

# Schema

**title:** OpenC2 Language Objects  
**module:** oasis-open.org/openc2/oc2ls/v1.0  
**patch:** 0-csdpr02+slpf.merged  
**description:** OpenC2 Language content used by Stateless Packet Filters.  
**exports:** OpenC2-Command, OpenC2-Response, Message-Type, Status-Code, Request-Id, Date-Time

## OpenC2-Command (Record)

ID	Name	Type	#	Description
1	action	Action	1	The task or activity to be performed (i.e., the 'verb').
2	target	Target	1	The object of the action. The action is performed on the target.
3	args	Args	0..1	Additional information that applies to the command.
4	actuator	Actuator	0..1	The subject of the action. The actuator executes the action on the target.

## Action (Enumerated)

ID	Name	Description
3	query	Initiate a request for information.
6	deny	Prevent a certain event or action from completion, such as preventing a flow from reaching a destination or preventing access.
8	allow	Permit access to or execution of a target.
16	update	Instruct a component to retrieve, install, process, and operate in accordance with a software update, reconfiguration, or other update.
20	delete	Remove an entity (e.g., data, files, flows).

## Target (Choice)

ID	Name	Type	#	Description
16	features	Features	1	A set of items used with the query action to determine an actuator's capabilities
10	file	File	1	Properties of a file.
11	ip_addr	IP-Addr	1	The representation of one or more IP addresses (either version 4 or version 6).
15	ip_connection	IP-Connection	1	A network connection that originates from a source and is addressed to a destination.
1024	slpf	slpf:Target	1	Targets defined in the Stateless Packet Filter Profile

## Actuator (Choice)

ID	Name	Type	#	Description
1024	slpf	slpf:Specifiers	1	Actuator specifiers and options as defined in the Stateless Packet Filter profile

## Args (Map)

ID	Name	Type	#	Description
1	start_time	Date-Time	0..1	The specific date/time to initiate the action
2	stop_time	Date-Time	0..1	The specific date/time to terminate the action
3	duration	Duration	0..1	The length of time for an action to be in effect
4	response_requested	Response-Type	0..1	The type of response required for the action
1024	slpf	slpf:Args	0..1	Command arguments defined in the Stateless Packet Filter profile

## OpenC2-Response (Map)

ID	Name	Type	#	Description
1	status	Status-Code	0..1	An integer status code (Duplicates message status code)
2	status_text	String	0..1	A free-form human-readable description of the response status
6	versions	Version	0..n	Supported OpenC2 Language versions
7	profiles	jadn:Uname	0..n	List of profiles supported by this actuator
8	schema	jadn:Schema	0..1	Syntax of the OpenC2 language elements supported by this actuator
9	pairs	Action-Targets	0..n	List of targets applicable to each supported action
10	rate_limit	Number	0..1	Maximum number of requests per minute supported by design or policy
1024	slpf	slpf:Results	0..1	Response data defined in the Stateless Packet Filter profile

## Status-Code (Enumerated.ID)

ID	Description
102	Processing -- an interim response used to inform the client that the server has accepted the request but not yet completed it.
200	OK -- the request has succeeded.
400	Bad Request -- the consumer cannot process the request due to something that is perceived to be a client error (e.g., malformed request syntax.)
500	Internal Error -- the consumer encountered an unexpected condition that prevented it from fulfilling the request.
501	Not Implemented -- the consumer does not support the functionality required to fulfill the request.

