Subjects, overview

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CVR nr. 82 15 14 19

Introduction

This document includes tips and trick for how to configure the DKTCOMEGA 797xx series, known as JUMA/Forsete-II.
The examples come from real life experiences, and can be used by operators as part of their integration process.

Please notice that these are examples only, it is a representation of just a sub-set of the switch capabilities; please refer to user syntax guide for the full overview.

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How to enable flow control

```
# From firmware 05_08 and forward flow control is
disabled on all port, prior to this release it was
enabled per default. The reason for the change is that
QoS is not fully functional when flow control is enabled.
# In order to enabled flow control please add the
following commands
# Enable flow control on a single port (e.g. port 0):
conf port set auto-nego port 0 ability 10h 10f 100h 100f 1000f
flow-control asy-flow-control

# Enable flow control on all ports:
conf port set auto-nego port 0-4 ability 10h 10f 100h 100f
1000f flow-control asy-flow-control
```

How to allow SSH management from one IP address only

```
=================SSH ACL
policy==================================
# Step 1. enable LAN port and WAN port acl state acl set
port 0-4 state enable

# Step 2. packet field selector setting
```

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```
# This command can configure acl user defined field. Each
field can set 16-bits content of packet which user wants
to filter for acl uage. From pure raw packet to layer-4
content as tcp or udp, the field can be set for parsing
content of packet inside the first 256 bytes.
field-selector set index 1 format ipv4-header offset 8
field-selector set index 2 format ip-payload offset 2

# Step 3. acl template setting
# This command can use to configure content of editing
template. Each template contains limited packet pattern
bits for acl rule matching. The ordering of editing
template pattern bits is depended on editing order.
Notice sip equals source ipv4 address acl clear template
acl set template user-field 1 acl set template user-field
2 acl set template sip acl add template entry 1

# Step 4. acl entry 2: SSH with specific source IP
address, trap these frames to cpu port.
# This command can edit wanted rule contents before being
added to device. The rule content is depended on which
template is used. So, configuring used template is more
important before setting rule, which was done above.
acl set rule template entry 1
acl set rule state valid
acl set rule port 0-4
# ipv4-header offset 8 value = 0x0006 meas TCP acl set
rule user-field 1 data 0x0006 mask 0x00ff # TCP
destination port = 0x16 means SSH protocol acl set rule
user-field 2 data 0x16 mask 0xffff acl set rule sip data
192.168.1.1 mask 255.255.255.255

# This command can clear configured actions of editing
rule. It should be execute before adding new configured
rule.
acl clear action
# This command can edit wanted actions of rule will be
added to device. Let us trap frames to CPU port acl set
action trap-to-cpu

# Execute the entry
acl add entry 2

# Step 5. acl entry 3: SSH with source IP not matching
entry2, drop these frames acl set rule template entry 1
acl set rule state valid acl set rule port 0-4 # ipv4-
header offset 8 value = 0x0006 meas TCP acl set rule
user-field 1 data 0x0006 mask 0x00ff # TCP destination
```


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```
port = 0x16 means SSH protocol acl set rule user-field 2
data 0x16 mask 0xffff

acl clear action
# This command can edit wanted actions of rule will be
added to device. Let us trap frames to nowhere acl set
action redirect port none

acl add entry 3
=================SSH
=========================================
```

How to pass only certain frames, discard others

```
# The following example shows how to discard all frames
on LAN 2, except for PPPoE with Ethertype 8864/64

# FOLLOWING IS ENABLING DEVICE TEMPLATES
# Clear device templates
acl clear template
# Set device template Destination MAC address
acl set template dmac
# Set device template C-Tag VLAN
acl set template ctag
# Set device template Source MAC address
acl set template smac
# Set device template Ethertype
acl set template ethertype
# Add ACL entry, index 0
acl add template entry 0

# FOLLOWING IS DEFINING ACL RULE CONTENT
# ACL clear is typically needed, before modifying rules,
etc.
acl clear
# Create a rule for template entry 0, defined above
acl set rule template entry 0
# enable the rule
acl set rule state valid
# apply the rule for port 1, which is LAN port 2
acl set rule port 1
# The following is set, in order to enable the NOT bit.
By setting this bit, the comparison result of ACL rule
will be converted. That is, un-matched packet would be
assigned a “matched” result and a matched packet will be
considered as “un-matched”
acl set rule operation reverse-state enable
```

