Configuring and Diagnosing SCALANCE W/M with SNMP

SNMP

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Contents

1   General Notes

Purpose

SCALANCE W and SCALANCE M devices can be configured and diagnosed with SNMP. This document describes frequently used OIDs for various options.
This document is meant simply as a rough guideline and only ever mentions the explicit OIDs.

MIB and OIDs

The requirement for successful transfer of values and in this way network monitoring via SNMP is to have fully functioning communication between the SNMP client and the SNMP server. For this the available SNMP objects must have unique addresses that are known to both sides.

For the access to be manufacturer-neutral and to work with different client-server combinations, the Management Information Base (MIB) has been developed as an independent format for storing device information. In an MIB file, all searchable objects in a device are described using an "Object Identifier" (OID). Via these OIDs, SNMP objects are defined with a unique address, a name, and information on the type, access rights, and a description of the respective object.

MIB also supports tables that are used when access to several similar objects is necessary and the exact number of instances is unknown. Typical examples of this are the different ports of a switch or the load values of a server with multiple processors. For this, first, the OIDs of all columns of a table row are defined. Access is given to the specific objects in a table via these OIDs in an attached index value.

SNMP Server / SNMP Client

The SCALANCE W devices take over the role of the SNMP server. Possible clients:

- SIMATIC S7-1500, SIMATIC S7-300

- Own applications on IPCs

- Network management tools: SINEC NMS, for example

Note	Using function blocks you can operate the SIMATIC CPU as an SNMP client. The function blocks and an application example are available in the Siemens Industry Online Support in Entry ID: 57249109 https://support.industry.siemens.com/cs/en/en/view/57249109

Basic OIDs and Extensions

The OIDs visible in the MIB always specify the so-called base OID. In most cases this has to be extended by at least one extra number in order, for example, to address the desired radio interface or to specify a row in a table.

The radio interfaces, VAPs and WDS IDs can always be addressed with the following numbers:

- WLAN 1: number 6
- WLAN 2: number 7
- VAP 1.1 – VAP 1.8: numbers 10-17
- VAP 2.1 – VAP 2.8: numbers 30-37
- VAP 1.1 – VAP 1.8: numbers 70-77
- VAP 2.1 – VAP 2.8: numbers 90-97

The following table shows a selection of sample number assignments:

Table 1-1

Interface	Number
VAP 1.4	13
WDS 1.6	75
WDS 2.7	96

SNMP commands

The main SNMP commands for this documentation are the following:

1. SNMP SET REQUEST
2. SNMP GET REQUEST
3. SNMP GET NEXT REQUEST
4. SNMP GET BULK REQUEST

With the SNMP command "set" you can change the value of one or more objects of a network device.

With the SNMP command "get" you can read out the value of one or more objects of a network device.

The SNMP command "get next" is for running through the tables in the MIB.

The SNMP command "get bulk" is for reading out an entire table.

2 Configuration

2.1 Set the SSID in the Client

2.1.1 Web Based Management

In the WBM of the client, in the menu "Interfaces > WLAN > Client", you can set the SSID with which the SCALANCE W client is to connect. A table with up to eight items is available.

Figure 2-1

Radio	Enabled	SSID
WLAN 1	☐	
WLAN 1	☐	
WLAN 1	☐	
WLAN 1	☐	
WLAN 1	☐	
WLAN 1	☐	
WLAN 1	☐	
WLAN 1	☐	

To use an SSID you have to specify and enable it.

Figure 2-2

Radio	Enabled	SSID
WLAN 1	☑	Test123
WLAN 1	☐	
WLAN 1	☐	
WLAN 1	☐	
WLAN 1	☐	
WLAN 1	☐	
WLAN 1	☐	
WLAN 1	☐	

You can input the SSID string and enable the row in one configuration step.

2.1.2   SNMP

Overview

With SNMP it takes two configuration steps to define and enable the SSID in the client:

1. Enter the SSID string
2. Enable the table row

Base OID

The base OID for entering the SSID string is as follows:

1.3.6.1.4.1.4329.20.1.1.1.1.27.1.1.2.2.1.2

The base OID for enabling the SSID is as follows:

1.3.6.1.4.1.4329.20.1.1.1.1.27.1.1.2.2.1.3

OID extension

To both base OIDs you have to add the number for the radio interface. The numbers 6 (WLAN 1) and 7 (WLAN 2) are available for this.

In addition, you have to add the row number of the table to the OID that you want to describe. The numbers 1 (row 1) and 8 (row 8) are available for this.

Example for Step 1

For the radio interface "WLAN 1" you want to enter the SSID "Test123" in row 1 of the table. The OID for this is as follows:

1.3.6.1.4.1.4329.20.1.1.1.1.27.1.1.2.2.1.2.6.1

In addition, you must transfer the SSID as a string.

The complete SNMP command is defined as follows:

set   1.3.6.1.4.1.4329.20.1.1.1.1.27.1.1.2.2.1.2.6.1   Test123

The result is as follows:

Figure 2-3

Radio	Enabled	SSID
WLAN 1	☐	Test123
WLAN 1	☐	
WLAN 1	☐	
WLAN 1	☐	
WLAN 1	☐	
WLAN 1	☐	
WLAN 1	☐	
WLAN 1	☐	

Note here that you still have to enable the SSID.

Example for Step 2

You would like to enable the SSID just defined in table row 1.

