Discussion on a new Work Item proposal on integration of 3GPP and ONAP

AT&T, Deutsche Telekom, Ericsson, Huawei, Nokia, Orange

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SA5 and ONAP

- Two ongoing (non normative) Study Items:
  - Study on integration of ONAP DCAE and 3GPP management architecture (Rapporteurs: AT&T, Orange)
    - Focus on Assurance (FM/PM)
    - Gap analysis b/w 3GPP FM/PM management services APIs, and DCAE Collectors APIs
  - Study on integration of ONAP and 3GPP configuration management services for 5G networks (Rapporteur: Ericsson)
    - Focus on Fulfillment (CM/LCM)
    - Gap analysis b/w 3GPP CM management services APIs, and APPC 'southbound' APIs
  - Commonalities:
    - Expected completion date: March 2019
    - Output: TR 28.890 (previously TR 28.900)
    - ONAP Baseline: Release 3 (Casablanca)
    - 3GPP baseline: Rel-15 TSs
- Proposal to launch a (normative) Rel-16 Work Item, submitted to SA#83

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Objectives

- Provide a comprehensive solution for the Management and Orchestration of 3GPP 5G networks using ONAP
- No gap, no overlap between ONAP and 3GPP

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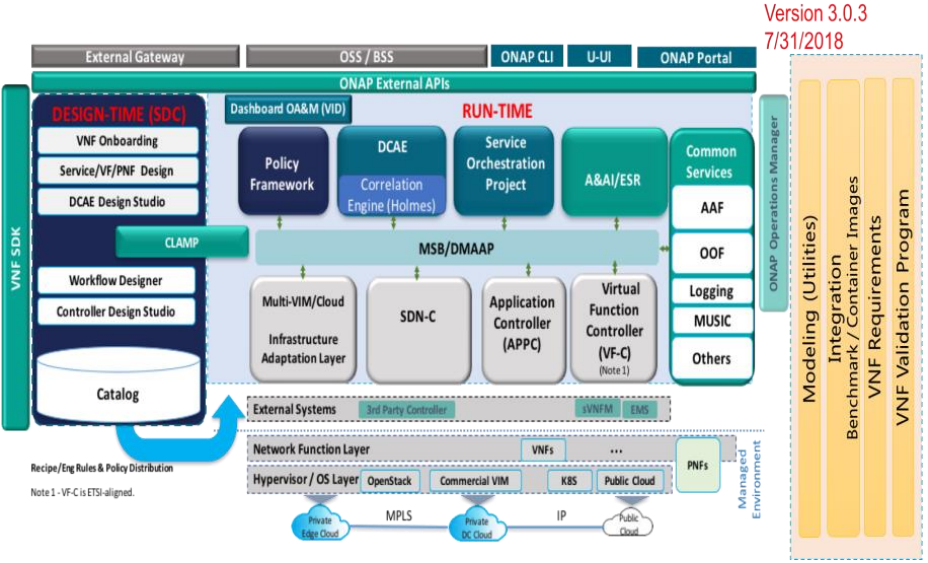
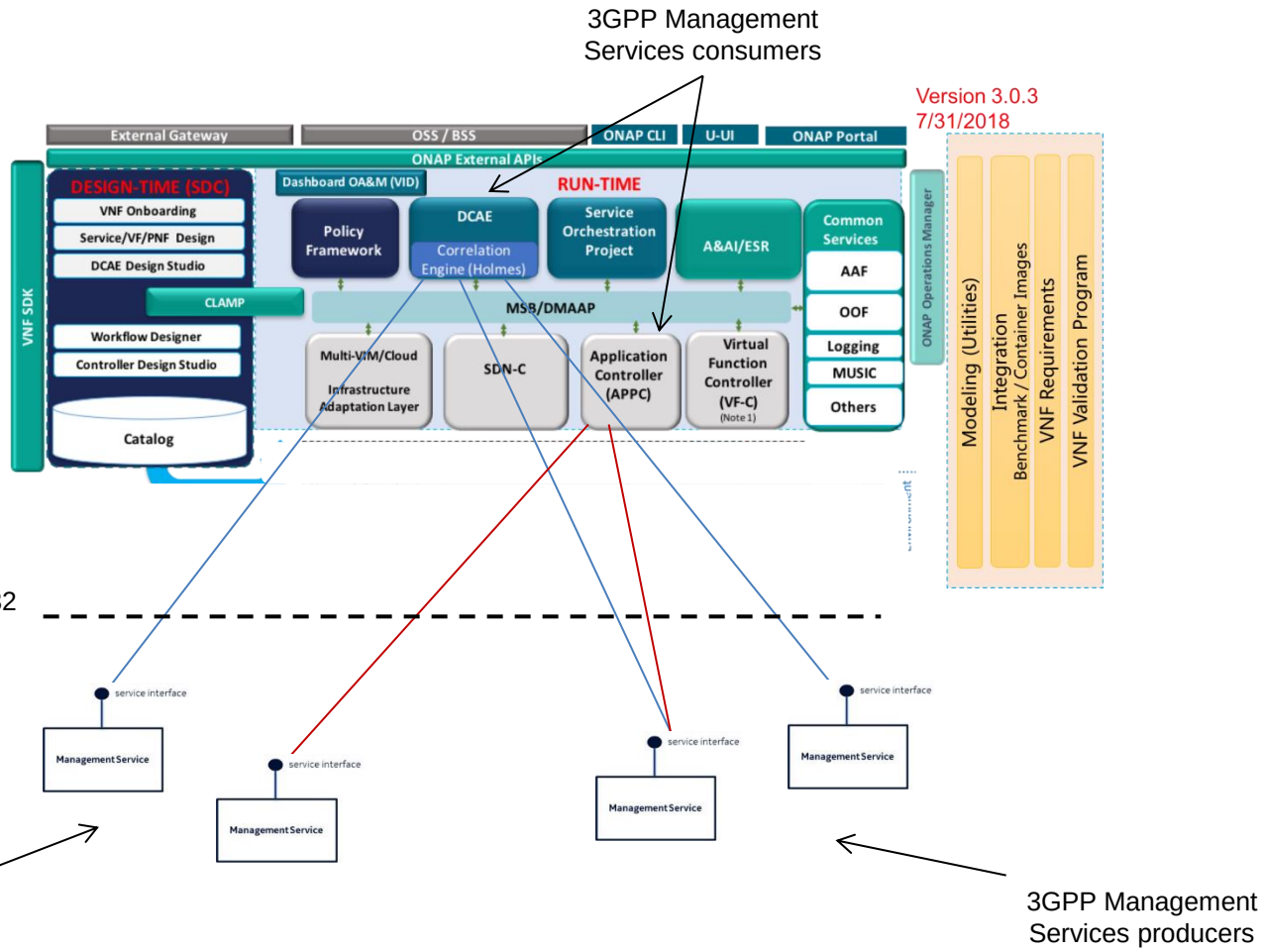
Positioning ONAP wrt. 3GPP MnSs