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```
# Check for PPPoE frames, The following is set, in order
to enable the NOT bit, correct? By setting this bit, the
comparison result of ACL rule will be converted. That is,
un-matched packet would be assigned a “matched” result
and a matched packet will be considered as “un-matched”
acl set rule ethertype data 0x8863 mask 0xfff8

# FOLLOWING IS ACL RULE ADDING
# ACL clear is typically needed, before modifying rules,
etc.
acl clear action
# all other frames than PPPoE defined above should be
discarded, define a rule for this
acl set action redirect port none
# Defined rule as entry 1
acl add entry 1
```

How to mirror from WAN to LAN1

```
conf mirror set mirroring-port 0 mirrored-port 4 rx-
mirror tx-mirror
```

How to isolate LAN ports from each other

```
conf port set isolation port 0 mode0 egress-port 4
conf port set isolation port 1 mode0 egress-port 4
conf port set isolation port 2 mode0 egress-port 4
conf port set isolation port 3 mode0 egress-port 4
```

How to create S-VLAN 1001 on WAN, C-VLANs 100, 200 on LAN1…4, Mgt VLAN 300, keep tpid 8100 for S-tag

```
switch --enable-lan

conf <<EOF
# initialize VLAN configuration
vlan init
# create C-VLAN 100
vlan create vlan-table vid 100
# create C-VLAN 200
vlan create vlan-table vid 200
# define member ports for C-VLAN 100, LAN 1...4 and WAN
vlan set vlan-table vid 100 member 0-4
# define member ports for C-VLAN 200, LAN 1...4 and WAN
vlan set vlan-table vid 200 member 0-4
# defined config port based vid for LAN port 1...4
vlan set pvid port 0 100
vlan set pvid port 1 100
```

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```
vlan set pvid port 2 100
vlan set pvid port 3 100
# enable SVLAN on WAN port
svlan set service-port 4
# define members for management vlan 300, CPU and WAN
ports
svlan create svlan-table svid 300
svlan set svlan-table svid 300 member 4,6
svlan set svlan-table svid 300 untag-member 6
# defined config port based vid for CPU port
vlan set pvid port 6 300
# define CPU as untagged member of VLAN 300
vlan set vlan-table vid 300 untag-member 6
# create vid 0 for management, dummy vid
svlan create svlan-table svid 0
# add CPU and WAN ports to dummy vid
svlan set svlan-table svid 0 member 4,6
# dummy vid is untagged on CPU and WAN port
svlan set svlan-table svid 0 untag-member 4,6

# downstream SVLAN untag action, downstream SVLAN untag
action for vid 0
svlan set untag assign-svlan svid 0

# assign vid 0 to CPU port
svlan set port 6 svid 0

# set tag protocol identifier of STAG to 9100, note other
identifiers will be excluded
svlan set tpid 0x8100

# create S-VLAN 1001
svlan create svlan-table svid 1001

# defined member ports for S-VLAN 1001, LAN 1...4 and WAN
svlan set svlan-table svid 1001 member 0-4

# defined config port based vid for LAN port 1...4
svlan set port 0 svid 1001
svlan set port 1 svid 1001
svlan set port 2 svid 1001
svlan set port 3 svid 1001

# S-VLAN 1001 is untagged on LAN port 1,,,4
svlan set svlan-table svid 1001 untag-member 0-3

# define tagged frames on LAN 1...4 and WAN only
vlan set accept-frame-type port 0 tag-only
```

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```
vlan set accept-frame-type port 1 tag-only
vlan set accept-frame-type port 2 tag-only
vlan set accept-frame-type port 3 tag-only

# Isolate LAN port 1...4 from each other, allow only
communication between LANx and WAN
port set isolation port 0 mode0 egress-port 4
port set isolation port 1 mode0 egress-port 4
port set isolation port 2 mode0 egress-port 4
port set isolation port 3 mode0 egress-port 4

exit
EOF
```

How to make transparency to any VLANs so VLAN tagged frames are not filtered.

