

# SCMS MANAGER™

SECURITY CREDENTIAL MANAGEMENT SYSTEM

---

## ASN.1 FOR MISBEHAVIOR REPORTING

---

VERSION 1.1

April 23, 2019

**Author(s)**

SCMS Manager Board of Directors

## TABLE OF CONTENTS

---

|   |    |
|---|----|
| <i>SCMS Manager ASN.1 for Misbehavior Reporting</i> ..... | 2  |
| 1.0 ASN.1 for Misbehavior Reporting Overview .....        | 2  |
| 2.0 ASN.1 Module for Misbehavior Reporting .....          | 2  |
| 3.0 Revision History .....                                | 14 |

# SCMS MANAGER ASN.1 FOR MISBEHAVIOR REPORTING

---

## 1.0 ASN.1 FOR MISBEHAVIOR REPORTING OVERVIEW

---

This document defines the ASN.1 for Misbehavior Reporting.

## 2.0 ASN.1 MODULE FOR MISBEHAVIOR REPORTING

---

```
CvPdMbdModule {iso(1) identified-organization(3) ieee(111)
standards-association-numbered-series-standards(2) wave-stds(1609)
dot2(2) tmp(256) cvpd-mbd(1)}
```

```
DEFINITIONS AUTOMATIC TAGS ::= BEGIN
```

```
EXPORTS ALL;
```

```
IMPORTS
```

```
ieee1609Dot2Data, Certificate
```

```
FROM
```

```
IEEE1609dot2 {iso(1) identified-organization(3) ieee(111)
standards-association-numbered-series-standards(2) wave-stds(1609)
dot2(2) base (1) schema (1) major-version-2(2)}
```

```
Psid,
Time32,
Uint8,
Uint16,
ThreeDLocation
```

```
FROM ieee1609dot2BaseTypes {iso(1) identified-organization(3) ieee(111)
standards-association-numbered-series-standards(2) wave-stds(1609)
dot2(2) base(1) base-types(2) major-version-2(2)};
```

```
---
```

```
-- @brief The EndEntityMaInterfacePDU is the parent message type for messages sent between End
-- Entities (EE) and the Misbehavior Authority (MA).
-- @class EndEntityMaInterfacePDU
-- @param eeMaMisbehaviorReport contains the misbehavior report sent by an end entity to the MA.
EndEntityMaInterfacePDU ::= CHOICE {
    eeMaApplicationSpecificMisbehaviorReport EeMaApplicationSpecificMisbehaviorReport,
    ...
}
```

```

---
-- @brief This data type contains the misbehavior report sent by an end entity to the MA.
-- @class EeMaMisbehaviorReport
-- @param version contains the current version of the data type. The version specified
--   in this document is version 1, represented by the integer 1.
-- @param generationTime contains the generation time of misbehavior report.
-- @param psid contains the PSID for the application for which misbehavior is
--   being reported.
-- @param contents contains the PSID-specific misbehavior report contents.
-- @see Uint8, Time32, Psid

```

```

EeMaApplicationSpecificMisbehaviorReport ::= SEQUENCE {
  version      Uint8,
  generationTime Time32,
  generationLocation ThreeDLocation,
  psid         APPLICATION-SPECIFIC-MISBEHAVIOR-REPORT.&id({CvpdMbr}),
  contents     APPLICATION-SPECIFIC-MISBEHAVIOR-REPORT.
               &Contents({CvpdMbr}{@.psid}),
  ...
}

```

```

---
-- @brief This is an ASN.1 CLASS to enable the definition of an arbitrary number
--   of PSID-specific misbehavior reports
-- @class APPLICATION-SPECIFIC-MISBEHAVIOR-REPORT
-- @param id is the PSID for which the report is being defined
-- @param Contents is the PSID-specific misbehavior report contents.
-- @see Psid

```

```

APPLICATION-SPECIFIC-MISBEHAVIOR-REPORT ::= CLASS {
  &id    Psid,
  &Contents
} WITH SYNTAX {&Contents IDENTIFIED BY &id}

```

```

---
-- @brief This is a list of the APPLICATION-SPECIFIC-MISBEHAVIOR-REPORT
--   instances that are supported for CV Pilot Deployments
-- @class CvpdMbr
-- @param Psid20Mbr is the misbehavior report type associated with PSID 0x20.
-- @see APPLICATION-SPECIFIC-MISBEHAVIOR-REPORT
-- @note it would be better to import a BsmPsid value from elsewhere rather
--   than explicitly defining it as 32 (0x20), but explicitly defining
--   it as 0x20 won't cause any inconsistencies.
CvpdMbr APPLICATION-SPECIFIC-MISBEHAVIOR-REPORT ::= {
  { Psid20Mbr IDENTIFIED BY 32 },

