

**Oracle® Communications  
Performance Intelligence Center**

**Release Notes**

Release 10.3.0.1

**F18540-01**

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Oracle® Communications Performance Intelligence Center Release Notes, Release 10.3.0.1  
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**CAUTION: Use only the guide downloaded from Oracle Help Center.**

Refer to Appendix section for instructions on accessing My Oracle Support and Oracle Help Center.

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## Introduction

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Oracle Communications Performance Intelligence Center provides the tools that service providers need to capture network traffic data and convert it into useful Business Intelligence for troubleshooting and for managing traffic, roaming, and services, in addition to revenue. With its powerful and configurable filtering, operators can sort through the data to create comprehensive dashboards and key performance indicators (KPIs) for all departments within the service provider. They can also leverage a comprehensive array of performance management and service management capabilities based on network traffic.

This Release Notice includes information on new Features, Supported Hardware Baseline, Media and Documentation pack contents, and identifies Firmware and Supported Upgrade Paths for Release 10.3.0.1.0 This document also includes listing of both Resolved and Known Bugs for this Release.

Release Notice is included in the Documentation Pack and made available with every Software Release.

# 1. Release 10.3.0.1 Content Description

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## 1.1. Supported Hardware Baseline

Refer to the Hardware Installation Guidelines E98794-01 for this release.

## 1.2. Software Lifecycle

- HTTP2 Monitoring support
- Addition of Diversion Number in SIPT xDR
- Charge number and P-Charge-Info field in xDR for all flavor of SIP builders
- Adding IMPU/IMPI/MSISDN fields in Generic LTE Diameter TDR
- Virtualization supported for all PIC components (including Integrated Acquisition)
- Performance Improvement of Integrated Acquisition
- Filter that will display xDR records where the "A" number is like the "B" number.
- Mediation Protocols Features and Improvements
  - Display Collected Info and Collected digits fields in the xDR's generated
  - Add Calling Name XDR field in SS7 ISUP ANSI CDR
  - MAP SM TDR: IMSI should be enriched on all SMS of same TCAP transaction
  - New xDR field "network-access-mode" in LTE Diameter S6 TDR
  - Detection of AVP doubling for Diameter Network Security pre-package
  - Option to not overwrite spare TT in xDR field
  - Add Source and Destination IP addresses in SS7 UM SUDR XDR
  - MSISDN should not be populated by the temporary MSISDN provided by VLR

## 1.3. Feature Overview- HTTP2 Monitoring

OCPIC 10.3.0.1 has a support for a new builder EVOLVED HTTP TDR BUILDER that shall be used to correlate HTTP2 frames in transaction mode. The correlation shall be done using the combination of IP Addresses, Ports and Stream ID. A single HTTP2 packet can contain multiple HTTP2 frames, however the evolved http tdr builder will work only on the individual frames, so each of the HTTP2 frame should be de-chunked from the packet before evolved http tdr builder can process it. The dechunking of HTTP2 frames can be done either on the PROBE or on the EVOLVED HTTP TDR BUILDER itself, but it is highly recommended to configure the de-chunking on the PROBE for better performance of the evolved http tdr builder.

Following enhancements have been done in OCPIC 10.3.0.1 components for HTTP2 monitoring.

- De-chunking of HTTP2 messages on PROBE
- Decoding builder for HTTP2 Frames on MEDPROT
- Transaction level correlation builder for HTTP2 on MEDPROT
- Prolib decoding support for HTTP2 frames on Mediation
- PCAP Export Support on MGMT for HTTP2 frames

### 1.3.1. Configuration- HTTP2 monitoring

- Create a Traffic Classification using one of the following allowed combinations
  - Protocol as ALL with Forwarding as TcpFlow & Chunks
  - Protocol as TCP with Forwarding as TcpFlow
- Create an IP Dataflow using one more TC created with suggested configuration above.
- Create a Data Flow Processing and select EVOLVED HTTP TDR BUILDER and create an XDR session.
- Refer EVOLVED HTTP TDR BUILDER builder content document to configure buider specific parameters.

### 1.3.2. Limitation of HTTP2 monitoring

- Deciphering of TLS messages is not supported in current delivery.
- Reassembly of HTTP2 Frames is not supported in current delivery.
- Decoding of Data Frame (type 0x0) and Connection messages is not available in EVOLVED HTTP TDR BUILDER. However the full decoding is available using PROLIB in the 4th window of the XDR Session in Troubleshooting application.
- Correlation and differentiation of messages based on interfaces (like diameter) is not supported in current release.

### 1.3.3. Observations and Troubleshooting steps

*Important Note : None of these issues are impacting the XDR Builder Correlation.*

- The decoding of the JSON data in the packet could get truncated in the 4th window in Troubleshooting Application if the size of incoming packet is more than the size mentioned by PmFrSize in LongParamTable in PROBE. The "PmFrSize" parameter value in LongParamTable in PROBE should be set to a value higher than incoming packet length for correct decoding of JSON data in prolib. The default value of PmFrSize is 2000. After increasing the value, the pmiaMonitor process needs to be restarted. Post this the JSON data should be correctly decoded.
- The decoding of Header Frames in the 4<sup>th</sup> Window is not displayed correctly. The workaround is to restart "dsapi" process on the IXP server where the build process is hosted or spawned. The decoding is correctly shown after the process restart. This is a random issue and occurs rarely.
- The HTTP2 Response status code 451 is mapped as "ID Error" in dictionary and thus it is showing "ID Error" in Troubleshooting Application. Whereas some specs indicate status code 451 should be "Unavailable For Legal Reasons"

## 1.4. Obsolescence

- HP G6 Bare metal servers are not supported.
- HP G8 Blades servers are not supported.
- Direct support of P2000 and attached D2700 is no more supported.
- Performance Intelligent Center is no longer compatible with
  - Neptune 3G Probe
  - PMF SS7
  - Cross-connect

- Web service to apply queries without connecting to UI
- Mediation Protocols End of Service Life for the following protocols:

Family	Builder	SKU	SW license name	Legacy Part Number
GPRS	Gn Gp Stats	L99462	OC Protocol Mediation I	950-0180-01MKT
SS7	IUP CDR Reconstitution	L99462	OC Protocol Mediation I	950-0214-01MKT
SS7	TUP CDR Reconstitution	L99462	OC Protocol Mediation I	950-0082-01MKT
VoIP	RTCP stats	L99462	OC Protocol Mediation I	950-0124-01MKT

Note: These are already part of 10.3.0 release.

## 2. Media and Documentation

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### 2.1. Media Pack

All components available for download from the Oracle Software Delivery Cloud (OSDC)

<https://edelivery.oracle.com/> .

Note: This list is accurate at the time of release, but is subject to change. View the Oracle Software Delivery Cloud site for the latest information. In addition, look for the latest patches for this release in the Knowledge Management note [Information Center: Patches for Oracle Communications Performance Intelligence Center \(Doc ID 1989320.2\)](#) in <https://support.oracle.com>

Name	Platform
Oracle Communications Performance Intelligence Center 10.3.0.1.0	Tekelec
Tekelec Platform Distribution 7.6.0.0.0	Tekelec



## 2.2. Load Line up

PIC 10.3.0.1.0	Software Version	Platform
Mediation Server - IXP Base (on Tekelec Platform Distribution)	10.3.0.1.0_1.9.0	Tekelec
Management - NSP (on Oracle Linux)	10.3.0.1_1.43.0	Tekelec*/OL
Probed and Integrated Acquisition - xMF(on Tekelec Platform Distribution)	10.3.0.1.0_1.1.0	Tekelec
Mediation Protocol - xDR Builder	10.3.0.1.0-1.8.0	Tekelec
Acquisition Data Feed - Tadapt(32bits)	10.3.0.0.0_1.1.0	Tekelec
Performance Intelligence Center MIBS	10.3.0.0.0	Tekelec
Compatible Software		
Tekelec Platform Distribution	7.6.0.0.0_88.54.0	Tekelec
Java 8	8U112 or later	Linux-x86-64
Oracle Linux 7	Update 4 or later	Linux-x86-64
Oracle Database 12c Enterprise Edition Release 64bit	12.1.0.2.0 or later	Linux-x86-64
Oracle WebLogic Server enterprise Edition (FMW, WLS, WebLogic Server 12c) for platform Linux x86-64	12.2.1.1.0 or later	Linux-x86-64
Oracle WebLogic Server Plug-in from Oracle WebLogic Server Standard Edition 12.1.0.0.0 for Linux x86-64	12.1.3.0.0 or later	Linux-x86-64
Oracle ASMLib	2.0.8 or later	Linux-x86-64
KVM hypervisor	1.5.3 or later	Linux-x86-64
Open vSwitch	2.5.5 or later	Linux-x86-64
Compatible Products		
Eagle	46.5, 46.6	
Diameter Signaling Router	8.0, 8.1, 8.2	
Falco	Latest	
Oracle Database Appliance	Latest	
Oracle ZFS Storage Appliance	Latest	
Firmware		
HP Solutions Firmware Upgrade Pack	2.2.10 or later	
Oracle Firmware Upgrade Pack	3.1.6 or later	

Note \*: Management on TPD support is deprecated.