## Features

Type Name	Base Type	Description
Features	ArrayOf(Feature) [0..n]	A target used to query Actuator for its supported capabilities

## File (Map)

ID	Name	Type	#	Description
1	name	String	0..1	The name of the file as defined in the file system
2	path	String	0..1	The absolute path to the location of the file in the file system
3	hashes	Hashes	0..1	One or more cryptographic hash codes of the file contents

## IP-Addr

Type Name	Base Type	Description
IP-Addr	Binary (ip-addr)	32 bit IPv4 address or 128 bit IPv6 address

## IP-Connection (Record)

ID	Name	Type	#	Description
1	src_addr	IP-Addr	0..1	source address
2	src_port	Port	0..1	source TCP/UDP port number
3	dst_addr	IP-Addr	0..1	destination address
4	dst_port	Port	0..1	destination TCP/UDP port number
5	protocol	L4-Protocol	0..1	Protocol (IPv4) / Next Header (IPv6)

## Message-Type (Enumerated)

ID	Name	Description
0	notification	A message that does not solicit a response
1	request	A message for which a response is requested
2	response	A message containing a response to a request

## Request-Id

Type Name	Base Type	Description
Request-Id	Binary	A value of up to 128 bits that uniquely identifies a particular command

## Date-Time

Type Name	Base Type	Description
Date-Time	Integer	Milliseconds since 00:00:00 UTC, 1 January 1970.

## Duration

Type Name	Base Type	Description
Duration	Integer	Milliseconds

## Hashes (Map)

ID	Name	Type	#	Description
1	md5	Binary	0..1	MD5 hash as defined in RFC3121
4	sha1	Binary	0..1	SHA1 hash as defined in RFC3174

**L4-Protocol (Enumerated)**

ID	Name	Description
1	icmp	Internet Control Message Protocol – RFC 792
6	tcp	Transmission Control Protocol – RFC 793–
17	udp	User Datagram Protocol – RFC 768
132	sctp	Stream Control Transmission Protocol – RFC 4960

**Port**

Type Name	Base Type	Description
Port	Integer [0..65535]	Transport Protocol Port Number, RFC 6335

**Feature (Enumerated)**

ID	Name	Description
1	versions	List of OpenC2 language versions supported by this actuator
2	profiles	List of profiles supported by this actuator
3	schema	Definition of the command syntax supported by this actuator
4	pairs	List of supported actions and applicable targets
5	rate_limit	Maximum number of supported requests per minute

**Response-Type (Enumerated)**

ID	Name	Description
0	none	No response
1	ack	Respond when command received
2	status	Respond with progress toward command completion
3	complete	Respond when all aspects of command completed

**Version**

Type Name	Base Type	Description
Version	String	Major.Minor version number

**Action-Targets (Array)**

ID	Type	#	Description
1	Action	1	action -- An action supported by this actuator
2	Target.*	1..n	targets -- List of targets applicable to this action

**slpf:Target (Choice)**

ID	Name	Type	#	Description
1	rule_number	slpf:Rule-ID	1	Uniquely identifies a rule associated with a previously-issued deny or allow.

**slpf:Args (Map)**

ID	Name	Type	#	Description
1	drop_process	slpf:Drop-Process	0..1	Specifies how to handle denied packets
2	running	Boolean	0..1	Normal operation assumes updates are persistent. If TRUE, updates are not persistent in the event of a reboot or restart. Default=FALSE.
3	direction	slpf:Direction	0..1	Specifies whether to apply rules to incoming or outgoing traffic. If omitted, rules are applied to both.
4	insert_rule	slpf:Rule-ID	0..1	Specifies the identifier of the rule within a list, typically used in a top-down rule list.

**slpf:Drop-Process (Enumerated)**

ID	Name	Description
1	none	Drop the packet and do not send a notification to the source of the packet.

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|---|-----------|--|
| 2 | reject    | Drop the packet and send an ICMP host unreachable (or equivalent) to the source of the packet.   |
| 3 | false_ack | Drop the traffic and send a false acknowledgement that the data was received by the destination. |

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#### slpf:Direction (Enumerated)

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ID	Name	Description
1	ingress	Apply rules to incoming traffic only
2	egress	Apply rule to outbound traffic only

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#### slpf:Rule-ID

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Type Name	Base Type	Description
slpf:Rule-ID	Integer	Immutable identifier assigned when an access rule is created.

