

# RPKI Workshop

## Routing Lab

AfNOG / Dar es Salaam

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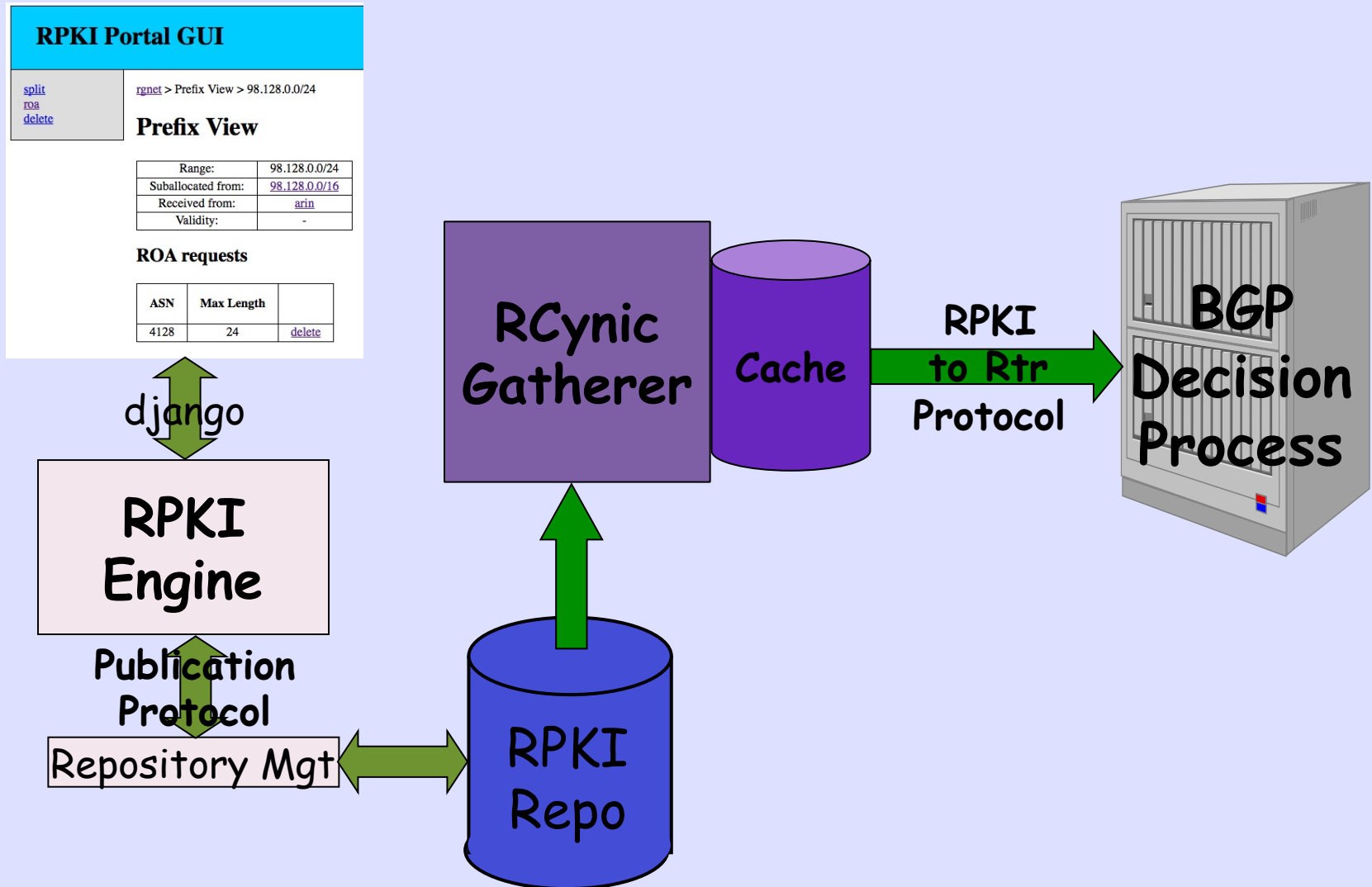
Michael Elkins <me@sigpipe.org>