PIC was tested with the above versions of Compatible Software. For the latest versions:

- Java 8 refer to My Oracle Support Information Center: Installation & Configuration for Oracle Java SE (Doc ID 1412103.2)
- HP Firmware refer to Oracle Help Center <https://docs.oracle.com/en/industries/communications/tekelec-platform/index.html>
- Oracle Firmware refer to Oracle Help Center <https://docs.oracle.com/en/industries/communications/tekelec-platform/index.html>
- Oracle Linux refer to Oracle Software Delivery Cloud <https://edelivery.oracle.com/>

- Oracle Database and related patches refer to Oracle Software Delivery Cloud <https://edelivery.oracle.com/> and My Oracle Support <https://support.oracle.com/>
- Oracle WebLogic Server and Proxy Plugins refer to Oracle Software Delivery Cloud <https://edelivery.oracle.com/>
- Oracle ASMLib refer to Oracle Technology Network <http://www.oracle.com/technetwork/server-storage/linux/asmlib/ol7-2352094.html>

### 2.3. Core Documentation Set

PIC customer documentation and online help are created whenever significant changes are made that affect system operation or configuration. Revised editions of the documentation and online help are distributed and installed on the customer system. Consult your Installation Manual for details on how to update user documentation. Additionally, all customer documentation is available on the Oracle Help Center. Release Notes are available on Oracle Help Center with each new release of software. The Release Notes list the bugs that have been resolved in the current release and the bugs that are known to exist in the current release.

Listed below is the entire PIC documentation library of User's Guides.

- Management Security Guide
- Alarm Forwarding Guide
- Alarm Application Guide
- Alarm Configuration Guide
- Centralized Configuration Manager Guide
- On Demand UP Guide
- KPI Configuration Guide
- Dashboard Application Guide
- Dashboard Configuration Guide
- System Alarms Guide
- Troubleshooting Application Guide
- Data Feed Configuration Guide
- Audit Viewer Guide
- SS7 Surveillance Guide
- SigTran Surveillance Guide
- Browser Export Scheduler Guide
- Browser Export Guide
- Quick Start Guide

Workstation minimal requirements are now part of the Quick Start Guide

## 3. Supported Upgrade Path

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### 3.1. Upgrade and Installation

Upgrade/Installation are supported with the software distributions described in these Release Notes.

All documents are available on Oracle Help Center.

#### 3.1.1. Major Upgrade:

Performance Intelligent Center 10.2.0 to 10.3.0.1.0

Performance Intelligent Center 10.2.1 to 10.3.0.1.0

#### 3.1.2. Patch Install Support:

Performance Intelligent Center 10.3.0.0.0 to 10.3.0.1.0

#### 3.1.3. Fresh Install Support:

Performance Intelligent Center 10.3.0.1.0

#### 3.1.4. Disaster Recovery:

Performance Intelligent Center 10.3.0.1.0

Disaster Recovery (HW failure) shall replace existing supported server with the same HW if available. If not possible, a fresh install of the new hardware shall be done in PIC 10.3.0.1.0

## 4. Resolved and Known Bugs

### 4.1. Severity Definitions

The following sections refer to Bug severity levels. Definitions of these levels can be found in the following publication: *TL9000 Quality Management System - R 5.5*

### 4.2. Resolved Bugs

Fixed in 10.3.0.1.0 release

Bug	Component	Title	Severity
29583445	MGMT	SR: PCAP Export shows 10000 counts but exports only 250 records	2
29501314	MEDSRV	'Purge PDU storage' and 'Purge IDB' are not started after upgrade to 10.3	2
29440437	MEDSRV	SR: Disable SQL Tuning Advisor from the xDR server	3
29302225	MEDPROT	SR: MAP SM Builder crashes frequently	2
29160089	MGMT	SR: Additional duplicate route added in routing table after upgrade to 10.2.1	3
29131126	INT_OPS	CS: SS7 MAP Data Broker TDR 7.2.3 holds Incorrect operation resolution value	3
28458062	MGMT	SR: 'Failed converting Timestamp for row' observed during Apply changes	3
28026475	MGMT	SR: Linkset name is not visible in dashboard report as bar chart	4
25531506	MEDPROT	SS7 MAP Data Broker "Operation Resolution Value" is incorrect in some cases	2
29673314	INT_OPS	SR: DataBroker export will not accept a "/" character in the Directory Parameter	2

Fixed in 10.3.0.0.0 release:

Bug	Component	Title	Severity
28906597	MEDPROT	SR: Builds are continually restarting	3
28883028	MEDSRV	jmx logs reporting repeated alarms due to Incorrect string value: '\xE0,	2
28768387	MEDPROT	SR: Mixed MSU from different calls while using Call-ID	3
28648660	MEDPROT	The 'IsFalco' parameter is not available in DFP SS7 Transport layer	3

Bug	Component	Title	Severity
28472186	MEDPROT	SS7 MAP2 TDR ISD detail content is not properly decoded	3
28430175	MEDPROT	SR:LTE DIAMETER AAA Builder:Extra digit is attached at the end of IMSI field	3
28428222	MEDSRV	SR: iAudit does not report the error correction status properly	4
28405296	MEDSRV	Hardcoding of Oracle database port in mediation/Acq Mbean	4
28225083	MGMT	NSP_LOG table space is 99% full - Excessive logs in Dashboard	3
28111887	MEDPROT	SR: Incorrect decoding of MSISDN in MAP ATM	3
28106623	MGMT	SR: analyze_subsystem.sh script giving errors because of shl.show command	4
28064493	MGMT	SR:Oracle DB on NSP Not Starting After Reboot on Standard Server	2
27681028	MGMT	SR: Full titles not visible in Statistic Line drop down menu	3
27340392	MGMT	Cannot run Protocol Tracing from Session Views	3
26959508	MEDPROT	RAN CC2 correlation is very low due to NOT MATCHED IU Release/Complete	2
26955107	MEDPROT	SIP NOTIFY Message Body is not decoded properly	3
26940989	MEDSRV	createUserTbsp.sh setting unsupported parameter in Oracle DB 12.2c	3
26556171	MGMT	Not able to proceed with NSP install due to incorrect SYS password	3
26525419	MGMT	Axis side is not dipayed with the good value	4
25473620	MGMT	Dashboard Barchart not displaying (blank)	3
25421959	MGMT	No more button -Save as default- in User preferences for NspAdmin	3
25151853	MGMT	Historical Protraq : Unable to Load Scenario List.	3
25139800	MGMT	Token calculation not accurate	4
25041782	MGMT	Menu "Help" is missing for user profiles different from Administrator	3

Fixed in past releases/patches:

Bug	Component	Title	Severity
28302633	MEDPROT	SR: SIP session is not populating correct "CONTACT" field	2
28178484	MEDPROT	New xDR field $\zeta$ network-access-mode $\zeta$ in LTE Diameter S6 TDR	2
28178457	MGMT	Export failed error when using PNG export function in SS7 Surveillance	3

Bug	Component	Title	Severity
28178408	MGMT	No PDUs on Multi-Protocol Trace (Paw Icon)	3
28031314	MGMT	Order of chaging permissions in upgrade script need to be corrected	2
27366094	PROBED	IMF Q752 Configuration Session donot have any link statistics data	2
27355007	PROBED	Eaglemonitor events are not reaching fcmonitor	3
27354995	PROBED	Firewall should be turned off on IMF server post install/upgrade	2
27232718	MEDSRV	IXP Monitoring session are not updated on the PIC 10.2.1 Setup	2
27198058	PROBED	Application alarms related o IMF is not observed on Management Server	2
27163036	PROBED	IMF server state is marked as OOS with two IMF servers in subsystem	2
27008040	MEDPROT	VMSC Address not properly decoded in full decoding	3
26771124	MEDSRV	The IxpExtendDataBroker24hrs.sh script fails to execute	2
26832139	MEDPROT	SIP xDR end-date timestamp is 24 hours behind last PDU end-date timestamp	2
26695879	PROBED	PDU is getting dropped on PMF	2
26100339	MGMT	MAJOR UPGRADE 10.1.x to 10.2.1 does not create correct wallet	3
25548756	MEDPROT	SIP: In conversation Parial xDR not created	3
25047123	MGMT	Upgrade failed because of access rights	3
24761509	MEDPROT	SCTP Patch naming note about length must be corrected	3
23584900	MGMT	Management server virtualization requirement are not documented	3
25056950	MGMT	WebLogic instance are not shutting down	3
24570456	MEDPROT	UMTS lu CS TDR some fields empty in TDR if paging received on LUDT	3
24399872	PROBED	pmiaMonitor process stuck due to filter using NOT condition	2
23753991	PROBED	PMF does not get traffic on new TC	3
23624848	MEDSRV	Full decoding not displayed in ProTrace	3
23578175	MGMT	Scheduler Export Is Run, but No File Can Be Found (password related)	2
23346178	MGMT	Calculate Session Period job is not working if DWS SID is not default one	3
23297636	MEDPROT	Paging Timer is not working correctly	2
23172875	MGMT	NSP CCM must not allow wildcard filter	3
23143957	MGMT	NSP Association Selector does not show up	3
22827742	MGMT	Builder installation is failing	3