```

```

...
}

---
-- @brief This data type contains the PSID 0x20-specific misbehavior report. It is
-- intended to go inside an APPLICATION-SPECIFIC-MISBEHAVIOR-REPORT.
-- @class Psid20Mbr
-- @param version contains the current version of the data type. The version specified
-- in this document is version 1, represented by the integer 1.
-- @param type contains an identifier for the high-level type of the report
-- being provided. Currently two types are supported, inconsistent (tuples of)
-- BSMs and implausible (single) BSMs.
-- @param subtype contains an identifier for the subtype of the report, and
-- any parameters specific to that subtype.
-- @param evidence contains the evidence data structure corresponding to the
-- indicated high-level report type.
-- @see Uint8, Time32, Psid
Psid20Mbr ::= SEQUENCE {
    version Uint8, -- 1 for this version
    type PSID-20-SPECIFIC-MBR.&type({CvpdPsid20Mbr}),
    subtype PSID-20-SPECIFIC-MBR.&SubtypeArrayAndParams({CvpdPsid20Mbr}{@.type}),
    evidence PSID-20-SPECIFIC-MBR.&Evidence({CvpdPsid20Mbr}{@.type}),
    ...
}

---
-- @brief This is an ASN.1 CLASS to enable the definition of an arbitrary number
-- of misbehavior reports specific to PSID 0x20
-- @class PSID-20-SPECIFIC-MBR
-- @param type is the high-level report type
-- @param SubtypeArray is the type-specific array of subtypes and associated
-- parameters
-- @param Evidence is the type-specific set of evidence relevant to this type of MBR
-- @see Psid

PSID-20-SPECIFIC-MBR ::= CLASS {
    &type Psid20MbrType,
    &SubtypeArrayAndParams,
    &Evidence
} WITH SYNTAX {&Evidence FOR SUBTYPES &SubtypeArrayAndParams IDENTIFIED BY &type}

---
-- @brief This data type contains the misbehavior report type.
-- @class Psid20MbrType
-- @param psid20MbrType1VInconsistent Indicates that the report concerns
-- two or more BSMs from the same sender that are inconsistent with
-- each other.

```

```

-- @param psid20MbrTypeImplausible Indicates that the report concerns a
--   single BSM containing one or more fields that are implausible
--   based on known physics.
-- @param psid20MbrTypeObsImplausible Indicates that the report concerns a
--   single BSM containing one or more fields that are implausible
--   based on information available to the reporter. (These reports
--   create a significant risk of false reporting and the MA should
--   use them with caution).
Psid20MbrType ::= INTEGER (0..255)
psid20MbrType1VInconsistent Psid20MbrType ::= 1
psid20MbrTypeImplausible Psid20MbrType ::= 2
psid20MbrTypeObsImplausible Psid20MbrType ::= 3

```

```

-- @brief This is a list of the PSID-20-SPECIFIC-MBR
--   instances that are supported for CV Pilot Deployments. Entries
--   are of the form [Evidence] FOR SUBTYPES [Subtypes and params]
--   IDENTIFIED BY [Subtype ID].
-- @class CvpdPsid20Mbr
-- @see Psid20MbrType, Psid20MbrEvidence1VInconsistent,
--   Psid20MbrSubtype1VInconsistentList,
--   Psid20MbrEvidenceImplausible,
--   Psid20MbrSubtypeImplausibleList
--   - mbr-Psid20Mbr-1VInconsistent
--   - mbr-Psid20Mbr-Implausible
--   - mbr-Psid20Mbr-ObsImplausible

```

```

CvpdPsid20Mbr PSID-20-SPECIFIC-MBR ::= {
  {Psid20MbrEvidence1VInconsistent
    FOR SUBTYPES Psid20MbrSubtype1VInconsistentList
    IDENTIFIED BY psid20MbrType1VInconsistent} |
  {Psid20MbrEvidenceImplausible
    FOR SUBTYPES Psid20MbrSubtypeImplausibleList
    IDENTIFIED BY psid20MbrTypeImplausible} |
  {Psid20MbrEvidenceObsImplausible
    FOR SUBTYPES Psid20MbrSubtypeObsImplausibleList
    IDENTIFIED BY psid20MbrTypeObsImplausible},
  ...
}