You use the following OID for this:

1.3.6.1.4.1.4329.20.1.1.1.1.27.1.1.2.2.1.3.6.1

In addition, you have to transfer the information about whether you want to enable or disable the SSID. The following integer values are available for this:

Table 2-1

Integer	Meaning
1	enable
2	disable

The complete SNMP command is defined as follows:

set   **1.3.6.1.4.1.4329.20.1.1.1.1.27.1.1.2.2.1.3.6.1   1**

The result is as follows:

Figure 2-4

Radio	Enabled	SSID
WLAN 1	☑	Test123
WLAN 1	☐	
WLAN 1	☐	
WLAN 1	☐	
WLAN 1	☐	
WLAN 1	☐	
WLAN 1	☐	
WLAN 1	☐	

2.2 Activate Channels via the Allowed Channel List

2.2.1 Web Based Management

When changing between access points, WLAN clients must always scan the available channels. The channels to be scanned can be taken from the so-called "Allowed Channels" list. To be able to select the required channels you first have to enable the option "Use Allowed Channels only".

The function is available in the SCALANCE W client menu "Interfaces > WLAN > Allowed Channels":

Figure 2-5

You can enable the option and select the channels in one configuration step.

2.2.2 SNMP

Overview

With SNMP it takes two configuration steps to select the channels in the client:

1. Enable the option "Use Allowed Channels only"
2. Select the channels

Base OIDs

The base OID for enabling the option "Use Allowed Channels only" is (object: snMspsWlanPhyOperationAllowedChannelSelect):
1.3.6.1.4.1.4329.20.1.1.1.1.27.1.4.1.1.11

The base OID for selecting the channels is (object: snMspsWlanAllowedChannelConfigEnabled):
1.3.6.1.4.1.4329.20.1.1.1.1.27.1.1.3.1.4

OID extension

To both base OIDs you have to add the number for the radio interface. The numbers 6 (WLAN 1) and 7 (WLAN 2) are available for this.

To select a specific channel you have to add to the base OIDs for selecting the channels also the channel number with the corresponding frequency in MHz. A list of the frequency numbers is given in Table 2-2.

List of supported frequencies

The following table shows the channels with their corresponding frequency numbers:

Table 2-2

2.4 GHz channel	Frequency	5 GHz channel	Frequency
Channel 1	2412	Channel 36	5180
Channel 2	2417	Channel 40	5200
Channel 3	2422	Channel 44	5220
Channel 4	2427	Channel 48	5240
Channel 5	2432	Channel 52	5260
Channel 6	2437	Channel 56	5280
Channel 7	2442	Channel 60	5300
Channel 8	2447	Channel 64	5320
Channel 9	2452	Channel 100	5500
Channel 10	2457	Channel 104	5520
Channel 11	2462	Channel 112	5560
Channel 12	2467	Channel 116	5580
Channel 13	2472	Channel 120	5600
Channel 14	2484	Channel 124	5620
		Channel 128	5640
		Channel 132	5660
		Channel 136	5680
		Channel 140	5700
		Channel 149	5745
		Channel 153	5765
		Channel 157	5785
		Channel 161	5805
		Channel 165	5825

Example for Step 1

On the "WLAN 1" interface you want to use the option "Use Allowed Channels only". The OID for this is as follows:

1.3.6.1.4.1.4329.20.1.1.1.1.27.1.4.1.1.11.6

In addition, you have to transfer the information about whether you want to enable or disable the option. The following integer values are available for this:

Table 2-3

Integer	Meaning
1	enable
2	disable

The complete SNMP command is defined as follows:

set   1.3.6.1.4.1.4329.20.1.1.1.1.27.1.4.1.1.11.6   1

The result is as follows:

Figure 2-6

Example for Step 2

You want to disable channel 36 on the "WLAN 1" interface.

The first addition to the base OID is the WLAN interface as follows:

1.3.6.1.4.1.4329.20.1.1.1.1.27.1.1.3.1.4.6

In addition, you have to add the corresponding channel frequency number to the OID. Channel 36 has the frequency number 5180.
The second addition to the OID is as follows:

1.3.6.1.4.1.4329.20.1.1.1.1.27.1.1.3.1.4.6.5180

In addition, you have to transfer the information about whether you want to enable or disable the channel. The following integer values are available for this:

Table 2-4

Integer	Meaning
1	enable
2	disable

The complete SNMP command is defined as follows:

set   1.3.6.1.4.1.4329.20.1.1.1.1.27.1.1.3.1.4.6.5180 2

The result is as follows:

Figure 2-7
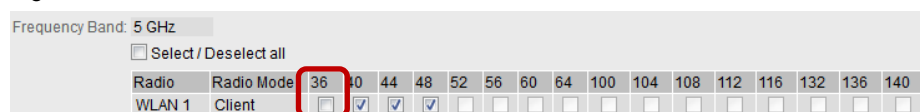
2.3 Enable and Disable Radio

2.3.1 Web Based Management

You can enable and disable the radio interface of an access point or client in the WBM via the menu "Interfaces > WLAN > Basic".

