

January 2017

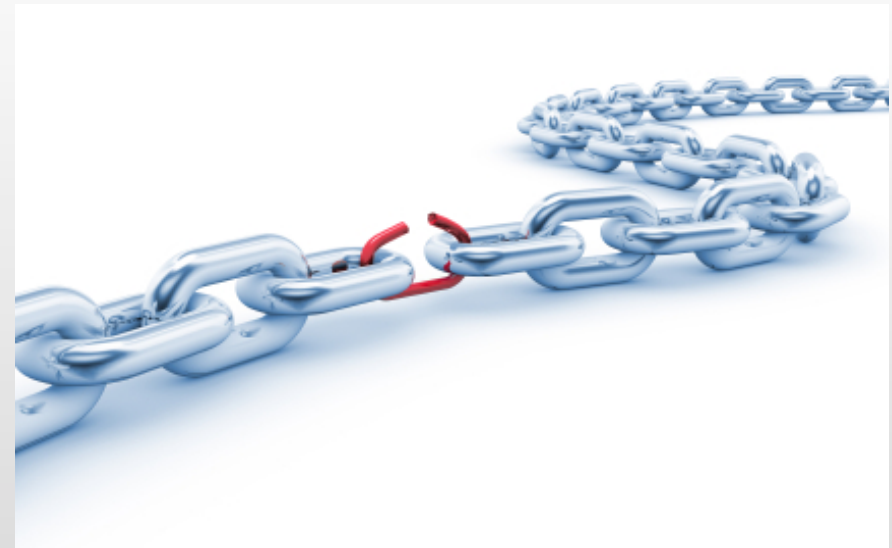
# MANRS a community effort for improving global routing security

<https://www.manrs.org/>



# Is routing security a problem?

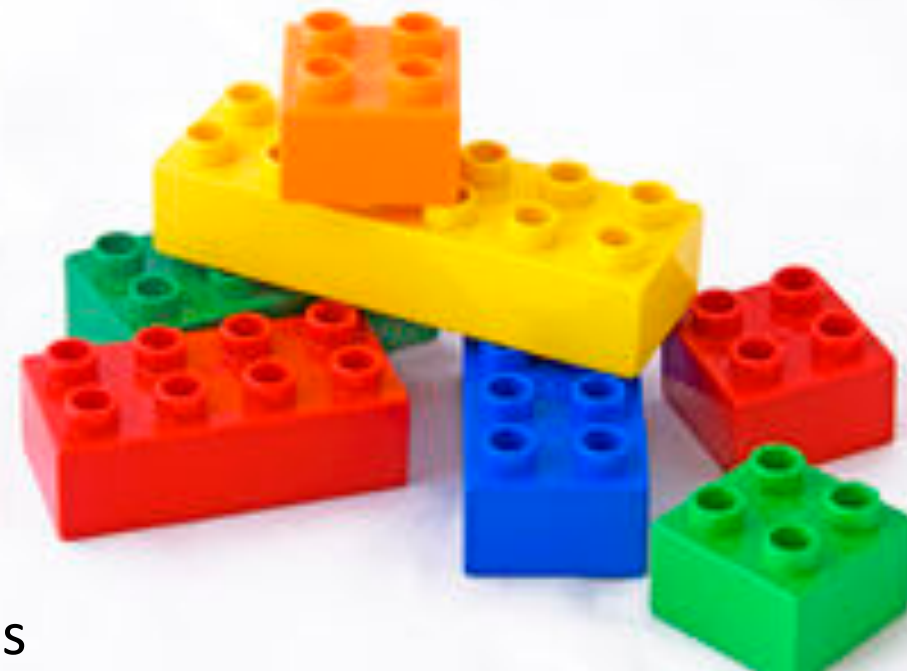
- Internet routing infrastructure is vulnerable
  - Traffic can be hijacked, blackholed or detoured
  - Traffic can be spoofed
  - Human error and malicious attacks
  - A fix for malicious activity can impact legitimate traffic after attack ceases
- BGP is based on trust
  - No built-in validation of the legitimacy of updates



# Are there solutions?

- Yes!
  - Prefix and AS-PATH filtering, RPKI, IRR, ...
  - BGPSEC under development at the IETF
  - Whois, Routing Registries and Peering databases

- But...
  - Lack of deployment
  - Lack of reliable data



Event type	Country	ASN	Start time	End time	info
BGP Leak		Origin AS: AS number for New World Telephone Ltd. (AS 17444) Leaker AS: Suite 2101-02, 21/F, Tower 2, Nina Tower (AS 45474)	2016-11-16 15:39:21		<a href="#">More detail</a>
Outage		Assoc do Inst Nac de Matematica Pura e Aplicada (AS 262829)	2016-11-16 15:32:00	2016-11-16 15:35:00	<a href="#">More detail</a>
Outage		ETAPA EP (AS 27668)	2016-11-16 15:28:00	2016-11-16 15:32:00	<a href="#">More detail</a>
BGP Leak		Origin AS: TECHSPACE INC. (AS 20277) Leaker AS: ViaWest (AS 13649)	2016-11-16 15:19:57		<a href="#">More detail</a>
Outage		ETAPA EP (AS 27668)	2016-11-16 15:10:00	2016-11-16 15:14:00	<a href="#">More detail</a>
Outage		MGNET INFORMATICA E SERVIÇOS LTDA (AS 262569)	2016-11-16 15:05:00		<a href="#">More detail</a>
Outage		Global Conect Ltda (AS 262735)	2016-11-16 14:52:00		<a href="#">More detail</a>
BGP Leak		Origin AS: iPI9 (AS 37390) Leaker AS: OPENTRANSIT (AS 5511)	2016-11-16 14:35:59		<a href="#">More detail</a>
Outage		POWERSAT SERVICOS DE TELECOMUNICACOES LTDA (AS 262337)	2016-11-16 14:13:00	2016-11-16 14:17:00	<a href="#">More detail</a>

