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Power systems management and associated information exchange - Data and communications security -
Part 7: Network and System Management (NSM) data object models

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CONTENTS

FOREWORD 8
1 Scope 10
2 Normative references 10
3 Terms and definitions 12
4 Abbreviated terms and acronyms 14
5 Overview of Network and System Management (NSM) 14
5.1 Objectives 14
5.2 NSM concepts 16
5.2.1 Simple Network Management Protocol (SNMP) 16
5.2.2 ISO NSM categories 16
5.2.3 NSM "data objects" for power system operations 16
5.2.4 Other NSM protocols 17
5.3 Communication network management 17
5.3.1 Network configuration 17
5.3.2 Network backup 17
5.3.3 Communications failures and degradation 18
5.4 Communication protocols 18
5.5 End systems management 19
5.6 Intrusion detection systems (IDS) 20
5.6.1 IDS guidelines 20
5.6.2 IDS: Passive observation techniques 21
5.6.3 IDS: Active security monitoring architecture with NSM data objects 21
5.7 End-to-end security 22
5.7.1 End-to-end security concepts 22
5.7.2 Role of NSM in end-to-end security 23
5.8 NSM requirements: detection functions 25
5.8.1 Detecting unauthorized access 25
5.8.2 Detecting resource exhaustion as a denial of service (DoS) attack 25
5.8.3 Detecting invalid buffer access DoS attacks 26
5.8.4 Detecting tampered/malformed PDUs 26
5.8.5 Detecting physical access disruption 26
5.8.6 Detecting invalid network access 27
5.8.7 Detecting coordinated attacks 27
5.9 Abstract object and agent UML descriptions 28
5.9.1 Purpose of UML 28
5.9.2 Abstract types and base types 28
5.9.3 Enumerated Types 29
5.9.4 Abstract agents 29
5.9.5 Unsolicited Event Notification 32
5.9.6 UML Model extension 32
5.10 Abstract Object UML translation to SNMP 33
5.10.1 Simple Network Management Protocol (SNMP) 33
5.10.2 Management information bases (MIBs) 33
5.11 SNMP mapping of UML model Objects 34
5.12 SNMP Security 36
6 Abstract objects 38

6.1 General 38
6.2 Package Abstract Types 39
6.2.1 General 39
6.2.2 BooleanValue 39
6.2.3 BooleanValueTs 39
6.2.4 CounterTs 40
6.2.5 CntRs 40
6.2.6 Floating 40
6.2.7 FloatingTs 41
6.2.8 EntityIndex 41
6.2.9 Integer 41
6.2.10 IntegerTs 41
6.2.11 InetAddress 42
6.2.12 InetAddressType 42
6.2.13 MacAddress 42
6.2.14 Selector 43
6.2.15 Timestamp 43
6.2.16 CharString 43
6.2.17 CharStringTs 43
6.2.18 AbstractBaseType root class 44
6.2.19 AbstractAgent root class 44
6.3 Package EnumeratedTypes 44
6.3.1 General 44
6.3.2 AppDatStKind enumeration 44
6.3.3 PhyHealthKind enumeration 44
6.3.4 ExtKind enumeration 45
6.3.5 IntKind enumeration 45
6.3.6 LnkKind enumeration 45
6.3.7 PSPAccKind enumeration 46
6.3.8 ProtIdKind enumeration 46
6.3.9 EventKind enumeration 46
6.3.10 TimSyncIssueKind enumeration 47
6.3.11 SecurityProfileKind enumeration 47
6.3.12 TimSyncSrcKind enumeration 47
6.3.13 AppDatStType 48
6.3.14 PhyHealthType 48
6.3.15 ExtType 48
6.3.16 IntType 49
6.3.17 EventType 49
6.3.18 PSPAccType 49
6.3.19 ProtIdType 49
6.3.20 TimSyncIssueType 50
6.3.21 SecurityProfileType 50
6.3.22 TimSyncSrcType 50
6.3.23 GseSubsStKind enumeration 50
6.3.24 GseSubsStType 51
6.3.25 LnkType 51
7 Agents 51