Figure 2-8

2.3.2 SNMP

Base OID

The base OID for enabling or disabling the radio interface is:
1.3.6.1.2.1.2.2.1.7

OID extension

To the base OIDs you have to add the number for the radio interface used. The following numbers are available for this:

- WLAN 1: number 6
- WLAN 2: number 7
- VAP 1.1 – VAP 1.8: numbers 10-17
- VAP 2.1 – VAP 2.8: numbers 30-37
- VAP 1.1 – VAP 1.8: numbers 70-77
- VAP 2.1 – VAP 2.8: numbers 90-97

Example 1

You want to disable the "WLAN 1" interface. The OID for this is as follows:
1.3.6.1.2.1.2.2.1.7.6

In addition, you have to transfer the information about whether you want to enable or disable the radio interface. The following integer values are available for this:

Table 2-5

Integer	Meaning
1	enable
2	disable

The complete SNMP command is defined as follows:

set   1.3.6.1.2.1.2.2.1.7.6   2

The result is as follows:

Figure 2-9

Example 2

You want to disable the "VAP1.1" interface. The OID for this is as follows:

1.3.6.1.2.1.2.2.1.7.10

In addition, you have to transfer the information about whether you want to enable or disable the radio interface. The following integer values are available for this:

Table 2-6

Integer	Meaning
1	enable
2	disable

The complete SNMP command is defined as follows:

set   1.3.6.1.2.1.2.2.1.7.10   2

The result is as follows:

Figure 2-10

2.4 Change the Operating Mode at the Access Point

2.4.1 Web Based Management

You can also operate an access point as client. You can change the operating mode in the menu "Interfaces > WLAN > Basic" in the "Device Mode" section.
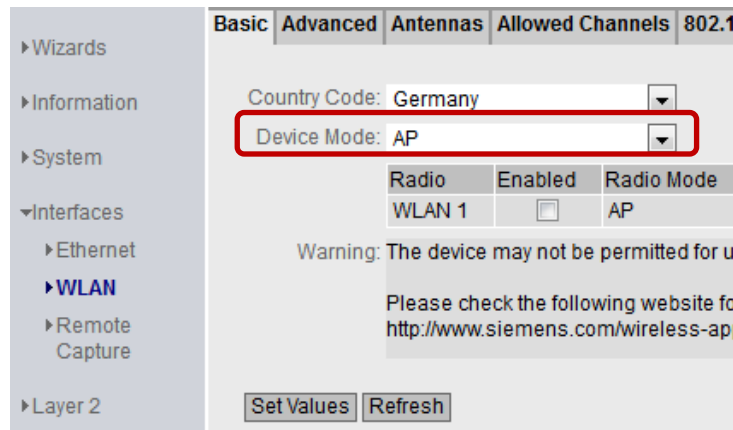
2.4.2 SNMP

Base OID

The base OID for changing the operating mode is:
1.3.6.1.4.1.4329.20.1.1.1.1.27.1.1.1.1.1

OID extension

To the base OID you have to add the number for the radio interface used. The numbers 6 (WLAN 1) and 7 (WLAN 2) are available for this.

Example

On the "WLAN 1" radio interface you want to set the operating mode to "Client". The OID for this is as follows:

1.3.6.1.4.1.4329.20.1.1.1.1.27.1.1.1.1.1.6

In addition, you have to transfer the information about which operating mode you would like to use. The following integer values are available for this:

Table 2-7

Integer	Meaning
1	"Access Point" operating mode
2	"Client" operating mode

The complete SNMP command is defined as follows:

set   1.3.6.1.4.1.4329.20.1.1.1.1.27.1.1.1.1.1.6   2

The result is as follows:

Figure 2-11

2.5 Change the SSID at the Access Point

2.5.1 Web Based Management

Contrary to an SSID list with WLAN clients, in the case of access points a difference is made between so-called Virtual Access Points (abbreviation: VAP). You can set the SSID of a VAP in the menu "Interfaces > WLAN > AP". Here a distinction is made between a maximum of 16 VAPs (VAP 1.1 to VAP 1.8 and VAP 2.1 to VAP 2.8 with Dual Radio). To be able to use a VAP you have to specify and enable the SSID of a VAP.

Figure 2-12

You can define and enable the SSID in one configuration step.

2.5.2 SNMP

Overview

With SNMP it takes two configuration steps to define and enable the SSID:
1. Enter the SSID
2. Enable the SSID

Base OIDs

The base OID for defining the SSID is a part of the standard MIB "IEEE802dot11" and is as follows:

1.2.840.10036.1.1.1.9

The base OID for enabling the SSID is a part of the standard MIB and is as follows:

1.3.6.1.2.1.2.2.1.7

OID extension

To both base OIDs you have to add the number for the radio interface used. The following numbers are available for this:

- VAP 1.1 – VAP 1.8: numbers 10-17
- VAP 2.1 – VAP 2.8: numbers 30-37

Example for Step 1

For the radio interface "VAP 1.1" you want to enter the SSID "Test". The OID for this is as follows:

1.2.840.10036.1.1.1.9.10

In addition, you must transfer the SSID as a string.

The complete SNMP command is defined as follows:

set   1.2.840.10036.1.1.1.9.10   Test

Example for Step 2

You would like to enable the SSID just defined.

You use the following OID for this:

1.3.6.1.2.1.2.2.1.7.10

In addition, you have to transfer the information about whether you want to enable or disable the SSID. The following integer values are available for this:

Table 2-8

Integer	Meaning
1	enable
2	disable

The complete SNMP command is defined as follows:

set   1.3.6.1.2.1.2.2.1.7.10   1

The overall result is as follows:

Figure 2-13

2.6 Set the Channel at the Access Point

2.6.1 Web Based Management

At the access point you can define a main channel for the radio interface. If the access point itself is to search for a free channel, use "Auto". If you want to use a specific channel, you select the required channel from the drop-down list box.

