FR-SE Meeting : Report & Proposal

AFNIC, October 1st 2012

Collaboration on DNS Checking Tools

***Executive Summary***

*On Oct 1st, AFNIC and .SE held a meeting at AFNIC’s premises in order to discuss the opportunity of a collaboration on DNS checking tools and to study the way forward (collaboration form, required resources and timeline, etc.). After benchmarking both existing tools against a set of high-level criteria, the participants proceeded to scenarios identification and assessment for the “most viable” solution for a common DNS checking tool. Two scenarios were shortlisted and assessed: the first one consists in starting from Swedish dnscheck, upgrade it as much as possible. The second scenario is the “from scratch one”. The benchmarking exercise gave a clear advantage to the “from-scratch” scenario. The participants got a strong consensus on submitting that scenario as the recommended and most viable one, based on strategic, marketing & tech and economic objectives, commonly shared by both parties. The following report goes into details through all the steps which brought this conclusion. It also points at open questions and yet-to-be discussed issues.*

## Participants

* **From AFNIC:** Fabien Bétrémieux, Mohsen Souissi, Patrick Mevzek, Samia Mtimet, Sandoche Balakrichenan, Stéphane Bortzmeyer and Xavier Beaudouin
* **From .SE:** Anne-Marie Eklund-Löwinder, Einar Lönn and Patrik Wallström

Mohsen Souissi (AFNIC) moderated the meeting.

## Background and objectives of the meeting

Mohsen recalled the first discussion between Danny Aerts (.SE’s CEO) and Mathieu Weill (AFNIC’s CEO) during CENTR Salzburg (February 2012) regarding a potential collaboration between R&D teams on DNS checking tools. The idea was to put together efforts in order to make the most out of each one’s experience and checking tool, DNSCheck by .SE, and ZoneCheck by AFNIC.

R&D teams were then asked to study the opportunity for such collaboration and the way it could be carried out in 2013 and beyond. This meeting was decided after a short meeting between both teams during the CENTR Jamboree week in Frankfurt (June 2012).

## What do we want to do together, what are our shared objectives?

It was useful to first make sure participants had a common understanding of the expected outcome for the meeting. After a short discussion, it was quite easy to reach a strong agreement on the principle of undertaking collaboration on DNS checking tools.

Then participants expressed the willingness to go as far as possible in specifying the nature and scope of the work to be carried out together. As a matter of fact, the participants shared the objective of reaching a consensus on concrete (alternative) scenarios for collaboration, based on identified projects with as much information as possible on objectives, deliverables, estimated costs and timelines.

It was also useful to share opinions and expectations on each side, regarding the **final objective** sought in this collaboration. In other words, to what strategic goal a (new) checking would contribute? To this question, the answer from both AFNIC and .SE was: “Contribute to improving the resilience of the Internet, by improving the resilience of the DNS”.

Further, the participants also shared the ambitious **derived objective** of “Building a standard DNS checking tool, to become the reference for the entire ecosystem”. The target audience (to take advantage of such a tool) includes, but is not limited to: registries, registrars, registrants, DNS administrators & service providers, Public Authorities, third party businesses, researchers…

## Common main high-level criteria for a standard and modern checking tool and assessment of the existing tools (DNSCheck vs ZoneCheck)

The participants proceeded to this apart of the discussion in tow steps: first define high-level criteria, then make respective assessments. DNSCheck (*DC*) and ZoneCheck (*ZC*) tools are rated on a 0-5 scale against each criterion (0 is the worst, 5 is the best). Here is a summary:

|  |  |  |
| --- | --- | --- |
| **High Level Criteria** | **DC** | **ZC** |
| