



Monitor Subscriber and Protocol Support

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Feature Summary and Revision History

Summary Data

Table 1: Summary Data

Applicable Product(s) or Functional Area	cnSGW-C
Applicable Platform(s)	SMI
Feature Default Setting	Enabled – Configuration required to disable
Related Documentation	Not Applicable

Revision History

Table 2: Revision History

Revision Details	Release
First introduced.	2021.01.0

Feature Description

The cnSGW-C service supports the subscriber map and the operator policy configurations for the SGW service parameters.

Feature Configuration

Configuring this feature involves the following steps:

- Configure the monitor subscriber utility to trace messages related to a specified subscriber. For more information, refer to [Configuring the Monitor Subscriber, on page 2](#).
- An example of the monitor subscriber utility. For more information, refer to [Configuration Example, on page 3](#).
- Configure the monitor protocol utility to capture packets on a specified interface. For more information, refer to [Configuring the Monitor Protocol, on page 25](#).
- An example of the monitor protocol utility. For more information, refer to [Configuration Example, on page 26](#).
- Configure the Request Response messages in the transaction logs. For more information, refer to [Configuring the Transaction Messages, on page 37](#).
- An example of the transaction logs. For more information, refer to [Configuration Example, on page 37](#).
- Access the monitor subscriber and protocol logs. For more information, refer to [Accessing the Logs, on page 41](#).

Configuring the Monitor Subscriber

To configure this feature use the following configuration:

```
exec
  monitor subscriber
    capture-duration capture_duration
    dump filename filename_value
    gr-instance gr_instance
    imei imei_value
    imsi imsi_value
    supi supi_value
    list subscriber_list
    internal-messages [ Yes | No ]
    transaction-logs [ Yes | No ]
    nf-service nf_service
  end
```



Note In 2021.02 and later releases, the namespace keyword is deprecated and replaced with nf-service.

NOTES:

- **capture-duration** *capture_duration*—Specify the duration in seconds during which the monitor subscriber feature is enabled. The default value is 300 seconds.
- **supi** *supi_value*—Specify the subscriber identifier. For example, imsi-123456789 and imsi-123*

- **imsi** *imsi_value*—Specify the IMSI value. For example, 123456789 and *
- **imei** *imei_value*—Specify the IMEI value. For example, 123456789012345 and *
- **internal-messages** [**Yes** | **No**]—Configures internal messaging. When set to yes, the internal messaging is enabled. By default, the configuration is disabled.
- **transaction-logs** [**Yes** | **No**]—Configures transaction logging. By default, the configuration is disabled.



Note At any point, either the internal messages or the transaction logs are displayed.

- **nf-service** *nf_service*—Specify the NF service. The accepted services are sgw and smf. The default value is none.
- **gr-instance** *gr_instance*—Specify the GR instance that the cnSGW-C monitors the subscriber for.

Configuration Example

The following is an example configuration.

```
monitor subscriber imsi 123456789 capture-duration 100 internal-messages yes
monitor subscriber imsi 123456789 capture-duration 100 transaction-logs yes
```

Sample Output

The following is a sample output.

```
monitor subscriber imsi * namespace sgw
supi: imsi-*
captureDuration: 300
enableInternalMsg: false
enableTxnLog: false
namespace(deprecated. Use nf-service instead.): sgw
nf-service: none
gr-instance: 0
% Total      % Received % Xferd  Average Speed   Time    Time       Time  Current
   Dload  Upload   Total             Spent    Left  Speed
100  277  100    89  100    188    5235  11058  --:--:--  --:--:--  --:--:-- 16294
Command: --header Content-type:application/json --request POST --data
{"commandname":"mon_sub","parameters":{"supi":"imsi-*","duration":300,
"enableTxnLog":false,
"enableInternalMsg":false,"action":"start","namespace":"sgw","nf-service":"none",
"grInstance":0}}
http://oam-pod:8879/commands
Result start mon_sub, fileName ->
logs/monsublogs/sgw.imsi-*_TS_2021-08-15T12:36:17.569800845.txt
Starting to tail the monsub messages from file:
logs/monsublogs/sgw.imsi-*_TS_2021-08-15T12:36:17.569800845.txt
Defaulting container name to oam-pod.
Use 'kubectl describe pod/oam-pod-0 -n cn' to see all of the containers in this pod.
Subscriber Id: imsi-123456789012348
Timestamp: 2021/08/15 12:39:25.288997
Message: Sx Session Establishment Request
Description: Sx Session Establishment Request Message from SGWC to SGWU
Source: 209.165.201.19 (SGW.protocol.DC.Local.1)
Destination: 209.165.201.20 (SGW.udp-proxy.DC.Local.0)
PAYLOAD:
Sx Session Establishment Request:
Sx Session Establishment Request:
```

```

FSeid:
  Seid: 1297038098512740679
  IPv4Address: 209.165.201.19
CreatePdr:
  CreatePdr[0]:
    PdrId: 1
    Precedence: 0
    Pdi:
      SrcIf: CORE
      UeIp:
        Src: false
        Dst: false
        IPv4Addr: 209.165.201.30
      TEndpointId: 1
      Valid: true
    OuterHdrRem: 0
    FarId:
      FarId[0]: 1
    Qfi: 0
    OuterHdrRemValid: false
  CreatePdr[1]:
    PdrId: 2
    Precedence: 0
    Pdi:
      SrcIf: ACCESS
      UeIp:
        Src: false
        Dst: false
        IPv4Addr: 209.165.201.30
      TEndpointId: 2
      Valid: true
    OuterHdrRem: 0
    FarId:
      FarId[0]: 2
    Qfi: 0
    OuterHdrRemValid: false
CreateFar:
  CreateFar[0]:
    FarId: 1
    ApplyAction:
      Drop: true
      Frwd: false
      Buff: false
      Nocp: false
      Dupl: false
      Valid: true
    FwdParams:
      DestIf: ACCESS
      RedirectInfo:
        AddrType: 0
        Valid: false
      OuterHdr:
        OuterHdrDesc: 0
        Teid: 0
        IPv4Address: 209.165.201.30
        Port: 0
        Valid: false
      TEndptId: 2
      OuterPktTos: 255
      InnerPktTos: 255
      TosOpt:
        CopyInner: false
        CopyOuter: false
      SendTos: 0

```

```
PfcpSmFlags:
  Drobu: false
  Qaurr: false
  Sndem: false
  Valid: false
Valid: true
NextHopId: 0
DuplParams:
  DestIf: ACCESS
  OuterHdr:
    OuterHdrDesc: 0
    Teid: 0
    IPv4Address: 209.165.201.30
    Port: 0
    Valid: false
  InterceptInfo:
    InterceptId: 0
    ChargingId: 0
    SmfLiNodeId:
      IpDesc: 0
      IPv4Address: 209.165.201.30
      Valid: false
    PduSessionId: 0
    Valid: false
  Valid: false
BarId: 0
CreateFar[1]:
  FarId: 2
  ApplyAction:
    Drop: true
    Frwd: false
    Buff: false
    Nocp: false
    Dupl: false
    Valid: true
  FwdParams:
    DestIf: CORE
    RedirectInfo:
      AddrType: 0
      Valid: false
    OuterHdr:
      OuterHdrDesc: 0
      Teid: 0
      IPv4Address: 209.165.201.30
      Port: 0
      Valid: false
    TEndptId: 1
    OuterPktTos: 255
    InnerPktTos: 255
    TosOpt:
      CopyInner: false
      CopyOuter: false
    SendTos: 0
  PfcpSmFlags:
    Drobu: false
    Qaurr: false
    Sndem: false
    Valid: false
  Valid: true
  NextHopId: 0
  DuplParams:
    DestIf: ACCESS
    OuterHdr:
      OuterHdrDesc: 0
```

```

        Teid: 0
        IPv4Address: 209.165.201.30
        Port: 0
        Valid: false
    InterceptInfo:
        InterceptId: 0
        ChargingId: 0
        SmfLiNodeId:
            IpDesc: 0
            IPv4Address: 209.165.201.30
            Valid: false
        PduSessionId: 0
        Valid: false
    Valid: false
    BarId: 0
CreateTEndpt:
    CreateTEndpt[0]:
        EndpointId: 1
        FTeid:
            Teid: 0
            IPv4Address: 209.165.201.30
            ChooseId: 0
        BearerLvlInfo:
            Valid: 1
            Qci: 6
    CreateTEndpt[1]:
        EndpointId: 2
        FTeid:
            Teid: 0
            IPv4Address: 209.165.201.30
            ChooseId: 0
        BearerLvlInfo:
            Valid: 1
            Qci: 6
PdnType: 0
UplaneInacTimer: 0
MetaData: From:209.165.201.19:10665->To:209.165.201.20:8805
Supi:
Seid: 1297038098512740679
Seqno: 4252
Version: 0
MsgPriority: false
MsgPriorityVal: 0
Cmnid: 0
Rseid: 0
IntfType: 0
HdrLen: 0
MsgLen: 0
UserIDInfo:
    Imsi: 123456789012348
    Imei: 123456786666660
    Msisdn: 223310101010101
    Valid: true
XHeaderInfo:
    RatType:
        Valid: false
CfPolicyId:
    PolicyId: 0
    Valid: false
ChargingDisabled:
    Valid: false
    Value: false
ChargingParams:
    Valid: 0

```

```
GyOfflineChargingEnabled: 0
NextHopIPv4: 0
```

```
-----

Subscriber Id: imsi-123456789012348
Timestamp: 2021/08/15 12:39:25.371114
Message: Sx Session Establishment Response
Description: Sx Session Establishment Response Message from SGWU to SGWC
Source: 209.165.201.20 (SGW.udp-proxy.DC.Local.0)
Destination: 209.165.201.19 (SGW.protocol.DC.Local.1)
PAYLOAD:
  Sx Session Establishment Response:
    Sx Session Establishment Response:
      Cause: 1
      OffendingIe: 0
      FSeid:
        Seid: 10002
        IPv4Address: 209.165.201.20
      CreatedTEndpt:
        CreatedTEndpt[0]:
          EndpointId: 1
          FTeid:
            Teid: 25270
            IPv4Address: 209.165.201.1
            ChooseId: 0
        CreatedTEndpt[1]:
          EndpointId: 2
          FTeid:
            Teid: 25271
            IPv4Address: 209.165.200.226
            ChooseId: 0
      MetaData: From:209.165.201.20:8805->To:209.165.201.19:10665
      Supi:
      Seid: 1297038098512740679
      Seqno: 4252
      Version: 0
      MsgPriority: false
      MsgPriorityVal: 0
      Cmnid: 0
      Rseid: 0
      IntfType: 0
      HdrLen: 0
      MsgLen: 0
      LoadControlInfo:
        SeqNum: 0
        Metric: 0
        Valid: false
      OverloadControlInfo:
        SeqNum: 0
        Metric: 0
        Ociflag: 0
        Valid: false
-----

Subscriber Id: imsi-123456789012348
Timestamp: 2021/08/15 12:39:25.377609
Message: GtpEpDecodeRPCResponse
Description: 2071
Source:
Destination:
PAYLOAD:
```

```
-----  
Subscriber Id: imsi-123456789012348  
Timestamp: 2021/08/15 12:39:25.379043  
Message: S5 S8 Create Session Request  
Description: S5 S8 Create Session Request Message  
Source: 209.165.201.19  
Destination: 209.165.201.18  
PAYLOAD:  
  S5 S8 Create Session Request:  
    S5 S8 Create Session Request:  
      Version: 2  
      Pflag: false  
      TEIDflag: true  
      MsgPriority: false  
      MsgLength: 221  
      TIED: 0  
      Seq: 66683  
      MsgTypeId: 32  
      MsgPriorityValue: 0  
      Peer_IPv4_Flag: false  
      Peer_IPv6_Flag: false  
      MetaData: From:209.165.201.19:15001->To:209.165.201.18:2123  
      Seid: 0  
      Rseid: 0  
      Cmnid: 0  
      MsgType:  
        Create_Session_Request:  
          IMSI: 123456789012348  
          Recovery:  
            Value: 0  
          APN: intershat  
          AMBR: UL: 232323 kbps, DL: 232323 kbps  
          MEI: 123456786666660  
          MSISDN: 223310101010101  
          Indication:  
            DAF: false  
            DTF: false  
            HI: false  
            DFI: false  
            OI: false  
            ISRSI: false  
            ISRAI: false  
            SGWCI: false  
            SQCI: false  
            UIMSI: false  
            CFSI: false  
            CRSI: false  
            P: false  
            PT: false  
            SI: false  
            MSV: false  
            RetLoc: false  
            PBIC: false  
            SRNI: false  
            S6AF: false  
            S4AF: false  
            MBMDT: false  
            ISRAU: false  
            CCRSI: false  
            CPRAI: false  
            ARRL: false  
            PPOF: false  
            PPON_PPEI: false
```

```
PPSI: false
CSFBI: false
CLII: false
CPSR: false
NSI: false
UASI: false
DTCI: false
BDWI: false
PSCI: false
PCRI: false
AOSI: false
AOPI: false
ROAAI: false
EPCOSI: false
CPOPCI: false
PMTSMI: false
S11TF: false
PNSI: false
UNACCSI: false
WPMSI: false
5GSIWK: false
EEVRSI: false
LTEMUI: false
LTEMPI: false
ENBCRSI: false
TSPCMI: false
PGBK: false
PCPSI: false
PCP: false
PCPU: false
N26_5GS: false
RI_5GCN: false
RS_5GCN: false
PAA:
  PDN_Type: 1
  IPv4: 209.165.201.30
  IPv6_Prefix: 0
RAT_Type:
  Value: 6
Serving_Network:
  MCC: 123
  MNC: 456
ULI:
  UliTai: Mcc: 123, Mnc: 456, TAC: 2346
  UliEcgi:
    Mcc: 123
    Mnc: 456
    Eci: 1234567
FQ_TEID:
  SgwCntrl:
    IFace: 6
    TEID: 1375732039
    IPv4: 209.165.201.19
Bearer_Context_List:
  NumBearerCtxt: 1
  PbBearerCxt:
    PbBearerCxt[0]:
      BearerCtxType: 0
      EBI: 5
      Fqteid:
        SgwData:
          IFace: 0
          TEID: 25270
          IPv4: 209.165.201.1
```

```

        BearerQos:
            PCI: true
            PL: 12
            PVI: true
            QCI: 6
            UL_MBR: 0 kbps
            DL_MBR: 0 kbps
            UL_GBR: 0 kbps
            DL_GBR: 0 kbps
            Arp: 113
            QciType: 0
    Charging_Characteristics:
        Value:
            Value[0]: 210
            Value[1]: 4
            Value[2]: 0
            Value[3]: 0
    PDN_Type:
        Value: 1
    UE_Time_Zone:
        Time_Zone: 16
        Daylight_Saving_Time: 1
    APN_Restriction:
        Value: 0
    Selection_Mode:
        Value: 0
    EPCO:
        Len: 5
        Value:
            Value[0]: 128
            Value[1]: 0
            Value[2]: 26
            Value[3]: 1
            Value[4]: 5

