

# vMTAS Network Impact Report from 1.14.0 to 1.15.0

MTAS

NETWORK IMPACT REPORT

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# 1 Introduction

This Network Impact Report (NIR) describes how vMTAS 1.15.0, with new and enhanced features and corrections, affects vMTAS 1.14.0. The NIR also describes the impact on the overall network, including all affected products and functions.

This document covers the following new and enhanced features:

## **New Features**

- 5G TADS adaptation
- MTAS call success rate and drop rate per PLMN
- Protection against endpoints not including SDP in 200OK
- Reporting Ro CCR(Terminate) failure over Rf interface
- Support CAP call forwarding indication in MTAS
- Unified roaming determination correction and support for domestic roaming in multiple services

## **Enhanced Features**

- MTAS barring program enhancements
- Multi-X: Active persona device selection (former Multi-X: Hunting on persona)
- Remove Service-Interact-Info Header
- Ro Announcement for errors without Announcement AVP (Phase 2)
- Ro Announcement for errors without Announcement AVP (Phase 3)
- Supplementary Service support for multi-persona in IMS/VoLTE

For more information on the changed features, see Section 5 on page 23.

## 1.1 Terms of Phasing Out Features

The following terms are used when phasing out and removing features from the product:

### **Deprecated**

A feature that is deprecated means that the feature is still there and usable, but is now substituted by another feature, and is subject to be made obsolete or be deleted after one year. During the time from deprecation to making a feature



obsolete or deleted, all use of the deprecated feature needs to be migrated to the new feature.

### **Obsolete**

Making a feature obsolete means, that the feature or parts of it might be still part of the product (for technical reasons) but are not supported anymore. Use of these features is not possible.

### **Deleted**

Deletion means that the feature is deleted as such, it is not visible and there is no way to use it any more, from the current Release and onwards.



## 2 General Impact

This section describes the general impact owing to the introduction of vMTAS 1.15.0.

### 2.1 Backward Compatibility

vMTAS 1.15.0 is backward compatible and unless stated otherwise, legacy behavior is preserved.

#### 2.1.1 Interoperable Network Elements

The interoperable Network Elements for vMTAS 1.15.0 are described in Table 1.

Table 1 Supported Versions of Network Elements

Network Element	Earliest Supported Versions
MRS	14A
CSCF	14A
HSS	14A
OSS-RC	<p>O16A:</p> <p>Upgrade for OSS-RC is only needed when new parameters and counters are introduced in MTAS and are to be used.</p> <p>Up to O18B:</p> <p>The vMTAS 1.15 is backward compatible except synchronizing Number Normalization, Number Analysis and Carrier Select configuration. The same function level exists, but the method for synchronizing the configuration is changed. Respective Table EditAction and CommitAction commands need to be executed before and after the configuration change.</p>
EMA	7.0 CP2
SBG	15B
vENM	<p>vMTAS Lifecycle Management requires 17.15(-3.6.8) version of VNF-LCM; therefore use the 18A release of ENM.</p> <p>Up to ENM 19.1:</p> <p>The vMTAS 1.15 is backward compatible except synchronizing Number Normalization, Number Analysis and Carrier Select configuration. The same function level exists, but the method for synchronizing the configuration is changed. Respective Table EditAction and CommitAction commands need to be executed before and after the configuration change.</p>

### 2.2 Capacity and Performance

#### 2.2.1 Subscriber Capacity

The subscriber capacity is not affected by the introduction of vMTAS 1.15.0.



The number of half call establishments and releases per second determines the need of processing resources. Processing capacity is the limiting factor for the MMTel, SCC, Conf, NW, and SIP Trunking AS.

## **2.2.2 Network Performance and Traffic Capacity**

Between vMTAS release 1.14.0 and 1.15.0, Capacity can be considered roughly aligned with 1.14.0 release for SCC AS, MMTel AS and NW AS.

## **2.2.3 License Handling**

It is mandatory to use Network License Server (NeLS) product with vMTAS 1.15.0.

For more information, refer to [MTAS Licenses](#).





## 3 Licenses

This section lists the new and changed license codes added in vMTAS 1.15.0. For a list of (v)MTAS licenses, refer to [MTAS Licenses](#).

### 3.1 New Licenses

The new licenses are shown in Table 2.

Table 2 New Licenses

Name	Identity	Version
-	-	-

### 3.2 Changed Licenses

The changed licenses are shown in Table 3.

Table 3 Changed Licenses

Name	Description of Changes
-	-

### 3.3 Deprecated Licenses

The deprecated licenses are shown in Table 4.

Table 4 Deprecated Licenses

Name	Description of Changes
-	-

### 3.4 Deleted Licenses

The deleted licenses are shown in Table 5.

Table 5 Deleted Licenses

Name	Description of Changes
-	-





## 4 Interfaces

This section describes interface changes between the existing and new revisions of the product.

### 4.1 Inter-Node Interfaces

The changes to the inter-node interfaces are described in Table 6.

The description of impact is as follows:

- **No Impact** - New version can be installed without affecting other nodes.
- **Minor Impact** – There are changes, but with extra configuration the previous behavior can be kept.
- **Major Impact** – The change has made an interface backward incompatible.
- **New Interface** – The interface did not exist in the previous revision.
- **Obsolete** – The interface no longer exists.

