation
SC-X:~#amf-adm repaired safSu=SC-2,safSg=2N,safApp=ERIC-com.oam.access.aggregation
SC-X:~#amf-adm unlock-in safSu=SC-2,safSg=2N,safApp=ERIC-com.oam.access.aggregation
SC-X:~#amf-adm unlock safSu=SC-2,safSg=2N,safApp=ERIC-com.oam.access.aggregation
```

Check the status of COM, for example:



```
SC-X:~ # cmw-status -v su|grep -i com.oam -A4
safSu=SC-1,safSg=2N,safApp=ERIC-com.oam.access.aggregation
AdminState=UNLOCKED(1)
OperState=ENABLED(1)
PresenceState=INSTANTIATED(3)
ReadinessState=IN-SERVICE(2)

safSu=SC-2,safSg=2N,safApp=ERIC-com.oam.access.aggregation
AdminState=UNLOCKED(1)
OperState=ENABLED(1)
PresenceState=INSTANTIATED(3)
ReadinessState=IN-SERVICE(2)
```

The preceding output shows COM works normally. If not, contact next level of Ericsson support.

5.5 IPWorks DNS Management

This section provides information on resolving problems with the IPWorks DNS Management in Web GUI.

5.5.1 Trouble Symptoms

This section describes following common IPWorks DNS Management problems as shown in Table 10.

Table 10 Common Trouble Symptoms

Symptoms	Locating Fault
Session time out	See Section 5.5.2.1 on page 52
Log in failed	See Section 5.5.2.2 on page 53

5.5.2 Locating Fault

This section describes how to locate common IPWorks DNS Management problems described in Section 5.5.1 on page 52.

If the problems persist, users need to relogin their sessions. Alternatively, users need to restart the IPWorks DNS Management.

5.5.2.1 Session Time Out

By default, sessions times out after 30 minutes of inactivity. If this happens, user must log in again.

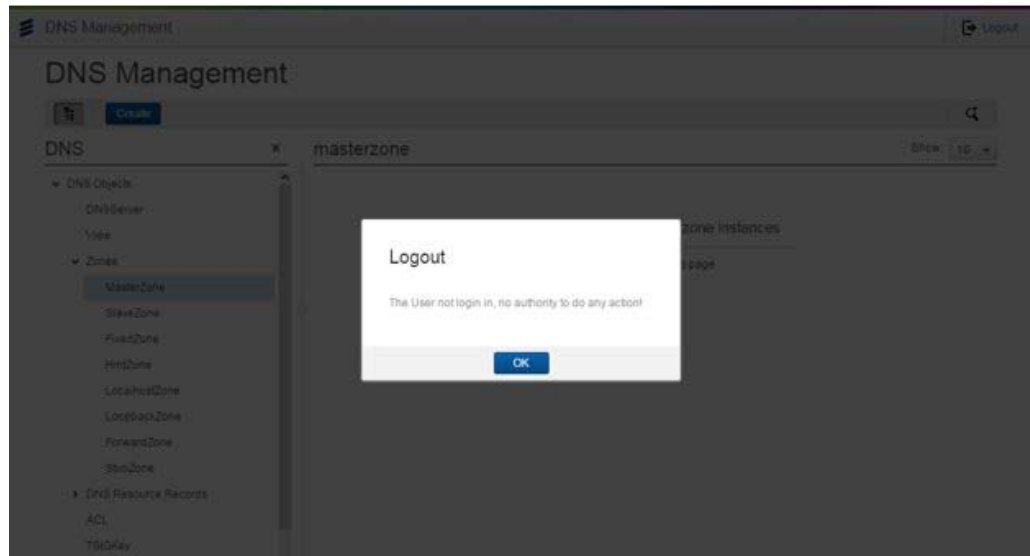


Figure 2 Session Time Out

5.5.2.2 Log in failed

5.5.2.2.1 Tunnel not work or IPWorks SS down

Normally following two cases can cause the error shown as Figure 3.

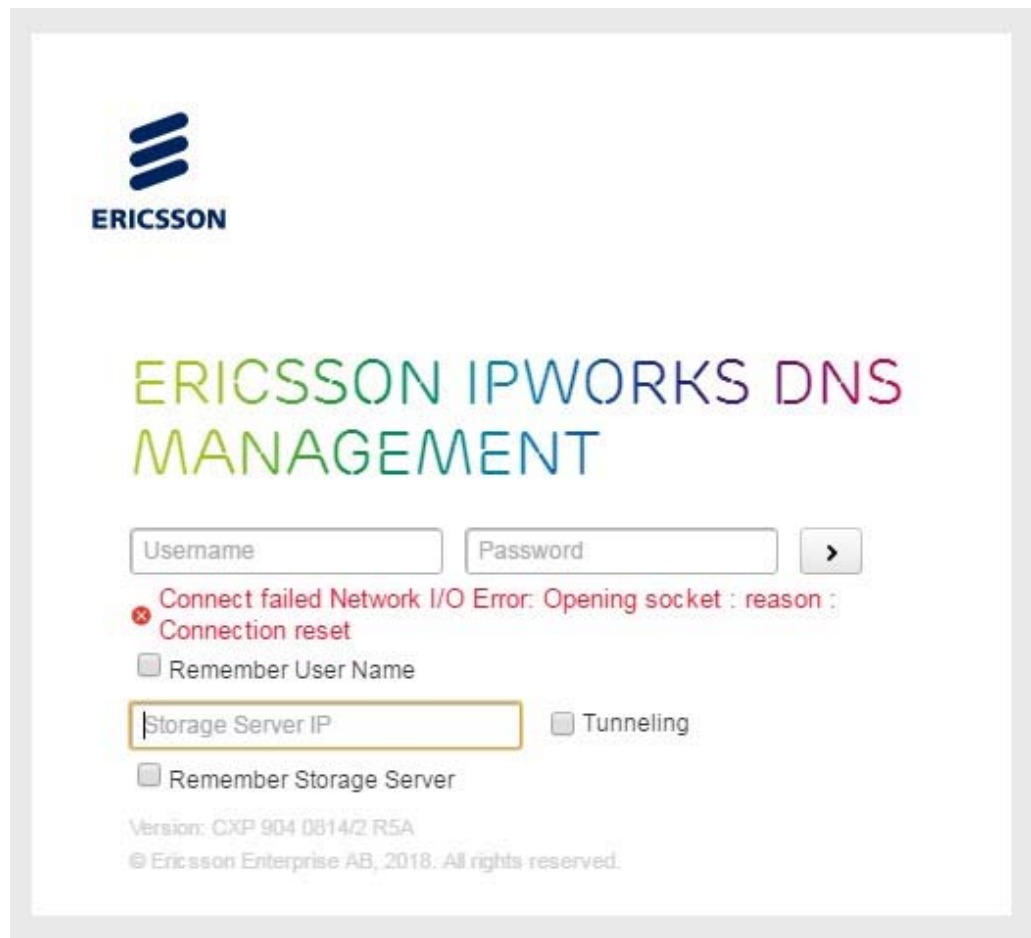


Figure 3 Tunnel Not Work or IPWorks SS Down

— The tunnel can not be created or not work well.

Check the status of the port used to create the tunnel, take 17071 as an example.

- Take Windows system for example, check the port status on your client with following command and the result should be like following:

```
>netstat -ano | findstr 17071
```

```
TCP 127.0.0.1:17071 0.0.0.0:0 LISTENING 11960
```

```
TCP [::1]:17071 [::]:0 LISTENING 11960
```

- Check the port status on your jump server. SUSE are supposed to be the system of the jump server.

Use following command and the result should be like following:

```
# netstat -ano | grep 17071
```



```
tcp 0 0 127.0.0.1:17071 0.0.0.0:* LISTEN off (0.00/0/0)
```

```
tcp6 0 0 :::1:17071 :::* LISTEN off (0.00/0/0)
```

- The IPWorks Storage Server is down.

Check the status of IPWorks Storage Server with following command and ensure that the SS is running:

```
# ipw-ctr status all
```

```
on SC-1 :
```

ss	is running as active role.
csvengine	is down.
sqlnodemgr	is running as active role.

5.5.2.2.2 IPWorks DNS Management Engine down

If the error message in Figure 4 is displayed, there is error in the DNS Management Engine start.

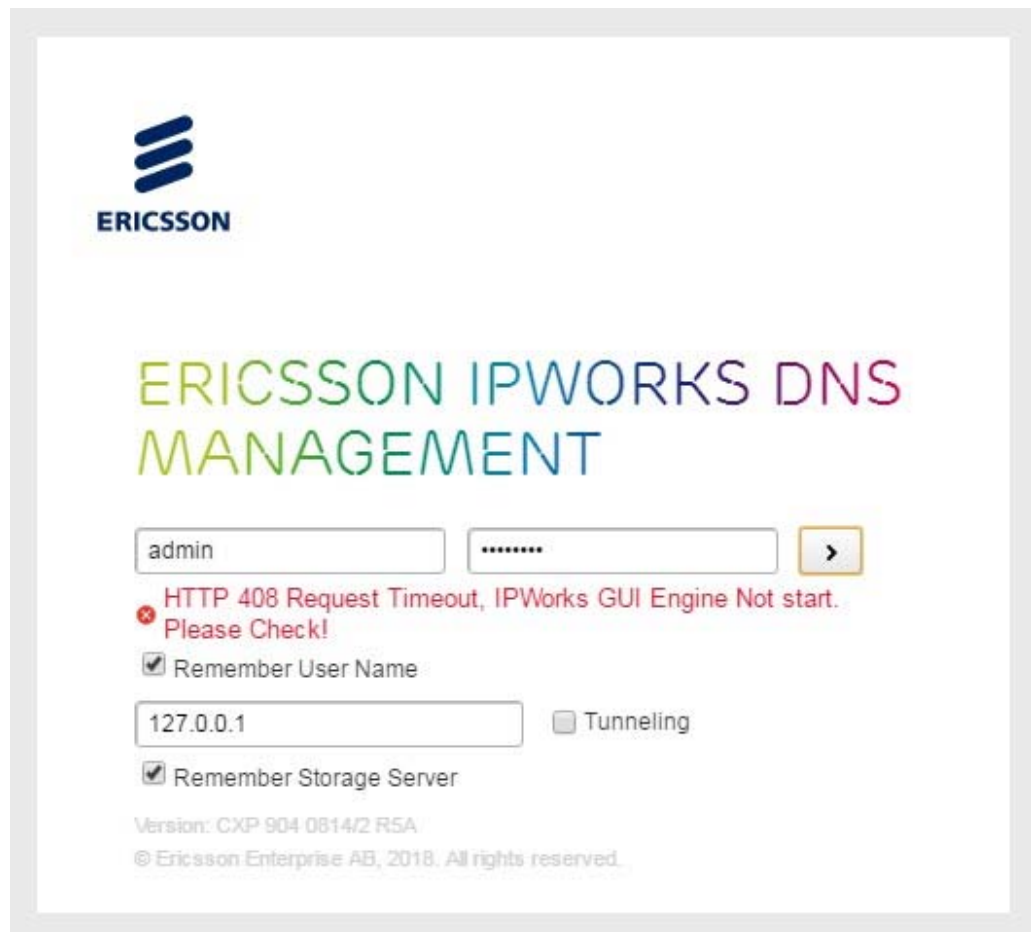


Figure 4 IPWorks DNS Management Engine Down

1. Close the DNS Management.
2. Check the port 8080 with the following command and ensure that the port is not occupied by other application.

```
>netstat -ano | findstr 8080
```

```
TCP 0.0.0.0:8080 0.0.0.0:0 LISTENING 6288
```

```
TCP [::]:8080 [::]:0 LISTENING 6288
```

5.5.3 Confirming Solution

Redo the login operation and check whether login is successful, if not, contact next level of Ericsson support.

5.6 Storage Server

This section describes Storage Server troubleshooting cases.



5.6.1 Failed to Stop/Start/Restart Storage Server by ipw-ctr

5.6.1.1 Trouble Symptoms

Failure to start Storage Server will cause the SC reboot.

For example, you might see the following output:

```
SC-1:~ # ipw-ctr start ss
```

```
Start ss ==> failed!
```

After several seconds, the following output might be displayed:

```
Broadcast message from root@SC-1 (somewhere) (Wed Mar 15 09:42:36 2017):
```

```
The system is going down for reboot NOW!
```

5.6.1.2 Locating Fault

Do the following steps to trouble shoot the root cause.

1. Stop both SS on SC-1 and SC-2 immediately.

```
# ipw-ctr stop ss SC-1
```

```
# ipw-ctr stop ss SC-2
```

2. Check if the SQL Node can be started on SC.

```
# /etc/init.d/ipworks.mysql start-sqlnodemgr
```

```
# /etc/init.d/ipworks.mysql show-status
```

If the output is shown as below, it indicates that the SQL Node is not started. Refer to Section 5.16.1 on page 109 and Section 5.16.7 on page 116 to fix sqlnode. Then check if ss can be started normally, otherwise continue with Step 3.

```
[...]
[mysqld(API)] 24 node(s)
id=3 (not connected, accepting connect from any host)
[...]
```

3. Check Storage Server status.

```
# ipw-ctr status ss <SC-ID>
```

<SC-ID> can be SC-1 or SC-2 which Storage Server is running on.



If output shows `saAmfSUPresenceState` is failed, go to Step 4. Otherwise, go to Step 5.

4. Repair Storage Server.

```
# ipw-ctr repaired ss <SC-ID>
```

After executing this command, execute Step 3 again to check the status.

If it is failed, continue Step 5. Otherwise, start both Storage Server in both SCs.

5. Enable trace log in ECLI for Storage Server.

```
>dn ManagedElement=1,IpworksFunction=1,IpworksComm  
onRoot=1,StorageServer=1  
(StorageServer=1)>configure  
(config-StorageServer=1)>level=LOG_LEVEL_TRACE  
(config-StorageServer=1)>commit  
(StorageServer=1)>exit
```

6. Start Storage Server by executing script `ipworks.ss` directly in unhealthy SC.

a. Start Storage Server by script.

```
#cd /opt/ipworks/ss/scripts
```

```
#bash +x ipworks.ss start_debug
```

Check the output to find if there is any failure information.

b. Check Storage Server log.

```
#cd /storage/no-backup/ipworks/logs/<SC-ID>
```

Check log files `ipworks_ss_SC-1.log` and `ss_amf_wrapper.log` to find the if there is any failure information.

Check `/var/log/<SC-ID>/messages`, and search `ipworks.ss` to find Storage Server related log.

5.6.1.3 Confirming Solution

From all above logs, you can find which failure cause Storage Server fails to start. If the problem still remains, collect all the related information to ask for next level support.



5.6.2 Storage Server Not Listen on the Port

5.6.2.1 Trouble Symptoms

The SS started successfully, but the SS function is abnormal.

The following output might be displayed:

```
SC-1:~ # ipwcli
```

```
IPWorks> Login:admin
```

```
IPWorks> Password:*****
```

```
Unexpected error detected: Could not create connection to database server. A
```

5.6.2.2 Locating Fault

1. Check Storage Server status.

```
# ipw-ctr status ss <SC-ID>
```

<SC-ID> can be SC-1 or SC-2 which Storage Server is running on.

For example:

```
SC-1:~ # ipw-ctr status ss sc-1
```

ss on SC-1 is running, working as an active node.

2. Check Storage Server process status on the active SC.

```
SC-1:~#ps -ef |grep StorageServer |grep -v grep
```

```
root      13664      1  0 08:35 ?        00:00:08 java -DTCPPORT=9701
-DTCPPENDPORT=9708 -DMULTICASTADDRESS=224.0.0.1 -DMULTICASTPORT=15663
-DBIND_INTERFACE_ADDRESS=169.254.100.23 -Djboss.server.name=ipwss_SC-1
-Djava.net.preferIPv4Stack=true -Djava.util.logging.config.file=/opt/ipworks/
jre/java/lib/logging.properties -server -DApp=ipwss -DSysLogin=root -Xmx512m
-Xms512m -cp /opt/ipworks/ss/scripts:/opt/ipworks/common/java/AdventNetLogging
.jar:/opt/ipworks/common/java/log4j-1.2.15.jar:/opt/ipworks/common/java/ipwcom
mon.jar:/opt/ipworks/common/java/AdventNetAgentRuntimeUtilities.jar:/opt/ipwo
rks/common/java/dom4j-1.6.1.jar:/opt/ipworks/common/java/ipwse.jar:/opt/ipworks
/common/java/AdventNetSnmp.jar:/opt/ipworks/common/java/AdventNetSnmpAgent.jar
:/opt/ipworks/ss/java/mysql-connector-java-commercial-5.1.16-bin.jar:/opt/ipwo
rks/ss/java/ipwss.jar:/home/javaoam/lib/jna-4.0.0.jar:/home/javaoam/lib/cglib-
2.2.jar:/home/javaoam/lib/javaoam-core-2.2.0-186.jar:/home/javaoam/lib/javaoam
-coremw-spi-2.2.0-186.jar ericsson.ipworks.storage.server.StorageServer
```

From the output, you can see the process is running.

3. Check if the SS port is listening by below command.

```
# netstat -anp |grep <ss_port>
```

The default value of <ss_port> is 17071. For more information, refer to the section Storage Server Initial Configuration in IPWorks Initial Configuration.



For example:

```
SC-1:~ # netstat -anp |grep 17071
```

```
tcp          0      0 0.0.0.0:17071      0.0.0.0:*
LISTEN       13664/java
```

From the output, you can see the port 17071 is listening here.

If the port is not displayed in the output, check if there is alarm related to SS in FM, the specific problems might are:

— Storage Server, MySQL Cluster Node Unreachable, for example:

```
FmAlarm=40
activeSeverity=MAJOR
additionalText="This alarm is issued when the MySQL Cluster [ SC-1:SQL Node ] is down"
eventType=COMMUNICATIONSALARM
lastEventTime="2017-03-17T02:43:57.429+01:00"
majorType=193
minorType=860161
originalAdditionalText="This alarm is issued when the MySQL Cluster [ SC-1:SQL Node ] is down"
originalEventTime="2017-03-17T02:43:57.429+01:00"
originalSeverity=MAJOR
probableCause=306
sequenceNumber=90
source="ManagedElement=ipworks_cba, SystemFunctions=1, Fm=1, FmAlarmModel=ipworksEM, FmAlarm=40"
specificProblem="Storage Server, MySQL Cluster Node Unreachable"
```

To clear the alarm, refer to [Storage Server, MySQL Cluster Node Unreachable](#).

— Storage Server, MySQL Database Unreachable, for example:

```
FmAlarm=42
activeSeverity=CRITICAL
additionalText="This alarm is issued when Storage Server loses communication with Database"
eventType=COMMUNICATIONSALARM
lastEventTime="2017-03-17T02:44:01.690+01:00"
majorType=193
minorType=860162
originalAdditionalText="This alarm is issued when Storage Server loses communication with Database"
originalEventTime="2017-03-17T02:44:01.690+01:00"
originalSeverity=CRITICAL
probableCause=306
sequenceNumber=92
source="ManagedElement=ipworks_cba, SystemFunctions=1, Fm=1, FmAlarmModel=ipworksEM, FmAlarm=42"
specificProblem="Storage Server, MySQL Database Unreachable"
```

To clear the alarm, refer to [Storage Server, MySQL Database Unreachable](#).

After MySQL alarm ceased, wait for 10 seconds to check again.

5.6.2.3 Confirming Solution

If the problem still remains, enable the trace login ECLI for Storage Server as the Step 5 in Section 5.6.1 on page 56 and contact next level of Ericsson support.



5.7 Server Manager

This section provides information on resolving problems with the IPWorks Server Manager (SM).

For DNS and ASDNS, each has an associated Server Manager component residing on the same machine. The Server Manager serves as the link between the DNS or ASDNS server and the rest of the IPWorks system. All communication between the Storage Server and the DNS or ASDNS server is through the Server Manager.

When the Server Manager starts up, it connects to the SS, logs on, registers as a remote agent for the PS, and reports the status of the PS to the SS. Use ECLI on which the Server Manager is running to configure the data that the Server Manager uses in contacting the SS.

5.7.1 Server Manager Failed to Start

5.7.1.1 Trouble Symptoms

The Server Manager failed to start.

5.7.1.2 Locating Fault

Use the ECLI to configure a higher logging level for the Server Manager (see Section 3.6 on page 28). Then restart the Server Manager (see Section 2.1.2 on page 4) and check the log file to find the specific problem.

Note: Use debug logging only to diagnose problems. Turn it off during normal operation. This is because the log file grows rapidly when debugging is enabled. This will degrade server performance, especially at higher levels of debug logging.

5.7.1.3 Confirming Solution

5.7.2 Problem in Deleting Server Instance

5.7.2.1 Trouble Symptoms

When an instance is in running status, it cannot be deleted.

5.7.2.2 Locating Fault

To delete a server instance from the IPWorks CLI, ensure that the Server Manager for that server is not running. For instance, to delete a DNS Server from machine 10.0.0.1, stop the DNS Server Manager in 10.0.0.1.



5.7.2.3 Confirming Solution

After stopping the Server Manager, test the behavior again. If the problem persists, contact Ericsson support.

5.7.3 Network Unreachable Exception

5.7.3.1 Trouble Symptoms

If the log of Server Manager reports an exception "Network unreachable" when the Server Manager starts up, the machine is not configured to route packets to the machine on which the Storage Server is running.

5.7.3.2 Locating Fault

Check the interfaces configured for the machine using **ifconfig -a** and check the routing table using **netstat -r**.

5.7.3.3 Confirming Solution

When correctly configured, the Storage Server machine can be ping from the Server Manager machine.

5.7.4 Access Denied Exception

5.7.4.1 Trouble Symptoms

When the IPWorks username and password configured for the Server Manager is not a valid combination in the Storage Server, the logon attempt fails. Also, the alarm DNS, Storage Server Unreachable from Server is raised.

5.7.4.2 Locating Fault

Use the ECLI to check the configuration parameters of Server Manager. Ensure that the Storage Server address is pointing to a Storage Server that is running.

```
>show -v ManagedElement=<Node Name>,IpworksFunction=1,Ipwo  
rksDnsRoot=1,DnsServer=1,DnsSm=1  
DnsSm=1  
  dnsSmId="1"  
  ssAddress="ipw_ss" <default>  
  ssPassword="<Encrypted Password>"  
  ssUserName="admin" <default>  
  DnsSmLog=1
```

Example 14 Verify DNS SM Configuration

Then, check the SS status through **ipw-ctrl**. If it is running, try to log on to the **ipwcli** to verify whether the Storage Server is reachable.



```
SC-2:~ # ipw-ctr status ss
ss on SC-2 is running, working as an active node
```

Example 15 Check SS Status

5.7.4.3 Confirming Solution

After correcting the configuration of Server Manager, try the logon attempt again.