Rob Austein <sra@isc.org>

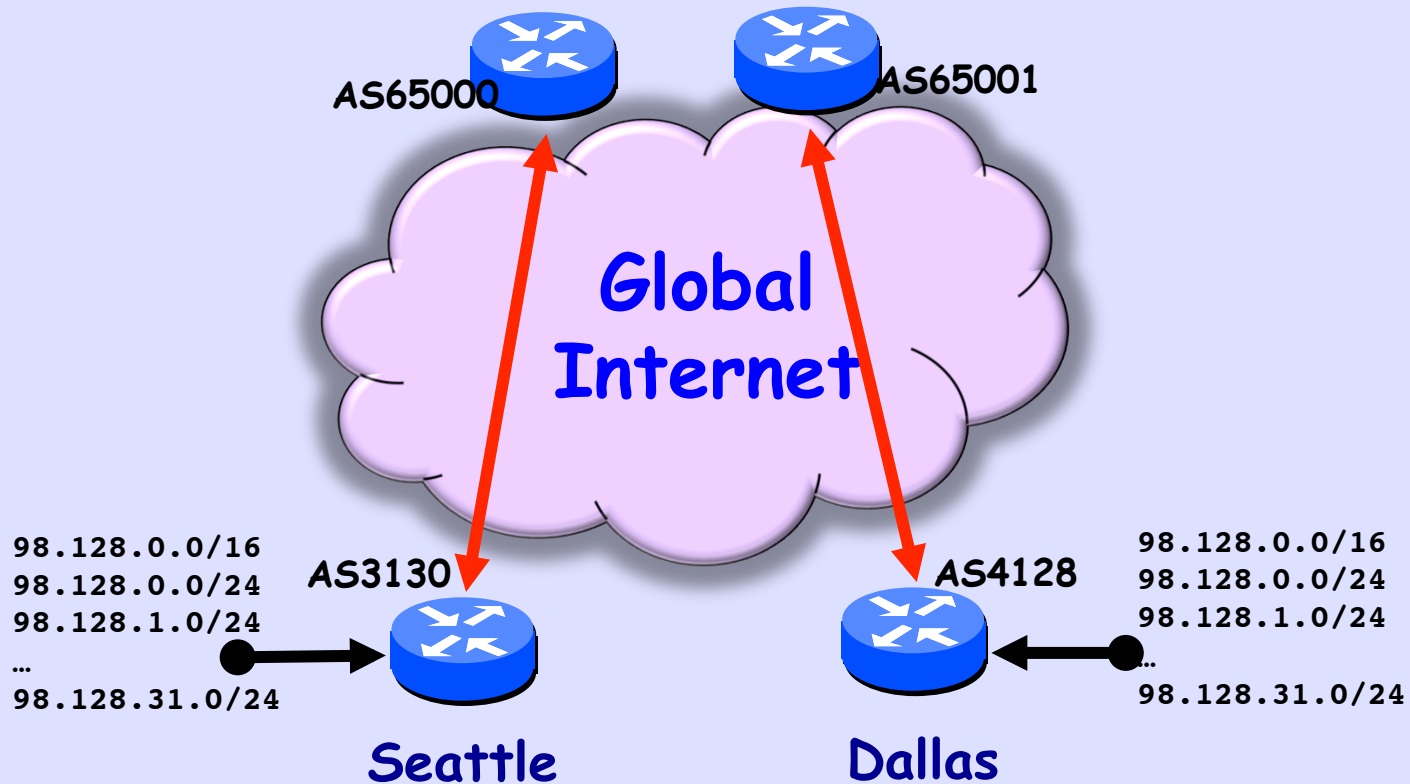
Philip Smith <pfs@cisco.com>

<http://archive.psg.com/110603.afnog-lab.pdf>

# Lab Overview



# BGP Feeds into Lab



# DynaMIPS on MacBook Pro 17"

10.0.0.0/8

RPKI-Rtr Protocol

AS65000

AS65001

196.200.222.128/192

Global Internet

RPKI Cache

98.128.0.0/16  
98.128.0.0/24  
