**Mikrotik VLAN settings on different types of devices**

**(Switch CRS125-24G-1S, router RB2011UiAS-2HnD, hAP RB951Ui-2nD).**

|  |
| --- |
| Useful links: |
| 1. [Layer2 misconfigurations](https://wiki.mikrotik.com/wiki/Manual:Layer2_misconfiguration#Bridged_VLAN_on_physical_interfaces) |
| 1. [CRS1xx/CRS2xx series devices](https://wiki.mikrotik.com/wiki/Manual:CRS_examples#Port_Based_VLAN) |
| 1. [Other devices with a switch chip](https://wiki.mikrotik.com/wiki/Manual:Switch_Chip_Features#VLAN_Example_1_.28Trunk_and_Access_Ports.29) |

WARNING: Use **SAFE MODE** while settings!!!

1. **VLAN settings on switch CRS125-24G-1S (switch QCA-8513L)**

Create a bridge.

|  |
| --- |
| /interface bridge  add admin-mac=CC:2D:E0:22:22:22 auto-mac=no name=BR\_MAIN |

Create VLAN-interfaces (for assigning of IP-addresses):

|  |
| --- |
| /interface vlan  add interface=BR\_MAIN name=vlan30 vlan-id=30  add interface=BR\_MAIN name=vlan31 vlan-id=31 |

Add Ethernet ports in the bridge:

|  |
| --- |
| /interface bridge port  add bridge=BR\_MAIN interface=ether1  add bridge=BR\_MAIN interface=ether2  add bridge=BR\_MAIN interface=ether3  ### < omitted - the same settings for ether4 – ether18 > ###  add bridge=BR\_MAIN interface=ether19  add bridge=BR\_MAIN interface=ether20  add bridge=BR\_MAIN interface=ether21 |

Set up IP-addresses on VLAN-interfaces:

|  |
| --- |
| /ip address  add address=192.168.30.1/24 interface=vlan30 network=192.168.30.0  add address=172.16.31.1/24 interface=vlan31 network=172.16.31.0 |

Switch-chip VLAN settings (VLAN-table settings):

|  |
| --- |
| /interface ethernet switch vlan  add ports=ether1,ether2,switch1-cpu vlan-id=31  add ports=ether1,ether2,ether3,ether4,ether5,ether6,ether7,ether8,ether9,ether10,\  ether11,ether12,ether13,ether14,ether15,ether16,ether17,ether18,ether19,ether20,\  ether21,sfp1,switch1-cpu vlan-id=30 |

!!! Port switch-CPU – switch1-cpu – must be added in VLAN-table in order for the L3-VLAN-interfaces to work.

Set up switch-chip 802.1q tagged ports:

|  |
| --- |
| /interface ethernet switch egress-vlan-tag  add tagged-ports=switch1-cpu vlan-id=30  add tagged-ports=ether1,ether2,switch1-cpu vlan-id=31 |

!!! If you are going to use Layer3 VLAN functional, you should add appropriate VLAN as tagged for switch1-cpu!!! In this example we use L3-VLAN-interfaces with VLAN ID 30 and 31. So we have to tag switch1-cpu with VLAN IDs 30,31.

Add access-ports in VLAN 30.

|  |
| --- |
| /interface ethernet switch ingress-vlan-translation  add customer-vid=0 new-customer-vid=30 ports=ether1,ether2,ether3,ether4,ether5,ether6,ether7,ether8,ether9,\  ether10,ether11,ether12,ether13,ether14,ether15,ether16,ether17,ether18,\  ether19,ether20,ether21,sfp1 |

!!! In these settings we have set up ports ether1 and ether2 as hybrid-ports – access VLAN 30 and trunk VLAN 31. VLAN 30 is as native for these ports.

1. **VLAN settings on router RB2011UiAS-2HnD (switches Atheros-8327 and Atheros-8227)**

Router 2011UiAS-2HnD has two integrated switches:

1. Atheros-8327 switch chip with five 1Gbps Ethernet interfaces and one 1G SFP interface.
2. Atheros-8227 switch chip with five 100Mbps Ethernet ports.

This means that there is two different VLAN-tables on a hardware level and they don’t know about each other. If we want to use the same VLANs on both switches we have to add ports of each switches in different bridges. Further we will need to connect 1 port from each switch with UTP cable. And then we will configure these ports in the trunk with the necessary VLAN tags.

Create two bridges.

|  |
| --- |
| /interface bridge  add admin-mac=CC:2D:E0:11:11:11 auto-mac=no name=BR\_MAIN  add admin-mac=CC:2D:E0:39:CD:6A auto-mac=no name=BR\_MAIN\_2 |

Create VLAN-interfaces (for assigning of IP-addresses):

|  |
| --- |
| /interface vlan  add interface=BR\_MAIN name=vlan30 vlan-id=30  add interface=BR\_MAIN name=vlan31 vlan-id=31 |

We should use just one bridge for the appropriate L3-VLAN-interfaces. In our case we chose BR\_MAIN.