```

```

--*****
--
--           SINGLE-VEHICLE INCONSISTENT BSMS           --
--
--*****

```

```

---
-- @brief This data type contains the set of report subtypes corresponding
-- to an Inconsistent BSM report.
-- @class Psid20MbrSubtype1VINconsistentList
-- @see Psid20MbrSubtype1VINconsistent
Psid20MbrSubtype1VINconsistentList ::=
  SEQUENCE (SIZE (1..MAX)) OF Psid20MbrSubtypeParams1VINconsistent
---
-- @brief This data type contains the subtype and parameters for reports of type
-- single-vehicle inconsistent BSMs
-- @class Psid20MbrSubtypeParams1VINconsistent
-- @param subtype the subtype of the report.
-- @param params the parameters associated with that subtype, if any.
-- @see CvpdPsid20Mbr1VINconsistentStParams
Psid20MbrSubtypeParams1VINconsistent ::= SEQUENCE {
  subtype PSID-20-MBR-ST-PARAMS-1VINCONSISTENT.
    &subtype({CvpdPsid20Mbr1VINconsistentStParams}),
  params PSID-20-MBR-ST-PARAMS-1VINCONSISTENT.
    &Params({CvpdPsid20Mbr1VINconsistentStParams}{@.subtype})
}
---
-- @brief This is an ASN.1 CLASS to enable the definition of an arbitrary number
-- of misbehavior reports specific to single-vehicle BSM inconsistency.
-- @class PSID-20-MBR-ST-PARAMS-1VINCONSISTENT
-- @param type is the high-level report type
-- @param SubtypeArray is the type-specific array of subtypes and associated
-- parameters
-- @see Psid

PSID-20-MBR-ST-PARAMS-1VINCONSISTENT ::= CLASS {
  &subtype Psid20MbrSubtype1VINconsistent,
  &Params
} WITH SYNTAX {SUBTYPE &subtype USING PARAMS &Params}
---
-- @brief This data type indicates the misbehavior report subtype for
-- inconsistent BSMs from a single sender. A single-vehicle Inconsistent
-- BSM report can in principle correspond to multiple subtypes, although
-- in practice the ones defined in this project are mutually exclusive.
-- @class Psid20MbrSubtype1VINconsistent
-- @param psid20MbrSubtype1VINconsistentConstantPosition Indicates that
-- multiple consecutive BSMs from the same sender have the same
-- position but non-zero speed.
-- @param psid20MbrSubtype1VINconsistentRandomPosition Indicates that
-- multiple consecutive BSMs from the same sender have positions

```

```

-- that are different but inconsistent with the speed, even taking
-- GPS drift into account.
Psid20MbrSubtype1VInconsistent ::= INTEGER (0..255)
psid20MbrSubtype1VInconsistentConstantPosition Psid20MbrSubtype1VInconsistent ::= 1
psid20MbrSubtype1VInconsistentRandomPosition Psid20MbrSubtype1VInconsistent ::= 2

-- @brief This is a list of the PSID-20-MBR-ST-PARAMS-1VINCONSISTENT
-- instances that are supported for CV Pilot Deployments. Entries are
-- of the form [Subtype ID] [(optionally) USING PARAMS [Params]].
-- @class CvpdPsid20Mbr1VInconsistentStParams
-- @see Psid20MbrSubtype1VInconsistent, Psid20MbrParams1VInconsistentRandomPosition

```

```

CvpdPsid20Mbr1VInconsistentStParams PSID-20-MBR-ST-PARAMS-1VINCONSISTENT ::= {
  {SUBTYPE psid20MbrSubtype1VInconsistentConstantPosition USING PARAMS NULL} |
  {SUBTYPE psid20MbrSubtype1VInconsistentRandomPosition USING PARAMS
    Psid20MbrParams1VInconsistentRandomPosition},
  ...
}

```

```

-- @brief This data type gives the parameters for the Implausible
-- Random Position misbehavior report type.
-- @class Psid20MbrParams1VInconsistentRandomPosition
-- @param gpsDrift This is the maximum amount of difference in position
-- between two BSMs, sent 0.1 seconds apart, that the reporter
-- believes can be explained by GPS drift. This quantity MAY be 0.
-- The units of this quantity are thousandths of a meter. The
-- Evidence associated with these parameters will include at least
-- one pair of consecutive BSMs for which the difference in location
-- is greater than would be indicated by the speed, acceleration, and
-- this GPS drift value.