98.128.1.0/24  
...  
98.128.31.0/24

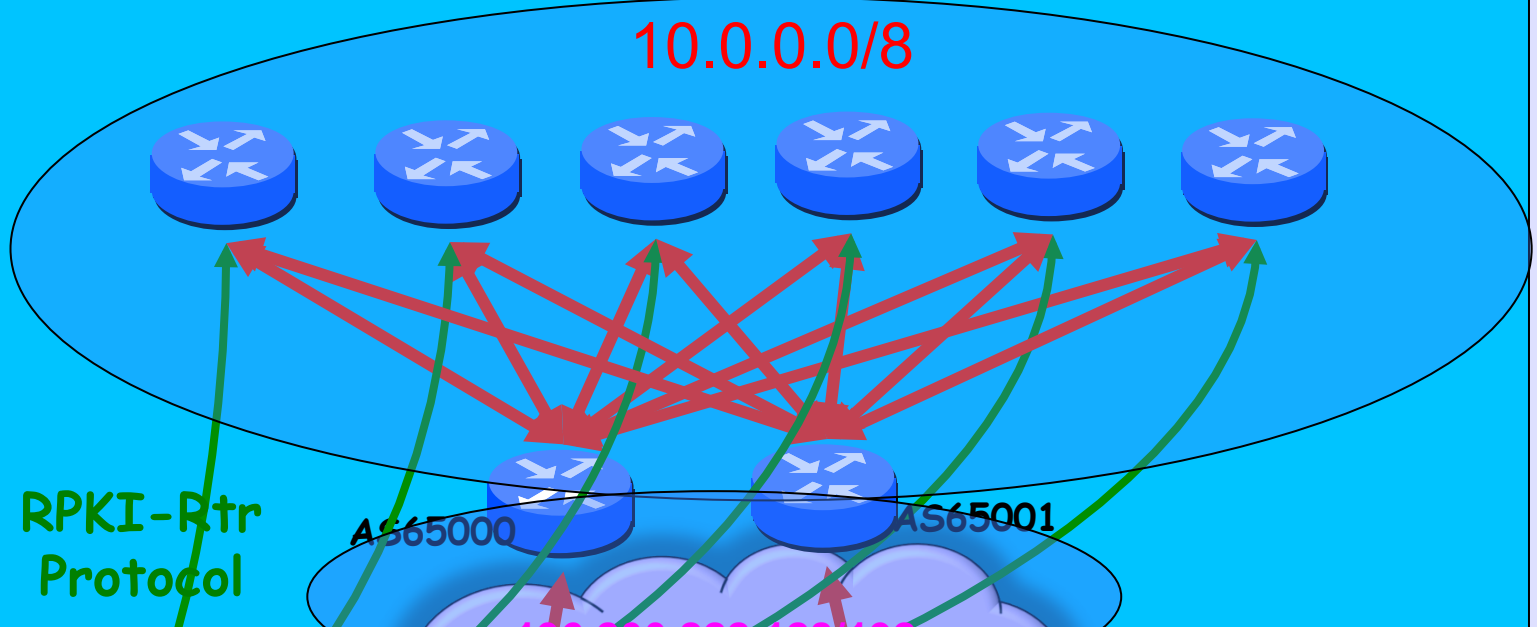
AS3130

Seattle

98.128.0.0/16  
98.128.0.0/24  
98.128.1.0/24  
...  
98.128.31.0/24

AS4128

Dallas



# IP Address Allocation

98.128.0.0/16 ARIN Experimental Allocation

98.128.0.0/24 Instructors Play

98.128.1.0/24 labuser01

98.128.2.0/24 labuser02

...

