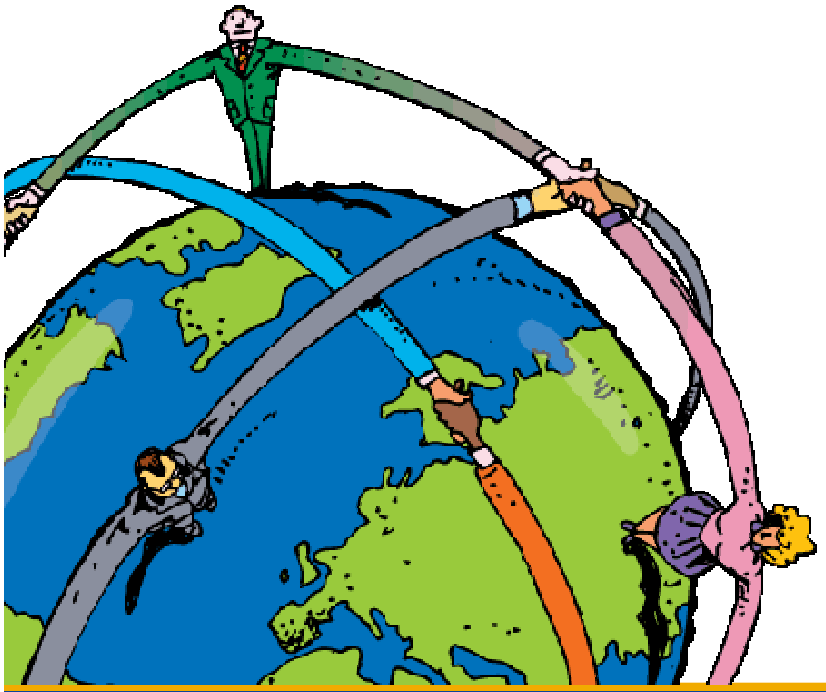

TWNIC 11th OPM, Nov. 2008

4-byte ASN Y2008 Current Status & Basic Configuration

Kevin Chao (趙善崑)

Professional Service APAC

Outline

- 4-byte ASN Quick Reminders
- Juniper Feature Support Status
- Basic Configuration (JUNOS)
- Summary

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4-byte AS Quick Reminders

- **Running Out of 2-byte AS Numbers (ASN)**
  - *http://www.potaroo.net/tools/asns*
- **From 2009/1, RIRs are allocating 4-byte ASN**
  - *If I need a new one, I'll get a 4-byte*
- **No Worry**
  - *It's "Backward Compatible" with 2-byte ASN in BGP*
  - *If I get a new 4-byte ASN now, I can still talk to Internet*
- **No Hurry**
  - *RFC4893 proposes how to do transition*
  - *No "Flag Day" for the transition*

4-byte AS Quick Reminders – cont.

- **ASPLAIN vs. ASDOT Notation**
  - *240611 vs. 3.64003*
- **Mappable vs. Non-mappable ASN**
  - *0.64003 vs. 3.64003(240611)*
- **From RFC4893, for the transition**
  - *Changes when build up BGP (AS_TRANS, 23456)*
  - *Changes in AS PATH (AS4_PATH)*
  - *Changes in AS Aggregator (AS4_AGGREGATOR)*
  - *Changes will be needed in BGP Community (AS-EXT-COM)*
- **Other References**
  - http://opm.twnic.net.tw/8th/
  - http://wiki.icons.apnic.net/pages/viewpage.action?pageId=983042
  - http://tools.ietf.org/id/draft-rekhter-as4octet-ext-community-03.txt

RFC 4893 Recap.

- **How should New and Old BGP Routers talk?**
  - *A New Capability Code when initiate BGP session*
  - *Use AS23456 as a token, (AS_TRANS)*

  "I'm AS23456" + "I'm capable of talking 4-byte ASN, and my real ASN is 1111111"

- **How to update 4byte AS PATH?**
  - *AS4_PATH Attribute (Optional and Transitive)*
  - *AS4_AGGREGATOR Attribute (Optional and Transitive)*

RFC 4893 Recap. – cont.