```
# ipwcli
IPWorks> Login: <SS Username>
IPWorks> Password:
Login to server successful.
IPWorks>
```

Example 16 Verify whether SS is Reachable

5.7.5 Connection Time-out Exception

5.7.5.1 Trouble Symptoms

When the IP address configured for the Primary Storage Server is pointing at a machine that is down or not reachable on the network, the Server Manager tries to contact the Secondary Storage Server. If the Secondary Storage Server is unreachable, then the Server Manager reports a "connect time out" exception. This exception is reported after a delay of 60 seconds by default.

5.7.5.2 Locating Fault

Use ECLI to verify (and correct) the address or password, or both of the Storage Server.

5.7.5.3 Confirming Solution

After correcting the configuration of Storage Server, check whether the Storage Server machine is up and reachable using ping.

5.7.6 Failed Attempting to Get Machine Information

5.7.6.1 Trouble Symptoms

If the machine is not properly configured with a DNS name, the Server Manager reports the message "Failed attempting to get machine information.".

5.7.6.2 Locating Fault

Check that the domain name parameter is properly configured in the `/etc/resolv.conf` file.



Ensure that the 'hostname' has a corresponding entry in the file `/etc/hosts`, otherwise the Server Manager does not start.

5.7.6.3 Confirm Fault

After configuring the parameter properly in the configuration file, check whether the exception will be raised again.

5.7.7 New or Renamed Object Already Exists Exception

5.7.7.1 Trouble Symptoms

When there is a DNS server object in the Storage Server with the same hostname but different IP address, the Server Manager reports an exception "New or renamed object already exists".

5.7.7.2 Locating Fault

- Change the IP address of the machine to that used by the server object in the Storage Server.

Or

- Change the IP address of the object in the Storage Server to that of the machine.

5.7.7.3 Confirm Fault

After changing the IP address, check whether the exception will be raised again.

5.7.8 Permission Denied Exception

5.7.8.1 Trouble Symptoms

After the Server Manager has connected and registered, it attempts to write the status of the DNS server to the Storage Server. When the user under which the Server Manager is running has no write privileges, the Server Manager reports an exception "Permission to create/change/delete object denied".

5.7.8.2 Locating Fault

Configure the Server Manager using the DNS Server Manager configuration file (see Table 4 or Section 2.3.3 on page 13) or change the permissions of the user to allow writing.



5.7.8.3 Confirming Solution

After the changing of user permission and correcting the Server Manager configuration, try to perform some write operations to check whether the exception will be raised again.

5.7.9 Cannot Stop the Server Manager

5.7.9.1 Trouble Symptoms

The Server Manager does not stop when the user tries to stop it using `ipw-ctr`.

5.7.9.2 Locating Fault

Make sure that the root user (or other user under which the Server Manager is running) has a path to `/opt/ipworks/common/scripts/`. Manually run from a terminal window:

```
#/opt/ipworks/common/scripts/ipw-ctr stop <type-of-server>sm  
<hostname>
```

Where: <type of server> stands for dns or asdns.

If this fails to stop the Server Manager, make sure that the file `/var/run/*sm.port` exists and has not been modified. If it is necessary to stop the Server Manager using the kill command, use kill without the `-9` parameter. This allows the Server Manager to clean up the file `/var/run/*sm.port`.

5.7.9.3 Confirming Solution

Not applicable.

5.7.10 Failed Sending Command to the DNS Server

5.7.10.1 Trouble Symptoms

The IPWorks CLI reports "Failed sending the RNDc <cmd> command to <servername> server", where <cmd> is "stop", "reload", and so on. The server is the name of the machine on which the DNS server and DNS Server Manager are running. This message is also displayed in the Server Manager log file at LOG_LEVEL_INFO, LOG_LEVEL_DEBUG, or LOG_LEVEL_TRACE.

5.7.10.2 Locating Fault

Make sure that the root user (or other user under which the Server Manager is running) has a path to `/opt/ipworks/dns/usr/bin/` and that the file `/etc/rndc.key` exists and contains a valid TSIG key.



5.7.10.3 Confirming Solution

Run `rndc` from the command line to verify that the server responds correctly.

Example:

```
rndc status
version: 2.6.32.12-0.7-default
CPUs found: 1
worker threads: 1
UDP listeners per interface: 1
number of zones: 99
debug level: 90
xfers running: 0
xfers deferred: 0
soa queries in progress: 0
query logging is OFF
recursive clients: 0/0/1000
tcp clients: 0/100
server is up and running
```

5.7.11 Cannot Find Script

5.7.11.1 Trouble Symptoms

The `runscript` operation and possibly the update operation cause the Server Manager to execute a script on the DNS server machine. These scripts must be placed in the appropriate scripts directory. If the Server Manager cannot find the script, it reports the message "script not found", where script is the absolute path of the script.

5.7.11.2 Locating Fault

Move the script to the correct scripts directory on the DNS server machine.

5.7.11.3 Confirming Solution

After moving the script file to the correct directory, check whether update operation will raise the message again.



5.7.12 Cannot Execute Message When Running a Script

5.7.12.1 Trouble Symptoms

If the script is in the `scripts` directory but does not have execute permission for the Server Manager process user (usually root), the Server Manager reports the message "cannot execute".

5.7.12.2 Locating Fault

Change the permissions on the script to allow the Server Manager to execute the script.

Example:

```
>chmod 555 script_file
```

5.7.12.3 Confirming Solution

After changing the permissions for the script, perform certain execution for the Server Manager to check whether the message will be reported.

5.7.13 IPWorks CLI Displays DNS Records Slowly

5.7.13.1 Trouble Symptoms

Dynamic resource records are retrieved from the DNS server to be presented to the IPWorks CLI. If the query requires excessive data, it takes a long time to transfer it from the DNS server to the Server Manager, to the Storage Server, then to the user interface.

5.7.13.2 Locating Fault

Formulate queries for dynamic data using filters that minimize the amount of data that is retrieved.

5.7.13.3 Confirming Solution

Check whether the new query still takes a long time.

5.7.14 Large Data Queries Cause Memory Problems

5.7.14.1 Trouble Symptoms

The machine on which the DNS server and Server Manager are running must have enough physical memory to avoid excessive paging. If there is not enough



physical memory, the query takes a long time. If necessary, increase the physical memory of the DNS server machine.

Sufficient memory must also be made available to the Java Virtual Machine for the Server Manager to create enough resource record or lease objects. The Server Manager log may record an "Out of memory" exception in response to a query for a large amount of data.

5.7.14.2 Locating Fault

Configure the Java Virtual Machine to use more of the machine memory. To do this, edit the file `/opt/ipworks/IPWsm/scripts/ipwsm`. In the last line of this script, the Java Virtual Machine is started with the parameter `-mx128m`, indicating a maximum memory use of 128 MB. Increasing this value allows the Server Manager to use more of the system memory.

5.7.14.3 Confirming Solution

After configuring the machine memory, check whether the queries still take a long time.

5.7.15 DNS Server Performance Drops during Queries

5.7.15.1 Trouble Symptoms

Querying a DNS server for a large amount of data can affect the performance of the machine and thus the performance of the DNS server.

5.7.15.2 Locating Fault

Limit the queries that the Server Manager performs in `ipworks_*sm.conf` to prevent degradation of the DNS services. For more information, see Table 4 and Section 2.3.3 on page 13.

5.7.15.3 Confirming Solution

Check whether the revised query still affects the performance.

5.7.16 Status of Server in Interface Disagrees with Current Status

5.7.16.1 Trouble Symptoms

The status shown on a DNS server object displayed in the IPWorks CLI can be down when in fact the DNS server is running, or conversely. The DNS server does not automatically inform the Server Manager (SM) of a change in status. The status field on a DNS server also contains a time stamp, for example, "On



04/30/03 at 09:51:30 server is 'down". This does not indicate the status of the server; it only indicates that at a particular time the server had this status.

5.7.16.2 Locating Fault

There is a communication problem possibly between the DNS server and the DNS SM.

For example, a service used the same port as the DNS server. If so, follow the procedures to solve the problem:

1. Check the alarm for more information.
2. Stop the DNS server, then the DNS SM.
3. Start the DNS SM, then the DNS server.
4. If the problem remains, consult the next level of maintenance support.

Note: Through restarting DNS SM, a new port is assigned. For how to start or stop DNS server, see Section 2.1.2 on page 4.

5.7.16.3 Confirming Solution

Use `ipw-ctr` to get server status. For more information, see Section 2.1.2 on page 4.

```
ipw-ctr status dns pl-3
dns on PL-3 is running.
```

Example 17 Check Status of DNS Server on PL-3

5.7.17 RNDC Statistics History Is Lost

5.7.17.1 Trouble Symptoms

The `rndcstats` and `clearrndcstats` operations use the RNDC command to display BIND server statistics. This works as a history, appending the results for every `rndcstats` operation until the `clearrndcstats` operation is called to delete the previous results. The DNS Server stores all RNDC statistics in a single file. A `clearrndcstats` operation by one user clears the history for all users.

5.7.17.2 Locating Fault

Multiple users of `rndcstats` must coordinate their use of this operation for any particular DNS Server.

5.7.17.3 Confirming Solution

After the coordination of the users is performed, check the history by using `ipwcli`.



Note: The `rndcstats` command is issued from the CLI.

```
# ipwcli
IPWorks> select dnserver <dns-server>
IPWorks> show rndcstats
```

Example 18 Show RND C Statistics History

5.8 DNS Server

This section provides information on resolving problems with the IPWorks DNS Server.

The DNS Server manages DNS data and responds to queries from DNS clients. For more information on DNS management, refer to the section [DNS Management in IPWorks Configuration Management](#).

5.8.1 Master Server Errors

This section describes some common mistakes in configuring master servers.

5.8.1.1 Forgetting to Reload

After changing to a zone, administrators sometimes forget to reload the master server. Thus, while the change was made to the zone configuration, the server is not using the updated information.

5.8.1.2 Forgetting to Update PTR Records

Some applications require that there exist a reverse mapping for each name to address mapping. This is done using PTR records.

Also, when removing forward entries (A and AAAA records) do not forget to delete the corresponding PTR records.

Note: The IPWorks CLI can automatically generate PTR records when adding A or AAAA records.

5.8.1.3 Forgetting to Set up Delegations

It is important to have the proper delegations set up in both the parent and child zones. While IPWorks normally takes care of the zones it manages, there may be other DNS servers that need to have delegations to the IPWorks servers and zones and these must be properly configured.



5.8.2 Slave Server Errors

This section describes some common mistakes in configuring slave servers.

5.8.2.1 Forgetting Slave Files

A filename of DNS slave zone should generally be configured in the filename field of `slavezone` object. So that a backup copy of the zone is kept when a loss of network connectivity with the master servers. It ensures that a backup copy is available for loading if the slave server reboots. Without this, a disconnected slave server that is not able to connect to a master server will have no DNS data to serve.

5.8.2.2 Caching Server Errors

DNS Servers not only serve authoritative data, but they can also be used to answer queries where the answer is not in their authoritative zone. The answers to these queries are then cached for future use.

For this to work, the DNS Servers that are not authoritative for the root "." zone should have a hint zone configured. The hint zone lists the servers authoritative for root. The root zone delegates authority for all top-level domains such as .com, .net, .uk, or .se.

By knowing where the top of the DNS namespace is, the server has a starting point to look for and find the DNS Servers that are authoritative for the name being queried.

Without the hint zone, queries are likely not answered and the DNS Server returns an error code `SERVFAIL`(server failure).

5.8.2.3 Forwarding Server Errors

It is often an error to configure a forwarding server to forward all requests even when the server is authoritative for one or more zones. If the forwarding server is authoritative for a zone, then the administrator should override the default forwarders setting in the DNS Server object by configuring a null forwarders option for the appropriate zones.

For example, a DNS Server configuration, causing all requests except for those for `example.com` (and any sub zones) to be forwarded, would have a null forwarders option in the master or slave zone object.

5.8.2.4 Connectivity Errors

If a client cannot connect to one or more DNS Servers, perform the following:

- Check the `/etc/resolv.conf` file on the client machine if the application cannot connect or is not getting answers and check the addresses listed against `name server`.



- Use the `ping` utility to see if there is connectivity to the addresses.
- Use the command `netstat -x` to check the router settings for the TCP and UDP ports for DNS (port 53).
- Use `dig` (see Section 2.1.9 on page 7) or another query utility to query the server.

5.8.2.5 Delegation Errors

A DNS delegation is the relationship between a parent and a child zone. It consists of NS and A or AAAA records that allow the parent to tell DNS clients or servers where to send queries that belong to the child. Common delegation errors include the following:

- Not putting the same set of NS records in both parent and child zones. At least one NS record must be the same in both parent and child zones. It is most desirable for all NS records to be the same in both parent and child. Normally IPWorks manages NS records, so this should not be an issue unless they have been manually adjusted.
- No A or AAAA records to direct queries to the address of the child server. NS records report the names of the servers for a zone to DNS. Do **NOT** forget to provide the name-to-address mapping in the parent zone, if the name of the server belongs to the child zone. Otherwise, it is impossible to reach the servers of child zone. Again, IPWorks normally manages these.

Note: The NS and A or AAAA records that appear in the parent zone are called glue records.

- Putting domain names that belong to the child zone in the parent zone. The only exception to this is the glue NS records. The IPWorks DNS Server defers to the child zone and the parent server does not answer queries that belong to the child domain. This is an exception to the NS records mentioned previously.

5.8.3 DNS Server Fails to Start after System Boot

5.8.3.1 Trouble Symptoms

After system boot, DNS server can neither run, nor start request, nor reload configuration.

5.8.3.2 Locating Fault

1. Check the `syslog` utility for errors. The corresponding path is `/var/log/messages`. Search for `named`.
2. Use the ECLI to enable the debug logging for DNS server (see Example 12), and check the file `ipworks_dns.log`. Other errors may include:



- Running the server from the wrong account.
- Improperly configured network interfaces – use the command `ifconfig -a` to check.

3. Use the IPWorks CLI to check the server configuration.

5.8.3.3 Confirming Solution

Use `ipw-ctr` to check the DNS server status.

5.8.4 Slave Server Fails to Transfer Zone Data from the Master

5.8.4.1 Trouble Symptoms

Slave server fails to transfer zone data from the master server.

5.8.4.2 Locating Fault

1. Check for errors in the slave zone configuration. See Section 5.8.2 on page 70.
2. Check for errors in the master zone configuration. See Section 5.8.1 on page 70.
3. Check connectivity between the master and slave servers. For information on Connectivity Errors, see Section 5.8.2.4 on page 71.
4. Check the serial numbers of the slave and SOA of master zone. The slave does not initiate a transfer if its serial number is higher than the master's.

5.8.4.3 Confirming Solution

Not applicable.

5.8.5 Server Query Problems

If a server does not respond to queries by using query utility `dig`, fails to provide an answer for data it should have, or returns an error for queries, then do the following steps. If only specific clients are having problems, run a query utility on one of those systems.

If the utility reports a time-out, check for connectivity problems. Connectivity problems can include the following:

- Low-level network connectivity may be broken. Try `ping` to see if communication is possible between client and server or server and server. If not, use the command `netstat -r` to check the configuration and router settings of client.



- The DNS Server may be denying access with the allow-query or blackhole option in the DNS Server object.

If the query utility reports a status of NXDOMAIN, then the server is indicating that no resource record exists for the domain name, resource record type, and class. Perform the following to solve a query problem:

- Check the master zone for the record in question.
- If the records are in the master zone, it is possible that the zone is loaded but the records are not, as update might not have been issued.
- Check if the domain name requested belongs to a child zone.

If the status is SERVFAIL, the server does not have the answer to the query and may have configuration problems that are preventing it from getting the answer. Check if the server being queried contains a hint file. As DNS is a distributed system, servers need a common connection point. The hint file contains the location of the authoritative servers for the root zone. They provide delegation information for all servers in the namespace.

If the status is REFUSED, the server is configured not to allow queries to proceed. If possible check the settings of the allow-query option or check the match-client and match-destinations.

Check the internetDNS attribute through (BindService=1)>**show -v**.

- If it is `true`, check whether the `keyId="FAT1023219/1"` (Internet DNS) exists. If exists, check whether the file `/etc/ipworks/root_cert.cfg` exists or the file is corrupted.
- If it is `false`, check whether the `keyId="FAT1023219/4"` (DNS TPS) exists. If exists, check whether the file `/etc/ipworks/root_cert.cfg` exists or the file is corrupted.

Note: Internet DNS license is only introduced for IPWorks deployed in KVM.

For information about how to check KeyId, refer to [View License Information, Reference \[16\]](#).

If `dig` returns `ANSWER: 0`, it means that the domain name requested does exist but there is no resource record for the type requested. For example, if the user wants PTR records and type `dig example.com` but forget to mention the wanted PTR records, use `dig example.com PTR`.

If the query utility does not help, look in the `ipworks_dns.log` server log file (see Section 3.2.5 on page 21).

If **IncludeRecord** is used, consider any content error in the related **IncludeFile**. This is because **IncludeFile** can be expanded into the masterzone that is affected by the content in **IncludeFile**.



For more information about the **IncludeRecord** and **IncludeFile** objects, refer to the **IncludeRecord** and **IncludeFile** sections of **IPWorks DNS, ASDNS, ENUM Parameter Description**.

5.8.6 Operations Protected by TSIG Fail

If TSIG is used to restrict access to a server, the following is required:

- The same key must be configured at both ends of the TSIG signed transaction – the key must contain the same secret and key name.
- The system clocks for both ends of the TSIG signed transaction must be reasonably synchronized (the times must be within 5 minutes of each other). Use the `date -u` command on both machines to get the time settings in GMT. It is best to use a time synchronizing application such as NTP (Network Time Protocol).

5.8.7 Incorrect Data Returned for Queries

5.8.7.1 Trouble Symptoms

A DNS answer to a query differs from the expected answer.

5.8.7.2 Locating Fault

- Make sure that after changing to the zone, the DNS Server is updated and the master server loads the zone correctly.
- If querying a slave server, check the SOA serial number in the slave against the master. If the slave server has a lower serial number, the slave server may have not loaded the most recent data from the master. If the slave has a SOA serial number higher than the master for a zone, it does not perform a zone transfer. Delete the zone file in the slave and reload.
- Check slave server logs in the file `ipworks_dns.log` (see Section 3.2.5 on page 21). They may report errors transferring data from the master.

For more information on Master Server errors, see Section 5.8.1 on page 70.

Note: If ActiveSelect DNS is enabled on the domain name under question, it may also alter the data returned based on the state of the monitored systems, the source of the query and the ActiveSelect DNS configuration.

5.8.7.3 Confirming Solution

Not applicable.



5.8.8 Bad Data from a Malicious External DNS Server

5.8.8.1 Trouble Symptoms

When a Cache DNS server sends a request to a malicious external DNS server, and the external DNS server probably returns with a negative answer.

5.8.8.2 Locating Fault

1. Restart the Cache DNS Server.
2. Stop the communication between the Cache DNS server and the external DNS server if the problem exists.

Note: How to stop the communication is out of the scope of this document.

5.8.8.3 Confirming Solution

Not applicable.

5.8.9 Bad Data from a Roaming Partner

5.8.9.1 Trouble Symptoms

When a Cache DNS server sends a request to a roaming partner, while the roaming partner is updating the NS records without updating the related Glue records together, the Cache DNS server probably receives a negative answer.

5.8.9.2 Locating Fault

1. Control the negative cache TTL locally using the parameter `max-ncache-ttl` (default value: 10,800 s; recommended value: 60 s).

```
IPWorks>modify dnsserver dns1 \  
-add option="max-ncache-ttl 60"  
Working on 1 object(s).  
1 object(s) were updated.
```

```
IPWorks> update dnsserver
```

2. Flush the stored local cache.

```
#rndc flush
```

3. Send the query to the roaming partner again.
 - Contact the roaming partner to update the related Glue Records if the problem exists, and IPWorks DNS resumes the query automatically when the roaming partner updates the Glue Records.



5.8.9.3 Confirming Solution

Not applicable.

5.8.10 External Clients Are Unable to Query the Server

5.8.10.1 Trouble Symptoms

The external clients cannot query the server.

5.8.10.2 Locating Fault

- Check to assure general connectivity first by using ping and other tools.
- Check for delegation errors or missing delegations between any child zone and its parent zone. If appropriate address (A and AAAA) and server (NS) records are not set properly in the parent zone, there is no way for external DNS clients to find the authoritative servers.
- Check for allow-query or black hole options that may be preventing access to external clients.

5.8.10.3 Confirming Solution

Not applicable.

5.8.11 Dynamic DNS Update Failed

5.8.11.1 Trouble Symptoms

When users try to perform dynamic DNS update, the update fails.

5.8.11.2 Locating Fault

Check that the master zone configuration allows updates. Verify that each dynamic zone (both forward and reverse) includes an allow-update option with an IP address value that includes the IP address of the DHCP server or other DDNS update clients.

It is recommended that users use TSIG for dynamic updates. In this case, make sure that the TSIG keys are the same and that the server security allows updates through the desired TSIG keys.

5.8.11.3 Confirming Solution

Not applicable.



5.8.12 Authoritative Server for Dynamic Zone Crashes

5.8.12.1 Trouble Symptoms

The DNS Server may crash if a zone file is modified for a dynamic zone while the DNS Server is running.

5.8.12.2 Locating Fault

To change a dynamic zone manually, the user **must** use the following procedure:

1. Use the `ipw-ctr` to stop the DNS Server.
2. Wait for the server to exit.
3. Delete the zone `.jnl` file. The path of the file is `/etc/ipworks/dns`. Removing the `.jnl` file is critical because the manual edits are not present in the journal, rendering it inconsistent with the contents of the zone file.
4. Edit the zone file.
5. Use the `ipw-ctr` to start the DNS Server.

Note: If the journal file is deleted, all the dynamic data will be lost next time the server is restarted.

5.8.12.3 Confirming Solution

Not applicable.

5.8.13 Rename the DNS Server

5.8.13.1 Trouble Symptoms

If user wants to rename the DNS Server, a friendly message is displayed. For example:

```
IPWorks> modify dnsserver dns1 -set name=dns2
Working on 1 object(s).
DnsServers name cannot be renamed.
No object(s) were updated.
```

5.8.13.2 Locating Fault

This is because there are too many things such as `view`, `key`, `acl`, `masterzone` in the `dnsserver`. The `dnsserver` name is an important piece of information to maintain the relationship for the related objects. If there are thousands of data existing in DB, it takes long time to finish this. For all the related `masterzone` objects, `zoneid` is changed. It is ambiguous whether the records in this zone



should be changed as well when a `zoneid` is changed. So it should be a prevented activity and a friendly error message is given.

Note: If the user must change the name of the DNS Server, the user has to delete the `dnsserver` and all the related objects, then create everything again.

5.8.13.3 Confirming Solution

Not applicable.

5.9 ActiveSelect DNS Server

This section provides information on resolving problems with the IPWorks ActiveSelect DNS (also called ASDNS) and ActiveSelect DNS Monitor.

ActiveSelect DNS is an IPWorks specific feature that allows redundancy to be defined in the network, and allows the performance of complex load balancing than normally possible within the DNS protocol. ActiveSelect DNS is an extension to the IPWorks DNS Server. This extension makes DNS more dynamic when responding to queries. The IPWorks DNS Server with ActiveSelect DNS uses information sent to it from ActiveSelect DNS Monitors so that it can make more intelligent decisions about what information to include in a response.

5.9.1 Order of Returned Addresses Changes

5.9.1.1 Trouble Symptoms

The order of returned addresses might change with each query.

5.9.1.2 Locating Fault

ActiveSelect DNS results are dynamic and depend on the reported status and load of the resources and on statistics that are used to balance the load across the available resources.

By default, round robin is used to balance the load between resources.

5.9.1.3 Confirming Solution

Not applicable.

5.9.2 Address Is Displayed in Responses When the Resource Is Down

5.9.2.1 Trouble Symptoms

An address can appear in responses when the resource is down.



5.9.2.2 Locating Fault

To avoid this issue, try to avoid the following conditions:

- The resource is monitored periodically and this period may not have elapsed. Retry the query after the monitor interval has elapsed.
- All addresses for the domain name are down, ActiveSelect DNS can be configured either to return all addresses, only site addresses or no addresses.
- The query is not directed to an authoritative server. The answer may be from cached data. Reduce the TTL of the ActiveSelect DNS enabled domain name or direct queries to an authoritative server.
- The monitoring script (provided by customer) is reporting the incorrect status information to the monitor. This can be caused by a coding error in the script.
- The query was sent from a client that did not have access to the DNS View where ActiveSelect DNS was enabled for the domain name. Verify the ACL list on each DNS View and which views ActiveSelect DNS have enabled for the name.

5.9.2.3 Confirming Solution

Not applicable.

5.9.3 Address Does Not Appear in Responses When Resource Is Up

5.9.3.1 Trouble Symptoms

An address may not appear in responses when the resource is up.

5.9.3.2 Locating Fault

To avoid this issue, try to avoid the following conditions:

- The resource is monitored periodically and this period may not have elapsed. Retry the query after the monitor interval has elapsed.
- The configuration on the ActiveSelect Sites may be limiting the number of addresses returned.
- Prefer Statements may be filtering the addresses that are returned based on the source of the query.
- The query is not directed to an authoritative server. The answer may be from cached data. Reduce the TTL of the ActiveSelect DNS enabled domain name or direct queries to an authoritative server.



- The DNS Server is overloaded and unable to process ActiveSelect DNS Monitor updates.
- The ActiveSelect DNS monitors may not be configured to report status on all the addresses for the domain name.
- The ActiveSelect DNS Monitor and DNS Server are using different TSIG keys or have a too large time drift.
- The ActiveSelect DNS Monitor may be considering dependencies when determining if an address is up and this may be down.
- The monitoring script is reporting the incorrect status information to the monitor. This can be caused by a coding error in the script.
- The query was sent from a client that did not have access to the DNS View where ActiveSelect DNS was enabled for the domain name. Verify the ACL list on each DNS View and which views ActiveSelect DNS have enabled for the name.

5.10 ENUM Server

This section provides information on resolving problems with the IPWorks ENUM Server.

The IPWorks ENUM Server provides mapping from telephone numbers to domain names or SIP URIs that can be used to route a call.

For more information on concepts of ENUM management, refer to the Section [ENUM Management of IPWorks Configuration Management](#). For more information on ENUM configuration, refer to the Section [Configuring ENUM of Configure DNS and ENUM](#).

5.10.1 ENUM Server Connectivity Errors

5.10.1.1 Trouble Symptoms

A client failed to connect to one or more ENUM servers.

The ENUM server does not respond to requests.

5.10.1.2 Locating Fault

Use the following methods to locate the fault:

- Use the ping command to see whether the communication between the client and the server exists.



- Use the `ping` command to see whether the communication between iENUM and eENUM exists.
- Check the configuration of the client.
- Use the `netstat -r` command to check the router settings.
- Use the ECLI interface to check the ENUM server configuration. For example, check the port number.
- Use `dig` (see Section 2.1.9 on page 7) command or another query command to query the server.

5.10.1.3 Confirming Solution

The ENUM server can get successful reply.

5.10.2 Failed to Stop/Start/Restart ENUM Server by ipw-ctr

5.10.2.1 Trouble Symptoms

The ENUM Server works normal, but it cannot be started/stopped/restarted by using `ipw-ctr`.

The question can be showed by following exampled procedure:

1. Check the ENUM Server status.

```
# ps -ef|grep enum
```

```
root 7234 1 0 Oct27 ? 01:10:58 /opt/ipworks/enum/bin/ipwenum
root 29996 16881 0 16:52 pts/1 00:00:00 grep enum
```

2. Check the ENUM Server status by using `ipw-ctr`.

```
# ipw-ctr status enum pl-3
```

```
safSu=PL-3,safSg=NWA,safApp=ERIC-sv.SVENUM saAmfSUAdminState=UNLOCKED
(1) saAmfSUOperState=DISABLED(2) saAmfSUPresenceState=UNINSTANTIATED(1) saAmfSUReadinessState=
```

The output shows that the ENUM Server is stopped or out of service.

3. Under this condition, execute the command to restart ENUM by using `ipw-ctr`.

```
# ipw-ctr restart enum pl-3
```

```
Stop enum ==> success.
Start enum ==> failed!
```



The output shows that the restart is failed.

4. Check the status of ENUM Server again.

