Westlake Consulting Limited

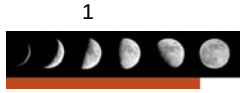
Independent Review of the Root Server System Advisory Committee

Report to The Internet Corporation for Assigned Names and Numbers

Prepared by Westlake Consulting Limited

February 2009

1.Summary



1.1. Introduction

The Internet Corporation for Assigned Names and Numbers (ICANN) Bylaws define the responsibility of the DNS Root Server System Advisory Committee (RSSAC) as:

> *To advise the Board about the operation of the root name servers of the domain name system.*

The Bylaws require an independent review every three years if practicable, of the performance and operation of each arm of ICANN. The goal of each review is to determine:

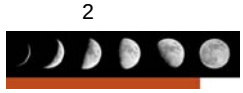
1. Whether that organization has a continuing purpose in the ICANN structure; and
2. If so, whether any change in structure or operations is desirable to improve its effectiveness.

ICANN announced in October 2008 that it had appointed Westlake Consulting Limited (WCL) to conduct the first such independent review of the RSSAC.

1.2. Methodology

The WCL Review Team members attended the ICANN meeting in Cairo, Egypt, and the Internet Engineering Task Force (IETF) meeting in Minneapolis, Minnesota, USA, both in November 2008, where they interviewed a significant number of people about the RSSAC. WCL has also conducted further telephone interviews and has received feedback and comments from a range of people.

In addition to a total of about fifty face to face and telephone interviews, the WCL team researched as much of the RSSAC's publicly-available written record as possible, such as the ICANN website and minutes of meetings of the RSSAC. The review team invited comment from any interested party, through both the ICANN website and the RSSAC mailing list. WCL team members also drew on their experience in governance roles in commercial and non-profit organizations, in order to draw conclusions and make recommendations about the purpose, structure and operations of the RSSAC.



Towards the end of the review, the WCL Review Team held a conference call with the Independent Reviewers appointed to review ICANN's Security and Stability Advisory Committee (SSAC) at the same time as our review, in order to ensure as far as possible that there were no inconsistencies between our respective conclusions and recommendations.

1.3. Background

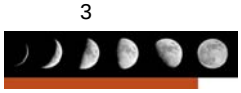
RSSAC was established to meet obligations set out in the Joint Project Agreement (JPA) between the United States Government's Department of Commerce and ICANN. Wording from the JPA is clearly reflected in the ICANN Bylaws where they describe RSSAC's role. is evident in the RSSAC Section of the ICANN Bylaws.

The Bylaws describe the purpose and tasks to be conducted by the RSSAC, as well as setting out in broad terms the RSSAC's membership and process for appointment of a Chair.

1.4. Findings

The main findings from our research were as follows:

- The RSSAC is largely reactive and issues-based, rather than providing advice proactively to the Board of ICANN;
- There is a lack of regular communication and agreement over expectations between the RSSAC and the Board;
- The RSSAC is dominated by, and largely indistinguishable from, the Root Server Operators (root server operators), who are almost all independent of ICANN. The focus of the root server operators is largely operational. As a result, the RSSAC has provided little advice at a more strategic level to the Board.
- The RSSAC's committee and meeting processes are poor and incomplete. At the time of writing, the latest minutes available on the RSSAC website are those from the RSSAC meeting in December 2007, while three further meetings have taken place since then.
- Appointment and succession processes for Committee Members and the Chair are poorly defined or absent.



- The RSSAC has not delivered advice against many of the responsibilities listed in the Bylaws, while the root server operators consider that several of these are their responsibility rather than ICANN's.
- The RSSAC is effectively disconnected from the rest of ICANN because it does not meet at, nor do many of its members attend, regular ICANN meetings. Rather, it holds its meetings at Internet Engineering Task Force (IETF) meetings, which occur several weeks after ICANN meetings. As a result there is little interaction between the RSSAC and other ICANN entities, for example the Government Advisory Committee or the Generic Names Supporting Organisation.

1.5. Options

The WCL Review Team identified and considered five main structural options for the RSSAC:

- No change.
- Disband it, or merge its functions into another part of ICANN, such as the SSAC.
- Re-focus it and add ICANN resources to support it.
- Convert it to an ICANN supporting organization.
- Re-launch it as a Joint Strategy Group, accountable to the root server operators and ICANN.

1.6. Recommended Option

The recommended option is to restructure and re-launch the RSSAC as a joint strategy group, accountable to both the root server operators and ICANN. We recognised that this dual accountability would be different from the way in which the other advisory committees of ICANN operate. However, we consider this is an essential feature of what we propose. The dual line of accountability is intended to demonstrate to the root server operators and to ICANN that the proposed new structure is there to facilitate consideration of strategic issues of interest to both. The purpose is not to imply in any way an attempt to shift power or influence from one party to the other.

Since the positioning, terms of reference and composition of the relaunched RSSAC will differ significantly from those of the current RSSAC, we considered giving it a new name. However, on balance we decided that debate over a new name might well outweigh consideration of the substantive changes.

The relaunched RSSAC will require changes to the ICANN Bylaws. The proposed new purpose for RSSAC has a strategic focus, which will be complementary to that of the root server operators, whose main focus is operational.

We propose that the new version of the RSSAC will be set up as follows:

Composition

The RSSAC will initially have nine members:

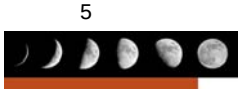
- Four root server operators, selected by the root server operators collectively;
- Four appointed by ICANN, being one each from:
  - The Address Supporting Organization (ASO);
  - The Country-Code Names Supporting Organization (ccNSO);
  - The Generic Names Supporting Organization (GNSO); and
  - The At-Large Advisory Committee (ALAC).
- One appointed by IANA.

This structure means that no bloc of members will have a majority and will need at least the support of the IANA member, who will, in effect, hold the casting vote.

ICANN-funded Support

ICANN will make available to the RSSAC two employees, who will provide executive support for the Committee:

- One technical fellow, who will need to be highly competent in the technical aspects and issues of the DNS Root server system; and
- One administrative support officer, who will be responsible for all administrative matters, such as travel, accommodation and meeting arrangements. This person also will need to understand the technical aspects and issues, although not to the same level as the technical fellow;



- Travel and accommodation for members attending ICANN meetings and relevant technical meetings.

Meetings

Unlike RSSAC meetings to date, the relaunched RSSAC will meet in open session at ICANN meetings.

Invitations to attend RSSAC meetings, with speaking rights, will be issued specifically to a representative of each Root server operator which does not already have a member of the relaunched RSSAC.

If the RSSAC determines that it needs to meet in closed session, all root server operators will be entitled to attend the closed session and to participate, subject to the Chair's discretion, as will any ICANN Board representative attending the meeting, the Board liaison and the technical fellow.

Unlike the current RSSAC, the new version of the RSSAC will convene at ICANN meetings, in order that other parts of ICANN may engage with it. Besides the ICANN meetings, the RSSAC may determine that it needs to meet at relevant technical meetings. Travel and accommodation for such attendance would also be paid for by ICANN in accordance with its normal travel policy for ICANN meetings.

Liaisons

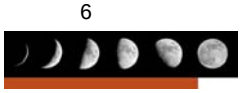
The RSSAC will initially have the following non-voting liaison positions:

- Outward: Board liaison, as at present;
- Inward: appointed by IETF;
- Both outward and inward: the SSAC.

Besides these formal liaisons, there may be benefit in the RSSAC meeting formally with other ICANN entities, such as the Government Advisory Committee.

1.7. List of Recommendations

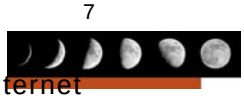
Recommendation 1 **That** the RSSAC be reformed as a strategy group, run jointly by ICANN and the root server operators.



Recommendation 2 **That** the substance of the RSSAC's 'Terms of Reference' as laid out in the Bylaws should be amended to set out RSSAC's new purpose:

- The role of the Root Server System Advisory Committee ("RSSAC") shall be to provide a source of unbiased strategic advice to ICANN, the root server operators and the Internet Community about the best way ahead for the Root Server System. The role will include the following functions:

  - To analyse, assess and monitor, at a strategic level, proposed changes to the root server system in order to provide timely advice to the root server operators and ICANN on the implications, desirability and risks of such changes;
  - To provide reassurance and transparency to the Internet Community that these tasks are under control and that they can have confidence in the reliability and robustness of the root server system;
  - To identify strategic risks to the root server system, and to ensure that planning is in place to address failures of critical systems, including – but not limited to – the demise or critical breakdown of one or more root server operators, or ICANN or IANA;
  - To ensure the performance of the root server system is monitored in the light of anticipated or actual changes to the system or in global Internet usage;
  - To provide a means of liaison between the root server operators, ICANN and the Internet Community.
  - root server operators, ICANN and the Internet Community, via the ALAC, ASO, ccNSO, gNSO and other relevant stakeholders.



Recommendation 3 **That** the RSSAC should initially be constituted with a membership of nine, as follows:

- 4 Root server Operators, appointed by the operators, including at least one who is non-US based;
- 1 appointed by IANA;
- 4 appointed by the Board / Nominating Committee of ICANN, drawn as follows:
  - 1 from the ASO;
  - 1 from the ccNSO;
  - 1 from the gNSO; and
  - 1 from the ALAC.

Recommendation 4 **That** the RSSAC should appoint its Chair from among its members:

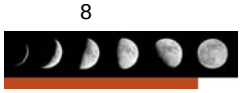
- And that the term of appointment be two years with a limit of three consecutive two-year terms.

Recommendation 5 **That** ICANN nominate two members of staff to support the RSSAC:

- Technical Fellow: The purpose of this role will be to do the research and drafting for reports on behalf of the RSSAC
- Administrative Support: the purpose of this role will be to provide the administrative role necessary for the effective operation of a group of part-time volunteer members.

Recommendation 6 **That** the ICANN Technical Fellow role be carried out separately from L-root operations.

Recommendation 7 **That** ICANN fund travel and accommodation for RSSAC members to and from ICANN meetings.



Recommendation 8 **That** ICANN fund travel and accommodation for RSSAC members at appropriate technical meetings from time to time.

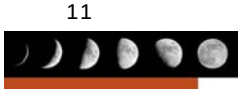
Recommendation 9 In relation to the RSSAC's meetings:

1. **That** the RSSAC should meet at each ICANN meeting, with provision for it to hold additional meetings in between these.
2. **That** its sessions be held in public, so that anybody who wishes may attend, but with provision for it to go into closed session for part of a meeting if a majority of the RSSAC members at the meeting believe it appropriate.
3. **That** all root server operators be invited to attend meetings and have speaking rights (at the discretion of the Chair who will be responsible for managing the Agenda).
4. **That** other attendees at RSSAC meetings may be granted speaking rights at the discretion of the Chair.
5. **That**, in the event that RSSAC went into closed session, subject to the Chair's discretion in case of exceptional circumstances, the root server operators and any members of the ICANN Board and formally-appointed Liaisons would be invited to join the closed session.

Recommendation 10 **That** the following non-voting liaison positions be established:

1. Outward liaison from the RSSAC to the ICANN Board (as currently exists);
2. Inward liaison to the RSSAC from IETF/IAB; this will provide additional technical input into the proceedings of the RSSAC;
3. Both inward and outward liaisons between the RSSAC and the SSAC**.**

CONTENTS



2. About this report

2.1. Purpose of the Review

This Independent Review of the DNS Root Server System Advisory Committee (RSSAC), like other such reviews, is mandated in the ICANN Bylaws:

> *The Board shall cause a periodic review, if feasible no less frequently than every three years, of the performance and operation of each Supporting Organization, each Supporting Organization Council, each Advisory Committee… by an entity or entities independent of the organization under review.*
>
> *The goal of the review, to be undertaken pursuant to such criteria and standards as the Board shall direct, shall be to determine*
>
> *(i) whether that organization has a continuing purpose in the ICANN structure, and*
>
> *(ii) if so, whether any change in structure or operations is desirable to improve its effectiveness.*[1]

Our Terms of Reference[2] pose these two questions, together with 17 related questions, all of which are addressed in our Report.

2.2. Relationship to Root Server Operators

Although the RSSAC comprises mainly root server operators, it is important to note that the RSSAC is not the root server operators' group. This review is a review of the RSSAC. It does not address the root server operators' group or root server operations.

2.3. Methodology

The methodology adopted for our review consists of three partly overlapping phases: evidence gathering; analysis; and producing the report.

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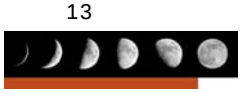
1 ICANN Bylaws, Article IV, Section 4. http://www.icann.org/en/general/archive-bylaws/bylaws-08apr05.htm#IV

2 Appendix A – Terms of Reference



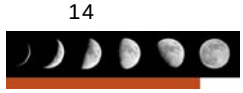
Phase 1: Evidence gathering

Our evidence includes facts, historical evidence and input from stakeholders. Where possible, we refer to the underlying evidence in this report. Evidence gathering was the longest phase, lasting from shortly before ICANN's November 2008 Cairo meeting until a few weeks before the report was produced.

Specifically, the information gathering phase involved:

- Two representatives of Westlake Consulting Limited (WCL), Colin Jackson and Andy Linton, attending the ICANN Cairo meeting in November 2008, where they attended a number of sessions and interviewed many relevant attendees;
- Two representatives of WCL, Andy Linton and Vaughan Renner, attending the IETF Minneapolis, Minnesota, meeting in November 2008, where they attended the RSSAC meeting and interviewed additional people, many of them root server operators, most of whom did not attend the Cairo ICANN meeting;
- Following these meetings, interviewing more people by email, Skype and telephone;
- By means of the RSSAC Mailing List and ICANN website, inviting any interested parties to contact us either with comments, or to request an interview;
- Researching RSSAC's history and evolution as far as practicable through its ICANN website[3], and other Internet-based materials and publications.
- Obtaining and reading recent reviews of other parts of ICANN including the Nominating Committee, the Generic Name Supporting Organization and the At-Large Advisory Committee (the last conducted by WCL during 2008); and

[3] http://www.icann.org/en/committees/dns-root/



- Towards the end of our research, when some themes had emerged, interviewing several senior members of ICANN management.

We assured all interviewees that we would treat their input as confidential and that we would take reasonable steps to ensure that individual respondents could not be identified through our report. Accordingly, we have not attributed comments in our report, but we have tried to indicate the relative importance and whether respondents' views were widely shared. It is important to note, however, that a minority view may be just as valid as a majority view.

Phase 2: Analysis

This phase did not begin until a substantial amount of the information gathering had taken place, in order to avoid premature conclusions colouring our interviews. The range and depth of the team members' experience in technical and organizational issues and history was very useful during this phase. Specific activities in this phase included:

- Identifying gaps in information when compared to the questions in the terms of reference, so that they could be researched further;
- Further discussions with some people to elicit information as required;
- Validating through the Board's Review Working Group the range of interviewees to confirm coverage of relevant groups both inside and outside ICANN, and seeking further interviews where necessary;
- Identifying common themes from the issues raised by interviewees, our own observations and the terms of reference;
- Developing the report outline based on background material, themes, recommendations and the terms of reference;
- For each question in the terms of reference, considering the range of views from interviewees and factual information, to produce tentative conclusions for internal discussion; and

- Debating the tentative conclusions within the team to produce consensus, or agree alternatives, to inform the drafting process.

Phase 3: Producing the report

The report was drafted by the Review Team in January and February 2009. As part of this process, we compiled input we received during the information gathering phase and forwarded it to the RSSAC mailing list for comment. We also discussed the input with the Board's Review Working Group.

Consistency Check against SSAC Review

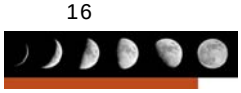
An independent review of the Security and Stability Advisory Committee (SSAC) is proceeding at the same time as our review. While the functions of the RSSAC and SSAC are quite distinct, there is some overlap and there are significant areas of common interest (we note, as a topical example, the recent joint meeting of members of the SSAC and RSSAC to discuss the study of the capacity and scaling of the root server system, following a request from Board member, and former Chair of the SSAC, Dr Steve Crocker[4].)

We therefore believed it would be prudent to check whether our findings were consistent with those of the SSAC reviewers. ICANN staff members facilitated a conference call in early February at which we were able to discuss this. We were pleased that both review teams appear to have reached conclusions that were, if not similar – because of the different subject matter – at least consistent.

2.4. Limitations

We have taken all reasonable steps to ensure the factual accuracy of our report, but we acknowledge that it may contain errors of fact or material omissions because of evidence we have overlooked or misinterpreted. We accept responsibility for any such lapses. We believe this is a consequence of the independent position we have been encouraged to maintain at all times in conducting our review.

[4] http://www.icann.org/en/minutes/prelim-report-03feb09.htm

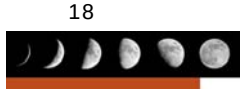


2.5. Acknowledgments

In the course of this review, Westlake Consulting Limited (WCL) has received submissions, advice and assistance from a wide variety of people. We have interviewed about fifty people in person, by telephone or by Skype. Those people's names are listed in Appendix C – Sources. In addition we had numerous informal discussions both at the ICANN and IETF meetings and subsequently with a range of people, and we have received useful feedback and comment from the members of the Review Working Group and many ICANN staff members.

All the people we approached have given freely of their time and views, and we thank them for this. In particular we should like to thank our key contact at ICANN, Marco Lorenzoni, for his quick responses, administrative assistance and close interest in our work, and Patrick Sharry for his help during the early stages of the review.

3.Background



3.1. What does ICANN do?

ICANN is an internationally organized, non-profit corporation that has responsibility for Internet Protocol (IP) address space allocation, protocol identifier assignment, generic (gTLD) and country code (ccTLD) Top-Level Domain name system management, and root server system management functions. These services were originally performed under United States Government contract by the Internet Assigned Numbers Authority (IANA) and other entities. ICANN now performs the IANA function.

As a private-public partnership, ICANN is dedicated to preserving the operational stability of the Internet; to promoting competition; to achieving broad representation of global Internet communities; and to developing policy appropriate to its mission through bottom-up, consensus-based processes.[5]

What is ICANN's Role?

With regard to the root server system, ICANN is responsible for coordinating the management of the technical elements of the DNS to ensure universal resolvability so that all users of the Internet can find all valid addresses. It does this by overseeing the distribution of unique technical identifiers used in the Internet's operations, and delegation of Top-Level Domain names (such as .com, .info, etc.).

Other issues of concern to Internet users, such as the rules for financial transactions, Internet content control, unsolicited commercial email (spam), and data protection are outside the range of ICANN's mission of technical coordination.[6]

[5] http://www.icann.org/tr/english.html
[6] Ibid.

3.2. What is RSSAC's role?

The ICANN Bylaws (Article VII, Section 3(b)) describe the DNS Root Server System Advisory Committee as follows:

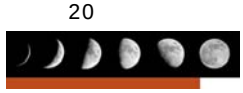
> *There shall be a DNS Root Server System Advisory Committee. The initial chairman of the DNS Root Server System Advisory Committee shall be appointed by the Board; subsequent chairs shall be elected by the members of the DNS Root Server System Advisory Committee pursuant to procedures adopted by the members. The responsibility of the Root Server System Advisory Committee shall be to advise the Board about the operation of the root name servers of the domain name system. The Root Server System Advisory Committee should consider and provide advice on the operational requirements of root name servers, including host hardware capacities, operating systems and name server software versions, network connectivity and physical environment. The Root Server System Advisory Committee should examine and advise on the security aspects of the root name server system. Further, the Root Server System Advisory Committee should review the number, location, and distribution of root name servers considering the total system performance, robustness, and reliability.*[7]

3.3. Where has the RSSAC come from?

The RSSAC was formed in 1998 and first met in 1999 to address requirements in the ICANN Joint Project Agreement ('JPA')-MoU with the United States Government. The relevant section is:

> *Collaborate on a study and process for making the management of the root server system more robust and secure. This aspect of the Project will address:*
>
> > *a. Operational requirements of root name servers, including host hardware capacities, operating system and name server software versions, network connectivity, and physical environment.*

[7] http://www.icann.org/en/committees/dns-root/



> *b. Examination of the security aspects of the root name server system and review of the number, location, and distribution of root name servers considering the total system performance; robustness, and reliability.*
>
> *c. Development of operational procedures for the root system, including formalization of contractual relationships under which root servers throughout the world are operated.*[8]

The Board appointed Dr Jun Murai (at the time an ICANN Director) as the Chair of the committee.

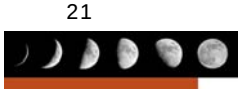
3.4. How does the RSSAC work?

The RSSAC is an advisory committee, set up under the ICANN Bylaws[9] and whose role is *to advise the Board about the operation of the root name servers of the domain name system*. Its membership comprises the operators of the 13 root name servers and others who have an interest in running the root server system. The ICANN Board also has the ability to appoint members to the RSSAC.