The function is available in the SCALANCE W access point menu "Interfaces > WLAN > AP":

Figure 2-14
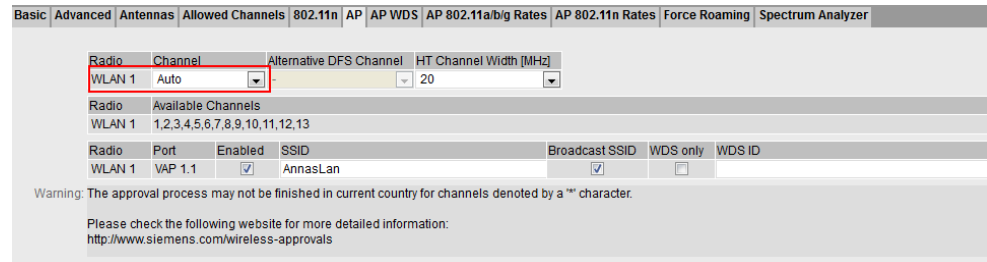
2.6.2 SNMP

Base OID

The base OID for selecting the main channel is (object: snMspsWlanPhyOperationChannel):
1.3.6.1.4.1.4329.20.1.1.1.1.27.1.4.1.1.9

OID extension

To the base OID you have to add the number for the radio interface used. The numbers 6 (WLAN 1) and 7 (WLAN 2) are available for this.

Example

You want to define channel 1 on the "WLAN 1" interface as main channel. The OID for this is as follows:
1.3.6.1.4.1.4329.20.1.1.1.1.27.1.4.1.1.9.6

In addition, you must transfer the channel number as an integer.

The complete SNMP command is defined as follows:

set   1.3.6.1.4.1.4329.20.1.1.1.1.27.1.4.1.1.9.6   1

The result is as follows:

Figure 2-15
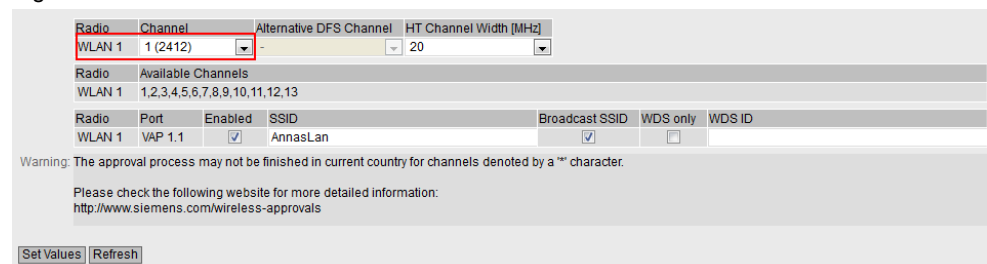
2.7 Start the Scan Procedure for Roaming via SNMP

With SNMP you can manually trigger the scan procedure on the client. If you start the scan procedure manually, the client searches for the next possible access point.

Base OID

The base OID for starting the scan procedure is (object: snMspsWlanForceHandover):

1.3.6.1.4.1.4329.20.1.1.1.1.27.1.1.4.1.14

OID extension

To the base OID you have to add the number for the radio interface used. The numbers 6 (WLAN 1) and 7 (WLAN 2) are available for this.

Example

You want to start the scan procedure on the "WLAN 1" interface. The OID for this is as follows:

1.3.6.1.4.1.4329.20.1.1.1.1.27.1.1.4.1.14.6

In addition, you have to transfer the information about whether or not you want to force the scan procedure. The following integer values are available for this:

Table 2-9

Integer	Meaning
0	no action (idle)
1	Force roaming

The complete SNMP command is defined as follows:

set   1.3.6.1.4.1.4329.20.1.1.1.1.27.1.1.4.1.14.6   1

2.8   Set digital Output via SNMP

The SCALANCE W788-x/W748-x devices in the RJ-45 variant have a digital input/output. With SNMP you can manually control the digital output.

Base OID

The base OID for controlling the digital output is (object: snMspsDigitalOutputLevel):

1.3.6.1.4.1.4329.20.1.1.1.1.39.1.3.1.6

Example

You want to control the digital output with signallevel "1". The OID for this is as follows:

1.3.6.1.4.1.4329.20.1.1.1.1.39.1.3.1.6

In addition, you have to transfer the information about the signallevel of the digital output. The following integer values are available for this:

Table 2-10

Integer	Meaning
1	Digital output is open (DO and 1L are interrupted).
2	Digital output is closed (DO and 1L are jumpered).

The complete SNMP command is defined as follows:

set   **1.3.6.1.4.1.4329.20.1.1.1.1.39.1.3.1.6**   **2**

2.9 Configure and activate Sleep mode

To reduce the power consumption of the device, the following SCALANCE devices support the energy-saving mode "Sleep Mode":

- SCALANCE M
- SCALANCE WxM766
- SCALANCE WxM763

In this mode, the device is in sleep mode and returns to the previous state after the set time has elapsed.

2.9.1 Web Based Management

In Web Based Management, you define the time after which the device in energy-saving mode wakes up again and activate sleep mode.

NOTE	You can only activate and set the sleep mode for SCALANCE M devices via Web Based Management.