```

```

Psid20MbrParams1VInconsistentRandomPosition ::= SEQUENCE {
  gpsDrift    Uint16,
  ...
}

```

```

---
-- @brief This data type contains the evidence used to support an Inconsistent
-- BSM report, which is a set of the BSMs from the suspect sender. NOTE
-- that SignedBsmsWithCertificate may contain a single BSM, but if used
-- in this context it SHALL contain at least two BSMs.
-- @class Psid20MbrEvidence1VInconsistent
-- @see SignedBsmsWithCertificate
Psid20MbrEvidence1VInconsistent ::= SignedBsmsWithCertificate

```

```

--*****_

```

```

--
-- IMPLAUSIBLE SINGLE BSMS
--

```



```

--
--*****_
-- @brief This data type contains the set of report subtypes corresponding
-- to an Implausible Single BSM report and their associated parameters
-- @class Psid20MbrSubtypeImplausibleList
-- @see Psid20MbrSubtypeParamsImplausible
Psid20MbrSubtypeImplausibleList ::=
    SEQUENCE (SIZE (1..MAX)) OF Psid20MbrSubtypeParamsImplausible

---
-- @brief This data type contains the subtype and parameters for reports of type
-- single implausible BSM.
-- @class Psid20MbrSubtypeParamsImplausible
-- @param subtype the subtype of the report.
-- @param params the parameters associated with that subtype, if any.
-- @see CvpdPsid20MbrImplausibleStParams
Psid20MbrSubtypeParamsImplausible ::= SEQUENCE {
    subtype PSID-20-MBR-ST-PARAMS-IMPLAUSIBLE.
        &subtype({CvpdPsid20MbrImplausibleStParams}),
    params PSID-20-MBR-ST-PARAMS-IMPLAUSIBLE.
        &Params({CvpdPsid20MbrImplausibleStParams}{@.subtype})
}

---
-- @brief This is an ASN.1 CLASS to enable the definition of an arbitrary number
-- of misbehavior reports specific to single-BSM implausibility.
-- @class PSID-20-MBR-ST-PARAMS-IMPLAUSIBLE
-- @param type is the high-level report type
-- @param SubtypeArray is the type-specific array of subtypes and associated
-- parameters
-- @see Psid

PSID-20-MBR-ST-PARAMS-IMPLAUSIBLE ::= CLASS {
    &subtype Psid20MbrSubtypeImplausible,
    &Params
} WITH SYNTAX {SUBTYPE &subtype USING PARAMS &Params}

---
-- @brief This data type indicates the misbehavior report subtype for
-- implausible single BSMs. A single-vehicle Inconsistent BSM report can
-- correspond to multiple subtypes.
-- @class Psid20MbrSubtypeImplausible
-- @param psid20MbrSubtypeImplausibleMaxSpeed Indicates that the speed
-- given in the BSM in the evidence field is implausibly high.
-- @param psid20MbrSubtypeImplausibleMaxAcceleration Indicates that the acceleration

```

```

-- given in the BSM in the evidence field is implausibly high.
-- @param psid20MbrSubtypeImplausibleBrakeAcceleration Indicates that in the
-- BSM in the evidence field, the brakes are showing as on but the
-- acceleration is not negative, i.e. not in basically the opposite
-- direction to the speed.
Psid20MbrSubtypeImplausible ::= INTEGER (0..255)
psid20MbrSubtypeImplausibleMaxSpeed Psid20MbrSubtypeImplausible ::= 1
psid20MbrSubtypeImplausibleMaxAcceleration Psid20MbrSubtypeImplausible ::= 2
psid20MbrSubtypeImplausibleBrakeAcceleration Psid20MbrSubtypeImplausible ::= 3

```

```

-- @brief This is a list of the PSID-20-MBR-ST-PARAMS-IMPLAUSIBLE
-- instances that are supported for CV Pilot Deployments. Entries are
-- of the form [Subtype ID] [(optionally) USING PARAMS [Params]].
-- @class CvpdPsid20MbrImplausibleStParams
-- @see Psid20MbrSubtypeImplausible, Psid20MbrParamsImplausibleMaxSpeed,
-- Psid20MbrParamsImplausibleMaxAcceleration