```
# ps -elf | grep enum
```

```
root 7234 1 0 Oct27 ? 01:10:58 /opt/ipworks/enum/bin/ipwenum
root 29996 16881 0 16:52 pts/1 00:00:00 grep enum
```

5.10.2.2 Locating Fault

Use amf native command to repair the fault by the following example procedure on PL-3:

1. Repair ENUM AMF status.

```
# ipw-ctr repaired enum PL-3
```

2. Execute the amf commands.

```
# amf-adm lock-in safSu=PL-3,safSg=NWA,safApp=ERIC-sv.SVENUM
```

3. Check the ENUM Server status.

```
# ps -elf | grep enum
```

```
0 S root 3424 16881 0 80 0 - 1433 pipe_w 17:14 pts/1 00:00:00 grep enum
4 S root 30293 1 0 80 0 - 154894 futex_ 16:52 ? 00:00:05 /opt/ipworks/enum/bin/ipwenum
```

The ENUM process is running.

4. Check the ENUM Server status again.

```
# ps -elf | grep enum
```

```
0 R root 3560 16881 0 80 0 - 1433 - 17:15 pts/1 00:00:00 grep enum
```

The ENUM process is stopped.

5.10.2.3 Confirming Solution

1. Start ENUM Server by using ipw-ctr.

```
# ipw-ctr start enum PL-3
```

```
Start enum ==> success
```

2. Check the ENUM Server status.

```
# ps -elf | grep enum
```



```
4 S root 4402 1 1 80 0 - 180389 futex_ 17:17 ? 00:00:00 /opt/ipworks/enum/bin/ipwenum
0 S root 4562 16881 0 80 0 - 1433 pipe_w 17:17 pts/1 00:00:00 grep enum
```

The ENUM process is running.

3. Check the status of ENUM Server by using ipw-ctr.

```
# ipw-ctr status enum pl-3
```

```
enum on PL-3 is running
```

5.10.3 Error Responses to ENUM Requests

The operator can check the Rcode field to determine the problem reason when ENUM server returns an error response.

Rcode Field / Result	Possible Cause	Solution
1 (Format Error)	The ENUM request is incorrect or contains a syntax error.	Try sending the request again in case it was corrupted during the transmission.
2 (Server Failure)	The ENUM Server cannot connect to an NDB Cluster.	Use the show command in the ndb_mgm tool to check the status of the NDB Cluster.
3 (Name Error)	The query is below an equipped ENUM zone but the specific domain name is not provisioned in the database.	Make sure the specific domain name is provisioned in the database.
4 (Not Implemented)	The ENUM server does not support the Opcode value in the request.	
5 (REFUSED)	dnsResolver=false	Configure parameter dnsResolver=true and restart ENUM service.
16 (Bad Version)	The request contains an OPT resource record with a non-zero version.	
Connection timeout	DNS service is stopped.	Execute commands: #ipw-ctr restart dns <PL hostname>

5.10.4 Errors Related to ERH

The following table contains the error messages related to the ERH and provides the possible cause:

Error Message in Log	Possible Cause	Solution
2008/11/27 10:07:46 AIN stat SSN 100 UserId 40 Instance 1 Bind confirmed Failure	Wrong SSN or SPC has been configured, or SS7 stack has the wrong status.	See Section 5.10.4.1 on page 85
2008/11/27 10:34:19 AIN warning Received T_NOTICE with SSN 200 userId 40 DID 1, report casue No trans for Addr of such Nature	No translation type has been mentioned or wrong translation type has mentioned.	See Section 5.10.4.2 on page 85



Error Message in Log	Possible Cause	Solution
2014/07/29 21:18:27 ENUM+ Debug not found dn 2014/07/29 21:18:27 ENUM+ Debug not found dnrange 2014/07/29 21:18:27 ENUM+ Debug sendto in.	The query is not sent to the NPDB by the LDAP protocol.	See Section 5.10.4.3 on page 85
2014/07/29 22:13:02 ENUM+ Warning Invalid NPHandler has been used.	The ENUM LDAP switch is not open in ECLI.	See Section 5.10.4.4 on page 86

5.10.4.1 Check SSN and SPC Configuration

To resolve this problem, do the following:

1. Check the configuration of **AINNode**, **MAPNode**, and **INAPNode** in IPWCLI. The configuration of LocalSPC and LocalSSN must be the same as SS7 stack which has been installed in the local machine.

If the configuration is inconsistent, correct the configuration of the objects either in IPWCLI or Signaling Manager.

2. Set the NPSSwitch field of **AINNode**, **MAPNode**, and **INAPNode** to 0, and wait for ENUM to unload the ERH module.
3. Set the NPSSwitch field of **AINNode**, **MAPNode**, and **INAPNode** to 1, then try again.
4. Check the status of SS7.

For information on how to check SS7 stack, refer to the section Verifying Stack Configuration in *Configure SS7 for ENUM Number Portability*.

5.10.4.2 Check Translation Type and GT

To resolve this problem, do the following:

1. Check whether the value of translation type in IPWCLI is the same as the configuration of SS7 stack.
2. Check whether GT has been configured in the SS7 stack. For details, refer to *Reconfiguring SS7 Network, Creating and Defining GT Routing*.

5.10.4.3 Check EnumDnRange Configuration

To resolve this problem, do the following:

1. Check the configuration of **EnumDnRange**.

```
# ipwcli
```

```
IPWorks> list enumdnrange
```

For example:



```
[EnumDNRange 50 8652]
  enumZoneId: 50
  viewId: 0
  enumDnRange: 8652
  scope:
    destNode: ldap
  updateLevel: 0
Working on 1 object(s).
IPWorks>
```

The destNode must be ldap when this EnumDnRange is configured for the NP by LDAP.

For example:

```
IPWorks> modify enumdnrange <2.5.6.8...> -set destnode=ldap
Working on 1 object(s).
1 object(s) were updated
```

5.10.4.4 Open ENUM LDAP Switch

To resolve this problem, do the following:

1. Enter the ECLI.

```
# /opt/com/bin/cliss
```

```
> ManagedElement=<Node Name>,IpworksFunction=1,IpworksDnsRoot=1,IpworksEnumRoot=1,EnumServer=1,Erh=1
```

2. Set the parameter ldap to true to open the ENUM LDAP switch.

```
(Erh=1>) configure
```

```
(config-Erh=1)> ldap=true
```

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

5.10.5 NP Traffic Loss

5.10.5.1 Trouble Symptoms

When NP traffic starts, the system drops packets before sending them to the ENUM server. The number of dropped packets is equal to the lost on the client side.



5.10.5.2 Locating Fault

This may be caused by the small value of `net.core.rmem_default`, which is the default buffer size in FUnit bytes for receiving socket. The problem can be solved by resetting the `net.core.rmem_default` value to its maximum.

The maximum value can be retrieved by issuing the following command:

```
# sysctl -a | grep net.core  
  
...  
net.core.rmem_max = <max value>  
...
```

The default value can be increased by issuing the following command:

```
# sysctl -w net.core.rmem_default=<max value>
```

5.10.5.3 Confirming Solution

After configuring the value, check if any packet lost on the client side.

5.11 ENUM Front End

IPWorks ENUM Front End (FE) is a component of data layered architecture (DLA), where application and user data are separated in different layers that are implemented in different network functional entities. The role of ENUM FE is to provide the application logic and enable ENUM server to access to CUDB instead of local NDB. CUDB is an extensible, high-performance, subscriber-centric database system, which communicates with IPWorks by LDAP protocol and SOAP protocol.

Figure 5 illustrates the architecture of ENUM FE:

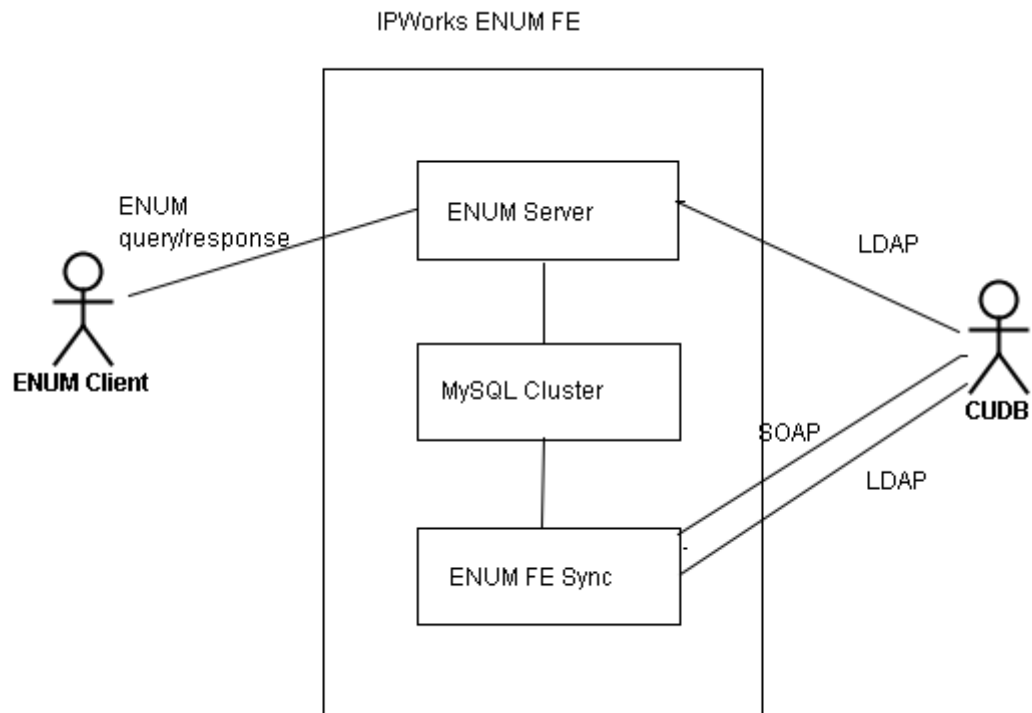


Figure 5 ENUM Front End Generic Architecture

ENUM Server implements a business logic layer. The data of IPWorks ENUM FE is on the CUDB. For traffic handling, ENUM FE queries the user data from the CUDB by LDAP protocol.

ENUM FE Sync implements the cache mechanism of ENUMDnRange and ENUMDnSched. Following list describes how the cache mechanism functions:

1. ENUM FE Sync acts as SOAP server to handle SOAP notifications from CUDB when ENUMDnRange and ENUMDnSched provisioning.
2. ENUM FE Sync caches ENUMDnRange and ENUMDnSched in local and re-caches them when they expire.
3. ENUM FE Sync provides a method to manually refresh the cached ENUMDnRange and ENUMDnSched.

ENUM FE Configuration Pre-Check

Enable ENUM FE Function in ECLI:

To make ENUM FE functions, it must be enabled first:

1. Log on to the ECLI interface on the SC.

```
# ssh <username>@<SC MIP Address> -t -s cli
```
2. Configure the MO EnumFE.



```
>configure
```

```
(config)>dn ManagedElement=<Node Name>,IpworksFunction=1,IpworksDnsRoot=1,IpworksEnumRoot=1,EnumFE=1
```

```
(config-Erh=1)>enableEnumFE=true
```

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

```
(config-Erh=1)>exit
```

3. Restart ENUM server and ENUM FE Sync to make the change takes effect.

```
# ipw-ctr restart enum <PL hostname>
```

```
# ipw-ctr restart fesync <PL hostname>
```

Make Connection Available:

Make sure that all connections are available with databases (CUDB and local MySQL DB cluster).

If any DB connection related alarms are raised, follow the procedures described in the following alarm OPIs:

- ENUM, CUDB Node Failure
- ENUM, CUDB Site Failure
- ENUM, Server Lost Connections of DB
- ENUM FE Sync, All CUDB Connections Failure
- ENUM FE Sync, Server Lost Connections of DB

License is Valid:

Make sure that license for ENUM FE function is valid.

For details, see Section 5.15.1 on page 106.

5.11.1 No LDAP Connection

5.11.1.1 Trouble Symptoms

The following error message is logged in the log file `ipworks_enum.log`:

```
"LDAPProvider::find ldapConnection is null!"
```

However, no related alarms are raised.



5.11.1.2 Locating Fault

This issue occurs when the connection configuration for ENUM server is not configured. An example is provided as below:

For example:

```
SC-X:~ # /opt/com/bin/cliss
```

```
>ManagedElement=<Node Name>,IpworksFunction=1,IpworksCommonRoot=1
,DataBaseInfo=1,CudbManager=1,CudbServiceSite=ENUM,CudbSiteManager
=1,CudbSite=<CudbSite Name>, CudbNode=<CudbNode Name>
```

```
(CudbNode=<CudbNode Name>)>show -v
```

```
CudbNode=<CudbNode Name>
address="192.168.20.14"
cudbNodeId="<CudbNode Name>"
distinguishedName=""
password=""
poolSize=16
port=389 <default>
```

5.11.1.3 Confirming Solution

Check whether the same issue occurs after the configuration.

5.11.2 Server Fail in ENUM Response

5.11.2.1 Trouble Symptoms

The Rcode field of ENUM response is Server Fail.

5.11.2.2 Locating Fault

1. When ENUM Zone in IPWorks does not match the ENUM record in CUDB. Make sure that there is an ENUM Zone matching this query.

Each ENUM record in CUDB must match an ENUM Zone. Otherwise, it's unavailable to ENUM Server. For NAPTR queries, only those can find valid zones in ENUM Server will be continued with the following ENUM processing. For example, two NAPTRs in CUDB:

```
fqdn=1.2.3.4.5.6.7.8.9.0.3.3.1.e164.ipitelco.com
fqdn=1.2.3.4.5.6.7.8.9.0.3.3.2.e164.ipitelco.com
```

An EnumZone object e164.ipitelco.com must be created:



```
IPWorks>create enumzone 1 -set enumzonename="e164.iptelco.com"
```

```
IPWorks>exit
```

Note: When the ENUM FE is running, the configuration of EnumZone impacts the performance.

2. Make sure that DB connection is available, including CUDB and NDB. For details, see Make Connection Available.
3. Make sure that ENUM server process is running by executing the command `ps -ef|grep ipwenum`.

5.11.2.3 Confirming Solution

Check whether the Rcode is still Server Fail after the configuration.

5.11.3 Failed to Cache ENUMDnSched to Local MySQL Cluster (for ENUM)

5.11.3.1 Trouble Symptoms

The following warning message is logged in `ipwenum.log`:

```
"Tuple already existed when attempting to insert"
```

5.11.3.2 Locating Fault

The same ENUMDnSched are cached into MySQL Cluster at the same time on both ENUM servers. The reason is, both ENUM servers receive the same ENUM query at the same time, then search in CUDB and cache fetched record to IPWorks MySQL Cluster, this results in that one success and other fail because this record is existed.

5.11.3.3 Confirming Solution

This is warning message, and there is no side effect for any ENUM FE function.

5.11.4 Failed to Cache ENUMDnSched to Local MySQL Cluster (for ENUM FE Sync)

5.11.4.1 Trouble Symptoms

The following error message is logged in the `ipworks_fesync.log`:

```
"enumDnSchedCache is disable"
```



5.11.4.2 Locating Fault

ENUM FE Sync receives an EnumDnSched SOAP message, but the switch enableEnumDnSchedCache is disabled.

1. Log on to the ECLI.

```
# ssh <username>@<OAM IP Address> -t -s cli
```

2. Enable EnumDnSched cache by configuring MO EnumFE.

```
>configure
```

```
(config)>dn ManagedElement=<Node Name>,IpworksFunction=1,IpworksDnsRoot=1,IpworksEnumRoot=1,EnumFE=1
```

```
(config-EnumFE=1)>enableEnumDnSchedCache=true
```

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

```
(config-EnumFE=1)>exit
```

Note: When the value of enableEnumDnSchedCache is set to false, all the cached EnumDnSched in the local will be removed.

3. Restart the ENUM server and ENUM FE Sync to make the changes take effect.

```
# ipw-ctr restart enum <PL hostname>
```

```
# ipw-ctr start fesync <PL hostname>
```

5.11.4.3 Confirming Solution

Check whether the same issue occurs after the configuration.

5.11.5 Failed to Refresh EnumDnRange

There are totally 4 typical cases about this chapter.

5.11.5.1 Case 1

5.11.5.1.1 Trouble Symptoms

When you perform manual refresh on EnumDnRange by using /opt/ipworks/enumfe/scripts/manual_refresh ENUMDnRange, you will receive the following error message:

```
"EnumDnRange is initialing."
```



5.11.5.1.2 Locating Fault

When ENUM FE Sync is starting, if there is no EnumDnRange in local MySQL cluster, ENUM FE Sync will get the EnumDnRange from CUDB and store it in the local MySQL Cluster. Meanwhile, ENUM FE Sync receives a command "Manual refresh EnumDnRange", then it will report this message "EnumDnRange is initialing."

5.11.5.1.3 Confirming Solution

It is recommended that the manual refresh is performed after the initial.

5.11.5.2 Case 2

5.11.5.2.1 Trouble Symptoms

When you perform manual refresh on EnumDnRange by using /opt/ipworks/enumfe/scripts/manual_refresh ENUMDnRange, you will receive the error message by executing the following steps:

1. Execute the following command:

```
PL-3:~ # /opt/ipworks/enumfe/scripts/manual_refresh ENUMDnRange
```

% Total	% Received	% Xferd	Average Speed	Time	Time	Time	Current
			Dload Upload	Total	Spent	Left	Speed
100	891	0	295	100	596	3908	7897

```
keep old enum dnrage in cache,enum dnrage refresh fail, detial reason refer to output.log
```

2. Execute the following command:

```
PL-3:~ # vi output.log
```

The error message is displayed as follows:

```
<?xml version='1.0' encoding='UTF-8?'><soapenv:Envelope xmlns:soapenv=
"http://schemas.xmlsoap.org/soap/envelope/"><soapenv:Body><soapenv:Fault>
<faultcode>soapenv:Server</faultcode><faultstring>Can't call rollback when
autocommit=true</faultstring><detail /></soapenv:Fault></soapenv:Body></soapenv:Envelope>
~
```

5.11.5.2.2 Locating Fault

We need to delete the record in the DNRANGEEVENTHANDLE table since it has not rollback. The steps are as follows:

1. Log in the database:

```
SC-1: /usr/local/mysql/bin/mysql -P 3307 --protocol=tcp
```



2. Choose the ipworks database:

```
mysql> use ipworks;
```

3. Query all the record(s) of the DNRANGEEVENTHANDLE table:

```
mysql> select * from DNRANGEEVENTHANDLE;
```

```
+-----+-----+
| id | eventhandletag |
+-----+-----+
| 1 | 0 |
+-----+-----+
1 row in set (0.00 sec)
```

4. Delete the record:

```
mysql> delete from DNRANGEEVENTHANDLE;
```

```
Query OK, 1 row affected (0.00 sec)
```

5. Check if there is any record left in the DNRANGEEVENTHANDLE table:

```
mysql> select * from DNRANGEEVENTHANDLE;
```

```
Empty set (0.00 sec)
```

6. Exit:

```
mysql> quit
```

5.11.5.2.3 Confirming Solution

It is recommended that the manual refresh is performed after the above action.

5.11.5.3 Case 3

5.11.5.3.1 Trouble Symptoms

When you perform manual refresh on EnumDnRange by using `/opt/ipworks/enumfe/scripts/manual_refresh ENUMDnRange`, you will receive the error message by executing the following command:

```
PL-3:~ # /opt/ipworks/enumfe/scripts/manual_refresh ENUMDnRange
```

The error message is displayed as follows:



```
% Total      % Received % Xferd  Average Speed   Time    Time       Time  Current
   0         0         0      0         0     0         0      0
(7) Failed to connect to 127.0.0.1 port 8080: Connection refused
keep old enum dnrange in cache,enum dnrange refresh fail, detail reason refer to output.log
```

5.11.5.3.2 Locating Fault

Execute the following command:

```
PL-3:~ # ipw-ctr status fesync
```

If the output is as one of the below items, you can conclude that the issue occurs when fesync in PL-3 is stopped, out of service or working as a standby node.

```
—

fesync in PL-3 is stopped or out of service. Detail info is as below:
safSu=PL-3,safSg=2N,safApp=ERIC-sv.SVENUMFE
saAmfSUAdminState=LOCKED-INSTANTIATION(3)
saAmfSUOperState=ENABLED(1)
saAmfSUPresenceState=UNINSTANTIATED(1)
saAmfSUReadinessState=OUT-OF-SERVICE(1)
```

Or

```
—

fesync on PL-3 is running, working as a standby node
```

5.11.5.3.3 Confirming Solution

The command `manual_refresh` must be executed only on the PL with active fesync.

5.11.5.4 Case 4

5.11.5.4.1 Trouble Symptoms

When you perform manual refresh on EnumDnRange by using `/opt/ipworks/enumfe/scripts/manual_refresh ENUMDnRange`, you will receive the error message by executing the following steps:

1. Execute the following command:

```
PL-3:~ # /opt/ipworks/enumfe/scripts/manual_refresh ENUMDnRange
```



```

% Total      % Received % Xferd  Average Speed   Time    Time       Time  Current
   100      891    0   295   100    596    1067    2157  --:--:--  --:--:--  --:--:--  2167

keep old enum dnrage in cache,enum dnrage refresh fail, detial reason refer to output.log

```

2. Execute the following command:

```
PL-3:~ # vi output.log
```

The error message is displayed as follows:

```

<?xml version='1.0' encoding='UTF-8'?><soapenv:Envelope xmlns:soapenv=
"http://schemas.xmlsoap.org/soap/envelope/"><soapenv:Body><soapenv:Fault>
<faultcode>soapenv:Server</faultcode><faultstring>no available ldap connection
</faultstring><detail /></soapenv:Fault></soapenv:Body></soapenv:Envelope>

```

5.11.5.4.2 Locating Fault

Refer to Section 5.11.1.2 on page 89 of Section 5.11.1 on page 89.

5.11.5.4.3 Confirming Solution

The command `manual_refresh` must be executed after the problem is solved.

5.11.6 Cannot Find ENUM Zone

5.11.6.1 Trouble Symptoms

The following error message is logged in `ipworks_fesync.log`:

```
"can't find enum zone!"
```

5.11.6.2 Locating Fault

When ENUM FE Sync receives an ENUMDnSched SOAP message, but there is no matched ENUM zone for this record.

Refer to the section `Configuring EnumZone` according to CUDB ENUM records in `Configure DNS and ENUM`.

5.11.6.3 Confirming Solution

Check whether the same issue occurs after the configuration.



5.12 Radius AAA Server

This section provides information on resolving problems with the IPWorks Radius AAA Server.

5.12.1 Radius AAA Server Process Not Running

5.12.1.1 Trouble Symptoms

Radius AAA sever processes cannot be started.

5.12.1.2 Locating Fault

Use any of the following methods to locate the fault:

- Use `ipw-ctr` to check Radius AAA server status on SC.

```
# ipw-ctr status aaa_radius_stack <PL hostname>
```

```
# ipw-ctr status aaa_radius_backend <PL hostname>
```

```
# ipw-ctr status csvengine <SC hostname>
```

- Use the `ps` command on PL or SC to check if Radius AAA process is running.

- PL:

```
# ps -ef | grep a3radiusd
```

```
# ps -ef | grep a3backend
```

- SC:

```
# ps -ef | grep a3csvengine
```

- Check Radius AAA log to see if any error trace. For example:

```
#cat /cluster/storage/no-backup/ipworks/logs/<PL  
hostname>/aaa_radius_stack.log* | grep -i error
```

```
#cat /cluster/storage/no-backup/ipworks/logs/<PL  
hostname>/aaa_radius_backend.log* | grep -i error
```

```
#cat /cluster/storage/no-backup/ipworks/logs/<SC  
hostname>/aaa_radius_csvengine.log* | grep -i error
```

5.12.1.3 Confirming Solution

Contact the support to fix the issue that is reported in Radius AAA error log.



5.12.2 Unreachable Radius Traffic

5.12.2.1 Trouble Symptoms

Radius AAA server cannot receive traffic from client when Radius AAA server is in operation.

5.12.2.2 Locating Fault

Use any of the following methods to locate the fault:

- Use ping to check the connection between client and server.
- Check the eVIP flow policy for Radius AAA.
 - a Check the instance of MO `RadiusInterface` to find out port numbers.

For example:

```
SC-X:~ # cliss
>ManagedElement=<Node Name>,IpworksFunction=1,IPWorksAAARoot=1,⇒
IPWorksRadiusAAARoot=1,RadiusStack=1,RadiusInterface=1
(RadiusInterface=1)>show -v
RadiusInterface=1
  acctAddress="any" <default>
  acctPort=1813 <default>
  authAuthzAddress="any" <default>
  authAuthzPort=1812 <default>
  dmCooPort=3799 <default>
  localhostBindIPType=IPV4 <default>
  proxyAddress="any" <default>
  proxyBindIPType=IPV4 <default>
  proxyPortsNumEachPL=200
  proxyStartPort=10000 <default>
  radiusInterfaceId="1"
```

- b Check the instances of MO `EvipFlowPolicy` to see whether the Radius listening ports (1812, 1813, and 3799) are configured already.

For example:

```
>ManagedElement=1,Transport=1,Evip=1,EvipAlbs=1,⇒
EvipAlb=ipw_sig_sp,EvipFlowPolicies=1,EvipFlowPolicy=radius_port_1812
(EvipFlowPolicy=radius_port_1812)>show -v
EvipFlowPolicy=radius_port_1812
  addressFamily="ipv4" <obsolete>
  dest=<VIP_TRF_IP1>
  destPort="1812"
  evipFlowPolicyId="radius_port_1812"
  protocol="udp"
  soGrp=[] <empty>
  src=[] <empty>
  srcPort=[] <empty>
  targetPool="SIG_pools"
  usageState=IDLE <read-only>
```

Where: `<VIP_TRF_IP1>` represents the Radius AAA traffic eVIP address.



5.12.2.3 Confirming Solution

Correct the configuration of eVIP policy flow in ECLI.

5.12.3 AAA Rejects Authentication or Authorization Request

5.12.3.1 Trouble Symptoms

Authentication or authorization request from Radius client is rejected by IPWorks AAA server.

Use tcpdump to capture the packet, you receive the following error message:

```
Reply-Message : fail to verify user password
```

For how to capture the packet, refer to Section 7 on page 169.

5.12.3.2 Locating Faults

This issue occurs when the configurations of ShareSecret are not synchronized between ECLI and client.

1. Check the value of ShareSecret in a Radius client.

The actual procedure depends on the customer's environment. Details are out of the scope of IPWorks documents.

2. Check the value of `ClientSharedSecret` in ECLI.

