



### MANRS Steering Committee Meeting #7

13 July 2022

Kevin Meynell, Version 1.0

#### Attendees

<u>Name</u>	<u>Organisation</u>	<u>Sector</u>
Andrew Gallo - Vice-Chair	GWU	Network Operator
Nick Hilliard	INEX	IXP
Megan Kruse	Internet Society	-
Kevin Meynell - Secretary	Internet Society	-
Warrick Mitchell - Chair	AARNet	Network Operator
Arturo Sevrin	Google	CDN/Cloud Provider
Max Stucchi	Internet Society	-
Jeff Tantsura	Microsoft	CDN/Cloud Provider
Tony Tauber	Comcast	Network Operator

Apologies were received from:

Melchior Aelmans	Juniper Networks	Vendor
Flavio Luciani	NAMEX	IXP
Arnold Nipper	DE-CIX	IXP
Andrei Robachevsky	Internet Society	-
Aftab Siddiqui	Internet Society	-

#### 1. Approval of Minutes

The minutes from the last meeting on 9 June 2022 were approved.

#### 2. Actions from last meeting

- 6.1 Aftab Siddiqui to set-up workshop between MANRS participants and CAIDA.  
*Done*
- 6.2 Andrei Robachevsky to send more details about the MANRS Roundtable to the Steering Committee.  
*Done*
- 6.3 Andrei Robachevsky to follow-up with Melchior Aelmans on Platfrom Internetstandaarden submission.

*Done*

6.4 Warrick Mitchell to provide update on the MANRS R&E Programme at the next Steering Committee meeting.

*Done*

6.5 Kevin Meynell to send out meeting details.

*Done*

5.2 Aftab Siddiqui to send to the Steering Committee the data on reserved versus available bogons, as well as the RADB analysis.

*Ongoing*

4.1 Kevin Meynell to investigate data consent for secondary contacts.

*Ongoing*

### 3. MANRS+ Roundtable Outcomes

Megan reported that the MANRS+ Roundtable had been held on 8 June 2022. This involved 13 participants from ISOC, network operators, IXPs, CDN and the financial services sector.

This meeting discussed how routing security implementation by participants could be improved, what areas might reasonably be added to MANRS (e.g. Man-in-the-Middle Attacks, unwanted traffic detection), auditing and scrutiny, and other problems that had been encountered. The two questions to be answered are what would encourage operators to join, and what would encourage enterprises to join?

There were some good preliminary discussions and the participants all agreed to come back with some input to the questions with a view to forming a working group to take this work forward. Another question was how other sectors could be involved, such as healthcare, public utilities and healthcare where awareness of routing security was low.

Megan said that she would forward the Google doc that had been used to brief the Roundtable to the Steering Committee.

Action 7.1 – Megan Kruse to forward MANRS+ briefing document to Steering Committee.

Tony added that there had been some discussion around automated auditing toolsets. He felt this was not viable as there were too many variations in operator set-ups, plus there would be all of the legal concerns. However, he could see the scenario where an external auditor could come in, although it needed to be further discussed how that would be paid for.

Megan said the next step was to constitute the MANRS+ working group and develop some terms of reference.

Action 7.2 – Andrei Robachevsky to constitute the MANRS+ working group.

## 4. Update of MANRS Actions for Network Operators document

Kevin presented some proposed changes to the MANRS Action for Network Operators document to allow exclusion of 'administrative bogons' from MANRS conformance scores. These were legitimately assigned IP prefixes that were marked bogon for a given period by some RIRs if the holder had an unpaid bill or contact had been lost, but were often transitional in nature and accounted for up to 80% of observed bogons which skewed conformance scores.