You can find the function in the SCALANCE M menu

"System > restart > Sleep Mode":

Figure 2-16
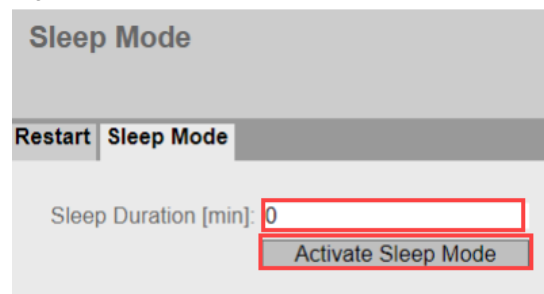
2.9.2 SNMP

Overview

To schedule and enable sleep mode, you must perform two separate configuration steps with SNMP:

1. Schedule Sleep Mode
2. Activate Sleep Mode

OIDs

The OID for terminating the sleep mode is:

1.3.6.1.4.1.4329.20.1.1.1.1.93.5.5.0

The OID for activating the sleep mode is:

1.3.6.1.4.1.4329.20.1.1.1.1.93.5.20.0

Step 1 example

You want to set the duration of the sleep mode to 2 minutes. The OID for this is as follows:

1.3.6.1.4.1.4329.20.1.1.1.1.93.5.5.0

In addition, you must pass the duration [in minutes] as a string.

The complete SNMP command is defined as follows:

set 1.3.6.1.4.1.4329.20.1.1.1.1.93.5.5.0 2

Step 2 example

You want to activate sleep mode.

The following OID is used for this purpose:

1.3.6.1.4.1.4329.20.1.1.1.1.93.5.20.0

In addition, you must pass the statement whether you want to activate or deactivate the sleep mode. The following integer values are available for this purpose:

Table 2-11

Integer	Meaning
1	activate
2	deactivate

The complete SNMP command is defined as follows:

set   1.3.6.1.4.1.4329.20.1.1.1.1.93.5.20.0   1

3 Diagnostics

3.1 Read Out Client List at the Access Point

3.1.1 Web Based Management

The SCALANCE W access points give you the option of displaying the connected clients in a list. Like this, for example:

Figure 3-1

3.1.2 SNMP

You can also call the list of connected clients via SNMP. With SNMP this is a table that is displayed as follows in the MIB of the access point:

Figure 3-2
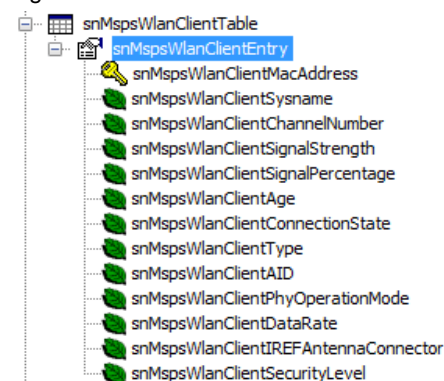
To obtain access to the single rows you have to work with the SNMP command "get next". The background is that each row in the list is referenced with the MAC address of the relevant client.

Procedure

The "get next" command runs through the table column by column and row by row. The starting point is the column "snMspsWLANClientSysname".

1. You start the "get next" command with the base OID of the client list.
2. As a response you receive an extended OID and the value of the first cell from the column. The extended OID is structured as follows:
   - Base OID
   - Index of the column (for example, number 2 for the "System Name" column)
   - Number of the radio interface (for example, number 10 for VAP 1.1)
   - MAC address of the first client
3. This extended OID is the starting point for the next "get next" command trigger.
4. In this way the "get next" command runs through the table.

Note	This automatically gives you the MAC addresses of the connected clients.
	If you want to read out the complete table in one go, then you can use the SNMP command "get bulk".

Base OID

The base OID in the private MIB for the client list is:

1.3.6.1.4.1.4329.20.1.1.1.1.27.1.1.10.1

Example

The following clients are logged on at the access point:

Figure 3-3

Associated stations: 2

AID	Radio	Port	Type	MAC Address	System Name	Channel	Signal Strength [dBm]	Signal Strength [%]	Age [s]	Security	WLAN Mode	Max. Data Rate [Mbps]	State
2	WLAN 1	VAP 1.1	Station	00-1b-1b-e6-5c-33	W722	12	-74	42	0	Open System	802.11 n	65.0	connected
1	WLAN 1	VAP 1.1	Station	20-87-56-98-d5-f0	W774	12	-85	21	0	Open System	802.11 n	65.0	connected

Refresh

You start the "get next" command with the base OID of the client list.

The SNMP command is defined as follows:

get next   1.3.6.1.4.1.4329.20.1.1.1.1.27.1.1.10.1

The "get next" commands deliver the table contents as follows (the example here is the MIB browser iReasoning):

