January 2017

MANRS a community effort for improving global routing security

https://www.manrs.org/

MANRS

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
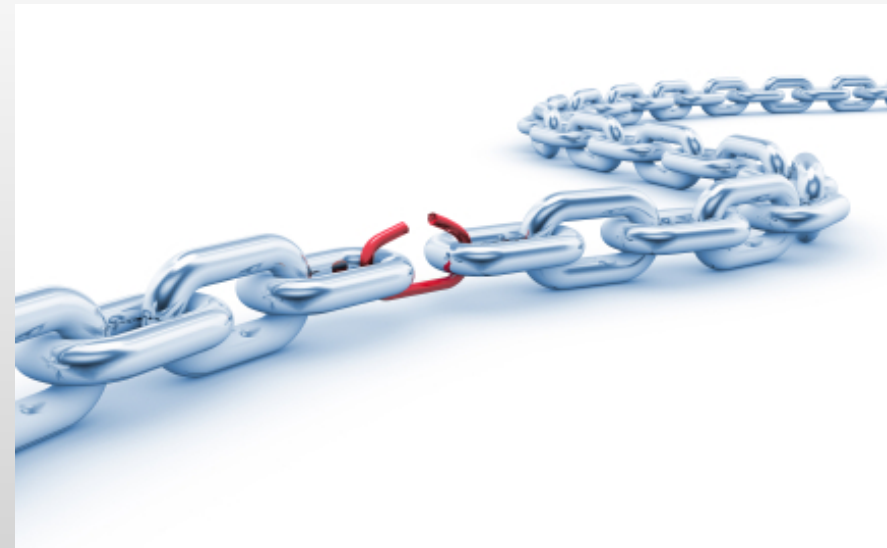
Are there solutions?

- 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
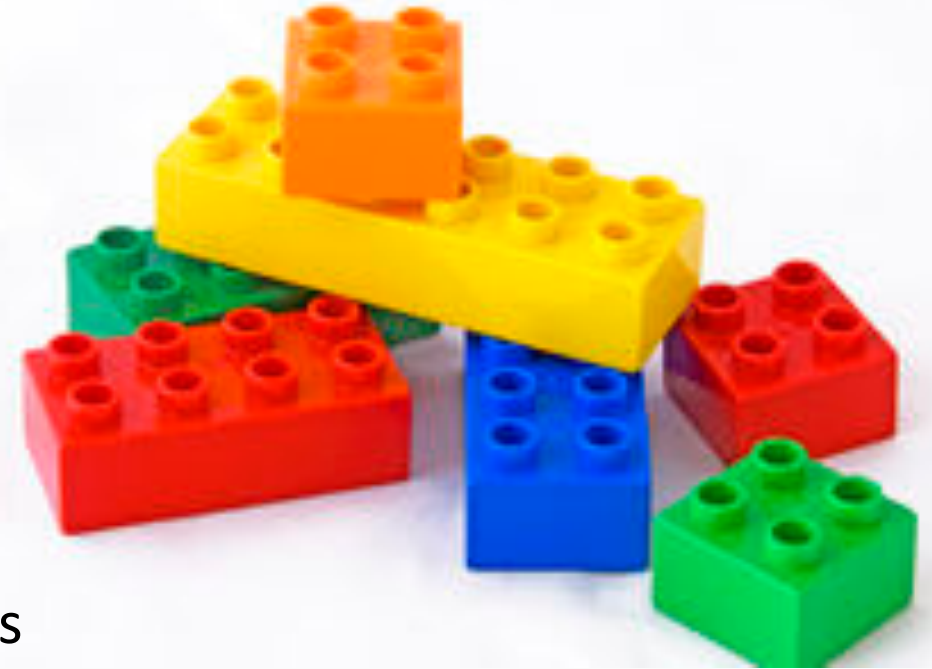
Event type	Country	ASN	Start time	End time	info
BGP Leak		*Origin AS:* AS number for New World Telephone Ltd. (AS 17444) *Leaker AS:* Suite 2101~02, 21/F, Tower 2, Nina Tower (AS 45474)	2016-11-16 15:39:21		More detail
Outage		Assoc do Inst Nac de Matematica Pura e Aplicada (AS 262829)	2016-11-16 15:32:00	2016-11-16 15:35:00	More detail
Outage		ETAPA EP (AS 27668)	2016-11-16 15:28:00	2016-11-16 15:32:00	More detail
BGP Leak		*Origin AS:* TECHSPACE INC. (AS 20277) *Leaker AS:* ViaWest (AS 13649)	2016-11-16 15:19:57		More detail
Outage		ETAPA EP (AS 27668)	2016-11-16 15:10:00	2016-11-16 15:14:00	More detail
Outage		MGNET INFORMATICA E SERVIÇOS LTDA (AS 262569)	2016-11-16 15:05:00		More detail
Outage		Global Conect Ltda (AS 262735)	2016-11-16 14:52:00		More detail
BGP Leak		*Origin AS:* iPi9 (AS 37390) *Leaker AS:* OPENTRANSIT (AS 5511)	2016-11-16 14:35:59		More detail
Outage		POWERSAT SERVICOS DE TELECOMUNICACOES LTDA (AS 262337)	2016-11-16 14:13:00	2016-11-16 14:17:00	More detail