The RSSAC generally meets after a private root server operators' meeting held in conjunction with the tri-annual IETF meetings.

Typically the RSSAC is an issues-based and reactive committee – it responds to issues and requests when raised by the ICANN Board. Requests from, and responses to, the Board are communicated via the Board liaison.

[8] http://www.icann.org/en/general/icann-mou-25nov98.htm
[9] ICANN website: http://www.icann.org/en/general/archive-bylaws/bylaws-08apr05



4.Findings

4.1. Purpose

The purpose that the RSSAC serves

The ostensible purpose of the RSSAC is set out in the ICANN Bylaws, which is quoted in Section 3.2 above. However, the majority of interviewees believed the purpose that the RSSAC currently fulfils is rather simpler, specifically:

- To provide advice to the ICANN Board about the root server system; and
- To act as a communications channel between the root server operators, ICANN and other entities such as the RIRs, IANA and IAB.

The RSSAC's advice to the ICANN Board is seen as "reactive", that is, advice is only provided when asked for and this advice is provided on an "issue by issue" basis. It also appears that much of the advice provided to the ICANN Board is transmitted on a relatively informal basis by means of the RSSAC liaison to the Board.

All of the root server operators interviewed also noted that the section of the Bylaws, *the RSSAC should review the number, location, and distribution of root name servers considering the total system performance, robustness, and reliability,* is no longer relevant, following the introduction of Anycast servers to the root server system.

The purpose the RSSAC is currently fulfilling is therefore at odds with the role assigned to it in the Bylaws.

The RSSAC and the Internet Community

RSSAC's interaction with the Internet Community is relatively low key. There are several websites that provide information about the activities of the committee, including the official ICANN site[10] and an unofficial site[11]

[10] http://www.icann.org/en/committees/dns-root/
[11] http://www.rssac.org/

Both these websites have copies of the minutes of most of the meetings and other documents. Neither site provides material that is particularly comprehensible to anyone who is not already familiar with the workings of the RSSAC or DNS operations at a technical level.

Over the last ten years the RSSAC minutes have noted the importance of producing accurate minutes in a timely manner. This appears to have been an ongoing struggle over the years. The most recent set of minutes on the RSSAC section of the ICANN website is from December 2007 while the unofficial site has minutes for the following meeting, held in March 2008.

The RSSAC section of the ICANN website needs to be more actively maintained. In particular:

- Documents describing work that RSSAC has been involved in are missing from the site. An example is the joint report from SSAC and RSSAC on Accommodating IP Version 6 Address Resource Records for the Root of the Domain Name System[12].
- The main content of the site, apart from a table listing meeting minutes, is a description of work in progress from 2001 with no clear description of the outcome of that work or where results from it can be found.
- The contact email address for the committee appears at the end of a long, unstructured web page.
- There is no information on the RSSAC pages of how to find out about the root server operators[13] or independent work on DNS root server measurement[14].

Providing more information on these pages could well go a long way to alleviating concerns about lack of activity and transparency in the work of RSSAC. This is work that ICANN staff ought to carry out under direction from RSSAC.

[12] available at http://www.icann.org/en/committees/security/sac018.pdf
[13] i.e. http://www.root-servers.org/
[14] e.g. by CAIDA (http://www.caida.org/), Team Cymru (http://www.cymru.com/monitoring/dnssumm/) or RIPE NCC (http://dnsmon.ripe.net/dns-servmon/)

4.2. Structure

ICANN Bylaws state: *the Membership in the RSSAC shall consist of (i) each operator of an authoritative root name server (as listed at ftp://ftp.internic.net/domain/named.root), and (ii) such other persons as are appointed by the ICANN Board.* Elsewhere on the ICANN website, membership is described as including representatives of organizations responsible for operating the world's thirteen root name servers and other organizations concerned with stable technical operation of the authoritative root server system[15].

Membership of the RSSAC has been discussed on a number of occasions at committee meetings. The first was at the meeting on 17th March 1999. At that point it was noted that membership should include *the root server operators, IANA staff, liaisons from the leadership of the IETF and ICANN supporting organizations, and recognized experts in various relevant technical areas*.[16] At a subsequent meeting (15th July 2002) membership was again discussed[17] with a several members noting that renewed involvement of the Internet Activities Board (IAB) / Internet Engineering Steering Group (IESG) would be helpful. It was agreed that an invitation to IAB/IESG would be made to designate liaison members, but it is not clear whether such liaisons were ever designated.

As noted above, the Bylaws provide the ICANN Board with the ability to appoint members to the RSSAC. We have found no evidence that the Board has appointed members of the ICANN community (other than root server operators) to the RSSAC and we are unaware whether the Board has tried to appoint members and failed, or whether they have not attempted to make any appointments.

While it appears that the Board may not have made good use of the appointment option, several interviewees thought that the RSSAC should be more representative of the Internet Community at large.

15 http://www.icann.org/en/committees/dns-root/
16 http://public.icann.org/en/node/795
17 http://www.icann.org/en/committees/dns-root/rssac-meetings/2002YokahamaJP.html

We found it difficult to define accurately the current membership of the RSSAC. The best definition available from those interviewed was *current members are those who are on the RSSAC mailing list.* A number commented that membership had grown haphazardly over the years and that attendance at RSSAC meetings *tends to depend on who is in town*. We also found that single root server operators were sometimes represented in RSSAC meetings by a number of attendees. Defining the current size of the RSSAC is therefore problematic.

Views among interviewees varied about the optimal size of the RSSAC. Some felt the RSSAC should be smaller, while others thought size was irrelevant to the effective operation of the committee.

We received a number of different views about committee membership from current RSSAC members. Some thought the current membership was appropriate and effort should go into improving effectiveness prior to analysing membership. While others thought that committee effectiveness could be improved by broadening the membership to include representatives from the wider root server system community and maybe even representatives from other ICANN supporting organizations or advisory committees.

Resourcing

The overwhelming view of current RSSAC members is that the committee is very resource poor – many interviewees commented that the root server operators all have “day jobs” and they tend not to go out looking for additional work. This was supported by the strong view that the operators run the root server system well and that they are very capable technically, but typically they were “time poor” and sometimes lacked the incentive to participate actively within the RSSAC. In particular we heard that members were good at commenting on prepared drafts but that many were reluctant to be involved in preparing draft reports for comment.

We were also advised by many current RSSAC members that the operators were technically focused engineers who were much more likely to engage on issues that directly affected them or the operation of the root server system.

There is a perception amongst the RSSAC members that ICANN has provided little support to the RSSAC. However we have found little evidence[18] to suggest that the RSSAC has previously requested support from ICANN staff. Minutes of early RSSAC meetings show that the members were discussing the issue; however no obvious progress was made.

During the interview phase of our review many commented that ICANN staff support would significantly improve the effectiveness of RSSAC. This support was highlighted for both secretarial and technical functions.

On the other hand, from ICANN's perspective, we were advised that ICANN staff stood ready to provide support as soon as a need for it was demonstrated, or if it was asked for.

Some interviewees also cautioned against an overemphasis on staff support as they warned against the RSSAC becoming a "clone" of the SSAC: they see the RSSAC as a different committee with a different mandate from the SSAC, which they see serving a wider community on a broader range of issues.

4.3. Procedures

Planning

As we have noted elsewhere, interviewees have advised that the RSSAC tends to be an issues-based, reactive committee. It develops and provides advice on request from the ICANN Board. The reactive nature of the committee also tends to limit the amount of planning the RSSAC undertakes.

[18] Admininstrative support was discussed at the 25th RSSAC meeting in Montreal.

In particular, the ICANN Board advice process has been described by current RSSAC members as relatively "ad hoc." The committee will typically debate an issue until it reaches consensus, before providing a response to the Board. This often involves the issue being more widely debated at the private and smaller root server operators' meeting before being discussed at the RSSAC meeting. The root server operators' meeting occurs immediately prior to the RSSAC meeting. Those who have attended both meetings have advised that the root server operators' meeting is more candid and that there appears to be a higher level of trust than at the RSSAC meeting.

We were also advised that there tends to be little active engagement of the RSSAC members on particular issues between the RSSAC meetings via the mailing list. This is supported by the fact that there appear to be very few postings to the RSSAC mailing list between meetings unless there is a particular issue to discuss.

Internal procedures and policies

We found no evidence of formal documented policies and procedures for the RSSAC.

Some members stated that this is not surprising owing to the way the committee reports on a 'reactive and issue by issue' basis. Even if this view is accepted, the review team believes the effectiveness of the RSSAC could be greatly improved by developing and documenting policies and procedures to guide the work of the committee.

Reviewing the available minutes of the RSSAC meetings highlights that members have recognised that the processes of the committee have needed improvement over the years of its existence. However, while the issue has been recognised it does not appear that action has been taken to develop policies and procedures for the RSSAC.

Chair selection

The ICANN Bylaws state: *The initial chairman of the DNS Root Server System Advisory Committee shall be appointed by the Board; subsequent chairs shall be elected by the members of the DNS Root Server System Advisory Committee pursuant to procedures adopted by the members.* [19]

The Chair was appointed by the ICANN Board as provided for above at the formation of the RSSAC in 1999, and remains in place to date.

There is no Chair selection process extant within the RSSAC. Many thought that one should be developed. Further, they believed that it should include policies for Chair rotation, limiting the length of term and number of consecutive terms. This was reinforced by a number of comments from current members about standard committee practices, for example: *this committee needs to work like a real committee.*

While noting that a selection process for the Chair is necessary, there was also agreement among the RSSAC members interviewed that the Chair should be a root server operator.

At the 25th RSSAC Meeting in Montreal, Quebec, in July 2006 the committee discussed "Reconstruction of RSSAC" including the addition of a Vice Chair and a process for Chair selection. It was agreed a Vice Chair would be useful and subsequently Matt Larson of Verisign was confirmed in the role. It is unclear from the minutes if there was any further action regarding a Chair selection process.

4.3.4 Conflict of interest policy

There is a level of professional trust between the operators that works to minimise potential conflicts of interest. However, the lack of processes and procedures implies that there are insufficient safeguards against potential (or actual) conflicts of interest.

[19] http://www.icann.org/en/general/bylaws.htm#XI

4.3.5 Transparency

Transparency to the Internet Community has been limited by the sporadic publishing of RSSAC meeting minutes, limited co-ordinated web based information and by the effective closure of RSSAC meetings to the wider Internet Community.