```
switch --enable-lan

conf <<EOF
vlan init
# Enable VLAN transparency
vlan set ingress-filter port 0-4 state disable
vlan set transparent state enable
vlan set egress port 0-4 keep-tag ingress-port 0-4 state
enable
l2-table set lookup-miss port 0-4 ip-mcast action flood-
in-vlan
l2-table set lookup-miss port 0-4 ip6-mcast action flood-
in-vlan
exit
EOF
```

How to make transparency to any VLANs and have VLAN 50 as mgt.

```
switch --enable-lan

conf <<EOF
vlan init
vlan create vlan-table vid 50
vlan set vlan-table vid 50 member 4,6
vlan set vlan-table vid 50 ext-member 0-5
vlan set pvid port 6 50
vlan set vlan-table vid 50 tag-member 4
# Remove untagged management from CPU
vlan set vlan-table vid 1 member 0-4
# Enable VLAN transparency
```

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```
vlan set ingress-filter port 0-4 state disable
vlan set transparent state enable
vlan set egress port 0-4 keep-tag ingress-port 0-4 state
enable
# CPU port egress tagged
vlan set egress port 6 keep-tag ingress-port 4 state
disable
# Configure classifier rule for management VLAN 50
classf set cf-sel-port pon enable
classf set upstream-unmatch-act permit
classf clear
classf set rule direction downstream
classf set rule tag-vid data 50 mask 0xfff
classf set downstream-action uni-forward-act forced port
6
classf set downstream-action cvlan-act del
classf add entry 0
l2-table set lookup-miss port 0-4 ip-mcast action flood-
in-vlan
l2-table set lookup-miss port 0-4 ip6-mcast action flood-
in-vlan
exit
EOF
```

How to 3 VLANs with 1 mgt VLAN

```
# Vlan 601 Mgmt
# Vlan 602 Bridge Internet LANport1+2
# Vlan 603 Bridge Voip LANport3
# Vlan 604 IPTV LAN4

switch --enable-lan

conf <<EOF
# initialize VLAN configuration
vlan init
# create C-VLAN 601
vlan create vlan-table vid 601
# create C-VLAN 602
vlan create vlan-table vid 602
# create C-VLAN 603
vlan create vlan-table vid 603
# create C-VLAN 604
vlan create vlan-table vid 604
# define member ports for C-VLAN 602, LAN 1, 2 and WAN
vlan set vlan-table vid 602 member 0,1,4
vlan set vlan-table vid 602 untag-member 0,1
```

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```
# define member ports for C-VLAN 603, LAN 3 and WAN
vlan set vlan-table vid 603 member 2,4
vlan set vlan-table vid 603 untag-member 2
# define member ports for C-VLAN 604, LAN 4 and WAN
vlan set vlan-table vid 604 member 3,4
vlan set vlan-table vid 604 untag-member 3
# define management vlan vid 601
vlan create vlan-table vid 601
vlan set vlan-table vid 601 member 4,6
vlan set vlan-table vid 601 ext-member 0-5
vlan set pvid port 6 601
# define WAN as tagged member of VLAN 601
vlan set vlan-table vid 601 tag-member 4
# define CPU as untagged member of VLAN 601
vlan set vlan-table vid 601 untag-member 6


# defined config port based vid for LAN port 1...4
vlan set pvid port 0 602
vlan set pvid port 1 602
vlan set pvid port 2 603
vlan set pvid port 3 604
exit
EOF
```

How to reprioritize frames entering on one port to another

```
# If you want to set port-based priority of a port
(example priority 1), the following commands can be used:
conf qos set remapping port all internal-priority 1
conf qos get remapping port all
```

How to enable dhcp relay and let the frames keep their origin tags