ONAP R3 (Casablanca) architecture



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FM / PM – General

	ONAP	3GPP	Proposed action
GEN 1 – FM/PM events recipient	DCAE Collector(s) as recipient(s) of any sorts of events from xNFs. VNF: Address of DCAE Collector(s). Can be provisioned at VNF instantiation time. PNF: Address of DCAE Collector(s). Can be provisioned after MOI creation.	Based on Subscribe / Notify paradigm and filtering conditions. N-to-M relationship b/w notification emitters and recipients.	AI 3GPP: Specify a solution to model the association between 5G NRM IOC instances and the address(es) of 'notification consumer(s)', configurable via 'NF Provisioning Management Service'.

Per Network Function MOI?
Per Network Slice Subnet MOI?

Type of event	JSON VES Collectors' address list	HV VES Collectors' address list	Data File Collectors' address list
'fault'	{VES Coll#1 IP@}		
'measurement'	{VES Coll#2 IP@}	{HV Coll#1 IP@}	{DF Coll#1 IP@}
'heartbeat'	{VES Coll#1 IP@, VES Coll#2 IP@}	{HV Coll#1 IP@}	{DF Coll#1 IP@}
…			

NOTE: this is for discussion during the normative work.

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Fault Management

	ONAP	3GPP	Proposed action
FM 1 – Data Model for Event Records / Common Header	'Common Header' captures fields to be sent out to DCAE Collector(s), whatever the event type.	Similar to Pre-5G Notification IRP parameters. N/A from 5G onwards.	AI 3GPP: Identify mandatory parameters of all notifications and provide a mapping to ONAP 'Common Header' required (only) fields.
FM 2 - Data Model for Event Records / Fault Record	'Fault' Record fields defined – see next slide.	3GPP alarm notifications parameters hardly mappable onto ONAP Fault Record fields.	AI in ONAP: 1/Introduce a new Technology-Specific Record 'Fault3GPP' – see next slides. 2/ Define the 'Fault3GPP' JSON schema AI 3GPP: New mapping table + JSON Stage 3 for 'Fault3GPP'
FM 3 – Alarm Reporting Method	1/ In 'Normal conditions' (TBD) -> VES JSON Collector (using REST / HTTP(s) / JSON) 2/ In 'Alarm flooding conditions' (TBD) -> VES HV Collector (using TCP (/TLS) / GPB)	1/ REST JSON Stage 3 2/ Not supported	AI in ONAP: See above. AI 3GPP: Decide whether another solution in addition to REST/JSON is needed. ASN.1? Rel-17 only?

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FM 1 – Mapping TS 28.532 common notification parameters to VES JSON required ‘commonEventHeader’ fields

Example based on notifyNewAlarm () (cf. TS 28.532 – clause 9.2.2)

9.2.2 Notification notifyNewAlarm

The IS notification parameters are mapped to SS equivalents according to table 9.2.2-1.

Table 9.2.2-1: Mapping of IS notification parameters to SS equivalents

IS notification parameter name	SS parameter location	SS parameter name	SS parameter type	SQ
objectClass, objectInstance	request body	href	uri-Type	M
notificationId	request body	notificationId	notificationId-Type	M
notificationType	request body	notificationType	notificationType-Type	M
eventTime	request body	eventTime	dateTime-Type	M
systemDN	request body	systemDN	systemDN-Type	C
probableCause	request body	probableCause	probableCause-Type	M
perceivedSeverity	request body	perceivedSeverity	perceivedSeverity-Type	M
rootCauseIndicator	request body	rootCauseIndicator	rootCauseIndicator-Type	O
alarmType	request body	alarmType	alarmType-Type	M
specificProblem	request body	specificProblem	specificProblem-Type	O
correlatedNotifications	request body	correlatedNotifications	array(correlatedNotification-Type)	O
backedUpStatus	request body	backedUpStatus	backedUpStatus-Type	O
backUpObject	request body	backUpObject	backUpObject-Type	O
trendIndication	request body	trendIndication	trendIndication-Type	O
thresholdInfo	request body	thresholdInfo	thresholdInfo-Type	O
stateChangeDefinition	request body	stateChangeDefinition	array(attributeValueChange-Type)	O
monitoredAttributes	request body	monitoredAttributes	array(attributeNameValuePair-Type)	O
proposedRepairActions	request body	proposedRepairActions	proposedRepairActions-Type	O
additionalText	request body	additionalText	additionalText-Type	O
additionalInformation	request body	additionalInformation	array(attributeNameValuePair-Type)	O
alarmId	request body	alarmId	alarmId-Type	O