Table 6 Changed Inter-Node Interfaces

Interface	Protocol	Impact	Description of Changes
ISC	SIP	Minor Impact	When received BYE message, with transport, specified in request URI, MTAS uses this transport for outgoing BYE transaction. TR HX43449.
SH	Diameter	Minor Impact	If NPLI request is sent with InitiateActiveLocationRetrieval current-location value, then the received location information is accepted even if the CurrentLocationRetrieved indication is missing from the answer. (TR HX51849)
ISC	SIP	Minor Impact	When mtasRbtSendonlySdp is set to any value except 0, It's pre-requisite to support 100rel in initial INVITE for RBT service to trigger tone. (TR HX36395)
Rf	Diameter	Minor Impact	New ACR[Event] with Ro failure information is sent over Rf interface
ISC	SIP	Minor Impact	If the SDP answer has been provided in an unreliable provisional response and there is no SDP body in the received 200 OK response to the initial INVITE request, MTAS will reject the call initiation if mtasSipOfferAnswerExchangeControl =1.
Sh	Diameter	Minor Impact	When error response is received for INVITE in SCC Terminating or SCC Terminating Unregistered session, if served user location is not available and mtasSccNpliTerminatingOnInviteReject is enabled, MTAS will trigger NPLI query to obtain the location information.



Table 6 Changed Inter-Node Interfaces

Interface	Protocol	Impact	Description of Changes
Mp	H.248	Minor Impact	Newly introduced, supported H.248 error codes returned by vMRF or native MRFP: <ul style="list-style-type: none"><li>• 403 (Syntax error in transaction request)</li><li>• 410 (Incorrect identifier)</li><li>• 442 (Syntax Error in Command)</li><li>• 449 (Unsupported or Unknown Parameter or Property Value)</li><li>• 502 (Not ready)</li><li>• 503 (Service Unavailable)</li><li>• 531 (Permanent Network failure)</li><li>• 533 (Response exceeds maximum transport PDU size)</li></ul> (TR HX51034)
Mr	SIP	Minor Impact	For HX31478 we introduced a new parameter called MtasMrfcNodePriority. Nodes with "Primary" priority value will be preferred over nodes with "Backup" priority value, with the exception when the nodes with primary value are not working in the current selection group.
Mr	SIP	Minor Impact	If mtasMrControllerMrfcNodeRecoveryTimer is set to 0, then none of the configured MRFCs will be marked as "NOT_RESPONDING". (TR HX52510)
Ut, CAI3G	XCAP, CAI3G	Minor Impact	Tomcat is updated 8.5.37 version and JRE/JDK is updated 8u202 version.
ISC, Ma	SIP	Major Impact	<p>MMTel AS and SCC AS are starting to use the AS generic SIP port instead of using dedicated SIP ports for each session case and registration state.</p> <p>The use of the AS generic SIP port requires that the application server trigger in HSS includes the AS name in the trigger. The AS name is added in the Route header in the "as=" parameter.</p> <p>Example for MMTel AS:</p> <p>Route:&lt; sip:mtas.operator.net; as=MMTelAS; lr &gt;</p> <p>and for SCC AS:</p> <p>Route:&lt; sip:mtas.operator.net; as=SCC AS; lr &gt;</p> <p>To be able to determine the session case and reg state, the P-Served-User header must be included in the SIP request.</p> <p>The AS generic SIP port is also handling the PSI functionality over the MA interface. In this case, the AS name must not be included in the Route header.</p> <p>The currently used AS choosing algorithm, based on the configured ports, is deprecated from the 1.10 release.</p>

## 4.2 Operation and Maintenance

This section describes changes to attributes, alarms, triggers, and performance measurement counters.

### 4.2.1 Provisioning

This section describes new, changed, deprecated, obsolete and deleted provisioning attributes.



#### 4.2.1.1 New Provisioning Attributes

The new provisioning attributes are listed in Table 7.

Table 7 New Provisioning Attributes

Interface	Protocol	Description of Changes
CAI3G	CAI3G	New elements introduced in Multi-Persona Service: <ul style="list-style-type: none"> <li>Supplementary-service identity code (not supported in this LSV)</li> <li>User default identity (used by a user to set default persona within a mobile subscription)</li> <li>User usage (used by a user to set persona policy)</li> </ul>
CAI3G	CAI3G	New element introduced in Mobile subscription list: SIP CC impi, (used when registering a sip control channel).
CAI3G	HTTP	New MO Type MMTelContext is introduced with MMTel Context Identity. CAI3G MMTel context Create/Set/Get /Delete is supported. MMTel Context has MMTel <context-identity> element. It must be present always. 2 new lists are introduced in Multi Persona service: public-identity-list and subscription-identity-mapping-list.
Sh	Diameter	MMT_SERVICE_CONFIG service document is appended with zero or more MMTel Context data. 2 new lists are introduced in Multi Persona service: public-identity-list and subscription-identity-mapping-list.

#### 4.2.1.2 Changed Provisioning Attributes

The changed provisioning attributes are listed in Table 8.

Table 8 Changed Provisioning Attributes

Interface	Protocol	Impact	Description of Changes
-	-	-	-

#### 4.2.1.3 Deprecated Provisioning Attributes

The deprecated provisioning attributes are listed in Table 9.

Table 9 Deprecated Provisioning Attributes

Interface	Protocol	Description of Changes
-	-	-

#### 4.2.1.4 Obsolete Provisioning Attributes

The obsolete provisioning attributes are listed in Table 10.

Table 10 Obsolete Provisioning Attributes

Interface	Protocol	Description of Changes
-	-	-



#### 4.2.1.5 Deleted Provisioning Attributes

The deleted provisioning attributes are listed in Table 11.

Table 11 Deleted Provisioning Attributes

Interface	Protocol	Description of Changes
-	-	-

#### 4.2.2 Configuration

This section describes new, changed, deprecated, obsolete, and deleted configuration attributes.

For more information on attributes and parameters, refer to [vMTAS Master Parameter Value List](#).

##### 4.2.2.1 New Configuration Attributes

The new configuration attributes are listed in Table 12.