```

```

-----
Subscriber Id: imsi-123456789012348
Timestamp: 2021/06/08 04:37:51.487884
Message: GtpEpDecodeRPCResponse
Description: 2071
Source:
Destination:
PAYLOAD:

```

```

-----
Subscriber Id: imsi-123456789012348
Timestamp: 2021/06/08 04:37:51.487884
Message: GtpEpDecodeRPCIPCRResponse
Description: 2071
Source:
Destination:
PAYLOAD:

```

```

-----
Subscriber Id: imsi-123456789012348
Timestamp: 2021/08/15 12:39:25.475859
Message: GtpEpDecodeRPCResponse
Description: 2071
Source:
Destination:
PAYLOAD:

```

```
-----
Subscriber Id: imsi-123456789012348
Timestamp: 2021/08/15 12:39:25.476252
Message: S5 S8 Create Session Response
Description: S5 S8 Create Session Response Message
Source: 209.165.201.18
Destination: 209.165.201.19
PAYLOAD:
  S5 S8 Create Session Response:
    S5 S8 Create Session Response:
      Version: 2
      Pflag: false
      TEIDflag: true
      MsgPriority: false
      MsgLength: 107
      TIED: 1375732039
      Seq: 66683
      MsgTypeId: 33
      MsgPriorityValue: 0
      Peer_IPv4_Flag: false
      Peer_IPv6_Flag: false
      MetaData: From:209.165.201.18:0->To:209.165.201.19:0
      Seid: 0
      Rseid: 0
      Cmnid: 0
      MsgType:
        Create_Session_Response:
          Cause:
            Cause_Value: 16
            PCE: false
            BCE: false
            OrigInd: false
          Recovery:
            Value: 100
          AMBR: UL: 10 kbps, DL: 20 kbps
          PAA:
            PDN_Type: 1
            IPv4: 209.165.201.26
            IPv6_Prefix: 0
          FQ_TEID:
            PgwCntrl:
              IFace: 7
              TEID: 13210
              IPv4: 209.165.201.18
          Bearer_Context_List:
            NumBearerCtxt: 1
            PbBearerCxt:
              PbBearerCxt[0]:
                BearerCtxType: 0
                EBI: 5
                Cause:
                  Cause_Value: 16
                  PCE: false
                  BCE: false
                  OrigInd: false
                Fqteid:
                  PgwData:
                    IFace: 5
                    TEID: 13211
                    IPv4: 209.165.201.18
                ChrgId:
                  Value: 303174163
```

APN_Restriction:
Value: 1

Subscriber Id: imsi-123456789012348
Timestamp: 2021/08/15 12:39:25.483195
Message: Sx Session Modification Request
Description: Sx Session Modification Request Message from SGWC to SGWU
Source: 209.165.201.19 (SGW.protocol.DC.Local.2)
Destination: 209.165.201.20 (SGW.udp-proxy.DC.Local.0)
PAYLOAD:
 Sx Session Modification Request:
 Sx Session Modification Request:
 UpdatePdr:
 UpdatePdr[0]:
 PdrId: 1
 OuterHdrRem: 0
 Precedence: 0
 Pdi:
 SrcIf: ACCESS
 UeIp:
 Src: false
 Dst: false
 IPv4Addr: 209.165.201.30
 TEndpointId: 0
 Valid: false
 Qfi: 0
 UpdateFar:
 UpdateFar[0]:
 FarId: 2
 ApplyAction:
 Drop: false
 Frwd: true
 Buff: false
 Nocp: false
 Dupl: false
 Valid: true
 UpdateFwdParams:
 DestIf: ACCESS
 RedirectInfo:
 AddrType: 0
 Valid: false
 OuterHdr:
 OuterHdrDesc: 256
 Teid: 13211
 IPv4Address: 209.165.201.18
 Port: 0
 Valid: true
 TEndptId: 0
 OuterPktTos: 0
 InnerPktTos: 0
 TosOpt:
 CopyInner: false
 CopyOuter: false
 SendTos: 0
 PfcpsmFlags:
 Drobu: false
 Qaurr: false
 Sndem: false
 Valid: false
 Valid: true
 NextHopId: 0
 UpdateDuplParams:

```
DestIf: ACCESS
OuterHdr:
  OuterHdrDesc: 0
  Teid: 0
  IPv4Address: 209.165.201.30
  Port: 0
  Valid: false
InterceptInfo:
  InterceptId: 0
  ChargingId: 0
  SmfLiNodeId:
    IpDesc: 0
    IPv4Address: 209.165.201.30
    Valid: false
  PduSessionId: 0
  Valid: false
Valid: false
BarId: 0
UplaneInacTimer: 0
MetaData: From:209.165.201.19:10002->To:209.165.201.20:8805
Supi:
Seid: 1297038098512740679
Seqno: 4248
Version: 0
MsgPriority: false
MsgPriorityVal: 0
Cmnid: 0
Rseid: 10002
IntfType: 0
HdrLen: 0
MsgLen: 0
PfcPsmFlags:
  Drobu: false
  Qaurr: false
  Sndem: false
  Valid: false
UserIDInfo:
  Valid: false
XHeaderInfo:
  RatType:
  Valid: false
CfPolicyId:
  PolicyId: 0
  Valid: false
GyStatus:
  Valid: false
  Value: false
ChargingDisabled:
  Valid: false
  Value: false
QueryInterface:
  Valid: false
  OfflineUrr: false
  OnlineUrr: false
  RadiusUrr: false
  BearerUrr: false
  SessUrr: false
```

```
-----
Subscriber Id: imsi-123456789012348
Timestamp: 2021/08/15 12:39:25.549171
Message: Sx Session Modification Response
Description: Sx Session Modification Response Message from SGWU to SGWC
```

```

Source: 209.165.201.20 (SGW.udp-proxy.DC.Local.0)
Destination: 209.165.201.19 (SGW.protocol.DC.Local.2)
PAYLOAD:
  Sx Session Modification Response:
    Sx Session Modification Response:
      Cause: 1
      OffendingIe: 0
      LoadControlInfo:
        SeqNum: 0
        Metric: 0
        Valid: false
      OverloadControlInfo:
        SeqNum: 0
        Metric: 0
        Ociflag: 0
        Valid: false
      MetaData: From:209.165.201.20:8805->To:209.165.201.19:10002
      Supi:
      Seid: 1297038098512740679
      Seqno: 4248
      Version: 1
      MsgPriority: false
      MsgPriorityVal: 0
      Cmnid: 0
      Rseid: 0
      IntfType: 0
      HdrLen: 17
      MsgLen: 0

```

```

-----
Subscriber Id: imsi-123456789012348
Timestamp: 2021/08/15 12:39:25.262224
Message: S11 Create Session Request
Description: S11 Create Session Request Message
Source: 209.165.201.20
Destination: 209.165.201.19
PAYLOAD:
  S11 Create Session Request:
    S11 Create Session Request:
      Version: 2
      Pflag: false
      TEIDflag: true
      MsgPriority: false
      MsgLength: 223
      TIED: 0
      Seq: 5842
      MsgTypeId: 32
      MsgPriorityValue: 0
      Peer_IPv4_Flag: false
      Peer_IPv6_Flag: false
      MetaData: From:209.165.201.20:2123->To:209.165.201.19:2123
      Seid: 0
      Rseid: 0
      Cmnid: 0
      MsgType:
        Create_Session_Request:
          IMSI: 123456789012348
          Recovery:
            Value: 100
          APN: intershat
          AMBR: UL: 232323 kbps, DL: 232323 kbps
          MEI: 123456786666660
          MSISDN: 223310101010101

```

```
Indication:
  DAF: false
  DTF: false
  HI: false
  DFI: false
  OI: false
  ISRSI: false
  ISRAI: false
  SGWCI: false
  SQCI: false
  UIMSI: false
  CFSI: false
  CRSI: false
  P: false
  PT: false
  SI: false
  MSV: false
  RetLoc: false
  PBIC: false
  SRNI: false
  S6AF: false
  S4AF: false
  MBMDT: false
  ISRAU: false
  CCRSI: false
  CPRAI: false
  ARRL: false
  PPOF: false
  PPON_PPEI: false
  PPSI: false
  CSFBI: false
  CLII: false
  CPSR: false
  NSI: false
  UASI: false
  DTCI: false
  BDWI: false
  PSCI: false
  PCRI: false
  AOSI: false
  AOPI: false
  ROAAI: false
  EPCOSI: false
  CPOPCI: false
  PMTSMI: false
  S11TF: false
  PNSI: false
  UNACCSI: false
  WPMSI: false
  5GSIWK: false
  EEVRSI: false
  LTEMUI: false
  LTEMP: false
  ENBCRSI: false
  TSPCMI: false
  PGBK: false
  PCPSI: false
  PCP: false
  PCPU: false
  N26_5GS: false
  RI_5GCN: false
  RS_5GCN: false
PAA:
  PDN_Type: 1
```

```

IPv4: 209.165.201.30
IPv6_Prefix: 0
RAT_Type:
  Value: 6
Serving_Network:
  MCC: 123
  MNC: 456
ULI:
  UliTai: Mcc: 123, Mnc: 456, TAC: 2346
  UliEcgi:
    Mcc: 123
    Mnc: 456
    Eci: 1234567
FQ_TEID:
  MmcCntrl:
    IFace: 10
    TEID: 25269
    IPv4: 209.165.201.20
  PgwCntrl:
    IFace: 7
    TEID: 0
    IPv4: 209.165.201.18
Bearer_Context_List:
  NumBearerCtxt: 1
  PbBearerCxt:
    PbBearerCxt[0]:
      BearerCtxType: 0
      EBI: 5
      Fqteid:
      BearerQos:
        PCI: true
        PL: 12
        PVI: true
        QCI: 6
        UL_MBR: 0 kbps
        DL_MBR: 0 kbps
        UL_GBR: 0 kbps
        DL_GBR: 0 kbps
        Arp: 113
        QciType: 0
Charging_Characteristics:
  Value:
    Value[0]: 210
    Value[1]: 4
    Value[2]: 0
    Value[3]: 0
PDN_Type:
  Value: 1
UE_Time_Zone:
  Time_Zone: 16
  Daylight_Saving_Time: 1
APN_Restriction:
  Value: 0
Selection_Mode:
  Value: 0
EPCO:
  Len: 5
  Value:
    Value[0]: 128
    Value[1]: 0
    Value[2]: 26
    Value[3]: 1
    Value[4]: 5