Only few notification parameters can be mapped to VES JSON common event header fields


```
{
"definitions": {
        "commonEventHeader": {
                "description": "fields common to all events",
                "type": "object",
                "properties": {
                        "domain": {
                                "description": "the eventing domain associated with the event",
                                "type": "string",
                                "enum": [
                                        "fault",
                                        "heartbeat",
                                        "measurement",
                                        "mobileFlow",
                                        "notification",
                                        "other",
                                        "pnfRegistration",
                                        "sipSignaling",
                                        "stateChange",
                                        "syslog",
                                        "thresholdCrossingAlert",
                                        "voiceQuality",

                                ]
                        },
                        "eventId": {
                                "description": "event key that is unique to the event source",
                                "type": "string"
                        },
                        "eventName": {
                                "description": "unique event name",
                                "type": "string"
                        },
                        "lastEpochMicrosec": {
                                "description": "the latest unix time aka epoch time associated with the event from any component--as microseconds elapsed
                                "type": "number"
                        },
                        "priority": {
                                "description": "processing priority",
                                "type": "string",
                                "enum": [
                                        "High",
                                        "Medium",
                                        "Normal",
                                        "Low"
                                ]
                        },
                        "reportingEntityName": {
                                "description": "name of the entity reporting the event, for example, an EMS name; may be the same as sourceName",
                                "type": "string"
                        },
                        "sequence": {
                                "description": "ordering of events communicated by an event source instance or 0 if not needed",
                                "type": "integer"
                        },
                        "sourceName": {
                                "description": "name of the entity experiencing the event issue",
                                "type": "string"
                        },
                        "startEpochMicrosec": {
                                "description": "the earliest unix time aka epoch time associated with the event from any component--as microseconds elaps
                                "type": "number"
                        },
                        "version": {
                                "description": "version of the event header",
                                "type": "string",
                                "enum": ["4.0"]
                        },
                        "vesCommonEventFormatVersion": {
                                "description": "version of the VES common event format",
                                "type": "string",
                                "enum": ["30.0"]
                        }
                },
                "additionalProperties": false,
                "required": ["domain", "eventId", "eventName", "lastEpochMicrosec",
                        "priority", "reportingEntityName", "sequence", "sourceName",
                        "startEpochMicrosec", "version", "vesCommonEventFormatVersion"
                ]
```


To be added to 28.532:
“10 RESTful HTTP-based solution set for integration with ONAP, with:
a) New mapping to be added, from common notification parameters to ‘commonEventHeader’ fields
b) New JSON schema to be defined in TS 28.532 for ‘commonEventHeader’
c) New OpenAPI spec for existing notifications

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FM 2 – Mapping remaining TS 28.532 notification parameters to VES JSON 'Fault' fields

Most 3GPP Alarm notification parameters would have to be captured in « alarm Additional Information » field, as 'key:value' pairs

->

After evaluation in our study item, we do not recommend this approach

'Fault' Domain Datatypes

Datatype: faultFields

The faultFields datatype consists of the following fields:

Field	Type	Required?	Description
alarmAdditional Information	hashMap	No	Additional alarm information. • Note1: for SNMP mapping to VES, for hash key use OID of varbind, for value use incoming data for that varbind). • Note2: Alarm ID for 3GPP should be included (if applicable) in alarmAdditon **alInformation** as 'alarmId':'a larmIdValue'. Could contain managed object instance as separate key:value; could add probable cause as separate key:value.
alarmCondition	string	Yes	Short name of the alarm condition/probl em, such as a trap name. Should not have white space (e.g., tpLgCgiNotInCon fig, BfdSessionDown, linkDown, etc...)
alarmInterfaceA	string	No	Card, port, channel or interface name of the device generating the alarm. This could reflect managed object.
eventCategory	string	No	Event category, for example: 'license', 'link', 'routing', 'security', 'signaling'
eventSeverity	string	Yes	Event severity enumeration: 'CRITICAL', 'MAJOR', 'MINOR', 'WARNING', 'NORMAL'. NORMAL is used to represent clear.
eventSourceType	string	Yes	Examples: 'card', 'host', 'other', 'port', 'portThreshold' , 'router', 'slotThreshold' , 'switch', 'virtualMachine ', 'virtualNetwork Function'. This could be managed object class.
faultFieldsVers ion	string	Yes	Version of the faultFields block as "#.#" where # is a digit; see section 1 for the correct digits to use.
specificProblem	string	Yes	Description of the alarm or problem (e.g., 'eNodeB 155197 in PLMN 310-410 with eNodeB name KYL05197 is lost'). 3GPP probable cause would be included in this field.
vfStatus	string	Yes	Virtual function status enumeration: 'Active', 'Idle', 'Preparing to terminate', 'Ready to terminate', 'Requesting Termination'

