

Infrastructure Adaptation

DESCRIPTION

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1 Understanding Infrastructure Adaptation

1.1 Key Infrastructure Adaptation Concepts

This description covers changes of fundamental parameters related to the Transport managed area, and how these changes can affect the service availability of the Managed Element (ME).

The Infrastructure Adaptation Management here concerns the following operation:

- Change of Maximum Transmission Unit (MTU) size.

Admonition texts in the specific Operating Instructions indicate the risks and disturbance impact in each case, for example, whether a cluster reboot is needed.

1.2 Change of MTU Size

The Managed Element (ME) changes to initially set the MTU parameter described in this document only concerns a NE which is deployed with the embedded Virtual IP (VIP) addressing framework “eVIP” and operating system infrastructure “LDEwS”. The upper limit for the MTU parameter depends on the internal infrastructure underlay and hardware upon which the NE is deployed. At the Ethernet level, an extra 48 bytes of payload headroom is required in Ethernet frames to allow for Network Element (NE) internal packet encapsulation.

Note: For specific NEs using the SCTP protocol the change of MTU size may require reconfiguration of MTU specific parameter in the SS7CAF. For more information regarding the use-case of Virtual IP addressing with eVIP, refer to the SS7CAF documentation.

There are two distinct modes of configuration used for configuring MTU in a NE deployed with eVIP. The applicable configuration mode is determined by the value set to the parameter **EvipParam=mtu**.

In the first configuration mode - Infrastructure Mode, the **EvipParam=mtu** parameter value is initialized to value “0” and must afterwards not be changed through the North Bound element management interface. In the Infrastructure Mode, the procedure for changing MTU value on network interfaces is controlled by LDEwS and therefor the LDEwS Management Guide must be consulted.

In the second mode - Framework Mode, the **EvipParam=mtu** parameter value may be changed. For example, a parameter value originally set to 1452 bytes may be changed to a lower value of 1280, or to a higher value of 1500. In the Framework Mode the procedure for changing MTU values is described in the OPI [Change Maximum Transmission Unit Size](#).



From the North Bound interface used for management of the NE, the parameter **EvipParam=mtu** can be reached as shown in Example 1 using the Ericsson Command-Line Interface (ECLI):

```
>ManagedElement=myNODEname,Transport=1,Evip=1,EvipParams=1,EvipParam=mtu
```

Example 1 Changing the MTU Parameter

Note: Changing the value of **EvipParam=mtu** in-service requires a cluster reboot, causing an interruption of service.

2 Basic Infrastructure Adaptation Procedures

Infrastructure Adaptation concerns change of operation according to the below listed OPI and provides related auxiliary instruction guidelines:

— Change Maximum Transmission Unit Size

The instruction in the OPI **Change Maximum Transmission Unit Size** describes how to identify which mode of configuration for MTU size changes must be used for the NE. That is, MTU size change implemented according to the Infrastructure Mode procedures or MTU size change implemented according to the Framework Mode procedures.

Note: The instructions for changing MTU value in the OPI **Change Maximum Transmission Unit Size** must only be used for MTU changes done in the Framework Mode.

2.1 Changing MTU Size in the Infrastructure Mode

In the configuration mode - Infrastructure Mode, all changes of MTU values must be done through the LDEwS operating system infrastructure. The **LDEwS Management Guide** describes the procedures for setting MTU size values on interfaces.

When implementing the instructions for changing MTU values as described in the **LDEwS Management Guide**, it must in addition be ascertained that the Infrastructure Mode is initialized.

The Initialization of Infrastructure Mode can take place either before or after the LDEwS invoked change of MTU value for the concerned network interfaces has been done.

Initializing the Infrastructure Mode is done by setting **EvipParam=mtu** value to “0”. Thereafter, that “0” value must not be changed. The “0” value is a unique characteristic of the Infrastructure Mode.



Note: Changing the value of **EvipParam=mtu** in-service requires a cluster reboot, causing an interruption of service.

When the initialization step is completed, the LDEwS invoked change of MTU value can be done, per network interface, as described in **LDEwS Management Guide**. Alternatively, the LDEwS invoked changes of MTU value can be done prior to the Framework Mode initialization step. For example, in the special case, when the LDEwS default MTU value already given by LDEwS to the network interfaces, equals the required MTU size values, there is no need to reconfigure the already given MTU value for the network interfaces after the Infrastructure Mode initialization.

Note:

- Until the LDEwS invoked MTU configuration step is complete for all the interfaces to be changed, the nodes of the cluster (for instance, VMs) must not be re-loaded.
- To avoid fragmentation of incoming packets from external networks it is recommended that Interfaces on the backplane interfaces are configured with an MTU value of 48 bytes higher than that of the MTU value configured to front-end interfaces facing external networks connected to gateway routers towards DCN.

2.2 Changing MTU Size in the Framework Mode

The MTU configuration mode - Framework Mode, is recognized by a non-zero value assigned to **EvipParam=mtu**. In case the **EvipParam=mtu** has been set to a non-zero value, for example 1452 bytes, that means that the value of this parameter can be changed. For example, the value can be changed to 1500 bytes, provided that the internal switching infrastructure is able to accommodate a payload of at least 1548 bytes in its Ethernet frames. In this example, the desired payload of 1500 bytes plus the 48 extra bytes used for internal encapsulation, in total, equals the required headroom in Ethernet frames for carrying 1548 bytes.

Note: Changing the value of **EvipParam=mtu** in-service, requires a cluster reboot, causing an interruption of service.

The default value of **EvipParam=mtu** is 1452 bytes, which implies Framework Mode. Furthermore, the value of 1452 bytes here allows for an unfragmented free passage of 1452 byte IP packets within the system internal IPv6 tunnels, when the undelaying Ethernet frames can carry a 1500 bytes total payload. That is, IP packets of 1452 byte + 48 byte overhead for IPv6 internal tunnel encapsulation is system internally handled unfragmented.

The default value 1452 works for the widest variety of available Ethernet switching infrastructure underlay and hardware and there is in general no need to deviate from the default value.

The OPI Change Maximum Transmission Unit Size describes for the Framework Mode, the detailed command steps that are required to change the numerical value of the **EvipParam=mtu** parameter.