98.128.16.0/24 labuser16

# GUI Accounts

<https://demo.rpki.net/rpki>

<u>UserID</u>	<u>Password</u>
labuser01	fnord
labuser02	fnord
labuser03	fnord
...	
labuser16	fnord

# Router Accounts

```
telnet rmac.psg.com 20xx (your UserID)
```

```
% telnet rmac.psg.com 2001
```

```
user: cisco
```

```
password: cisco
```

```
enable: cisco
```

# Configure RPKI Server

```
router bgp <AS>
```

```
bgp rpki server tcp <ip address> port <port>  
refresh <time in sec>
```

```
router bgp 651xx
```

```
bgp rpki server tcp 198.180.150.1 port \  
42420 refresh 120
```



# Check Server

```
r0.sea#show ip bgp rpki servers
```

```
BGP SOVC neighbor is 198.180.150.1/42420 connected to port 42420
```

```
Flags 0, Refresh time is 600, Serial number is 1304239609
```

```
InQ has 0 messages, OutQ has 0 messages, formatted msg 345
```

```
Session IO flags 3, Session flags 4008
```

```
Neighbor Statistics:
```

```
Nets Processed 624
```

```
Connection state is ESTAB, I/O status: 1, unread input bytes: 0
```

```
Connection is ECN Disabled
```

```
Minimum incoming TTL 0, Outgoing TTL 255
```

```
Local host: 199.238.113.10, Local port: 57932
```

```
Foreign host: 198.180.150.1, Foreign port: 42420
```

```
Connection tableid (VRF): 0
```

# Look at Table

```
router1#show ip bgp rpkf table
```

```
76 BGP sovc network entries using 6688 bytes of memory
```

```
78 BGP sovc record entries using 1560 bytes of memory
```

Network	Maxlen	Origin-AS	Source	Neighbor
98.128.0.0/24	24	3130	0	198.180.150.1/424
98.128.0.0/16	16	3130	0	198.180.150.1/424
98.128.6.0/24	24	4128	0	198.180.150.1/424
98.128.9.0/24	24	3130	0	198.180.150.1/424
98.128.30.0/24	24	1234	0	198.180.150.1/424
128.224.1.0/24	24	3130	0	198.180.150.1/424
129.6.0.0/17	17	49	0	198.180.150.1/424
129.6.112.0/24	24	10866	0	198.180.150.1/424
129.6.128.0/17	17	49	0	198.180.150.1/424
147.28.0.0/16	16	3130	0	198.180.150.1/424

# Look at BGP Table

```
* i I198.180.150.0      144.232.9.61      100  0 1239 3927 i
*> I                    199.238.113.9      0 2914 3927 i
* I                    129.250.11.41      0 2914 3927 i
*> V198.180.152.0      199.238.113.9      0 2914 4128 i
* V                    129.250.11.41      0 2914 4128 i
*> N198.180.155.0      199.238.113.9      0 2914 22773 i
* N                    129.250.11.41      0 2914 22773 i
*> N198.180.160.0      199.238.113.9      0 2914 23308 13408 5752 i
* N                    129.250.11.41      0 2914 23308 13408 5752 i
```

# Look at a Prefix

```
R3#show ip bgp 98.128.0.0/24
```

```
BGP routing table entry for 98.128.0.0/24, version 360
```

```
Paths: (2 available, best #1, table default)
```

```
65000 3130
```

```
10.0.0.1 from 10.0.0.1 (193.0.24.64)
```