This required the definition of a bogon, which was proposed as follows:

*Bogon: An ASN or IP Prefix that is not assigned to an LIR and therefore should never be routed on the Internet. This includes Special-Use Addresses as defined by RFC 6890.*

There was also a proposed addition to the Conformance Requirements for Action 1:

*It is recognised that RIRs classify assigned Internet number resources as 'reserved' for administrative reasons (e.g. loss of contact or non-payment of fees) which therefore appear to be bogon even though they are being advertised by ASNs still authorised to originate them. For this reason, originating or propagating Internet number resources that are temporarily classified as 'reserved' will not be considered non-conformance.*

These changes would in principle allow administrative bogons to be excluded from conformance scores, although a technical solution still needed to be found to do this in a practical way. Ideally, the RIRs could simply categorise these differently and Aftab Siddiqui and Kevin had already met with APNIC to discuss this, although ARIN and the RIPE NCC were more reluctant to do this. Nevertheless, APNIC had agreed to raise this at the next meeting of the NRO Engineering Research Group.

Andrew and Tony raised some questions around what exactly constituted a bogon, and this led to further discussion that indicated here was not clarity on this. Kevin (and Andrew) said he'd looked for a formal definition, but this did not seem to exist.

Nick added that MANRS needed to be careful about how it defined a bogon in the MANRS Actions document, as this might start being used as a formal and erroneous definition by others. He suggested to come-up with a more generic term such as 'non-routable number resources'.

Warrick further pointed out that RFCs don't specifically state that bogons should not be routed.

Tony also raised the issue of IPv6 addresses and how that should be defined. Kevin replied that as most of it wasn't yet allocated to an RIR, anything that wasn't should clearly be considered bogon.

Andrew suggested to ask the NRO to come-up with formal definition of a bogon (or alternative term), and possibly different categories that could also help with the problems MANRS had. He didn't think that important conformance measures should be entirely reliance on crowd-sourced definitions.

Kevin summarized that defining a bogon was more complicated than it first appeared and even those on the Steering Committee had slightly different ideas of what constituted one, so it was clear some more work was required on this. The first action was to ask the NRO whether they could agree the definition of a bogon and/or classifications for this.

Action 7.3 – MANRS Secretariat to ask NRO about definition of a bogon and classifications.

The second action – in case the NRO was unable or unwilling to provide this, was to work further on refining our own definition and using an alternative term that would not cause any confusion with (different) existing definitions.

Action 7.4 – MANRS Secretariat to refine definition of bogon and devise alternative term for referring to them.

On the proposed addition to Conformance Requirements for Action 1, Warrick pointed out that the use of the term ‘reserved’ may have different meanings between RIRs, and also asked whether ASNs also marked bogon for administrative reasons.

Kevin said that Aftab Siddiqui as a former NRO member would have the best knowledge about this, so he’d clarify with him.

Action 7.5 – Kevin Meynell to clarify the use of the term ‘reserved’ and whether ASNs were also being marked bogon for administrative reasons.

Andrew also pointed out there were some IP prefixes that were routed without an ASN, so suggested a change of wording to:

*It is recognised that RIRs classify assigned Internet number resources as ‘reserved’ for administrative reasons (e.g. loss of contact or non-payment of fees) which therefore appear to be bogon even though they are being advertised by network operators ASNs still authorised to use originate them. For this reason, originating or propagating Internet number resources that are temporarily classified as ‘reserved’ will not be considered non-conformance.*

Warrick also pointed out there would now be some slight inconsistencies in the terminology between the revised addition, and the earlier existing text of that section.

Kevin said that he’d clarify the various questions, add the suggested changes, and then go through the document to address any inconsistencies.

Action 7.6 – Kevin Meynell to re-draft MANRS Actions for Network Operators document.

## 5. Possible communique to NRO regarding Bogon classification

Andrew proposed that a problem statement be submitted to the RIRs and NRO outlining the previously discussed issues with bogons, and asking whether any harmonisation is possible in terms of terminology and classification of bogons (or some alternative term).

Nick added that the lack of clarity around the handling of bogons could potentially have legal implications if network operators were being encouraged to implement ROV and drop invalid routes based on imperfect information. Decisions made now could have significant impact on network operators, and was this something that MANRS should be getting involved with?

Kevin replied that MANRS was to some extent already involved as it was – along with the RIRs - encouraging the use of RPKI and ROV and this was significantly better than using IRRs which was also a MANRS Action. In fact, this was an issue that the RIRs also needed to resolve as their databases contained out-of-date and incorrect information as well.