Table 12 New Configuration Attributes

Attribute Name	Description
mtasAsIwInviteHeaderFilter	Added but not supported
mtasAsIwInviteHeaderFilterSessionCase	Added but not supported
MtasBNumberType	Added but not supported
MtasBNumberTypeList	Added but not supported
mtasBNumberTypeTrunkContext	Added but not supported
mtasBNumberTypeTrunkGroup	Added but not supported
MtasCallType	Added but not supported
MtasCallTypeList	Added but not supported
mtasCallTypeTrunkContext	Added but not supported
mtasCallTypeTrunkGroup	Added but not supported
mtasChargingProfileEnhancedReportRoFailureOverRf	Now supported
mtasMmtDomesticRoaming	Added and supported
mtasMmtNpliAccessDomainBasedOnUpli	Added but not supported
mtasMmtVersion	Now supported
mtasMrfcNodePriority	Added and supported
mtasNumNormLocalnessExceptionListBehaviour	Added but not supported
mtasNumNormLocalnessInterLataAdjBehaviour	Added but not supported
mtasSccNpliAccessDomainBasedOnUpli	Added but not supported
mtasSccNpliTerminatingOnInviteReject	Added and supported



Attribute Name	Description
mtasSdsConditionalGlobalTitle	Added but not supported
mtasSdsConditionalServiceKey	Added but not supported
mtasSipOfferAnswerExchangeControl	Added and supported
mtasSipTransparentTelContact	Added but not supported
mtasSrvccPreconditionTime	Now supported
mtasTadsSuppressCsRetryWhen5G	Added and supported
MtasTrunkGroup	Added but not supported
mtasTrunkGroupAddLataForTollFree	Added but not supported
mtasTrunkGroupAdministrativeState	Added but not supported
VtasCallTypeList	Added but not supported
VtasDnm	Added but not supported
vtasDnmAdministrativeState	Added but not supported
vtasDnmAnnLocalFormatDialingFailure	Added but not supported
vtasDnmAnnPreventedAccessTypeWifi	Added but not supported
vtasDnmAnnRejectInvalidDialedNumberLength	Added but not supported
vtasDnmAnnRejectInvalidNPA	Added but not supported
vtasDnmAnnRejectLocalFormatNbr	Added but not supported
vtasDnmAnnRejectLocalFormatNbrRestriction	Added but not supported
vtasDnmAnnRejectShortCodeNbr	Added but not supported
vtasDnmAnnShortCodeFailure	Added but not supported
vtasDnmAnnTransitionArea	Added but not supported
vtasDnmAnnWarningLongDistance	Added but not supported
vtasDnmDropback	Added but not supported
vtasDnmFixedDeviceSupport	Added but not supported
vtasDnmFixedDeviceSupportApplicableForLocalness	Added but not supported
vtasDnmNationalAfterLocal	Added but not supported
vtasMmtDomesticRoaming	Now supported
vtasMmtVersion	Now supported
VtasTrunkGroup	Added but not supported
vtasTrunkGroupAddLataForTollFree	Added but not supported
vtasTrunkGroupAdministrativeState	Added but not supported
vtasTrunkGroupDropBack	Added but not supported
VtasTrunkGroupForVoiceMail	Added but not supported
vtasTrunkGroupForVoiceMailRetrievalOrDeposit	Added but not supported
vtasTrunkGroupForVoiceMailTrunkContext	Added but not supported
vtasTrunkGroupForVoiceMailTrunkGroup	Added but not supported



#### 4.2.2.2 Changed Configuration Attributes

The changed configuration attributes are shown in Table 13.

Table 13 Changed Configuration Attributes

Attribute Name	Description of Changes
DN_mmasMemoryMonitoringId=1,mmasMonitoringId=1,mmasId=1 "enabled"	enabled is set to false ensuring that the alarm will not come anymore. For more information, see section Deleted Alarms.
mtasChargingProfileRoRejectAnn	new Pattern supported: ^\$ ^ [0-9]{4} \   ann=[a-zA-Z0-9_]+\$
mtasMrControllerMrfcNodeRecoveryTimer	Range changed from 10–7200 to 0–7200. 0 means that the timer is not started, and the MrfcNode is not put to blacklist at all. See HX52510.
mtasOcbBCatNumBarred	Support of wildcard "^" character in number matching pattern
mtasOcbBCatNumExempted	Support of wildcard "^" and fixed length limiter "\$" in number matching pattern
mtasOcbOpBCatNumBarred	Support of wildcard "^" character in number matching pattern
mtasOcbOpBCatNumExempted	Support of wildcard "^" and fixed length limiter "\$" in number matching pattern
mtasStodCallPullPolicyRoaming	New enum value: 3: SAME_NETWORK. Pull from roaming device is allowed when target device and pulling device are roaming in same network. Device (mobile/fixed) in home network can always pull the call.
MtasTestAnnNumbers	According our documentation for MtasTestAnnNumbers, the maximum number is 255. This number was not checked before, now this fault is fixed. See HX47949.
vtasOcbBCatNumBarred	Support of wildcard "^" character in number matching pattern
vtasOcbBCatNumExempted	Support of wildcard "^" and fixed length limiter "\$" in number matching pattern
vtasOcbOpBCatNumBarred	Support of wildcard "^" character in number matching pattern
vtasOcbOpBCatNumExempted	Support of wildcard "^" and fixed length limiter "\$" in number matching pattern

#### 4.2.2.3 Deprecated Configuration Attributes

The deprecated configuration attributes are listed in Table 14.

Table 14 Deprecated Configuration Attributes

Attribute Name	Description of Changes
MtasChargingProfileRoReject	Was never supported
mtasChargingProfileRoRejectGa	Was never supported
mtasSdsConditionalServiceKeys	Was never supported





#### 4.2.2.4 Obsolete Configuration Attributes

The configuration MOCs and attributes made obsolete are shown in Table 15.

Table 15 Obsolete Configuration Attributes

Attribute Name	Description of Changes
mtasSystemConstantSC1	Obsoleted (Parameter provides a possibility to configure MMTel AS to suppress the general No Reply Timer supervision in case CFNR or FCD-NR supervisions expire. This in order to avoid conflicting actions resulting in failed diversion.)
SC 72	System Constant 72 is obsoleted
SC 86	System Constant 86 is obsoleted

#### 4.2.2.5 Deleted Configuration Attributes

The deleted configuration attributes are shown in Table 16.