- **Some Considerations**
  - *Start using a 4-byte AS number only after all BGP speakers within that AS have been upgraded*
  - *Old BGP Speakers MUST NOT use AS_TRANS as its ASN*
  - *Non-mappable 4-byte AS can't not be used in BGP sub-confederation*
  - *A case if an Old BGP refers to MED from peers*

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Juniper Feature Support Status

- **Support features defined by RFC 4893**
- **JUNOS (M/T/MX/EX/J) starts this since 9.1**
  - *9.2 enhances ASDOT*
- **JUNOSe (E-series) shall officially announce it in 9-3-X**
  - *Started before 8-1-0 when it's still "draft-ietf-idr-as4bytes-08.txt"*
  - *No ASDOT plan*
- **Juniper keeps supporting 2-byte ASN**

"Please Consult your Solution Provider before Upgrade"

Outline

- § 4-byte ASN Quick Reminders
- § Juniper Feature Support Status
- § **Basic Configuration (JUNOS)**
  - AS Number and Community
  - BGP New-to-New
  - BGP New-to-OLD
  - Some Observations
- § Summary

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- 4-byte ASN Quick Reminders
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Basic Configuration – AS Number

```
routing-options {
    autonomous-system 260611;          #JUNOS 9.1
}
```

```
routing-options {
    autonomous-system 3.64003;         #JUNOS 9.2
}
```

Basic Configuration – Community

- ***4byte AS specific BGP Extended Community still in draft***

  http://tools.ietf.org/id/draft-rekhter-as4octet-ext-community-03.txt

```
policy-options {
    community peer2 members origin:260611L:222;          #JUNOS 9.1
}
```

```
policy-options {
    community peer members origin:2.64002:111;          #JUNOS 9.2
}
```

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Basic Configuration – BGP New to New

```
protocols {
    bgp {
        group NEW-BGP-peer {
            type external;
            neighbor 172.16.34.4 {
                peer-as 130537;                    #1.65001 after JUNOS 9.2
            }
        }
    }
}
```

Basic Configuration – BGP New to Old

OLD-BGP

```
routing-options {
    autonomous-system 2222;
}

bgp {
    group NEW-BGP-peer {
        type external;
        neighbor 172.16.23.3 {
            peer-as 23456;
        }
    }
}
```

New-BGP

```
routing-options {
    autonomous-system 333333;
}

bgp {
    group OLD-BGP-peer {
        type external;
        neighbor 172.16.23.2 {
            peer-as 2222;
        }
    }
}
```

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Observation – BGP Neighbor Status