It was therefore agreed that Andrew and Aftab Siddiqui should draft a communique to the NRO.

Action 7.7 – Andrew Gallo and Aftab Siddiqui to draft communique to the NRO outlining the bogon problem, and requesting clarification on terminology and classification.

## 6. MANRS R&E Programme Developments

Warrick reported that a presentation had been made at TNC 2022, which was followed by a virtual meeting of 45 R&E network operator (from 65 invites).

There had been a discussion about the unique characteristics of R&E network operators and this focused around mutual back-up paths and the particular issues with ARIN. Around 50% of the 2,500 or so routes in the Internet2 community are legacy, and whilst ARIN is now willing to make bespoke agreements, this is still going to require a lot of negotiations.

The difficulties of creating ROAs notwithstanding (because of the high number of legacy number resources), it was agreed that MANRS should be deployed consistently amongst the R&E networks operators. There were also further discussions about ROV implementation and whether this should also be made compulsory.

A follow-up meeting was planned, although the date(s) had yet to be decided.

## 7. Discussion on making ROV a recommended or compulsory Action

Warrick kicked off the discussion asking whether ROV should become a MANRS Action, whether recommended or compulsory. He said most major T1 operators were now dropping invalid routes, and so should MANRS also providing a greater emphasis on encouraging ROV implementation.

Kevin said that ROV had been envisaged early in the MANRS programme, but at that time few network operators were even implementing RPKI which is why even that was only a recommended action. Encouraging rollout of RPKI had been quite successful amongst the MANRS participants since then (at 75%), so ROV implementation was now more practical, and indeed what was the purpose of ROA creation if they were not actually used? However, they'd really only thought about ROV being a recommended action.

Nick felt there were significant legal issues to consider around this, and mentioned some of the issues with AFRINIC and the NIRs. There was already some EU jurisprudence related to network filtering (ECJ: Sabam v Scarlet), but regulations and judgements could be different in different jurisdictions.

Arturo suggested that ROV should be strongly recommended, with an eventual view to being compulsory within a stated period of time. That would then provide strong incentives to address the remaining issues related to ROA creation.

Tony said the issues raised by Nick were concerning, but equally network operators were going to continue to implement ROV because they were also under other pressures to secure their networks (e.g. proposed government regulation).

Warrick proposed that the next step was for the Programmes Working Group to develop a discussion document that outlined the case for ROV along with the considerations and barriers to implementation.

Action 7.8 – Programmes Working Group to develop ROV discussion document.

## 8. Next meetings

The next meeting will be held on Wednesday, 7 September 2022 at 15.00-16.00 UTC.

The following meeting will provisionally be held on Thursday, 13 October 2022 at 15.00-16.00 UTC.

It was also planned to hold a MANRS Community Meeting at RIPE 85.

Action 7.9 – Kevin Meynell to send out meeting details.

## Open Actions

- 4.1 Kevin Meynell to investigate data consent for secondary contacts.
- 5.2 Aftab Siddiqui to send to the Steering Committee the data on reserved versus available bogons, as well as the RADB analysis.
- 7.1 Megan Kruse to forward MANRS+ briefing document to Steering Committee.
- 7.2 Andrei Robachevsky to constitute the MANRS+ working group.
- 7.3 MANRS Secretariat to ask NRO about definition of a bogon and classifications.
- 7.4 MANRS Secretariat to refine definition of bogon and devise alternative term for referring to them.
- 7.5 Kevin Meynell to clarify the use of the term 'reserved' and whether ASNs were also being marked bogon for administrative reasons.

- 7.6 Kevin Meynell to re-draft MANRS Actions for Network Operators document.
- 7.7 Andrew Gallo and Aftab Siddiqui to draft communique to the NRO outlining the bogon problem, and requesting clarification on terminology and classification.
- 7.8 Programmes Working Group to develop ROV discussion document.
- 7.9 Kevin Meynell to send out meeting details.