Bug	Component	Title	Severity
22746962	MGMT	Exception when accessing historical KPI after upgrade from 10.1 to 10.2	3
22670795	MEDSRV	Enhancements of IP SMPP TDR builder.	4
22670722	MEDPROT	RADIUS: correlation issues (collisions on different ID and not matched)	3
22644316	MGMT	Nightly backup not created after Mgmt-one box major upgrade on standard server	3
22594609	MEDPROT	VoIP SIP : Mixed MSU from different call while using "Call-ID + To + From" mode	2
22566943	MGMT	Contact the Tekelec Customer Care Center.	3
22511373	MGMT	Execution right missing on optional App install scripts	4
22352408	MEDSRV	All diameter AVP are not decoded in PDU part if pdu too big	3
22327850	MEDPROT	Nature of address for D number in ISUP is not populated every time	3
22268224	MEDPROT	Bad xDR reordering message in SIP build log	4
22148854	MEDPROT	UCP TDR: Addr Code Originator field is truncated	3
22134197	PROBED	pduServer0 log out of sequence messages	4
21967169	MEDPROT	Sip call with proxy server not well correlated.	2
21802570	MEDSRV	Decoding issue on TP-Parameter-Indicator SM-TP	3
21769730	MEDSRV	BSSAP Speech codec information Decode Issue.	3
21649273	MEDPROT	Enhancements of IP SMPP TDR builder.	4
21565826	MGMT	Cross Control Alarm should be removed	4
21368311	PROBED	Capacity Management is not reporting incident and rejected frames	3
21363378	MEDPROT	IxpBuild process is crashing abterm on MobileAssociationTable	3
20357494	MEDSRV	TKPIC25058: IXP: Transfer late	3
20345363	MEDSRV	MAP Protocol not decoding Na ESRD field	3
20344730	MGMT	TKPIC00006: Authentication failed	3
20219961	MGMT	Zip export with option stored in database - error with session view	3
20182877	MGMT	Exception when exporting Diameter Gy	4
19880758	MGMT	post_upgrade_sanity_check.sh errors on weblogic2 server	3
19561431	MGMT	restore_ixp_xmf.sh reports wrong status	3
19545176	MGMT	Alarm description are not updated while the upgrade	3
19285045	MGMT	Filtering using % is not working	3
19119906	MEDSRV	[236582]ORA-14074 error during IXP_ADD_PARTITIONS procedure	3
19118143	MGMT	[240139]auto completion filter not complete	3



Bug	Component	Title	Severity
19116550	MEDSRV	[239278]Prolib do not decode sccp over sigtran when sscp message type is FE.	2
19108079	MEDPROT	[232669]RAN MM: Procedure "MM CM Svc Req-MO estab" should have his own timeout s	4

### 4.3. Known Bugs

Bug	Component	Title	Severity	Customer Impact	Workaround
27506656	MGMT	sync credentials on MGMT with other components does not work	3	This issue occurs only when Mgmt. is using Oracle 12c version 12.2.0. The acquisition and mediation servers are using oracle instant client version 12.1.0. This results in wallet being copied into the directory which is not present on acquisition and mediation servers.	<p>The following workaround should be applied on all the acquisition and mediation servers.</p> <ol style="list-style-type: none"> <li>1. Login to the affected acquisition/mediation server as root user</li> <li>2. Create following symlink in the directory "/usr/lib/oracle" 12.2 -&gt; /usr/lib/oracle/12.1/</li> <li>3. Verify that symlinks is created.</li> <li>4. Sync the wallet from the mgmt. server by running "Wallet Sync" procedure again.</li> <li>5. Verify on acquisition/mediation server that wallet is copied successfully.</li> </ol> <p>Verify that database connection is working fine using wallet. Execute sqlplus /@nsp as cfguser</p>
27491990	MGMT	MGMT10.2.1: Weblogic service is not running after major upgrade on NSP	3	After executing upgrade script "sh /mnt/upgrade/upgrade_nsp.sh" on MGMT server, weblogic service is not starting automatically which causes the major upgrade unsuccessful.	<p>Workaround is to login to the console of the MGMT server and execute the following steps.</p> <ol style="list-style-type: none"> <li>1. Start the nspservice using the command <code>service nspservice start</code></li> </ol> <p>Now check and verify the Major upgrade by running the upgrade script, it should be successful.</p>
27347747	PROBED	E_NOMEM error in IMF leads to input traffic drop	3	The issue has an impact on the IMFs with less memory e.g. E5-APP-B with 8GB RAM. The fcMonitor hogs upto 60% of physical memory and during failover the system might get into in No Memory state and drops MSUs.	<p>When E_NOMEM, error is observed in fcMonitor or eagleMonitor process traces and shl.op is showing Deny counts increasing continuously in its output, then perform the following steps:</p> <ol style="list-style-type: none"> <li>1. Login as <code>cfguser</code> on IMF server</li> <li>2. Run command <code>pm.set off fcMonitor</code></li> <li>3. Run command <code>pm.set on fcMonitor</code></li> <li>4. Execute <code>shl.op</code> command to verify that Deny count in the output is not increasing.</li> </ol> <p>Apart from the above work around, it is recommended that FC links and associations are distributed across other spare servers if available in IMF sub-system.</p>
27340452	MGMT	Unable to execute Historical Protraq sessions	3	In case the issue is encountered then concerned historical KPI does not work and also the running historical	<p>If the status goes to cancelled instead of idle when you click on Stop then</p> <ol style="list-style-type: none"> <li>1. Click the stop button again.</li> </ol>

				KPI can't be stopped.	2. The status will be changed back to idle. Now check and verify that the session can be started.
25118601	MGMT	restore_ixp_xmf.sh reports restore successful but backup was not found/restored	3		Workaround is to manually verify that the file was copied.
24961171	MGMT	The changes in assoc is not reflected as the child panel is not getting refreshed	3		In the Sigtran Surveillance application, reload to reflect the changes in associations.
24672430	MGMT	User is taken to first page on each refresh	3		In the Sigtran Surveillance application and when using multiple pages, pause the refresh and manually resume.
29680982	MEDSRV	OCPIC 10.3.0.1 Max value of all Unsigned Datatype is not available in first window	3	The max value of all unsigned datatypes of the dictionary fields is not displayed in 1 <sup>st</sup> window of the XDR session in Troubleshooting Application.	Not Available.
29899110	PROBED	incorrect header version being set by the fcMonitor	3	This will result in the incompatibility between integrated acquisition server and mediation server for the IP packets. As a result, build processes will re-start for the dataflow processings being fed by IP dataflows from integrated acquisition server(IMFs).	Workaround: The workaround is to explicitly set the IPHeaderFormat version to value 2 in LongParam on all IMF sub-system.  <ol style="list-style-type: none"> <li>1. Login to imf primary server as cfguser</li> <li>2. Edit LongParam table using ivi LongParam</li> <li>3. Update parameter IPHeaderFormat to "2"</li> <li>4. Save the table, enter OK when ask to save the table.</li> <li>5. Restart pduServer0 process on all the servers in the IMF sub-system using, pm.set off pduServer0; pm.set on pduServer0</li> </ol>

## Appendix A: List of supported protocols and builders

The following table identifies protocols supported by PIC and the version of the protocol specification implemented.