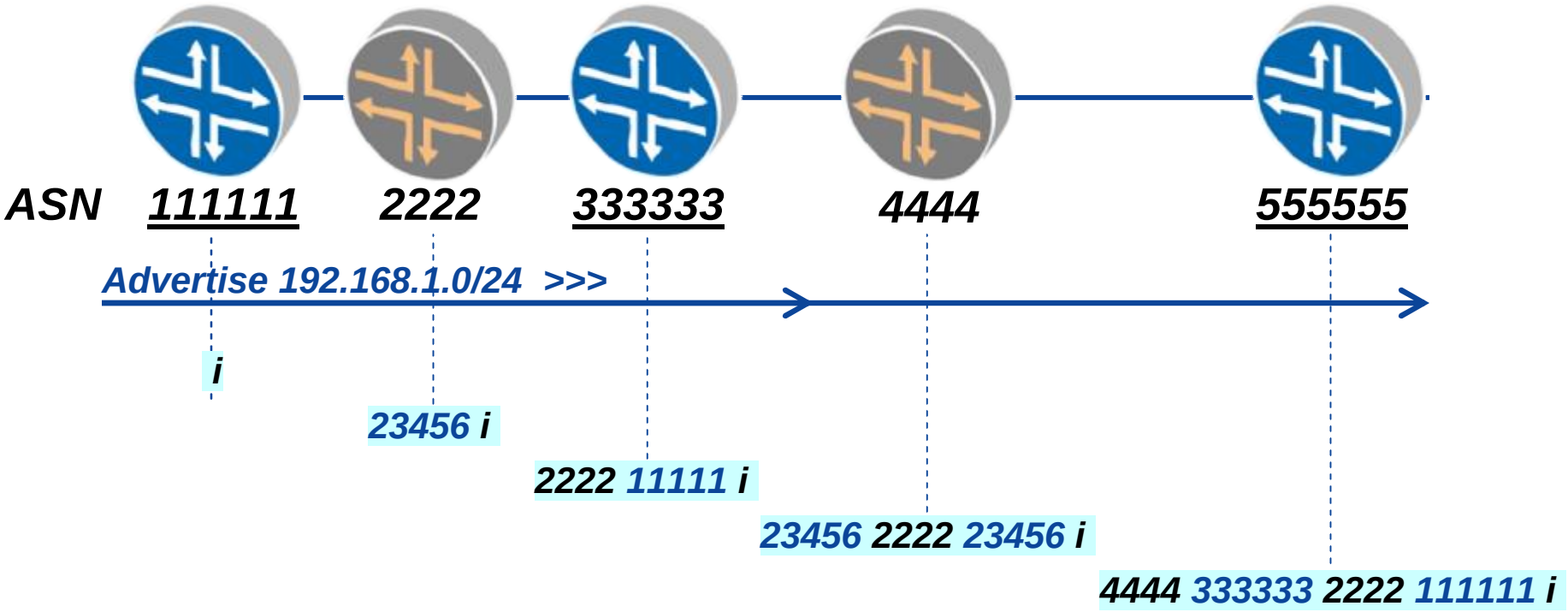
>**show bgp neighbor** 172.16.23.2

Peer: 172.16.23.2+179 AS 22222 **Local:** 172.16.23.3+62663 **AS 333333**
Type: External State: Established Flags: <ImportEval Sync>
…
Peer ID: 2.2.2.2 Local ID: 3.3.3.3 Active Holdtime: 90
Keepalive Interval: 30 Peer index: 1
…
…
Peer does not support 4 byte AS extension

