Two years of good MANRS
Improving Global Routing Security and Resilience

https://www.manrs.org/
Is there a problem?

- Internet routing infrastructure is vulnerable
  - Traffic can be hijacked, blackholed or detoured
  - Traffic can be spoofed
  - Fat-fingers and malicious attacks
- 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
It is a socio-economic problem – a tragedy of the commons

- From the routing perspective securing one’s own network does not make it more secure. The network security is in someone else’s hands
  - The more hands – the better the security

- Is there a clear, visible and industry supported line between good and bad?
  - A cultural norm
A clearly articulated baseline – a minimum requirement (MCOP) + Visible support with commitment
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
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.
A growing list of participants

<table>
<thead>
<tr>
<th></th>
<th>Country</th>
<th>ASNs</th>
<th>Filtering</th>
<th>Anti-spoofing</th>
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Two years of MANRS

MANRS members by # of AS’es

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You may say we’re dreamers...

MANRS members by # of AS’es
• How to bridge this gap?
Leveraging market forces and peer pressure

• Developing a better “business case” for MANRS
  • MANRS value proposition for your customers and your own network

• Creating a trusted community
  • A group with a similar attitude towards security
Increasing gravity by making MANRS a platform for related activities

• Developing better guidance
  • MANRS Best Current Operational Practices (BCOP) document: http://www.routingmanifesto.org/bcop/

• Training/certification programme
  • Based on BCOP document and an online module

• Bringing new types of members on board
  • IXPs
MANRS training and certification

• Routing security is hard
  • The MANRS BCOP was envisaged as a simple instruction set
  • Instead we have a 50-page document that assumes certain level of expertise
  • How can we make it more accessible?

• A set of online training modules
  • Based on the MANRS BCOP
  • Walks a student through the tutorial with a test at the end
  • Working with and looking for partners that are interested in integrating it in their curricula

• A hands-on lab to achieve MANRS certification
  • Completing an online module as a first step in MANRS certification
  • Looking for partners
MANRS IXP Partnership Programme

• There is synergy between MANRS and IXPs in this area
  • IXPs form a community with a common operational objective
  • MANRS is a reference point with a global presence – useful for building a “safe neighborhood”

• How can IXPs contribute?
  • Technical measures: Route Server with validation, alerting on unwanted traffic, providing debugging and monitoring tools
  • Social measures: MANRS ambassador role, local audit as part of the on-boarding process
  • A development team is working on a set of useful actions
How to sign up

• 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
Please join us to make routing more secure

https://www.manrs.org/signup