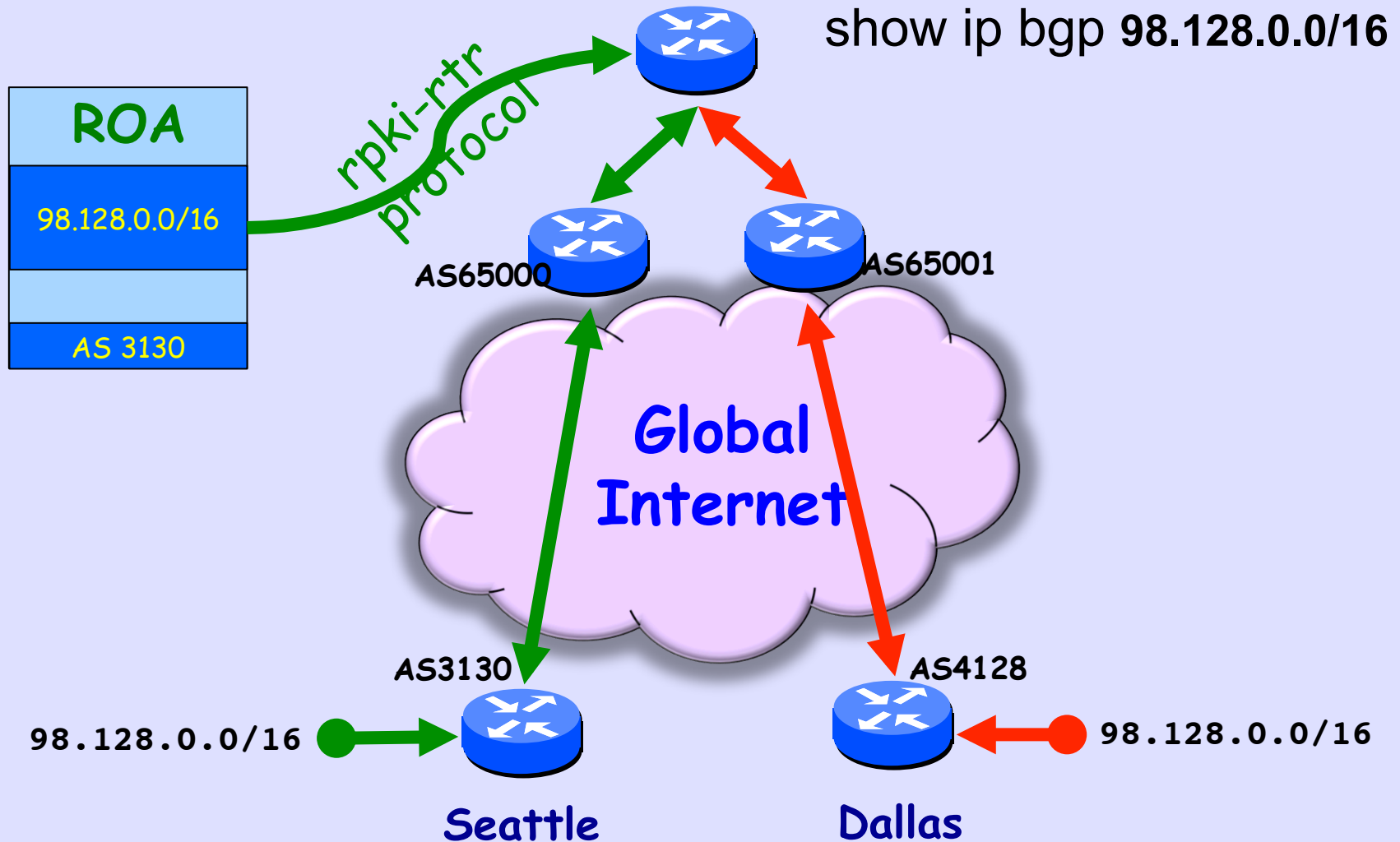
```
Origin IGP, localpref 100, valid, external, best  
path 680D859C RPKI State valid
```

```
65001 4128
```