```
# ssh <Username>@<MIP_OAM_IP>
Password: <Password>
dn ManagedElement=1,IpworksFunction=1,IPWorksAAARoot=1,IPWorksRadiusAAARoot=1,IPWorksRadiusStack=1,SharedSecretMgr=1,ClientSharedSecretMgr=1,ClientSharedSecret=1
(ClientSharedSecret=1)>show -v
ClientSharedSecret=1
  clientIPAddr=<Client IP>
  clientSharedSecretId="1" <default>
  sharedSecretValue=<Shared Secret Value>
  type=ALL <default>
```

Note: To get OAM IP address, check the oam in `/etc/hosts`.

3. Ensure that the value of ShareSecret fetched in Step 1 is the same with the value of `shareSecretValue` fetched in Step 2.

5.12.3.3 Confirming Solution

Check whether you can send out the requests to the client successfully.



5.12.4 AAA Does Not Proxy Radius Message

5.12.4.1 Trouble Symptoms

Authentication or authorization request from Radius client is not forwarded to target server by IPWorks AAA server.

Use `tcpdump` to capture the packet, you find the radius message IPWorks AAA server received is not forwarded to other servers.

For how to capture the packet, refer to Section 7 on page 169.

5.12.4.2 Locating Faults

This issue occurs when the configurations of proxy rule is not updated to PL-X from IPWCLI.

1. Check the configure file `/etc/ipworks/<AAA Server host, PL-x>/aaa_radius/aaa_realm.conf`. exists in each blade which AAA is running on, for example:

```
cat /etc/ipworks/PL-3/aaa_radius/aaa_realm.conf
```

Exampled output:

```
[REALM]
name=Ericsson.com
striprealm=false
access
{
  destination={192.168.10.1}
  requestchecklist={( Service-Type = 1 || Service-Type = 2 ) && User-Password
  replychecklist={( Service-Type = 1 || Service-Type = 2 )}
  requestchangelist={add:Framed-Protocol="1",delete:Service-Type="2"}
  replychangelist={add:User-Name="AAA-Test@Ericsson.com",add:Framed-Protocol=
}

accounting
{
  destination={192.168.10.1}
}
```

The actual content depends on the environment of customer. Details are out of the scope of IPWorks documents.

2. Check the AAA server configuration in IPWCLI, make sure AAA server are created for each PL that AAA will be running.

```
#ipwcli
```



```
#list aaaserver
```

```
[AAAServer aaasrv1]
Name: aaasrv1
Address: 169.254.100.3
```

```
[AAAServer aaasrv2]
Name: aaasrv1
Address: 169.254.100.4
```

3. Update the configured proxy and realm information is updated to each blade that aaa server will be running.

```
#ipwcli
```

```
#update aaaserver
```

```
Result of performing an export is:
Exported aaa realm Ericsson.com
Updated the configuration
Reload proxy realm configuration successfully
Reload proxy realm configuration container successfully
```

5.12.4.3 Confirming Solution

Check whether AAA server can proxy the requests to the target server.

5.12.5 AAA Rejects EAP-AKA/SIM Authentication Request

5.12.5.1 Trouble Symptoms

IPWorks AAA server rejects the authentication request from Radius client.

Use tcpdump to capture the packet, you can find the following flow:

```
| ----- Access Request --> |
| <----Access Challenge --- |
| -----Access Request --> |
| <-----Access Reject --- |
```

For how to capture the packet, refer to Section 7 on page 169.

5.12.5.2 Locating Faults

This issue occurs when the AAA cannot connect HLR, do the followings:



1. Check the SS7 Stack in IPWorks AAA Server.

The actual output depends on the environment of customer. Details are out of the scope of IPWorks documents.

a. Check the SS7 stack configuration by signal manager.

```
#/opt/sign/EABss7050/bin/signmgu -own.conf
/opt/sign/etc/signmgr.cnf &
```

For more details, refer to section Configuring SS7 for Wi-Fi AAA in Configure SS7 for AAA.

b. Check the SS7 configuration in Radius AAA by COMCLI.

```
>ManagedElement=ipworks_cba,IpworksFunction=1,IPWorksAAARoot=1,IPWorks
RadiusAAARoot=1,RadiusAAAService=1,IWLANSservice=1,RadiusSS7Stack=1
(RadiusSS7Stack=1)>show -v
RadiusSS7Stack=1
cpmAddress="ss7cafcpmaddress:6669"
isdnNumber="1234567"
isdnNumberNature=NOA_NATIONAL_SIGNIFICANT <default>
nodeType=1 <default>
numberOfAAAProcess=10 <default>
numberOfBEInstance=10
originalSignalingPointCode=100 <default>
radiusSs7StackId="1"
sgsnAddress="192.168.10.13"
useGT4CallingPartyAddress=false <default>
```

2. Ensure that the Radius AAA Server is connected to SS7 Stack successfully.

5.12.5.3

Confirming Solution

Check whether you can receive Access Accept from AAA Server.

5.13

EPC AAA Server

This section provides information on resolving problems with the IPWorks EPC AAA Server.

5.13.1

EPC AAA Server Process Not Running

5.13.1.1

Trouble Symptoms

EPC AAA sever processes cannot be started.

5.13.1.2

Locating Fault

Use any of the following methods to locate the fault:



- Use `ipw-ctr` to check EPC AAA server status on SC.

```
# ipw-ctr status aaa_diameter <PL hostname>
```

- Use the command `ps -ef | grep ipwa3d` on PL to see if the EPC AAA server is running.
- Check EPC AAA log to see if any error trace. For example:

```
# /cluster/storage/no-backup/ipworks/logs/<PL hostname>/aaa_diameter_server.log
```

5.13.1.3 Confirming Solution

Contact the support to fix the issue that is reported in EPC AAA error log.

5.13.2 C-diameter Stack Not Running

For details, see Section 5.18 C-Diameter on page 129.

5.13.3 Ineffective Diameter over SCTP

5.13.3.1 Trouble Symptoms

The traffic of SCTP is down.

5.13.3.2 Locating Fault

Use the following methods to locate the fault:

- Use the `netstat` command to see whether the connection between Diameter EPC AAA server and SS7 stack is established.

```
PL-X:~ # netstat -nap|grep 6669|grep beam
```

```
tcp 0 0 169.254.100.3:48576 169.254.100.3:6669 ESTABLISHED
4838/beam.smp
```

- Use the SS7 signaling manager to see whether the SS7 stack works normally. The procedure is the same as the SS7 configuration, refer to the Section [Configuring SS7 for Diameter over SCTP](#) in [Configure SS7 for AAA](#).

5.13.3.3 Confirming Solution

Correct the SS7 Stack configuration. Refer to the Section [Configuring SS7 for Diameter over SCTP](#) in [Configure SS7 for AAA](#).

Restart the C-Diameter Stack:



1. Restart the C-Diameter Stack:

a. List installed CDIA Service Unit (SU).

```
SC-X # cmw-status -v su | grep -i CDIA

safSu=PL-4,safSg=NWA,safApp=ERIC-sv.SVCDiameter

safSu=PL-3,safSg=NWA,safApp=ERIC-sv.SVCDiameter
```

b. Restart CDIA SU one by one.

```
SC-X # amf-adm restart safSu=PL-4,safSg=NWA,safApp=ERIC
-sv.SVCDiameter

SC-X # amf-state su all safSu=PL-4,safSg=NWA,safApp=ERIC
-sv.SVCDiameter

SC-X # amf-adm restart safSu=PL-3,safSg=NWA,safApp=ERIC
-sv.SVCDiameter

SC-X # amf-state su all safSu=PL-3,safSg=NWA,safApp=ERIC
-sv.SVCDiameter
```

2. Restart the EPC AAA Server:

```
SC-X:~ #ipw-ctr restart aaa_diameter PL-3
```

5.13.4 High failure ratio caused by discarding DERs

5.13.4.1 Trouble Symptoms

A High failure ratio is caused by discarding DERs.

5.13.4.2 Locating Fault

AAA server deals with DERs from UE and gets the response from HSS then replies DEAs to UE correctly.

AAA server can deal with DERs in the case of different sessionid from UE.

When UE sends DERs with same sessionid to IPWorks, AAA server deals with only the first DER and deletes the remaining requests, then sends DEAs "DIAMETER_UNABLE_TO_COMPLY". It is a normal working way for AAA server.

In this case, if the AAA server can not deal with the first DER from UE, please report the problem to the maintenance support through a CSR.



5.14 DHCP Server

This section provides information on resolving problems with the IPWorks DHCP Server.

5.14.1 Error returns when attempting to update a server or show status

5.14.1.1 Trouble Symptoms

The below output is displayed:

Object dhcpv4server|active|*** has been deleted.

For example:

```
IPWorks> create dhcpv4server dhcp1 -set address=169.254.
100.3;failoveraddress=192.168.20.13
1 object(s) created.
IPWorks> create dhcpv4server dhcp2 -set address=169.254.100.4;failoveraddress=192.168.20.13
1 object(s) created.
IPWorks> create dhcpv4server dhcp3 -set address=169.254.100.3;failoveraddress=192.168.20.13
1 object(s) created.
IPWorks> create dhcpv4server dhcp4 -set address=169.254.100.4;failoveraddress=192.168.20.13
1 object(s) created.
IPWorks>
IPWorks> show status dhcpv4server
[DhcpV4Server dhcp3] is non-local, bypass the operation.
[DhcpV4Server dhcp2] (169.254.100.4) is not currently available. Operation failed.
[DhcpV4Server dhcp1] (169.254.100.3) On 06/08/18 at 15:16:59 server is 'down'
[DhcpV4Server dhcp4] is non-local, bypass the operation.
IPWorks> delete dhcpv4server dhcp1
Working on 1 object(s).
1 object(s) were updated.
IPWorks> create dhcpv4server dhcpxxx -set address=169.254.100.3;failoveraddress=192.168.20.13
1 object(s) created.
IPWorks> show status dhcpv4server
[DhcpV4Server dhcp3] is non-local, bypass the operation.
[DhcpV4Server dhcp2] (169.254.100.4) is not currently available. Operation failed.
[DhcpV4Server dhcp4] is non-local, bypass the operation.
Object dhcpv4server|active|dhcp1 has been deleted
IPWorks>
```

5.14.1.2 Locating Fault

This error happens when DHCP Geographic Redundancy is enabled, and a local server has been renamed (or deleted and then recreated with a different name). The dhcpsm must be restarted before issuing the operation command such as 'update' and 'show status' on that server. Otherwise the operation will fail.



5.14.1.3 Confirming Solution

Restart the corresponding DHCPSPM.

5.15 License Problems

This section describes licenses related troubleshooting cases.

5.15.1 License Control Problem

5.15.1.1 Trouble Symptoms

When the user creates an ENUMDNSCHED object, the operation is rejected.

5.15.1.2 Locating Fault

The ENUMDNSCHED object is controlled by ENUMDNSCHED Capacity license. When any problem in license control happens, the output "License exception detected: <Fault Reason>" is shown in the `ipwcli`. See Table 11 for details.

When the problem happens, the specific server might receive license-related alarms, such as License Management, License Key Not Available, License Management, Capacity Usage Threshold Reached.

Table 11 Fault Reason and How to Locate the Fault

ID	Fault Reason	Locating Fault
1	The license key file used by LM is not available. For details, refer to License Management, Key File Fault.	<pre>>ManagedElement=<Node Name>,SystemFunctions=1,Lm=1 >show lmState</pre> <p>Check whether the output is LOCKED. If so, refer to License Management, Key File Fault.</p>
2	The operation mode in the current version of License Manager is not supported by JavaOaM.	Collect the <code>cmw-repository-list</code> and contact Ericsson support.
3	License is expired. Please update license. For details, refer to License Management, License Key Not Available	<pre>>ManagedElement=<Node Name>,SystemFunctions=1,Lm=1 >show all CapacityKey=<Id> expiration=<yyyy-mm-dd> keyId="FAT1023219/2"</pre> <p>Check whether the license has expired through the expiration attribute. If the license has expired, refer to License Management, License Key Not Available.</p>



4	The requested license is not yet available for use. It will become valid in the future.	<pre>>ManagedElement=<Node Name>,SystemFunctions=1,Lm=1 >show all CapacityKey=<Id> keyId="FAT1023219/2" validFrom="<yyyy-mm-dd>"</pre> <p>Check whether the date in validFrom is reached. If the day and time is not reached, refer to License Management, License Key Not Available, or wait for the license to be available.</p>
5	The requested licensed capacity cannot be used because the corresponding license keys are unavailable.	<pre>>ManagedElement=<Node Name>,SystemFunctions=1,Lm=1 >show all</pre> <p>Check whether there is CapacityKey=<Id> with keyId="FAT1023219/2" in the output.</p> <p>If no, refer to License Management, License Key Not Available.</p>
6	<ul style="list-style-type: none"> License capacity limitation has been exceeded. For details, refer to License Management, Capacity Usage Threshold Reached License capacity limitation has been reached or exceeded. For details, refer to License Management, Capacity Usage Threshold Reached License capacity limitation will be exceeded. For details, refer to License Management, Capacity Usage Threshold Reached 	<pre>>ManagedElement=<Node Name>,SystemFunctions=1,Lm=1 >show all CapacityKey=<Id> licensedCapacityLimit value=<LmCapacityValue></pre> <p>Check whether the number of provisioned ENUMDNSCHED is equal or larger than the value. If so, refer to License Management, Capacity Usage Threshold Reached.</p>



7	<ul style="list-style-type: none"> The requested license key is not installed, check if the requested license is installed, /etc/ipworks/root_cert.cfg exists, connection between License Management server and client is good and inspects the Storage Server logs. Requesting license failed, check if the requested license is installed, /etc/ipworks/root_cert.cfg exists, connection between License Management server and client is good and inspects the Storage Server logs. 	<p>Step 1:</p> <pre>>ManagedElement=<Node Name>,SystemFunctions=1,Lm=1 >show all</pre> <p>Check whether there is CapacityKey=<Id> with keyId="FAT1023219/2" in the output.</p> <p>Step 2:</p> <p>Check whether the file /etc/ipworks/root_cert.cfg exists or corrupted. If so, contact Ericsson support.</p> <p>Step 3:</p> <pre>>ManagedElement=<Node Name>,SystemFunctions=1,Lm=1 >publishLicenseInventory</pre> <p>If the result is "ERROR: Call command failed, error code: ComNotExist". Use the following command:</p> <pre>amf-adm unlock safSu=SC-1,safSg=2N,safApp=ERIC-lm.server.aggregation amf-adm unlock safSu=SC-2,safSg=2N,safApp=ERIC-lm.server.aggregation</pre> <p>Step 4:</p> <p>If the fault cannot be located by the above methods, collect the log under /cluster/storage/no-backup/ipworks/logs/SC-1/ipworks_ss_SC-1.log and /cluster/storage/no-backup/ipworks/logs/SC-2/ipworks_ss_SC-2.log.</p>
8	Software issue, restart Storage Server to fix the issue.	<p>Software fault, restart SS.</p> <pre>pw-ctr stop ss <active SC> ipw-ctr start ss <active SC></pre>

5.15.1.3 Confirming Solution

After applying corresponding methods to resolve the issues, check whether the license is available. For details, refer to [View License Information](#).

5.15.2 Clear the Emergency Unlock Alarm

5.15.2.1 Trouble Symptoms

"Emergency Unlock Reset Key Required" alarm is raised by IPWorks.

5.15.2.2 Locating Fault

Emergency Unlock mode is NOT supported by IPWorks LM component. If Emergency Unlock mode is activated by mistake, the "Emergency Unlock Reset Key Required" alarm will be raised by LM.



5.15.2.3 Confirming Solution

Make sure the license key is existed.

To clear the alarm "Emergency Unlock Reset Key Required", run the following command:

```
SC-1:~ # ntfsend -s 0 -c 193,6,0 -n "lmId=1" -N "lmId=1" -a "" -p
74 -e 16384
```

5.16 MySQL NDB Cluster

This section describes NDB Cluster troubleshooting cases.

5.16.1 SQL Node Not Started

5.16.1.1 Trouble Symptoms

The following example shows an error message after executing the command: `/etc/init.d/ipworks.mysql show-status`. This output indicates that one of SQL Nodes is not started.

```
[...]
[mysqld(API)] 24 node(s)
id=3 (not connected, accepting connect from any host)
[...]
```

5.16.1.2 Locating Fault

This issue occurs because Data Node has not been started completely. Check Data Node status by using `/etc/init.d/ipworks.mysql show-status`, following is a sample output:

```
[ndbd(NDB)] 2 node(s)
id=27 @169.254.100.1 (mysql-5.6.27 ndb-7.4.8, starting, Nodegroup: 0, *)
id=28 @169.254.100.2 (mysql-5.6.27 ndb-7.4.8, starting, Nodegroup: 0)
[...]
```

ndbd (NDB), id=27 and id=28 show that the status of Data Node is **starting**. When any Data Node is no longer **starting**, which means Data Nodes are started completely, then the SQL Node can be started successfully.

5.16.1.3 Confirming Solution

After the Data Nodes are started completely, start the SQL Node and check whether SQL Node is started successfully.

The following output indicates that both the SQL Nodes are started.



```
[...]
[mysqld(API)] 24 node(s)
id=3 @169.254.101.1 (mysql-5.6.27 ndb-7.4.8)
id=4 (not connected, accepting connect from SC-2)
[...]
```

5.16.2 Management Node Down

5.16.2.1 Trouble Symptoms

The **Storage Server, MySQL Cluster node Unreachable** might be raised when the Management Node is down.

5.16.2.2 Locating Fault

To check if the Management Node is down, use either of the following ways:

- **Method 1:** Checking the Management Node status:

```
# ps -ef | grep ndb_mgmd
root      29963      1  0 09:13 ?           00:00:00
/opt/ipworks/mysql/mysql/sbin/ndb_mgmd -f
/home/ipworks/mysql/confs/ipworks_mgm.conf --initial
```

If there is not pid displayed in the output for the Management Node, it means that the Management Node is down.

- **Method 2:** Checking the Management Node Status

```
# /etc/init.d/ipworks.mysql show-status
```

If it displays message as followings, it means that the Management Node is down.

For example,

```
Unable to connect with connect string:
nodeid=0,localhost:1186 Retrying every 5 seconds.  Attempts
left:  2 1, failed.
```

To fix the issue, perform the following steps based on the status of Data Node and SQL Node:

- If the Data Node and SQL Node are running, start the Management Node by script.

```
# /etc/init.d/ipworks.mysql start-mgmd
```

- If the Data Node and SQL Node are down, start the Management Node, Data Node, and SQL Node in sequence.



```
# /etc/init.d/ipworks.mysql start-mgmd

# /etc/init.d/ipworks.mysql start-ndbd

# /etc/init.d/ipworks.mysql start-sqlnode
```

5.16.2.3 Confirming Solution

After performing the solution, check whether the Management Nodes are started through `ps -ef | grep ndb_mgmd` or `/etc/init.d/ipworks.mysql show-status`.

5.16.3 Data Node Down

5.16.3.1 Trouble Symptoms

The **Storage Server, MySQL Cluster Node Unreachable** might be raised when the Data Node is down.

5.16.3.2 Locating Fault

In some situations, the Data Node is down. Users need to start the Data Node manually by using `ipworks.mysql` script or must configure some files to avoid the Data Node down.

Check if there is any error log in `/local/ipworks/mysql-cluster/datanode/ndb_<id>_out.log`.

The users need to start the Data Node manually by using `ipworks.mysql` script, see Section 5.16.3.2.1 on page 111.

5.16.3.2.1 Starting Data Node

To troubleshoot the issues caused by the Data Node down, perform one or all the following steps:

1. Check whether the Data Node is down and start the Data Node by using `ipworks.mysql` script.

```
# /etc/init.d/ipworks.mysql show-status
```

If the status of Data Node is displayed like the following, it means that the Data Node (id=27) is down:

```
[ndbd(NDB)] 2 node(s)
id=27 (not connected, accepting connect from SC-1)
```

If the Data Node (id=27) is down, use the following command to start it.



```
# /etc/init.d/ipworks.mysql start-ndbd
```

2. Check if the issue is caused by the Data Node memory size problem and fix the specific issues according to Section 5.16.3.2.2 on page 112.

5.16.3.2.2 Data Node Memory Size Problem

The memory size value of Data Node depends on the size of IPWorks application need. Large Data requires large memory size of Data Node.

Too small memory size also causes several problems, such as ENUM Server or Data Node cannot be started successfully, slow response speed of machine.

Users can adjust the Data Node memory in `/home/ipworks/mysql/conf/ipworks_mgm.conf`.

5.16.4 SQL Node Down

5.16.4.1 Trouble Symptoms

The **Storage Server, MySQL Cluster Node Unreachable** might be raised when the Management Node is down.

5.16.4.2 Locating Fault

To troubleshoot the issues caused by the SQL Node down, do the following:

1. Check whether the SQL Nodes on SC-1 and SC-2 are started and fix the issue described in Section 5.16.1 on page 109.
2. Log on SC-1.

```
# ssh <Username>@<SC-1 or SC-2 IP Address>
```

3. Check whether the accessing privilege is granted to the NDB.

```
#!/usr/local/mysql/bin/mysql \
-P 3307 -h localhost --protocol=tcp
```

```
mysql>select user, host from mysql.user;
```

Check the output to see if `<SS OAM IP Address>` is assigned to the user.
For example,

```
+-----+-----+
| user | host      |
+-----+-----+
| root | 127.0.0.1 |
| root | ::1       |
|      | SC-1      |
| root | SC-1      |
```




```

|      | ipw_ss |
|      | localhost |
| root | localhost |
+-----+-----+
7 rows in set (0.01 sec)

```

The example shows that the privilege is assigned.

If an output shows that the privilege is not assigned, use the following commands to grant the privilege on the NDB side:

```

# /usr/local/mysql/bin/mysql \
-P 3307 -h localhost --protocol=tcp

```

```
mysql> grant all privileges on *.* to '@ipw_ss'
```

4. Repeat Step 2 to Step 3 to check the accessing privilege on SC-2.

5.16.4.3 Confirming Solution

After performing the solution, check whether the SQL Nodes are started through `/etc/init.d/ipworks.mysql show-status`.

5.16.5 MySQL NDB Cluster Status Abnormal

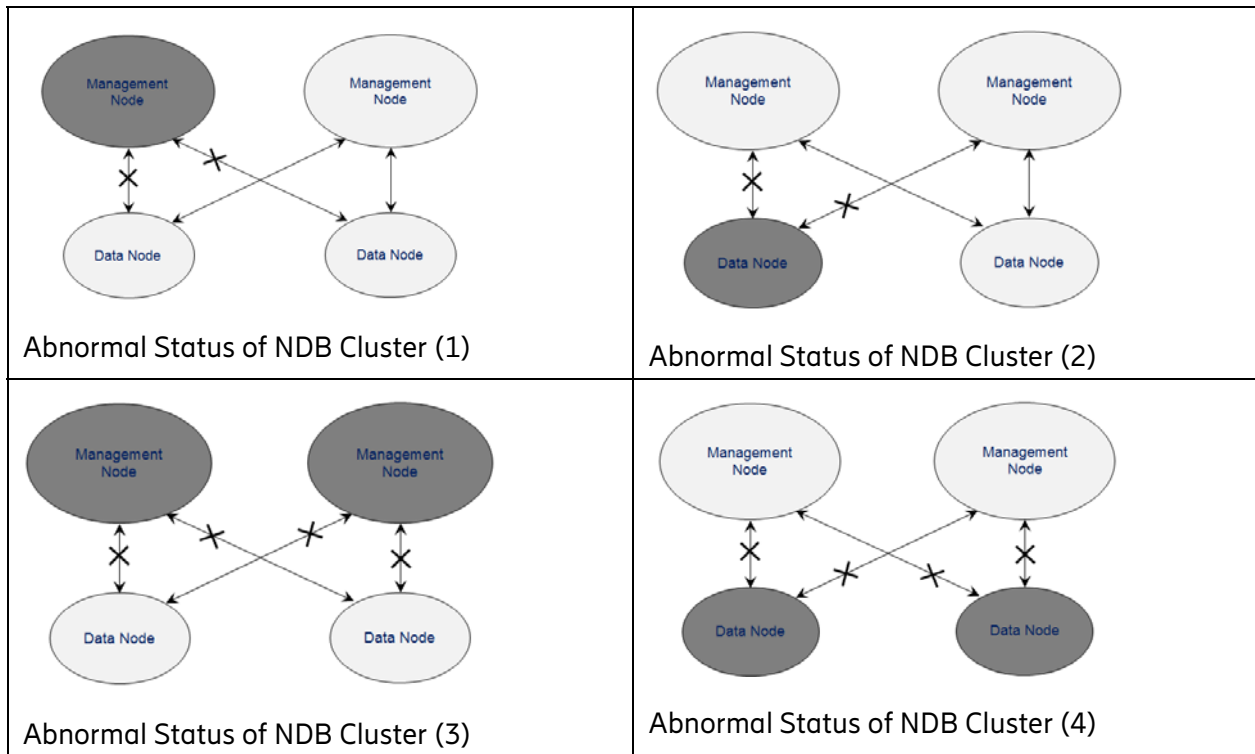
This section describes how to troubleshoot the issues caused by the abnormal status of MySQL NDB Cluster.

5.16.5.1 Trouble Symptoms

Table 12 lists the figures of the abnormal status of MySQL NDB Cluster.



Table 12 Abnormal Status of MySQL NDB Cluster



5.16.5.2 Locating Fault

Table 13 lists the situations causing the abnormal status of MySQL NDB Cluster and provides the solutions to the issues.

Table 13 Abnormal Status of MySQL NDB Cluster

Situation	Solution	Command
The Management Node is stopped, and both of the Data Nodes are running (as shown in the Figure 1).	Start the Management Node.	<code># /etc/init.d/ipworks.mysql start-mgmd</code>
The Management Node is stopped, and only one of the Data Nodes is stopped or in the starting state (as shown in the Figure 2).	Start the Data Node.	<code># /etc/init.d/ipworks.mysql start-ndbd</code>
The Management Node and one of the Data Nodes are stopped(as shown in the Figure 3).	Start the Management Node and the Data Node.	<code># /etc/init.d/ipworks.mysql start-mgmd</code> <code># /etc/init.d/ipworks.mysql start-ndbd</code>
Both of the Data Nodes are stopped or in the starting state (as shown in the Figure 4).	Start the MySQL NDB cluster.	<code># /etc/init.d/ipworks.mysql start-ndbcluster</code>



5.16.5.3 Confirming Solution

Users can check the status of MySQL NDB Cluster nodes by `/etc/init.d/ipworks.mysql show-status`. Figure 6 shows the normal status of NDB Cluster, the Management Node and both of the Data Nodes are running.

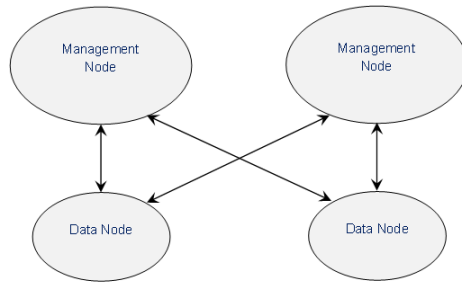


Figure 6 Normal Status of MySQL NDB Cluster

5.16.6 MySQL NDB Cluster Cannot Work Normally

This section describes how to recover the NDB Cluster by performing the initial start of the cluster.

5.16.6.1 Trouble Symptoms

The MySQL Cluster cannot work normally, and some serious error might occur. For example, mysql table is missing, Data Node cannot start.

5.16.6.2 Locating Fault

To recover the NDB Cluster, do the following:

1. Stop Storage Server.