```

```
-----  
Subscriber Id: imsi-123456789012348  
Timestamp: 2021/08/15 12:39:25.568954  
Message: GtpEpDecodeRPCResponse  
Description: 258  
Source:  
Destination:  
PAYLOAD:
```

```
-----  
Subscriber Id: imsi-123456789012348  
Timestamp: 2021/08/15 12:39:25.569939  
Message: S11 Create Session Response  
Description: S11 Create Session Response Message  
Source: 209.165.201.19  
Destination: 209.165.201.20  
PAYLOAD:  
  S11 Create Session Response:  
    S11 Create Session Response:  
      Version: 2  
      Pflag: false  
      TEIDflag: true  
      MsgPriority: false  
      MsgLength: 120  
      TIED: 25269  
      Seq: 5842  
      MsgTypeId: 33  
      MsgPriorityValue: 0  
      Peer_IPv4_Flag: false  
      Peer_IPv6_Flag: false  
      MetaData: From:209.165.201.19:2123->To:209.165.201.20:2123  
      Seid: 0  
      Rseid: 0  
      Cmnid: 0  
      MsgType:  
        Create_Session_Response:  
          Cause:  
            Cause_Value: 16  
            PCE: false  
            BCE: false  
            OrigInd: false  
          Recovery:  
            Value: 0  
          AMBR: UL: 10 kbps, DL: 20 kbps  
          PAA:  
            PDN_Type: 1  
            IPv4: 209.165.201.26  
            IPv6_Prefix: 0  
          FQ_TEID:  
            PgwCntrl:  
              IFace: 7  
              TEID: 13210  
              IPv4: 209.165.201.18  
            SgwCntrl:  
              IFace: 11  
              TEID: 301990215  
              IPv4: 209.165.201.19  
          Bearer_Context_List:  
            NumBearerCtxt: 1  
            PbBearerCxt:  
              PbBearerCxt[0]:  
                BearerCtxType: 0
```

```

EBI: 5
Cause:
  Cause_Value: 16
  PCE: false
  BCE: false
  OrigInd: false
Fqteid:
  PgwData:
    IFace: 5
    TEID: 13211
    IPv4: 209.165.201.18
  SgwData:
    IFace: 1
    TEID: 25271
    IPv4: 209.165.200.226
ChrgId:
  Value: 303174163
APN_Restriction:
  Value: 1

```

```

-----
Subscriber Id: imsi-123456789012348
Timestamp: 2021/08/15 12:39:25.570132
Message: S11 Create Session Response
Description: S11 Create Session Response Message
Source: 209.165.201.19
Destination: 209.165.201.20
PAYLOAD:
  S11 Create Session Response:
    S11 Create Session Response:
      Version: 2
      Pflag: false
      TEIDflag: true
      MsgPriority: false
      MsgLength: 120
      TIED: 25269
      Seq: 5842
      MsgTypeId: 33
      MsgPriorityValue: 0
      Peer_IPv4_Flag: false
      Peer_IPv6_Flag: false
      MetaData: From:209.165.201.19:2123->To:209.165.201.20:2123
      Seid: 0
      Rseid: 0
      Cmnid: 0
      MsgType:
        Create_Session_Response:
          Cause:
            Cause_Value: 16
            PCE: false
            BCE: false
            OrigInd: false
          Recovery:
            Value: 0
          AMBR: UL: 10 kbps, DL: 20 kbps
          PAA:
            PDN_Type: 1
            IPv4: 209.165.201.26
            IPv6_Prefix: 0
          FQ_TEID:
            PgwCntrl:
              IFace: 7
              TEID: 13210

```

```

        IPv4: 209.165.201.18
    SgwCntrl:
        IFace: 11
        TEID: 301990215
        IPv4: 209.165.201.19
    Bearer_Context_List:
        NumBearerCtxt: 1
        PbBearerCxt:
            PbBearerCxt[0]:
                BearerCtxType: 0
                EBI: 5
                Cause:
                    Cause_Value: 16
                    PCE: false
                    BCE: false
                    OrigInd: false
                Fqteid:
                    PgwData:
                        IFace: 5
                        TEID: 13211
                        IPv4: 209.165.201.18
                    SgwData:
                        IFace: 1
                        TEID: 25271
                        IPv4: 209.165.200.226
                ChrgId:
                    Value: 303174163
    APN_Restriction:
        Value: 1

```

```

-----
Subscriber Id: imsi-123456789012348
Timestamp: 2021/08/15 12:39:25.652708
Message: Sx Session Modification Request
Description: Sx Session Modification Request Message from SGWC to SGWU
Source: 209.165.201.19 (SGW.protocol.DC.Local.0)
Destination: 209.165.201.20 (SGW.udp-proxy.DC.Local.0)
PAYLOAD:
    Sx Session Modification Request:
        Sx Session Modification Request:
            UpdatePdr:
                UpdatePdr[0]:
                    PdrId: 2
                    OuterHdrRem: 0
                    Precedence: 0
                    Pdi:
                        SrcIf: ACCESS
                        UeIp:
                            Src: false
                            Dst: false
                            IPv4Addr: 209.165.201.30
                        TEndpointId: 0
                        Valid: false
                    Qfi: 0
            UpdateFar:
                UpdateFar[0]:
                    FarId: 1
                    ApplyAction:
                        Drop: false
                        Frwd: true
                        Buff: false
                        Ncp: false
                        Dupl: false

```

```
Valid: true
UpdateFwdParams:
  DestIf: ACCESS
  RedirectInfo:
    AddrType: 0
    Valid: false
  OuterHdr:
    OuterHdrDesc: 256
    Teid: 25272
    IPv4Address: 209.165.201.20
    Port: 0
    Valid: true
  TEndptId: 0
  OuterPktTos: 0
  InnerPktTos: 0
  TosOpt:
    CopyInner: false
    CopyOuter: false
  SendTos: 0
  PfcpsmFlags:
    Drobu: false
    Qaurr: false
    Sndem: false
    Valid: false
  Valid: true
  NextHopId: 0
UpdateDuplParams:
  DestIf: ACCESS
  OuterHdr:
    OuterHdrDesc: 0
    Teid: 0
    IPv4Address: 209.165.201.30
    Port: 0
    Valid: false
  InterceptInfo:
    InterceptId: 0
    ChargingId: 0
    SmfLiNodeId:
      IpDesc: 0
      IPv4Address: 209.165.201.30
      Valid: false
    PduSessionId: 0
    Valid: false
  Valid: false
BarId: 0
UplaneInacTimer: 0
MetaData: From:209.165.201.19:13486->To:209.165.201.20:8805
Supi:
Seid: 1297038098512740679
Seqno: 4245
Version: 0
MsgPriority: false
MsgPriorityVal: 0
Cmnid: 0
Rseid: 10002
IntfType: 0
HdrLen: 0
MsgLen: 0
PfcpsmFlags:
  Drobu: false
  Qaurr: false
  Sndem: false
  Valid: false
UserIDInfo:
```

```
Valid: false
XHeaderInfo:
  RatType:
    Valid: false
CfPolicyId:
  PolicyId: 0
  Valid: false
GyStatus:
  Valid: false
  Value: false
ChargingDisabled:
  Valid: false
  Value: false
QueryInterface:
  Valid: false
  OfflineUrr: false
  OnlineUrr: false
  RadiusUrr: false
  BearerUrr: false
  SessUrr: false
```

```
-----
Subscriber Id: imsi-123456789012348
Timestamp: 2021/08/15 12:39:25.713891
Message: Sx Session Modification Response
Description: Sx Session Modification Response Message from SGWU to SGWC
Source: 209.165.201.20 (SGW.udp-proxy.DC.Local.0)
Destination: 209.165.201.19 (SGW.protocol.DC.Local.0)
PAYLOAD:
  Sx Session Modification Response:
    Sx Session Modification Response:
      Cause: 1
      OffendingIe: 0
      LoadControlInfo:
        SeqNum: 0
        Metric: 0
        Valid: false
      OverloadControlInfo:
        SeqNum: 0
        Metric: 0
        Ociflag: 0
        Valid: false
      MetaData: From:209.165.201.20:8805->To:209.165.201.19:13486
      Supi:
      Seid: 1297038098512740679
      Seqno: 4245
      Version: 1
      MsgPriority: false
      MsgPriorityVal: 0
      Cmnid: 0
      Rseid: 0
      IntfType: 0
      HdrLen: 17
      MsgLen: 0
```

```
-----
Subscriber Id: imsi-123456789012348
Timestamp: 2021/08/15 12:39:25.640179
Message: S11 Modify Bearer Request
Description: S11 Modify Bearer Request Message
Source: 209.165.201.20
Destination: 209.165.201.19
```

```
PAYLOAD:
  S11 Modify Bearer Request:
    S11 Modify Bearer Request:
      Version: 2
      Pflag: false
      TEIDflag: true
      MsgPriority: false
      MsgLength: 58
      TIED: 301990215
      Seq: 5843
      MsgTypeId: 34
      MsgPriorityValue: 0
      Peer_IPv4_Flag: false
      Peer_IPv6_Flag: false
      MetaData: From:209.165.201.20:2123->To:209.165.201.19:2123
      Seid: 0
      Rseid: 0
      Cmnid: 0
      MsgType:
        Modify_Bearer_Request:
          RAT_Type:
            Value: 6
          Indication:
            DAF: false
            DTF: false
            HI: false
            DFI: false
            OI: false
            ISRSI: false
            ISRAI: false
            SGWCI: false
            SQCI: false
            UIMSI: false
            CFSI: false
            CRSI: false
            P: false
            PT: false
            SI: false
            MSV: false
            RetLoc: false
            PBIC: false
            SRNI: false
            S6AF: false
            S4AF: false
            MBMDT: false
            ISRAU: false
            CCRSI: false
            CPRAI: false
            ARRL: false
            PPOF: false
            PPON_PPEI: false
            PPSI: false
            CSFBI: false
            CLII: false
            CPSR: false
            NSI: false
            UASI: false
            DTCI: false
            BDWI: false
            PSCI: false
            PCRI: false
            AOSI: false
            AOPI: false
            ROAAI: false
```

```

EPCOSI: false
CPOPCI: false
PMTSMI: false
S11TF: false
PNSI: false
UNACCSI: false
WPMSI: false
5GSIWK: false
EEVRSI: false
LTEMUI: false
LTEMPI: false
ENBCRSI: false
TSPCMI: false
PGBK: false
PCPSI: false
PCP: false
PCPU: false
N26_5GS: false
RI_5GCN: false
RS_5GCN: false
FQ_TEID:
DelayValue:
  Value: 0
Recovery:
  Value: 100
Bearer_Context_List:
  NumBearerCtxt: 1
  PbBearerCxt:
    PbBearerCxt[0]:
      BearerCtxType: 0
      EBI: 5
      Fqteid:
        ENbData:
          IFace: 0
          TEID: 25272
          IPv4: 209.165.201.20

```

```

-----
Subscriber Id: imsi-123456789012348
Timestamp: 2021/08/15 12:39:25.729811
Message: S11 Modify Bearer Response
Description: S11 Modify Bearer Response Message
Source: 209.165.201.19
Destination: 209.165.201.20
PAYLOAD:
  S11 Modify Bearer Response:
    S11 Modify Bearer Response:
      Version: 2
      Pflag: false
      TEIDflag: true
      MsgPriority: false
      MsgLength: 42
      TIED: 25269
      Seq: 5843
      MsgTypeId: 35
      MsgPriorityValue: 0
      Peer_IPv4_Flag: false
      Peer_IPv6_Flag: false
      MetaData: From:209.165.201.19:2123->To:209.165.201.20:2123
      Seid: 0
      Rseid: 0
      Cmnid: 0
      MsgType:

```

```

Modify_Bearer_Response:
  Cause:
    Cause_Value: 16
    PCE: false
    BCE: false
    OrigInd: false
  Bearer_Context_List:
    NumBearerCtxt: 1
    PbBearerCtxt:
      PbBearerCtxt[0]:
        BearerCtxType: 0
        EBI: 5
        Cause:
          Cause_Value: 16
          PCE: false
          BCE: false
          OrigInd: false
        Fqteid:
          SgwData:
            IFace: 1
            TEID: 25271
            IPv4: 209.165.200.226

```

```

-----
Subscriber Id: imsi-123456789012348
Timestamp: 2021/08/15 12:39:25.730371
Message: S11 Modify Bearer Response
Description: S11 Modify Bearer Response Message
Source: 209.165.201.19
Destination: 209.165.201.20
PAYLOAD:
  S11 Modify Bearer Response:
    S11 Modify Bearer Response:
      Version: 2
      Pflag: false
      TEIDflag: true
      MsgPriority: false
      MsgLength: 42
      TIED: 25269
      Seq: 5843
      MsgTypeId: 35
      MsgPriorityValue: 0
      Peer_IPv4_Flag: false
      Peer_IPv6_Flag: false
      MetaData: From:209.165.201.19:2123->To:209.165.201.20:2123
      Seid: 0
      Rseid: 0
      Cmnid: 0
      MsgType:
        Modify_Bearer_Response:
          Cause:
            Cause_Value: 16
            PCE: false
            BCE: false
            OrigInd: false
          Bearer_Context_List:
            NumBearerCtxt: 1
            PbBearerCtxt:
              PbBearerCtxt[0]:
                BearerCtxType: 0
                EBI: 5
                Cause:
                  Cause_Value: 16

```

```

PCE: false
BCE: false
OrigInd: false
Fqteid:
SgwData:
  IFace: 1
  TEID: 25271
  IPv4: 209.165.200.226

-----

command terminated with exit code 124
% Total      % Received % Xferd  Average Speed   Time
Time        Time      Current                Dload  Upload   Total
Spent       Left    Speed
100   222   100     35   100     187    4375   23375
--:--:-- --:--:-- --:--:-- 27750
Stop Response Disabled mon_sub as part of timeout for
Cmd: --header Content-type:application/json --request
POST --data
{"commandname":"mon_sub","parameters":{"supi":"imsi-*","duration":300,
"enableTxnLog":false,"enableInternalMsg":false,"action":"stop","namespace":
"sgw","nf-service":"none","grInstance":0}}
http://oam-pod:8879/commands

```

Configuring the Monitor Protocol

To configure this feature, use the following configuration:

exec

```

monitor protocol interface interface
  capture-duration capture_duration
  pcap [ Yes | No ]
  gr-instance gr_instance
end

```

NOTES:

- **monitor protocol interface *interface***—Specify the interface on which PCAP is captured. For example, sbi, pfcf, gtpu, gtpc, gtp, and radius.
- **capture-duration *capture_duration***—Specify the duration in seconds during which PCAP is captured. The default value is 300 seconds.
- **pcap [Yes | No]**—Configures the PCAP file generation. By default, the pcap feature is disabled.
- **gr-instance *gr_instance***—Specify the GR instance that the cnSGW-C monitors the subscriber for.



Note

If the GTP endpoint IPs are the same on S5e and S11 interfaces, the protocol output is inconsistent and displays S11 for the S5 interface on which the message is received. The following is a sample of an endpoint configuration:

```

instance instance-id 1 endpoint gtp replicas 3 interface s5e vip-ip 209.165.201.22
instance instance-id 1 endpoint gtp replicas 3 interface s11 vip-ip 209.165.201.22

```

Configuration Example

The following is an example configuration.

```
monitor protocol interface pfcfp,gtpc capture-duration 100 pcap yes
```

Sample Output

The following is a sample output.

```
monitor protocol interface pfcfp,gtpc capture-duration 100 pcap yes
% Total      % Received % Xferd  Average Speed   Time    Time     Time  Current
                  Dload  Upload    Total     Spent    Left  Speed
100   231   100   101   100   130   6733   8666  --:--:--  --:--:--  --:--:-- 15400
Command: --header Content-type:application/json --request POST --data
{"commandname":"mon_pro","parameters":{"interface":"pfcfp, gtpc","duration":
:100,"action":"start","enable_pcap": true,"grInstance":0}} http://oam-pod:8879/commands
Result start mon_pro, fileName -> logs/monprologs/sessintfname_pfcfp,
gtpc_at_2021-06-06T06:15:39.005414271.txt
Starting to tail the monpro messages from file: logs/monprologs/sessintfname_pfcfp,
gtpc_at_2021-06-06T06:15:39.005414271.txt
Defaulting container name to oam-pod.
Use 'kubectl describe pod/oam-pod-0 -n cn' to see all of the containers in this pod.
InterfaceName = gtpc | InterfaceIP = 209.165.200.229 | Filter = (tcp or udp or sctp)
and (port 2123 or (host 209.165.200.227 and port 2123)
or (host 209.165.201.11 and port 2123) or (host 209.165.200.228 and port 2123))
<<<<OUTBOUND
from 209.165.200.229:15002 to 209.165.200.228:2123
Protocol: UDP | Sequence Number: 0
Packet Metadata: {Timestamp:2021-06-06 06:16:00.373101 +0000 UTC CaptureLength:59
Length:59 InterfaceIndex:0 AncillaryData:[]}
```

Packet Raw Bytes:

```
0004000100060050569c095908004528002dcc0e4000401
155510a01029c0a01029b3a9a084b001919634863000d000008d0
020175004900010005
```

Packet Dump:

```
-- FULL PACKET DATA (59 bytes) -----
00000000  00 04 00 01 00 06 00 50  56 9c 09 59 08 00 45 28  |.....PV..Y..E(|
00000010  00 2d cc 0e 40 00 40 11  55 51 0a 01 02 9c 0a 01  |.-..@.@.UQ.....|
00000020  02 9b 3a 9a 08 4b 00 19  19 63 48 63 00 0d 00 00  |...K...cHc....|
00000030  08 d0 02 01 75 00 49 00  01 00 05                    |....u.I....|
--- Layer 1 ---
Ethernet      {Contents=[..14..] Payload=[..45..] SrcMAC=00:50:56:9c:09:59
DstMAC=00:04:00:01:00:06 EthernetType=IPv4 Length=0}
00000000  00 04 00 01 00 06 00 50  56 9c 09 59 08 00         |.....PV..Y..|
--- Layer 2 ---
IPv4          {Contents=[..20..] Payload=[..25..] Version=4 IHL=5 TOS=40 Length=45
Id=52238 Flags=DF FragOffset=0 TTL=64 Protocol=UDP
Checksum=21841 SrcIP=209.165.200.229 DstIP=209.165.200.228 Options=[] Padding=[]}
00000000  45 28 00 2d cc 0e 40 00  40 11 55 51 0a 01 02 9c  |E(.-..@.@.UQ....|
00000010  0a 01 02 9b                |....|
--- Layer 3 ---
UDP           {Contents=[..8..] Payload=[..17..] SrcPort=15002 DstPort=2123(gtp-control)
Length=25 Checksum=6499}
00000000  3a 9a 08 4b 00 19 19 63    |...K...c|
--- Layer 4 ---
Payload 17 byte(s)
00000000  48 63 00 0d 00 00 08 d0  02 01 75 00 49 00 01 00  |Hc.....u.I...|
00000010  05                          |.|
```

```

InterfaceName = gtpc | InterfaceIP = 209.165.200.229 | Filter = (tcp or udp or sctp)
and (port 2123 or (host 209.165.200.227 and port 2123))
or (host 209.165.201.11 and port 2123) or (host 209.165.200.228 and port 2123))
<<<<OUTBOUND
from 209.165.200.229:15000 to 209.165.200.227:2123
Protocol: UDP | Sequence Number: 0
Packet Metadata: {Timestamp:2021-06-06 06:16:00.373236 +0000 UTC CaptureLength:72
Length:72 InterfaceIndex:0 AncillaryData:[]}
```

Packet Raw Bytes:

```

0004000100060050569c095908004528003a9af
c4000401186570a01029c0a01029a3a98084b0026196f 4824001a0000074a
00014f0049000100055700090086510000970a01029c
```

Packet Dump:

```

-- FULL PACKET DATA (72 bytes) -----
00000000  00 04 00 01 00 06 00 50  56 9c 09 59 08 00 45 28  |.....PV..Y..E(|
00000010  00 3a 9a fc 40 00 40 11  86 57 0a 01 02 9c 0a 01  |:...@..W.....|
00000020  02 9a 3a 98 08 4b 00 26  19 6f 48 24 00 1a 00 00  |....K.&.oH$....|
00000030  07 4a 00 01 4f 00 49 00  01 00 05 57 00 09 00 86  |.J..O.I....W....|
00000040  51 00 00 97 0a 01 02 9c                |Q.....|
--- Layer 1 ---
Ethernet      {Contents=[..14..] Payload=[..58..] SrcMAC=00:50:56:9c:09:59
DstMAC=00:04:00:01:00:06 EthernetType=IPv4 Length=0}
00000000  00 04 00 01 00 06 00 50  56 9c 09 59 08 00        |.....PV..Y..|
--- Layer 2 ---
IPv4          {Contents=[..20..] Payload=[..38..] Version=4 IHL=5 TOS=40 Length=58
Id=39676 Flags=DF FragOffset=0 TTL=64 Protocol=UDP
Checksum=34391 SrcIP=209.165.200.229 DstIP=209.165.200.227 Options=[] Padding=[]}
00000000  45 28 00 3a 9a fc 40 00  40 11 86 57 0a 01 02 9c  |E(...@..W....|
00000010  0a 01 02 9a                |....|
--- Layer 3 ---
UDP           {Contents=[..8..] Payload=[..30..] SrcPort=15000(hydap) DstPort=2123(gtp-control)
Length=38 Checksum=6511}
00000000  3a 98 08 4b 00 26 19 6f                |...K.&.o|
--- Layer 4 ---
Payload 30 byte(s)
00000000  48 24 00 1a 00 00 07 4a  00 01 4f 00 49 00 01 00  |H$.....J..O.I...|
00000010  05 57 00 09 00 86 51 00  00 97 0a 01 02 9c        |.W....Q.....|
```

```

-----
InterfaceName = gtpc | InterfaceIP = 209.165.200.229 | Filter = (tcp or udp or sctp)
and (port 2123 or (host 209.165.200.227 and port 2123))
or (host 209.165.201.11 and port 2123) or (host 209.165.200.228 and port 2123))
<<<<OUTBOUND
from 209.165.200.229:15000 to 209.165.200.227:2123
Protocol: UDP | Sequence Number: 0
Packet Metadata: {Timestamp:2021-06-06 06:16:02.462216 +0000 UTC CaptureLength:72
Length:72 InterfaceIndex:0 AncillaryData:[]}
```

Packet Raw Bytes:

```

0004000100060050569c095908004528003a9cdc4000401184770a01029c0a
01029a3a98084b0026196f4824001a0000074a00014f0049000100055700090086510000970a01029c
```

Packet Dump:

```

-- FULL PACKET DATA (72 bytes) -----
00000000  00 04 00 01 00 06 00 50  56 9c 09 59 08 00 45 28  |.....PV..Y..E(|
00000010  00 3a 9c dc 40 00 40 11  84 77 0a 01 02 9c 0a 01  |:...@..w.....|
00000020  02 9a 3a 98 08 4b 00 26  19 6f 48 24 00 1a 00 00  |....K.&.oH$....|
00000030  07 4a 00 01 4f 00 49 00  01 00 05 57 00 09 00 86  |.J..O.I....W....|
00000040  51 00 00 97 0a 01 02 9c                |Q.....|
--- Layer 1 ---
Ethernet      {Contents=[..14..] Payload=[..58..] SrcMAC=00:50:56:9c:09:59
```

