AOS-CX 10.09 Ingress policy support for sub interfaces

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6300,6400,8360 switch platforms

Agenda

1	Ingress policy support on specific platforms for sub interfaces	1of2
2	Ingress policy support on specific platform with PBR	2of2

Ingress policy support for sub interfaces

6300,6400,8360 switch platforms

Sub-interfaces summary

Overview – introduced in 10.08 but without policy support for sub-interfaces

- A sub-interface (also called child-interface) is a virtual interface created by dividing one parent interface (physical or LAG) into multiple logical interfaces that are tagged using different VLAN-IDs.
- Sub-interfaces use the parent physical interface for sending and receiving IP traffic.
- The feature is related to IP transport and not to Ethernet transport: consequently, sub-interfaces are available only for L3 interfaces. No sub-interface support for L2 interface.
- Multiple sub-interfaces (or child interfaces) can now be created below one parent interface.
- Parent interface can be a regular physical L3 interface including a split L3 port or a L3 LAG

ROP (L3 port)

```
interface 1/1/2
    no shutdown
interface 1/1/2.1
interface 1/1/2.2
interface 1/1/2.7
interface 1/1/2.9
interface 1/1/2.10
interface 1/1/2.11
interface 1/1/2.12
interface 1/1/2.13
interface 1/1/2.14
interface 1/1/2.15
interface 1/1/2.100
```

Split L3 Port

```
interface 1/1/35
    split
interface 1/1/35:1
    no shutdown
interface 1/1/35:1.1
interface 1/1/35:1.2
interface 1/1/35:2
    no shutdown
interface 1/1/35:2.1
interface 1/1/35:2.2
interface 1/1/35:2.3
interface 1/1/35:2.4
interface 1/1/35:2.5
```

L3 LAG

```
interface lag 1
interface lag1.1
interface lag1.5
interface lag1.10
interface lag1.11
interface lag1.12
interface lag1.13
interface lag1.14
interface lag1.20
```

Policy Support inbound for sub-interfaces

Overview

- Policy support for inbound sub interfaces is now supported in 10-09
- Policy can only be applied ‘inbound’ on an interface – no egress policy support
- Application of policy must adhere to existing feature functional requirements of sub interfaces, example L3 only for sub interfaces on standard interfaces & L3 LAG. L2 sub-interfaces are not supported
  - sub-interfaces are referenced as a ‘child’ interface
  - the sub-interface parent must be up/routing
  - cannot configure IP addresses on parent
  - Parent must be ‘routing’ (not layer 2) and in the ‘no shut’ state
- Policy follows existing process of a ‘Classifier’ tied to ‘Policy’, as used for policy application with interfaces, and this leveraged for sub-interface policy support
- Policy support includes IPv4,IPv6 and mac classifying and policing within VLAN

Policy Support inbound for sub-interfaces

Overview continued

- Classifier
  - A classifier policy allows an administrator to define sets of rules based on network traffic addressing or other content, and use these rules to match and restrict or alter the traffic passage through the switch by applying to a policy
  - There are three type of rules for traffic classes , MAC, IPv4 & IPv6, which are focussed on each frame/packet characteristics
- Policy
  - Choosing the rule criteria is called classification and one rule or list of rules is called a policy which can leverage a single or multiple ‘actions’ matched by the traffic class
  - A policy contains one or more entries listed based on priority by sequence number
  - Policy actions are broadly classified as following:
    - Remark
    - Police actions
    - Other actions