Figure 3-4

snMspsWlanClientSysname.10.0.27.27.230.92.51	W722
snMspsWlanClientSysname.10.32.135.86.152.213.240	W774
snMspsWlanClientChannelNumber.10.0.27.27.230.92.51	12
snMspsWlanClientChannelNumber.10.32.135.86.152.213.240	12
snMspsWlanClientSignalStrength.10.0.27.27.230.92.51	-74
snMspsWlanClientSignalStrength.10.32.135.86.152.213.240	-85
snMspsWlanClientSignalPercentage.10.0.27.27.230.92.51	42
snMspsWlanClientSignalPercentage.10.32.135.86.152.213.240	21
snMspsWlanClientAge.10.0.27.27.230.92.51	0
snMspsWlanClientAge.10.32.135.86.152.213.240	15
snMspsWlanClientConnectionState.10.0.27.27.230.92.51	connected (1)
snMspsWlanClientConnectionState.10.32.135.86.152.213.240	connected (1)
snMspsWlanClientType.10.0.27.27.230.92.51	apSta (2)
snMspsWlanClientType.10.32.135.86.152.213.240	apSta (2)
snMspsWlanClientAID.10.0.27.27.230.92.51	2
snMspsWlanClientAID.10.32.135.86.152.213.240	1
snMspsWlanClientPhyOperationMode.10.0.27.27.230.92.51	5
snMspsWlanClientPhyOperationMode.10.32.135.86.152.213.240	5
snMspsWlanClientDataRate.10.0.27.27.230.92.51	65000000
snMspsWlanClientDataRate.10.32.135.86.152.213.240	65000000
snMspsWlanClientIREFAntennaConnector.10.0.27.27.230.92.51	not-available (0)
snMspsWlanClientIREFAntennaConnector.10.32.135.86.152.213.240	not-available (0)
snMspsWlanClientSecurityLevel.10.0.27.27.230.92.51	openSystem (1)
snMspsWlanClientSecurityLevel.10.32.135.86.152.213.240	openSystem (1)

3.2 Acquire Single Information Items of a Client

3.2.1 Web Based Management

The SCALANCE W access points give you the option of displaying the connected clients and their information. Like this, for example:

Figure 3-5

| Overview AP | Client List | WDS List | Overlap AP | Force Roaming | Noise Floor |

Associated stations: 3

AID	Radio	Port	Type	MAC Address	System Name	Channel	Signal Strength [dBm]	Signal Strength [%]
1	WLAN 1	VAP 1.1	L2T	00-1b-1b-90-15-17	DK-Nico-W761-1-CL	9	-54	80
1	WLAN 1	VAP 1.2	Station	c4-61-8b-38-e8-f9		9	-28	100
2	WLAN 1	VAP 1.2	Station	e0-c7-67-83-cd-60		9	-37	100

For example, here you can find information about the signal strength of the clients.

3.2.2 SNMP

Also with SNMP you can read out single information items from the table of the client list.

Base OID

The base OID in the private MIB for the client list is:

1.3.6.1.4.1.4329.20.1.1.1.1.27.1.1.10.1

OID extension

To the base OID you have to add the following:

- The number of the desired information. The following numbers are available for the information items to be read out:
  - System Name: number 2
  - Channel Number: number 3
  - Signal Strength [dBm]: number 4
  - Signal Strength [%]: number 5
  - Age: number 6
  - Connection State: number 7
  - Type: number 8
  - AID: number 10
  - PHY Operation Mode: number 12
  - Data Rate: number 13
  - IREF Antenna Connector: number 15
  - Security Level: number 20

- The number of the radio interface used. The following numbers are available for the radio interface:
  - WLAN 1: number 6
  - WLAN 2: number 7
  - VAP 1.1 – VAP 1.8: numbers 10-17
  - VAP 2.1 – VAP 2.8: numbers 30-37
  - VAP 1.1 – VAP 1.8: numbers 70-77
  - VAP 2.1 – VAP 2.8: numbers 90-97
- The MAC address of the client. The information about the MAC address of the client is given in decimal notation.
  Example:
  Your client has the MAC address 00-0c-29-e1-3d-e3. The decimal notation for this is 0.12.41.225.61.227.

Example

You want to read out the signal strength [in dBm] of the client with the MAC address 00-0c-29-e1-3d-e3 on the radio interface "VAP 1.1". The OID for this is as follows:

1.3.6.1.4.1.4329.20.1.1.1.1.27.1.1.10.1.4.10.0.12.41.225.61.227

The SNMP command is defined as follows:

get **1.3.6.1.4.1.4329.20.1.1.1.1.27.1.1.10.1.4.10.0.12.41.225.61.227**

3.3 Read Out Available AP List on the Client

3.3.1 Web Based Management

The SCALANCE W clients provide the option of displaying all the access points that the client sees. In the list are also access points to which the client cannot connect because of its configuration. The overview is available via the menu "Information > WLAN > Available AP".

Figure 3-6

	Radio	SSID	BSSID	System Name	Channel	Signal Strength [dBm]	Signal Strength [%]	Type	Security	WLAN Mode	State
	WLAN 1	AnnasLan	00-1b-1b-e8-61-38	W761	12	-77	36	Station	Open System	802.11 n	connected

Overview Client | Available AP | IP Mapping | Force Roaming | Noise Floor

Refresh

3.3.2 SNMP

You can also call the list of visible access points via SNMP. With SNMP this is a table whose columns are displayed as follows in the MIB of the client:

Figure 3-7
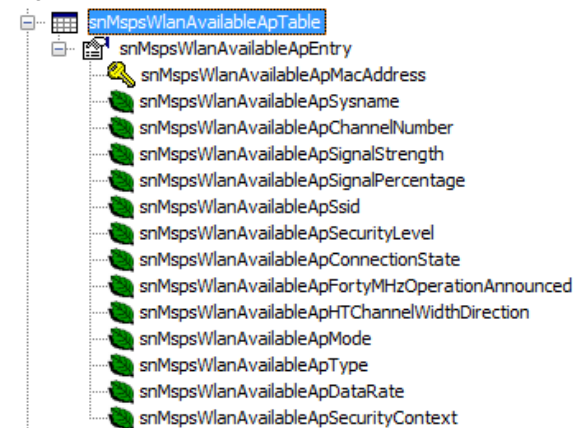
snMspsWlanAvailableApTable
  snMspsWlanAvailableApEntry
    snMspsWlanAvailableApMacAddress
    snMspsWlanAvailableApSysname
    snMspsWlanAvailableApChannelNumber
    snMspsWlanAvailableApSignalStrength
    snMspsWlanAvailableApSignalPercentage
    snMspsWlanAvailableApSsid
    snMspsWlanAvailableApSecurityLevel
    snMspsWlanAvailableApConnectionState
    snMspsWlanAvailableApFortyMHzOperationAnnounced
    snMspsWlanAvailableApHTChannelWidthDirection
    snMspsWlanAvailableApMode
    snMspsWlanAvailableApType
    snMspsWlanAvailableApDataRate
    snMspsWlanAvailableApSecurityContext