Configuration Example

```

DstMAC=00:04:00:01:00:06 EthernetType=IPv4 Length=0}
00000000 00 04 00 01 00 06 00 50 56 9c 09 59 08 00 |.....PV..Y..|
--- Layer 2 ---
IPv4 {Contents=[..20..] Payload=[..38..] Version=4 IHL=5 TOS=40 Length=58
Id=40156 Flags=DF FragOffset=0 TTL=64 Protocol=UDP
Checksum=33911 SrcIP=209.165.200.229 DstIP=209.165.200.227 Options=[] Padding=[]}
00000000 45 28 00 3a 9c dc 40 00 40 11 84 77 0a 01 02 9c |E(...@.@..w....|
00000010 0a 01 02 9a |....|
--- Layer 3 ---
UDP {Contents=[..8..] Payload=[..30..] SrcPort=15000(hydap) DstPort=2123(gtp-control)
Length=38 Checksum=6511}
00000000 3a 98 08 4b 00 26 19 6f |:.K.&.o|
--- Layer 4 ---
Payload 30 byte(s)
00000000 48 24 00 1a 00 00 07 4a 00 01 4f 00 49 00 01 00 |H$.....J..O.I...|
00000010 05 57 00 09 00 86 51 00 00 97 0a 01 02 9c |.W....Q.....|

```

```

-----
InterfaceName = gtpc | InterfaceIP = 209.165.200.229 | Filter = (tcp or udp or sctp)
and (port 2123 or (host 209.165.200.227 and port 2123)
or (host 209.165.201.11 and port 2123) or (host 209.165.200.228 and port 2123))
<<<<OUTBOUND
from 209.165.200.229:15000 to 209.165.200.227:2123
Protocol: UDP | Sequence Number: 0
Packet Metadata: {Timestamp:2021-06-06 06:16:04.563024 +0000 UTC CaptureLength:72
Length:72 InterfaceIndex:0 AncillaryData:[]}

```

Packet Raw Bytes:

```

0004000100060050569c095908004528003a9e4740004011830c0a01029c0a01029a3a98084b
0026196f4824001a0000074a00014f0049000100055700090086510000970a01029c

```

Packet Dump:

```

-- FULL PACKET DATA (72 bytes) -----
00000000 00 04 00 01 00 06 00 50 56 9c 09 59 08 00 45 28 |.....PV..Y..E(|
00000010 00 3a 9e 47 40 00 40 11 83 0c 0a 01 02 9c 0a 01 |...G@.@.....|
00000020 02 9a 3a 98 08 4b 00 26 19 6f 48 24 00 1a 00 00 |...:K.&.oH$....|
00000030 07 4a 00 01 4f 00 49 00 01 00 05 57 00 09 00 86 |.J..O.I...W....|
00000040 51 00 00 97 0a 01 02 9c |Q.....|
--- Layer 1 ---
Ethernet {Contents=[..14..] Payload=[..58..] SrcMAC=00:50:56:9c:09:59
DstMAC=00:04:00:01:00:06 EthernetType=IPv4 Length=0}
00000000 00 04 00 01 00 06 00 50 56 9c 09 59 08 00 |.....PV..Y..|
--- Layer 2 ---
IPv4 {Contents=[..20..] Payload=[..38..] Version=4 IHL=5 TOS=40 Length=58
Id=40519 Flags=DF FragOffset=0 TTL=64 Protocol=UDP
Checksum=33548 SrcIP=209.165.200.229 DstIP=209.165.200.227 Options=[] Padding=[]}
00000000 45 28 00 3a 9e 47 40 00 40 11 83 0c 0a 01 02 9c |E(...G@.@.....|
00000010 0a 01 02 9a |....|
--- Layer 3 ---
UDP {Contents=[..8..] Payload=[..30..] SrcPort=15000(hydap)
DstPort=2123(gtp-control) Length=38 Checksum=6511}
00000000 3a 98 08 4b 00 26 19 6f |:.K.&.o|
--- Layer 4 ---
Payload 30 byte(s)
00000000 48 24 00 1a 00 00 07 4a 00 01 4f 00 49 00 01 00 |H$.....J..O.I...|
00000010 05 57 00 09 00 86 51 00 00 97 0a 01 02 9c |.W....Q.....|

```

```

-----
InterfaceName = gtpc | InterfaceIP = 209.165.200.229 | Filter = (tcp or udp or sctp)
and (port 2123 or (host 209.165.200.227 and port 2123)
or (host 209.165.201.11 and port 2123) or (host 209.165.200.228 and port 2123))
<<<<OUTBOUND

```

```

from 209.165.200.229:15000 to 209.165.200.227:2123
Protocol: UDP | Sequence Number: 0
Packet Metadata: {Timestamp:2021-06-06 06:16:06.662105 +0000 UTC CaptureLength:72
Length:72 InterfaceIndex:0 AncillaryData:[]}
```

```

Packet Raw Bytes:
0004000100060050569c095908004528003a9eb440004011829f0a01029c0a01029a3a
98084b0026196f4824001a0000074a00014f0049000100055700090086510000970a01029c
```

Packet Dump:

```

-- FULL PACKET DATA (72 bytes) -----
00000000  00 04 00 01 00 06 00 50  56 9c 09 59 08 00 45 28  |.....PV..Y..E(|
00000010  00 3a 9e b4 40 00 40 11  82 9f 0a 01 02 9c 0a 01  |...@.@.....|
00000020  02 9a 3a 98 08 4b 00 26  19 6f 48 24 00 1a 00 00  |....K.&.oH$....|
00000030  07 4a 00 01 4f 00 49 00  01 00 05 57 00 09 00 86  |.J..O.I...W....|
00000040  51 00 00 97 0a 01 02 9c  |Q.....|
--- Layer 1 ---
Ethernet      {Contents=[..14..] Payload=[..58..] SrcMAC=00:50:56:9c:09:59
DstMAC=00:04:00:01:00:06 EthernetType=IPv4 Length=0}
00000000  00 04 00 01 00 06 00 50  56 9c 09 59 08 00  |.....PV..Y..|
--- Layer 2 ---
IPv4          {Contents=[..20..] Payload=[..38..] Version=4 IHL=5 TOS=40 Length=58
Id=40628 Flags=DF FragOffset=0 TTL=64 Protocol=UDP
Checksum=33439 SrcIP=209.165.200.229 DstIP=209.165.200.227 Options=[] Padding=[]}
00000000  45 28 00 3a 9e b4 40 00  40 11 82 9f 0a 01 02 9c  |E(...@.@.....|
00000010  0a 01 02 9a  |....|
--- Layer 3 ---
UDP           {Contents=[..8..] Payload=[..30..] SrcPort=15000(hydap)
DstPort=2123(gtp-control) Length=38 Checksum=6511}
00000000  3a 98 08 4b 00 26 19 6f  |...K.&.o|
--- Layer 4 ---
Payload 30 byte(s)
00000000  48 24 00 1a 00 00 07 4a  00 01 4f 00 49 00 01 00  |H$.....J..O.I...|
00000010  05 57 00 09 00 86 51 00  00 97 0a 01 02 9c  |.W....Q.....|
```

```

-----
InterfaceName = gtpc | InterfaceIP = 209.165.200.229 | Filter = (tcp or udp or sctp)
and (port 2123 or (host 209.165.200.227 and port 2123)
or (host 209.165.201.11 and port 2123) or (host 209.165.200.228 and port 2123))
<<<<OUTBOUND
from 209.165.200.229:15002 to 209.165.200.228:2123
Protocol: UDP | Sequence Number: 0
Packet Metadata: {Timestamp:2021-06-06 06:16:07.385688 +0000 UTC CaptureLength:59
Length:59 InterfaceIndex:0 AncillaryData:[]}
```

```

Packet Raw Bytes:
0004000100060050569c095908004528002dd2dd400040114e820a0102
9c0a01029b3a9a084b001919634863000d000000 8d0020175004900010005
```

Packet Dump:

```

-- FULL PACKET DATA (59 bytes) -----
00000000  00 04 00 01 00 06 00 50  56 9c 09 59 08 00 45 28  |.....PV..Y..E(|
00000010  00 2d d2 dd 40 00 40 11  4e 82 0a 01 02 9c 0a 01  |.-..@.@.N.....|
00000020  02 9b 3a 9a 08 4b 00 19  19 63 48 63 00 0d 00 00  |....K...cHC....|
00000030  08 d0 02 01 75 00 49 00  01 00 05  |....u.I...|
--- Layer 1 ---
Ethernet      {Contents=[..14..] Payload=[..45..] SrcMAC=00:50:56:9c:09:59
DstMAC=00:04:00:01:00:06 EthernetType=IPv4 Length=0}
00000000  00 04 00 01 00 06 00 50  56 9c 09 59 08 00  |.....PV..Y..|
--- Layer 2 ---
IPv4          {Contents=[..20..] Payload=[..25..] Version=4 IHL=5 TOS=40 Length=45
Id=53981 Flags=DF FragOffset=0 TTL=64 Protocol=UDP
Checksum=20098 SrcIP=209.165.200.229 DstIP=209.165.200.228 Options=[] Padding=[]}
```

Configuration Example

```

00000000 45 28 00 2d d2 dd 40 00 40 11 4e 82 0a 01 02 9c |E(.-..@.@.N....|
00000010 0a 01 02 9b                                     |....|
--- Layer 3 ---
UDP      {Contents=[..8..] Payload=[..17..] SrcPort=15002 DstPort=2123(gtp-control)
Length=25 Checksum=6499}
00000000 3a 9a 08 4b 00 19 19 63                         |:...K...c|
--- Layer 4 ---
Payload 17 byte(s)
00000000 48 63 00 0d 00 00 08 d0 02 01 75 00 49 00 01 00 |Hc.....u.I...|
00000010 05                                           |.|

-----
InterfaceName = gtpc | InterfaceIP = 209.165.200.229 | Filter = (tcp or udp or sctp)
and (port 2123 or (host 209.165.200.227 and port 2123)
or (host 209.165.201.11 and port 2123) or (host 209.165.200.228 and port 2123))
<<<<OUTBOUND
from 209.165.200.229:15001 to 209.165.200.227:2123
Protocol: UDP | Sequence Number: 0
Packet Metadata: {Timestamp:2021-06-06 06:16:13.078691 +0000 UTC CaptureLength:55
Length:55 InterfaceIndex:0 AncillaryData:[]}

Packet Raw Bytes:
0004000100060050569c0959080045280029a11540004011804f0a01029c0
a01029a3a99084b0015195e400100090101ab000300010000

Packet Dump:
-- FULL PACKET DATA (55 bytes) -----
00000000 00 04 00 01 00 06 00 50 56 9c 09 59 08 00 45 28 |.....PV..Y..E(|
00000010 00 29 a1 15 40 00 40 11 80 4f 0a 01 02 9c 0a 01 |.)...@.@..O.....|
00000020 02 9a 3a 99 08 4b 00 15 19 5e 40 01 00 09 01 01 |...:K...^@.....|
00000030 ab 00 03 00 01 00 00                         |.....|
--- Layer 1 ---
Ethernet {Contents=[..14..] Payload=[..41..] SrcMAC=00:50:56:9c:09:59
DstMAC=00:04:00:01:00:06 EthernetType=IPv4 Length=0}
00000000 00 04 00 01 00 06 00 50 56 9c 09 59 08 00       |.....PV..Y..|
--- Layer 2 ---
IPv4     {Contents=[..20..] Payload=[..21..] Version=4 IHL=5 TOS=40 Length=41
Id=41237 Flags=DF FragOffset=0 TTL=64 Protocol=UDP
Checksum=32847 SrcIP=209.165.200.229 DstIP=209.165.200.227 Options=[] Padding=[]}
00000000 45 28 00 29 a1 15 40 00 40 11 80 4f 0a 01 02 9c |E(.)...@.@..O....|
00000010 0a 01 02 9a                                     |....|
--- Layer 3 ---
UDP      {Contents=[..8..] Payload=[..13..] SrcPort=15001 DstPort=2123(gtp-control)
Length=21 Checksum=6494}
00000000 3a 99 08 4b 00 15 19 5e                         |:...K...^|
--- Layer 4 ---
Payload 13 byte(s)
00000000 40 01 00 09 01 01 ab 00 03 00 01 00 00             |@.....|

-----
InterfaceName = gtpc | InterfaceIP = 209.165.200.229 | Filter = (tcp or udp or sctp)
and (port 2123 or (host 209.165.200.227 and port 2123)
or (host 209.165.201.11 and port 2123) or (host 209.165.200.228 and port 2123))
<<<<OUTBOUND
from 209.165.200.229:15000 to 209.165.200.228:2123
Protocol: UDP | Sequence Number: 0
Packet Metadata: {Timestamp:2021-06-06 06:16:13.084971 +0000 UTC CaptureLength:55
Length:55 InterfaceIndex:0 AncillaryData:[]}

Packet Raw Bytes:
0004000100060050569c0959080045280029d5a7400040114bbc0a01029c0a01029b3
a98084b0015195f400100090000df000300010000