RSSAC members recognise this lack of transparency and discussed it at their July 2002 meeting in Tokyo. While that discussion appears to have recognised the importance of publishing minutes soon after RSSAC meetings, timely publication of committee minutes remains a problem today. As noted earlier, the last published minutes of an RSSAC meeting on the ICANN website are for the meeting dated December 2007. Three meetings have taken place since then.

The WCL Review Team can attest that a member of the Internet Community would have great difficulty trying to obtain information about the RSSAC on the web. There are multiple sources of information but with no linkage from ICANN's RSSAC site. From our review, we also note that information about the root server system is widely scattered and performance measures are difficult to obtain.

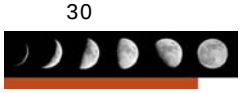
4.4. Effectiveness

Advice to the ICANN Board

We were presented with views that ranged from *RSSAC never tell us anything* to *ICANN never ask us anything*. There was clear agreement that in general RSSAC advice was provided on an issue-by-issue basis and that there were times when there were no current issues.

Aside from responding on an issue-by-issue basis, a number of interviewees also questioned the timeliness of advice from the RSSAC – there is a perception that it takes a long time to get the RSSAC to communicate their view. However, there was a consensus that the RSSAC would respond once they had been asked.

Many interviewees also believed that ICANN Staff support would improve the timeliness and the quality of advice and reporting provided to the Board.



As noted earlier there is a lack of formality in the RSSAC processes, this was highlighted by many committee members and was reinforced by a review of the RSSAC minutes and documented statements, as well as our own experience attending an RSSAC meeting. Some excused this lack of formality due to the committee working on an issue-by-issue basis and that they therefore did not need a lot of structure, while others felt the exact opposite was true.

A number of interviewees stated that the ICANN Board had not requested technical advice from RSSAC on particular issues. While we have not investigated these issues, we believe this reinforces a view that the RSSAC and the ICANN Board need to more clearly understand and agree their expectations of each other.

In reviewing the effectiveness of engagement between the ICANN Board and RSSAC, we note the difference between the way that the IESG sends architectural questions to the IAB[20] and the interaction between ICANN and the RSSAC on an issue (see Appendix G).

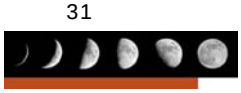
Having said this, we were also provided with an example where the RSSAC apparently did not communicate about a technical issue with the ICANN board:

> *The Anycast thing is a really good example of where a new technology got introduced, a new protocol got introduced, and it enabled people to disperse root servers in a much wider way but they didn't do that through ICANN, they just went ahead and did it; they didn't actually ask anybody if it was a good thing to do.*

The RSSAC Board Liaison

Most interviewees reflected that a non-voting liaison was the most appropriate way to represent the views of the RSSAC to the ICANN Board. They also felt the 'non-voting' position was important as it allowed the liaison to be 'with but not of the Board' Many felt that this role was vital in that it provided a conduit to the Board on technical matters related to the operation of the root server system.

[20] http://www.ietf.org/IESG/architectural-iab.html



There were also a number of comments regarding the communication 'to the Board' being effective but that communication 'from the Board' was less effective and that this could be improved. In particular several interviewees raised the issue of informality – some Board requests appear to be communicated verbally (via the liaison) and therefore tend to be informal and open to misinterpretation.

A number of people commented on the current ICANN Board Review and how the outcome of this review may impact the role of the current RSSAC Board liaison. If the ICANN Board becomes more of a 'governance' type board, then some form of RSSAC/ICANN Staff liaison would be desirable to ensure the RSSAC maintained sufficient input and representation.

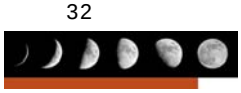
Other Supporting Organization and Advisory Committee interactions

We were advised of a significant amount of interaction between the RSSAC and the SSAC, with little evidence of activity with other supporting organizations or advisory committees. While the RSSAC/SSAC interactions have taken place, they are not necessarily widely known or well documented.

We found little evidence of communication between RSSAC and other advisory committees and supporting organizations, however we note that issues have been few and far between: for issues that have been raised, RSSAC have responded well but not necessarily in a timely manner. Informality, as noted earlier, may drive some of these timing issues.

In discussions with other supporting organizations and advisory committees a number of themes emerged:

- *What would we actually be asking of the RSSAC?*
- *Advice we don't get is fine!*
- *Everything must be ok as it appears to be working well*.



Other than interactions with supporting organizations and advisory committees, we identified interactions between the RSSAC and ICANN and IANA staff on particular issues. A number of interviewees noted that ICANN staff worked well with the RSSAC on the IDN issue, producing one of the few public RSSAC statements on record, the RSSAC Statement on ICANN's Proposed Next Steps for IDN Deployment in the Root Zone.[21]

How effective is the RSSAC?

Our interviews highlighted a number of issues related to the effectiveness of the RSSAC:

- The RSSAC has not fulfilled part of the role as set out in the Bylaws, in that it has not provided advice to the Board about detailed operational matters such as operating systems for root servers. Root server operators see these issues as falling within their domain, rather than issues for ICANN to be concerned about: they question whether it is ICANN's role even to be asking about these issues.

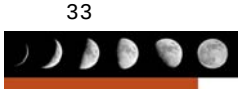
- Issues related to location and number of servers are seen by most as having been overtaken by events (e.g. Anycast).

- There are positive examples of the effectiveness of the RSSAC, such as; IPV6, DNSSEC and IDN.

- Public perception of some aspects of the management of the root server system and the role of the RSSAC is dictated by the ICANN website: it is very difficult to gather information about RSSAC (the ICANN website reflects poorly what the RSSAC and root server operators do).

- RSSAC is a reactive group that deals with issues as they arrive and not always in a timely manner. This may be the correct approach for some of the activities of the group but there are tasks that should be dealt with in a more routine and predictable manner.

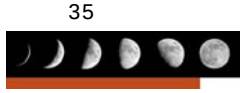
[21] http://www.icann.org/en/committees/dns-root/rssac-idn-statement.htm



- Consensus is difficult for RSSAC as the members operate independently.

While we were finalising this report, a joint steering group was formed by RSSAC and SSAC to deal with an ICANN Board request for a study of root zone scaling issues. We envisage that a properly constituted and more functional RSSAC would be driving such issues proactively and bringing them to the attention of the ICANN Board and the Internet Community, rather than reacting to requests.

5.Conclusions



5.1. Does the RSSAC have a continuing purpose?

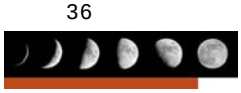
There is an important point to make about RSSAC's purpose before analysing it in detail. That is, there may be an assumption that ICANN is an accountability mechanism for the root server operators. The language in the Joint Project Agreement (the JPA) between ICANN and the United States Department of Commerce asks ICANN to make agreements with root server operators. The implication is that, when the JPA was drafted, the Department of Commerce wanted to be able to hold ICANN to account for the performance of the root server system.

Our research shows that that the root server operators regard themselves as accountable to the Internet Community, as does ICANN. It is not necessary for ICANN to be formally part of a chain of accountability between the root server operators and the US government. Moreover, the JPA is set to expire this year, which would render this moot. ICANN can play a role in facilitating the root server operators' accountability to the Internet Community, e.g. by regularly publishing information in agreed formats. Therefore, the assumption in the statement above that root server operators are directly accountable to ICANN needs to be amended or deleted to reflect reality. Individual Memoranda of Understanding such as the one signed between ICANN and the Internet Systems Consortium (ISC), who operate the F-root server, may be of help here. Our discussions with root server operators during our research revealed that the root servers generally do not regard themselves as being in any way accountable to ICANN.

Returning to the detail of the statement in the Bylaws which defines RSSAC's role, the statement says that the RSSAC's purpose is to advise the Board about root server operations. It goes on to specify three functional areas that advice should cover:

- Detailed operational requirements;
- Root server system security; and
- The right number and location of servers to provide best service.

The appropriateness (and adequacy) of each of these three potential streams of advice is discussed below.



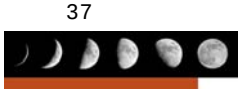
Detailed operational requirements

It does not seem appropriate for the Board to seek advice about detailed operational requirements for the root servers. We can find no evidence that RSSAC has ever provided the Board with advice on, for instance, operating systems, nor would we expect the Board to take an interest in such matters of operational detail. It is important that there be coordination and information sharing among root server operators about technical detail, but we are told that this takes place in the root operators' own forum. It is not clear that the Board would need such detailed advice, or indeed what the Board would do with the advice if it received it.

There is, in our view, a sound argument that the Board should seek sufficient information to assure itself that the system is resilient. Diversity of operating systems and other operational matters is seen as being necessary for resilience. However, the Board can assure itself about diversity and resilience without requiring detailed operating system information from each operator. The Board could achieve this end by seeking and receiving formal assurance from the RSSAC (or successor body) about the steps undertaken for resilience, including steps to maintain diversity.

Root server system security

The continued physical and data security of the root server system is as important to the Internet as the resilience of the system. Several parties are involved in maintaining this security, including IANA and the root server operators themselves. It is entirely valid that the ICANN Board should expect a qualified group to provide it with assurance about security of the system, and RSSAC is the best placed in the ICANN system to do this.



Number and location of servers

The RSSAC has never reviewed the number or location of root servers. This is not to say that no work has been done to diversify root server location: although the majority of entities operating root servers are based in the United States, use of Anycast technology by some root servers means that there are many server instances[22] spread around the world.

Root operators currently have their own forum in which, we were advised during our research, technical information is shared and some coordination is done. We are unable to gauge the extent of this work because these are closed meetings for which no minutes are published. This forum generally meets at IETF meetings, and RSSAC meetings are generally brief and follow the root server operators' own meeting. RSSAC meetings are therefore not held in parallel with ICANN meetings, unlike those of other ICANN advisory committees and supporting organizations.

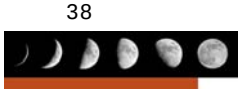
The ICANN Board and the Internet Community have a legitimate interest in system stability and robustness, and in arrangements to ensure appropriate geographical and administrative spread of the root servers. In our view, the Board should have little or no interest in technical detail provided it can gain sufficient information to assure itself that these matters are being well managed.

In summary, the purpose of RSSAC as currently stated in the ICANN Bylaws is partly valid and partly unnecessary, or even undesirable. The assumption in the stated purpose that ICANN is a vehicle for root server operator accountability to the United States Government is not correct. Furthermore, it is not useful to either party for RSSAC to advise the Board on technical minutiae of root server operations.