Policy examples: Remark, Police, Drop, Mirror and other actions

Policy actions - example

Remark Policy inbound
Remark to AF41 DSCP

Police Policy inbound
subnet 10.1.0.0/24 CIR rate 10000 kbps

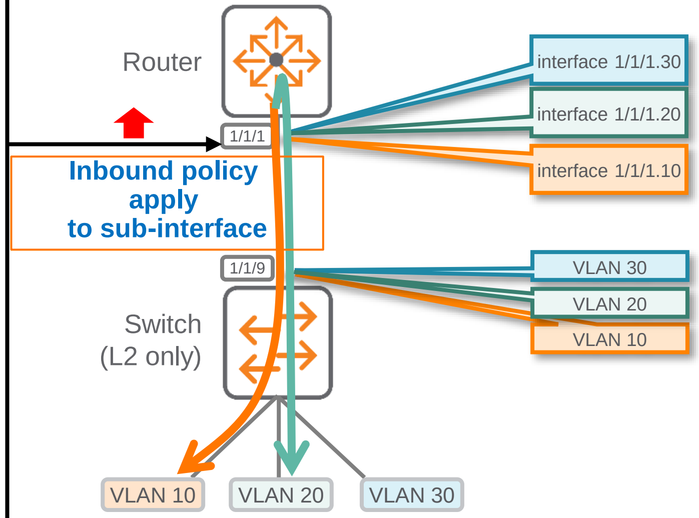
Drop Policy inbound
Host(s) 10.1.1.1 drop

Mirror Policy inbound
Host(s) 10.1.2.2 mirror

Other actions
PBR, PCP (priority Code Point), local-priority

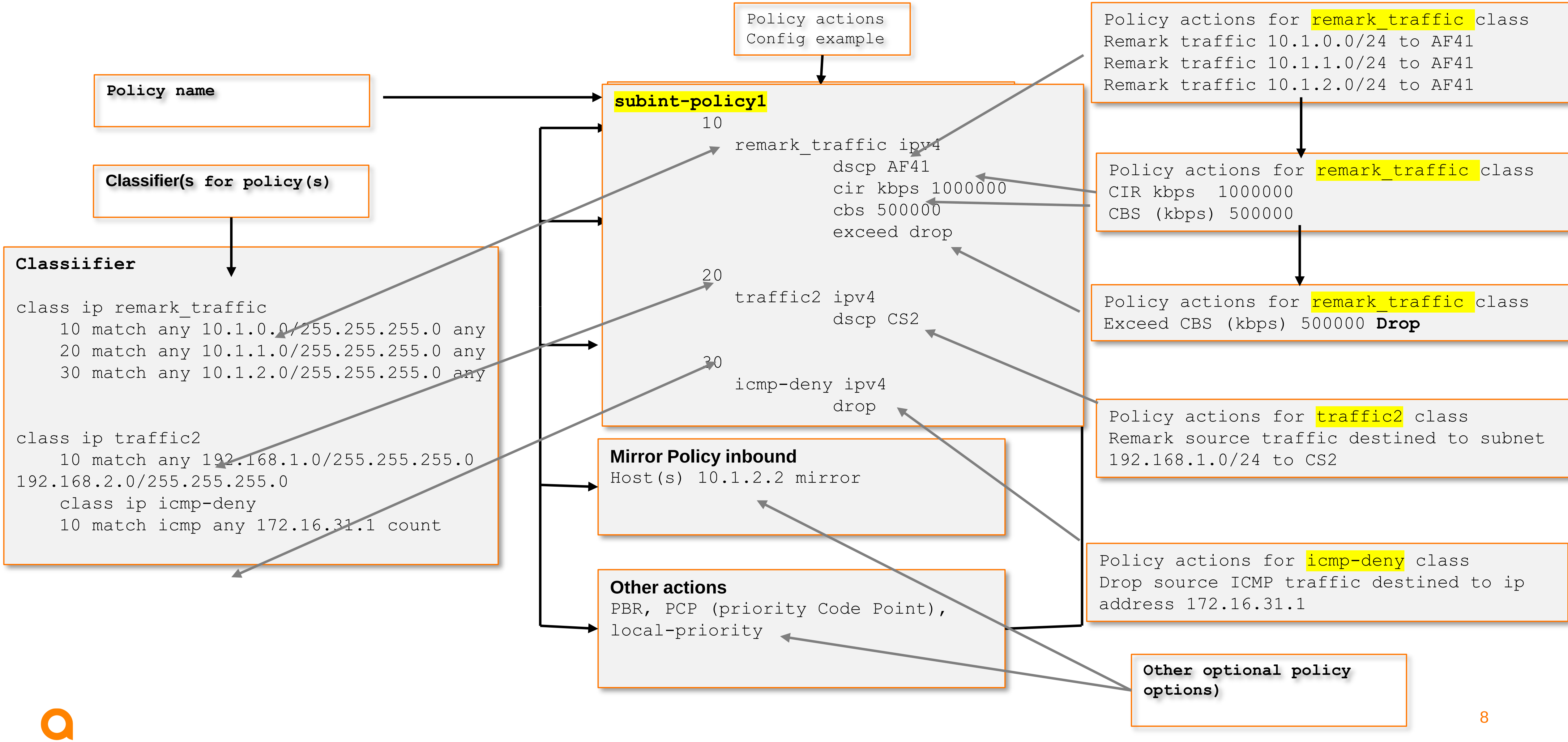
Classifier(s for policy(s)

```
Classifier

class ip icmp-deny
    10 match icmp any 172.16.31.1 count

class ip remark_traffic
    10 match any 10.1.0.0/255.255.255.0 any
    20 match any 10.1.1.0/255.255.255.0 any
    30 match any 10.1.2.0/255.255.255.0 any


class ip traffic2
    10 match any 192.168.1.0/255.255.255.0
192.168.2.0/255.255.255.0
    20 match ah 192.168.3.250 any
```



