

## DE-CIX Academy: BGP Communities

Handout Document

Where  
networks  
meet



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### Links visited during the webinar

- **RFCs:** see next page
- Well-known communities:
  - Standard: <https://www.iana.org/assignments/bgp-well-known-communities/bgp-well-known-communities.xhtml#bgp-well-known-communities-1>
  - Extended: <https://www.iana.org/assignments/bgp-well-known-communities/bgp-well-known-communities.xhtml#bgp-well-known-communities-1>
- Provider Examples:
  - DE-CIX Communities: <https://www.de-cix.net/en/resources/informational-bgp-communities>
  - DE-CIX Routerserver Guides: <https://www.de-cix.net/en/resources/route-server-guides>
  - KPN - AS286 - Community page: <https://as286.net/AS286-communities.html>
  - NTT - AS2914 - Community page: <https://www.us.ntt.net/support/policy/routing.cfm>
  - NTT Looking Glass: <https://www.us.ntt.net/support/looking-glass/>
- Tools which helped building this presentation:
  - GNS3: <https://www.gns3.com>
  - Dynamips: <https://github.com/GNS3/dynamips/>
- Configuration examples Cisco IOS:
  - See next pages

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### BGP Community Evolution

	Original Communities	Extended Communities	Large Communities
<b>Defined in</b>	<a href="#">RFC1997</a>	<a href="#">RFC4360</a>	<a href="#">RFC8092</a>
<b>Published</b>	August 1996	February 2006	February 2017
<b>Additional RFCs</b>	<a href="#">RFC1998</a> , <a href="#">RFC3765</a> , <a href="#">RFC7999</a>	<a href="#">RFC4384</a> , <a href="#">RFC5668</a> , <a href="#">RFC5701</a> , <a href="#">RFC7153</a> , <a href="#">RFC8097</a>	<a href="#">RFC8195</a>
<b>Size</b>	32bit	64bit	96bit
<b>Commonly used</b>	16Bit AS : 16Bit Value	Type : 32Bit AS : 16Bit Value -or- Type : 16Bit Value: 32Bit AS	32Bit AS : 32Bit Value : 32Bit Value
<b>Example</b>	6695:65010	RT:6695:2010223112	6695:65010:2010223112
<b>Intention</b>		Replace original standard	Supplement original standard

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### BGP Communities for DE-CIX Route Servers

Example is for DE-CIX Frankfurt, AS6695. For other sites replace 6695 to the local route server AS.

	Original Communities	Extended Communities	Large Communities
Announce to all peers	6695:6695	rt:6695:6695	6695:1:0
Do not announce to any peer	0:6695	rt:0:6695	6695:0:0
Redistribute to PEERAS	6695:PEERAS (16Bit only)	rt:6695:PEERAS	6695:1:PEERAS
Do not redistribute to PEERAS	0:PEERAS	rt:0:PEERAS	6695:0:PEERAS
Add NO-EXPORT	6695:65281		6695:901:0
Add NO-ADVERTISE	6695:65282		6695:902:0
Add NO-EXPORT to PEERAS			6695:901:PEERAS
Add NO-ADVERTISE to PEERAS			6695:902:PEERAS
Prepend 1 times to all peers	65001:0		6695:101:0
Prepend 2 times to all peers	65002:0		6695:102:0
Prepend 3 times to all peers	65003:0		6695:103:0
Prepend 1 times to PEERAS	65001:PEERAS	rt:65001:PEERAS	6695:101:PEERAS
Prepend 2 times to PEERAS	65002:PEERAS	rt:65002:PEERAS	6695:102:PEERAS
Prepend 3 times to PEERAS	65003:PEERAS	rt:65003:PEERAS	6695:103:PEERAS
Blackhole (if supported by Peer)	BLACKHOLE		

Empty means this community is not offered.

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### Configuration Example: Scrubbing

Scrub all standard communities beginning with "64500:..." on received prefixes.

#### Cisco IOS

```
ip community-list expanded scrub-incoming permit 64500:.*
!
route-map upstream-in permit 10
  set comm-list scrub-incoming delete
!
router bgp 64500
  neighbor upstream route-map upstream-in in
```

#### Juniper

```
policy-options {
  community my-communities members 65001:*;

  policy-statement from-upstream {
    from protocol bgp;
    then {
      community delete my-communities;
      accept;
    }
  }
}

protocols {
  bgp {
    group upstream {
      type external;
      import from-upstream;
    }
  }
}
```

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### Configuration Example: Announcements

Announce to Upstream, Peering, Customers depending on communities set

#### Cisco IOS

```
ip community-list expanded remove-my-communities permit 64500:.*
ip community-list expanded announce-to-customers permit 64500:5[1357].*
ip community-list expanded announce-to-upstream permit 64500:5[4567].*
ip community-list expanded announce-to-upstream permit 64500:5[2367].*
!
route-map upstream-out permit 10
  match community announce-to-upstream
  set comm-list remove-my-communities delete
!
route-map peering-out permit 10
  match community announce-to-peering
  set comm-list remove-my-communities delete
!
route-map customers-out permit 10
  match community announce-to-customers
  set comm-list remove-my-communities delete
!
router bgp 64500
  neighbor customers route-map customers-out out
  neighbor peering route-map peering-out out
  neighbor upstream route-map upstream out
```