5.2. Is the RSSAC the most suitable vehicle?

As currently constituted, the RSSAC is not a suitable vehicle for delivering the purpose outlined above, for the following reasons:

[22] 167 instances according to root-servers.org on 24th February 2009



- The current membership of the RSSAC is predominantly the root server operators, although it is not their decision-making forum. Its agenda also appears to reflect the agenda of meetings of the root server operators. As a result, the RSSAC is, at best, hard to distinguish from the root server operators' own forum.

- The RSSAC's procedures are inadequate for a formal committee. Minutes are aimed primarily at a technical audience, are hard to interpret and seldom posted online in a timely manner. Among the lack of formal processes, there is, for instance, no documented procedure to appoint a committee Chair, and only limited evidence of productive work done by RSSAC over the ten years of its existence.

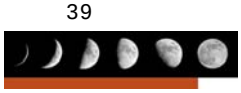
- There is no evidence that the RSSAC has ever attempted to fulfil those parts of its stated purpose related to coordination, nor is it clear how it could do so. That said, we have already commented that some of the existing roles of the RSSAC are inappropriate.

- The RSSAC relies on volunteer labour – there is little formal staff support from ICANN.

- It does not meet at ICANN meetings, or in public session. This means that it is not practicable for other arms of ICANN, for example the ccNSO, to meet with the RSSAC to discuss any areas of interest they may have in common.

- Where it has produced useful documentation, there is sometimes evidence on parts of the ICANN website, but no reference to it on the ICANN RSSAC web pages[23].

[23] E.g. A RSSAC / SSAC joint report about IPv6 deployment is online at http://www.icann.org/committees/security/sac018.pdf but not linked from RSSAC's web pages.



5.3. RSSAC's purpose going forward

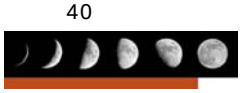
There is, however, a purpose for a more strategic group than the current RSSAC, to plan how the root server system can continue to meet the increasing expectation of the Internet Community. This group, which we propose would be an evolution from the current RSSAC, would provide a source of unbiased strategic advice to ICANN, the root server operators and the Internet Community. The group would analyse, assess and monitor risks and proposed changes to the root server system, and provide reassurance and transparency to the Internet Community about the reliability and robustness of the system.

As an ICANN-supported body, the review team believes the new group should meet at regular ICANN meetings, although inter-sessional meetings would also be possible. In keeping with the requirements of accountability to the Internet Community, the group should meet in public, except for any periods necessary to consider specific items that should remain confidential for security or commercial reasons. The current presumption of secrecy should be reversed. We also note that "security through obscurity" is held by many experts to be of limited, and possibly negative, value in securing systems on the Internet.

The reconstituted RSSAC is intended to be a bridge between the ICANN Board and the root server operators. This aspect of its role needs to be formalised and strengthened.

5.4. Role of the Board liaison

The role of the RSSAC liaison to the Board is important. It is the role of this individual to provide the Board with advice about the potential impact of any policy change (e.g. the introduction of IDNs) on root server performance, to convey concerns from the root server operators to the Board, and to ensure that any questions or concerns the Board might have are conveyed to the root server operators.



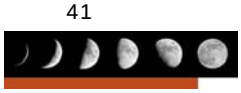
Given the lack of RSSAC minutes mandating the liaison to carry specific messages or reports to the Board, communications between the Board and root server operators have in practice depended heavily on the individual concerned. Following our research, we have no doubt about the ability or performance of the current liaison to keep the channels of communication open. But reliance on a single individual in this way is informal and does not provide adequate risk management for some of the critical issues that need to be addressed. There should be a job description, to be developed by the RSSAC, for this role. There also needs to be more formal communication in both directions, with the RSSAC and the Board making and answering written requests of each other (see Appendix G).

5.5. Options for change

As discussed above, there is a valid purpose for the RSSAC or a similar group. As currently constituted, the RSSAC cannot fulfil that purpose. We have identified four options for structural change to fulfil the purpose:

Option 1: No change, i.e. keep RSSAC as is.

> This is not a recommended option for reasons discussed above. It is not analysed further.



Option 2: Disband RSSAC, or merge its functions into another part of ICANN, such as the SSAC.

This option would involve simple removal of RSSAC from the ICANN structure. The Review Team considered whether a merger with another part of ICANN (the SSAC appeared the most logical option) would be appropriate. While this had some superficial attraction and there are clear overlaps between the remit of the RSSAC and the SSAC, the Review Team concluded that the purpose and functions of the RSSAC did not lend themselves to being merged into any other ICANN structure. Disbanding the RSSAC in total would have the disadvantage of removing the RSSAC liaison from the Board, which would in practice remove the limited amount of contact that exists currently between the root server operators and ICANN, as well as signalling that ICANN was not interested in root servers. This option was discarded and is not analysed further.

Option 3: Replace RSSAC with an ICANN supporting organization (the RSSO?).

This option would involve creating a new supporting organization like the ASO, the ccNSO and the GNSO. Supporting organizations are primarily bodies which drive ICANN's policy development processes. This is not consistent with ICANN's or the root server operators' needs: root server operators need to comment on others' draft policy but do not generally drive policy development for ICANN. This option is not analysed further.

Option 4: Refocus RSSAC and provide more support.

This option would involve changing RSSAC's purpose and adding staff support. The change in purpose would be to remove the requirements currently in the Bylaws for RSSAC to report in detail about the operation of each server, and replace them with a requirement to work with the Board on agreeing and implementing a reporting regime.

Option 5: Reinvent RSSAC as a joint strategy group.

> Under this option, RSSAC would be recreated to contain a subset of the root server operators, along with other interested parties appointed by ICANN and the Internet Community. Its purpose would be re-written to emphasise a co-operative approach between root server operators and ICANN, and accountability to the Internet Community. ICANN would provide staff support.

Options 4 and 5 are assessed below against the following criteria:

a) The degree to which it meets the needs of the Internet Community for root server performance, functionality and resilience.

b) Transparency and accountability.

c) Likely effectiveness.

Analysis

	Option 4: Refocussed RSSAC	**Option 5: Reinvented RSSAC**
Membership	Existing	Mix of root server operators, Internet technical community and ICANN
Purpose	Existing purpose with currently-ignored reporting requirements removed	Strategic oversight of root server system; monitoring and analysis.
Support	ICANN staff to provide technical and administrative support	ICANN staff to provide technical and administrative support
Liaisons	Outward to Board	Outward to Board and SSAC. Inward from technical community and SSAC
Performance, functionality and resilience	As at present.	At least as good as at current; joint approach to strategy may improve resilience.

	Option 4: Refocussed RSSAC	**Option 5: Reinvented RSSAC**
Transparency and accountability	Moderate transparency. Improvement over existing RSSAC since staff support will produce minutes, etc.	Good transparency and accountability. Explicit representation from root server operators, ICANN and technical community. Staff to facilitate regular standardised reporting.
Likely effectiveness	Moderate. Staff support will help but balance of committee still makes it no more than a communications channel.	Good. Representation from different groups should promote coordination.

In the view of the Review Team, Option 5 – reinventing the RSSAC and giving it a more strategic mandate – better meets the objectives set out.

We show below a diagram illustrating its structure, linkages and accountabilities.

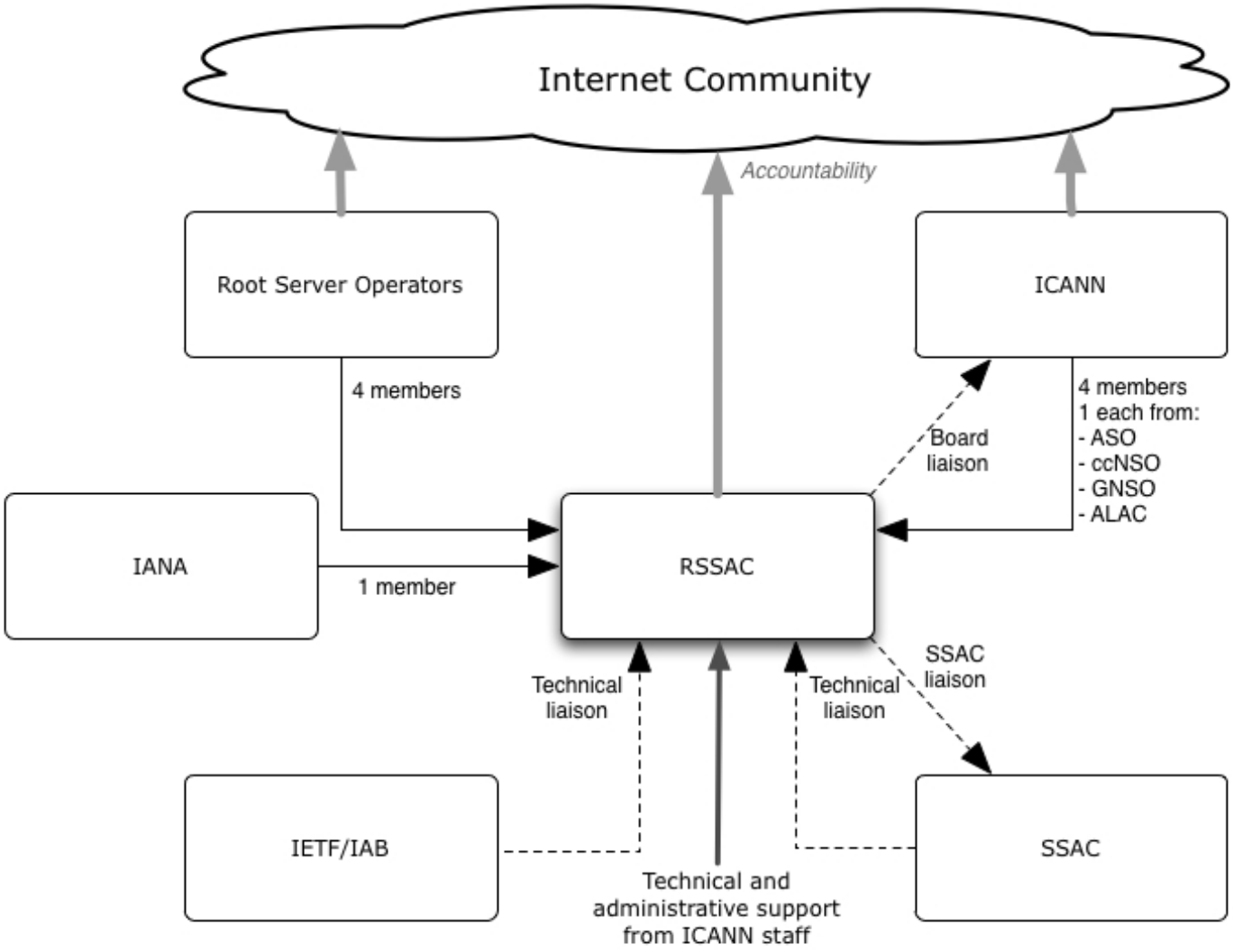


Figure 1 – Recommended Structure

The essential features are:

- Structure: the group has four members each from the root server operators and the ICANN community, and one member from IANA. The group also has incoming liaisons from the Internet technical community and the SSAC.
- Support: ICANN staff will supply both administrative and technical support staff.