```
# If both tagged/untagged vids are to be DHCP relayed to
CPU (DHCP option 82), then the following example can be
used. VLAN vid 1 is default CPU management vlan; VLAN vid
2 is untagged VLAN on LAN ports, tagged VLAN on WAN; VLAN
vid 50 is tagged VLAN on LAN/WAN ports
switch --enable-lan
/etc/init.d/dhcprelayd start -i

conf <<EOC

vlan create vlan-table vid 2
vlan create vlan-table vid 50
```

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```
vlan set vlan-table vid  2 member 0-6
vlan set vlan-table vid  2 untag-member 0-3
vlan set vlan-table vid  2 tag-member 4-6

vlan set vlan-table vid  50 member 0-6
vlan set vlan-table vid  50 tag-member 0-6

vlan set pvid port 0 2
vlan set pvid port 1 2
vlan set pvid port 4 1
vlan set pvid port 6 1
exit
EOC
```

How to rate limit traffic based on VLAN VID

```
# Here is an example for rate limiting vlan 100 on LAN
port 1 with a limitation of 10Mbps. Other VLANs on LAN
port 1 will not be affected by this rate limitation

conf <<EOC

# step 0, set a meter
meter set entry 1 rate 10000

# step 1, enable port 0 acl state
acl set port 0 state enable

# step 2, and a template to compare vlan id
acl clear template
acl set template ctag
acl add template entry 2

# step 3, add ACL rule entry
acl clear

# the template entry index
acl set rule template entry 2
acl set rule state valid

# LAN port 0
acl set rule port 0

# VLAN id = 100 will hit this ACL rule
acl set rule ctag data vid 100 priority 0 cfi 0 mask vid
0xfff priority 0x0 cfi 0x0
acl clear action
```

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```
# use meter index 1
acl set action meter 1

# the ACL rule means:  the traffic (with vlan tag = 100,
and rx from LAN port 0), will rate limit by meter index 1
acl add entry 10
exit
EOC
```

How to enable remarking of p-bit on WAN port for different vlans.

```
# 101, tagged WAN, untagged LAN 3, priority 6 on WAN
# 104, tagged WAN, untagged LAN 1, priority 1 on WAN
# 114, tagged WAN, untagged LAN 4, priority 5 on WAN
# 245, tagged WAN, tagged LAN 2, with priority 7 on WAN
# 247, tagged WAN, tagged LAN 2, with priority 6 on WAN
# 254, tagged WAN, tagged LAN 2, no priority

# Default-VLANs per port:
# LAN port 1 = 93, LAN port 3 = 91, LAN port 4 = 94

switch --enable-lan

conf << EOF
# VLAN definitions
vlan create vlan-table vid 101
vlan create vlan-table vid 104
vlan create vlan-table vid 114
vlan create vlan-table vid 245
vlan create vlan-table vid 247
vlan create vlan-table vid 254

# Member port assignments
vlan set vlan-table vid 101 member 2,4
vlan set vlan-table vid 104 member 0,4
vlan set vlan-table vid 114 member 3,4
vlan set vlan-table vid 245 member 1,4
vlan set vlan-table vid 247 member 1,4
vlan set vlan-table vid 254 member 1,4

# Untagged member ports, other members are default tagged
vlan set vlan-table vid 101 untag-member 2
vlan set vlan-table vid 104 untag-member 0
vlan set vlan-table vid 114 untag-member 3
```

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```
# default vid for ports, untagged frames are mapped into
default VLAN
vlan set pvid port 0 104
vlan set pvid port 2 101
vlan set pvid port 3 114

# Enable vlan based prioritization internally in switch
vlan set vlan-table vid 101 vlan-based-priority state
enable
vlan set vlan-table vid 104 vlan-based-priority state
enable
vlan set vlan-table vid 114 vlan-based-priority state
enable
vlan set vlan-table vid 245 vlan-based-priority state
enable
vlan set vlan-table vid 247 vlan-based-priority state
enable
vlan set vlan-table vid 254 vlan-based-priority state
enable

# Assign internal prioritization in switch based on vlan
vid
vlan set vlan-table vid 101 vlan-based-priority priority
6
vlan set vlan-table vid 104 vlan-based-priority priority
1
vlan set vlan-table vid 114 vlan-based-priority priority
5
vlan set vlan-table vid 245 vlan-based-priority priority
7
vlan set vlan-table vid 247 vlan-based-priority priority
6

# the following ports are untagged, so let us define
their internal priority value
qos set remapping port 0 internal-priority 0
qos set remapping port 2 internal-priority 0
qos set remapping port 3 internal-priority 0

# how to distingish between the priorities, vlan must be
of a higher value, as their internal prioritization value
must be carried to the egress of the switch
qos set priority-selector group-id 0 port 3
qos set priority-selector group-id 0 vlan 8

# definition of the remarking values at the egress of the
switch (comes from the internally prioritization values
above)
```