```

```

CvpdPsid20MbrImplausibleStParams PSID-20-MBR-ST-PARAMS-IMPLAUSIBLE ::= {
  {SUBTYPE psid20MbrSubtypeImplausibleMaxSpeed USING PARAMS
    Psid20MbrParamsImplausibleMaxSpeed} |
  {SUBTYPE psid20MbrSubtypeImplausibleMaxAcceleration USING PARAMS
    Psid20MbrParamsImplausibleMaxAcceleration} |
  {SUBTYPE psid20MbrSubtypeImplausibleBrakeAcceleration USING PARAMS NULL},
  ...
}

```

```

-- @brief This data type gives the parameters for the Implausible
-- Max Speed misbehavior report type
-- @class Psid20MbrParamsImplausibleMaxSpeed
-- @param threshold This is the threshold that the reporting device
-- implemented for reporting implausible max speeds. The BSM
-- provided in the corresponding Evidence field will indicate
-- a horizontal speed greater than this value. The units of
-- this quantity are meters per second.

```

```

Psid20MbrParamsImplausibleMaxSpeed ::= SEQUENCE {
  threshold Uint16,
  ...
}

```

```

-- @brief This data type gives the parameters for the Implausible
-- Max Acceleration misbehavior report type
-- @class Psid20MbrParamsImplausibleMaxSpeed
-- @param threshold This is the threshold that the reporting device
-- implemented for reporting implausible max acceleration. The
-- BSM provided in the corresponding Evidence field will indicate
-- a horizontal acceleration greater than this value.

```

```

-- The units of this quantity are hundredths of a meter
-- per second squared.
Psid20MbrParamsImplausibleMaxAcceleration ::= SEQUENCE {
    threshold    Uint16,
    ...
}

---
-- @brief This data type contains the evidence used to support an Implausible
-- Single BSM report, which is a single BSM from the suspect sender. NOTE
-- that SignedBsmsWithCertificate may have more than one BSM, but if used
-- in this context it SHALL only contain a single BSM.
-- @class Psid20MbrEvidenceImplausible
-- @see SignedBsmsWithCertificate
Psid20MbrEvidenceImplausible ::= SignedBsmsWithCertificate

--*****_
--
--          IMPLAUSIBLE OBSERVED BSMS          --
--
--*****_

-- @brief This data type contains the set of report subtypes corresponding
-- to an Implausible Observed BSM report and their associated parameters.
-- An implausible observed BSM is a BSM which is not implausible considered
-- on its own, but is implausible considered in conjunction with information
-- known to the observer. Implausible Observed BSM Reports may include
-- sensor information from the observer but do not need to include BSMs
-- from other vehicles.
-- @class Psid20MbrSubtypeObsImplausibleList
-- @see Psid20MbrSubtypeParamsObsImplausible
Psid20MbrSubtypeObsImplausibleList ::=
    SEQUENCE (SIZE (1..MAX)) OF Psid20MbrSubtypeParamsObsImplausible

---
-- @brief This data type contains the subtype and parameters for reports of type
-- single implausible BSM.
-- @class Psid20MbrSubtypeParamsObsImplausible
-- @param subtype the subtype of the report.
-- @param params the parameters associated with that subtype, if any.
-- @see CvpdPsid20MbrObsImplausibleStParams
Psid20MbrSubtypeParamsObsImplausible ::= SEQUENCE {
    subtype  PSID-20-MBR-ST-PARAMS-OBS-IMPLAUSIBLE.
             &subtype({CvpdPsid20MbrObsImplausibleStParams}),
    params   PSID-20-MBR-ST-PARAMS-OBS-IMPLAUSIBLE.
             &Params({CvpdPsid20MbrObsImplausibleStParams}){@.subtype})