- Accountability: The group will be accountable jointly to its main stakeholders, i.e. the root server operators and ICANN. It will ultimately be accountable to the Internet Community.

- Transparency: The group will meet in public and publish minutes (except for specific items where openness would compromise security or commercial confidentiality). The group will meet in parallel with ICANN meetings. (ICANN will provide travel assistance under its normal travel policy.)

- Mandate: The group will have a strategic focus, not an operational one.

This preferred option in described in more detail in the next section.

6. Recommendations

6.1. Role and Structure

We are proposing substantial changes to the RSSAC. These changes will affect the RSSAC's role and its composition.

We **recommend** that the RSSAC be reformed as a strategy group, run jointly by ICANN and the root server operators.

Although the reformed group will still be called RSSAC, i.e. it will be an advisory committee, its mandate will be substantially different from that of the existing RSSAC. In particular, it will not be a conventional ICANN Advisory Committee, in that it will have a joint accountability to both ICANN, which will provide financial and people support, and the root server operators (who are, as noted above, not answerable to ICANN).[24]

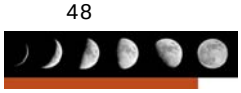
We considered renaming the group to have the word "Strategic" in its name, in order to differentiate its role from the operational role of the root server operators. The Review Team wishes to emphasise that the new group is not intended to encroach on operational "territory" that is rightly held by the root server operators. However, we decided that changing the name away from an advisory committee risked becoming a distraction since it is a well-understood term in the ICANN community, and advisory committees have their own section in the ICANN Bylaws.

Initiate advice

One of the recurring themes of our interviews was the reason given for the perceived inactivity of the RSSAC. This came in two main guises:

- From root server operators and those associated with them: *The Board never asks us anything.*
- From the Board and others within ICANN: *The root server operators never tell us anything.*

[24] One of the challenges that ICANN has faced in relation to the root server system has been that of how to engage the root server operators in constructive dialogue of strategic issues relevant to both parties.



One of the key requirements for an effective advisory committee is that it should keep an open line of communication with the intended recipients of its advice and take an active interest in matters where its advice may be valuable. We do not believe it is sufficient for such a committee merely to wait until the Board asks it for advice: the Board cannot "know what it doesn't know", and it should be able to rely on members of an advisory committee to become aware of an issue and exercise the initiative to bring it to the Board's attention.

Revised Terms of Reference

We **recommend** that the "Terms of Reference" for the RSSAC as laid out in the Bylaws[25] should be withdrawn and replaced with the following[26], which set out the recommended purpose and role of the RSSAC:

- The role of the Root Server System Advisory Committee ("RSSAC") shall be to provide a source of unbiased strategic advice to ICANN, the root server operators and the Internet Community about the best way ahead for the root server system. The role will include the following functions:
  - To analyse, assess and monitor, at a strategic level, proposed changes to the root server system in order to provide timely advice to the root server operators and ICANN on the implications, desirability and risks of such changes;
  - To provide reassurance and transparency to the Internet Community that these tasks are under control and that they can have confidence in the reliability and robustness of the root server system;
  - To identify strategic risks to the root server system, and to ensure that planning is in place to address failures of critical systems, including – but not limited to – the demise or critical breakdown of one or more root server operators, or ICANN or IANA;
  - To ensure that the performance of the root server system is monitored in the light of anticipated or actual changes to the system or in global Internet usage;

[25] Article XI Section 3(a-d): http://www.icann.org/en/general/archive-bylaws/bylaws-08apr05.htm#XI

[26] Our words provide the substance of the clause, but ICANN's lawyers would need to approve and/or provide wording that met the requirements of the Bylaws and any other related legal issues.

- To provide a means of liaison between the root server operators, ICANN and the Internet Community, via the ALAC, ASO, ccNSO, gNSO and other relevant stakeholders.
    - The RSSAC may collaborate with other advisory committees or supporting organizations to address a particular strategic issue, if in their view this is likely to lead to a better outcome for the Internet Community.

6.2. Accountability

We have recommended that the reformed RSSAC should have direct accountability to both the ICANN Board and the root server operators collectively. As indicated in *Figure 1 – Recommended Structure* on page 45, we have shown the root server operators and ICANN Board on the same level.

The main reason for this dual line is that, for it to be effective, the RSSAC will need to engage both groups of key stakeholders/influencers:

- Accountability to the Board is easy to understand, since it is in line with all other ICANN entities and accords with a conventional governance model. Further, since ICANN will provide financial and staff support, it is natural that ICANN will wish to hold the RSSAC accountable.

- Accountability to the root server operators is less conventional, but in this instance we consider it a practical necessity:

- First, this acknowledges the current composition of the RSSAC, which consists to a large degree only of the root server operators. By ensuring accountability to this group, it is hoped that the root server operators will understand that there is no intention (in reforming the RSSAC) of diluting their voice in matters relating to the root server system, and that in turn they will see value in engaging with ICANN on relevant strategic issues through the RSSAC.
- Secondly, any group that addressed strategic issues around the root server system, without having some accountability to those who manage the system, would be likely to lack technical credibility.

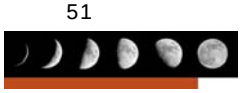
- The final key reason for this split accountability is to encourage greater two-way communication between the root server operators and ICANN than we understand currently exists, without either party being perceived as in any way superior or inferior to the other.
    - When the RSSAC provides advice to the Board and the root server operators, they will be able to consider it and respond or take action as they think fit.

During our research, the root server operators and ICANN told us on several occasions that they both regard themselves as ultimately accountable to the Internet Community.

Risks inherent in Dual Accountability

Dual accountability creates a number of risks that need to be addressed:

- How do we avoid deadlock if the interests of ICANN and those of the root server operators conflict?
    - This risk is mitigated by ensuring that neither the root server operators nor the ICANN appointees to the RSSAC can dominate without the support of at least one other member. In the event of a split along organizational lines, the IANA appointee will in effect have a casting vote. In the medium term, the success of the RSSAC will be assessed on the ability of the root server operators and ICANN appointees to collaborate to provide valuable advice at a strategic level to the two main stakeholders.



- If everything goes wrong, who can change or remove the RSSAC?
    - Under dual accountability, no party or group will have a majority on the RSSAC, so there is a possibility of deadlock or committee "paralysis". If the RSSAC is re-constituted as we have proposed, we consider that this is an unlikely outcome, because the strategic issues it addresses are likely to be of significant interest to all nominating stakeholders, and it is to be hoped that they will therefore have a shared interest in seeing the RSSAC operate effectively. However, in the unlikely event of the RSSAC becoming dysfunctional, ICANN would have the ability to modify or disestablish it by amending its Bylaws, under which the RSSAC is established. In addition, ICANN will be providing financial and people support to enable the RSSAC to operate, so in an extreme case it could decide simply to cut such support.

Composition

The membership should represent as wide a range of relevant perspectives as possible, while being small enough that it does not become cumbersome to administer.

It is also important that the RSSAC should not be dominated or controlled by any single stakeholder interest group, so we have recommended a structure that does not give any likely stakeholder group the ability to "capture" it, while also recognising the valid interests of both the root server operators and ICANN.

We recommend that the RSSAC should initially be constituted with a membership of nine, as follows (refer again to Figure 1):

- 4 root server operators, including at least one who is non-US based, appointed by the operators collectively;
- 1 appointed by IANA;
- 4 appointed by the Board / Nominating Committee of ICANN, drawn as follows:
    - 1 from the ASO;
    - 1 from the ccNSO;

- 1 from the gNSO; and
- 1 from the ALAC.

It is desirable that all nominees to the RSSAC should have a strong technical understanding of the root server system, combined with an appreciation of and sensitivity to the organizational and "political" environment, trends and risks within which the root servers operate.

Chair

We consider that the effectiveness of any Committee depends heavily on the quality of its Chair. We **recommend** that the RSSAC should appoint its Chair from among its members. We **recommend** that the term of appointment be two years (which should be long enough to see real progress, but short enough for unpaid volunteers, who may not be willing or able to commit to the workload for a longer period), with a limit of three two-year terms, in order to ensure that the Group seek "fresh blood" after a maximum of six years.

6.3. Resources

Self-organising

One of the features of the RSSAC is that it should be a self-organising Group, tasked with taking initiatives over relevant matters that need to be addressed.

Staff Support - ICANN

During our research, one of the common complaints from the RSSAC members was that there was no formal support from ICANN (in response, ICANN employees advised us that RSSAC had never requested such support, but ICANN was willing to provide it whenever the need was demonstrated).

We **recommend** that ICANN nominate two members of staff to support the RSSAC:

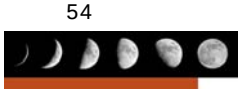
- *Technical fellow:* The purpose of this role will be to carry out research and drafting for reports on behalf of the RSSAC. Because of the nature of the issues, the person will need a thorough understanding of the root server system and will also need credibility within that community. In the early stages, the role may not be full-time, but it is likely to grow as the RSSAC addresses a wider range of strategic issues relevant to the root server system.

- *Administrative support:* the purpose of this role will be to provide the administrative role necessary for the effective operation of a group of part-time volunteer members. This will include meeting support, logistical arrangements, managing correspondence and the RSSAC's website, and support for the Chair between meetings. Maintenance of a current and complete website, with full records of meetings, activities, interaction with other entities and recommendations, will be in marked contrast to the recent history of the RSSAC, and will add substance to the commitment to transparency in the RSSAC's operations. The administrative support role is unlikely to be full-time, but is likely to experience busy peaks in the periods leading up to, and following, ICANN public meetings.

Funded travel to ICANN meetings

Another matter that was raised during our research was that the existing RSSAC holds its meetings in conjunction with those of the IETF, and that it does not participate in ICANN meetings. For example, we understand that the RSSAC has never met with the members of the GAC, although it would appear probable that there are several issues of common interest.