Family	Protocol	Organization	Complete Reference	PIC 10.2 standards	Final builder
SS7	ISUP V1	ITU-T			see ISUP V3
SS7	ISUP V2	ITU-T			see ISUP V3
SS7	ISUP V3	ITU-T	Signaling system N°7 - ISDN user part formats and codes	Q.763 / Sept_97 (Q.761 to Q.764, Q.766 and Q.767)	SS7IsupEtsiCdr SS7IsupEtsiSudrAccounting Ss7IsupEtsiSuperCdr SS7UMSudr
SS7	BT NUP (UK)	National UK BT	BT Network Requirement	BTNR 167 <i>Jul-87</i>	SS7BtntpCdr
SS7	ISUP ANSI  Party Information Parameter (PIP)	ANSI	Signaling System N°7 (SS7) - Integrated Services Digital Network (ISDN) User Part  Calling Party Name Convention Facility Specification	T1.113-1995 <i>Jun-05</i>  TICO076E <i>Feb-98</i>	SS7IsupAnsiCdr Ss7IsupAnsiSentinelCdr SS7UMSudr
SS7	ISUP Chinese		ETSI ISUP support with 24 bits OPC/DPC		see ISUP V3
SS7	ISUP Russian Variant (Sovintel)	National	CIS ISUP - Functional Description	CIS ISUP - Functional Description	see ISUP V3
SS7	ISUP Portuguese Variant (NOVIS)	National Portugal PT	ESPECIFICAÇÃO DE INTERFACE COM A REDE PÚBLICA INTERFACE DE COMUTADOR (2 Mbit/s) Sinalização Canal Comum SS#7 - Procedimento de taxaço em ISUP	Spécifications PT - Procedimento de taxaço em ISUP <i>Apr-99</i>	see ISUP V3
SS7	ISUP Brazilian Variant	TELEBRAS	#7 Common Channel Signaling System ISDN User part - ISUP, Issue 3	TB 220-250-732 <i>Apr-98</i>	see ISUP V3
SS7	ISUP Colombian Variant	Ministerio des Comunicaciones	Norma Nacional de Señalizacion por Canal Comun N.º7 - SCC7	Norma Nacional <i>Apr-98</i>	see ISUP V3

Family	Protocol	Organization	Complete Reference	PIC 10.2 standards	Final builder
SS7	ISUP Mexican Variant	Telmex	E-801.04 Sepcification - Integrated Services Degital Network user Part (ISUP), Edition "C-3"	E-801.04 Dec-97	see ISUP V3
SS7	ISUP Argentina variant	Telefonica Argentina	RDSI User Part Specification Signaling System N°7	General Specification AR.EG.s1.002 Ed 1 corrected	see ISUP V3
SS7	Cisco E-ISUP	Cisco	EISUP Specification - Cisco Systems	Cisco ENG-46168 Release 44	SS7_EISUP_CDR
		IETF	Reliable UDP Protocol	draft-ietf-sigtran-reliable-udp-00.txt Feb-1999	
SS7	LSSU	ITU-T	Signaling link	Q.703 Jul-96	
SS7	MTP ITU-T Level 2 & 3	ITU-T	Functional description of the Message Transfer Part (MTP) of Signaling System No. 7	Q.701 Mar-93	SS7L2L3EtsiSudr SS7Q752EtsiStats
			Signaling link	Q.703 / Q.704 Jul-96	
SS7	MTP ANSI Level 2 & 3	ANSI	Signaling System N°7 - Message Transfer Part (MTP)	T1.111-1996 Mar-96	SS7L2L3AnsiSudr
SS7	SCCP ITU-T	ITU-T	Signaling connection control part formats and codes	Q.713 Jul-96	Ss7SccpSuaSudr
SS7	SCCP ANSI	ANSI	Signaling System Number 7 - Signaling Connection Control Part (SCCP)	T1.112-1996 Jan-96	Ss7SccpSuaSudr
SS7	TCAP (MAP & INAP support)	ITU-T	Transaction capabilities formats and encoding	Q.773 Jun-97	
SS7	TCAP (IS-41 support)	ANSI	Signaling System Number 7 (SS7) - Transaction Capabilities Application Part (TCAP)	T1.114-1996 Mar-96	
		ANSI	Signaling System Number 7 (SS7) - Transaction Capabilities Application Part (TCAP)	T1.114-2000 Jun-00	

Family	Protocol	Organization	Complete Reference	PIC 10.2 standards	Final builder
SS7	INAP Siemens	Specific: Siemens	Siemens Core INAP	P30308-A7128-A120-01-7659 <i>May-98</i>	SS7InapSudrAccounting SS7InapTdr  SS7_INAP_Compact_TDR
SS7	INAP CS1	ETSI	Intelligent Network (IN); Intelligent Network Capability Set 1 (CS1); Core Intelligent Network Application Protocol (INAP);	ETS 300 374-1 <i>Sep-94</i>	SS7InapSudrAccounting SS7InapTdr  SS7_INAP_Compact_TDR
		ITU-T	Introduction to intelligent network capability set 1	ITU-T Q.1211 <i>Mar-93</i>	
		ITU-T	Distributed functional plane for intelligent network CS-1	ITU-T Q.1214 <i>Oct-95</i>	
		ITU-T	Interface Recommendation for intelligent network CS-1	ITU-T Q.1218 <i>Oct-95</i>	
SS7	INAP CS2	ITU-T	Intelligent Network (IN); Intelligent Network Application Protocol (INAP); Capability Set 2 (CS2)	ETS 301 140-1 <i>Jun-96</i>	SS7InapSudrAccounting SS7InapTdr  SS7_INAP_Compact_TDR
SS7	INAP Ericsson CS1	Ericsson	ERICSSON SUPPORT OF ETSI CORE INAP CS1 Ericsson Support of ETSI Core INAP CS1	87/155-CRT 249 12 Uen <i>May-98</i>	SS7InapSudrAccounting SS7InapTdr  SS7_INAP_Compact_TDR
SS7	INAP Ericsson CS1+	Ericsson	Ericsson INAP CS1+, Services assumed from TCAP, revision A	4/155 17-CRT 249 09 Uen <i>Aug-96</i>	SS7InapSudrAccounting SS7InapTdr  SS7_INAP_Compact_TDR
			Ericsson INAP CS1+, Abstract Synthax, revision B	171/155 17-CRT 249 12 Uen <i>Jun-03</i>	
SS7	INAP Ericsson V2 / V3 / V4	Ericsson	Ericsson's Protocol for Intelligent Networks, version 4, Formats and Codes	2/155 17-CRT 249 01 Uen D (V2) <i>Jan-96</i>  7/155 17-CRT 249 01 Uen B (V3) <i>Jan-97</i>	SS7InapSudrAccounting SS7InapTdr  SS7_INAP_Compact_TDR

Family	Protocol	Organization	Complete Reference	PIC 10.2 standards	Final builder
				12/155 17-CRT 249 01 Uen A (V4) <i>Jan-98</i>	
SS7	INAP Alcatel V3	Alcatel	INAP for E10 Version 3	ALCATEL E10 Version 3 <i>Sep-96</i>	SS7InapSudrAccounting SS7InapTdr  SS7_INAP_Compact_TDR
SS7	INAP Alcatel V4	Alcatel	INAP for E10 Version 5	ALCATEL E10 Version 5 <i>Jan-99</i>	SS7InapSudrAccounting SS7InapTdr  SS7_INAP_Compact_TDR
SS7	INAP Alcatel CS1	Alcatel	INAP Alcatel CS1	ALCATEL INAP CS1	SS7InapSudrAccounting SS7InapTdr  SS7_INAP_Compact_TDR
SS7	CAMEL Phase 2	ETSI	Digital cellular telecommunications system (Phase 2+); Customised Applications for Mobile network Enhanced Logic (CAMEL); CAMEL Application Part (CAP) specification - <b>GSM 09.78</b>	TS 101 046 V7.0.0 (Release 98) <i>Aug-99</i>	SS7InapSudrAccounting SS7InapTdr  SS7_INAP_Compact_TDR
SS7	CAMEL Phase 3	ETSI	Digital cellular telecommunications system (Phase 2+); Universal Mobile Telecommunications System (UMTS); Customised Applications for Mobile network Enhanced Logic (CAMEL); CAMEL Application Part (CAP) specification - <b>GSM 29.78</b>	TS 129 078 V5.9.0 (Release 5) <i>Sep-04</i>	SS7InapSudrAccounting SS7InapTdr  SS7_INAP_Compact_TDR
SS7	CAMEL Phase 4	ETSI	Digital cellular telecommunications system (Phase 2+); Universal Mobile Telecommunications System (UMTS); Customised Applications for Mobile network Enhanced Logic (CAMEL); CAMEL Application Part (CAP) specification - <b>GSM 29.78</b>	TS 129 078 V6.5.0 (Release 6) <i>Jun-06</i>	SS7InapSudrAccounting SS7InapTdr  SS7_INAP_Compact_TDR
SS7	BSSAP (Phase 2+) BSSMAP	ETSI	Digital cellular telecommunications system (Phase 2+); Mobile-services Switching Centre – Base Station System (MSC – BSS) interface; Layer 3 specification - <b>3GPP TS 08.08</b>	TS 48.008 V12.0.0 (Release 12)  Sept-14	RanCC2Cdr RanMMTdr RanSMSTdr RanUSSD SS7BssapTdr