7.1 Package Overview 51
7.2 Package Environmental Agent 52
7.2.1 General 52
7.2.2 (nsmAgent) Environmental 53
7.2.3 (nsmEntry) PSUPEntry 54
7.2.4 (nsmEvent) Notification 54
7.2.5 (nsmEvent) SecurityNotification 55
7.3 Package IED Agent 55
7.3.1 General 55
7.3.2 (nsmAgent) IED 56
7.3.3 (nsmEntry) CPUEntry 58
7.3.4 (nsmEntry) EXTEntry 58
7.3.5 (nsmEntry) STOREEntry 59
7.3.6 (nsmEvent) Notification 59
7.3.7 (nsmEvent) SecurityNotification 60
7.4 Package Application Protocols Agents 60
7.4.1 General 60
7.4.2 Package Common objects 61
7.4.3 Package IEC62351-3 ed.2 Agent 62
7.4.4 Package IEEE 1815 and IEC 60870-5 Agent 74
7.4.5 Package IEEE 1815 and IEC 60870-5 Agent – ed2 84
7.4.6 Package IEC61850 Agent 96
7.5 Package Interfaces Agent 117
7.5.1 General 117
7.5.2 Interface 118
7.5.3 (nsmAgent) Interfaces 119
7.5.4 (nsmEntry) ETHEntry 120
7.5.5 (nsmEntry) KEYEntry 120
7.5.6 (nsmEntry) SEREntry 120
7.5.7 (nsmEntry) ALGEntry 121
7.5.8 (nsmEntry) USBEntry 121
7.5.9 (nsmEvent) Notification 121
7.6 Package Clocks Agent 122
7.6.1 General 122
7.6.2 (nsmAgent) Clock 123
7.6.3 (nsmEntry) ClockEntry 123
7.6.4 (nsmEvent) SecurityNotification 124
7.7 Network and Transport Agents 124
7.7.1 TCP 124
7.7.2 User Datagram Protocol (UDP) 125
7.7.3 IP 125
8 SNMP security 125
9 Secured time synchronization 126
Annex A (informative) Mapping of relevant IEC 61850 Objects 127
Bibliography 128

Figure 1 – Example of a power system SCADA architecture extended with NSM Data Objects 15

Figure 2 – IDS Information exchange between applications: generic communication topology 20
Figure 3 – Active security monitoring architecture with NSM data objects 22
Figure 4 – Comparison of NSM data objects with IEC 61850 objects 24
Figure 5 – Management of both the power system infrastructure and the information infrastructure 24
Figure 6 – Abstract types 28
Figure 7 – Enumerated types 29
Figure 8 – Subagents 30
Figure 9 – Environmental agent 31
Figure 10 – Model stereotypes 32
Figure 11 – Object identifier structure 34
Figure 12 – SNMP table 36
Figure 13 – SNMP RFCs map and security 37
Figure 14 – SNMP Entity 38
Figure 15 – Class diagram Overview::Part7 Classes Overview 52
Figure 16 – Class diagram Environmental Agent::Environmental 53
Figure 17 – Class diagram IED Agent::IED 56
Figure 18 – Class diagram Common objects::Application Protocol common objects 61
Figure 19 – Class diagram IEC62351-3 ed.2 Agent::IEC 62351-3 ed.2 Agent Relationships 63
Figure 20 – Class diagram IEEE 1815 and IEC 60870-5 Agent::IEEE 1815 and IEC 60870-5 Agent 75
Figure 21 – Class diagram IEEE 1815 and IEC 60870-5 Agent – ed2::IEEE 1815 and IEC 60870 Agent Relationships 85
Figure 22 – Class diagram ACSI::ACSI 97
Figure 23 – Class diagram MMS::MMS 99
Figure 24 – Class diagram SV and GSE common objects::SV and GSE common objects 104
Figure 25 – Class diagram SV::SV 106
Figure 26 – Class diagram GSE::GSE 111
Figure 27 – Class diagram Interfaces Agent::Interfaces 118
Figure 28 – Class diagram Clocks Agent::Clocks Agent 122

Table 1 – Attributes of Abstract Types::BooleanValue 39
Table 2 – Attributes of Abstract Types::BooleanValueTs 40
Table 3 – Attributes of Abstract Types::CounterTs 40
Table 4 – Attributes of Abstract Types::CntRs 40
Table 5 – Attributes of Abstract Types::Floating 40
Table 6 – Attributes of Abstract Types::FloatingTs 41
Table 7 – Attributes of Abstract Types::EntityIndex 41
Table 8 – Attributes of Abstract Types::Integer 41
Table 9 – Attributes of Abstract Types::IntegerTs 42
Table 10 – Attributes of Abstract Types::InetAddress 42