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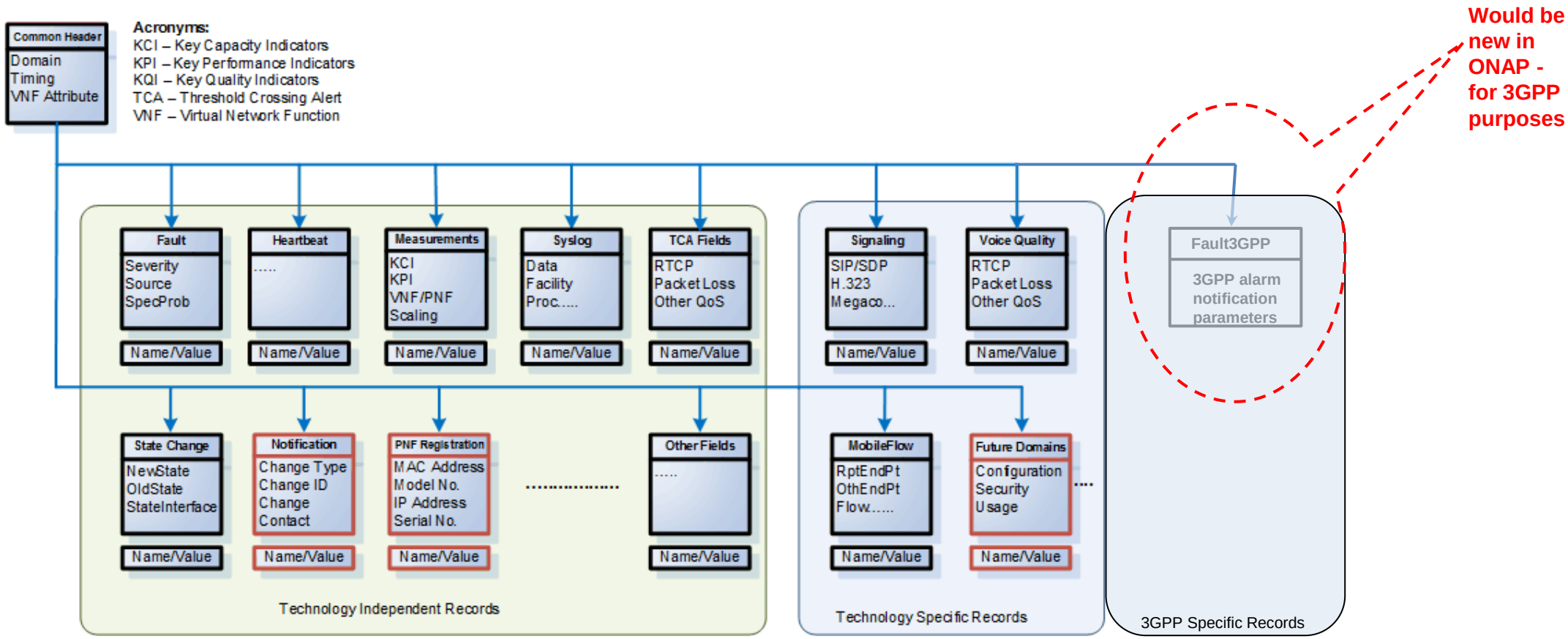
FM 2 - Introducing 'Fault3GPP' as new type of Technology Specific Record



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FM2 - Introduce a new Technology-Specific Record ‘fault3GPP’ in VES JSON -> Action in ONAP and in 3GPP

A GLOBAL INITIATIVE

Fichier Edition Format Affichage ?

```
{
        "$schema": "http://json-schema.org/draft-04/schema#",
        "title": "VES Event Listener Common Event Format",
        "type": "object",
        "properties": {
                "event": {
                        "$ref": "#/definitions/event"
                },
                "eventList": {
                        "$ref": "#/definitions/eventList"
                }
        },
        "definitions": {
                "commonEventHeader": {
                        "description": "fields common to all events",
                        "type": "object",
                        "properties": {
                                "domain": {
                                        "description": "the eventing domain associated with the event",
                                        "type": "string",
                                        "enum": [
                                                "fault",
                                                "heartbeat",
                                                "measurement",
                                                "mobileFlow",
                                                "notification",
                                                "other",
                                                "pnfRegistration",
                                                "sipSignaling",
                                                "stateChange",
                                                "syslog",
                                                "thresholdCrossingAlert",
                                                "voiceQuality",
                                                "fault3gpp"
                                        ]
                                },
                                "eventId": {
                                        "description": "event key that is unique to the event source",
                                        "type": "string"
                                },
                                "eventName": {
                                        "description": "unique event name",
                                        "type": "string"
                                },
                                "lastEpochMicrosec": {
                                        "description": "the latest unix time aka epoch time associated with the
                                        "type": "number"
                                },
                                "priority": {
                                        "description": "processing priority",
                                        "type": "string",
                                        "enum": [
                                                "High",
                                                "Medium",
                                                "Normal",
                                                "Low"
                                        ]
```

Example of ‘fault3GPP’ JSON schema to be defined in ONAP VES JSON Collector API

NOTE: this is a proposal only. To be further discussed during the normative work.

```
,
"fault3gppFields": {
        "description": "3GPP alarm notifications format, based on 3GPP TS 28.532.",
        "type": "object",
        "properties": {
                "fault3gppFieldsVersion": {
                        "description": "The version of the Fault Supervision Management Service in TS 28.532 - Clause A.2",
                        "type": "string"
                },
                "alarmNotification": {
                        "oneOf": [{
                                        "$ref": "#/definitions/notifyNewAlarmType"
                                },
                                {
                                        "$ref": "#/definitions/notifyNewSecurityAlarmType"
                                }
                                {
                                        "$ref": "#/definitions/notifyClearedAlarmType"
                                }
                                {
                                        "$ref": "#/definitions/notifyAlarmListRebuiltType"
                                }
                                ...
                        ]
                },
        },
```

To be added in 3GPP TS 28.532:

1. New clause:

“10 RESTful HTTP-based solution set for integration with ONAP”, and new annex A2, with new mapping from notification parameters to ‘fault3GPP’ field

2. New Annex for OpenAPI for ‘fault3GPP’

Fault Management operations

	ONAP	3GPP	Proposed action
FMO 1 - Retrieving missing alarms	Not addressed by ONAP	**getAlarmList ()** – used to deal with alarm loss. Two modes of operation: a) Synchronous mode: the list of missing alarms is returned synchronously with the operation b) Asynchronous mode: the list of missing alarms is returned via alarm notifications. In this mode of operation, the only information returned synchronously is the status of the operation.	AI 3GPP: Specify which mode(s) of operation is supported by ONAP. Possibly: # both modes if Consumer is a DCAE Collector; # only asynchronous mode if Consumer is APPC. AI ONAP: FFS (potentially introduce UC in ONAP and add operation getAlarmList to APPC API (cf. Note 1 below))
FMO 2 – Acknowledging Alarms	Not addressed by ONAP	**acknowledgeAlarms ()** – used to indicate that the activity to resolve the problem has started **unacknowledgeAlarms ()**	AI 3GPP: None. AI ONAP: FFS (potentially introduce UC and add these operations to VES JSON Collector API or to APPC API (cf. Note 1 below))
FMO 3 – Clearing Alarms	Not addressed by ONAP	**clearAlarms ()** – used for clearing alarms cleared	
FMO 4 – Setting comments	Not addressed by ONAP	**setComments ()** - used to set comments to alarms	