Family	Protocol	Organization	Complete Reference	PIC 10.2 standards	Final builder
	DTAP		Digital cellular telecommunications system (Phase 2+); Mobile Radio Interface; Layer 3 specification - <b>3GPP TS 04.08</b>	TS 24.008 V12.7.0 (Release 12) Sept-14	
	SMS		Digital cellular telecommunications system (Phase 2+); Point-to-Point (PP) Short message Service support on mobile radio interface - <b>3GPP TS 04.11</b>	TS 24.011 V12.0.0 (Release 12) Sept-14	
	SMS SM-TP		Digital cellular telecommunications system (Phase 2+); Technical realization of the short Message Service (SMS) - <b>3GPP TS 03.40</b>	TS 23.040 V12.2.0 (Release 12) Dec-14	
	Supplementary Services		Digital cellular telecommunications system (Phase 2+); Mobile Radio interface layer 3 supplementary service specification; Formats and Coding - <b>3GPP TS 04.80</b>	TS 24.080 V12.0.0 (Release 12) Sept-14	
SS7	BSSAP+ (Gs Interface)	ETSI	Digital Cellular Telecommunications System (Phase 2+); Universal Mobile Telecommunications System (UMTS); general Packet radio Service (GPRS); Serving GPRS Support Node (SGSN) - Visitor Location register (VLR); Gs Interface layer 3 Specification - <b>3GPP TS 29.018</b>	TS 29.018 V6.5.0 (Release 6) Dec-06	Ss7GsInterfaceTdr
SS7	GSM MAP	ETSI	Digital cellular telecommunications system (Phase 2+); Universal Mobile Telecommunications System (UMTS); Mobile Application Part (MAP) specification - <b>3GPP TS 29.002</b>	TS 29.002 V12.6.0 (Release 12) Sept-14	Ss7HLRVTdr SS7MapTdr SS7MapSudrAccounting SS7MapSmTdr SS7MapMultiLegTdr SS7MapDB SS7Smdr  SS7_MAP_Compact_TDR
SS7	IS-41 Révisions B, C, D & E (MAP)	ANSI	Cellular Radiotelecommunications Intersystem Operations	ANSI/TIA/EIA-41-D-1997 Nov-97	SS7IS41DB SS7IS41DE SS7IS41Tdr
	MEID	3GPP2	3G Mobile Equipment identifier (MEID) - Stage 1	3GPP2 S.R0048-A Ver 4.0 Jun-05	



Family	Protocol	Organization	Complete Reference	PIC 10.2 standards	Final builder
	<b>IS-41-P</b>	Telecommunications Industry Association	MEID Standards Update, version 1.8.4	TIA-MEID <i>Apr-06</i>	
	<b>IS-41-EE</b>	Lucent	ANSI -41 Protocol Extensions for Interfaces C and D (HLR - VLR/MSC) - Issue 2.0	IS-41-P <i>Nov-04</i>	
		Ericsson	IS-41 Intersystem Call delivery Signalling	IS-41-EE <i>Jan-99</i>	
<b>SS7</b>	<b>ISDN over IUA</b>	ITU-T	ISDN user-network interface layer 3 specification for basic call control	Q.931 <i>May-98</i>	VoIP_Q_931_Cdr
<b>SS7</b>	<b>AIN</b>  <b>MTP ANSI Level 2 &amp; 3</b>  <b>SCCP ANSI</b>  <b>TCAP (IS-41 support)</b>  <b>Services</b> <b>- CNAM</b> <b>- ATF</b> <b>- NS 800</b> <b>- LNP</b> <b>- Flexible Number Rounting</b>	ANSI  ANSI  ANSI  Telcordia  Telcordia  Telcordia	Signalling System N°7 - Message Transfer Part (MTP)  Signalling System Number 7 - Signalling Connection Control Part (SCCP)  Signalling System Number 7 (SS7) - Transaction Capabilities Application Part (TCAP)  Telcordia Technologies Generic Requirements, GR-1188-CORE: Calling Name Delivery Generic Requirements, Issue 2  Telcordia Technologies Generic Requirements, GR-533-CORE: Datababase Services Service Switching Points - Toll-Free Service Generic Requirements, Issue 2  Telcordia Technologies Generic Requirements, GR-1299-CORE: Switch - Service Control Point (SCP) / Adjunct Interface Generic requirements, Issue 6	T1.111-1996 <i>Mar-96</i>  T1.112-1996 <i>Jan-96</i>  T1.114-2000 <i>Jun-00</i>  GR-1188-CORE <i>Dec-00</i>  GR-533-CORE <i>Jun-01</i>  GR-1299-CORE <i>Nov-00</i>	SS7AinTdr

Family	Protocol	Organization	Complete Reference	PIC 10.2 standards	Final builder
		Telcordia	Telcordia Technologies Generic Requirements, GR-1519-CORE: CCS Network Interface Specification (CCSNIS) Supporting TR-NWT-001188 Calling Name Delivery Generic Requirements, Issue 1A	GR-1519-CORE <i>Oct-94</i>	
		Telcordia	Telcordia Technologies Generic Requirements, GR-2982-CORE: Local Number LNP Capability, Issue 1	GR-2982-CORE <i>Dec-97</i>	
		Telcordia	Telcordia Technologies Generic Requirements, GR-246-CORE: Specification of Signaling System Number 7, Issue 5	GR-246-CORE <i>Dec-00</i>	
		Telcordia	Telcordia Technologies Generic Requirements, GR-2892-CORE: Switching and Signaling Generic Requirements for Toll-Free Service using AIN, Issue 1	GR-2892-CORE <i>Apr-95</i>	
<b>SS7</b>	<b>LIDB</b>	Telcordia	Telcordia Technologies Generic Requirements, GR-1158-CORE : OSSGR Section 22.3: Line Information Database, Issue 4	GR-1158-CORE <i>Dec-00</i>	SS7LidbTdr
			Telcordia Technologies Generic Requirements, GR-1149-CORE - OSSGR Section 10: System Interfaces, Issue 6	GR-1149-CORE <i>Sep-06</i>	
<b>SS7</b>	<b>CLASS</b>	Telcordia	Telcordia Technologies Generic Requirements, GR-1188-CORE: Calling Name Delivery Generic Requirements, Issue 2	GR-1188-CORE <i>Dec-00</i>	SS7ClassTdr
			Telcordia Technologies Generic Requirements, GR-215-CORE: LSSGR: CLASS Feature: Automatic Callback (FSD 01-02-1250), Issue 2	GR-215-CORE <i>Apr-02</i>	
			Telcordia Technologies Generic Requirements, GR-220-CORE: LSSGR: CLASS Feature: Screening List Editing (FSD 30-28-0000), Issue 2	GR-220-CORE <i>Apr-02</i>	

Family	Protocol	Organization	Complete Reference	PIC 10.2 standards	Final builder
			Telcordia Technologies Generic Requirements, GR-227-CORE: LSSGR: CLASS Feature: Automatic Recall (FSD 01-02-1260), Issue 2	GR-227-CORE <i>Apr-02</i>	
SS7	<b>WIN Services</b>	Telcordia	Wireless Intelligent Network	EIA/TIA IS-771 <i>Jul-99</i>	SS7WinServiceTdr
	<b>IS-771</b>	Telcordia	Wireless Intelligent Network - Addendum 1	EIA/TIA IS-771 <i>Aug-01</i>	
		Telcordia	Cellular Radiotelecommunications Intersystem Operations, Revision B to E	EIS/TIA IS-41 <i>Nov-97</i>	
		3GPP2	Win Phase 1, Version 1.0	3GPP2 N.S0013-0 <i>Dec-98</i>	
		3GPP2	Win Phase 2, Version 1.0	3GPP2 N.S0004-0 <i>Apr-01</i>	
		3GPP2	ANSI -41-D Miscellaneous Enhancements, Version 1.0.0, Revision 0	3GPP2 N.S0015 <i>Jan-00</i>	
	<b>IS-826</b>	Telcordia	Wireless Intelligent Network Capabilities for pre-paid Charging	TIA/EIA/IS-826 (1 to 7) <i>Aug-00</i>	
	<b>J-STD-036B</b>	ANSI	Enhanced Wireless SP-3-3890-RV2 9-1-1 Phase II	J-STD-036-B <i>Jan-08</i>	
	<b>IS-843</b>	Telecommunications Industry Association	Wireless Intelligent network Support for Location Based Services	TIA-843 <i>Aug-04</i>	
<b>IS-801</b>	Telecommunications Industry Association	Position Determination Service for cdma2000 Spread Spectrum Systems	TIA-801-A <i>Apr-04</i>		
<b>IS-881</b>	Telecommunications Industry Association	TIA/EIA-41-D Location Services Enhancements	TIA-881 <i>Mar-04</i>		