Table 16 Deleted Configuration Attributes

Attribute Name	Description
-	-

### 4.2.3 Fault Management

This section describes changed, new, and removed alarms.

#### 4.2.3.1 New Alarms

The new alarms are shown in Table 17.

Table 17 New Alarms

Alarm Name	Description
-	-

#### 4.2.3.2 Changed Alarms

The changed alarms are shown in Table 18.

Table 18 Changed Alarms

Alarm Name	Description of Changes
-	-



### 4.2.3.3 Deleted Alarms

The deleted alarms are shown in Table 19.

Table 19 Deleted Alarms

Alarm Name	Description
MMAS, Heap Memory Load Limit Exceeded	<p>The alarm was raised by the Multimedia Application Server (MMAS) as part of overload protection when the heap memory load exceeds a configured threshold value.</p> <p>The reason to delete the alarm is because the behavior of standard Java raise the alarm, when the memory is allocated, and cease the alarm, when the garbage collection is executed. This result was a flaky alarm, without traffic impact. See HW61234.</p>

### 4.2.4 IFC Triggers

#### 4.2.4.1 New IFC Triggers

The new IFC triggers are listed in Table 20.

Table 20 New IFC Triggers

Reason	IFC
-	-

#### 4.2.4.2 Changed IFC Triggers

The changed IFC triggers are listed in Table 21

Table 21 Changed IFC Triggers

Reason	IFC
-	-

### 4.2.5 Performance Measurement

This section lists new and changed, deprecated, obsolete, and deleted Performance Measurement (PM) counters.

For more information on counter description, refer to [MTAS Performance Measurements](#).

#### 4.2.5.1 New PM Counters

The new PM counters are listed in Table 22.



Table 22 New PM Counters

Counter Name	Description
MtasMmtInitOrigPlmnSessNokNet	Now supported
MtasMmtInitOrigPlmnSessNokService	Now supported
MtasMmtInitOrigPlmnSessNokSupportNode	Now supported
MtasMmtInitOrigPlmnSessNokUser	Now supported
MtasMmtInitOrigPlmnUnregSessNokNet	Now supported
MtasMmtInitOrigPlmnUnregSessNokService	Now supported
MtasMmtInitOrigPlmnUnregSessNokSupportNode	Now supported
MtasMmtInitOrigPlmnUnregSessNokUser	Now supported
MtasMmtInitTermPlmnSessNokNet	Now supported
MtasMmtInitTermPlmnSessNokService	Now supported
MtasMmtInitTermPlmnSessNokSupportNode	Now supported
MtasMmtInitTermPlmnSessNokUser	Now supported
MtasMmtInitTermPlmnUnregSessNokNet	Now supported
MtasMmtInitTermPlmnUnregSessNokService	Now supported
MtasMmtInitTermPlmnUnregSessNokSupportNode	Now supported
MtasMmtInitTermPlmnUnregSessNokUser	Now supported
MtasMmtOrigPlmnNetworkSuccessSessionEstablish	Now supported
MtasMmtOrigPlmnUnregNetworkSuccessSessionEstablish	Now supported
MtasMmtTermOrigPlmnSessNok	Now supported
MtasMmtTermOrigPlmnSessNokECause	Now supported
MtasMmtTermOrigPlmnSessNokServiceCause	Now supported
MtasMmtTermOrigPlmnSessOk	Now supported
MtasMmtTermOrigPlmnUnregSessNok	Now supported
MtasMmtTermOrigPlmnUnregSessNokECause	Now supported
MtasMmtTermOrigPlmnUnregSessNokServiceCause	Now supported
MtasMmtTermOrigPlmnUnregSessOk	Now supported
MtasMmtTermPlmnNetworkSuccessSessionEstablish	Now supported
MtasMmtTermPlmnUnregNetworkSuccessSessionEstablish	Now supported
MtasMmtTermTermPlmnSessNok	Now supported
MtasMmtTermTermPlmnSessNokECause	Now supported
MtasMmtTermTermPlmnSessNokServiceCause	Now supported
MtasMmtTermTermPlmnSessOk	Now supported
MtasMmtTermTermPlmnUnregSessNok	Now supported
MtasMmtTermTermPlmnUnregSessNokECause	Now supported
MtasMmtTermTermPlmnUnregSessNokServiceCause	Now supported



Counter Name	Description
MtasMmtTermTermPlmnUnregSessOk	Now supported
MtasSccInitOrigCsPlmnSessAttempts	Now supported
MtasSccInitOrigCsPlmnSessNokNet	Now supported
MtasSccInitOrigCsPlmnSessNokUser	Now supported
MtasSccInitOrigCsPlmnSessOk	Now supported
MtasSccInitTermCsPlmnSessAttempts	Now supported
MtasSccInitTermCsPlmnSessNokNet	Now supported
MtasSccInitTermCsPlmnSessNokUser	Now supported
MtasSccInitTermCsPlmnSessOk	Now supported
MtasSccTermOrigCsPlmnSessCompletionAttempts	Now supported
MtasSccTermOrigCsPlmnSessNok	Now supported
MtasSccTermOrigCsPlmnSessOk	Now supported
MtasSccTermTermCsPlmnSessCompletionAttempts	Now supported
MtasSccTermTermCsPlmnSessNok	Now supported
MtasSccTermTermCsPlmnSessOk	Now supported
MtasSdsPlmnCapInitDPOrigNokE	Now supported
MtasSdsPlmnCapInitDPOrigNokI	Now supported
MtasSdsPlmnCapInitDPOrigOk	Now supported
MtasSdsPlmnImrnNokE	Now supported
MtasSdsPlmnImrnNokI	Now supported
MtasSdsPlmnImrnOk	Now supported

#### 4.2.5.2 Changed PM Counters

The changed PM counters are listed in Table 23.