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#### slpf:Specifiers (Map)

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ID	Name	Type	#	Description
1	hostname	String	0..1	RFC 1123 hostname (can be a domain name or IP address) for a particular device with SLPF functionality
2	named_group	String	0..1	User-defined collection of devices with SLPF functionality
3	asset_id	String	0..1	Unique identifier for a particular SLPF
4	asset_tuple	String	0..10	Unique tuple identifier for a particular SLPF consisting of a list of up to 10 strings

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#### slpf:Results (Map)

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ID	Name	Type	#	Description
1	rule_number	slpf:Rule-ID	0..1	Rule identifier returned from allow or deny command.

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#### jadn:Schema (Record)

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ID	Name	Type	#	Description
1	meta	jadn:Meta	1	Information about this schema module
2	types	jadn:Type	1..n	Types defined in this schema module

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#### jadn:Meta (Map)

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ID	Name	Type	#	Description
1	module	jadn:Uname	1	Schema unique name/version
2	patch	String	0..1	Patch version
3	title	String	0..1	Title
4	description	String	0..1	Description
5	imports	jadn:Import	0..n	Imported schema modules
6	exports	jadn:Identifier	0..n	Data types exported by this module
7	bounds	jadn:Bounds	0..1	Schema-wide upper bounds

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#### jadn:Import (Array)

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ID	Type	#	Description
1	jadn:Nsid	1	nsid -- A short local identifier (namespace id) used within this module to refer to the imported module
2	jadn:Uname	1	uname -- Unique name of imported module

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#### jadn:Bounds (Array)

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ID	Type	#	Description
1	Integer	1	max_msg -- Maximum serialized message size in octets or characters
2	Integer	1	max_str -- Maximum string length in characters
3	Integer	1	max_bin -- Maximum binary length in octets
4	Integer	1	max_fields -- Maximum number of elements in ArrayOf

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#### jadn:Type (Array)

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ID	Type	#	Description
1	jadn:Identifier	1	tname -- Name of this datatype

2	Enumerated.*	1	btype -- Base type. Enumerated value derived from list of JADN data types
3	jadn:Options	1	opts -- Type options
4	String	1	desc -- Description of this data type
5	jadn:JADN-Type	0..n	fields -- List of fields for compound types. Not present for primitive types

#### jadn:JADN-Type (Choice)

ID	Name	Type	#	Description
1	Binary	Null	1	Octet (binary) string
2	Boolean	Null	1	True or False
3	Integer	Null	1	Whole number
4	Number	Null	1	Real number
5	Null	Null	1	Nothing
6	String	Null	1	Character (text) string
7	Array	jadn:FullField	1	Ordered list of unnamed fields
8	ArrayOf	Null	1	Ordered list of fields of a specified type
9	Choice	jadn:FullField	1	One of a set of named fields
10	Enumerated	jadn:EnumField	1	One of a set of id:name pairs
11	Map	jadn:FullField	1	Unordered set of named fields
12	Record	jadn:FullField	1	Ordered list of named fields

#### jadn:EnumField (Array)

ID	Type	#	Description
1	Integer	1	Item ID
2	String	1	Item name
3	String	1	Item description

#### jadn:FullField (Array)

ID	Type	#	Description
1	Integer	1	Field ID or ordinal position
2	jadn:Identifier	1	Field name
3	jadn:Identifier	1	Field type
4	jadn:Options	1	Field options
5	String	1	Field description

#### jadn:Identifier

Type Name	Base Type	Description
jadn:Identifier	String [0..32]	A string starting with an alpha char followed by zero or more alphanumeric / underscore / dash chars

#### jadn:Nsid

Type Name	Base Type	Description
jadn:Nsid	String [1..8]	Namespace ID – a short identifier

#### jadn:Uname

Type Name	Base Type	Description
jadn:Uname	String [1..100]	Unique name (e.g., of a schema) – typically a set of Identifiers separated by forward slashes

#### jadn:Options

Type Name	Base Type	Description
jadn:Options	ArrayOf(jadn:Option) [0..10]	Options list may be empty but may not be omitted

#### jadn:Option

Type Name	Base Type	Description
jadn:Option	String [1..100]	Option string: 1st char = option id