In order for the RSSAC to perform effectively, we consider it essential that its members should attend ICANN meetings in order to allow effective exchange of information with other supporting organizations and advisory committees, and to give substance to the requirement for transparency that we discuss further below.



As with all supporting organizations, advisory committees and other governance positions in ICANN, the people serving on them are volunteers, who in many cases give up their own time to their roles. We **recommend** therefore that ICANN fund travel and accommodation for RSSAC members to and from ICANN meetings.

Meetings

An observation made to us several times during our research was that people had little knowledge of what the RSSAC actually did. One reason for this was that the RSSAC seldom if ever attended ICANN meetings, but conducted its business in association with the IETF meetings that usually occur some weeks after ICANN. Besides the natural lack of interaction that this leads to, the disconnected meetings lead to logistical difficulties if the ICANN Board should be seeking advice from the RSSAC. For practical purposes, it results in a likely delay of 6-8 months between the ICANN Board making a request and receiving any response of substance.

We **recommend** the following in relation to the RSSAC's meetings:

- **That** the RSSAC should meet at each ICANN meeting, with provision for it to hold additional meetings in between these.
- **That** its sessions be held in public, so that anybody who wishes may attend, but with provision for it to go into closed session for part of a meeting if a majority of committee members at the meeting believe it appropriate. We consider that this level of transparency is part of the accountability that will go with belonging to this Strategy Group. We accept that there are valid reasons for the root server operators' meetings to be held in closed session. We believe that this contrast of meeting procedures will go some way towards distinguishing the root server operators' meetings from those of the RSSAC.

- **That** all root server operators be invited to attend meetings and have speaking rights (at the discretion of the Chair who will be responsible for managing the Agenda). The intention of this is that, while we believe it is not appropriate for the RSSAC to have all the root server operators as members, this is for logistical reasons, rather than any desire to limit the root server operators' ability to follow proceedings or to have input into discussions. Similarly, members of the ICANN Board, and the liaisons between RSSAC and other entities would also have speaking rights.

- **That**, in the event that RSSAC went into closed session, subject to the Chair's discretion in case of exceptional circumstances, the root server operators and any members of the ICANN Board and formally-appointed liaisons would be invited to join the closed session.

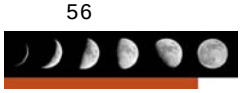
As an advisory committee, the RSSAC would not generally make substantive decisions other than to agree on processes for commissioning work and for making recommendations to the ICANN Board and root server operators.

Liaisons

We consider that the RSSAC should have a few key liaisons, both inward and outward, and that it should have the ability to make its own decisions about liaisons in addition to those we have suggested. As a minimum, we **recommend** the following non-voting liaison positions be established:

- Outward liaison from the RSSAC to the ICANN Board. This continues the existing arrangement as established in the Bylaws[27]. However, because the composition of the RSSAC will change, and its members will not all be appointed by ICANN (see *Composition* above), we do not believe that it is appropriate for the RSSAC to appoint a liaison to the Nominating Committee, as it currently does. For similar reasons, we do not recommend that the liaison to the Board should be replaced with one or more voting Board positions;

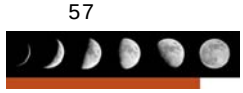
[27] Article XI, Section 2.3.d



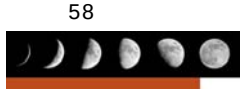
- Inward liaison to the RSSAC from IETF/IAB. This will provide additional technical input into the proceedings of the RSSAC;

- Both inward and outward liaisons between the RSSAC and the SSAC. The purpose of this is to ensure that there is a continuing dialogue between the RSSAC and the SSAC. We recognise that the two groups have a different focus but, as has been shown with the joint activity early in 2009, there is a strong crossover of interests and involvement between them. The establishment of formal liaisons, in conjunction with regular meetings between the two groups at each ICANN meeting, should ensure a continuing two-way flow of relevant information.

While we do not recommend the establishment of formal liaisons with the GAC (for largely practical reasons following our discussions and research), we consider that there should be regular meetings (not necessarily at every ICANN meeting, but possibly two per year) between the RSSAC and the GAC. These meetings would allow the GAC to be briefed on strategic issues affecting the root server system, and to express the governmental perspective on these. This contrasts with what we understand to be the current position, which may best be described as irregular and informal.



Bibliography and Appendices



BIBLIOGRAPHY

RFC1591: Domain Name System Structure and Delegation – Jon Postel, ISI, 1994

Ruling the Root: Internet Governance and the Taming of Cyberspace – Milton Mueller, MIT Press, 2002

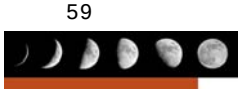
ICANN Bylaws

Official RSSAC Website at www.icann.org

Unofficial RSSAC website at www.rssac.org

Root server operators' web site at www.root-servers.org

Joint Project Agreement at www.icann.org



APPENDIX A – Terms of Reference of this Review

ICANN's Bylaws require that Supporting Organizations, Councils and Advisory Committees be independently reviewed. These Terms of Reference will form the basis for a review of the DNS Root Server System Advisory Committee (RSSAC). The purpose of the Review is to help determine the best way forward, but such analysis depends in the first instance upon a solid assessment of how the RSSAC has performed to date.

The results of the Review shall be posted for public review and comment, and shall be considered by the Board not later than its second scheduled meeting after being posted for 30 days. As provided in the Bylaws, consideration by the Board includes the ability to revise the structure or operation of the RSSAC by a two-thirds vote of all Members.

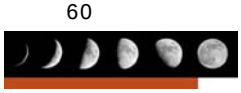
A. Scope of Review

In accordance with Article IV, Section 4, Paragraph 1 of the ICANN Bylaws, the review of the RSSAC is designed to determine:

- Whether the organization has a continuing purpose in the ICANN structure; and
- If so, whether any change in structure or operations is desirable to improve its effectiveness.

Both of these questions should be answered as comprehensively as possible, taking into account the rationale for the RSSAC and its functioning so far. Key questions that the Review should consider are indicated below. This list is intended to be illustrative, rather than definitive or exhaustive, particularly as the initial results of the Review may suggest related questions that should also be answered. It will be important to consider the questions from different perspectives, including past and current members of the RSSAC, the ICANN Board, other Supporting Organizations (SOs) and Advisory Committees (ACs) and perhaps others within (and outside of) the ICANN community.

It is also important to note that this is a review of the ICANN Root Server System Advisory Committee, not a review of the operation of the Root Servers.



B. Rationale for the RSSAC

In accordance of Article XI, Section 2 of the Bylaws , the role of the Root Server System Advisory Committee ("RSSAC") is to advise the Board about the operation of the root name servers of the domain name system. The RSSAC considers and provides advice on the operational requirements of root name servers, including host hardware capacities, operating systems and name server software versions, network connectivity and physical environment. The RSSAC also examines and advises on the security aspects of the root name server system, as well as reviews the number, location, and distribution of root name servers considering the total system performance, robustness, and reliability. (See http://icann.org/committees/dns-root/ for RSSAC information)

Membership in the RSSAC consists of (i) each operator of an authoritative root name server (as listed at ftp://ftp.internic.net/domain/named.root), and (ii) such other persons as are appointed by the ICANN Board. The Chair is elected by the members of the DNS Root Server System Advisory Committee pursuant to procedures adopted by the members. The RSSAC appoints one non-voting liaison to the ICANN Board of Directors.

C. Questions to address and cross-reference to this report

PART I. Does the RSSAC have a continuing purpose in the ICANN structure?

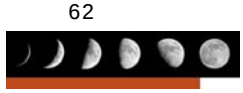
		Addressed in section:
1.	What purpose does the RSSAC serve?	4.1
2.	Has the RSSAC been effective in providing advice to the ICANN Board on matters as outlined in the Bylaws?	4.4
3.	How does RSSAC interact with other ICANN supporting organizations (SOs) and advisory committees (ACs)? Are there regular communications between the RSSAC and other SOs and ACs?	4.4
4.	How effective has the RSSAC been in providing input and advice to other SOs and ACs?	4.4

5.	Overall, how effectively has RSSAC performed its role?	4.4
6.	Does the rationale for the RSSAC in the Bylaws need to be revised?	5.1, 5.2
7.	What should be the purpose of the RSSAC going forward?	5.3

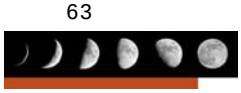
PART II. Is there any change in structure or operations that could improve the RSSAC's effectiveness?

Structure and composition		Addressed in section:
8.	What is the optimal size of RSSAC to maximize its effectiveness? Has the Board made effective use of its ability to appoint members of the ICANN community other than Root Server Operators to RSSAC?	6.2
9.	What should be the role of the Chair of the RSSAC, and how should that person be selected?	6.2
10.	Have members of the RSSAC had the skills needed to conduct their work effectively?	4.2
11.	Does a non-voting liaison seat on the Board provide sufficient input and representation for the Root Server System community? Is there any change needed?	6.3

Internal Operations and Procedures		Addressed in section:
12.	How does the RSSAC determine what advice to provide with respect to particular ICANN issues? What procedures govern how decisions regarding RSSAC input for the Board and other ICANN entities are made? Are any changes needed to these procedures to improve the timeliness and quality of advice that is provided?	4.3
13.	To what extent are the RSSAC's decisions and actions consistent with its procedures?	4.3
14.	Are sufficient safeguards in place to identify and address potential or actual conflicts of interest?	4.3



15. Does the RSSAC operate in an accountable and transparent manner? Are any changes to RSSAC procedures necessary to enhance accountability and transparency?	4.3
16. Are the RSSAC's procedures sufficient to guide all aspects of its work?	4.3
Resources and support	Addressed in section:
17. Has the RSSAC had the resources necessary to accomplish its tasks?	4.2
18. What kind of support has ICANN provided to the RSSAC? What is the appropriate level of financial, institutional and staff support that should be provided to RSSAC?	4.2
Overall	Addressed in section:
19. What other general or specific measures could enhance the effectiveness of RSSAC?	6.1-6.4



APPENDIX B – Who is Westlake Consulting Limited?

Westlake Consulting Limited (WCL) is a boutique New Zealand-based, globally-focused consulting firm. We advise Boards and Chief Executives on organizational governance, structures and board-management relationships, in the private and public sectors. We have particular experience working with non-governmental organizations (NGOs) and other not-for-profit organizations, along with those that fall between core government and fully commercial organizations.