```

Packet Dump:

```
-- FULL PACKET DATA (55 bytes) -----
00000000 00 04 00 01 00 06 00 50 56 9c 09 59 08 00 45 28 |.....PV..Y..E(|
00000010 00 29 d5 a7 40 00 40 11 4b bc 0a 01 02 9c 0a 01 |.)..@.@.K.....|
00000020 02 9b 3a 98 08 4b 00 15 19 5f 40 01 00 09 00 00 |...K..._@.....|
00000030 df 00 03 00 01 00 00 |.....|

--- Layer 1 ---
Ethernet {Contents=[..14..] Payload=[..41..] SrcMAC=00:50:56:9c:09:59
DstMAC=00:04:00:01:00:06 EthernetType=IPv4 Length=0}
00000000 00 04 00 01 00 06 00 50 56 9c 09 59 08 00 |.....PV..Y..|

--- Layer 2 ---
IPv4 {Contents=[..20..] Payload=[..21..] Version=4 IHL=5 TOS=40 Length=41
Id=54695 Flags=DF FragOffset=0 TTL=64 Protocol=UDP
Checksum=19388 SrcIP=209.165.200.229 DstIP=209.165.200.228 Options=[] Padding=[]}
00000000 45 28 00 29 d5 a7 40 00 40 11 4b bc 0a 01 02 9c |E(.)..@.@.K.....|
00000010 0a 01 02 9b |....|

--- Layer 3 ---
UDP {Contents=[..8..] Payload=[..13..] SrcPort=15000(hydap) DstPort=2123(gtp-control)
Length=21 Checksum=6495}
00000000 3a 98 08 4b 00 15 19 5f |:...K..._|

--- Layer 4 ---
Payload 13 byte(s)
00000000 40 01 00 09 00 00 df 00 03 00 01 00 00 |@.....|
```

```
-----
InterfaceName = gtpc | InterfaceIP = 209.165.200.229 | Filter = (tcp or udp or sctp)
and (port 2123 or (host 209.165.200.227 and port 2123)
or (host 209.165.201.11 and port 2123) or (host 209.165.200.228 and port 2123))
<<<<OUTBOUND
from 209.165.200.229:15002 to 209.165.200.228:2123
Protocol: UDP | Sequence Number: 0
Packet Metadata: {Timestamp:2021-06-06 06:16:14.485021 +0000 UTC CaptureLength:59
Length:59 InterfaceIndex:0 AncillaryData:[]}
```

Packet Raw Bytes:

```
0004000100060050569c095908004528002dd679400040114ae60a01029c0a01029b3
a9a084b001919634863000d000008d0020175004900010005
```

Packet Dump:

```
-- FULL PACKET DATA (59 bytes) -----
00000000 00 04 00 01 00 06 00 50 56 9c 09 59 08 00 45 28 |.....PV..Y..E(|
00000010 00 2d d6 79 40 00 40 11 4a e6 0a 01 02 9c 0a 01 |.-.y@.@.J.....|
00000020 02 9b 3a 9a 08 4b 00 19 19 63 48 63 00 0d 00 00 |...K...cHc....|
00000030 08 d0 02 01 75 00 49 00 01 00 05 |.....u.I....|

--- Layer 1 ---
Ethernet {Contents=[..14..] Payload=[..45..] SrcMAC=00:50:56:9c:09:59
DstMAC=00:04:00:01:00:06 EthernetType=IPv4 Length=0}
00000000 00 04 00 01 00 06 00 50 56 9c 09 59 08 00 |.....PV..Y..|

--- Layer 2 ---
IPv4 {Contents=[..20..] Payload=[..25..] Version=4 IHL=5 TOS=40 Length=45
Id=54905 Flags=DF FragOffset=0 TTL=64 Protocol=UDP
Checksum=19174 SrcIP=209.165.200.229 DstIP=209.165.200.228 Options=[] Padding=[]}
00000000 45 28 00 2d d6 79 40 00 40 11 4a e6 0a 01 02 9c |E(.-.y@.@.J.....|
00000010 0a 01 02 9b |....|

--- Layer 3 ---
UDP {Contents=[..8..] Payload=[..17..] SrcPort=15002 DstPort=2123(gtp-control)
Length=25 Checksum=6499}
00000000 3a 9a 08 4b 00 19 19 63 |:...K...c|

--- Layer 4 ---
Payload 17 byte(s)
00000000 48 63 00 0d 00 00 08 d0 02 01 75 00 49 00 01 00 |Hc.....u.I...|
00000010 05 |.|
```

Configuration Example

```
-----
InterfaceName = gtpc | InterfaceIP = 209.165.200.229 | Filter = (tcp or udp or sctp)
and (port 2123 or (host 209.165.200.227 and port 2123)
or (host 209.165.201.11 and port 2123) or (host 209.165.200.228 and port 2123))
<<<<OUTBOUND
from 209.165.200.229:15002 to 209.165.200.227:2123
Protocol: UDP | Sequence Number: 0
Packet Metadata: {Timestamp:2021-06-06 06:16:18.078521 +0000 UTC CaptureLength:55
Length:55 InterfaceIndex:0 AncillaryData:[]}
```

Packet Raw Bytes:

```
0004000100060050569c0959080045280029a1bb400040117fa90a01029c0a01029a3
a9a084b0015195e400100090201c9000300010000
```

Packet Dump:

```
-- FULL PACKET DATA (55 bytes) -----
00000000 00 04 00 01 00 06 00 50 56 9c 09 59 08 00 45 28 |.....PV..Y..E(|
00000010 00 29 a1 bb 40 00 40 11 7f a9 0a 01 02 9c 0a 01 |.)..@.@.....|
00000020 02 9a 3a 9a 08 4b 00 15 19 5e 40 01 00 09 02 01 |...K...^@.....|
00000030 c9 00 03 00 01 00 00 |.....|
--- Layer 1 ---
Ethernet {Contents=[..14..] Payload=[..41..] SrcMAC=00:50:56:9c:09:59
DstMAC=00:04:00:01:00:06 EthernetType=IPv4 Length=0}
00000000 00 04 00 01 00 06 00 50 56 9c 09 59 08 00 |.....PV..Y..|
--- Layer 2 ---
IPv4 {Contents=[..20..] Payload=[..21..] Version=4 IHL=5 TOS=40 Length=41
Id=41403 Flags=DF FragOffset=0 TTL=64 Protocol=UDP
Checksum=32681 SrcIP=209.165.200.229 DstIP=209.165.200.227 Options=[] Padding=[]}
00000000 45 28 00 29 a1 bb 40 00 40 11 7f a9 0a 01 02 9c |E(.)..@.@.....|
00000010 0a 01 02 9a |....|
--- Layer 3 ---
UDP {Contents=[..8..] Payload=[..13..] SrcPort=15002 DstPort=2123(gtp-control)
Length=21 Checksum=6494}
00000000 3a 9a 08 4b 00 15 19 5e |:...K...^|
--- Layer 4 ---
Payload 13 byte(s)
00000000 40 01 00 09 02 01 c9 00 03 00 01 00 00 |@.....|
```

```
-----
InterfaceName = gtpc | InterfaceIP = 209.165.200.229 | Filter = (tcp or udp or sctp)
and (port 2123 or (host 209.165.200.227 and port 2123)
or (host 209.165.201.11 and port 2123) or (host 209.165.200.228 and port 2123))
<<<<OUTBOUND
from 209.165.200.229:15000 to 209.165.200.228:2123
Protocol: UDP | Sequence Number: 0
Packet Metadata: {Timestamp:2021-06-06 06:16:18.089434 +0000 UTC CaptureLength:55
Length:55 InterfaceIndex:0 AncillaryData:[]}
```

Packet Raw Bytes:

```
0004000100060050569c0959080045280029d8cf4000401148940a0102
9c0a01029b3a98084b0015195f400100090000e0000300010000
```

Packet Dump:

```
-- FULL PACKET DATA (55 bytes) -----
00000000 00 04 00 01 00 06 00 50 56 9c 09 59 08 00 45 28 |.....PV..Y..E(|
00000010 00 29 d8 cf 40 00 40 11 48 94 0a 01 02 9c 0a 01 |.)..@.@.....|
00000020 02 9b 3a 98 08 4b 00 15 19 5f 40 01 00 09 00 00 |...K..._@.....|
00000030 e0 00 03 00 01 00 00 |.....|
--- Layer 1 ---
Ethernet {Contents=[..14..] Payload=[..41..] SrcMAC=00:50:56:9c:09:59
DstMAC=00:04:00:01:00:06 EthernetType=IPv4 Length=0}
```

```

00000000 00 04 00 01 00 06 00 50 56 9c 09 59 08 00 |.....PV..Y..|
--- Layer 2 ---
IPv4 {Contents=[..20..] Payload=[..21..] Version=4 IHL=5 TOS=40 Length=41
Id=55503 Flags=DF FragOffset=0 TTL=64 Protocol=UDP
Checksum=18580 SrcIP=209.165.200.229 DstIP=209.165.200.228 Options=[] Padding=[]}
00000000 45 28 00 29 d8 cf 40 00 40 11 48 94 0a 01 02 9c |E(..)..@.@.H....|
00000010 0a 01 02 9b |....|
--- Layer 3 ---
UDP {Contents=[..8..] Payload=[..13..] SrcPort=15000(hydap) DstPort=2123(gtp-control)
Length=21 Checksum=6495}
00000000 3a 98 08 4b 00 15 19 5f |:...K..._|
--- Layer 4 ---
Payload 13 byte(s)
00000000 40 01 00 09 00 00 e0 00 03 00 01 00 00 |@.....|

```

```

-----
InterfaceName = gtpc | InterfaceIP = 209.165.200.229 | Filter = (tcp or udp or sctp)
and (port 2123 or (host 209.165.200.227 and port 2123)
or (host 209.165.201.11 and port 2123) or (host 209.165.200.228 and port 2123))
<<<<OUTBOUND
from 209.165.200.229:15002 to 209.165.200.228:2123
Protocol: UDP | Sequence Number: 0
Packet Metadata: {Timestamp:2021-06-06 06:16:21.584999 +0000 UTC CaptureLength:59
Length:59 InterfaceIndex:0 AncillaryData:[]}
```

```

Packet Raw Bytes:
0004000100060050569c095908004528002ddb124000401146
4d0a01029c0a01029b3a9a084b001919634863000d00 0008d0020175004900010005

```

```

Packet Dump:
-- FULL PACKET DATA (59 bytes) -----
00000000 00 04 00 01 00 06 00 50 56 9c 09 59 08 00 45 28 |.....PV..Y..E(|
00000010 00 2d db 12 40 00 40 11 46 4d 0a 01 02 9c 0a 01 |.-..@.@.FM.....|
00000020 02 9b 3a 9a 08 4b 00 19 19 63 48 63 00 0d 00 00 |.....K....cHC....|
00000030 08 d0 02 01 75 00 49 00 01 00 05 |.....u.I....|
--- Layer 1 ---
Ethernet {Contents=[..14..] Payload=[..45..] SrcMAC=00:50:56:9c:09:59
DstMAC=00:04:00:01:00:06 EthernetType=IPv4 Length=0}
00000000 00 04 00 01 00 06 00 50 56 9c 09 59 08 00 |.....PV..Y..|
--- Layer 2 ---
IPv4 {Contents=[..20..] Payload=[..25..] Version=4 IHL=5 TOS=40 Length=45
Id=56082 Flags=DF FragOffset=0 TTL=64 Protocol=UDP
Checksum=17997 SrcIP=209.165.200.229 DstIP=209.165.200.228 Options=[] Padding=[]}
00000000 45 28 00 2d db 12 40 00 40 11 46 4d 0a 01 02 9c |E(.-..@.@.FM....|
00000010 0a 01 02 9b |....|
--- Layer 3 ---
UDP {Contents=[..8..] Payload=[..17..] SrcPort=15002 DstPort=2123(gtp-control)
Length=25 Checksum=6499}
00000000 3a 9a 08 4b 00 19 19 63 |:...K....c|
--- Layer 4 ---
Payload 17 byte(s)
00000000 48 63 00 0d 00 00 08 d0 02 01 75 00 49 00 01 00 |HC.....u.I...|
00000010 05 |.|