Family	Protocol	Organization	Complete Reference	PIC 10.2 standards	Final builder
	IS-725	Nortel	TIA/EIA-41-D Enhancements for Over-The-Air Service Provisioning (OTASP) & Parameter Administration (OTAPA), Version 1	TIA/EIA/IS-725-A <i>Mar-99</i>	
	IS-764	Telecommunications Industry Association	TIA/EIA-41-D Enhancements for Wireless Calling Name - Feature Descriptions	TIA-764 <i>Jan-02</i>	
	IS-756	Telcordia	TIA/EIA-41-D Enhancements for Wireless Number Portability Phase II	TIA/EIA/IS-756-A <i>Dec-98</i>	
SS7	BICC ETSI	ITU-T	Bearer Independent Call Control protocol  Signaling System N°7 - ISDN User Part	Q.1901 <i>Apr-02</i>  Q.763 <i>Sep-97</i> (Q.761 to Q.764, Q.766 and Q.767)	Ss7BICCETsiCdr
SS7	BICC ANSI	ANSI	Specifications of the Bearer Independent Call Control	ANSI T1.BICC.1-2000 to ANSI T1.BICC.7-2000 <i>Jan-00</i>	Ss7BICCAnsiCdr
SS7	SIGTRAN	IETF	<b>Support only for ISUP Family Planned for MAP, INAP and IS-41</b>		IPSctpStats IPSctpSudr SS7M2paStats SS7M2PaSudr Ss7M2uaStats Ss7M2uaSudr SS7M3uaStats Ss7M3uaSudr Ss7SccpSuaSudr Ss7SuaStats  SS7_SIGTRAN_Transport_SUDR
	SCTP		Stream Control Transmission Protocol . Used as support for SIGTRAN	RFC 2960 <i>Oct-00</i>	

Family	Protocol	Organization	Complete Reference	PIC 10.2 standards	Final builder
	<b>M3UA</b>		Signaling System 7 (SS7) Message Transfer Part 3 (MTP3) - User Adaptation Layer (M3UA). SUDR & Statistics	RFC 4666 <i>Sep-06</i>	
	<b>M2UA</b>		Signaling System 7 (SS7) Message Transfer Part 2 (MTP2) - User Adaptation Layer	RFC 3331 <i>Sep-02</i>	
	<b>SUA</b>		Signaling Connection Control Part User Adaptation Layer (SUA)	RFC 3868 <i>Oct-04</i>	
	<b>M2PA</b>		Signaling System 7 (SS7) Message Transfer Part 2 (MTP2) - User Peer-to-Peer Adaptation Layer (M2PA). SUDR & Statistics	RFC 4165 <i>Sep-05</i>	
<b>GPRS / IP</b>	<b>GPRS Gn &amp; Gp</b>	ETSI	Digital cellular telecommunications system (Phase 2+); General Packet Radio Service (GPRS); GPRS Tunneling Protocol (GTP) across the Gn and Gp Interface - <b>3GPP TS 09.60</b>  Digital cellular telecommunications system (Phase 2+); Universal Mobile Telecommunications System (UMTS); General Packet Radio Service (GPRS); GPRS Tunneling Protocol (GTP) across the Gn and Gp Interface - <b>3GPP TS 09.60</b>	TS 101 347 V7.8.0 (Release 98) <i>Sep-01</i>  TS 29.060 V12.6.0 (Release 12)  Sept-14	GprsGnGpCdr GprsGnGpTdr  IP_Sessions_summary_TDR
<b>GPRS</b>	<b>GPRS Gb</b>  <b>Network Service (NS)</b>  <b>BSS GPRS Protocol (BSSGP)</b>	ETSI  ETSI	Digital cellular telecommunications system (Phase 2+); General Packet Radio Service (GPRS); Base Station System (BSS) - Serving GPRS Support Node (SGSN) Interface; Network Service - <b>3GPP TS 48.016</b>  Digital cellular telecommunications system (Phase 2+); General Packet Radio Service (GPRS); Base Station System (BSS) - Serving GPRS Support Node (SGSN) Interface; BSS GPRS Protocol (BSSGP) - <b>3GPP TS 48.018</b>	TS 48.016 V7.4.0 (Release 7) <i>Mar-08</i>  TS 48.018 V7.13.0 (Release 7) <i>Dec-09</i>	GprsGbTdr

Family	Protocol	Organization	Complete Reference	PIC 10.2 standards	Final builder
	<b>Logical Link Control (LLC)</b>	ETSI	Digital cellular telecommunications system (Phase 2+); General Packet Radio Service (GPRS); Mobile Station - Serving GPRS Support Node (MS - SGSN) Logical Link Control Layer (LLC) - <b>3GPP TS 04.64</b>	TS 44.064 V7.3.0 (Release 7) <i>Mar-08</i>	
	<b>GPRS Mobility Management (GMM)</b> <b>GPRS Session Management (GSM)</b>	ETSI	Digital cellular telecommunications system (Phase 2+)(GSM); Mobile Radio Interface; Layer 3 Specification - <b>3GPP TS 04.08</b>	TS 24.008 V7.12.0 (Release 7) <i>Jun-08</i>	
	<b>SNDCP</b>	ETSI	Digital cellular telecommunications system (Phase 2+); General Packet Radio Service (GPRS); Mobile Station - Serving GPRS Support Node (MS - SGSN); Subnetwork Dependent Convergence Protocol (SNDCP) - <b>3GPP TS 04.65</b>	TS 24.065 V7.0.0 (Release 7) <i>Dec-06</i>	
	<b>Short Message Service (SMS)</b>	ETSI	Digital cellular telecommunications system (Phase 2+); Point-to-Point (PP) Short Message service (SMS) Support on Mobile Rdio Interface - <b>3GPP TS 04.11</b>	TS 24.011 V7.1.0 (Release 7) <i>Jun-09</i>	
			Digital cellular telecommunications system (Phase 2+); Technical realization of Short Message Service (SMS) Point-to-Point (PP) - <b>3GPP TS 03.40</b>	TS 23.040 V7.2.0 (Release 7) <i>Mar-09</i>	
<b>GPRS</b>	<b>GPRS Gr &amp; Gd</b>	ETSI	Digital cellular telecommunications system (Phase 2+); Universal Mobile Telecommunications System (UMTS); Mobile Application Part (MAP) specification - <b>3GPP TS 29.002</b>	TS 29.002 V12.6.0 (Release 12)  Sept-14	SS7MapTdr  SS7_MAP_Compact_TDR

Family	Protocol	Organization	Complete Reference	PIC 10.2 standards	Final builder
IP	DNS	IETF	Domain Names - Concepts and Facilities	<p>RFC 1034 <i>Nov-87</i></p> <p>Not relevant or supported: RFC1101, RFC1183, RFC1348, RFC1876, RFC1982, RFC2065, RFC2181, RFC2308, RFC2535, RFC4033, RFC4034, RFC4035, RFC4343, RFC4035, RFC4592, RFC5936</p> <p>RFC 1035 <i>Nov-87</i></p>	IpDnsTdr
			Domain Names - Implementation and Specification	<p>Not relevant or supported: RFC1101, RFC1183, RFC1348, RFC1876, RFC1982, RFC1995, RFC1996, RFC2065, RFC2136, RFC2181, RFC2137, RFC2308, RFC2535, RFC2845, RFC3425, RFC3658, RFC4033, RFC4034, RFC4035, RFC4343, RFC5936, RFC5966</p>	
IP	DNS ENUM	IETF	E.164 Number and DNS	<p>RFC 2916 <i>Sep-00</i></p>	IpDnsEnumTdr
IP	RADIUS	IETF	Remote Authentication Dial In User Service (RADIUS)	<p>RFC 2865 <i>Jun-00</i></p> <p>RFC2866 <i>Jun-00</i></p> <p>Not relevant or supported: RFC2868, RFC3575, RFC5080</p>	IpRadius
IP	DHCP  BOOTP	IETF	Bootstrap protocol (BOOTP)	<p>RFC 951 <i>Sep-85</i></p> <p>Not relevant or supported: RFC1395, RFC1497, RFC1532, RFC1542, RFC5494</p>	IpDhcpTdr