Other optional policy options)

Policy examples: Remark, Police, Drop, Mirror and other actions



Policy actions
Config example

Policy name

Classifier(s for policy(s)

Classiifier

```
class ip remark_traffic
    10 match any 10.1.0.0/255.255.255.0 any
    20 match any 10.1.1.0/255.255.255.0 any
    30 match any 10.1.2.0/255.255.255.0 any


class ip traffic2
    10 match any 192.168.1.0/255.255.255.0
192.168.2.0/255.255.255.0
    class ip icmp-deny
    10 match icmp any 172.16.31.1 count
```

```
subint-policy1
          10
             remark_traffic ipv4
                           dscp AF41
                           cir kbps 1000000
                           cbs 500000
                           exceed drop


          20
             traffic2 ipv4
                           dscp CS2

          30
             icmp-deny ipv4
                           drop
```

Mirror Policy inbound
Host(s) 10.1.2.2 mirror

Other actions
PBR, PCP (priority Code Point),
local-priority

Policy actions for remark_traffic class
Remark traffic 10.1.0.0/24 to AF41
Remark traffic 10.1.1.0/24 to AF41
Remark traffic 10.1.2.0/24 to AF41

Policy actions for remark_traffic class
CIR kbps 1000000
CBS (kbps) 500000

Policy actions for remark_traffic class
Exceed CBS (kbps) 500000 **Drop**

Policy actions for traffic2 class
Remark source traffic destined to subnet
192.168.1.0/24 to CS2

Policy actions for icmp-deny class
Drop source ICMP traffic destined to ip
address 172.16.31.1

**Other optional policy
options)**

Configuration summary example

Configure ‘class’ match

```
class ip remark_traffic
    10 match any 10.1.1.0/255.255.255.0 any
```

```
class ip traffic2
    10 match any 192.168.1.0/255.255.255.0
192.168.2.0/255.255.255.0
    20 match ah 192.168.3.250 any
```

Create a policy and attach ‘classifiers’

```
policy subint-policy1
    10 class ip remark_traffic action dscp AF41 action cir
kbps 1000000 cbs 500000 exceed drop
    20 class ip traffic2 action dscp CS2
```

Apply policy to sub-interface with ‘apply’ command

```
interface 1/3/48.10
    no shutdown
    apply policy subint-policy1 in
    ip address 172.16.31.1/31
    ip ospf 1 area 0.0.0.0
    no ip ospf passive
    ip ospf network point-to-point
    encapsulation dot1q 10
    exit
```