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```
qos set remarking dot1p user-priority 1 dot1p-priority 1
qos set remarking dot1p user-priority 5 dot1p-priority 5
qos set remarking dot1p user-priority 6 dot1p-priority 6
qos set remarking dot1p user-priority 7 dot1p-priority 7

# WAN port should have remarking enabled, so egress on
WAN p-bit value is kept from the internal value through
the egress assigned value
qos set remarking dot1p port 4 state enable

exit
EOF
```

How to select DHCP DISCOVERs from "valid" VLAN versus "invalid" VLAN when using DHCP relay feature (DHCP option 82)

```
# Applicable to firmware release 05_22 and later
# This relay feature is integrated in the DHCP option 82.
Typically with DHCP Option 82 all DHCP DISCOVERs/REQUESTs
are relayed to CPU. With this add-on feature, the
operator can specify from which VLAN(s) they would like
to have this support. DHCPs received from other than the
VLAN(s) defined will be dropped. Notie following example
is made with VALN vid 100.

# The following flag is to be set in order for specific
DHCP relay function (other than default) to work
fw_setenv dhcprelayd_ext_rules 1

# Please copy text between -------- below into a file on
device flash disc, alternatively tftp the file from TFTP
server:
/etc/config/flash/saved_configuration/dhcprelayd_start

# After download or copy, please start DHCP relay
function.
/etc/init.d/dhcprelayd start
#--------
conf <<EOF
# Define template for forwarding rule
field-selector set index 1 format ipv4-header offset 8
field-selector set index 2 format ip-payload offset 2
acl clear template
acl set template user-field 1
acl set template user-field 2
acl set template ctag
acl add template entry 1
acl set rule template entry 1
```

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```
acl set rule state valid
acl set rule port 0-3
# ipv4-header offset 8 value = 0x0011 meas UDP
acl set rule user-field 1 data 0x0011 mask 0x00ff
# UDP source port = 0x44 means DHCP Client
acl set rule user-field 2 data 0x0044 mask 0xffff
acl set rule ctag data vid 100 priority 0 cfi 0 mask vid
0xfff priority 0x0 cfi 0x0
1 # DHCP Server trap to CPU
field-selector set index 1 format ipv4-header offset 8
field-selector set index 2 format ip-payload offset 2
acl clear template
acl set template user-field 1
acl set template user-field 2
acl add template entry 1
acl set rule template entry 1
acl set rule state valid
acl set rule port 0-3
# ipv4-header offset 8 value = 0x0011 meas UDP
acl set rule user-field 1 data 0x0011 mask 0x00ff
# UDP source port = 0x43 means DHCP Server
acl set rule user-field 2 data 0x0043 mask 0xffff acl
clear action
acl set action redirect port 6
acl add entry 2

acl set port 0-3 state enable
acl set port 0-3 permit enable

# Define rule for how to handle untagged frames, notice
that ACL index number must be higher than previous ACL
rules.

acl set rule template entry 1
acl set rule state valid
acl set rule port 0-3
# ipv4-header offset 8 value = 0x0011 meas UDP
acl set rule user-field 1 data 0x0011 mask 0x00ff
# UDP source port = 0x44 means DHCP Client
acl set rule user-field 2 data 0x0044 mask 0xffff
acl clear action
#acl set action trap-to-cpu
#acl set action redirect port 6
acl set action drop
acl add entry 4
exit
EOF
```

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```
#--------
```

How to change managment vlan from native to specific vlan, once and for all?

```
# Device typically will boot in native vlan, however this
can be changed, either by applying DHCP option 125 in
DHCP offer or using the following syntax in configuration
script

# Please specify the VLAN VID within the <>

VID=`fw_printenv vlan`
   if [ "x$VID" = "x" ]; then
       fw_setenv vlan <VLAN VID>
       reboot
   else
```

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