```
SC-1:~# ipw-ctr stop ss SC-1
```

```
SC-1:~# ipw-ctr stop ss SC-2
```

2. Stop all the running ENUM server and AAA server.

```
SC-1:~# ipw-ctr stop enum <PL of running enum>
```

```
SC-1:~# ipw-ctr stop aaa-diameter <PL of running aaa diameter>
```

3. Initial start NDB Cluster.

```
SC-1:~# /opt/ipworks/ss/scripts/init_ndb.sh
```

4. Initialize the Storage Server.

```
SC-1:~# /opt/ipworks/ss/scripts/init_ss.sh
```



5.16.6.3 Confirming Solution

This issue is fixed when the operator can log on to the IPWCLI successfully.

5.16.7 SQL Node Start Failure with Wrong Folder Permission

5.16.7.1 Trouble Symptoms

When you try to start the SQL Node, it fails. Additionally, you receive with the following error message in the error log file `/local/ipworks/mysql-cluster/sqlnode/sqlnode.err`:

```
"Fatal error: Can't open and lock privilege tables: Table 'host'
is read only"
```

This issue occurs because of the wrong permission for the SQL Node data related folders.

Note: In the normal condition, the folder permission must not be changed. However, if the folder permission is changed, and this change causes the issue, the operator should follow this method to recover the startup of SQL Node.

5.16.7.2 Locating Fault

Check permission for the following folder, make sure that the permission for each level of the folder is 755:

```
/local/ipworks/mysql-cluster/sqlnode
```

Use the following command to change the folder permission:

```
# chmod 755 <folder name>
```

5.16.7.3 Confirming Solution

After the folder permission is changed to 755, the SQL Node can start successfully.

For more information on how to start SQL Node, refer to [Configure MySQL NDB Cluster](#).

5.16.8 MySQL Data Lost on an SC

5.16.8.1 Trouble Symptoms

MySQL data is lost on an SC. This issue results in the abnormal work of the MySQL nodes.



5.16.8.2 Locating Fault

Log on to SC-1 and SC-2 respectively, and check whether MySQL data (located in /local/ipworks) is lost.

If the MySQL data on one of the SCs is lost (for example, SC-1), use the following way to recover the data:

1. Stop all the MySQL Nodes on the SC that have the problem.

```
SC-1:~ # /etc/init.d/ipworks.mysql stop
```

2. Recover the lost data on the SC.

```
SC-1:~ # /etc/init.d/ipworks.mysql recover
```

5.16.8.3 Confirming Solution

After the recovery operation is performed successfully, you can login the MySQL successfully, and all the data in /local/ipworks is restored.

5.16.9 MySQL Data Node Cannot Be Started with Error Code 2311

5.16.9.1 Trouble Symptoms

1. Check whether the Data Node is started.

```
SC-1: ~# ndb_mgm
-- NDB Cluster -- Management Client --
ndb_mgm> 27 status
Connected to Management Server at: localhost:1186
Node 27: started (mysql-5.6.31 ndb-7.4.12)

ndb_mgm> 28 status
Node 28: started (mysql-5.6.31 ndb-7.4.12)
```

In the preceding output, the Data Node is started. SC-1 Data Node id is 27, and SC-2 Data Node id is 28.

If the output shows that Node status is starting or not connected, the Data Node is not started, and proceed to Step 2.

2. Check the error log.

Check whether the error log is in path /local/ipworks/mysql-cluster/dat anode on SC node. The error log name on SC-1 is ndb_27_error.log, and the error log name on SC-2 is db_28_error.log.

Example output for error log:



```

Time: Friday 4 May 2018 - 13:36:22
Status: Temporary error, restart node
Message: Conflict when selecting restart type (Internal error, programming error or missing er
Error: 2311
Error data: Cluster requires this node to be started with --initial as partial start has been
Error object: DBDIH (Line: 2249) 0x00000000
Program: ndbmt
Pid: 6344 thr: 0

```

If only one SC node has the error log, recover one Data Node on the issue SC node. If both SC nodes have error logs, recover both Data Nodes.

5.16.9.2

Locating Fault

1. Log on to the SC where the Data Node has problem.

```
# ssh root@<MIP_OAM_IP>
```

Note: The following steps must be executed on the SC where the Data Node has problem.

2. Collect MySQL log for root cause analysis.

```
SC-x:~ # mkdir /cluster/mysqlerrorlog
```

```
SC-x:~ # cp -R /local/ipworks/mysql-cluster/mgmnode
/cluster/mysqlerrorlog/
```

```
SC-x:~ # cp -R /local/ipworks/mysql-cluster/sqlnode
/cluster/mysqlerrorlog/
```

```
SC-x:~ # cp /local/ipworks/mysql-cluster/datanode/ndb_*log*
/cluster/mysqlerrorlog
```

```
SC-x:~ # cp /local/ipworks/mysql-cluster/datanode/ndb_*trace*
/cluster/mysqlerrorlog
```

To recover one Data Node:

1. Stop all the MySQL Nodes on the SC that have problem.

```
SC-1:~ # /etc/init.d/ipworks.mysql stop
```

2. Check whether all the processes about MySQL are stopped. Execute command on the SC node where MySQL has problem:

```
SC-1:~# ps -ef|grep mysql |grep -v grep |grep -v
"StorageServer"
```

If the output is not empty, execute command: `kill -9 <pid>`

For example:



```
SC-1:~ # ps -ef|grep mysql |grep -v grep |grep -v "StorageServer"
root      10236      1  0 13:53 ?          00:00:01 /opt/ipworks/mysql/mysql/sbin/ndb_mgmd -f /
root      10282      1  0 13:53 ?          00:00:00 /bin/sh /opt/ipworks/mysql/mysql/bin/mysqlc
mysql     11713 10282  0 13:53 ?          00:00:02 /opt/ipworks/mysql/mysql/sbin/mysqld --defa
root      11871      1  0 13:53 ?          00:00:00 /opt/ipworks/mysql/mysql/sbin/ndbmttd --defa
root      11872 11871 10 13:53 ?          00:00:34 /opt/ipworks/mysql/mysql/sbin/ndbmttd --defa

SC-1:~# kill -9 10236      10282  11713      11871      11872
```

To make sure all the processes are stopped, repeat below command until the output is empty:

```
SC-1:~# ps -ef|grep mysql |grep -v grep |grep -v
"StorageServer"
```

3. Recover the lost data on the SC.

```
SC-1:~ # /etc/init.d/ipworks.mysql recover
```

To recover two Data Nodes:

1. Stop all the services except DNS, DHCP, for example:

```
SC-1:~ # ipw-ctr status all
on SC-1 :
    ss                      is running as active role.
    csvengine               is running as active role.
    sqlnodemgr              is running as active role.
on SC-2 :
    ss                      is running as standby role.
    csvengine               is running as standby role.
    sqlnodemgr              is running as standby role.
on PL-3 :
    aaa_diameter             is down.
    aaa_radius_stack         is running.
    aaa_radius_backend       is running.
    aaasm                   is running.
on PL-4 :
    aaa_diameter             is down.
    aaa_radius_stack         is running.
    aaa_radius_backend       is running.
    aaasm                   is running.
SC-1:~ # ipw-ctr stop aaa_radius_stack PL-3
SC-1:~ # ipw-ctr stop aaa_radius_stack PL-4
SC-1:~ # ipw-ctr stop aaa_radius_backend PL-3
SC-1:~ # ipw-ctr stop aaa_radius_backend PL-4
SC-1:~ # ipw-ctr stop aaasm PL-3
SC-1:~ # ipw-ctr stop aaasm PL-4
SC-1:~ # ipw-ctr stop ss SC-1
SC-1:~ # ipw-ctr stop ss SC-2
SC-1:~ # ipw-ctr stop csvengine SC-1
SC-1:~ # ipw-ctr stop csvengine SC-2
SC-1:~ # ipw-ctr stop sqlnodemgr SC-1
SC-1:~ # ipw-ctr stop sqlnodemgr SC-2
```

2. Stop NDB Cluster on one SC node.

```
SC-1:~ # /etc/init.d/ipworks.mysql stop-ndbcluster
```

3. Check whether all the processes about MySQL are stopped. Execute command on both SC nodes:



```
SC-1:~# ps -ef|grep mysql |grep -v grep |grep -v
"StorageServer"
```

If the output is not empty, execute command: `kill -9 <pid>`

```
SC-1:~ # ps -ef|grep mysql |grep -v grep |grep -v "StorageServer"
root      10236      1  0 13:53 ?          00:00:01 /opt/ipworks/mysql/mysql/sbin/ndb_mgmd -f /hom
root      10282      1  0 13:53 ?          00:00:00 /bin/sh /opt/ipworks/mysql/mysql/bin/mysqld_sa
mysql     11713 10282  0 13:53 ?          00:00:02 /opt/ipworks/mysql/mysql/sbin/mysqld --default
root      11871      1  0 13:53 ?          00:00:00 /opt/ipworks/mysql/mysql/sbin/ndbmttd --default
root      11872 11871 10 13:53 ?          00:00:34 /opt/ipworks/mysql/mysql/sbin/ndbmttd --default

SC-1:~# kill -9 10236      10282 11713      11871      11872
```

To make sure all the processes are stopped, repeat below command until the output is empty:

```
SC-1:~# ps -ef|grep mysql |grep -v grep |grep -v
"StorageServer"
```

4. Start Manager node on SC-1 and SC-2 at the same time.

```
SC-1:~ # /etc/init.d/ipworks.mysql start-mgmd
```

```
SC-2:~ # /etc/init.d/ipworks.mysql start-mgmd
```

5. Start Data Node with option `start-ndbd-initial` on SC-1 and SC-2 at the same time.

```
SC-1:~ # /etc/init.d/ipworks.mysql start-ndbd-initial
```

```
SC-2:~ # /etc/init.d/ipworks.mysql start-ndbd-initial
```

6. Start SQL Node on SC-1 and SC-2 at the same time.

```
SC-1:~ # /etc/init.d/ipworks.mysql start-sqlnode
```

```
SC-2:~ # /etc/init.d/ipworks.mysql start-sqlnode
```

7. Initialize ndb on one SC node.

```
SC-1:~ #/opt/ipworks/ss/scripts/init_ndb.sh
```

8. Initialize SS on one SC node.

```
SC-1:~ #/opt/ipworks/ss/scripts/init_ss.sh
```

9. Switch to root.

```
#su -
```

10. Initialize IPWCLI Administrator Password.



For KVM, refer to section Initialize IPWCLI Administrator Password in IPWorks Auto Deployment Guideline for KVM - DL380 Gen9 or in IPWorks Auto Deployment Guideline for KVM - DL380 Gen10.

For CEE, refer to section Initialize IPWCLI Administrator Password in IPWorks Deployment Guide.

11. Restore user data.

- a. Find the latest USERDATA backup file:

```
SC-1:~ #cd /cluster/ipwbrf/backup
SC-1:~ #ls -al
Example :
SC-1:~ # ls -al
drwxr-xr-x 2 root root 4096 Mar 23 17:30 NDB_IPWorks_20180323
drwxr-xr-x 2 root root 4096 Mar 24 17:35 NDB_IPWorks_20180324
SC-1:~ #cp /cluster/ipwbrf/backup/<latest backup folder>/*.tar.gz /cluster/sqlre
```

- b. If there is the latest USERDATA backup with prefix “ndb” in the backup name, use USERDATA to restore (refer to section Restore User Data Backup in [Restore Backup](#));

Or, use MYSQL file in USERDATA backup file to restore manually:

```
SC-1:~ #mkdir -p /cluster/sqlrestore

SC-1:~ #cp /cluster/ipwbrf/backup/<latest backup
folder>/*.tar.gz /cluster/sqlrestore/
```

For example, to restore user data using MySQL file on USERDATA backup file:

```
SC-1:~ #cp /cluster/ipwbrf/backup/NDB_IPWorks_20180324/NDB_IP
Works_20180324.tar.gz /cluster/sqlrestore/
SC-1:~ #cd /cluster/sqlrestore/
SC-1:~ #tar -zxvf NDB_IPWorks_20180324.tar.gz

SC-1:~ #gunzip -c ipworks_dump.gz | mysql -P 3307 --protocol=tcp -h ipw_sql -f ipw
SC-1:~ #gunzip -c ipw_prov_aaa_dump.gz | mysql -P 3307 --protocol=tcp -h ipw_sql -
SC-1:~ #gunzip -c ipw_enum_dump.gz | mysql -P 3307 --protocol=tcp -h ipw_sql -f ip
SC-1:~ #gunzip -c ipw_dhcp_dump.gz | mysql -P 3307 --protocol=tcp -h ipw_sql -f ip
```

- c. Remove the folder /cluster/sqlrestore/ after restoring user data.

12. Re-build all DNS or DHCP servers.

Skip this step if there is no DNS or DHCP service.

— Re-build all DNS servers:

Skip this step if the backup file used in Step 11 is the latest, and there is no new provision data after creating the backup.



```
SC-1:~ #ipwcli
IPWorks> select dnsserver
IPWorks> update dnsserver -rebuild=true
```

Note: If the DNS server has large data, the process needs to take much time. For example, 2 M data is estimated to take 2 hours.

— Re-build all DHCP servers:

Skip this step if the backup file used in Step 11 is the latest, and there is no new provision data after creating the backup.

```
SC-1:~ #ipwcli
IPWorks> update dhcpv4server
```

Restart DHCP servers, for example:

```
SC-1:~ # ipw-ctr restart dhcp PL-3
SC-1:~ # ipw-ctr restart dhcp PL-4
SC-1:~ # ipw-ctr restart dhcpsm PL-3
SC-1:~ # ipw-ctr restart dhcpsm PL-4
```

13. Start services stopped in Step 1.

```
SC-1:~ # ipw-ctr start aaa_radius_stack PL-3
SC-1:~ # ipw-ctr start aaa_radius_stack PL-4
SC-1:~ # ipw-ctr start aaa_radius_backend PL-3
SC-1:~ # ipw-ctr start aaa_radius_backend PL-4
SC-1:~ # ipw-ctr start aaasm PL-3
SC-1:~ # ipw-ctr start aaasm PL-4
SC-1:~ # ipw-ctr start ss SC-1
SC-1:~ # ipw-ctr start ss SC-2
SC-1:~ # ipw-ctr start csvengine SC-1
SC-1:~ # ipw-ctr start csvengine SC-2
SC-1:~ # ipw-ctr start sqlnodemgr SC-1
SC-1:~ # ipw-ctr start sqlnodemgr SC-2
```

5.16.9.3

Confirming Solution

Check the Data Node status:



```
SC-1: ~# ndb_mgm
-- NDB Cluster -- Management Client --
ndb_mgm> 27 status
Connected to Management Server at: localhost:1186
Node 27: started (mysql-5.6.31 ndb-7.4.12)

ndb_mgm> 28 status
Node 28: started (mysql-5.6.31 ndb-7.4.12)
```

Note: Make sure both Data Nodes status are started.

5.16.10 MySQL Data Node Cannot Be Started with Error Code 2341 or 2310

This troubleshooting method is available for the scenario when only one Data Node cannot be started while the other Data Node still works well.

5.16.10.1 Trouble Symptoms

1. Check whether the Data Node is started.

```
SC-1: ~# ndb_mgm

-- NDB Cluster -- Management Client --
ndb_mgm> 27 status
Connected to Management Server at: localhost:1186
Node 27: started (mysql-5.6.31 ndb-7.4.12)

ndb_mgm> 28 status
Node 28: started (mysql-5.6.31 ndb-7.4.12)
```

In the preceding output, the Data Node is started. SC-1 Data Node id is 27, and SC-2 Data Node id is 28.

If the output shows that Node status is starting or not connected, the Data Node is not started, then proceed to Step 2.

2. Check the error log.

Check whether the error log is in path `/local/ipworks/mysql-cluster/data` on SC node. The error log name on SC-1 is `ndb_27_error.log`, and the error log name on SC-2 is `db_28_error.log`.

Example output for error log:

```
Time: Wednesday 9 May 2018 - 10:01:10
Status: Temporary error, restart node
Message: Internal program error (failed ndbrequire) (Internal error, prog
Error: 2341
Error data: DblqhMain.cpp
```



```
Error object: DBLQH (Line: 18585) 0x00000000
Program: ndbmt
Pid: 4307 thr: 2
Version: mysql-5.6.31 ndb-7.4.12
Trace: /local/ipworks/mysql-cluster/datanode//ndb_27_trace.log.1 [t1..t9]
***EOM***
```

In this example, the error code is 2341.

If SC node has the error log (error code is 2341 or 2310), recover Data Node on the issue SC node.

5.16.10.2 Locating Fault

1. Log on to the SC where the Data Node has problem.

```
# ssh root@<MIP_OAM_IP>
```

2. Start the Data Node.

```
# /etc/init.d/ipworks.mysql start-ndbd-initial
```

5.16.10.3 Confirming Solution

```
-- NDB Cluster -- Management Client --
ndb_mgm> 27 status
Connected to Management Server at: localhost:1186
Node 27: started (mysql-5.6.31 ndb-7.4.12)

ndb_mgm> 28 status
Node 28: started (mysql-5.6.31 ndb-7.4.12)
```

Make sure of both Data Nodes are in started status.

5.17 Backup and Restore

This section provides information on resolving problems in backing up or restoring IPWorks data.

Backup handling enables the operator to schedule backups at periodic intervals, at a fixed time, or at one point of time. It provides a complete backup for all the configured and provisioned data or a partial backup for only the configured data for IPWorks, and it is possible to restore the system fully to a point of time from when the backup was taken or partially restore the system without the provisioned data as well.

There are several problems could cause backup and restore handling failed. First check the log file if the process has not been finished



successfully. The detail error information should be recorded in the log file in `/cluster/storage/no-backup/ipworks/logs/<hostname>/ipwbrf.log`.

5.17.1 No Enough Space in the Disk

5.17.1.1 Trouble Symptoms

If there is not enough space there, backup or restore handling is failed.

5.17.1.2 Locating Fault

When backup or restore handling started, ensure that there is enough space in the disk, especially for the directory `/cluster/ipwbrf` and which stored the backup archived file. The tool `df` can be used to check the capability of disk space. See Section 2.1.11 on page 10 for details.

5.17.1.3 Confirming Solution

Try the backup or restore operation again, check whether the operation is successful. For details, refer to [Create Backup](#) and [Restore Backup](#).

5.17.2 Complete Backup or Restore Failed due to MySQL NDB Process Not Started

5.17.2.1 Trouble Symptoms

The backup or restore operation is failed if MySQL NDB process is not started.

5.17.2.2 Locating Fault

When the complete backup or restore operation is started, MySQL NDB is used to dump the database or restore the database. This issue occurs if the MySQL NDB process is not started or the MySQL NDB process is killed during backup or restore phase.

To fix this issue, do the following:

1. Stop the MySQL NDB cluster.

```
# /etc/init.d/ipworks.mysql stop-ndbcluster
```

2. Start the MySQL NDB cluster.

```
# /etc/init.d/ipworks.mysql start-ndbcluster
```

3. Check the MySQL NDB cluster status.

```
# /etc/init.d/ipworks.mysql show-status
```



4. Try to perform complete backup or restore again.

Refer to [Create Backup and Restore Backup](#).

5.17.2.3 Confirming Solution

The complete backup or restore operation is successful.

5.17.3 Restart Server Failed

5.17.3.1 Trouble Symptoms

Even though the restore operation is completed successfully, certain processes does not start automatically.

5.17.3.2 Locating Fault

The restore handling would stop all the running IPWorks processes except MySQL process. These stopped processes will start automatically after the restore operation is completed. Sometimes, certain processes do not restart successfully. Try to start the process manually. If the process still cannot start, refer to service-specific troubleshooting (for example, Section 5.8 on page 70)

5.17.3.3 Confirming Solution

The process starts.

5.17.4 Slow Backup or Restore Operation

5.17.4.1 Trouble Symptoms

The backup or restore operation takes more time (about 10 minutes) than expected.

5.17.4.2 Locating Fault

This issue occurs when one System Controller (SC) is down in an abnormal way (such as, the power outage).

This is a limitation of the CBA common component BRFC.

To resolve the issue, start the SC that is down, and make sure that the startup performs successfully and the SC works normally.

Note: If the SC is down in a normal way (such as, using `poweroff` command), the backup or restore will not be affected.



5.17.4.3 Confirming Solution

Check whether the operation is complete in a normal time.

5.17.5 ECLI Login Failed

5.17.5.1 Trouble Symptoms

IPWorks system works abnormally, and ECLI cannot be logged in to restore the system. To restore system through lde-brf:

5.17.5.2 Locating Fault

To restore system:

1. Clean up IMM status.

Before restoring a System or User Data backup, make sure that the Information Model Management (IMM) status for DHCP or AAA is cleaned up. The cleanup operation must be performed on all PL nodes.

- a. Log on to SC node, and then connect to PL node.

```
# ssh <User Name>@<MIP_OAM_IP>
```

```
SC-X:~# ssh <PL hostname>
```

- b. Check the status of IPWorks services.

```
PL-X:~# ipw-ctr status all
```

- c. If the DHCP service is NOT running, clean up the DHCP related IMM status.

```
PL-X:~# /opt/ipworks/dhcp/scripts/ipworks.dhcpv4 cleanup
```

- d. If the AAA service is NOT running, clean up the AAA related IMM status.

```
PL-X:~# /opt/ipworks/aaa_radius/backend/script/ipworks
.aaa_backend cleanup
```

```
PL-X:~# /opt/ipworks/aaa_radius/stack/script/ipworks.aaa
_radius_stack cleanup
```

```
PL-X:~# /opt/ipworks/aaa_diameter/scripts/ipworks.aaa
cleanup
```

```
PL-X:~# exit
```



```
SC-X:~# /opt/ipworks/aaa_radius/csvengine/script/ipworks.aaa_csv_engine cleanup
```

2. Check backup label.

- a. Log on to SC-X.

```
# ssh root@<MIP_OAM_IP>
```

- b. Check backup label.

```
# lde-brf print labels
```

```
software : test1
```

```
config : test1
```

3. Execute lde-brf command.

```
# lde-brf restore -l <Label> -t system
```

```
# lde-brf restore --commit -l <Label>
```

Example of restoring label test1:

```
#lde-brf restore -l test1 -t system
#lde-brf restore --commit -l test1
Starting RPM synchronization of node 1
Synchronizing ldews-control-cxp9020125-4.4.1-1.sle12.x86_64.67ddcb
.....
Synchronizing sec-ldap-sm-cxp9028981-2.5.0-082.sle12.x86_64.45e5b2
Synchronizing sec-crypto-cxp9027895-2.5.0-082.sle12.x86_64.0cea5eb
Completed RPM synchronization of node 4
```

4. Reboot the cluster.