Table 23 Changed PM Counters

Counter Name	Description of Changes
-	-

#### 4.2.5.3 Deprecated PM Counters

The deprecated PM counters are listed in Table 24.

Table 24 Deprecated PM Counters

Counter Name	Description of Changes
MtasMmtInitOrigSessNokNet	MtasMmtInitOrigPlmnSessNokNet counter can be used instead
MtasMmtInitOrigSessNokService	MtasMmtInitOrigPlmnSessNokService counter can be used instead



Counter Name	Description of Changes
MtasMmtInitOrigSessNokSupportNode	MtasMmtInitOrigPlmnSessNokSupportNode counter can be used instead
MtasMmtInitOrigSessNokUser	MtasMmtInitOrigPlmnSessNokUser counter can be used instead
MtasMmtInitOrigUnregSessNokNet	MtasMmtInitOrigPlmnUnregSessNokNet counter can be used instead
MtasMmtInitOrigUnregSessNokService	MtasMmtInitOrigPlmnUnregSessNokService counter can be used instead
MtasMmtInitOrigUnregSessNokSupportNode	MtasMmtInitOrigPlmnUnregSessNokSupportNode counter can be used instead
MtasMmtInitOrigUnregSessNokUser	MtasMmtInitOrigPlmnUnregSessNokUser counter can be used instead
MtasMmtInitTermSessNokNet	MtasMmtInitTermPlmnSessNokNet counter can be used instead
MtasMmtInitTermSessNokService	MtasMmtInitTermPlmnSessNokService counter can be used instead
MtasMmtInitTermSessNokSupportNode	MtasMmtInitTermPlmnSessNokSupportNode counter can be used instead
MtasMmtInitTermSessNokUser	MtasMmtInitTermPlmnSessNokUser counter can be used instead
MtasMmtInitTermUnregSessNokNet	MtasMmtInitTermPlmnUnregSessNokNet counter can be used instead
MtasMmtInitTermUnregSessNokService	MtasMmtInitTermPlmnUnregSessNokService counter can be used instead
MtasMmtInitTermUnregSessNokSupportNode	MtasMmtInitTermPlmnUnregSessNokSupportNode counter can be used instead
MtasMmtInitTermUnregSessNokUser	MtasMmtInitTermPlmnUnregSessNokUser counter can be used instead
MtasMmtOrigNetworkSuccessSessionEstablish	MtasMmtOrigPlmnNetworkSuccessSessionEstablish counter can be used instead
MtasMmtOrigUnregNetworkSuccessSessionEstablish	MtasMmtOrigPlmnUnregNetworkSuccessSessionEstablish counter can be used instead
MtasMmtTermNetworkSuccessSessionEstablish	MtasMmtTermPlmnNetworkSuccessSessionEstablish counter can be used instead
MtasMmtTermOrigSessNok	MtasMmtTermOrigPlmnSessNok counter can be used instead
MtasMmtTermOrigSessNokECause	MtasMmtTermOrigPlmnSessNokECause counter can be used instead
MtasMmtTermOrigSessNokServiceCause	MtasMmtTermOrigPlmnSessNokServiceCause counter can be used instead
MtasMmtTermOrigSessOk	MtasMmtTermOrigPlmnSessOk counter can be used instead
MtasMmtTermOrigUnregSessNok	MtasMmtTermOrigPlmnUnregSessNok counter can be used instead
MtasMmtTermOrigUnregSessNokECause	MtasMmtTermOrigPlmnUnregSessNokECause counter can be used instead
MtasMmtTermOrigUnregSessNokServiceCause	MtasMmtTermOrigPlmnUnregSessNokServiceCause counter can be used instead
MtasMmtTermOrigUnregSessOk	MtasMmtTermOrigPlmnUnregSessOk counter can be used instead



Counter Name	Description of Changes
MtasMmtTermTermSessNOk	MtasMmtTermTermPlmnSessNOk counter can be used instead
MtasMmtTermTermSessNOkECause	MtasMmtTermTermPlmnSessNOkECause counter can be used instead
MtasMmtTermTermSessNOkServiceCause	MtasMmtTermTermPlmnSessNOkServiceCause counter can be used instead
MtasMmtTermTermSessOk	MtasMmtTermTermPlmnSessOk counter can be used instead
MtasMmtTermTermUnregSessNOk	MtasMmtTermTermPlmnUnregSessNOk counter can be used instead
MtasMmtTermTermUnregSessNOkECause	MtasMmtTermTermPlmnUnregSessNOkECause counter can be used instead
MtasMmtTermTermUnregSessNOkServiceCause	MtasMmtTermTermPlmnUnregSessNOkServiceCause counter can be used instead
MtasMmtTermTermUnregSessOk	MtasMmtTermTermPlmnUnregSessOk counter can be used instead
MtasMmtTermUnregNetworkSuccessSessionEstablish	MtasMmtTermPlmnUnregNetworkSuccessSessionEstablish counter can be used instead

#### 4.2.5.4 Obsolete PM Counters

The obsolete PM counters are listed in Table 25.

Table 25 Obsolete PM Counters

Counter Name	Description of Changes
-	-

#### 4.2.5.5 Deleted PM Counters

The deleted PM counters are shown in Table 26.

Table 26 Deleted PM Counters

Counter Name	Description of Changes
MtasSdsPlmnCapInitDPOrigPlmnOk	It was never supported.
MtasSdsPlmnCapInitDPOrigPlmnNOkE	It was never supported.
MtasSdsPlmnCapInitDPOrigPlmnNOkI	It was never supported.

### 4.3 Impacts to Continuous Delivery Machinery

This section summarizes the impacts to the Continuous Delivery Machinery, which can need changes based on the listed items.

A summary of impacts is shown in Table 27.



The description of impact is as follows:

- **No Impact** – This change has a very low chance to have an impact on any CD Machinery or can be activated with additional configuration.
- **Minor Impact** – This change has a medium chance to have an impact on any CD Machinery.
- **Major Impact** – This change is having an impact on CD Machinery with high probability.