Note 1: https://onap.readthedocs.io/en/casablanca/submodules/appc.git/docs/

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Performance Management

	ONAP	3GPP	Proposed action
PM 1 - Control of Performance Management (e.g. measurement start time, end time, Granularity Period, Reporting Period, measurements to be collected, etc.)	Parameters are provisioned (as other VNF configuration parameters) at instantiation time and can be modified later	Based on PM job (createMeasurementJob (), stopMeasurementJob (), …)	AI 3GPP: Specify a solution, e.g. based on S5-186404 (TD Rel-15 TS 28622 Generic NRM IS on Measurement Control).
PM 2 – Data File Reporting	Introduced in ONAP R3.	Natively supported – from Rel-4.	No gap identified. No action required.
PM 3 – Stream Reporting	Natively supported from ONAP R1 (REST / JSON). + TCP/GPB from R3, for High-Volumes.	Introduced in Rel-15 for 5G. At Dec. 2018: no Stage 2 and 3 available for PM data streaming, i.e. no RESTful HTTP-based solution set for PM data streaming, no OpenAPI spec for PM data streaming.	AI 3GPP: 1/ Specify a Stage 2 for PM data streaming 2/ Specify a REST JSON Stage 3, based on: a) Mapping to Common Event Header fields b) Introduce a new 'Perf3GPP' event type c) Perf3GPPFields JSON schema (see slide #15) 3/ Decide whether another solution set in addition to REST/JSON is needed for PM RT/HV data streaming. ASN.1? Rel-17 only?

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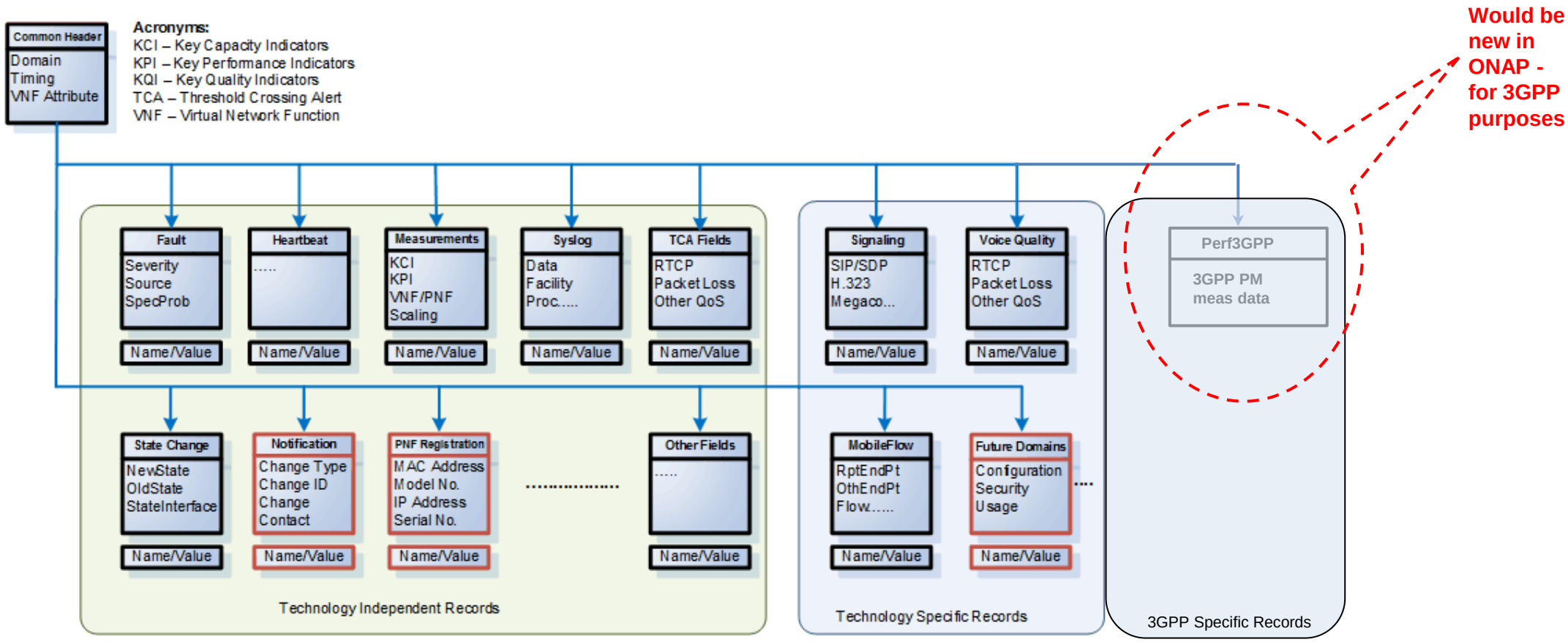
PM 3 - Introducing 'Perf3GPP' as new type of Technology Specific Record



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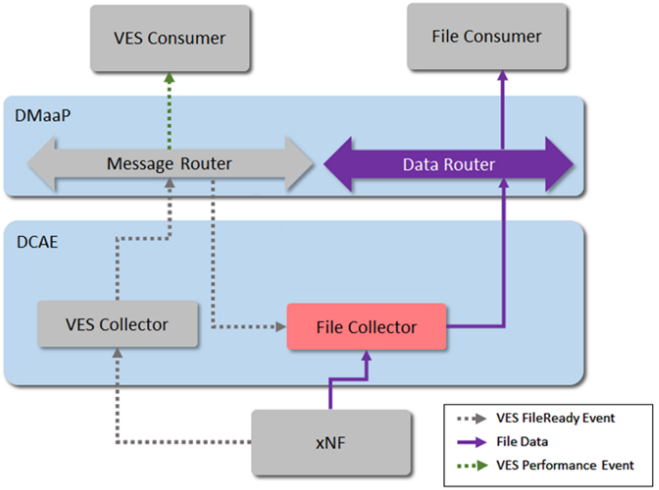
3GPP Bulk PM in ONAP
From Casablanca to Dublin (under discussions in ONAP)

