IRS16: 4 byte ASN

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4 byte ASNの対応状況

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4 byte ASNの対応状況

- IOS XR 3.4

- IOS:
- 12.0S　2008 End (TBC?)
- 12.2SR　2008 End
- 12.2SB　2008 End
- 12.2SX　2008 End
- 12.5T　2009 Q2

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実装

- RFC 4893
- draft-rekhter-as4octet-ext-community-02.txt
- 4-byte ASN value has the format of "XX.YY"

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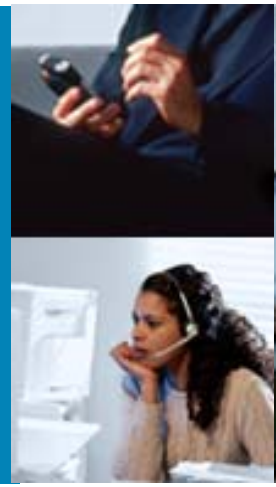
運用での変更点



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configuration (IOS XR, as4bytes)

```
RP/0/1/CPU0:MF12404D-XR(config)#router bgp ?
  <1-65535>   AS # for our autonomous system
  <1-65535>.  AS # for our autonomous system (xx.yy format)
RP/0/1/CPU0:MF12404D-XR(config)#router bgp 10.?
  <0-65535>  Second half of xx.yy AS number


RP/0/1/CPU0:MF12404D-XR(config)#router bgp 3.3
RP/0/1/CPU0:MF12404D-XR(config-bgp)#neighbor 1.1.1.1
RP/0/1/CPU0:MF12404D-XR(config-bgp-nbr)#remote-as ?
  <1-65535>   AS of remote neighbor
  <1-65535>.  AS of remote neighbor (xx.yy format)
```


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configuration (IOS XR, as4bytes)

```
router bgp 3.3
 address-family ipv4 unicast
  network 5.5.5.5/32
 !
 neighbor 12.12.12.10
  remote-as 2
  address-family ipv4 unicast
   route-policy ANY in
   route-policy ANY out
  !
 !
!
```

相手AS番号が2-byteの時はこれまでどおりの表記 (0.2ではない)

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configuration (IOS XR, as4bytes)

```
RP/0/0/CPU0:MF12404B-XR#sh run router bgp
router bgp 109
 address-family ipv4 unicast
  network 7.7.7.7/32
 !
 neighbor 12.12.12.4
  remote-as 2.2
  address-family ipv4 unicast
   route-policy ANY in
   route-policy ANY out
  !
```

自AS番号が2-byteの時はこれまでどおりの表記
(0.109ではない)

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configuration (IOS XR, as4bytes)

```
!
route-policy hogehoge
  if as-path passes-through '5.5' then
    drop
  else
    pass
  endif
!
prepend as-path 100.20 3
!
as-path-set hoge
  ios-regex ‘^(4713_)+(2.0_)+$’,     ! 200,210… にmatch
  ios-regex ‘^(4713_)+(2¥.0_)+$’     ! 2.0 に match
end-set
!
```


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show bgp (IOS XR)

```
RP/0/0/CPU0:MF12404A-XR#sh bgp
BGP router identifier 4.4.4.4, local AS number 2.2
BGP generic scan interval 60 secs
BGP table state: Active
Table ID: 0xe0000000
BGP main routing table version 12
BGP scan interval 60 secs

Status codes: s suppressed, d damped, h history, * valid, > best
              i - internal, S stale
Origin codes: i - IGP, e - EGP, ? - incomplete
   Network            Next Hop            Metric LocPrf Weight Path
*> 1.1.1.1/32         10.10.10.1               0             0 1 i
*> 4.4.4.4/32         0.0.0.0                  0         32768 i
*> 5.5.5.5/32         10.10.10.1                             0 1 2 3.3 i
*> 10.10.10.10/32     10.10.10.1                             0 1 2 i

Processed 4 prefixes, 4 paths
```