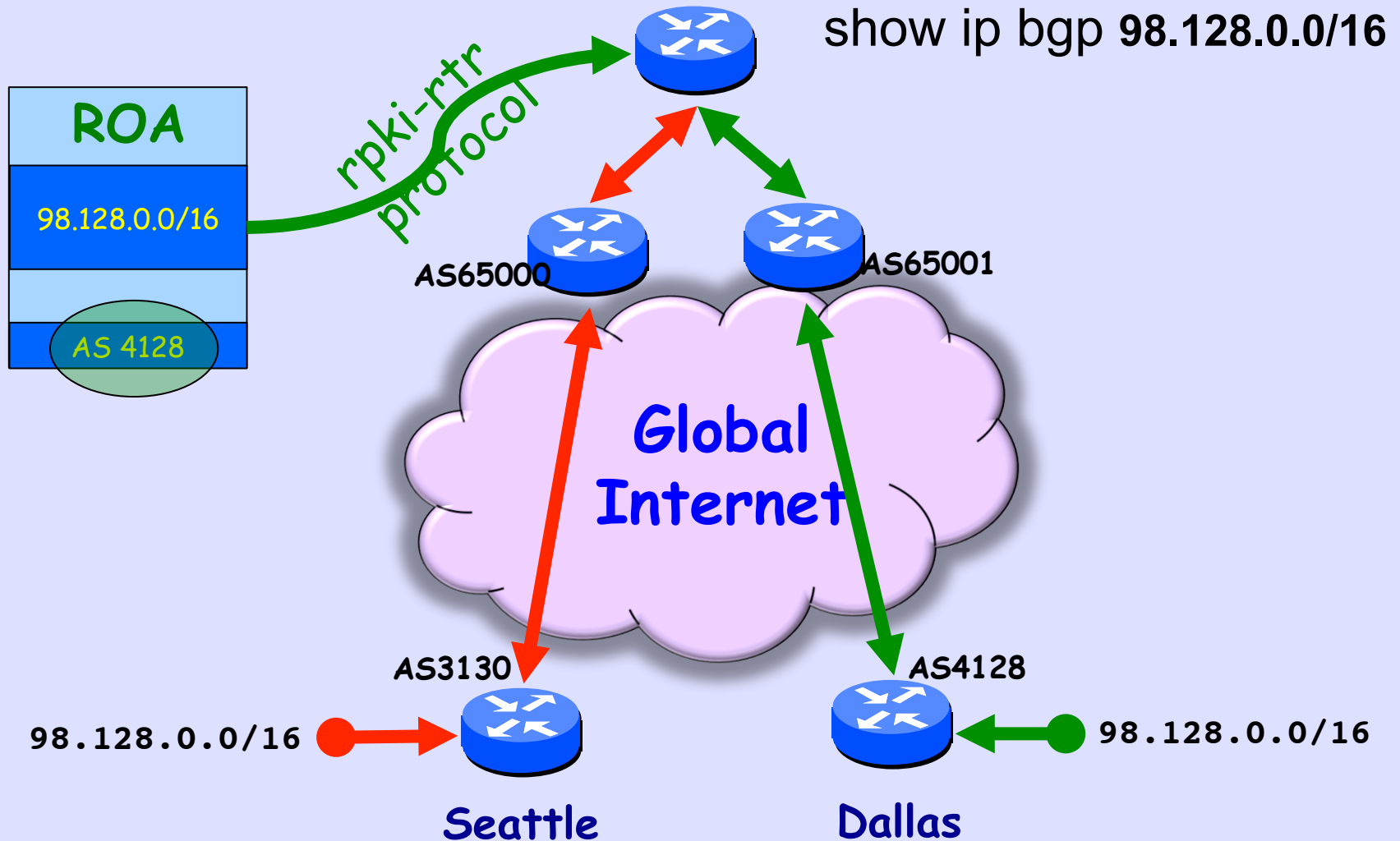
```
10.0.1.1 from 10.0.1.1 (193.0.24.65)
```

```
Origin IGP, localpref 100, valid, external  
path 680D914C RPKI State invalid
```