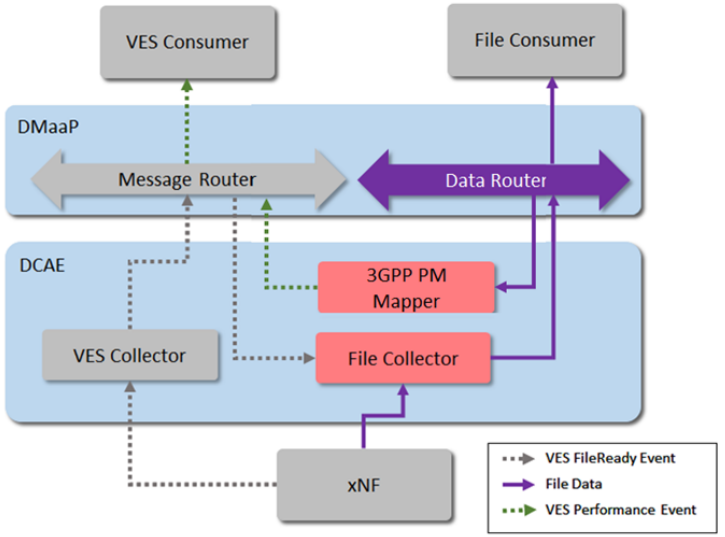
Overview - Casablanca



PM support in Casablanca includes:

- Data File Collector microservice
- *Notification: fileReady* VES event
- UC to collect PM files and distribute via Data Router
  - DFC listens for 'FileReady' VES events sent from an xNF via the VES collector.
  - as files become available DFC fetches them.
  - the collected data files are published internally on a DMaaP Data Router (DR) feed.

Overview – Dublin



PM support in Dublin proposal:

- 3GPP PM Mapper microservice
- *perf3gpp*: *pmMeasResult* VES event
- UC to convert PM data from 3GPP XML input to VES *pmMeasResult* output:
  - micro-service subscribes to PM feed from DR
  - measurements from the PM files are extracted and mapped to VES *pmMeasResult* events

3GPP Bulk PM in ONAP R4 (Dublin)

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perf3GPPFields JSON schema


```
},
"perf3gppFields": {
        "description": "3GPP PM format, based on 3GPP TS 28.550.",
        "type": "object",
        "properties": {
                "perf3gppFieldsVersion": {
                        "description": "The hvMeasFields version",
                        "type": "string"
                },
                "eventAddlFlds": {
                        "description": "Additional fields.",
                        "$ref": "#/definitions/hashMap"
                },
                "measDataCollection": {
                        "$ref": "#/definitions/measDataCollection"
                }
        },
        "additionalProperties": false,
        "required": ["measDataCollection"]
},
"measDataCollection": {
        "description": "3GPP Measurement Collection. Structure aligned with 3GPP F
        "type": "object",
        "properties": {
                "formatVersion": {
                        "description": "Definition for 3GPP PM reporting aligned w
                        "type": "string"
                },
                "granularityPeriod": {
                        "description": "The granularity period, in seconds.",
                        "type": "integer"
                },
                "measuredEntityUserName": {
                        "description": "As specified in 3GPP TS 28.550.",
                        "type": "string"
                },
                "measuredEntityDn": {
                        "description": "DN as per 3GPP TS 32.300.",
                        "type": "string"
                },
                "measuredEntitySoftwareVersion": {
                        "description": "As specified in 3GPP TS 28.550.",
                        "type": "string"
                },
                "measObjInstIdList": {
                        "description": "An array of monitored object LDNs as per 3
                        "type": "array",
                        "items": {
                                "type": "string"
                        }
                },
                "measInfo": {
                        "description": "An array of measurements.",
                        "type": "array",
                        "items": {
                                "$ref": "#/definitions/measInfo"
                        }
                }
        },
        "additionalProperties": false,
        "required": ["measuredEntityDn", "measInfo"]
},
"measInfo": {
        "description": "Measurement information.",
        "type": "object",
        "properties": {
```


Example of perf3GPPFields JSON message


```
{
    "event": {
      "commonEventHeader": {
        "domain": "perf3gpp",
        "eventId": "perf3gpp<seqNum>",
        "eventName": "perf3gpp_Ericsson_AB_pmMeasResult",
        "lastEpochMicrosec": 1538482500000000 ,
        "priority": "Normal",
        "reportingEntityName": "3gppMapperSevice001",
        "sequence": 0,
        "startEpochMicrosec": 1538481600000000 ,
        "timeZoneOffset": "",
        "version": "4.0",
        "vesCommonEventFormatVersion": "30.0",
        "sourceName": ""
      },
      "perf3gppFields": {
        "perf3gppFieldsVersion": "1.0",
        "measDataCollection": {
          "granularityPeriod": "PT900S",
          "measuredEntityUserName": "",
          "measuredEntityDn": "Dublin",
          "measuredEntitySoftwareVersion": "r0.1",
          "measInfo": [
            {
              "measInfoId": {
                "iMeasInfoId": 0
              },
                  "jobId":1_USERDEF.ALL_COUNTERS.Profile1.Continuous_Y.MEASJOB",
              "measTypes": [
                "pmL2tpRecPack",
                "pmL2tpLostPack",
                "pmL2tpSentPack"
              ],
              "measValues": [
                {
                  "measObjInstId": "ManagedElement=LTE73dg2ERBS00019,BtsFunction=1,GsmSector=1,AbisIp=
                  "suspectFlag":false,
                  "measResults": [
                    {
                      "p": 1,
                      "ivalue": "76"
                    },
                    {
                      "p": 2,
                      "ivalue": "27"
                    },
                    {
                      "p": 3,
                      "ivalue": "98"
                    }
                  ]
                }
              ]
            },
            {
              "measInfoId":{
                "iMeasInfoId": 0
              },
                  "jobId":1_USERDEF.ALL_COUNTERS.Profile1.Continuous_Y.MEASJOB",
              "measTypes":["aclEntryPackets"],
```


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PM 3 – PM data streaming

- Proposal is to use ONAP ‘perf3GPPFields’ JSON schema for 3GPP PM data streaming
  - New Stage 3 SS definitions, for PM data streaming
  - New mapping on ONAP Common Event header fields to be provided

- Additional Stage 3 SS definitions for ASN.1 – TBC (Could be in Rel-17?)