```

```

-----
InterfaceName = gtpc | InterfaceIP = 209.165.200.229 | Filter = (tcp or udp or sctp)
and (port 2123 or (host 209.165.200.227 and port 2123)
or (host 209.165.201.11 and port 2123) or (host 209.165.200.228 and port 2123))
<<<<OUTBOUND
from 209.165.200.229:15001 to 209.165.200.227:2123
Protocol: UDP | Sequence Number: 0
Packet Metadata: {Timestamp:2021-06-06 06:16:23.07887 +0000 UTC CaptureLength:55

```

Configuration Example

```
Length:55 InterfaceIndex:0 AncillaryData:[]}
```

Packet Raw Bytes:

```
0004000100060050569c0959080045280029a2c0400040117
ea40a01029c0a01029a3a99084b0015195e400100090101ac000300010000
```

Packet Dump:

```
-- FULL PACKET DATA (55 bytes) -----
00000000 00 04 00 01 00 06 00 50 56 9c 09 59 08 00 45 28 |.....PV..Y..E(|
00000010 00 29 a2 c0 40 00 40 11 7e a4 0a 01 02 9c 0a 01 |.)..@.@.~.....|
00000020 02 9a 3a 99 08 4b 00 15 19 5e 40 01 00 09 01 01 |...K...^@.....|
00000030 ac 00 03 00 01 00 00 |.....|
--- Layer 1 ---
Ethernet {Contents=[..14..] Payload=[..41..] SrcMAC=00:50:56:9c:09:59
DstMAC=00:04:00:01:00:06 EthernetType=IPv4 Length=0}
00000000 00 04 00 01 00 06 00 50 56 9c 09 59 08 00 |.....PV..Y..|
--- Layer 2 ---
IPv4 {Contents=[..20..] Payload=[..21..] Version=4 IHL=5 TOS=40 Length=41
Id=41664 Flags=DF FragOffset=0 TTL=64 Protocol=UDP
Checksum=32420 SrcIP=209.165.200.229 DstIP=209.165.200.227 Options=[] Padding=[]}
00000000 45 28 00 29 a2 c0 40 00 40 11 7e a4 0a 01 02 9c |E(..)@.@.~.....|
00000010 0a 01 02 9a |....|
--- Layer 3 ---
UDP {Contents=[..8..] Payload=[..13..] SrcPort=15001 DstPort=2123(gtp-control)
Length=21 Checksum=6494}
00000000 3a 99 08 4b 00 15 19 5e |:...K...^|
--- Layer 4 ---
Payload 13 byte(s)
00000000 40 01 00 09 01 01 ac 00 03 00 01 00 00 |@.....|
```

```
-----
InterfaceName = gtpc | InterfaceIP = 209.165.200.229 | Filter = (tcp or udp or sctp)
and (port 2123 or (host 209.165.200.227 and port 2123)
or (host 209.165.201.11 and port 2123) or (host 209.165.200.228 and port 2123))
<<<<OUTBOUND
from 209.165.200.229:15002 to 209.165.200.228:2123
Protocol: UDP | Sequence Number: 0
Packet Metadata: {Timestamp:2021-06-06 06:16:23.086144 +0000 UTC CaptureLength:55
Length:55 InterfaceIndex:0 AncillaryData:[]}
```

Packet Raw Bytes:

```
0004000100060050569c0959080045280029dbe740004011457c0a01029c0a01029b3
a9a084b0015195f40010009020176000300010000
```

Packet Dump:

```
-- FULL PACKET DATA (55 bytes) -----
00000000 00 04 00 01 00 06 00 50 56 9c 09 59 08 00 45 28 |.....PV..Y..E(|
00000010 00 29 db e7 40 00 40 11 45 7c 0a 01 02 9c 0a 01 |.)..@.@.E|.....|
00000020 02 9b 3a 9a 08 4b 00 15 19 5f 40 01 00 09 02 01 |...K..._@.....|
00000030 76 00 03 00 01 00 00 |v.....|
--- Layer 1 ---
Ethernet {Contents=[..14..] Payload=[..41..] SrcMAC=00:50:56:9c:09:59
DstMAC=00:04:00:01:00:06 EthernetType=IPv4 Length=0}
00000000 00 04 00 01 00 06 00 50 56 9c 09 59 08 00 |.....PV..Y..|
--- Layer 2 ---
IPv4 {Contents=[..20..] Payload=[..21..] Version=4 IHL=5 TOS=40 Length=41
Id=56295 Flags=DF FragOffset=0 TTL=64 Protocol=UDP
Checksum=17788 SrcIP=209.165.200.229 DstIP=209.165.200.228 Options=[] Padding=[]}
00000000 45 28 00 29 db e7 40 00 40 11 45 7c 0a 01 02 9c |E(..)@.@.E|.....|
00000010 0a 01 02 9b |....|
--- Layer 3 ---
UDP {Contents=[..8..] Payload=[..13..] SrcPort=15002 DstPort=2123(gtp-control)
Length=21 Checksum=6495}
```

```

00000000  3a 9a 08 4b 00 15 19 5f          |:...K..._|
--- Layer 4 ---
Payload 13 byte(s)
00000000  40 01 00 09 02 01 76 00  03 00 01 00 00          |@.....v.....|

-----
InterfaceName = gtpc | InterfaceIP = 209.165.200.229 | Filter = (tcp or udp or sctp)
and (port 2123 or (host 209.165.200.227 and port 2123)
or (host 209.165.201.11 and port 2123) or (host 209.165.200.228 and port 2123))
<<<<OUTBOUND
from 209.165.200.229:15002 to 209.165.200.227:2123
Protocol: UDP | Sequence Number: 0
Packet Metadata: {Timestamp:2021-06-06 06:16:28.079013 +0000 UTC CaptureLength:55
Length:55 InterfaceIndex:0 AncillaryData:[]}}

Packet Raw Bytes:
0004000100060050569c0959080045280029a336400040117e2e0a01029c0
a01029a3a9a084b0015195e400100090201ca000300010000

Packet Dump:
-- FULL PACKET DATA (55 bytes) -----
00000000  00 04 00 01 00 06 00 50  56 9c 09 59 08 00 45 28  |.....PV..Y..E(|
00000010  00 29 a3 36 40 00 40 11  7e 2e 0a 01 02 9c 0a 01  |.)..6@.@..~.....|
00000020  02 9a 3a 9a 08 4b 00 15  19 5e 40 01 00 09 02 01  |:...K...^@.....|
00000030  ca 00 03 00 01 00 00          |.....|
--- Layer 1 ---
Ethernet {Contents=[..14..] Payload=[..41..] SrcMAC=00:50:56:9c:09:59
DstMAC=00:04:00:01:00:06 EthernetType=IPv4 Length=0}
00000000  00 04 00 01 00 06 00 50  56 9c 09 59 08 00          |.....PV..Y...|
--- Layer 2 ---
IPv4 {Contents=[..20..] Payload=[..21..] Version=4 IHL=5 TOS=40 Length=41
Id=41782 Flags=DF FragOffset=0 TTL=64 Protocol=UDP
Checksum=32302 SrcIP=209.165.200.229 DstIP=209.165.200.227 Options=[] Padding=[]}
00000000  45 28 00 29 a3 36 40 00  40 11 7e 2e 0a 01 02 9c  |E(.)..6@.@..~.....|
00000010  0a 01 02 9a          |.....|
--- Layer 3 ---
UDP {Contents=[..8..] Payload=[..13..] SrcPort=15002 DstPort=2123(gtp-control)
Length=21 Checksum=6494}
00000000  3a 9a 08 4b 00 15 19 5e          |:...K...^|
--- Layer 4 ---
Payload 13 byte(s)
00000000  40 01 00 09 02 01 ca 00  03 00 01 00 00          |@.....|

-----
InterfaceName = gtpc | InterfaceIP = 209.165.200.229 | Filter = (tcp or udp or sctp)
and (port 2123 or (host 209.165.200.227 and port 2123)
or (host 209.165.201.11 and port 2123) or (host 209.165.200.228 and port 2123))
<<<<OUTBOUND
from 209.165.200.229:15002 to 209.165.200.228:2123
Protocol: UDP | Sequence Number: 0
Packet Metadata: {Timestamp:2021-06-06 06:16:28.086562 +0000 UTC CaptureLength:55
Length:55 InterfaceIndex:0 AncillaryData:[]}}

Packet Raw Bytes:
0004000100060050569c0959080045280029dfb14000401141b20a01029
c0a01029b3a9a084b0015195f40010009020177000300010000

Packet Dump:
-- FULL PACKET DATA (55 bytes) -----
00000000  00 04 00 01 00 06 00 50  56 9c 09 59 08 00 45 28  |.....PV..Y..E(|
00000010  00 29 df b1 40 00 40 11  41 b2 0a 01 02 9c 0a 01  |.)...@.@.....|
00000020  02 9b 3a 9a 08 4b 00 15  19 5f 40 01 00 09 02 01  |:...K..._@.....|

```

Configuration Example

```

00000030  77 00 03 00 01 00 00          |w.....|
--- Layer 1 ---
Ethernet      {Contents=[..14..] Payload=[..41..] SrcMAC=00:50:56:9c:09:59
DstMAC=00:04:00:01:00:06 EthernetType=IPv4 Length=0}
00000000  00 04 00 01 00 06 00 50 56 9c 09 59 08 00          |.....PV..Y..|
--- Layer 2 ---
IPv4          {Contents=[..20..] Payload=[..21..] Version=4 IHL=5 TOS=40 Length=41
Id=57265 Flags=DF FragOffset=0 TTL=64 Protocol=UDP
Checksum=16818 SrcIP=209.165.200.229 DstIP=209.165.200.228 Options=[] Padding=[]}
00000000  45 28 00 29 df b1 40 00 40 11 41 b2 0a 01 02 9c  |E(..).@.@.A.....|
00000010  0a 01 02 9b          |....|
--- Layer 3 ---
UDP           {Contents=[..8..] Payload=[..13..] SrcPort=15002 DstPort=2123(gtp-control)
Length=21 Checksum=6495}
00000000  3a 9a 08 4b 00 15 19 5f          |:..K..._|
--- Layer 4 ---
Payload 13 byte(s)
00000000  40 01 00 09 02 01 77 00 03 00 01 00 00          |@.....w.....|

-----
InterfaceName = gtpc | InterfaceIP = 209.165.200.229 | Filter = (tcp or udp or sctp)
and (port 2123 or (host 209.165.200.227 and port 2123)
or (host 209.165.201.11 and port 2123) or (host 209.165.200.228 and port 2123))
<<<<OUTBOUND
from 209.165.200.229:15002 to 209.165.200.228:2123
Protocol: UDP | Sequence Number: 0
Packet Metadata: {Timestamp:2021-06-06 06:16:28.685112 +0000 UTC CaptureLength:59
Length:59 InterfaceIndex:0 AncillaryData:[]}

Packet Raw Bytes:
0004000100060050569c095908004528002de03240004011412d0a01029c0a01029b3a9a
084b001919634863000d000008d0020175004900010005

Packet Dump:
-- FULL PACKET DATA (59 bytes) -----
00000000  00 04 00 01 00 06 00 50 56 9c 09 59 08 00 45 28  |.....PV..Y..E(|
00000010  00 2d e0 32 40 00 40 11 41 2d 0a 01 02 9c 0a 01  |.-.2@.@.A-.....|
00000020  02 9b 3a 9a 08 4b 00 19 19 63 48 63 00 0d 00 00  ||...K...cHc....|
00000030  08 d0 02 01 75 00 49 00 01 00 05          |....u.I....|
--- Layer 1 ---
Ethernet      {Contents=[..14..] Payload=[..45..] SrcMAC=00:50:56:9c:09:59
DstMAC=00:04:00:01:00:06 EthernetType=IPv4 Length=0}
00000000  00 04 00 01 00 06 00 50 56 9c 09 59 08 00          |.....PV..Y..|
--- Layer 2 ---
IPv4          {Contents=[..20..] Payload=[..25..] Version=4 IHL=5 TOS=40 Length=45
Id=57394 Flags=DF FragOffset=0 TTL=64 Protocol=UDP
Checksum=16685 SrcIP=209.165.200.229 DstIP=209.165.200.228 Options=[] Padding=[]}
00000000  45 28 00 2d e0 32 40 00 40 11 41 2d 0a 01 02 9c  |E(..).2@.@.A-....|
00000010  0a 01 02 9b          |....|
--- Layer 3 ---
UDP           {Contents=[..8..] Payload=[..17..] SrcPort=15002 DstPort=2123(gtp-control)
Length=25 Checksum=6499}
00000000  3a 9a 08 4b 00 19 19 63          |:..K...c|
--- Layer 4 ---
Payload 17 byte(s)
00000000  48 63 00 0d 00 00 08 d0 02 01 75 00 49 00 01 00  |Hc.....u.I...|
00000010  05          |.|

-----
command terminated with exit code 124
% Total      % Received % Xferd  Average Speed   Time    Time       Time  Current
   Dload  Upload   Total             Spent      Left   Speed

```

```

100 172 100 43 100 129 8600 25800 --:--:-- --:--:-- --:--:-- 34400
Stop Response Already disabled mon_pro as part of timeout for Cmd: --header
Content-type:application/json --request POST --data
{"commandname":"mon_pro","parameters":{"interface":"pcfp,gtpc","duration":100,"action":
"stop","enable_pcap":true,"grInstance":0}} http://oam-pod:8879/commands

```

Configuring the Transaction Messages

To configure the transaction logs, use the following configuration:

```

config
    logging transaction message [ disable | enable ]
end

```

NOTES:

- **logging transaction message [disable | enable]**—Configure the messages in transaction logging. When set to enable, the transactional and internal logs are combined. By default, the logs are disabled.