```
# cluster reboot -a
```

Note: Proceed with the next step after the system is rebooted successfully.

5. Create the link and folder for ss7caf on SC nodes manually.

Execute the following commands on both SC-1 and SC-2:

```
# ln -s /storage/system/config/ss7caf-ana90137/etc
/opt/sign/etc
```

```
# ln -s /storage/no-backup/ss7caf-ana90137/log /opt/sign/log
```

```
# mkdir -p /opt/sign/cnf_template
```

6. Replace the ipworks_sql.conf file.



Execute the following command on SC-1 and SC-2.

```
# cp /opt/ipworks/ss/db/ipworks_sql.conf
/opt/ipworks/mysql/db/ipworks_sql.conf
```

7. Start MySQL NDB cluster manually on SC-1 or SC-2.

```
# /etc/init.d/ipworks.mysql start-ndbcluster
```

8. Perform health check.

For information on how to check service status, refer to IPWorks Manual Health Check.

5.17.5.3 Confirming Solution

Restore operation is successful.

5.18 C-Diameter

This section provides information on resolving problems with C-Diameter.

5.18.1 C-Diameter OperState is DISABLED

5.18.1.1 Trouble Symptoms

C-Diameter OperState is DISABLED and C-Diameter processes cannot be started.

5.18.1.2 Locating Fault

Use the following methods to locate the fault:

- Use **cmw-status** to check C-Diameter status on any SC or PL.

```
# cmw-status -v su | grep -i CDIA -A 4
```

- Check the result to see if any abnormal state found.

If any error occurs, the command output is shown as below:

```
safSu=ERIC-CDIA-Runtime-1,safSg=ERIC-CDIA-SG,safApp=ERIC-CDIA-Runtime
AdminState=UNLOCKED(1)
OperState=DISABLED(2)
PresenceState=TERMINATION-FAILED(7)
ReadinessState=IN-SERVICE(2)
```



5.18.1.3 Confirming Solution

If the output shows that “OperState=DISABLED”, it represents the C-diameter status is abnormal.

Repair the C-diameter stack on any SC or PL:

```
# amf-adm repaired safSu=PL-3,safSg=NWA,safApp=ERIC-sv.SVCDiameter
```

```
# amf-adm repaired safSu=PL-4,safSg=NWA,safApp=ERIC-sv.SVCDiameter
```

If the C-diameter stack is repaired successfully, the output of **cmw-status** will be shown:

```
safSu=ERIC-CDIA-Runtime-1,safSg=ERIC-CDIA-SG,safApp=ERIC-CDIA-Runtime
AdminState=UNLOCKED(1)
OperState=ENABLED(1)
PresenceState=UNINSTANTIATED(1)
ReadinessState=IN-SERVICE(2)
```

5.18.2 C-Diameter Stack Cannot Listen the Listening Port (3868)

5.18.2.1 Trouble Symptoms

C-diameter stack cannot listen the listening port (3868).

5.18.2.2 Locating Fault

Use the following methods to locate the fault:

- Use **ps** command to check process status of C-Diameter on all PLs.

```
# ps -ef | grep DiaServer
```

```
root 8943 8769 0 18:19 pts/0 00:00:00 grep DiaServer
root 9435 1 0 Jan22 ? 00:15:51 /opt/diacc/bin//DiaServer
root 9490 9435 0 Jan22 ? 00:00:31 DSDTrace[local{1}](9435): /opt/diacc/bin/
```

- Use **ps** command to check process status of IPWorks AAA on any PL.

```
# ps -ef | grep ipwa3d
```

```
root 7687 1 4 Jan22 ? 01:04:02 /opt/ipworks/aaa_diameter/bin/ipwa3d
root 8019 7687 0 Jan22 ? 00:00:00 [ipwa3d] <defunct>
root 8028 7687 0 Jan22 ? 00:00:00 [ipwa3d] <defunct>
root 15940 8769 0 18:22 pts/0 00:00:00 grep ipwa3d
```

- Use the **DiaDictManager** command to see whether the dictionary of Diameter exists on PLs.



```
# /opt/diacc/bin/DiaDictManager list
```

```
dictionary_sta
dictionary_swm
dictionary_s13
dictionary_sh
dictionary_swx
dictionary_s6b
dictionary_ts29273
```

5.18.2.3 Confirming Solution

If any process information or dictionary is not found. Use the following method to repair the environment.

1. If the dictionaries of Diameter are not installed, use **DiaDictManager** command to install them on all PLs.

```
PL-X:~ # /opt/diacc/bin/DiaDictManager add /etc/ipworks/aaa_dia
meter/dict/ dictionary_ts29273
```

```
PL-X:~ # /opt/diacc/bin/DiaDictManager add /etc/ipworks/aaa_di
ameter/dict/*
```

After the directories are installed successfully, command output is shown as below:

```
PL-X:~ # /opt/diacc/bin/DiaDictManager list
```

```
dictionary_sh
dictionary_s13
dictionary_s6b
dictionary_sta
dictionary_swm
dictionary_swx
dictionary_ts29273
```

2. Restart the C-Diameter Stack.

- a. List installed CDIA Service Unit (SU).

```
SC-X # cmw-status -v su|grep -i CDIA
```

```
safSu=PL-4,safSg=NWA,safApp=ERIC-sv.SVCDiameter
```

```
safSu=PL-3,safSg=NWA,safApp=ERIC-sv.SVCDiameter
```

- b. Restart CDIA SU one by one.

```
SC-X # amf-adm restart safSu=PL-4,safSg=NWA,safApp=ERIC
-sv.SVCDiameter
```



```
SC-X # amf-state su all safSu=PL-4,safSg=NWA,safApp=ERIC
-sv.SVCDiameter
```

```
SC-X # amf-adm restart safSu=PL-3,safSg=NWA,safApp=ERIC
-sv.SVCDiameter
```

```
SC-X # amf-state su all safSu=PL-3,safSg=NWA,safApp=ERIC
-sv.SVCDiameter
```

- c. Restart the EPC AAA Server.

```
PL-X:~ #ipw-ctr restart aaa_diameter
```

5.19 Geographic Redundancy

This section provides information on resolving problems with Geographic Redundancy.

5.19.1 MySQL Replication for Geographic Redundancy Failed on One Site

5.19.1.1 Trouble Symptoms

When the alarm of MySQL Replication for Geographic Redundancy Failed appears on only one site, it means that the MySQL Replication have some problem on this node.

5.19.1.2 Locating Fault

5.19.1.2.1 Checking the AAANSUser Data (For Non-SIM service)

The replicated AAA user data contains aaansduser, aaapolicy, aauser, aauser_policy, aauser_groupname, and aausergroup_policy, check if any of them on the two sites are different.

Note: All other AAA user data is not replicated automatically, they also must be same on both sites.

Take AAANSUser as example, check that if the AAANSUser data on the two sites are different:

1. Perform checksum on AAANSUser on SC-1 or SC-2 of Site A:

```
# mysql -P3307 -h ipw_sql --protocol=tcp -e "select
sum(crc32(concat_ws(',', name, password, imsi, msisdn, apn,
userstatus, certificateissuename, certificateid))) from
ipw_prov_aaa.aaansduser;"
```

Record the output integer value as [CHECKSUM_A].



This command will perform about 30 s to show the output.

2. Perform checksum on SC-1 or SC-2 of Site B:

```
# mysql -P3307 -h ipw_sql --protocol=tcp -e "select
sum(crc32(concat_ws(',', name, password, imsi, msisdn, apn,
userstatus, certificateissuername, certificateid))) from
ipw_prov_aaa.aaansduser;"
```

Record the output integer value as [CHECKSUM_B].

If [CHECKSUM_A] equals to [CHECKSUM_B], it is almost certain that the tables are the same. There is no need to recovering data synchronization. Refer to *Storage Server, The MySQL Replication for Geographic Redundancy Failed*.

If [CHECKSUM_A] does not equals to [CHECKSUM_B], do the following steps in Section 5.19.1.2.3 on page 134.

5.19.1.2.2 Checking ENUM User Data (For ENUM Service)

The replicated ENUM user data contains enumzone, enumview, enumzvrel, enumacl, destnode, enumdnrge, enumdnsched, check if any of them on the two sites are different.

Note: All other ENUM user data is not replicated automatically, they also should be same on both sites.

Take ENUMZONE as example:

1. Perform checksum on ENUMZONE on SC-1 or SC-2 of Site A:

```
# mysql -P3307 -h ipw_sql --protocol=tcp -e "select
sum(crc32(concat_ws(',', id, enumzoneid, enumzonename,
indefaultview, defaultttl))) from ipw_enum. ENUMZONE;"
```

Record the output integer value as [CHECKSUM_A].

This command will perform about 30 s to show the output.

2. Perform checksum on SC-1 or SC-2 of Site B:

```
# mysql -P3307 -h ipw_sql --protocol=tcp -e "select
sum(crc32(concat_ws(',', id, enumzoneid, enumzonename,
indefaultview, defaultttl))) from ipw_enum. ENUMZONE;"
```

Record the output integer value as [CHECKSUM_B].

If [CHECKSUM_A] equals to [CHECKSUM_B], it is almost certain that the tables are the same. There is no need to recovering data synchronization. Refer to *Storage Server, The MySQL Replication for Geographic Redundancy Failed*.



If [CHECKSUM_A] does not equals to [CHECKSUM_B], do the following steps in Section 5.19.1.2.3 on page 134.

5.19.1.2.3 Recovering Data Synchronization

All these following steps are performed on either SC-1 or SC-2, take AAANSUser as example:

Note:

- All AAANSUser data on Site B will be erased and resynchronized to that on Site A.
- AAA User data mentioned above is stored in database `ipw_prov_aaa` and ENUM user data is stored in database `ipw_enum`. So, the mysql commands should be applied with corresponding database name and table name in different scenario.

1. Stop AAANSUser provision on both Site A and Site B.
2. On both Site A and Site B, stop MySQL slave:

```
#mysql -P3307 -h ipw_sql --protocol=tcp -e "stop slave;"
```

3. On Site A, dump AAANSUser data:

```
#mysqldump -P3307 -h ipw_sql --protocol=tcp --no-create-info  
--opt ipw_prov_aaa.aaansduser > ~/aaansduser_dump.sql
```

4. On Site A, transfer the SQL dump file to Site B.

```
#scp ~/aaansduser_dump.sql root@[OAM IP of SiteB]:~
```

5. On Site A, reset MySQL slave:

```
#mysql -P3307 -h ipw_sql --protocol=tcp
```

6. On Site B, delete aaansduser:

```
#mysql -P3307 -h ipw_sql --protocol=tcp -e "delete from  
ipw_prov_aaa.aaansduser;"
```

7. On Site B, restore AAANSUser data:

```
#mysql -P 3307 -h ipw_sql --protocol=tcp -f ipworks_prov_aaa  
< ~/aaansduser_dump.sql
```

8. On Site B, record File and Position in the output of the following command as [BINLOG_NAME_SITEB] and [BINLOG_POS_SITEB]:

```
#mysql -P 3307 -h ipw_sql --protocol=tcp -e "show master  
status;"
```



9. On Site A, configure and start MySQL slave:

```
mysql> change master to master_host='<MIP of MySQL Cluster
SQL Node in Site B>', master_log_file='<BINLOG_NAME_SITEB>',
master_log_pos=<BINLOG_POS_SITEB>,master_user='ipw
orks',master_password='ipworks',master_port=3307,
master_retry_count=86400,master_connect_retry=5;
mysql> start slave;
mysql> exit;
```

10. On Site B, start MySQL slave:

```
# mysql -P 3307 -h ipw_sql --protocol=tcp -e "start slave;"
```

5.19.1.3 Confirming Fault

After MySQL Replication for Geographic Redundancy Failed alarm cleared, use Check steps Section 5.19.1.1 on page 132 to verify if [CHECKSUM_A] equals to [CHECKSUM_B].

5.19.2 MySQL Replication for Geographic Redundancy Failed On All Sites

5.19.2.1 Trouble Symptoms

When the alarm MySQL Replication for Geographic Redundancy Failed appears on only all site, it means that the MySQL Replication have some problem on all site.

5.19.2.2 Locating Fault

5.19.2.2.1 Checking the AAANSUser Data (For Non-SIM service)

Before recovery steps, you must check that if the AAANSUser data on the two sites are different:

1. Make sure the AAANSUser data on the two sites are different.
 - a. Perform checksum on AAANSUser on SC-1 or SC-2 of Site A:

```
# mysql -P3307 -h ipw_sql --protocol=tcp -e "select
sum(crc32(concat_ws(',', name, password, imsi, msisdn,
apn, userstatus, certificateissuename, certificateid)))
from ipw_prov_aaa.aaansduser;"
```

Record the output integer value as [CHECKSUM_A].

This command will perform about 30 s to show the output.

- b. Perform checksum on AAANSUser on SC-1 or SC-2 of Site B:



```
# mysql -P3307 -h ipw_sql --protocol=tcp -e "select
sum(crc32(concat_ws(',', name, password, imsi, msisdn,
apn, userstatus, certificateissuename, certificateid)))
from ipw_prov_aaa.aaansduser;"
```

Record the output integer value as [CHECKSUM_B].

If [CHECKSUM_A] equals to [CHECKSUM_B], the AAANSUser data on the two sites are the same, it is almost certain that the tables are the same. So, there is no need to recovering data synchronization. For more detail, refer to [Storage Server, The MySQL Replication for Geographic Redundancy Failed](#).

2. Make sure perl DBI is installed.

```
# perl -e "use DBI;"
```

The output shall contain no error messages. If not, install perl-DBI and perl-DBD-mysql.

```
# cd /opt/ipworks/sqlnodemgr/scripts/
```

```
# rpm -i libmysqlclient18-10.0.11-6.4.x86_64.rpm perl-DBI-1.628
-3.214.x86_64.rpm perl-DBD-mysql-4.021-7.178.x86_64.rpm
```

5.19.2.2.2

Recovering Data Synchronization for AAA User Data

If the replication of both directions are down, you can recover data synchronization by the following steps.

1. Check AAANSUser consistency on SC-1 or SC-2 of Site A.

```
# cd /opt/ipworks/sqlnodemgr/scripts/
```

```
# ./ipw-db-checker --mysqld1 h=ipw_sql:P=3307:u=root --mysqld2
h=[MIP prv of Site B]:P=3307:u=ipworks:p=ipworks --database
ipw_prov_aaa --tables aaansduser
```

2. Check the output.

If the following output is displayed, the data is consistent. No further operation is needed.

```
Test connection to mysqld1 .....done
Test connection to mysqld2 .....done

Checking mysqld1 Master Status .....done
Checking mysqld2 Master Status .....done

Checking table aaansduser .....Consistent
```

If the following output is displayed, the data is inconsistent. Continue with next step.



```
Test connection to mysqld1 .....done
Test connection to mysqld2 .....done

Checking mysqld1 Master Status .....done
Checking mysqld2 Master Status .....done

Checking table aaansduser .....Inconsistent
```

3. If the result is inconsistent, two cli scripts are generated under /tmp:

```
/tmp/sync_commands_for_sqlnode1_aaansduser.cli
```

The script contains commands that can make the data on Site A be the same as Site B.

```
/tmp/sync_commands_for_sqlnode2_aaansduser.cli
```

The script contains commands that can make the data on Site B be the same as Site A.

4. Review and modify the scripts mentioned above according to the need.
5. Execute the modified script on SC-1 or SC-2 of Site A.

```
#ipwcli -user=[ipwcli User Name] -password=[ipwcli Password]
/tmp/sync_commands_for_sqlnode1_aaansduser.cli
```

6. Transfer the second script to Site B.

```
# scp /tmp/sync_commands_for_sqlnode2_aaansduser.cli root@[OAM
IP of Site B]:/tmp/
```

7. Execute the modified script on SC-1 or SC-2 of Site B.

```
#ipwcli -user=[ipwcli User Name] -password=[ipwcli Password]
/tmp/sync_commands_for_sqlnode2_aaansduser.cli
```

8. Go back to step 2.

5.19.2.2.3 Checking the ENUM User Data and Radius User Data

1. Stop the provisioning of user data.
2. Stop the MySQL Slave on both sites.

```
# mysql -P 3307 --protocol=tcp -h ipw_sql

mysql> stop slave;

mysql> exit;
```

3. Checking the data consistency.

```
# mkdir /tmp/db_checker
```



```
# cp /opt/ipworks/common/bin/ipw-db-checker /tmp/db_checker
# cp /opt/ipworks/common/etc/DbChecker.conf /tmp/db_checker
# cd /tmp/db_checker
# ./ipw-db-checker <MIP_PROV_IP of the other Site> <Database name needed t
```

Note: ENUM user data is stored in database ipw_enum while Radius user data is stored in database ipw_prov_aaa.

For example:

```
./ipw-db-checker "10.175.171.76" "ipw_enum"
Tables in ipw_enum is:
DESTNODE;ENUMACL;ENUMDNRRANGE;ENUMDNSCHED;ENUMVIEW;ENUMZONE;ENUMZVREL;

Checking table DESTNODE start.
connect to sqlnode1 ipw_sql:::ipw_enum:DESTNODE
connect to sqlnode2 10.175.171.76:ipworks:ipworks:ipw_enum:DESTNODE
reading data...please wait...finished
comparing data...please wait...finished
Checking table DESTNODE ----- Consistent

Checking table ENUMACL start.
connect to sqlnode1 ipw_sql:::ipw_enum:ENUMACL
connect to sqlnode2 10.175.171.76:ipworks:ipworks:ipw_enum:ENUMACL
reading data...please wait...finished
comparing data...please wait...finished
Checking table ENUMACL ----- Consistent

...
```

5.19.2.2.4 Recovering Data Synchronization for ENUM User Data and Radius User Data

If the checking result is inconsistent, sql files will be generated in path /tmp/db_checker.

For example:

```
SC-1: /#ls -l /tmp/db_checker
```

```
total 4935052
-rw-r--r-- 1 root root      1504 Jul 17 11:50 DbChecker.conf
-rw-r--r-- 1 root root     14900 Jul 18 15:28 dbchecker.log
-rwxr-xr-x 1 root root    7898108 Jul 17 12:56 ipw-db-checker
-rwxr-xr-x 1 root root    7893923 Jul 17 11:48 ipw-db-checker_back
-rw-r--r-- 1 root root 5032718815 Jul 18 15:28 sync_commands_for_sqlnode1.sql
-rw-r--r-- 1 root root 5032718815 Jul 18 15:28 sync_commands_for_sqlnode2.sql
```

To synchronize the data between two sites, load the sync_commands_for_sqlnode1.sql in Site A and sync_commands_for_sqlnode2.sql in Site B.

1. Synchronize the data in Site.

If sync_commands_for_sqlnode1.sql is not generated, then just skip this step.



- a. Login SC-1 or SC-2 in Site A
- b. Login SQL Node.

```
# mysql -P 3307 --protocol=tcp -h ipw_sql
mysql> use ipw_enum;
mysql> source /tmp/db_checker/sync_commands_for_sqlnode1.sql;
mysql> exit;
```

Note: If Radius user data is to be synchronized, execute use ipw_prov_aaa.

2. Synchronize the data in Site B.

If sync_commands_for_sqlnode2.sql is not generated, then just skip this step.

- a. Login SC-1 or SC-2 in Site B.
- b. Login SQL Node.

```
# mysql -P 3307 --protocol=tcp -h ipw_sql
mysql> use ipw_enum;
mysql> source /tmp/db_checker/sync_commands_for_sqlnode2.sql;

mysql> exit;
```

Note: If Radius user data is to be synchronized, execute use ipw_prov_aaa.

3. Changing Master-Host and Setting Binlog.

Refer to section Change Master-Host and Setting Binlog in IPWorks Geographic Redundancy.

5.19.2.3 Confirming Fault

After the alarm MySQL Replication for Geographic Redundancy Failed is cleared on all sites, use the checking steps in Section 5.19.2.2.1 on page 135 to verify if [CHECKSUM_A] equals to [CHECKSUM_B].

5.19.3 Slave SQL Process Not Running After Cluster Reboot on Slave Site

5.19.3.1 Trouble Symptoms

In geographic redundancy scenario, two sites are configured as MySQL replication. During Site A provisioning, perform cluster reboot on Site B. After Site B reboot



finished, the slave SQL process may be not running on Site B, and the alarm "MySQL Replication for Geographic Redundancy Failed" appears on Site B.

5.19.3.2 Locating Fault

5.19.3.2.1 Checking the Fault

Before recovery procedure, check MySQL slave status on site B first.

For example:

```
mysql> show slave status;
***** 1. row *****
Slave_IO_State: Waiting for master to send event
Master_Host: 10.170.37.174
Master_User: ipworks
Master_Port: 3307
Connect_Retry: 5
Master_Log_File: sqlnode-bin.000004
Read_Master_Log_Pos: 11940639
Relay_Log_File: sqlnode.000014
Relay_Log_Pos: 448626
Relay_Master_Log_File: sqlnode-bin.000004
Slave_IO_Running: Yes
Slave_SQL_Running: No
...
Last_Errno: 1296
Last_Error: Error executing row event: 'Got error 4009 'Cluster Failure' from N
```

In the example, slave SQL process status is No, and error Got error 4009 'Cluster Failure' appears on site B. The cause for this case is that MySQL SQL node is started before Data node becomes ready during cluster reboot procedure.

5.19.3.2.2 Recovering MySQL Replication

To recover MySQL replication:

1. Log in to the SC on Site B.

```
SC-1:~ # ndb_mgm
```

2. Check if Data node is ready.

The status is ongoing, for example:



```
SC-1:~ # ndb_mgm
-- NDB Cluster -- Management Client --
ndb_mgm> show
Connected to Management Server at: localhost:1186
Cluster Configuration
-----
[ndbd(NDB)]          2 node(s)
id=27      @169.254.100.1  (mysql-5.6.31 ndb-7.4.12, starting, Nodegroup: 0)
id=28      @169.254.100.2  (mysql-5.6.31 ndb-7.4.12, Nodegroup: 0, *)

[ndb_mgmd(MGM)]      2 node(s)
id=1      @169.254.100.1  (mysql-5.6.31 ndb-7.4.12)
id=2      @169.254.100.2  (mysql-5.6.31 ndb-7.4.12)
```

The status is ready, for example:

```
SC-1:~ # ndb_mgm
-- NDB Cluster -- Management Client --
ndb_mgm> show
Connected to Management Server at: localhost:1186
Cluster Configuration
-----
[ndbd(NDB)]          2 node(s)
id=27      @169.254.100.1  (mysql-5.6.31 ndb-7.4.12, Nodegroup: 0)
id=28      @169.254.100.2  (mysql-5.6.31 ndb-7.4.12, Nodegroup: 0, *)

[ndb_mgmd(MGM)]      2 node(s)
id=1      @169.254.100.1  (mysql-5.6.31 ndb-7.4.12)
id=2      @169.254.100.2  (mysql-5.6.31 ndb-7.4.12)
```

3. Log in to SQL node and start slave SQL process.

```
# mysql -P 3307 --protocol=tcp -h ipw_sql

mysql> start slave

mysql> exit
```

5.19.3.3 Confirming Fault

Log in to SQL node and check MySQL slave status.

```
# mysql -P 3307 --protocol=tcp -h ipw_sql

mysql> show slave status

mysql> exit
```

For example:



```
mysql> show slave status;
***** 1. row *****
Slave_IO_State: Waiting for master to send event
Master_Host: 10.170.37.174
Master_User: ipworks
Master_Port: 3307
Connect_Retry: 5
Master_Log_File: sqlnode-bin.000004
Read_Master_Log_Pos: 11940639
Relay_Log_File: sqlnode.000014
Relay_Log_Pos: 448626
Relay_Master_Log_File: sqlnode-bin.000004
Slave_IO_Running: Yes
Slave_SQL_Running: Yes
...
Last_Errno:
Last_Error:
```

In the example, slave SQL process status is Yes, and error Got error 4009 'Cluster Failure' disappears on site B.

5.20 Data Migration

The section is a quick troubleshooting guide for the data migration from HP to IPWorks 1.

5.20.1 Backup failed

5.20.1.1 Trouble Symptoms

“Error Copying Configuration files:...” is displayed.

5.20.1.2 Locating Fault

When the configuration file or folder specified in the rule file does not exist on current environment.

- Check whether the backup is running on the right Node, SS or PS.

For example:

The DNS, ENUM, or other service configuration files will not be backed up, if the backup runs on SS.

- Otherwise, if the file or folder does not exist actually on current environment for the service, remove the file or folder from the rule file.

Redo the backup.



5.20.2 Required configuration files did not migrate from HP to IPWorks 1

5.20.2.1 Trouble Symptoms

- Configuration files are missing for backup.
- “Src file ... does not exists.” is displayed.

5.20.2.2 Locating Fault

If configuration files are not backed up, add them into `ipw_service_backup_rule.csv`.

Redo the backup.

5.20.3 Files missing in the migration process

5.20.3.1 Trouble Symptoms

“Dest file ... does not exists.” is displayed.

5.20.3.2 Locating Fault

The issue occurs, when the destination file is not configured correctly in the corresponding rule file.

Check the file name in the rule file, correct it and redo the migration steps.

5.20.4 Failed to import the netconf xml file to ECIM with netconf command

5.20.4.1 Trouble Symptoms

This issue occurs when import the netconf xml file into ECIM using netconf command.

5.20.4.2 Locating Fault

For details of NETCONF for importing the netconf configuration, refer to 5.3 Operation <edit-config> in Ericsson NETCONF Interface.



5.21 IPWorks Scaling

5.21.1 Unable Scale-In PL in ECLI

5.21.1.1 Trouble Symptoms

Take PL-5 as example.

When scale-in IPWorks in ECLI, the error No scale operation possible is reported.