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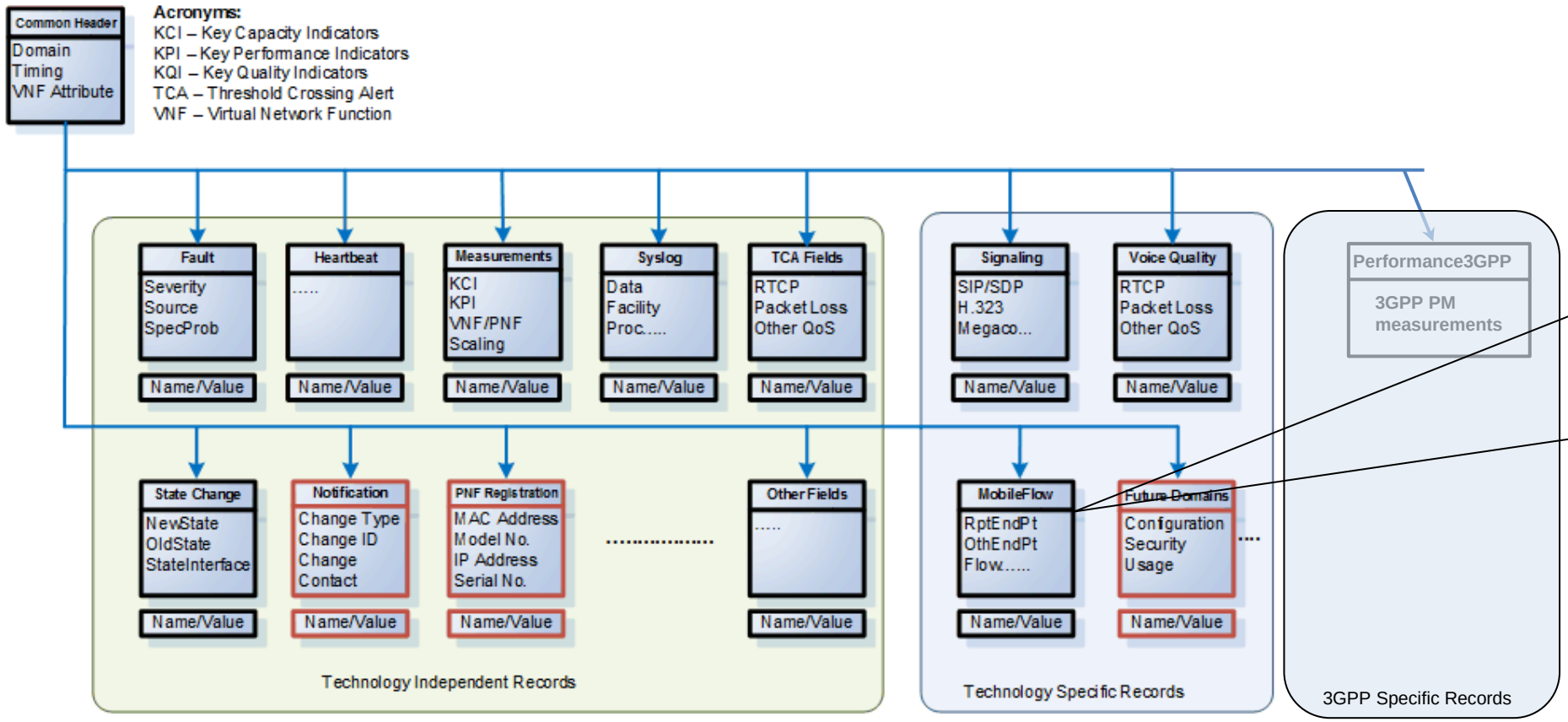
About 'MobileFlow' Technology Specific Record



May be perceived by external readers as mobile network performance measurements, colliding thus with 3GPP PM definitions in TS 28.552

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See next two slides

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ONAP existing 'MobileFlow' Record type (1/2)

IEs for Mobile Flow Record			
IE (Field Name)	Required / Optional	Data Type	Description
mobileFlowFieldsVersion	Yes	number	Version of the mobileFlowFields block (currently: 1.1)
additionalFields	No	Object Array	Additional mobileFlow fields if needed
applicationType	O	string [enum]	Application Type (inferred)
applProtocolType	O	string [enum]	Application protocol
applProtocolVersion	O	string [enum]	Application protocol version
cid	O	integer	"
connectionType	O [required if the connection implements a 3GPP-defined reference point)	string [enum]	Abbreviation referencing a 3GPP reference point (e.g., S1-U, S11, etc.)
ecgi	O	integer	"
flowDirection	R	sending / receiving indicator value	Flow direction, indicating if the reporting node is the source of the flow or destination for the flow
gtpPErFlowMetrics	R	gtpPerFlowMetrics	Mobility GTP Protocol per flow metrics
gtpProtocolType	O [required if the connection is a GTP connection]	string [enum]	GTP protocol
gtpVersion	O [required if the connection is a GTP connection]	string [enum]	GTP protocol version
httpHeader	O [required if remote endpoint is addressed by HTTP]	string	HTTP request header, if the flow connects to a node referenced by HTTP
imei	O	integer	IMEI for the subscriber UE used in this flow, if the flow connects to a mobile device
imsi	O [required if remote endpoint is a mobile UE]	integer	IMSI for the subscriber UE used in this flow, if the flow connects to a mobile device
ipProtocolType	R	string [enum]	IP protocol type (TCP, UDP, RTP, …)
ipVersion	R	string [enum]	IP protocol version (IPv4, IPv6)
lac	O	integer	"
mcc	O	integer	"
mnc	O	integer	"