Add ports in the bridges:

|  |
| --- |
| /interface bridge port  add bridge=BR\_MAIN comment=SW1\_eth1 interface=ether2  add bridge=BR\_MAIN interface=ether4  add bridge=BR\_MAIN interface=ether3  add bridge=BR\_MAIN interface=ether5  add bridge=BR\_MAIN\_2 interface=ether6  add bridge=BR\_MAIN\_2 interface=ether7  add bridge=BR\_MAIN\_2 interface=ether8  add bridge=BR\_MAIN\_2 interface=ether9  add bridge=BR\_MAIN\_2 interface=ether10  add bridge=BR\_MAIN interface=wlan1  add bridge=BR\_MAIN interface=sfp1 |

Set up IP-addresses on VLAN-interfaces:

|  |
| --- |
| /ip address  add address=192.168.30.3/24 comment=Office interface=vlan30 network=192.168.30.0  add address=172.16.31.3/24 comment=Guest interface=vlan31 network=172.16.31.0 |

Switch-chip VLAN settings (VLAN-table settings):

|  |
| --- |
| /interface ethernet switch vlan  add independent-learning=yes ports=ether2,ether3,ether4,ether5,switch1-cpu\  switch=switch1 vlan-id=30  add independent-learning=yes ports=ether2,ether3,ether4,ether5,switch1-cpu\  switch=switch1 vlan-id=31  add ports=switch2-cpu,ether6,ether7,ether8,ether9,ether10 switch=switch2\  vlan-id=30  add ports=switch2-cpu,ether6,ether7,ether8,ether9,ether10 switch=switch2\  vlan-id=31 |

!!! Ports switch-CPU – switch1-cpu and switch2-cpu – must be added in VLAN-table in order for the L3-VLAN-interfaces to work.

Set up switch-chip 802.1q tagged ports (eth2, eth5-7) with native VLAN30:

|  |
| --- |
| /interface ethernet switch port  set ether2 default-vlan-id=30 vlan-header=add-if-missing vlan-mode=secure  set ether5 default-vlan-id=30 vlan-header=add-if-missing vlan-mode=secure  set ether6 default-vlan-id=30 vlan-header=add-if-missing vlan-mode=secure  set ether7 default-vlan-id=30 vlan-header=add-if-missing vlan-mode=secure |

Add access ports in VLAN30:

|  |
| --- |
| /interface ethernet switch port  set ether3 default-vlan-id=30 vlan-header=always-strip vlan-mode=secure  set ether4 default-vlan-id=30 vlan-header=always-strip vlan-mode=secure  set ether8 default-vlan-id=30 vlan-header=always-strip vlan-mode=secure  set ether9 default-vlan-id=30 vlan-header=always-strip vlan-mode=secure  set ether10 default-vlan-id=30 vlan-header=always-strip vlan-mode=secure  set switch1-cpu vlan-mode=secure vlan-header=leave-as-is default-vlan-id=auto  set switch2-cpu vlan-mode=secure vlan-header=leave-as-is default-vlan-id=0 |

!!! VLAN-mode secure means – checking of tagged traffic against the VLAN Table for ingress traffic, dropping of all untagged traffic. Both ingress and egress port must be found in the VLAN Table for the appropriate VLAN ID, otherwise traffic is dropped.

Now we can connect port ether5 (switch1) and ether6 (switch2) with UTP-cable and enjoy working Layer2 switch functional.

1. **VLAN settings on hAP RB951Ui-2nD (switch Atheros-8227)**

Create a bridge.

|  |
| --- |
| /interface bridge  add admin-mac=C4:AD:34:2C:4E:67 auto-mac=no name=BR\_MAIN |

Create VLAN-interfaces (for assigning of IP-addresses):

|  |
| --- |
| /interface vlan  add comment=Office interface=BR\_MAIN name=vlan30 vlan-id=30  add comment=Guest interface=BR\_MAIN name=vlan31 vlan-id=31 |

Add ports in the bridges:

|  |
| --- |
| /interface bridge port  add bridge=BR\_MAIN interface=ether2  add bridge=BR\_MAIN interface=ether3  add bridge=BR\_MAIN interface=ether4  add bridge=BR\_MAIN interface=wlan1  add bridge=BR\_MAIN interface=ether5 |

Set up IP-addresses on VLAN-interfaces:

|  |
| --- |
| /ip address  add address=192.168.30.4/24 comment=Office interface=vlan30 network=192.168.30.0  add address=172.16.31.4/24 comment=Guest interface=vlan31 network=172.16.31.0 |

Switch-chip VLAN settings (VLAN-table settings):

|  |
| --- |
| /interface ethernet switch vlan  add ports=ether2,ether3,ether4,ether5,switch1-cpu switch=switch1 vlan-id=30  add ports=ether2,ether3,ether4,ether5,switch1-cpu switch=switch1 vlan-id=31 |

!!! Port switch-CPU – switch1-cpu – must be added in VLAN-table in order for the L3-VLAN-interfaces to work.

Set up switch-chip 802.1q tagged port (ether2) with native VLAN30:

|  |
| --- |
| /interface ethernet switch port  set ether2 default-vlan-id=30 vlan-header=add-if-missing vlan-mode=secure |

Add access ports in VLAN30:

|  |
| --- |
| /interface ethernet switch port  set ether3 default-vlan-id=30 vlan-mode=secure  set ether4 default-vlan-id=30 vlan-mode=secure  set ether5 default-vlan-id=30 vlan-mode=secure  set switch1-cpu vlan-mode=secure |

!!! VLAN-mode secure means – checking of tagged traffic against the VLAN Table for ingress traffic, dropping of all untagged traffic. Both ingress and egress port must be found in the VLAN Table for the appropriate VLAN ID, otherwise traffic is dropped.