```

```

}

---
-- @brief This is an ASN.1 CLASS to enable the definition of an arbitrary number
--   of misbehavior reports specific to observed BSM implausibility.
-- @class PSID-20-MBR-ST-PARAMS-OBS-IMPLAUSIBLE
-- @param type is the high-level report type
-- @param SubtypeArray is the type-specific array of subtypes and associated
--   parameters
-- @see Psid

PSID-20-MBR-ST-PARAMS-OBS-IMPLAUSIBLE ::= CLASS {
  &subtype    Psid20MbrSubtypeObsImplausible,
  &Params
} WITH SYNTAX {SUBTYPE &subtype USING PARAMS &Params}

---
-- @brief This data type indicates the misbehavior report subtype for
--   implausible single BSMs. A single-vehicle Inconsistent BSM report can
--   correspond to multiple subtypes.
-- @class Psid20MbrSubtypeObsImplausible
-- @param psid20MbrSubtypeObsImplausibleDistance Indicates that the distance
--   between the BSM and the receiver is implausibly high.
Psid20MbrSubtypeObsImplausible ::= INTEGER (0..255)
psid20MbrSubtypeObsImplausibleDistance    Psid20MbrSubtypeObsImplausible ::= 1

-- @brief This is a list of the PSID-20-MBR-ST-PARAMS-IMPLAUSIBLE
--   instances that are supported for CV Pilot Deployments. Entries are
--   of the form [Subtype ID] [(optionally) USING PARAMS [Params]]. The
--   list contains only one entry in this version of this file.
-- @class CvpdPsid20MbrObsImplausibleStParams
-- @see    Psid20MbrSubtypeObsImplausible, Psid20MbrParamsObsImplausibleDistance
CvpdPsid20MbrObsImplausibleStParams PSID-20-MBR-ST-PARAMS-OBS-IMPLAUSIBLE ::= {
  {SUBTYPE psid20MbrSubtypeObsImplausibleDistance USING PARAMS
    Psid20MbrParamsObsImplausibleDistance},
  ...
}

-- @brief This data type gives the parameters for the Implausible Observed
--   Distance misbehavior report type
-- @class Psid20MbrParamsObsImplausibleDistance
-- @param threshold This is the threshold that the reporting device
--   implemented for reporting implausible distances. The units of
--   this quantity are meters.
-- @param gpsDrift This is the maximum amount of difference in position

```

```

-- between two devices, separated by the distance given by threshold,
-- that the reporter believes can be explained by GPS drift. This
-- quantity MAY be 0. The units of this quantity are meters.
-- The Evidence associated with these parameters will include a
-- single Suspect BSM and a single Reporter BSM for which the difference
-- in location is greater than threshold even taking gpsDrift into
-- consideration.
Psid20MbrParamsObsImplausibleDistance ::= SEQUENCE {
    threshold    Uint16,
    gpsDrift     Uint16,
    ...
}

---
-- @brief This data type contains the evidence used to support an Implausible
-- Observed BSM report, which is a single BSM from the suspect sender,
-- and a single BSM from the observer, which shall have the 1609.2
-- generation times which are within 0.25 seconds of each other.
-- @class Psid20MbrEvidenceImplausible
-- @param suspectBsm The BSM sent by the sender. NOTE
-- that SignedBsmsWithCertificate may have more than one BSM, but when
-- used in this context it SHALL only contain a single BSM.
-- @param reporterBsm The BSM sent by the sender. NOTE
-- that SignedBsmsWithCertificate may have more than one BSM, but when
-- used in this context it SHALL only contain a single BSM.
-- @see SignedBsmsWithCertificate
Psid20MbrEvidenceObsImplausible ::= SEQUENCE {
    suspectBsm    SignedBsmsWithCertificate,
    reporterBsm   SignedBsmsWithCertificate,
    ...
}

--*****
--
-- Structures common to multiple report subtypes
--
--*****

---
-- @brief This data type contains BSMs along with the certificate used to sign them.
-- @class SignedBSMsWithCertificate
-- @param signedBSMList contains a list of signed BSMs which were all signed
-- with the same certificate, in which the SignerIdentifier is of type digest.
-- @param signingCertificate contains the certificate used to sign above BSMs.
SignedBsmsWithCertificate ::= SEQUENCE {
    signedBsmList SEQUENCE (SIZE(1..MAX)) OF SignedBSM,

```

```

    signingCertificate    Certificate,
    ...
}

---
-- @brief This data type contains a signed BSM.
-- @class SignedBSM
-- @param unsecuredData    is the UPER encoded BasicSafetyMessage as defined in J2735
--    and J2945/1.
SignedBSM ::= IEEE1609Dot2Data (WITH COMPONENTS { ...,
content (WITH COMPONENTS {
    signedData (WITH COMPONENTS { ...,
        tbsData (WITH COMPONENTS { ...,
            payload (WITH COMPONENTS {
                data (WITH COMPONENTS {
                    content (WITH COMPONENTS {
                        unsecuredData
                    })
                })
            })
        })
    })
})
})

END

```

### 3.0 REVISION HISTORY

---

|      |                   |                                 |
|------|-------------------|---------------------------------|
| V1.0 | February 14, 2019 | Release                         |
| V1.1 | April, 19 2019    | Added generationLocation to MBR |