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ONAP existing ‘MobileFlow’ Record type (2/2)

IEs for Mobile Flow Record			
IE (Field Name)	Required / Optional	Data Type	Description
otherEndpointPort	R	integer	IP port for the other endpoint, as used for the flow being reported on
otherEndpointIpAddress	R	string IPv4 or IPv6 address	IP address for the other endpoint, as used for the flow being reported on
otherFunctionalRole	O	string [enum]	Functional role of the other endpoint for the flow being reported on (e.g., MME, S-GW, P-GW, PCRF, …)
rac	O	integer	"
radioAccessTechnology	O	string [enum]	Radio Access Technology (2G, 3G, LTE)
reportingEndpointIpAddr	R	string IPv4 or IPv6 address	IP address for the reporting entity, as used for the flow being reported on
reportingEndpointPort	R	integer	IP port for the reporting entity, as used for the flow being reported on
sac	O	integer	"
samplingAlgorithm	O	integer	Integer identifier for the sampling algorithm or rule being applied in calculating the flow metrics if metrics are calculated based on a sample of packets, or 0 if no sampling is applied.
msisdn	O	integer	MSISDN for the subscriber UE used in this flow, as an integer, if the flow connects to a mobile device
tac	O	integer	"

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OA&M Data Communication Management

	ONAP	3GPP	Proposed action
DCM 1 - Heartbeat	Used by xNFs to communicate information about their health	No equivalent in 5G (Rel-15)	AI 3GPP: define a new management service with a notification for heartbeat messages (notification consumer(s) would be DCAE Collector(s))
DCM 2 - Event Throttling	Enables DCAE Collector to request a xNF to send less events	No equivalent in 5G (Rel-15)	AI 3GPP: define a new management service with operation to enable event throttling (operation consumer(s) would be DCAE Collector(s))

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Fulfillment / Lifecycle Management / Configuration Management

	ONAP	3GPP	Proposed action
CM 1 - CRUD operations on VNFs	NETCONF / YANG	YANG NRM	AI 3GPP: Add NETCONF-based solution set for Provisioning Management Service – see next slide.
CM 2 – CRUD related notifications	Not supported in R3 – TBC. Some discussions in R4 context (UC 'PNF plug-and-play')	Supported (REST / JSON)	AI ONAP: Introduce following notifications: objectCreationNotification objectDeletionNotification AttributeValueChangeNotification, As new '3GPP Technology-Specific Record', e.g. 'config3GPP'? With corresponding JSON schema. AI 3GPP: Specify a new REST JSON Stage 3, based on: a) Mapping to Common Event Header fields b) Introduce a new 'Config3GPP' event type c) Config3GPPFields JSON schema

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CM 1 - NETCONF / YANG

8 RESTful HTTP-based solution set of provisioning

8.1 Mapping of operations

8.1.1 Introduction

The IS operations are mapped to SS equivalents according to table 8.1.1-1.

Table 6.1.1-1: Mapping of IS operations to SS equivalents

IS operation	HTTP Method	Resource URI	Qualifier
createMOI	PUT	/{className}/{id}	M
getMOIAttributes	GET	/{className}/{id}	M
modifyMOIAttributes	PATCH	/{className}/{id}	M
deleteMOI	DELETE	/{className}/{id}	M
subscribe	POST	/subscriptions	M
unSubscribe	DELETE DELETE	/subscriptions /subscriptions/{subscriptionId}	M M

8.1.2 Operation "createMOI"

This operation creates a resource representing a managed object instance.

Table 8.1.2-1: Mapping of IS operation input parameters to SS equivalents (HTTP PUT)

IS operation parameter name	SS parameter location	SS parameter name	SS parameter type	SQ
managedObjectClass managedObjectInstance	path	/{className}/{id}	className: string id: string	M
referenceObjectInstance	n/a	n/a	n/a	n/a
attributeListIn	request body	data	resourceCreation-RequestType	M

Similar mapping table, applied to NetConf, to be added in TS 28.532

NETCONF

Operations [edit]

The base protocol defines the following protocol operations:

Operation	Description
<get>	Retrieve running configuration and device state information
<get-config>	Retrieve all or part of a specified configuration datastore
<edit-config>	Edit a configuration datastore by creating, deleting, merging or replacing content
<copy-config>	Copy an entire configuration datastore to another configuration datastore
<delete-config>	Delete a configuration datastore
<lock>	Lock an entire configuration datastore of a device
<unlock>	Release a configuration datastore lock previously obtained with the <lock> operation
<close-session>	Request graceful termination of a NETCONF session
<kill-session>	Force the termination of a NETCONF session

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Way forward

- It is proposed to start a new Work Item ASAP, i.e. from SA5#124
- Proposed scope:
  - Fault Management
  - Performance Management, incl. PM data streaming
  - Configuration Management
- Open points:
  - Do we need a dedicated Solution Set to address RT/HV requirements?
  - ASN.1? Other?
  - In Rel-16 or in Rel-17?

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External communication

- Communication about this work outside 3GPP is planned
- The following abstract has been submitted

--- Start of abstract ----

3GPP SA5 (Telecom Management) is responsible for standardizing the management and orchestration of 3GPP networks. For 5G networks, it specifies a service-based management framework offering services for the management of 5G network functions and network slices, which may be consumed by some ONAP constituents. However, 3GPP management framework and ONAP have slightly different paradigms, requiring some adaptations on both sides.

This presentation will a) highlight main existing gaps between 3GPP management framework (Rel-15) and ONAP (R3 – Casablanca) as well as actions proposed to fill in these gaps and b) illustrate how a traditional SDO and an open-source project can benefit from each other to enable automating the management and orchestration of 5G networks.

--- End of abstract ---

- and accepted for presentation, <u>on behalf of 3GPP/SA5</u>, to:
  - ZTA (Zero Touch Automation) congress, Madrid (Spain), March 26-28, 2019
  - NTC (Network Transformation Congress), San Jose, CA (USA), April 29th – May 1st, 2019

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Thank you!

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