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show bgp neighbor (IOS XR)

```
BGP neighbor is 11.11.11.5
 Remote AS 2.2, local AS 100, external link
 Remote router ID 5.5.5.5
  BGP state = Established, up for 00:33:17
  Last read 00:00:14, hold time is 180, keepalive interval is 60
seconds
  Precedence: internet
  Neighbor capabilities:
    Route refresh: advertised and received
    4-byte AS: advertised and received
    Address family IPv4 Unicast: advertised and received
  Received 37 messages, 0 notifications, 0 in queue
  Sent 37 messages, 1 notifications, 0 in queue
  Minimum time between advertisement runs is 30 seconds
```

4-byte capable でも自AS表記は旧表記

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configuration (IOS, not as4bytes)

```
router bgp 2
 bgp log-neighbor-changes
 neighbor 11.11.11.1 remote-as 1
 neighbor 12.12.12.5 remote-as 23456
 !
```


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show ip bgp (IOS)

```
MF7606A#sh ip bgp
BGP table version is 11, local router ID is 12.12.12.10
Status codes: s suppressed, d damped, h history, * valid, > best, i -
internal,
              r RIB-failure, S Stale
Origin codes: i - IGP, e - EGP, ? - incomplete

   Network          Next Hop            Metric LocPrf Weight Path
*> 1.1.1.1/32       11.11.11.1               0             0 1 i
*> 4.4.4.4/32       11.11.11.1                             0 1 23456 i
*> 5.5.5.5/32       12.12.12.5               0             0 23456 i
*> 10.10.10.10/32   0.0.0.0                  0         32768 i
```


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そのほか注意事項など

- neighbor に 4 byte ASN capable な人と not capable な人がいると、update-group が別々になります（次頁参照）

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そのほか注意事項など

```
RP/0/0/CPU0:MF12404A-XR#sh bgp neighbors

BGP neighbor is 10.10.10.1
 Remote AS 1, local AS 23456, external link
                  :
  Neighbor capabilities:
    Route refresh: advertised and received
    4-byte AS: advertised <<<< 隣は 2byte AS の人
    Address family IPv4 Unicast: advertised and received
                  :
 For Address Family: IPv4 Unicast
  BGP neighbor version 6
  Update group: 0.1

BGP neighbor is 12.12.12.7
 Remote AS 7.7, local AS 2.2, external link
                  :
  Neighbor capabilities:
    Route refresh: advertised and received
    4-byte AS: advertised and received              <<<< 隣は 4byte AS な人
    Address family IPv4 Unicast: advertised and received
                  :
 For Address Family: IPv4 Unicast
  BGP neighbor version 6
  Update group: 0.2
```


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そのほか注意事項など

```
RP/0/0/CPU0:MF12404A-XR#sh bgp update-group

Update group for IPv4 Unicast, index 0.1:
  Attributes:
    Outbound policy: ANY
    Minimum advertisement interval: 30
  Update group desynchronized: 0
  Sub-groups merged: 0
  Messages formatted: 2, replicated: 2
  All neighbors are assigned to sub-group(s)
    Neighbors in sub-group: 0.1
      10.10.10.1       <<<< 2byte AS の人

Update group for IPv4 Unicast, index 0.2:
  Attributes:
    Outbound policy: ANY
    4-byte AS capable
    Minimum advertisement interval: 30
  Update group desynchronized: 0
  Sub-groups merged: 0
  Messages formatted: 4, replicated: 4
  All neighbors are assigned to sub-group(s)
    Neighbors in sub-group: 0.2
      12.12.12.7       <<<< 4byte AS の人
```


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そのほか注意事項など

- as-path filter
  - –正規表現
  - –2-byte な人が複数の 4-byte な人の経路をフィルタ？
- aggregate
  - –2-byte な人が 4-byte の経路を集約したら？

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最後に...

- ご意見･ご要望を是非お聞かせ下さい

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