Table 27 Summary of Impacts to CD Machinery

Service	Impact	Description of Changes
-	-	-

## 4.4 Summary of Impacts per Feature

All MTAS nodes in the network must be upgraded before taking new services in operation. This section summarizes the impact per feature when the feature is turned on. A summary of impacts per feature is shown in Table 28.

The description of impact is as follows:

- **No Impact** – This change has very low chance to have an impact or can be activated with additional configuration.
- **Minor Impact** – This change has medium chance to have an impact.
- **Major Impact** – This change has an impact with a high probability.

Table 28 Summary of Impacts per Feature

Feature	Service	Impact	Description of Changes
Support CAP call forwarding indication in MTAS	NorthboundCallControlS service	Minor Impact	When an MMTel CDIV diverts the call at Busy or No-Reply and if the SCP node armed event reporting with RRB (tBusy/tNoAnswer) before that, the ERB notification with the 'callForwarded' indication will be sent by the NCC service
Ro Announcement for errors without Announcement AVP	Online charging	No impact	MTAS plays default generic announcement before terminating the call if: * both primary and secondary Ro diameter connections are unavailable; * no receipt of CCA response to CCR message; when mtasChargingProfileRo RejectDefaultAnnRemot eUser or mtasChargin



MTAS Barring Program enhancement	Communication Barring	No Impact	Service is enhanced to support Wildcard character '^' and Fixed length delimiter '\$' in number matching pattern in respective CM's are configured.
5G TADS adaptation	Terminating Access Domain Selection (T-ADS)	Minor Impact	Stored Mobile Access Node is updated with information retrieved during T-ADS Information request. If RAT type returned by HSS is 1004 (E-UTRAN) then Mobile Access Node is set to mme_node. If RAT type returned by HSS is 1006 (NR) then Mobile Access Node is
Unified roaming determination correction and support for domestic roaming in multiple services	OCB	Minor Impact	The served user roaming status in OCB service will be determined by roaming determination.
	ICB	Minor Impact	The served user roaming status in ICB service will be determined by roaming determination.
	CAT	Minor Impact	The served user roaming status in CAT service will be determined by roaming determination.
	RBT	Minor Impact	The served user roaming status in RBT service will be determined by roaming determination.
	Northbound Call Control	Minor Impact	The served user roaming status in Northbound Call Control service will be determined by roaming determination.
	Charging	Minor Impact	The served user roaming status in Online Charging service will be determined by roaming determination.
	Call Pull	Minor Impact	New 'same network' policy introduced in call pull. Domestic roaming support added in Call Pull service.

## 4.5 Other Interface Impacts

All MTAS nodes in the network must be upgraded before taking new services in operation.

The changes to existing services are described in Table 29.

The description of impact is as follows:

— **No Impact** – New version can be installed without affecting other nodes.





- **Minor Impact** – There are changes, but with extra configuration the previous behavior can be kept.
- **Major Impact** – The change has made an interface backward incompatible.
- **New Interface** – The interface did not exist in the previous revision.
- **Obsolete** – The interface no longer exists.

Table 29 Other Interface Changes

Source of Change	Service	Impact	Description of Changes
HW67604	N/A	Minor Impact	Because of an earlier fault, NeLS Alarms were not cleared even if the related features were disabled in MTAS. Now after bug fix NeLS Alarms are only reported, if the related feature's administrativeState is enabled in MTAS.
HX51446	Network Announcement Service	Minor Impact	Network Announcement Service is suppressed on terminating MTAS when CCNL service is unlocked and CCNL is indicated.
HX33804	Customized Alerting Tones	Minor Impact	When transparent mode is on, CatService handles subsequent 183 provisional responses without SDP from network and forwards the message. If transparent mode is off, stops the message.
HX55002	SIP Upstream Overload Control	No Impact	With the updated algorithm MTAS reaches a stable load in an overload situation faster.
HW64046	Workflow	Minor Impact	In the scope of the TR we implemented hardening directives according to the MTAS Hardening guideline in the post_instantiation.py LCM script: A new Workflow Admin user is introduced (wf_adm) which is used by the script;
HX53550	Scaling out	Major Impact	Because of a newly identified fault, there might be problems with the MRFP connections (H248). The manual scale out documentation has been updated with an extra step, to do a small restart after the scaling out operation, which will mitigate this problem.
HX35573	SRVCC	No Impact	When a new attribute (mtasSrvccPreconditionTime) is set to a value greater than 0, SRVCC pre-alerting access transfer INVITE will be delayed by SCC AS if there's an early dialog that does not have QoS parameters negotiated (if preconditions are required)
HX17177	SFTP	Minor Impact	The following issue has been corrected: In SFTP NBI session, an unauthorized user was able to execute below commands to navigate to the folders and access file information. This was possible only when the user knows the exact name and path of the files/folders.
HX46931	vMTAS Nettrace	Minor Impact	Nettrace existing logic of matching subscriber ID was based on regular expressions, after the TR solution, exact match will be used for the filtering.
HX53546	Number Analysis	Major Impact	New action parameters that trigger the configuration sync. If PDB is used to configure the node, New version of PDB which supports action attributes shall be used.





## 5 Impact on MTAS Features

This section describes the impact on vMTAS 1.15.0 features when the feature is turned on.

### 5.1 5G TADS Adaptation

The T-ADS service updates stored mobile access node type depending on the RAT type returned by HSS during TADSinformation request. If RAT type returned by HSS equals to 1004 (E-UTRAN) then Mobile Access Node is set to mme\_node. If RAT type returned by HSS is equals to 1006 (NG) then Mobile Access Node is set to amf\_node. This new feature can be configured with the following CM attribute: `mtasTadsSuppressCsRetryWhen5G`.

#### Impact

No impact on capacity, performance, network elements, and operation.