# Mutually Agreed Norms for Routing Security (MANRS)

MANRS defines four concrete actions that network operators should implement

- Technology-neutral baseline for global adoption

MANRS builds a visible community of security-minded operators

- Promotes culture of collaborative responsibility



MANRS

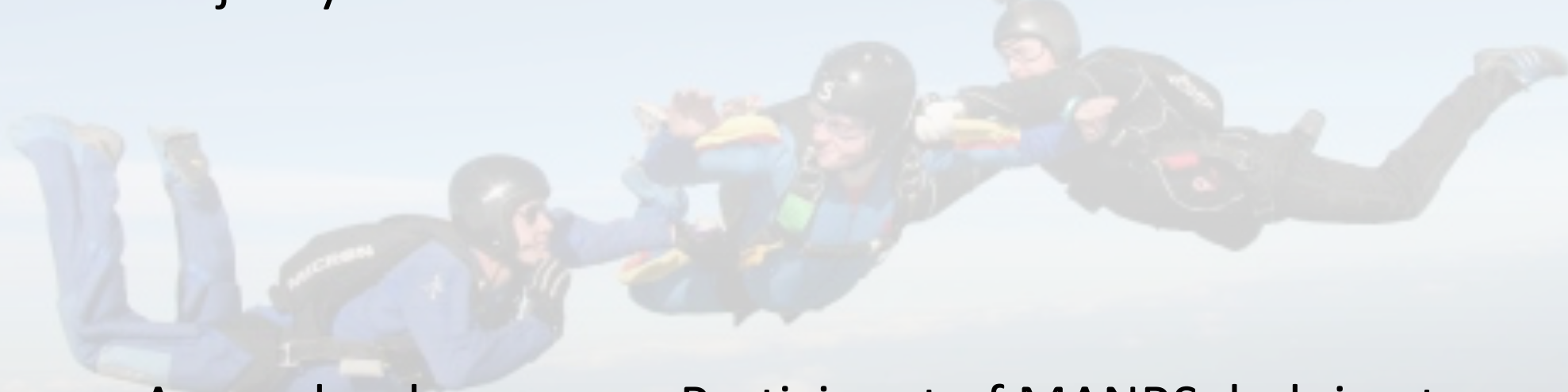
# Good MANRS



- **Filtering** – Prevent propagation of incorrect routing information
  - *Own announcements and the customer cone*
- **Anti-spoofing** – Prevent traffic with spoofed source IP addresses
  - *Single-homed stub customers and own infra*
- **Coordination** – Facilitate global operational communication and coordination between network operators
  - *Up-to-date and responsive public contacts*
- **Global Validation** – Facilitate validation of routing information on a global scale
  - *Publish your data, so others can validate*

# MANRS is not (only) a document – it is a commitment

- The members **support** the Principles and **implement** the majority of the Actions in their networks.



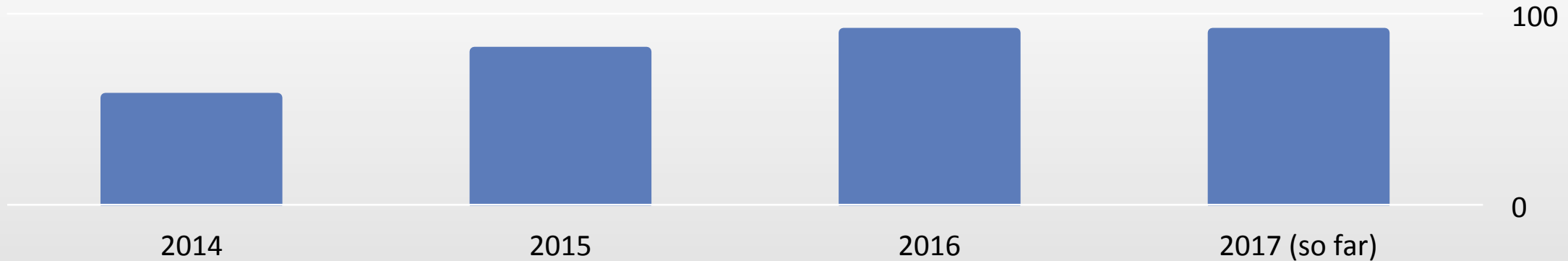
- A member becomes a Participant of MANRS, helping to **maintain and improve** the document and to **promote** MANRS objectives

# Two years of MANRS

- Officially launched in November 2014
- 9 initial participants from across North America and Europe
- BCOP released in 2014 through work with operator forums
- 47 networks participating as of May 1 2017 covering almost 100 ASNs

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# of AS



# Evolution of MANRS a platform for related activities

- Developing better guidance
  - MANRS Best Current Operational Practices (BCOP) document:  
<http://www.routingmanifesto.org/bcop/>
- Training and certification program
  - Based on BCOP document and an online module
- Bringing new types of members on board
  - IXP Partnership Program



# How to sign up for MANRS

- Go to <https://www.manrs.org/signup/>
  - Provide requested information
  - Please provide as much detail on how Actions are implemented as possible
- We may ask questions and ask you to run a few tests
  - Routing “background check”
  - Spoofer <https://www.caida.org/projects/spoofer/>
- Your answer to “Why did you decide to join?” may be displayed in the testimonials
- Download the logo and use it
- Become an active MANRS participant