To obtain access to the single rows you have to work with the SNMP command "get next". The background is that each row in the list is referenced with the MAC address of the relevant access point.

Procedure

The "get next" command runs through the table column by column and row by row. The starting point is the column "snMspsWlanAvailableApSysname".

1. You start the SNMP command with the base OID of the Available AP list.
2. As a response you receive an extended OID and the value of the first cell from the column. The extended OID is structured as follows:
   - Base OID
   - Index of the column (for example, number 2 for the "System Name" column)
   - Number of the radio interface (for example, number 6 for WLAN 1)
   - MAC address of the first access point
3. This extended OID is the starting point for the next "get next" command trigger.
4. In this way the "get next" command runs through the table.

Note	This automatically gives you the MAC addresses of the visible access points.
	If you want to read out the complete table in one go, then you can use the SNMP command "get bulk".

Base OID

The base OID in the private MIB for the Available AP list is:

1.3.6.1.4.1.4329.20.1.1.1.1.27.1.1.11.1

Example

The following access points are visible on the client:

Figure 3-8

Overview Client	Available AP	IP Mapping	Force Roaming	Noise Floor						
Radio	SSID	BSSID	System Name	Channel	Signal Strength [dBm]	Signal Strength [%]	Type	Security	WLAN Mode	State
WLAN 1	AnnasLan	00-1b-1b-e8-61-38	W761	12	-77	36	Station	Open System	802.11 n	connected

Refresh

You start the "get next" command with the base OID of the Available AP list.

The SNMP command is defined as follows:

get next   1.3.6.1.4.1.4329.20.1.1.1.1.27.1.1.11.1

The "get next" commands deliver the table contents as follows (the example here is the MIB browser iReasoning):

Figure 3-9

snMspsWlanAvailableApSysname.6.0.27.27.232.97.56	W761
snMspsWlanAvailableApChannelNumber.6.0.27.27.232.97.56	12
snMspsWlanAvailableApSignalStrength.6.0.27.27.232.97.56	-79
snMspsWlanAvailableApSignalPercentage.6.0.27.27.232.97.56	32
snMspsWlanAvailableApSsid.6.0.27.27.232.97.56	AnnasLan
snMspsWlanAvailableApSecurityLevel.6.0.27.27.232.97.56	openSystem (1)
snMspsWlanAvailableApConnectionState.6.0.27.27.232.97.56	connected (1)
snMspsWlanAvailableApFortyMHzOperationAnnounced.6.0.27.27.232.97.56	false (2)
snMspsWlanAvailableApHTChannelWidthDirection.6.0.27.27.232.97.56	down (2)
snMspsWlanAvailableApMode.6.0.27.27.232.97.56	mode11NG (5)

3.4   Acquire Single Information Items from the Available AP List

3.4.1   Web Based Management

The SCALANCE W clients provide the option of displaying all the access points that the client sees. In the list are also access points to which the client cannot connect because of its configuration. The overview is available via the menu "Information > WLAN > Available AP".

Figure 3-10

Radio	SSID	BSSID	System Name	Channel	Signal Strength [dBm]	Signal Strength [%]	Type	Security	WLAN Mode	State
WLAN 1	AnnasLan	00-1b-1b-e8-61-38	W761	12	-77	36	Station	Open System	802.11 n	connected

Refresh

Further information is also available about the access point, signal strength, for example.

3.4.2   SNMP

Also with SNMP you can read out single information items from the table of the Available AP list.

Base OID

The base OID in the private MIB for the Available AP list is:

1.3.6.1.4.1.4329.20.1.1.1.1.27.1.1.11.1

OID extension

To the base OID you have to add the following:

- The number of the desired information. The following numbers are available for the information items to be read out:
  - System Name: number 2
  - Channel Number: number 3
  - Signal Strength [dBm]: number 4
  - Signal Strength [%]: number 5
  - SSID: number 6
  - Security Level: number 7
  - Connection State: number 8
  - Forty MHz Operation Announced: number 9
  - HT Channel Width Direction: number 10
  - Mode: number 13
  - Type: number 15
  - Data Rate: number 17
  - Security Context: number 20
- The number of the radio interface used. The following numbers are available for the radio interface:
  - WLAN 1: number 6
  - WLAN 2: number 7

- MAC address of the access point. The information about the MAC address of the access point is given in decimal notation.
Example:
Your access point has the MAC address 00-0c-29-e1-3d-e3. The decimal notation for this is 0.12.41.225.61.227.