### 5.2 MTAS Call Success Rate And Drop Rate per PLMN

New session setup and completion counters have been added in MMTel AS and SCC AS with PLMN and access type key information. These counters can be used to troubleshoot the network issues.

The following counters have been added to support this functionality:

- `MtasMmtOrigPlmnNetworkSuccessSessionEstablish`
- `MtasMmtOrigPlmnUnregNetworkSuccessSessionEstablish`
- `MtasMmtTermPlmnNetworkSuccessSessionEstablish`
- `MtasMmtTermPlmnUnregNetworkSuccessSessionEstablish`
- `MtasMmtInitOrigPlmnSessN0kService`
- `MtasMmtInitOrigPlmnUnregSessN0kService`
- `MtasMmtInitTermPlmnSessN0kService`
- `MtasMmtInitTermPlmnUnregSessN0kService`
- `MtasMmtInitOrigPlmnSessN0kNet`
- `MtasMmtInitOrigPlmnUnregSessN0kNet`
- `MtasMmtInitTermPlmnSessN0kNet`



- MtasMmtInitTermPlmnUnregSessN0kNet
- MtasMmtInitOrigPlmnSessN0kUser
- MtasMmtInitOrigPlmnUnregSessN0kUser
- MtasMmtInitTermPlmnSessN0kUser
- MtasMmtInitTermPlmnUnregSessN0kUser
- MtasMmtInitOrigPlmnSessN0kSupportNode
- MtasMmtInitOrigPlmnUnregSessN0kSupportNode
- MtasMmtInitTermPlmnSessN0kSupportNode
- MtasMmtInitTermPlmnUnregSessN0kSupportNode
- MtasMmtTermOrigPlmnSessOk
- MtasMmtTermOrigPlmnSessN0k
- MtasMmtTermOrigPlmnSessN0kECause
- MtasMmtTermOrigPlmnSessN0kServiceCause
- MtasMmtTermTermPlmnSessOk
- MtasMmtTermTermPlmnSessN0k
- MtasMmtTermTermPlmnSessN0kECause
- MtasMmtTermTermPlmnSessN0kServiceCause
- MtasMmtTermOrigPlmnUnregSessOk
- MtasMmtTermOrigPlmnUnregSessN0k
- MtasMmtTermOrigPlmnUnregSessN0kECause
- MtasMmtTermOrigPlmnUnregSessN0kServiceCause
- MtasMmtTermTermPlmnUnregSessOk
- MtasMmtTermTermPlmnUnregSessN0k
- MtasMmtTermTermPlmnUnregSessN0kECause
- MtasMmtTermTermPlmnUnregSessN0kServiceCause
- MtasSccInitOrigCsPlmnSessAttempts
- MtasSccInitTermCsPlmnSessAttempts
- MtasSccInitOrigCsPlmnSessOk



- MtasSccInitTermCsPlmnSessOk
- MtasSccInitOrigCsPlmnSessN0kNet
- MtasSccInitTermCsPlmnSessN0kNet
- MtasSccInitOrigCsPlmnSessN0kUser
- MtasSccInitTermCsPlmnSessN0kUser
- MtasSdsPlmnCapInitDP0rigOk
- MtasSdsPlmnCapInitDP0rigN0kE
- MtasSdsPlmnCapInitDP0rigN0kI
- MtasSdsPlmnImrnOk
- MtasSdsPlmnImrnN0kE
- MtasSdsPlmnImrnN0kI
- MtasSccTermOrigCsPlmnSessCompletionAttempts
- MtasSccTermTermCsPlmnSessCompletionAttempts
- MtasSccTermOrigCsPlmnSessOk
- MtasSccTermTermCsPlmnSessOk
- MtasSccTermOrigCsPlmnSessN0k
- MtasSccTermTermCsPlmnSessN0k

Additionally, when error response is received for INVITE in SCC Terminating or SCC Terminating Unregistered session, if served user location is not available and `mtasSccNpliTerminatingOnInviteReject` is enabled, MTAS will trigger NPLI query to obtain the location information.

### Impact

No impact on capacity, performance, network elements, and operation.

## 5.3 Protection Against Endpoints Not Including SDP in 200OK

If MTAS receives a 200 OK response to an INVITE request without SDP and this has been preceded by an unreliable provisional response with SDP, then if an extended Offer/Answer exchange verification is enabled (`mtasSipOfferAnswerExchangeControl = 1`; REJECT\_ON\_UNRELIABLE\_SDP\_ANSWER), MTAS immediately shall release the session.



### **Impact**

No impact on capacity, performance, network elements, and operation.

## 5.4 Reporting Ro CCR(Terminate) failure over Rf interface

This feature extends the currently implemented Ro failure handling with providing information about the Ro CCR (Termination) failure on Rf interface. All Ro failures handled by CCFH are currently reported on Rf except for the Ro CCR (Termination) failure and backward compatibility is ensured by suppressing Ro-Information AVP in ACRs.

This feature can be controlled with the following Configuration Attribute:

— `mtasChargingProfileEnhancedReportRoFailureOverRf`

### **Impact**

No impact on capacity, performance, network elements, and operation.

## 5.5 Support CAP Call Forwarding Indication in MTAS

When an MMTel Communication Diversion service diverts the call at Busy or No-Reply and if the SCP node armed event reporting with RRB (tBusy/tNoAnswer) before that, the ERB notification with the 'callForwarded' indication will be sent by the NCC service.

### **Impact**

No impact on capacity, performance, network elements, and operation.

## 5.6 Unified Roaming Determination Correction And Support for Domestic Roaming in Multiple Services

MMTel AS provides unified roaming determination for originating and terminating services. For domestic roaming evaluation, services can select between MCC-only and MCC+MNC based roaming determination. This feature enhancement can be configured with the following CM attributes: `mtasMmtDomesticRoaming`, `mtasMmtVersion`, `vtasMmtDomesticRoaming`, and `vtasMmtVersion`.

### **Impact**

No impact on capacity, performance, network elements, and operation.