Family	Protocol	Organization	Complete Reference	PIC 10.2 standards	Final builder
	<b>DHCP</b>	IETF	Dynamic Host Configuration Protocol	RFC 2131 <i>May-97</i> Not relevant or supported: RFC3396, RFC4361, RFC5494	
<b>IP</b>	<b>WAP</b>  <b>WTP</b>  <b>WSP</b>	WAP Forum / OMA  WAP Forum / OMA	Wireless Transaction protocol  WAP - Wireless Session Protocol Specification	WAP-224-WTP-20010710-a <i>Jul-01</i>  WAP-230-WSP-20010705-p <i>Jul-01</i>	IpWapv1Tdr
<b>IP</b>	<b>MMS</b>	OMA	Multimedia Messaging Service Encapsulation Protocol Version 1.1	OMA-MMS-ENC-v1_1-20021030-C <i>Oct-02</i>	IpMmsWapv1Tdr IpMmsWapv2Tdr
<b>IP</b>	<b>HTTP</b>	IETF	Hypertext Transfer Protocol - HTTP/1.1	RFC 2616 <i>Jun-99</i> Not relevant or supported: RFC2817, RFC5785, RFC6266	IpHttpTdr
<b>IP</b>	<b>HTTP2</b>	IETF	Hypertext Transfer Protocol - HTTP/2	RFC 7540, 7541	EvolvedHttpTdr
<b>IP</b>	<b>WAP2</b>	IETF  WAP Forum / OMA	Hypertext Transfer Protocol - HTTP/1.1  WAP Architecture	RFC 2616 <i>Jun-99</i> Not relevant or supported: RFC2817, RFC5785, RFC6266  WAP-210-WAPArch-20010712 <i>Jul-01</i>	IpWapv2Tdr
<b>IP</b>	<b>POP3</b>	IETF	Post Office protocol - Version 3	RFC 1460 <i>Jun-93</i>	IpPop3Tdr
<b>IP</b>	<b>SMTP</b>	IETF	Simple Mail Transfer Protocol	RFC 2821 <i>Apr-01</i>	IpSmtptdr
<b>IP</b>	<b>IMAP4</b>	IETF	Internet Message Access Protocol - Version 4rev1	RFC 2060 <i>Mar-03</i>	IpImap4Tdr



Family	Protocol	Organization	Complete Reference	PIC 10.2 standards	Final builder
IP	FTP	IETF	File Transfer Protocol	RFC 959 <i>Oct-85</i>  Not relevant or supported: RFC2228, RFC2640, RFC2773, RFC3659, RFC5797	IpFtpTdr
IP	TCP	IETF	Transmission Control Protocol	RFC 793 <i>Sep-81</i>  Not relevant or supported: RFC1122, RFC3168, RFC6093	IpTcpCdr
IP	RTSP	IETF	Real Time Streaming Protocol (RTSP)	RFC 2326 <i>Apr-98</i>	IpRtspTdr
		IETF	SDP:Session Description Protocol	RFC 2327 <i>Apr-98</i>	
IP	SMPP	SMS Forum	Short Message Peer-to-Peer protocol Specification, Version 5.0	SMPP v5.0 <i>Feb-03</i>	IpSmppTdr
IP	UCP	Logica CMG	Short Message Service center; EMI - UCP Interface 4.6	EMI UCP Interface <i>May-05</i>	IpUcpTdr
UMTS	UMTS  Iu-CS Control Plane over IP Iu-PS Control Plane over IP		Universal Mobile Telecommunications System (UMTS); UTRAN Iu interface Radio Access Network Application Part (RANAP) signalling - <b>3GPP TS 25.413</b>  Digital cellular telecommunications system (Phase 2+); Universal Mobile Telecommunications System (UMTS); Mobile radio interface layer 3 specification; Radio Resource Control (RRC) protocol - <b>3GPP TS 44.018</b>	TS 25.413 V12.3.0 (Release 12)  Dec-14  TS 44.018 V12.3.0 (Release 12)  Sept-14	Ran_CC2_Cdr Ran_MM_Tdr Ran_SMS_Tdr Ran_USSD UMTS_Iu_C_TDR UMTS_Iu_P_GMM_TDR UMTS_Iu_P_TDR UMTS_Iu_P_SM_TDR

Family	Protocol	Organization	Complete Reference	PIC 10.2 standards	Final builder
	Iu-PS User Plane over IP	ETSI	Digital cellular telecommunications system (Phase 2+); Mobile Radio interface layer 3 supplementary service specification; Formats and Coding - <b>3GPP TS 04.80</b>	TS 24.080 V12.0.0 (Release 12) Sept-14	
Digital cellular telecommunications system (Phase 2+); Universal Mobile Telecommunications System (UMTS); Technical realization of Short Message Service (SMS) Point-to-Point (PP) - <b>3GPP TS 24.011</b>			TS 24.011 V12.0.0 (Release 12) Sept-14		
Digital cellular telecommunications system (Phase 2+); Universal Mobile Telecommunications System (UMTS); Mobile radio interface Layer 3 specification; Core network protocols; Stage 3 - <b>3GPP TS 24.008</b>			TS 24.008 V12.7.0 (Release 12) Sept-14		
Digital cellular telecommunications system (Phase 2+); Universal Mobile Telecommunications System (UMTS); General Packet Radio Service (GPRS); GPRS Tunneling Protocol (GTP) across the Gn and Gp Interface - <b>3GPP TS 09.60</b>			TS 29.060 V12.6.0 (Release 12) Sept-14		
VoIP	VoIP SIP / SIP-T / SIP-I	IETF	<b>SIP</b> Session Initiation Protocol	RFC 3261 Jun-02 Not relevant or supported: RFC3853, RFC4320, RFC4916, RFC5393, RFC5621, RFC5626, RFC5630, RFC5922, RFC5954, RFC6026, RFC6141	VoipSipCdr VoipSiptAnsiCdr VoipSiptItuCdr
		IETF	Reliability of Provisional Responses in the Session Initiation Protocol (SIP)	RFC 3262 Jun-02	
		IETF	Session Initiation Protocol (SIP) - Specific Event Notification	RFC 3265 Jun-02 Not relevant or supported: RFC5367, RFC5727, RFC6446	

Family	Protocol	Organization	Complete Reference	PIC 10.2 standards	Final builder
		IETF	The Session Initiation Protocol (SIP) UPDATE Method	RFC 3311 <i>Sep-02</i>	
		IETF	The Session Initiation Protocol (SIP) Refer Method	RFC 3515 <i>Apr-03</i>	
		IETF	The SIP INFO Method	RFC 2976 <i>Oct-00</i>	
		IETF	Session Initiation Protocol for Telephones ( <b>SIP-T</b> ): Context and Architectures	RFC 3372 <i>Sep-02</i>	
		IETF	SDP:Session Description Protocol	RFC 2327 <i>Apr-98</i>	
		IETF	Session Description Protocol (SDP) Simple Capability Declaration	RFC 3407	
		ITU-T	Interworking between Session Initiation Protocol (SIP) and Bearer Independent Call Control Protocol or ISDN User Part.	Q.1912-5 <i>Mar-04</i>	
			CS2000 SIP/SIP-T		
		Nortel	Interoperability Specification (Issue 0.82) System Requirement Document	Nortel CS2000 <i>01/10/2003</i>	
			Multiple Dialog Usages in the Session Initiation Protocol	<i>RFC5057</i>	
<b>VoIP</b>	<b>VoIP H.225/Q.931</b>	ITU-T	Serie H: Audiovisual and Multimedia Systems - Call Signalling protocols and media stream packetisation for packet-based multimedia communication systems	H.225.0 <i>Jul-03</i>	VoipQ931Cdr
		ITU-T	ISDN user-network interface layer 3 specification for basic call control	Q.931 <i>Dec-99</i>	
<b>VoIP</b>	<b>VoIP H.225/RAS</b>	ITU-T	Call Signalling protocols and media stream packetisation for packet-based multimedia communication systems	H.225.1 <i>Jul-03</i>	VoipRasTdr