Table 11 – Attributes of Abstract Types::InetAddressType 42
Table 12 – Attributes of Abstract Types::MacAddress 43
Table 13 – Attributes of Abstract Types::Selector 43
Table 14 – Attributes of Abstract Types::Timestamp 43
Table 15 – Attributes of Abstract Types::CharString 43
Table 16 – Attributes of Abstract Types::CharStringTs 44
Table 17 – Literals of EnumeratedTypes::AppDatStKind 44
Table 18 – Literals of EnumeratedTypes::PhyHealthKind 45
Table 19 – Literals of EnumeratedTypes::ExtKind 45
Table 20 – Literals of EnumeratedTypes::IntKind 45
Table 21 – Literals of EnumeratedTypes::LnkKind 45
Table 22 – Literals of EnumeratedTypes::PSPAccKind 46
Table 23 – Literals of EnumeratedTypes::ProtIdKind 46
Table 24 – Literals of EnumeratedTypes::EventKind 46
Table 25 – Literals of EnumeratedTypes::TimSyncIssueKind 47
Table 26 – Literals of EnumeratedTypes::SecurityProfileKind 47
Table 27 – Literals of EnumeratedTypes::TimSyncSrcKind 47
Table 28 – Attributes of EnumeratedTypes::AppDatStType 48
Table 29 – Attributes of EnumeratedTypes::PhyHealthType 48
Table 30 – Attributes of EnumeratedTypes::ExtType 48
Table 31 – Attributes of EnumeratedTypes::IntType 49
Table 32 – Attributes of EnumeratedTypes::EventType 49
Table 33 – Attributes of EnumeratedTypes::PSPAccType 49
Table 34 – Attributes of EnumeratedTypes::ProtIdType 49
Table 35 – Attributes of EnumeratedTypes::TimSyncIssueType 50
Table 36 – Attributes of EnumeratedTypes::SecurityProfileType 50
Table 37 – Attributes of EnumeratedTypes::TimSyncSrcType 50
Table 38 – Literals of EnumeratedTypes::GseSubsStKind 50
Table 39 – Attributes of EnumeratedTypes::GseSubsStType 51
Table 40 – Attributes of EnumeratedTypes::LnkType 51
Table 41 – Attributes of Environmental Agent::Environmental 54
Table 42 – Attributes of Environmental Agent::PSUPEntry 54
Table 43 – Attributes of Environmental Agent::Notification 55
Table 44 – Attributes of Environmental Agent::SecurityNotification 55
Table 45 – Attributes of IED Agent::IED 57
Table 46 – Attributes of IED Agent::CPUEntry 58
Table 47 – Attributes of IED Agent::EXTEntry 59
Table 48 – Attributes of IED Agent::STOREEntry 59
Table 49 – Attributes of IED Agent::Notification 60
Table 50 – Attributes of IED Agent::SecurityNotification 60
Table 51 – Attributes of Common objects::CommonProtocolInfo 62
Table 52 – Attributes of IEC62351-3 ed.2 Agent::IEC62351-3ed2security 64
Table 53 – Attributes of IEC62351-3 ed.2 Agent::TLSSession 66

Table 54 – Attributes of IEC62351-3 ed.2 Agent::Summary 68
Table 55 – Attributes of IEC62351-3 ed.2 Agent::IEC62351part3ed2SecurityNotification 70
Table 56 – Attributes of IEC62351-3 ed.2 Agent::ClientTLS 71
Table 57 – Attributes of IEC62351-3 ed.2 Agent::ServerTLS 73
Table 58 – Attributes of IEEE 1815 and IEC 60870-5 Agent::60870andDNPProtocolInfo 76
Table 59 – Attributes of IEEE 1815 and IEC 60870-5 Agent::Association 77
Table 60 – Attributes of IEEE 1815 and IEC 60870-5 Agent::Summary 79
Table 61 – Attributes of IEEE 1815 and IEC 60870-5 Agent::60870andDNPSecurityNotification 80
Table 62 – Attributes of IEEE 1815 and IEC 60870-5 Agent::60870andDNPNotification 81
Table 63 – Attributes of IEEE 1815 and IEC 60870-5 Agent::MasterAssociation 81
Table 64 – Attributes of IEEE 1815 and IEC 60870-5 Agent::OutstationAssociation 83
Table 65 – Attributes of IEEE 1815 and IEC 60870-5 Agent – ed2::60870andDNPProtocolInfoEd2 86
Table 66 – Attributes of IEEE 1815 and IEC 60870-5 Agent – ed2::IEC62351part5 87
Table 67 – Attributes of IEEE 1815 and IEC 60870-5 Agent – ed2::Association 88
Table 68 – Attributes of IEEE 1815 and IEC 60870-5 Agent – ed2::Summary 90
Table 69 – Attributes of IEEE 1815 and IEC 60870-5 Agent – ed2::60870andDNPSecurityNotificationEd2 92
Table 70 – Attributes of IEEE 1815 and IEC 60870-5 Agent – ed2::MasterAssociation 92
Table 71 – Attributes of IEEE 1815 and IEC 60870-5 Agent – ed2::OutstationAssociation 94
Table 72 – Attributes of ACSI::ACSISummary 97
Table 73 – Attributes of MMS::MMSProtocolInfo 100
Table 74 – Attributes of MMS::MMSProvider 101
Table 75 – Attributes of MMS::MMSAssociation 102
Table 76 – Attributes of MMS::MMSSecurityNotification 103
Table 77 – Attributes of MMS::MMSNotification 104
Table 78 – Attributes of SV and GSE common objects::GSEandSVCommon 105
Table 79 – Attributes of SV and GSE common objects::GSEandSVPublisherAssociation 105
Table 80 – Attributes of SV and GSE common objects::GSEandSVSubscriberAssociation 105
Table 81 – Attributes of SV::SVProvider 107
Table 82 – Attributes of SV::SVPublisherAssociationIP 107
Table 83 – Attributes of SV::SVPublisherAssociationL2 108
Table 84 – Attributes of SV::SVSubcriberAssociationIP 109
Table 85 – Attributes of SV::SVSubcriberAssociationL2 109
Table 86 – Attributes of SV::SVNotification 110
Table 87 – Attributes of GSE::GSESubscriberAssociation 112
Table 88 – Attributes of GSE::GSEProvider 113
Table 89 – Attributes of GSE::GSEPublisherAssociationIP 114
Table 90 – Attributes of GSE::GSEPublisherAssociationL2 114
Table 91 – Attributes of GSE::GSESubcriberAssociationIP 115