## 5.7 MTAS Barring Program Enhancements

This feature enhances OCB Barring Category pattern matching with following:

- Wildcarding of one or multiple digits in barred and exempted lists
- Fixed length number matching option in exempted lists

The enhanced pattern matching is applicable for the user part of the Tel URI or embedded Sip URI, that is,. for phone numbers only. The barred and exempted entries may include one or several wildcard characters in any position of the number part. The presence of such wildcard character is interpreted as any character value. The Exempted list entries may include a fixed length matching indicator character.

### Impact

There is a minor impact on capacity and performance when wildcarding is configured.

## 5.8 Multi-X: Active Persona Device Selection (Former Multi-X: Hunting on Persona)

The Multi-X:Active persona device selection service is a new service that consists of the following new functions:

- Adding support for the user to via cai3g set a policy (active or inactive persona) for originating and terminating communication per mobile device.
- Adapting the multi-persona on CS to the enhanced multi-persona service, that is to use the new multi-persona provisioning data, introducing policy validation, removing time delay between sending MESSAGE and INVITE on terminating side, adding of SIP CC impi provisioning.
- Adding service interaction use cases between Multi-Persona and other services especially the Multi Mobile subscription service.

### Impact

No impact on capacity, performance, network elements, and operation.

## 5.9 Remove Service-Interact-Info Header

The SIP headers of incoming INVITE requests (configured by CM `mtasAsIwInviteHeaderFilter`, for example, `mtasAsIwInviteHeaderFilter = "Service-Interact-Info"`) will be removed from the outgoing request when the filtering function is enabled.



## Impact

No impact on capacity, performance, network elements, and operation.

## 5.10 Ro Announcement for Errors Without Announcement AVP (Phase 2)

MTAS plays Ro reject announcement in case any CCA message contains command or service level error code or Experimental-Result-Code AVP, even when the CCA does not contain an Announcement-Instructions AVP, if CCFH action is set to TERMINATE.

It can be configured and controlled through the following CM parameters:

- The `mtasChargingProfileRoRejectAnn` CM parameter determines the announcement package to be played in case of a specific reject code. Announcement played to the served user, when the reject result code in the CCA-I on originating side, or in the CCA-U on both sides matches the result code configured in the CM parameter.

Example: `mtasChargingProfileRoRejectAnn = "4012|RoRejectAnnouncement"`. If the reject code in the CCA message is 4012, then the `RoRejectAnnouncement` keyed Generic announcement will be played to the served user.

- The `mtasChargingProfileRoRejectDefaultAnnRemoteUser` CM parameter determines the announcement package to be played for call termination to the remote user when CCR-I rejected on the terminating side.
- The `mtasChargingProfileRoRejectDefaultAnnServedUser` CM parameter determines the announcement package to be played for call termination to the served user, when CCR-I rejected on the originating side, or, when CCR-U rejected on both sides.

Example: `mtasChargingProfileRoRejectDefaultAnnServedUser = "DefaultRoRejectAnnouncement"`. If the reject code in the CCA message not matches the entries configured in `mtasChargingProfileRoRejectAnn` or `mtasChargingProfileRoRejectAnn` is not configured, then the `DefaultRoRejectAnnouncement` keyed Generic announcement will be played to the served user.

If both `mtasChargingProfileRoRejectDefaultAnnServedUser` and `mtasChargingProfileRoRejectAnn` CM parameters are configured and the reject code in the CCA message matches an entry in `mtasChargingProfileRoRejectAnn`, then the latter takes precedence.

These CM parameters are configurable per charging profile. There can be multiple instances (0–32) of `mtasChargingProfileRoRejectAnn`, but only a single instance of `mtasChargingProfileRoRejectDefaultAnnRemoteUser` and `mtasChargingProfileRoRejectDefaultAnnServedUser` per charging profile.





### Impact

By default, there is no impact. There can be additional strain on MRF resources, when the feature is enabled and configured by the CM parameters (announcement will be ordered from the MRF by MTAS for CCA messages containing error response), depending on the details of the configuration.

## 5.11 Ro Announcement for Errors Without Announcement AVP (Phase 3)

MTAS plays default generic announcement before terminating the call if both primary and secondary Ro diameter connections are unavailable no receipt of CCA response to CCR message.

This functionality can be configured and controlled through the following CM parameters:

- The `mtasChargingProfileRoRejectDefaultAnnRemoteUser` CM parameter determines the announcement package to be played for call termination to the remote user when CCR-I rejected on the terminating side.
- The `mtasChargingProfileRoRejectDefaultAnnServedUser` CM parameter determines the announcement package to be played for call termination to the served user, when CCR-I rejected on the originating side, or, when CCR-U rejected on both sides.

These CM parameters are configurable per charging profile.

### Impact

By default, there is no impact. There can be additional strain on MRF resources, when the feature is enabled and configured by the CM parameters (announcement will be ordered from the MRF by MTAS for CCA messages containing error response), depending on the details of the configuration.

## 5.12 Supplementary Service Support for Multi-Persona in IMS/VoLTE

Support multi-persona subscribers that shall have differentiation of supplementary services per persona. This is an enhancement on the existing Multi Persona feature. This enhanced functionality can be controlled by below node level configuration and user level provisioning.

To use this feature, operator needs to enable the following CM attributes along with valid Multi-Persona License:

- `mtasMmtMobileBehaviour` is set to 1 (MOBILE\_ENHANCEMENT\_ON)
- `mtasMultiPersonaAdministrativeState` = UNLOCKED



- `mtasMultiPersonaEnhancement = PERSONA_ENHANCEMENT_ON`

To use this feature, operator needs to provision and activate the MultiPersona service for the subscriber along with:

- `mobile-subscription-list` with one or more mobile subscriptions
- `personas-specific services`
- `public-identity-list` and `subscription-identity-mapping-list`.

### **Impact**

No impact on capacity, performance, network elements, and operation.