Family	Protocol	Organization	Complete Reference	PIC 10.2 standards	Final builder
VoIP	VoIP H.245	ITU-T	Control Protocol for multimedia communication	H.245 <i>Jul-03</i>	VoipH245Tdr
VoIP	VoIP RTP	IETF	RTP: A Transport Protocol for Real-Time Application	RFC 3550, <i>Jul-03</i> RFC3551 <i>Jul-03</i>  Not relevant or supported: RFC5506, RFC5761, RFC6051, RFC6222	VoipSipCdr
VoIP	MGCP	IETF  IETF  IETF	Media Gateway Control Protocol (MGCP) version 1.0  Media Gateway Control Protocol (MGCP) Return Code Usage  Media Gateway Control Protocol (MGCP) Packages	RFC 3435 <i>Jan-03</i>  Not relevant or supported: RFC3661  RFC 3661 <i>Dec-03</i>  RFC 3660 <i>Dec-03</i>	VoipMgcpCdr VoipMgcpTdr
VoIP	MEGACO	IETF	Gateway Control Protocol Version 1.0	RFC 3525 <i>Jun-03</i>	VoipMEGACOTdr
VoIP	H.248	ITU-T	Gateway Control Protocol: Version 2	H.248.1 <i>May-02</i>  Supported packages H.248.2 until H.248.31	VoipH248Tdr

Family	Protocol	Organization	Complete Reference	PIC 10.2 standards	Final builder
IMS	Diameter	IETF	Diameter Base Protocol	RFC 3588 Sep-03	ImsDiameterCcTdr ImsDiameterCxTdr ImsDiameterGqTdr ImsDiameterShTdr ImsDiameterTdr  LTE_Diameter-TDR
		IETF	Diameter Credit-Control Application	RFC 4006 Aug-05	
	Diameter Credit-Control (Cc, Ro, Rf, Gy, Ga)	ETSI / 3GPP	3rd Generation Partnership Project; Technical Specification Group Service and System Aspects; Telecommunication management; Charging management;	TS 32.299 V12.6.0 (Release 12) Sept-14	
	Diameter Gq	ETSI	Diameter charging applications  Universal Mobile Telecommunications System (UMTS); Policy control over Gq interface (3GPP TS 29.209 version 6.5.0 Release 6) . Replaced by Rx in LTE	TS 29.209 V6.5.0 (Release 6) Jun-06	
	Diameter Cx/Dx	ETSI	Digital cellular telecommunications system (Phase 2+); Universal Mobile Telecommunications System (UMTS); IP Multimedia (IM) Subsystem Cx and Dx Interfaces; Signalling flows and message contents <b>3GPP TS 29.228</b>	TS 29.228 V12.3.0 (Release 12) Sept-14	
		ETSI	Digital cellular telecommunications system (Phase 2+); Universal Mobile Telecommunications System (UMTS); Cx and Dx interfaces based on the Diameter protocol <b>3GPP TS 29.229</b>	TS 29.229 V12.3.0 (Release 12) Sept-14	
		ETSI	Digital cellular telecommunications system (Phase 2+); Universal Mobile Telecommunications System (UMTS); Diameter applications; 3GPP specific codes and identifiers <b>3GPP TS 29.230</b>	TS 29.230 V12.6.0 (Release 12) Sept-14	

Family	Protocol	Organization	Complete Reference	PIC 10.2 standards	Final builder
	Diameter Sh	ETSI	Digital cellular telecommunications system (Phase 2+); Universal Mobile Telecommunications System (UMTS); Sh interface based on the Diameter protocol; <b>3GPP TS 29.329</b>	TS 29.329 V12.4.0 (Release 12) Sept-14	
LTE	Diameter S6	3GPP	3rd Generation Partnership Project; Technical Specification Group Core Network and Terminals; Evolved Packet System (EPS); Mobility Management Entity (MME) and Serving GPRS Support Node (SGSN) related interfaces based on Diameter protocol (Release 9)	TS 29.272 V12.6.0 (Release 12) Sept-14	LTE_Diameter_S6_TDR LTE_Diameter_SUDR_Accounting LTE_Diameter-TDR
	Diameter Gx/S7	3GPP	3rd Generation Partnership Project; Technical Specification Group Core Network and Terminals; Policy and Charging Control over Gx reference point (Release 9)	TS 29.212 V12.6.0 (Release 12) Sept-14	LTE_Diameter_Gx_TDR LTE_Diameter-TDR
	Diameter Rx	3GPP	3rd Generation Partnership Project; Technical Specification Group Core Network and Terminals; Policy and Charging Control over Rx reference point (Release 9)	TS 29.214 V12.5.0 (Release 12) Sept-14	LTE_Diameter_Rx_TDR LTE_Diameter-TDR
	Diameter Gy	3GPP	3rd Generation Partnership Project; Technical Specification Group Services and System Aspects; Telecommunication management; Charging management; Diameter charging applications	TS 32.299 V12.6.0 (Release 12) Sept-14	LTE_DIAMETER_Gy_TDR LTE_Diameter-TDR
	Diameter S9	3GPP	3rd Generation Partnership Project; Technical Specification Group Core Network and Terminals; Policy and Charging Control (PCC) over S9 reference point; Stage 3	TS 29.215 V12.5.0 (Release 12) Sept-14	LTE_DIAMETER_S9_TDR LTE_Diameter-TDR

Family	Protocol	Organization	Complete Reference	PIC 10.2 standards	Final builder
	<b>Diameter AAA</b>	3GPP	3rd Generation Partnership Project; Technical Specification Group Core Network and Terminals; Evolved Packet System (EPS); 3GPP EPS AAA interfaces	TS 29.273 V12.5.0 (Release 12) Sept-14	LTE_Diameter_AAA_TDR
	<b>Diameter LCS</b>	3GPP	3rd Generation Partnership Project; Technical Specification Group Core Network and Terminals; Location Services (LCS); Evolved Packet Core (EPC) LCS Protocol (ELP) between the Gateway Mobile Location Centre (GMLC) and the Mobile Management Entity (MME); SLg interface	TS 29.172 V12.4.0 (Release 12) Mar-14	LTE_Diameter_LCS_TDR
			3rd Generation Partnership Project; Technical Specification Group Core Network and Terminals; Location Services (LCS); Diameter-based SLh interface for Control Plane LCS	TS 29.173 V12.2.0 (Release 12) Sept-14	
	<b>GTPv2</b>	3GPP	3rd Generation Partnership Project; Technical Specification Group Core Network and Terminals; 3GPP Evolved Packet System (EPS); Evolved General Packet Radio Service (GPRS) Tunnelling Protocol for Control plane (GTPv2-C); Stage 3 (Release 9)	TS 29.274 V12.6.0 (Release 12) Sept-14	LTE_GTP_v2_Tunnel_Management_TDR LTE_GTP_v2_Mobility_Management_TDR LTE_GTP_v2_Sv_TDR

Family	Protocol	Organization	Complete Reference	PIC 10.2 standards	Final builder
	<b>S1-AP</b>	3GPP	3rd Generation Partnership Project; Technical Specification Group Radio Access Network; Evolved Universal Terrestrial Radio Access Network (E-UTRAN); S1 Application Protocol (S1AP) (Release 9)	TS 36.413 V12.3.0 (Release 12)  Sept-14	LTE_S1AP_TDR RAN_ESM_TDR RAN_EMM_TDR
		3GPP	3rd Generation Partnership Project; Technical Specification Group Core Network and Terminals; Non-Access-Stratum (NAS) protocol for Evolved Packet System (EPS); Stage 3 (Release 9)	TS 24.301 V12.6.0 (Release 12) (Release 12)Sept-14	
	<b>SGs</b>	3GPP	3rd Generation Partnership Project; Technical Specification Group Core Network and Terminals; Mobility Management Entity (MME) – Visitor Location Register (VLR) SGs interface specification (Release 9)	TS 29.118 V12.6.0 (Release 12)  Sept-14	LTE_SGsAP_TDR
	<b>LTE User Plane (S5-U, S8-U, S1-U, S12-U)</b>	3GPP	3rd Generation Partnership Project; Technical Specification Group Core Network and Terminals; General Packet Radio System (GPRS) Tunnelling Protocol User Plane (GTPv1-U) (Release 9)	TS 29.281 V11.6.0 (Release 11)  Mar-13	LTE_GTP_User_Plane_Capture



## Appendix B: My Oracle Support

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My Oracle Support (<https://support.oracle.com>) is your initial point of contact for all product support and training needs. A representative at Customer Access Support (CAS) can assist you with My Oracle Support registration.

Call the CAS main number at 1-800-223-1711 (toll-free in the US), or call the Oracle Support hotline for your local country from the list at <http://www.oracle.com/us/support/contact/index.html>. When calling, make the selections in the sequence shown below on the Support telephone menu:

1. Select 2 for New Service Request
2. Select 3 for Hardware, Networking and Solaris Operating System Support
3. Select 2 for Non-technical issue

You will be connected to a live agent who can assist you with My Oracle Support registration and provide Support Identifiers. Simply mention you are a Tekelec Customer new to My Oracle Support.

My Oracle Support is available 24 hours a day, 7 days a week.