The firm operates as a virtual consultancy, engaging leading independent professionals with the specific skills relevant to each mandate. In working with its clients in other countries, WCL makes use of New Zealand's geographic time-zone (UTC + 12/13 hours), where the working day begins several hours ahead of the rest of the world, and there is also overlap with the previous day in the Americas.

WCL has worked for ICANN before as the independent reviewer of the ALAC in 2008.

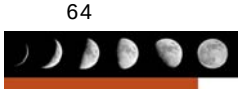
For this independent review of the Root Server System Advisory Committee, the Review Team has comprised principally:

Lead Reviewer – Richard Westlake, MA (Oxford)

Richard, the Managing Director of WCL, is acknowledged as an authority on governance in types of organization other than the traditional limited liability company. Richard is an experienced board chairman and director. He is currently Chair of the Standards Council of New Zealand (New Zealand's National Standards Body and member of ISO and the IEC) and of two other organizations. He was the Lead Reviewer in WCL's 2006-2007 structural review of InternetNZ, which runs the .nz domain, and for the independent review of ALAC in 2008.

Consultant – Vaughan Renner, MBA, BE (Hons), BSc

Vaughan has had a 20-year executive career that has included chief executive, senior leadership and general management positions. In addition to working as a senior consultant with WCL, he also holds a range of board positions. He was the second principal reviewer in WCL's 2006-2007 Structural Review of InternetNZ and for the review of the ALAC in 2008.

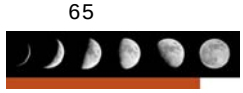


Consultant – Colin Jackson, MA (Cambridge)

Colin is an independent ICT consultant. He has been involved in Internet governance since 1995, when he was one of the founding members of InternetNZ. From 2005 to 2007 he was president of InternetNZ. He has attended many ICANN meetings and hosted the March 2006 ICANN Wellington meeting. Colin also participated in the ccNSO as a representative of InternetNZ and the GAC as a representative of the New Zealand government. Colin was part of the WCL team that reviewed the ALAC in 2008.

Consultant – Andy Linton, MSc, BEd

Andy is a senior network engineer who has worked in the UK, Australia and New Zealand Andy has had the technical lead in building and managing significant parts of New Zealand's Internet infrastructure. He was one of the builders of AARNet in Australia, and has worked for APNIC. Until recently he managed New Zealand's two main Internet exchanges, both of which house instances of root servers. Andy is now teaching network engineering at Victoria University of Wellington.



APPENDIX C – Sources

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Lesley Cowley
Lyman Chapin
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Ray Plzak
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Roberto Gaetano
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Steve Crocker
Suzanne Woolf
Tina Dam
Vint Cerf
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APPENDIX D – Draft Terms of Reference for RSSAC – from Section 6.1, page 49

- The role of the Root Server System Advisory Committee ("RSSAC") shall be to provide a source of unbiased strategic advice to ICANN, the root server operators and the Internet Community about the best way ahead for the root server system. The role will include the following functions:
  - To analyse, assess and monitor, at a strategic level, proposed changes to the root server system in order to provide timely advice to the root server operators and ICANN on the implications, desirability and risks of such changes;
  - To provide reassurance and transparency to the Internet Community that these tasks are under control and that they can have confidence in the reliability and robustness of the root server system;
  - To identify strategic risks to the root server system, and to ensure that planning is in place to address failures of critical systems, including – but not limited to – the demise or critical breakdown of one or more root server operators, or ICANN or IANA;
  - To ensure that the performance of the root server system is monitored in the light of anticipated or actual changes to the system or in global Internet usage;
  - To provide a means of liaison between the root server operators, ICANN and the Internet Community, via the ALAC, ASO, ccNSO, gNSO and other relevant stakeholders.
- The RSSAC may collaborate with other advisory committees or supporting organizations to address a particular strategic issue, if in their view this is likely to lead to a better outcome for the Internet Community.

APPENDIX E – Draft Position Descriptions

1. Draft Position Description - Chair of RSSAC

The Chair of the RSSAC is responsible for leading the RSSAC in its governance and strategic work to fulfil its purpose as set out in the Bylaws.

As well as the tasks laid out here, the Chair is required to carry out any responsibilities specifically defined in the Bylaws or the RSSAC's Rules of Procedure.

The Chair is elected by the members of the RSSAC for a term of two years with a maximum of three consecutive terms.

Specific responsibilities

1. Strategic leadership	The Chair will lead the RSSAC's strategic thinking on matters the committee should address;
2. Chairing meetings	The chair will Chair meetings of the RSSAC, whether face to face or by telephone or video conference. May depute to a Vice-Chair when necessary.
3. Rules of Procedure	The Chair will ensure that the RSSAC follows its own and ICANN's Rules of Procedure.
4. Staff support	On behalf of the RSSAC, the Chair will negotiate and manage agreement for support with ICANN staff.
5. Setting agendas	The Chair will set the agenda for the RSSAC's meetings (in consultation with the Vice-Chairs, liaisons and with assistance from ICANN staff).

6. Liaisons and Working Groups	The Chair is responsible for ensuring that the correct working groups are in place to enable the work of the RSSAC to be carried out. The Chair will: ▪ Recommend establishment/dis-establishment of working groups; ▪ Nominate chairs of Working Groups to the RSSAC; ▪ Monitor the work of Working Groups; ▪ Nominate the RSSAC liaisons to other ICANN bodies for consideration by RSSAC.
7. Reporting	With the assistance of ICANN staff, the Chair will provide written reports to the RSSAC meetings and to the ICANN board as necessary.
8. Representation	The Chair will represent the RSSAC at meetings and functions as appropriate. May depute to Vice-Chairs where necessary.
9. Composition and Succession	The Chair will actively manage the composition and succession of the RSSAC, in consultation with the nominating entities (the root server operators, ICANN and IANA), to ensure an appropriate balance of continuity, institutional understanding and fresh thinking.

2. Draft Position Description – Vice-Chair of RSSAC

The RSSAC shall have two Vice-Chairs, whose main task will be to provide support to the Chair and to deputise in the absence or incapacity of the Chair.

The Vice-Chairs are elected by the members of the RSSAC for a term of two years with a maximum of three consecutive terms. Following the transition period, one Vice-Chair position shall fall vacant each year.

It would be normal to expect that there would be one Vice-Chair appointed from the root server operator members of the RSSAC, and one from the ICANN members.

In the event that the Chair is absent or incapacitated, the Vice-Chair who has had the longer uninterrupted term in the role shall by default become the Acting Chair, with the other Vice-Chair continuing to act in that role. During such period in which a Vice-Chair holds the position of Acting Chair, there shall be no need to fill the vacancy for a second Vice-Chair.

If the Chair resigns or otherwise leaves office permanently for any reason other than through the normal two-yearly electoral cycle, the same provision shall apply in relation to the Vice-Chairs. In this event, the RSSAC is to appoint a new Chair, for which role either or both Vice-Chairs may be candidates, within twelve months, or at the expiry of the term the Chair would have been expected to serve, whichever shall fall the earlier.

While the Vice-Chairs shall have no formal duties, other than to provide support and deputise for the Chair, it is expected that they may be called upon by the Chair or by staff or liaisons to assist with workloads that might otherwise fall to the Chair.

3. RSSAC Members and Liaisons

Technical skills required:

- DNS operational experience at root server or TLD level
- Operational experience with mission critical services
- At least 5 years' experience in managing a technical function in an Internet environment

Knowledge of ICANN stakeholder communities and the technical structure of the Internet is essential.

4. RSSAC Technical Fellow

In addition to the technical skills required of RSSAC members, the RSSAC Technical Fellow:

- Must be able to initiate and commission research into matters that RSSAC requires;
- Must be able to provide information to RSSAC, executive staff, ICANN Board, and stakeholder groups;
- Must have strong written and oral skills;
- Must supervise and take part in the evaluation and documentation of RSSAC processes;
- Must develop and implement appropriate review procedures to continuously assess current processes, recommend improvements, and fix gaps.
- Will design and implement new processes to meet new stakeholder and community demands, using best current practices.
- Will seek continuous opportunities to improve operational effectiveness.

Experience/Knowledge

At least 5 years' experience in managing a technical function in an Internet environment. Knowledge of ICANN stakeholder communities and the technical structure of the Internet is essential.

Qualifications

Graduate degree in Computer Science or related area, or equivalent work experience in Internet operations management, are likely minimum requirements.

APPENDIX F – Draft Support Agreement

This is an agreement between ICANN and RSSAC.

ICANN will:

- Arrange RSSAC meetings (in parallel with main ICANN meetings);
- Provide administrative and secretarial support for RSSAC meetings;
- Provide travel and accommodation funding for RSSAC members who are not already funded to attend meetings;
- Publish RSSAC meeting agendas, minutes and other papers in a timely manner;
- Provide technical advisory and research support to the RSSAC to help it fulfil its mission;
- Provide resources as necessary for root server system monitoring.

RSSAC will:

- Meet at regular ICANN meetings;
- Provide liaisons to SSAC and the ICANN Board;

APPENDIX G - How IESG Sends Architectural Questions to IAB

Preparation

When IESG wants architectural help/review from/by the IAB, then it will properly formulate what it expects.

What we should make clear is:

1. What is the exact architectural question we have. It is good if IESG has consensus on the question as well.

2. What type of response we want to get, e.g. one or more of:
   - a document;
   - a (few) paragraph(s);
   - an e-mail to IESG or some specific mailing list;
   - discussion with IESG or some specific WG.

3. By what time we expect the above to happen.

4. If we believe we know who on the IAB would have the appropriate background to tackle the problem, we should be prepared to inform IAB, IAB-Chair or specific person(s) about that.

Actual Steps

1. Once IESG agrees on the above, the IESG chair sends an email to the IAB mailing list.

2. The first round of discussions is then to make sure that IAB and IESG have a common understanding of the question and expected delivery and time-frame.

3. If IAB however has clarifying questions then we need to discuss and explain, which may result in a re-statement of the question. This discussion is expected to happen on both IAB and IESG mailing lists. Sometimes things may be easy and do not need this step.

4. Once IAB and IESG agree on the question, the deliverable, and the respective IAB & IESG members who are designated as responsible for seeing this activity to completion, the IAB starts the work and delivers as requested. The designated stuckees may continue to discuss (liaise) refinements as needed.

5. When IAB thinks they have delivered, the IAB Chair sends an email to IESG saying so, and pointing to the deliverable.

6. IESG checks and IESG chair lets IAB know if they are happy and if not explains why not.