```
>ManagedElement=1, SystemFunctions=1, SysM=1, CrM=1, ComputeResourceRole=PL-5
(ComputeResourceRole=PL-5)>configure
(config-ComputeResourceRole=PL-5)>no provides
(config-ComputeResourceRole=PL-5)>up
(config-CrM=1)>commit
ERROR: Transaction not committed due to validation errors
Transaction validation failed!
No scale operation possible, maintenance lock not available
```

5.21.1.2 Locating Fault

1. Check PL-5 status.

```
>ManagedElement=1, SystemFunctions=1, SysM=1, CrM=1
(CrM=1)>ComputeResourceRole=PL-5
(ComputeResourceRole=PL-5)>show -v
ComputeResourceRole=PL-5
adminState=UNLOCKED
computeResourceRoleId="PL-5"
instantiationState=INSTANTIATING <read-only>
operationalState=DISABLED <read-only>
provides="ManagedElement=1, SystemFunctions=1, SysM=1, CrM=1, Role=Default-R
uses="ManagedElement=1, Equipment=1, ComputeResource=PL-5" <read-only>
```

2. Remove PL-5 after the value of instantiationState changes to INSTANTIATED.

```
>ManagedElement=1, SystemFunctions=1, SysM=1, CrM=1, C
omputeResourceRole=PL-5
(ComputeResourceRole=PL-5)>configure
(config-ComputeResourceRole=PL-5)>no provides
(config-ComputeResourceRole=PL-5)>up
(config-CrM=1)>commit
```




5.21.1.3 Confirming Solution

If the problem still remains, contact next level of Ericsson support.

5.21.2 Failed to Start Scale-Out VM on KVM

5.21.2.1 Trouble Symptoms

On KVM Platform, it fails to start PL with following errors:

```
cluster1-b-2:~ # virsh start Scale1
error: Failed to start domain Scale1
error: monitor socket did not show up: No such file or directory
```

5.21.2.2 Locating Fault

1. Restarts the service libvirtd to fix the error.
2. If the issue is still there, check the service libvirtd restart log, and find the bug in/etc/hosts.

```
cluster1-b-2:~ # service libvirtd status
* libvirtd.service - Virtualization daemon
   Loaded: loaded (/usr/lib/systemd/system/libvirtd.service; enabled; vendor preset: enabled)
   Active: active (running) since Sun 2017-08-27 01:38:58 EDT; 3min 9s ago
     Docs: man:libvirtd(8)
           http://libvirt.org
   Main PID: 19509 (libvirtd)
    Tasks: 16 (limit: 512)
   CGroup: /system.slice/libvirtd.service
           └─19509 /usr/sbin/libvirtd --listen

Aug 27 01:38:58 cluster1-b-2 libvirtd[19509]: 2017-08-27 05:38:58.102+0000: 19509: warning
Aug 27 01:38:58 cluster1-b-2 systemd[1]: Started Virtualization daemon.
Aug 27 01:39:05 cluster1-b-2 libvirtd[19509]: libvirt version: 2.0.0
Aug 27 01:39:05 cluster1-b-2 libvirtd[19509]: hostname: cluster1-b-2
Aug 27 01:39:05 cluster1-b-2 libvirtd[19509]: getaddrinfo failed for 'cluster1-b-2': Name
```

3. Add host name cluster1-b-2 in /etc/hosts and restart service libvirtd.

5.21.2.3 Confirming Solution

If the problem still remains, contact next level of Ericsson support.

5.21.3 Unable Scale-Out PL for Core Middleware

5.21.3.1 Trouble Symptoms

After scale-out operation is taken by heat stack-update, the new PL-5 cannot be scaled out and the compute resource cannot be found in ECLI DN:



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

5.21.3.2

Locating Fault

Check the failure reason by following steps:

1. Check both SCs /var/log/messages.

```
#grep -E "CSM|clustermonitor" /var/log/messages
```

You can find the SC-1 has more PL-5 scale-out log and related CSM log as below:

```
Sep 7 07:41:11 SC-1 clustermonitor: cmw-node-up received
Sep 7 07:41:11 SC-1 clustermonitor: ClusterMonitorTimer::stop()
Sep 7 07:41:11 SC-1 clustermonitor: ClusterMonitorTimer::start() called with timeout 140
Sep 7 07:43:31 SC-1 clustermonitor: ClusterMonitorTimer::stop()
Sep 7 07:43:31 SC-1 clustermonitor: searchObjectNames error 12
Sep 7 07:43:31 SC-1 clustermonitor: send signal to thread-Scaleout, vector.size 1
Sep 7 07:43:31 SC-1 clustermonitor: got scaleout signal, starting scale out...
Sep 7 07:43:31 SC-1 clustermonitor: ElasticEngine_Impl::scaleOut : node<PL-5> : not in cluster
Sep 7 07:43:31 SC-1 clustermonitor: ElasticEngine_Impl::scaleOut : node<PL-5> : continue scaling
Sep 7 07:43:31 SC-1 clustermonitor: scaleOut: maint_lock_cnt =1
Sep 7 07:43:31 SC-1 clustermonitor: successful to set state <1> for EE
Sep 7 07:43:32 SC-1 clustermonitor: Create ComputeResourceRole object request
Sep 7 07:43:32 SC-1 clustermonitor: ComputeResourceRole object Successfully created
Sep 7 07:43:32 SC-1 clustermonitor: addNodeToScalingList <PL-5>
Sep 7 07:43:32 SC-1 clustermonitor: CSM job started, EE-state=<1>.
Sep 7 07:43:33 SC-1 clustermonitor: successful to set state <2> for EE
Sep 7 07:43:33 SC-1 clustermonitor: successful to set state <3> for EE
Sep 7 07:43:33 SC-1 clustermonitor: error, csm-apply, err <89>
Sep 7 07:43:34 SC-1 clustermonitor: Calling /opt/csm/bin/csm-repair after /opt/csm/bin/csm-apply
Sep 7 07:43:34 SC-1 clustermonitor: successful to set state <4> for EE
Sep 7 07:43:34 SC-1 clustermonitor: error, /opt/csm/bin/csm-repair failed, rc <89>
Sep 7 07:43:35 SC-1 clustermonitor: Delete ComputeResourceRole object request
Sep 7 07:43:35 SC-1 clustermonitor: ComputeResourceRole object Successfully deleted
Sep 7 07:43:35 SC-1 clustermonitor: clearScalingList
Sep 7 07:43:35 SC-1 clustermonitor: successful to set state <0> for EE
```

If the error log can not provide enough information, go to next step to check clustermonitor log.

2. Check SC clustermonitor log.

```
#cd /var/opt/coremw/clustermonitor
```

```
#cat clustermonitor.log
```



```
Setting CDF_CONFIGPATH to /tmp/tmp.a456B4Ng47
Updated unit SH/IPWRAD in directory /usr/lib/ericsson/cba/csm/plugin/SH-IPWRADstuff-SH_IPWRAD
Updated unit SH/SS7CAF2 in directory /usr/lib/ericsson/cba/csm/plugin/SH-SS7CAF2
Updated unit SH/IPWDIA in directory /usr/lib/ericsson/cba/csm/plugin/SH-IPWDIAstuff-SH_IPWDIA
Updated unit SH/CoreMW1 in directory /usr/lib/ericsson/cba/csm/plugin/SH-CoreMW1-CXC12345
Updated unit SH/CoreMW2 in directory /usr/lib/ericsson/cba/csm/plugin/SH-CoreMW2-CXC12345
Updated unit SH/IPWENUM in directory /usr/lib/ericsson/cba/csm/plugin/SH-IPWENUMstuff-SH_IPWENUM
Updated unit SH/LDE in directory /usr/lib/ericsson/cba/csm/plugin/LDE_SH
Updated unit SH/SS7CAF1 in directory /usr/lib/ericsson/cba/csm/plugin/SH-SS7CAF1
Updated unit SH/IPWDNS in directory /usr/lib/ericsson/cba/csm/plugin/SH-IPWDNSstuff-SH_IPWDNS
ERROR exception caught
<type 'exceptions.IndentationError'>
  File "/usr/share/ericsson/csm/repo/DT-CSM-DT_CSM/lib/python2.7/csm/csmapply.py", line 203:
    environments = CSMEnvironments)
  File "/usr/share/ericsson/csm/repo/DT-Cdf-DT_Cdf/lib/python2.7/cdf/clicommon.py", line 35:
    for module in getPluginsInDirectory(pythonDir, filter, verbose):
  File "/usr/share/ericsson/csm/repo/DT-Cdf-DT_Cdf/lib/python2.7/cdf/clicommon.py", line 30:
    module = imp.load_source("plugin%s" % (postfix), file)
unexpected indent (csmplugin.py, line 57)
```

5.21.3.3 Confirming Solution

For this kind of issue, collect the log and then contact next level of Ericsson support.

5.21.4 Unable Scale-Out PL for SS7CAF

5.21.4.1 Trouble Symptoms

After scale-out operation is taken by heat stack-update, the new PL-6 can not scale-out and the compute resource can not be found in ECLI DN:

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

5.21.4.2 Locating Fault

Check the failure reason by following steps:

1. Check both SCs /var/log/messages.

```
#grep -E "CSM|clustermonitor" /var/log/messages
```



```

May 18 13:56:00 SC-1 CSM: ss7caf_csm_plugin_scale_out: EXCEPTION: Command:"sudo /opt/sign/EABss7077/ss7caf_scaling.
May 18 13:56:00 SC-1 osafimmnd[6594]: NO Ccb 1006 COMMITTED (EquipmentOwner)
May 18 13:56:00 SC-1 clustermonitor: successful to set state <3> for EE
May 18 13:56:00 SC-1 clustermonitor: error, csm-apply, err <1>
May 18 13:56:00 SC-1 osafimmnd[6594]: NO Ccb 1007 COMMITTED (EquipmentOwner)
May 18 13:56:00 SC-1 clustermonitor: Calling /opt/csm/bin/csm-repair after /opt/csm/bin/csm-ap
May 18 13:56:01 SC-1 CSM: scale in started
May 18 13:56:01 SC-1 CSM: SH/SS7CAF1 started prepare step
May 18 13:56:01 SC-1 CSM: ss7caf_csm_plugin_scale_in: SS7CAF Scale In plugin - prepare() calle
May 18 13:56:01 SC-1 CSM: SH/SS7CAF1 finished prepare step
May 18 13:56:01 SC-1 CSM: SH/IPW1 started prepare step
May 18 13:56:01 SC-1 CSM: IPWorks-ScaleIn: IPWorks plugin - prepare() called for use case Scal
May 18 13:56:01 SC-1 CSM: SH/IPW1 finished prepare step
May 18 13:56:01 SC-1 CSM: SH/EVIP started prepare step
May 18 13:56:01 SC-1 CSM: SH/EVIP finished prepare step
May 18 13:56:01 SC-1 CSM: SH/CoreMW1 started prepare step
May 18 13:56:01 SC-1 CSM: CMW-scale_in: prepare uc: ScaleIn
May 18 13:56:02 SC-1 CSM: CMW-scale_in: scale in node: PL-6
May 18 13:56:02 SC-1 clustermonitor: Received cluster update, Number of members in cluster=4
May 18 13:56:02 SC-1 clustermonitor: EE update node leave <PL-6>.
May 18 13:56:02 SC-1 clustermonitor: searchObjectNames error 12
May 18 13:56:02 SC-1 clustermonitor: Failure seraching for <CmwMonitorImmCkptId=PL-6,CmwMonito
May 18 13:56:02 SC-1 clustermonitor: searchObjectNames error 12
May 18 13:56:02 SC-1 clustermonitor: Successfully write 'downTime' for rdn <CmwMonitorImmCkptI
May 18 13:56:02 SC-1 clustermonitor: Node "safNode=PL-6,safCluster=myClmCluster" is no longer
May 18 13:56:04 SC-1 CSM: CMW-scale_in: Clm node already locked
May 18 13:56:07 SC-1 CSM: CMW-scale_in: exec: sudo /opt/coremw/lib/cmwmdf_gcc cleanup PL-6
May 18 13:56:07 SC-1 CSM: CMW-scale_in: scale-in node: PL-6 done
May 18 13:56:07 SC-1 CSM: SH/CoreMW1 finished prepare step
May 18 13:56:07 SC-1 CSM: SH/LDE started prepare step
May 18 13:56:07 SC-1 CSM: LDE OS plugin - prepare called for use case ScaleIn (repair: True)
May 18 13:56:07 SC-1 CSM: SH/SS7CAF1 started perform step
May 18 13:56:07 SC-1 CSM: ss7caf_csm_plugin_scale_in: SS7CAF Scale In plugin - perform() calle
May 18 13:56:07 SC-1 CSM: ss7caf_csm_plugin_scale_in: model.yml file not found. Will run check
May 18 13:56:07 SC-1 CSM: ss7caf_csm_plugin_scale_in: Checking that at least one SS7CAF payloa
May 18 13:56:07 SC-1 CSM: ss7caf_csm_plugin_scale_in: PL-3 is in Scaling Domain([u'PL-6', u'PL
May 18 13:56:07 SC-1 CSM: ss7caf_csm_plugin_scale_in: Call /opt/sign/EABss7077/ss7caf_scaling.
May 18 13:56:07 SC-1 systemd[1]: Starting Session c128 of user root.

```

5.21.4.3

Confirming Solution

For this kind of issue, collect the log and then contact next level of Ericsson support.

1. Collect SS7CAF scaling log in PL-6.

```
#/opt/sign/log/ss7caf_scaling.log[<log number>]
```

2. Collect SS7caf log by using SS7CAF tool. Execute the command in PL-6.

```
#/opt/sign/EABss7049/bin/sysCollTool.sh
```

3. Collect core middleware log.

Collect clustermonitor log in SC which report many CSM and clustermonitor log in /var/log/messages. The core middleware log is:

```
#/var/opt/coremw/clustermonitor/clustermonitor.log
```



5.21.5 AAA Cannot Start in Scale-Out PL

5.21.5.1 Trouble Symptoms

In the scale-out PL, AAA service cannot start. Take PL-5 as an example, PL-5 is a scale-out PL.

```
SC-1:/cluster # ipw-ctr status all | grep PL-5 -A20
```

on PL-5:

```
aaa_diameter      need repair.
aaa_radius_stack  need repair.
aaa_radius_backend need repair.
aaasm             is running.
```

5.21.5.2 Locating Fault

Check the failure reason by following steps:

1. Check the serviceType, ensure the serviceType includes "AAA".

```
SC-X:~ #/opt/com/bin/cliss
```

```
>ManagedElement=<Node Name>,IpworksFunction=1,IpworksCommonRoot=1
```

```
(IpworksCommonRoot=1)>show -v
```

```
IpworksCommonRoot=1
  ipworksCommonRootId="1"
  serviceType="AAA"
  DataBaseInfo=1
  StorageServer=1
```

2. Ensure AAAServer=PL-5 exists under IPWorksAAACommonRoot.

```
>ManagedElement=<Node Name>,IpworksFunction=1,IPWorksAAARoot=1,IPWorksAAACommonRoot=1
```

```
(IPWorksAAACommonRoot=1)>show -v
```

```
IPWorksAAACommonRoot=1
  ipworksAAACommonRootId="1"
  AAAServer=PL-3
  AAAServer=PL-4
  AAAServer=PL-5
  AAAServerManager=1
```



GTConvertManager=1

If AAAServer=PL-5 doesn't exist, the following procedures are needed on SC:

- a. Open a new file.

```
#vi /tmp/addAAAServer.sh
```

- b. Insert following content into /tmp/addAAAServer.sh. Note to change the aaaServer to a corresponding PL name.

```
#!/bin/bash
aaaServer=PL-5
immcfg << EOF
    immcfg -u -c AAAServer aaaServerId=$aaaServer,ipworksAAACCommonRootId=1,ipwork
    immcfg -u -c LogManagement logManagementId=1,aaaServerId=$aaaServer,ipworksAA
    immcfg -u -c ThreadControlManager threadControlManagerId=1,aaaServerId=$aaaSe
    immcfg -u -c IPWorksLog logId=AAA_DIAMETER_SERVER,logManagementId=1,aaaServerI
    immcfg -u -c IPWorksLog logId=AAA_RADIUS_BACKEND,logManagementId=1,aaaServerI
    immcfg -u -c IPWorksLog logId=AAA_RADIUS_STACK,logManagementId=1,aaaServerId=
    immcfg -u -c ThreadControl processId=AAA_DIAMETER_SERVER,threadControlManagerI
    immcfg -u -c ThreadControl processId=AAA_RADIUS_BACKEND,threadControlManagerI
    immcfg -u -c ThreadControl processId=AAA_RADIUS_STACK,threadControlManagerId=
EOF
```

- c. Execute the script.

```
#bash /tmp/addAAAServer.sh
```

3. Repair the AAA.

```
#ipw-ctr repaired aaa_diameter PL-5
```

```
#ipw-ctr repaired aaa_radius_stack PL-5
```

```
#ipw-ctr repaired aaa_radius_backend PL-5
```

4. Start the AAA

```
#ipw-ctr start aaa_diameter PL-5
```

```
#ipw-ctr start aaa_radius_stack PL-5
```

```
#ipw-ctr start aaa_radius_backend PL-5
```

5.21.5.3

Confirming Solution

Use ipw-ctr to get server status. The AAA services should be running.

```
SC-1:/cluster # ipw-ctr status all | grep PL-5 -A20
```

on PL-5:

```
aaa_diameter          is running.
```



```
aaa_radius_stack      is running.
aaa_radius_backend    is running.
aaasm                 is running.
```

5.21.6 Restore User Backup in Superset Cluster

5.21.6.1 Trouble Symptoms

Restore in a superset cluster is used in scenarios where backup was taken in a smaller cluster than the current size of the cluster. Cluster has been scaled out after the backup was taken.

In this situation, the restore operation will be failed.

5.21.6.2 Locating Fault

You can do followings:

1. Scale-in the IPWorks to remove the PLs which are not included in backup package.
2. Restore user data with backup package.
3. Scale out to desired PLs.

5.21.6.3 Confirming Solution

If the problem still remains, contact next level of Ericsson support.

5.21.7 Scale-Out Failure Triggers Scale-Out/Scale-In Cyclically

5.21.7.1 Trouble Symptoms

When scale-out PL-X failed because of incorrect configuration, CMW triggers automatic scale-in, but CMW dose not shutdown VM resource of PL-X. Then IPWorks continues "DHCP recovery", and triggers scale-out/scale-in cyclically. During a scale-in operation, LDE attempts to power off the node(s) being scaled in. This operation relies on ssh connectivity to the payload node, and should shutdown -h now remote command not succeed, there is a risk that the node will remain alive, with active TIPC and IP configuration but is no longer reachable by LDE or middleware. This is a limitation of LDE, details refer to section Fencing during a scale in in *LDE Scaling User's Guide*.

For scale-out/scale-in cyclically, check SC-X /var/opt/coremw/clustermonitor/clustermonitor.log file.

For example:



```

SC-1:~ #grep -E 'addNodeToScalingList|hostname "PL-5"' /var/opt/coremw/clustermon/clustermon.log
Dec 28 10:04:47.105663 clustermonitor [9869][../../../../src/clmon/ClusterMonitor]
Deleting ComputeResource node with hostname "PL-5"
Dec 28 10:10:23.318797 clustermonitor [9869][../../../../src/clmon/ClusterMonitor]
Deleting ComputeResource node with hostname "PL-5"
Dec 28 10:15:59.651078 clustermonitor [9869][../../../../src/clmon/ClusterMonitor]
Deleting ComputeResource node with hostname "PL-5"

```

5.21.7.2 Locating Fault

After scale-out failed, remove VM instance to fix the issue:

- For CEE, refer to section "Remove VM Instance" in IPWorks Scaling Guide for CEE.
- For KVM, refer to section "Remove VM Instance" in IPWorks Scaling Guide for KVM.

5.21.7.3 Confirming Solution

If the problem still remains, contact next level of Ericsson support.

5.22 IPWorks Deployment for KVM

5.22.1 Both SCs Cyclic Reboot after Deployment

5.22.1.1 Trouble Symptoms

On KVM Platform, after deployment, both SC cyclic reboot. The console log is as below:

```

[ 1302.862068] drbd drbd0: meta connection shut down by peer.
[ 1449.584045] drbd drbd0: PingAck did not arrive in time.
Starting NFS Mount Daemon...
[ OK ] Started NFS Mount Daemon.
Starting NFS Server...
[ OK ] Started NFS Server.
[ OK ] Created slice system-lde\x2dtftpd.slice.
Starting LDE tftpd...
[ OK ] Started LDE tftpd.
Stopping ISC DHCPv4 Server...
[ OK ] Stopped ISC DHCPv4 Server.
Starting ISC DHCPv4 Server...
[ OK ] Started ISC DHCPv4 Server.
Starting LDE dumpd...
[ OK ] Started LDE dumpd.
[ OK ] Stopped LDE CSM update service.

```




```

Starting LDE CSM update service...
[ OK ] Started LDE CSM update service.
[FAILED] Failed to start NTP Daemon.
See "systemctl status lde-ntp.service" for details.
Stopping NTP Daemon...
[ OK ] Stopped NTP Daemon.
Starting NTP Daemon...
[FAILED] Failed to start NTP Daemon.
See "systemctl status lde-ntp.service" for details.
Stopping NTP Daemon...
[ OK ] Stopped NTP Daemon.
Starting NTP Daemon...
[ OK ] Reached target Network is Online.

```

5.22.1.2 Locating Fault

This issue is mostly caused by disk performance issue. Try to suspend SC2 and start SC1 firstly:

1. Suspend SC2.

```
#virsh suspend SC-2
```

2. Wait until SC-1 startup successfully and SC-1 login can be launched.
3. Resume SC2.

```
#virsh resume SC-2
```

4. Check drdb status.

```
#cat /proc/drdb
```

5.22.2 Failed to Execute Scripts ipwInit.sh after a Re-deployment of IPWorks for KVM

5.22.2.1 Trouble Symptoms

The following warning message is logged when user executes scripts ipwInit.sh:

```
" CMW: ERROR (cmw-sdp-import): Already imported [ERIC-LmClientLibrary-CXP902
cmw-sdp-import /cluster/lm/lm/*.sdp execute failed, exit"
```

5.22.2.2 Locating Fault

The issue occurs when the qcow2 image on Host1 is not replaced by the original qcow2 image from the image package.

The following procedure is an example to fix this issue:



1. Check the parameter QCOW2_DIR configured in ipwenv.conf.

```
# grep -r "QCOW2_DIR" /root/auto_deployment/kvm_deployment/c
onfig/ipwenv.conf
```

Example output:

```
#QCOW2_DIR
QCOW2_DIR=/root/auto_deployment/images
```

2. Stop VMs and remove image files on both Host1 and Host2.

— On Host1:

```
# virsh destroy SC-1 2>/dev/null

# rm /root/auto_deployment/images/ipw-sc-22.qcow2
```

— On Host2:

```
# virsh destroy SC-2 2>/dev/null

# rm /root/auto_deployment/images/ipw-sc-22.qcow2
```

3. Unzip the image package into /root/auto_deployment to get the qcow2 image on Host1.

```
# cd /root/auto_deployment

#tar -zxvf /root/19010-CXP9023809_2_Ux_<Revision Number>.tar.gz
```

Example output:

```
images/
images/pxeboot.qcow2
images/ipw-sc-22.qcow2
```

4. Clean up IPWorks.

```
#./ipwdeploy.sh -a cleanup
```

5. Re-execute the script ipwdeploy.sh on Host1 to re-deploy IPWorks VNF.

```
# ./ipwdeploy.sh -a deploy
```

5.22.2.3

Confirming Solution

Check whether the same issue occurs when running scripts ipwInit.sh.



5.23 IPWorks Deployment for CEE

5.23.1 Fault Symptoms

When you deployed IPWorks successfully, the hosts timezone is mismatching with the `/cluster/etc/cluster.conf`. Then, you must manually synchronize the timezone.

5.23.2 Locating Fault

You can execute bellow steps to check if need to manually synchronize the timezone.

1. Log on to host, for example, log on to SC-1.

```
#ssh root@<SC-1_IP_Address>
```

2. Open `cluster.conf` file to check timezone information.

```
SC-1:~# vi /cluster/etc/cluster.conf
```

For example, The timezone in `/cluster/etc/cluster.conf` as below:

```
#Define time zone
#See/usr/share/zoneinfo/ for supported time zones
#timezone Asia/Shanghai
#timezone Asia/Shanghai
...
```

3. Check the timezone link and the host time.

```
SC-1:~# ll /etc/localtime
```

For example, execute the command `ll /etc/localtime` and output as below:

```
lrwxrwxrwx 1 root root 38 Mar 6 2017 /etc/localtime
../usr/share/zoneinfo/Europe/Stockholm
```

```
SC-1:~# date
```

4. Chck if the Step 2 and Step 3 timezone information is matching.
5. If not matched, you must manually synchronize the timezone.