Configuration Example

The following is an example configuration.

```
logging transaction message enable
```

Sample Output

The following is a sample output.

```
/opt/workspace/monsublogs# cat 'sgw.imsi-*_WithTxnLogs_TS_2020-12-22T15:16:58.158964842.txt'
```

```

Transaction Log received from Instance: smf.nodemgr.cn.cn.0
***** TRANSACTION: 00088 *****
TRANSACTION SUCCESS:
    Txn Type           : NmgrRersourceMgmtRequest(1025)
    Priority            : 1
    Session Namespace   : sgw(2)
LOG MESSAGES:
    2020/12/22 15:20:07.093 [TRACE] [infra.message_log.core] >>>>>>>
IPC message
Name: NmgrRersourceMgmtRequest
MessageType: NmgrRersourceMgmtRequest
Key:
--body--
{"supi":"imsi-123456789012348","idReqType":1,"serviceUsertype":2}
    2020/12/22 15:20:07.093 [DEBUG] [nodemgr0.app.Int]
        GetSessionNamespace for txn id: 88, Type: 1025
    2020/12/22 15:20:07.093 [DEBUG] [nodemgr0.app.Int]
        GetSessionNamespace returned namespace : 2
    2020/12/22 15:20:07.093 [INFO] [nodemgr0.app.Int]
        RECEIVED REQUEST <-- NmgrRersourceMgmtRequest
    2020/12/22 15:20:07.093 [TRACE] [infra.message_log.core] <<<<<<<

*****
Transaction Log received from Instance: smf.protocol.cn.cn.0
***** TRANSACTION: 00050 *****
TRANSACTION SUCCESS:
    Txn Type           : 524(524)
    Priority            : 1
    Session Namespace   : sgw(2)

```

```

INCOMING REQUEST:
  Message: Sx Session Establishment Request
  Description: Sx Session Establishment Request Message from SGWC to SGWU
  Source: 209.165.200.229
  Destination: 209.165.200.228
  PAYLOAD:
    Sx Session Establishment Request:
      Sx Session Establishment Request:
        CreatePdr:
          CreatePdr[0]:
            PdrId: 1
            Precedence: 0
            Pdi:
              SrcIf: CORE
              UeIp:
                Src: false
                Dst: false
                IPv4Addr: 209.165.201.30
              TEndpointId: 1
              Valid: true
            OuterHdrRem: 0
            FarId:
              FarId[0]: 1
            Qfi: 0
            OuterHdrRemValid: false
          CreatePdr[1]:
            PdrId: 2
            Precedence: 0
            Pdi:
              SrcIf: ACCESS
              UeIp:
                Src: false
                Dst: false
                IPv4Addr: 209.165.201.30
              TEndpointId: 2
              Valid: true
            OuterHdrRem: 0
            FarId:
              FarId[0]: 2
            Qfi: 0
            OuterHdrRemValid: false
        CreateFar:
          CreateFar[0]:
            FarId: 1
            ApplyAction:
              Drop: true
              Frwd: false
              Buff: false
              Nocp: false
              Dupl: false
              Valid: true
            FwdParams:
              DestIf: ACCESS
              RedirectInfo:
                AddrType: 0
                Valid: false
              OuterHdr:
                OuterHdrDesc: 0
                Teid: 0
                IPv4Address: 209.165.201.30
                Port: 0
                Valid: false
                TEndptId: 2
                OuterPktTos: 255

```

```
InnerPktTos: 255
TosOpt:
  CopyInner: false
  CopyOuter: false
SendTos: 0
PfcPsmFlags:
  Drobu: false
  Qaurr: false
  Sndem: false
  Valid: false
Valid: true
DuplParams:
  DestIf: ACCESS
  OuterHdr:
    OuterHdrDesc: 0
    Teid: 0
    IPv4Address: 209.165.201.30
    Port: 0
    Valid: false
  InterceptInfo:
    InterceptId: 0
    ChargingId: 0
    SmfLiNodeId:
      IpDesc: 0
      IPv4Address: 209.165.201.30
      Valid: false
    PduSessionId: 0
    Valid: false
  Valid: false
BarId: 0
CreateFar[1]:
  FarId: 2
  ApplyAction:
    Drop: true
    Frwd: false
    Buff: false
    Nocp: false
    Dupl: false
    Valid: true
  FwdParams:
    DestIf: CORE
    RedirectInfo:
      AddrType: 0
      Valid: false
    OuterHdr:
      OuterHdrDesc: 0
      Teid: 0
      IPv4Address: 209.165.201.30
      Port: 0
      Valid: false
  TEndptId: 1
  OuterPktTos: 255
  InnerPktTos: 255
  TosOpt:
    CopyInner: false
    CopyOuter: false
  SendTos: 0
  PfcPsmFlags:
    Drobu: false
    Qaurr: false
    Sndem: false
    Valid: false
  Valid: true
DuplParams:
```

```

        DestIf: ACCESS
        OuterHdr:
            OuterHdrDesc: 0
            Teid: 0
            IPv4Address: 209.165.201.30
            Port: 0
            Valid: false
        InterceptInfo:
            InterceptId: 0
            ChargingId: 0
            SmfLiNodeId:
                IpDesc: 0
                IPv4Address: 209.165.201.30
                Valid: false
            PduSessionId: 0
            Valid: false
        Valid: false
    BarId: 0
CreateTEndpt:
    CreateTEndpt[0]:
        EndpointId: 1
        FTeid:
            Teid: 0
            IPv4Address: 209.165.201.30
            ChooseId: 0
        BearerLvlInfo:
            Valid: 1
            Qci: 6
    CreateTEndpt[1]:
        EndpointId: 2
        FTeid:
            Teid: 0
            IPv4Address: 209.165.201.30
            ChooseId: 0
        BearerLvlInfo:
            Valid: 1
            Qci: 6
PdnType: 0
UplaneInacTimer: 0
MetaData: From:209.165.200.229:11000->To:209.165.200.228:8805 Seqno:37
        Supi: Seid:1224979349111832634 Cmnid:0 Rseid:0 IntfType:0
UserIDInfo:
    Valid: false
XHeaderInfo:
    RatType:
        Valid: false
CfPolicyId:
    PolicyId: 0
    Valid: false
ChargingDisabled:
    Valid: false
    Value: false
ChargingParams:
    Valid: 0
    GyOfflineChargingEnabled: 0

```

OUTGOING RESPONSE:

```

Message: Sx Session Establishment Response
Description: Sx Session Establishment Response Message from SGWU to SGWC
Source: 209.165.200.228
Destination: 209.165.200.229
PAYLOAD:
    Sx Session Establishment Response:
        Sx Session Establishment Response:

```

```

Cause: 1
OffendingIe: 0
FSeid:
    Seid: 10002
    IPv4Address: 209.165.200.228
CreatedTEndpt:
    CreatedTEndpt[0]:
        EndpointId: 1
        FTeid:
            Teid: 2086
            IPv4Address: 209.165.201.1
            ChooseId: 0
    CreatedTEndpt[1]:
        EndpointId: 2
        FTeid:
            Teid: 2087
            IPv4Address: 209.165.200.226
            ChooseId: 0
MetaData: From:209.165.200.228:8805->To:209.165.200.229:11000 Seqno:37
    Supi: Seid:1224979349111832634 Cmnd:0 Rseid:0 IntfType:0
LoadControlInfo:
    SeqNum: 0
    Metric: 0
    Valid: false
OverloadControlInfo:
    SeqNum: 0
    Metric: 0
    Ociflag: 0
    Valid: false

```

LOG MESSAGES:

```

2020/12/22 15:20:10.934 [TRACE] [infra.message_log.core] >>>>>>>

2020/12/22 15:20:10.934 [DEBUG] [proto_ep.app.Int]
    GetSessionNamespace for txn id: 50, Type: 524
2020/12/22 15:20:10.934 [DEBUG]
    [proto_ep.app.Int] GetSessionNamespace returned namespace : 2
2020/12/22 15:20:10.934 [DEBUG]
    [infra.ipc_action.core] BG IPC will be executed after process
continue.
2020/12/22 15:20:10.934 [DEBUG]
    [infra.ipc_action.core] BG IPC is executing after process
continue.
2020/12/22 15:20:10.967 [DEBUG]
    [infra.transaction.core] Response received for correlation ID
app_protocol-0_37
2020/12/22 15:20:10.967 [DEBUG]
    [infra.transaction.core]
    (1) All pending ipc action finished, hence waking up transaction

2020/12/22 15:20:10.967 [TRACE]
    [infra.message_log.core] <<<<<<<

```

Accessing the Logs

To access the monitor subscriber logs, navigate to the oam-pod at /opt/workspace/logs/monsublogs

Sample Logs

```

root@oam-pod-0:/opt/workspace/logs/monsublogs# ls
none.imsi-123456789_TS_2021-06-05T06:19:12.682444275.txt
sgw.imei-352099001761480_TS_2021-06-05T13:07:41.774214146.txt.sorted

```

```

none.imsi-123456789_TS_2021-06-05T06:20:39.751939118.txt
sgw.imei-352099001761480_TS_2021-06-05T13:48:51.868279985.txt
none.imsi-123456789_TS_2021-06-06T06:22:16.015635407.txt
sgw.imei-352099001761480_TS_2021-06-05T13:48:51.868279985.txt.sorted
sgw.imei-352099001761480_TS_2021-06-04T19:09:24.863985017.txt
sgw.imei-352099001761480_TS_2021-06-05T14:50:09.330635953.txt
sgw.imei-352099001761480_TS_2021-06-04T19:09:24.863985017.txt.sorted
sgw.imei-352099001761480_TS_2021-06-05T14:50:09.330635953.txt.sorted
sgw.imei-352099001761480_TS_2021-06-05T08:44:25.889632126.txt
sgw.imei-352099001761480_TS_2021-06-05T17:36:17.238331396.txt
sgw.imei-352099001761480_TS_2021-06-05T08:44:25.889632126.txt.sorted
sgw.imei-352099001761480_TS_2021-06-05T17:36:17.238331396.txt.sorted
sgw.imei-352099001761480_TS_2021-06-05T10:26:23.529652777.txt
'sgw.imsi-*_TS_2021-06-05T06:23:19.865508390.txt'
sgw.imei-352099001761480_TS_2021-06-05T10:26:23.529652777.txt.sorted
'sgw.imsi-*_TS_2021-06-05T06:25:18.219875282.txt'
sgw.imei-352099001761480_TS_2021-06-05T13:07:41.774214146.txt

```

To access the monitor protocol logs, navigate to the oam-pod at `/opt/workspace/logs/monprologs`.

Sample Logs

```

root@oam-pod-0:/opt/workspace/logs/monprologs# ls
sessintfname_gtpc_at_2021-06-05T06:28:18.310397784.pcap
sessintfname_pcfp_gtpc_at_2021-06-06T06:15:39.005414271.pcap
sessintfname_gtpc_at_2021-06-05T06:28:18.310397784.txt
sessintfname_pcfp_gtpc_at_2021-06-06T06:15:39.005414271.txt

```