Example

You want to read out the signal strength [in dBm] of the access point with the MAC address 00-1B-1B-E8-61-38 on the radio interface "WLAN 1". The OID for this is as follows:

1.3.6.1.4.1.4329.20.1.1.1.1.27.1.1.11.1.4.6.0.27.27.232.97.56

The SNMP command is defined as follows:

get   **1.3.6.1.4.1.4329.20.1.1.1.1.27.1.1.11.1.4.6.0.27.27.232.97.56**

Note

If you do not want to know the MAC address of the connected access point and do not want to determine if beforehand, you can also determine the MAC address via the MIB object snMspsWlanCurrentConnectionMacAddress (base OID: 1.3.6.1.4.1.4329.20.1.1.1.1.27.1.4.3.1.1.4).
Instructions are available in the Siemens Industry Online Support in the FAQ response "snMspsWlanCurrentConnectionMacAddress" in Entry ID: 109744342.
https://support.industry.siemens.com/cs/en/en/view/109744342

3.5 Read Out Overlap AP List at the Access Point

3.5.1 Web Based Management

For optimum data throughput the set radio channel must not be used by any other access points. At the access point, the menu "Information > WLAN > Overlap AP" gives an overview of all the access points that are visible on the set channel or on neighboring channels (with 2.4 GHz). If there are entries here, the maximum data throughput of the access point and the availability of the communications connection to the access point might be impaired.

Figure 3-11

3.5.2 SNMP

You can also call the list of overlapping access points via SNMP. With SNMP this is a table whose columns are displayed as follows in the MIB of the access point:

Figure 3-12
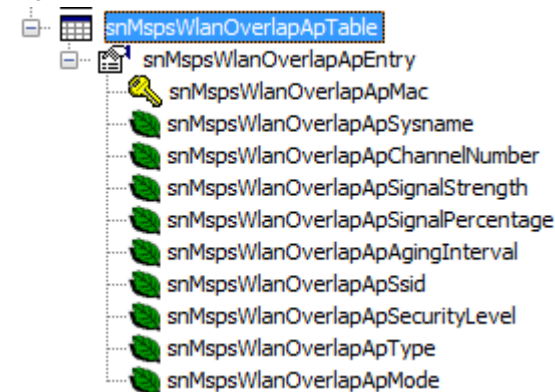
To obtain access to the single rows you have to work with the SNMP command "get next". The background is that each row in the list is referenced with the MAC address of the relevant access point.

Procedure

The "get next" command runs through the table column by column and row by row. The starting point is the column "snMspsWLANOverlapApSysname".

1. You start the "get next" command with the base OID of the Overlap AP list.

2. As a response you receive an extended OID and the value of the first cell from the column. The extended OID is structured as follows:

    -   Base OID

    -   Index of the column (for example, number 2 for the "System Name" column)

    -   Number of the radio interface (for example, number 6 for WLAN 1)

    -   MAC address of the first access point

3. This extended OID is the starting point for the next "get next" command trigger.

4. In this way the "get next" command runs through the table.

Note	This automatically gives you the MAC addresses of the overlapping access points.
	If you want to read out the complete table in one go, you can use the SNMP command "get bulk".

Base OID

The base OID in the private MIB for the Overlap AP list is:

1.3.6.1.4.1.4329.20.1.1.1.1.27.1.1.9.2.1

Example

You start the "get next" command with the base OID of the Overlap AP list.

The SNMP command is defined as follows:

get next   1.3.6.1.4.1.4329.20.1.1.1.1.27.1.1.9.2.1

3.6 Acquire Single Information Items from the Overlap AP List

3.6.1 Web Based Management

For optimum data throughput the set radio channel must not be used by any other access points. At the access point, the menu "Information > WLAN > Overlap AP" gives an overview of all the access points that are visible on the set channel or on neighboring channels (with 2.4 GHz). If there are entries here, the maximum data throughput of the access point and the availability of the communications connection to the access point might be impaired.

Figure 3-13

Further information is also available about the access point, signal strength, for example.

3.6.2 SNMP

The base OID in the private MIB for the Overlap AP list is:

1.3.6.1.4.1.4329.20.1.1.1.1.27.1.1.9.2.1

OID extension

To the base OID you have to add the following:

- The number of the desired information. The following numbers are available for the information items to be read out:
  - System Name: number 2
  - Channel Number: number 3
  - Signal Strength [dBm]: number 4
  - Signal Strength [%]: number 5
  - Aging Interval: number 6
  - SSID: number 7
  - Security Level: number 8
  - Type: number 9
  - Mode: number 12
- The number of the radio interface used. The following numbers are available for the radio interface:
  - WLAN 1: number 6
  - WLAN 2: number 7
  - VAP 1.1 – VAP 1.8: numbers 10-17
  - VAP 2.1 – VAP 2.8: numbers 30-37
  - VAP 1.1 – VAP 1.8: numbers 70-77
  - VAP 2.1 – VAP 2.8: numbers 90-97

- MAC address of the access point. The information about the MAC address of the access point is given in decimal notation.
Example:
Your access point has the MAC address 06-07-08-09-0A-0B. The decimal notation for this is 6.7.8.9.10.11.

Example

You want to read out the signal strength [in dBm] of the access point with the MAC address 06-07-08-09-0A-0B on the radio interface "WLAN 1". The OID for this is as follows:

1.3.6.1.4.1.4329.20.1.1.1.1.27.1.1.9.2.1.4.6.6.7.8.9.10.11

The SNMP command is defined as follows:

get   1.3.6.1.4.1.4329.20.1.1.1.1.27.1.1.9.2.1.4.6.6.7.8.9.10.11