```
#lde-config -r
```

5.23.3 Confirming Solution

Not applicable.



5.24 "COM SA, AMF Component Instantiation Failed" on SC-1

5.24.1 Trouble Symptoms

An alarm "COM SA, AMF Component Instantiation Failed" is issued on SC-1 node. And SC-1 node will be failed to take ownership of Management VIP (MIP_OAM_IP) when SC-2 is rebooting.

5.24.2 Locating Fault

The RPM com-comsa-cxp*.sle12 is installed on SC-1. However, the folder /opt/com/lib/comp and files under this folder are missing. This causes the COM process to hang before invoking AMF API.

Check the alarm by using ECLI:

```
>show ManagedElement=1,SystemFunctions=1,Fm=1 -m FmAlarm
...
FmAlarm=148
activeSeverity=MAJOR
additionalText="Instantiation of Component safComp=Cmw,safSu=SC-1,safSg=2N,safS
eventType=PROCESSINGERRORALARM
lastEventTime="2017-07-10T04:19:08.168+00:00"
majorType=18568
minorType=131074
originalAdditionalText="Instantiation of Component safComp=Cmw,safSu=SC-1,safS
originalEventTime="2017-07-10T04:19:08.168+00:00"
originalSeverity=MAJOR
probableCause=418
sequenceNumber=325
source="ManagedElement=UVIW-DEFRA-03-0001,SaAmfApplication.safApp=ERIC-ComSa,Sa
specificProblem="COM SA, AMF Component Instantiation Failed"
additionalInfo
name=""
value="ManagedElement=1,SaAmfCluster.safAmfCluster=myAmfCluster,SaAmfNode.safAm
...
```

Check the alarm by using CMW command:

```
SC-1:~ # cmw-status si |grep -A2 -i "comsa"
...
safSi=2N,safApp=ERIC-ComSa AdminState=UNLOCKED(1) AssignmentState=PARTIALLY_ASS
...
```

The following procedure is an example to fix this issue:



1. Run "cluster rootfs -c -o -n 1" on SC-1, reboot SC-1. Then the COMSA RPM will be re-installed, and the directory /opt/com/lib/comp/ and files will be created automatically.

- a. SC-1:~ # **cluster rootfs -c -o -n 1**

- b. SC-1:~ # **reboot**

2. Check if the alarm is still existed.

```
SC-1:~ # cmw-status si |grep -A2 -i "comsa"
```

3. If the alarm exists, remove it.

```
SC-1:~ # amf-adm -t 200 repaired safSu=SC-1,safSg=2N,safApp=ERIC-com.oam.access.aggregation
```

5.24.3 Confirming Solution

Check the alarm again by using ECLI:

```
>show ManagedElement=1,SystemFunctions=1,Fm=1 -m FmAlarm
```

The previous alarm information will be removed when the issue is fixed.

Check the alarm by using CMW command:

```
SC-1:~ # cmw-status si |grep -A2 -i "comsa"
```

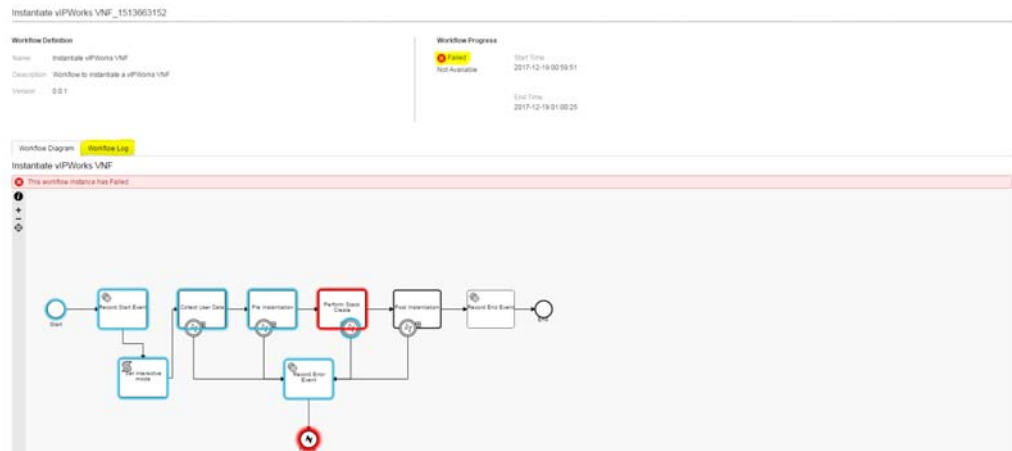
The previous alarm information will be removed when the issue is fixed.

If the alarm remains or the folder and files are still missing, contact next level of Ericsson support.

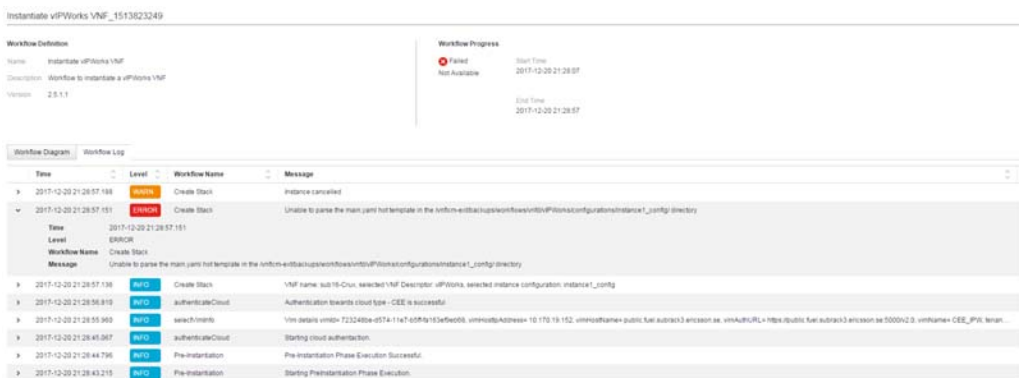
5.25 IPWorks Workflows Problems

This section provides information on resolving problems on IPWorks workflows.

All the tasks status is shown on the workflow application GUI. In **Workflow Diagram**, tasks with blue frame are passed, tasks with yellow frame are in process, and tasks with red frame are failed.



You can find the detailed information about the task on **Workflow Log**. And the logs are recorded in `/ericsson/3pp/jboss/standalone/log/server.log`.



For more information about IPWorks Workflow, refer to [IPWorks VNF Life Cycle Management](#).

5.25.1 Authentication Failed

5.25.1.1 Trouble Symptoms

The termination workflow failed at "Collect User Data" task.

The status of workflow is failed.

5.25.1.2 Locating Fault

Log on the VNF-LCM services VM:

```
#vi /ericsson/3pp/jboss/standalone/log/server.log
```

Search "Authentication Failed" to view the detailed log.



5.25.1.3 Confirming Solution

Ensure the cloud VIM configuration properties (such as `cloudUserName`, `cloudUserPassword`, `cloudBaseUrl`, and `cloudTenantId`) are configured correctly. For how to check the VIM details, refer to the document VNF-Lifecycle Manager System Administration Guide, Reference [37].

If the issue remains, collect the log and then contact next level of Ericsson support.

5.25.2 Parameter Value Is Wrong

5.25.2.1 Trouble Symptoms

The instantiation workflow failed at "Perform Stack Create" task.

The status of workflow is failed.

The workflow log on GUI shows "Instance cancelled".

5.25.2.2 Locating Fault

Log on the VNF-LCM services VM:

```
#vi /ericsson/3pp/jboss/standalone/log/server.log
```

Search "is invalid: Error validating value" to locate the invalid parameter.

5.25.2.3 Confirming Solution

Ensure the parameter value is correct in `env.yaml`.

If the issue remains, collect the log and then contact next level of Ericsson support.

5.25.3 Missing File in Configuration Directory

5.25.3.1 Trouble Symptoms

The instantiation workflow failed at "Post Instantiation" task, but "Perform Stack Create" task succeeded.

The status of workflow is failed.

The workflow log on GUI shows "No such file or directory".

5.25.3.2 Locating Fault

Log on the VNF-LCM services VM:



```
#vi /ericsson/3pp/jboss/standalone/log/server.log
```

Search "No such file or directory" to locate the missing file.

5.25.3.3 Confirming Solution

Check onboarding steps. Refer to the section Onboarding in IPWorks VNF Life Cycle Management.

Ensure the configure file is put under the configuration path.

5.25.4 Environment Has Been Used

5.25.4.1 Trouble Symptoms

The instantiation workflow failed at "Perform Stack Create" task.

The status of workflow is failed.

The workflow log on GUI shows "Instance cancelled".

5.25.4.2 Locating Fault

Log on the VNF-LCM services VM:

```
#vi /ericsson/3pp/jboss/standalone/log/server.log
```

Search "In Used" to locate the network or environment resources (such as vlan) that has been used.

5.25.4.3 Confirming Solution

Delete the server that is using the environment, or start a new available environment.

If the issue remains, collect the log and then contact next level of Ericsson support.

5.25.5 IPWorks Im or sql init Failed

5.25.5.1 Trouble Symptoms

The instantiation workflow failed at "Post Instantiation" task, but "Perform Stack Create" task succeeded.

The status of workflow is failed.

The workflow log on GUI shows "Instance Failed".



5.25.5.2 Locating Fault

Log on the VNF-LCM services VM:

```
#vi /ericsson/3pp/jboss/standalone/log/server.log
```

Search "ipw_init_phase_one failed" or "ipw_init_phase_two failed" to view the detailed failure of ipw_init_phase_failed.

5.25.5.3 Confirming Solution

Terminate the IPWorks, then instantiate it again.

If the issue remains, collect the log and then contact next level of Ericsson support.

5.25.6 Missing Parameter Value

5.25.6.1 Trouble Symptoms

The instantiation workflow failed at "Perform Stack Create" task.

The status of workflow is failed.

The workflow log on GUI shows "Instance cancelled".

5.25.6.2 Locating Fault

Log on the VNF-LCM services VM:

```
#vi /ericsson/3pp/jboss/standalone/log/server.log
```

Search "is not configured" to see what parameter is not configured, such as "EMERGENCY_USER".

5.25.6.3 Confirming Solution

Ensure the parameter value is correct in `env.yaml`. Then run instantiation steps, which will regenerate new `env.yaml` and `main.yaml` files. For more information about `env.yaml` and `main.yaml`, refer to the section [Instantiate VNF in IPWorks VNF Life Cycle Management](#).

If the issue remains, collect the log and then contact next level of Ericsson support.



5.25.7 Termination Script Missed in IPWorks

5.25.7.1 Trouble Symptoms

The termination workflow failed at "Pre Termination" task.

The status of workflow is failed.

The workflow log on GUI shows "Instance Failed".

5.25.7.2 Locating Fault

Log on the VNF-LCM services VM:

```
#vi /ericsson/3pp/jboss/standalone/log/server.log
```

Search "No such file or directory" to locate which file is missed.

5.25.7.3 Confirming Solution

Collect the log and then contact next level of Ericsson support.

5.25.8 Workflow Gets no Stacks

5.25.8.1 Trouble Symptoms

The termination workflow failed at "Collect Stack Details" task.

The status of workflow is failed.

The workflow log on GUI shows "Instance Failed".

5.25.8.2 Locating Fault

Log on the VNF-LCM services VM:

```
#vi /ericsson/3pp/jboss/standalone/log/server.log
```

You can find the detailed information about this problem, such as "stacklist is none".

IPWorks Workflows can only manage the stacks with tags.

5.25.8.3 Confirming Solution

Workflow can only manage the stacks with tags. Use OpenStack command to delete this stack.



```
#heat stack-delete <stack-name or stack-id>
```

If the issue remains, collect the log and then contact next level of Ericsson support.

5.25.9 Could Not Fetch Remote Template

5.25.9.1 Trouble Symptoms

The termination workflow failed at "Perform Scale" task.

The status of workflow is failed.

The workflow log on GUI shows "Instance cancelled".

5.25.9.2 Locating Fault

Log on the VNF-LCM services VM:

```
#vi /ericsson/3pp/jboss/standalone/log/server.log
```

Search "ERROR" upwards from the tail to find the latest error generated during scaling.

If the error log shows something like:

```
Could not fetch remote template \"ipw_scaling_group.yaml\".
```

Then it means that the VNF is deployed with an earlier version of VNF-LCM and workflow.

5.25.9.3 Confirming Solution

Refer to section Update VNF Stack Deployed by VNF-LCM in IPWorks Upgrade Instruction, Reference [29] to update the stack to a scalable one.

If the issue remains, collect the log and then contact next level of Ericsson support.

5.25.10 Scaling Failed at Pre-Scale Phase

5.25.10.1 Trouble Symptoms

The termination workflow failed at "Pre-Scale" task.

The status of workflow is failed.

The workflow log on GUI shows "Instance cancelled".



5.25.10.2 Locating Fault

Log on to the VNF-LCM services VM:

1. Locate the error from server.log.

```
#vi /ericsson/3pp/jboss/standalone/log/server.log
```

Search "ERROR" upwards from the tail to find the latest error generated during scaling.

2. Locate the error from python log of the latest workflow instance.

```
#cd /var/log/cmd-exec-service/
```

```
#cat `ls -rt *.error | tail -n 1`
```

5.25.10.3 Confirming Solution

Several possible errors may cause pre-scale fail:

- Service type error! (<service type>)

If the service type is DNS or DHCP, scaling is not supported.

- scale number must be [0..8]

Up to 8 VMs are allowed to be scaled out.

Fix the error according to the log.

If the issue remains, collect the log and then contact next level of Ericsson support.

5.25.11 Scaling Failed at Post-Scale Phase

5.25.11.1 Trouble Symptoms

The termination workflow failed at "Post-Scale" task.

The status of workflow is failed.

The workflow log on GUI shows "Instance cancelled".

5.25.11.2 Locating Fault

Log on to the VNF-LCM services VM:

1. Locate the error from server.log.

```
#vi /ericsson/3pp/jboss/standalone/log/server.log
```



Search "ERROR" upwards from the tail to find the latest error generated during scaling.

2. Locate the error from python log of the latest workflow instance.

```
#cd /var/log/cmd-exec-service/

#cat `ls -rt *.error | tail -n 1`
```

Several possible errors may cause post-scale fail:

— post scale timeout

If the conditions below can not be satisfied in 15 minutes, the timeout error will be thrown:

- IPWorks needs to wait for all the VMs come to the proper status after the stack update:

```
instantiationState=INSTANTIATED
```

```
operationalState=ENABLED
```

- The VMs deleted through scale-in must disappear from the modeling.

— rollback complete

The error usually happens if the resource for scaling-out is not sufficient, or the specified Availability zones contains invalid items.

If the stack update failed, the stack will be rolled back. Then IPWorks also needs to clean some IPWorks resources.

5.25.11.3 Confirming Solution

- For the timeout error, the scaling task may success in a few minutes later. Check the IPWorks VMs status by ECLI. For example:



```
SC-2:~ # cliss
>show ManagedElement=1,SystemFunctions=1,SysM=1,CrM=1 -m ComputeResourceRole
ComputeResourceRole=PL-5
  adminState=UNLOCKED
  instantiationState=INSTANTIATED
  operationalState=ENABLED
  provides="ManagedElement=1,SystemFunctions=1,SysM=1,CrM=1,Role=PLs"
  uses="ManagedElement=1,Equipment=1,ComputeResource=PL-5"
ComputeResourceRole=SC-1
  adminState=UNLOCKED
  instantiationState=INSTANTIATED
  operationalState=ENABLED
  provides="ManagedElement=1,SystemFunctions=1,SysM=1,CrM=1,Role=SCs"
  uses="ManagedElement=1,Equipment=1,ComputeResource=SC-1"
ComputeResourceRole=PL-4
  adminState=UNLOCKED
  instantiationState=INSTANTIATED
  operationalState=ENABLED
  provides="ManagedElement=1,SystemFunctions=1,SysM=1,CrM=1,Role=PLs"
  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=PLs"
  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=SCs"
  uses="ManagedElement=1,Equipment=1,ComputeResource=SC-2"
>exit
```

- For the rollback complete error, fix the resource problem and try again. Refer to the nova command `nova availability-zone-list` and `nova host-describe` to find the available zone for VMs.

If the issue remains, collect the log and then contact next level of Ericsson support.



6 Trouble Reporting

Problems identified that cannot be solved by using this document must be reported to the next level of maintenance support through a Customer Service Report (CSR).

The details of the trouble reporting process is outside the scope of this document.

When collecting information for further support, ensure that all current logs are recorded. See time and date for the logs.

For more information on how to collect information, refer to [Data Collection Guideline for IPWorks](#).

When sending crash dumps, ensure that the dump is of the actual scenario. See time and date for the dump.





7 Appendix A: Example of PM, FM, LM, and AMF Logs

This section gives examples of the Common Component logs.

```
=====
2015/04/29 10:30:31|DNS|Error|PM_Adaptor|system 140548769142528 -
/vobs/ims/ipworks/src/common/coremw_adaptor/pm_adaptor_scc/src/PmObserver
.cpp:27 initialize. saPmInitialize FAILED: 4
2015/04/29 10:30:42|DNS|Error|PM_Adaptor|system 140548733282064 -
/vobs/ims/ipworks/src/dns/dnspm_scc/src/PmObserverImpl.cpp:374 uploadPmData.
PM re-initialize FAILED: 4
2015/04/29 10:30:42|DNS|Error|PM_Adaptor|system 140548733282064 -
/vobs/ims/ipworks/src/dns/dnspm_scc/src/PmObserverImpl.cpp:671 uploadPmData.
pm not intialized!
2015/04/29 10:30:43|DNS|Error|PM_Adaptor|system 140548769142528 -
/vobs/ims/ipworks/src/dns/dnspm_scc/src/PmObserverImpl.cpp:144 initialize.
saPmPGaugeRefGet FAILED: 9
2015/04/29 10:30:53|DNS|Error|PM_Adaptor|system 140548733282064 -
/vobs/ims/ipworks/src/dns/dnspm_scc/src/PmObserverImpl.cpp:404 uploadPmData.
saPmPGaugeIntegerSet FAILED: 9
```

Example 19 Performance Management Logs

```
=====
2015/04/23 14:27:14|DNS|Info|DNSFM|user 140542940722944 -
/vobs/ims/ipworks/src/dns/dnsfm_ou/src/IpworksFmInterfaceImpl.cpp:74 finalize.
/vobs/ims/ipworks/src/dns/dnsfm_ou/src/IpworksFmInterfaceImpl.cpp:74 finalize -finalize successfully!
2015/04/23 14:27:14|DNS|Debug|DNSFM|user 140542940722944 -
/vobs/ims/ipworks/src/dns/dnsfm_ou/src/IpworksFmService.cpp:364 run.
/vobs/ims/ipworks/src/dns/dnsfm_ou/src/IpworksFmService.cpp:364 run exit the thread.
```

Example 20 Fault Management Logs

```
=====
2015/04/09 00:00:18|DNS|Info|LM|user 139788399494912 -
/vobs/ims/ipworks/src/common/coremw_adaptor/lm_adaptor_scc/src/IpworksLmCallbacks.cpp:24
operationalModeNotificationCallback.
/vobs/ims/ipworks/src/common/coremw_adaptor/lm_adaptor_scc/src/IpworksLmCallbacks.cpp:24
operationalModeNotificationCallback >> currentMode:0
2015/04/09 00:00:18|DNS|Warning|LM|user 139788399494912 -
/vobs/ims/ipworks/src/common/coremw_adaptor/lm_adaptor_scc/src/IpworksLmService.cpp:212
notifyLmChangeToApp. /vobs/ims/ipworks/src/common/coremw_adaptor/lm_adaptor_scc/src/
IpworksLmService.cpp:212 notifyLmChangeToApp. =>
Local license info is not in a good status! currentLicenseStatus = 5
2015/04/09 00:00:18|DNS|Warning|LM|user 139788399494912 -
/vobs/ims/ipworks/src/common/coremw_adaptor/lm_adaptor_scc/src/IpworksLmService.cpp:226 =>
notifyLmChangeToApp. /vobs/ims/ipworks/src/common/coremw_adaptor/lm_adaptor_scc/src/IpworksLmService.cpp:226
notifyLmChangeToApp. License Expired! No Service provided!
2015/04/09 00:00:18|DNS|Info|LM|user 139788399494912 -
/vobs/ims/ipworks/src/common/coremw_adaptor/lm_adaptor_scc/src/IpworksLmCallbacks.cpp:72
operationalModeNotificationCallback. /vobs/ims/ipworks/src/common/coremw_adaptor/lm_adaptor_scc/src/IpworksLmCal
operationalModeNotificationCallback Update License Done!
```

Example 21 License Management Logs



```
-----  
2015/04/09 00:15:51|amfwrapper|Trace|AMF_Adaptor|system 140376849086208 -  
/vobs/ims/ipworks/src/common/coremw_adaptor/amf_adaptor_scc/src/AmfMonitorThread.cpp:251  
amfHealthCheck. Healthcheck successful  
2015/04/09 00:15:51|amfwrapper|Trace|AMF_Adaptor|system 140376849086208 -  
/vobs/ims/ipworks/src/common/coremw_adaptor/amf_adaptor_scc/src/AmfMonitorThread.cpp:267  
amfHealthCheck. << saAmfResponse aisRet = 1  
2015/04/09 00:16:02|amfwrapper|Trace|AMF_Adaptor|system 140376849086208 -  
/vobs/ims/ipworks/src/common/coremw_adaptor/amf_adaptor_scc/src/AmfMonitorThread.cpp:242  
amfHealthCheck. >>  
2015/04/09 00:16:02|amfwrapper|Trace|AMF_WRAPPER|TRACE 140376849086208 -  
/vobs/ims/ipworks/src/common/amfwrapper/amfwrapper_scc/src/AmfObserverImpl.  
cpp:85 doHealthCheck. >>
```

Example 22 AMF Logs



8 Appendix B: Capturing and Tracing the Messages

8.1 Capturing and Tracing the Access-Request Messages

To capture and analyze the Access-request messages between GGSN node and IPWorks Radius node, do the following:

Note: Type whatever you want to filter or search directly in the **Filter** area.

1. Capture the authentication/authorization traces between GGSN node and IPWorks Radius node.

```
#tcpdump -i sig_data_sp -s 0 port 1812 -w trace20130104_PS1.cap
```

trace20130104_PS1.cap is the name of trace file that you want to use to save the captured message.

2. Download the trace file trace20130104_PS1.cap and open it by the package analyzer-Wireshark.
3. In Wireshark, analyze the captured message by the following steps:
 - a. Filter the string radius.code == 1 to get the number of Access-request messages.
 - b. Filter the string radius.code == 2 to get the number of Access-accept messages.
 - c. Filter the string radius.code == 3 to get the number of Access-reject messages.

Based on the filter output:

— Normal scenario

The best case is the number of Access-request messages = Access-accept + Access-reject. Additionally, the deviation can be ignored when the diff < 10 because of the manual operation.

— Abnormal scenario

If the number of Access-request messages > Access-accept + Access-reject, the Radius AAA server does not reply all the request messages sent from the GGSN side. In this abnormal situation, enable the logs in Radius AAA and trace the message in the Radius stack, Radius Backend by Acct-Session-Id and the time.



8.2 Capturing and Tracing the Accounting-request Messages

To capture and analyze the Accounting-request messages between GGSN node and IPWorks Radius node, do the following:

Note: Type whatever you want to filter or search directly in the **Filter** area.

1. Capture the accounting traces between GGSN node and IPWorks Radius node.

```
# tcpdump -i bond0 -s 0 port 1813 -w trace20130104_PS1.cap
```

trace20130104_PS1.cap is the name of trace file that you want to use to save the captured message.

2. Download the trace file and open it by the package analyzer-Wireshark.
3. In Wireshark, analyze the captured message by the following steps:

Prerequisite: The **proxy** function is enabled, the **interim update** function is enabled, and the **Disconnection message (DM)** is disabled. For how to enable and disable the previous functions, see the following subsections.

- a. Filter the string `radius.Acct_Status_Type == 1` to get the number of accounting-start messages.
- b. Filter the string `radius.Acct_Status_Type == 2` to get the number of accounting-stop messages.
- c. Filter the string `radius.Acct_Status_Type == 3` to get the number of accounting-update messages.
- d. Filter the string `radius.code == 5` to get the number of accounting-response messages.



Reference List

Ericsson Documents

- [1] IPWorks Manual Health Check
- [2] Glossary of Terms and Acronyms
- [3] Trademark Information
- [4] Typographic Conventions
- [5] Check Alarm Status
- [6] Fault Management
- [7] Data Collection Guideline for IPWorks
- [8] IPWorks Alarm List
- [9] IPWorks Measurement List
- [10] IPWorks Performance Measurements
- [11] Performance Management Report File Format
- [12] View Software Information
- [13] IPWorks DNS, ASDNS, ENUM Parameter Description
- [14] Configure MySQL NDB Cluster
- [15] IPWorks Configuration Management
- [16] View License Information
- [17] Storage Server, MySQL Cluster Node Unreachable
- [18] Create Backup
- [19] Restore Backup
- [20] Managed Object Model (MOM)
- [21] Storage Server, MySQL Cluster Node Unreachable
- [22] Storage Server, MySQL Database Unreachable
- [23] Storage Server, The MySQL Replication for Geographic Redundancy Failed



- [24] IPWorks Auto Deployment Guideline for KVM - DL380 Gen9
- [25] IPWorks Auto Deployment Guideline for KVM - DL380 Gen10
- [26] IPWorks Deployment Guide
- [27] IPWorks Initial Configuration, 5/1553-AVA 901 33/3 Uen
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- [38] LDE Scaling User's Guide, 3/1553-ANA 901 39/4 Uen

Online References

- [39] [MySQL 5.5 Reference Manual](#)