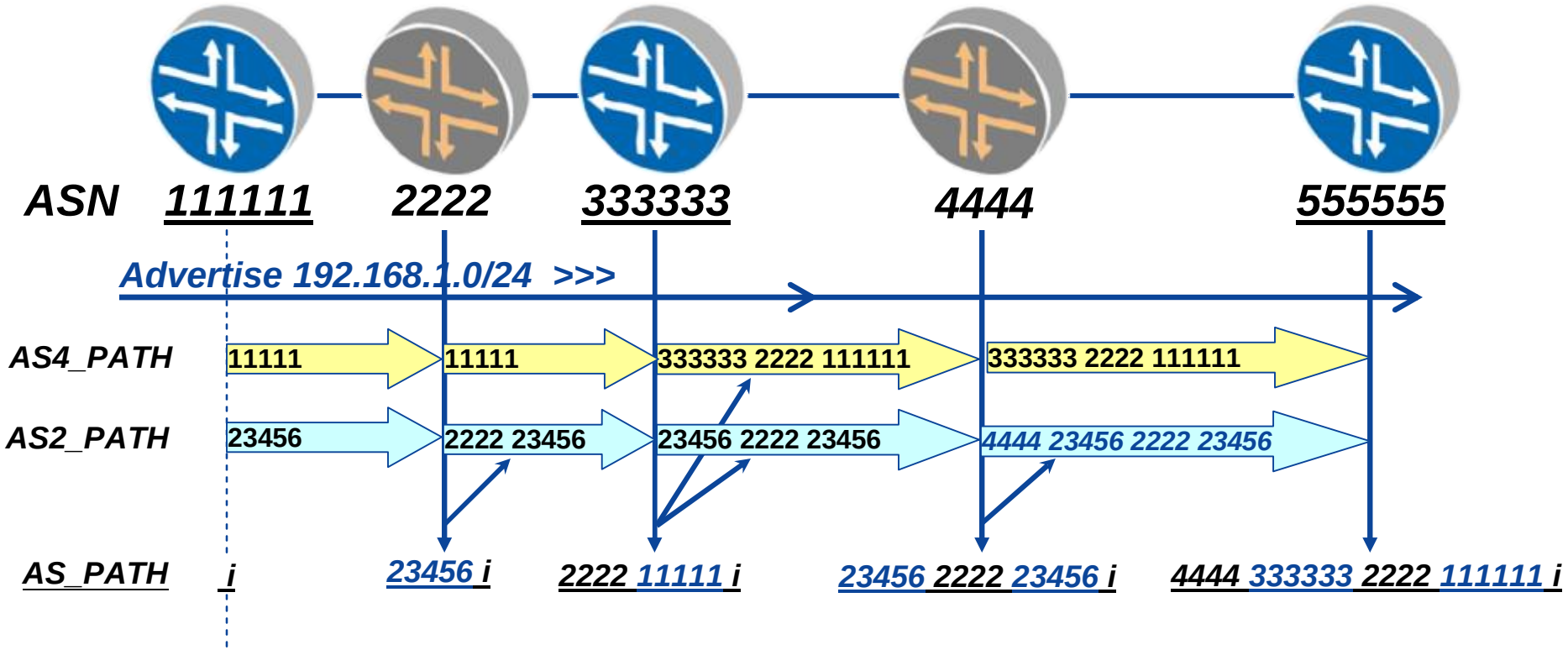
##Peer supports 4 byte AS extension (peer-as 129537)

…

Observation – AS_PATH Across Networks



Observation – AS PATH



Observation - AS4_PATH

New BGP Router Observation

A	Destination	P	Prf	Metric 1	Metric 2	Next hop	AS path
*	192.168.1.0/24	B	170	100		>172.16.35.3	4444 333333 2222 111111 I
*	192.168.2.0/24	B	170	100		>172.16.35.3	333333 2222 I
*	192.168.3.0/24	B	170	100		>172.16.45.4	4444 333333 I
*	192.168.4.0/24	B	170	100		>172.16.45.4	4444 I

Old BGP Router Observation

A	Destination	P	Prf	Metric 1	Metric 2	Next hop	AS path
*	192.168.1.0/24	B	170	100		>172.16.34.3	23456 2222 23456 I
*	192.168.2.0/24	B	170	100		>172.16.34.3	23456 2222 I
*	192.168.3.0/24	B	170	100		>172.16.34.3	23456 I
*	192.168.5.0/24	B	170	100		>172.16.45.5	23456 I

Anything Else? Yes!

Some Inconveniencies, such as..

- **An ‘Old-BGP’ speaker faces many ‘New-BGP’ Peers**
  - *All prefixes are seen as from AS23456*
  - *Inconvenient to maintain BGP policies*
  - *Try tag ‘community’ by Neighbor / Prefix*

- **When summarize Netflow records by ASN**
  - *All prefixes from 4-byte ASNs are seen as AS23456*
  - *Inconvenient to do peering/transit planning*
  - *Try summarize by prefix*

Summary

- **No Worry, No Hurry.**
- **Changes would be in..**
  - *BGP sessions*
  - *AS PATH, Community*
  - *BGP Policy*
  - *Traffic Accounting*
- **For transition procedure**
  - *Check with your solution provider for details*
  - *Prepare for the inconveniencies*