Configuration verification -1

```
6405-BLDG03# sh policy subint-policy1
           Name
           Additional Policy Parameters
  Sequence Comment
           Class Type
                    action
-------------------------------------------------------------------------------
           subint-policy1
        10
           remark_traffic ipv4
                    dscp AF41
                    cir kbps 1000000
                    cbs 500000
                    exceed drop

        20
           traffic2 ipv4
                    dscp CS2

        30
           icmp-deny ipv4
                    drop

-------------------------------------------------------------------------------
```

‘sh policy [policy-name]’

Configuration verification- 2

```
6405-BLDG03# sh running-config interface 1/3/48.10
interface 1/3/48.10
    no shutdown
    apply policy subint-policy1 routed-in
    ip address 172.16.31.1/31
    ip ospf 1 area 0.0.0.0
    no ip ospf passive
    ip ospf network point-to-point
    encapsulation dot1q 10
    exit
```

```
6405-BLDG03# sh policy hitcounts subint-policy1
Statistics for Policy subint-policy1:

VRF default
interface 1/3/48.10 (routed-in):
     Matched Packets  Configuration
10 class ip remark_traffic action dscp AF41 action cir kbps 1000000 cbs 500000 exceed drop
[ 0 kbps conform ]
                   -  10 match any 10.1.1.0/255.255.255.0 any
20 class ip traffic2 action dscp CS2
                   -  10 match any 192.168.1.0/255.255.255.0 192.168.2.0/255.255.255.0
                   -  20 match ah 192.168.3.250 any
30 class ip icmp-deny action drop
                   0  10 match icmp any 172.16.31.1 count
```

‘sh policy hitcounts [policy-name]’

Configuration verififcation-3

Output is all switch policy configuration

```
6405-BLDG03# sh policy configuration
```

Output is specific interface policy

```
6405-BLDG03# sh policy interface 1/3/48.10
```

Output is policy commands applied on the switch (not ‘class’ configured definitions)

```
6405-BLDG03# sh policy commands
policy subint-policy1
    10 class ip remark_traffic action dscp AF41 action cir kbps 1000000 cbs 500000 exceed
drop
    20 class ip traffic2 action dscp CS2
    30 class ip icmp-deny action drop
interface 1/3/48.10
    apply policy subint-policy1 routed-in
```

Output is vsx-peer node configuration and commands

```
6405-BLDG03# sh policy vsx-peer
  commands        Format output as CLI commands
  configuration   Display user-specified configuration
```

Policy configuration notes

Detail

- Multiple ‘classifiers’ can be tied to a policy, classifiers can have multiple ‘classifications’
- A policy cannot be applied to the ‘parent’ interface of one or more sub-interfaces. This also means a sub-interface cannot be applied to an interface if there is a policy applied (at parent interface)
- If a policy contains any in class entry with the ‘count’ keyword and is applied to multiple sub-interfaces in the same direction:
  - The statistics will be aggregated
  - For ‘routed-in’ direction the statistics will aggregated only for sub-interfaces in the same vrf
  - Separate stats for different sub-interfaces can be obtained using another policy
  - Per-interface keyword is not available in the sub-interface context
- Sub-interface applications share lookups with ingress and egress VLANs
- `no policy [policy name]` removes the policy from the global configuration (even if applied within an interface sub context)

Policy configuration notes -2

Detail -2

- Note the usage of ‘in’ and routed-in cli syntax when applying policy to an interface, example with policy ‘subint-policy1’

```
apply policy subint-policy1 routed-in
```

or

```
apply policy subint-policy1 in
```

	MAC Class(es)	PBR action
Ingress sub-interface policy ‘in’	yes	no
routed-ingress sub-interface policy ‘routed-in’	no	Yes

- The direction option ‘in’ & ‘routed-in’ provides the option for administrators to decide between mac class policy and the PBR option for routed traffic. For routed traffic and for the option of using the PBR feature, use the `routed-in` option aruba

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Thank you

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