Table 92 – Attributes of GSE::GSESubcriberAssociationL2 116
Table 93 – Attributes of GSE::GSENotification 117
Table 94 – Attributes of Interfaces Agent::Interface 119
Table 95 – Attributes of Interfaces Agent::Interfaces 119
Table 96 – Attributes of Interfaces Agent::ETHEntry 120
Table 97 – Attributes of Interfaces Agent::KEYEntry 120
Table 98 – Attributes of Interfaces Agent::SEREntry 120
Table 99 – Attributes of Interfaces Agent::ALGEntry 121
Table 100 – Attributes of Interfaces Agent::USBEntry 121
Table 101 – Attributes of Interfaces Agent::Notification 122
Table 102 – Attributes of Clocks Agent::Clock 123
Table 103 – Attributes of Clocks Agent::ClockEntry 123
Table 104 – Attributes of Clocks Agent::SecurityNotification 124
Table A.1 – IEC 61850-7-4 objects mapping 127

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This edition of IEC 62351-7 cancels and replaces IEC 62351-7 published in 2017. This new edition constitutes a technical revision and includes the following significant technical changes with respect to IEC 62351-7:

a) Reviewed and enriched the NSM object data model;
b) UML model adopted for NSM objects description;
c) SNMP protocol MIBs translation included as Code Components.

The text of this International Standard is based on the following documents:

Draft	Report on voting
57/2798/FDIS	57/2829/RVD

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– reconfirmed,
– withdrawn, or
– revised.

1 Scope

This part of IEC 62351 defines network and system management (NSM) data object models that are specific to power system operations. These NSM data objects will be used to monitor the health of networks and systems, to detect possible security intrusions, and to manage the performance and reliability of the information infrastructure. The goal is to define a set of abstract objects that will allow the remote monitoring of the health and condition of IEDs (Intelligent Electronic Devices), RTUs (Remote Terminal Units), DERs (Distributed Energy Resources) systems and other systems that are important to power system operations.

Power systems operations are increasingly reliant on information infrastructures, including communication networks, IEDs, and self-defining communication protocols. Therefore, management of the information infrastructure has become crucial to providing the necessary high levels of security and reliability in power system operations.

The telecommunication infrastructure that is in use for the transport of telecontrol and automation protocols is already subject to health and condition monitoring control, using the concepts developed in the IETF Simple Network Management Protocol (SNMP) standards for network management. However, power system specific devices (like teleprotection, telecontrol, substation automation, synchrophasors, inverters and protections) need instead a specific solution for monitoring their health.

The NSM objects provide monitoring data for IEC protocols used for power systems (IEC 61850, IEC 60870-5-104) and device specific environmental and security status. As a derivative of IEC 60870-5-104, IEEE 1815 DNP3 is also included in the list of monitored protocols. The NSM data objects use the naming conventions developed for IEC 61850, expanded to address NSM issues. For the sake of generality these data objects, and the data types of which they are comprised, are defined as abstract models of data objects.

In addition to the abstract model, in order to allow the integration of the monitoring of power system devices within the NSM environment in this part of IEC 62351, a mapping of objects to the SNMP protocol of Management Information Base (MIBs) is provided.

The objects that are already covered by existing MIBs are not defined here but are expected to be compliant with existing MIB standards. For example protocols including EST, SCEP, RADIUS, LDAP, GDOI are not in scope.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

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IEC TS 62351-2, *Power systems management and associated information exchange – Data and communications security – Part 2: Glossary of terms*

IEC 62351-3, *Power systems management and associated information exchange – Data and communications security – Part 3: Communication network and system security – Profiles including TCP/IP*

IEC 62351-4, *Power systems management and associated information exchange – Data and communications security – Part 4: Profiles including MMS*[1]

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