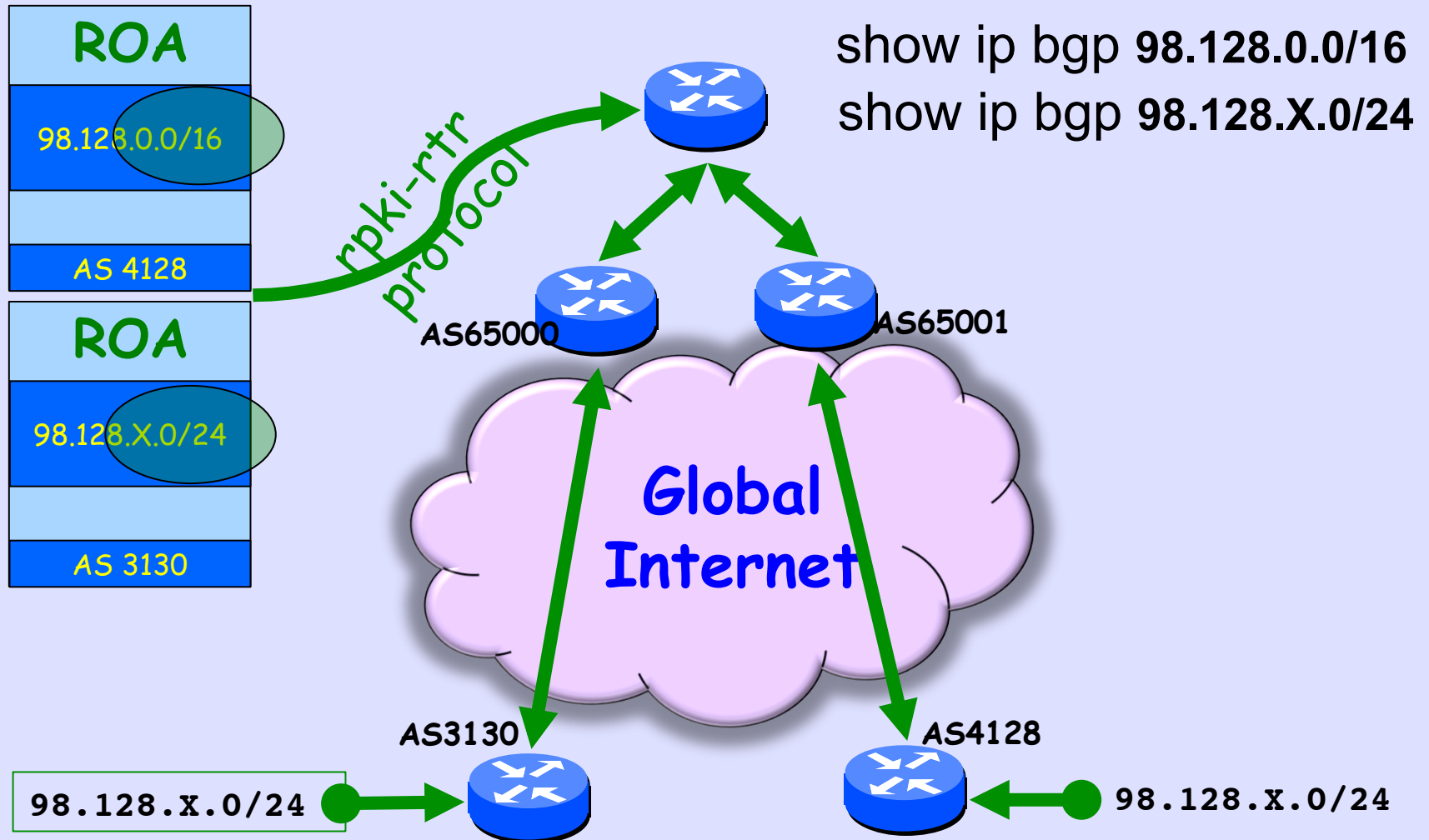
# Fat-Finger Detected



# ROA Controls Validity



# Try Your Own /24



# Mis-Origination Caught

```
R3#sh ip bg 98.128.0.0/24
```

```
BGP routing table entry for 98.128.0.0/24, version 94
```

```
Paths: (2 available, best #2, table default)
```

```
  Advertised to update-groups:
```

```
    1
```

```
  Refresh Epoch 1
```

```
 65000 3130
```

```
    10.0.0.1 from 10.0.0.1 (65.38.193.12)
```

```
      Origin IGP, localpref 100, valid, external
```

```
      path 6802D4DC RPKI State invalid
```

```
  Refresh Epoch 1
```

```
 65001 4128
```

```
    10.0.1.1 from 10.0.1.1 (65.38.193.13)
```

```
      Origin IGP, localpref 100, valid, external, best
```

```
      path 6802D7C8 RPKI State valid
```