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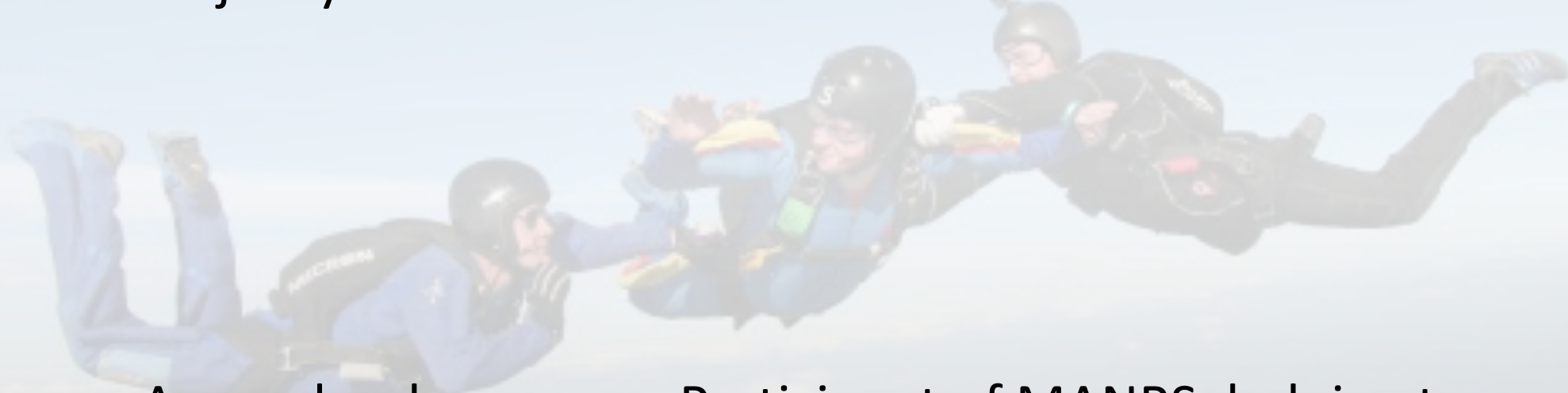
- A member becomes a Participant of MANRS, helping to **maintain and improve** the document and to **promote** MANRS objectives

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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**

# of AS
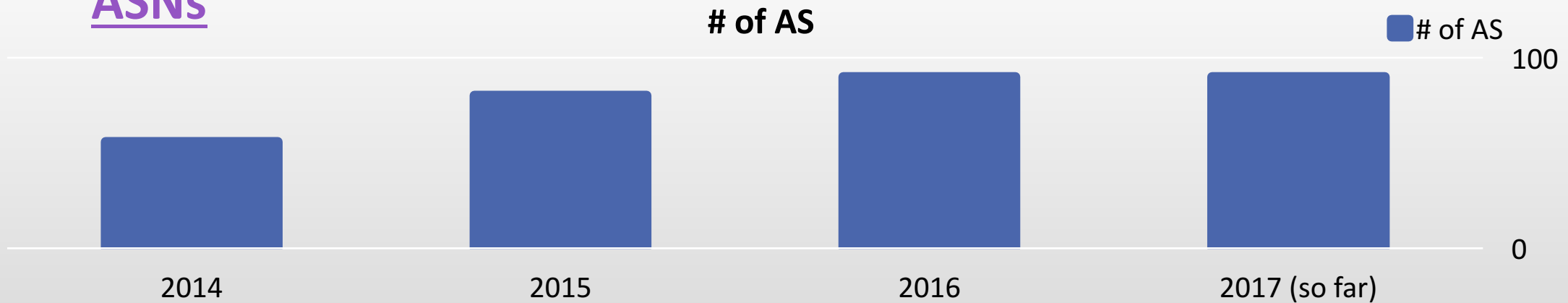
Evolution of MANRS a platform for related activities

- 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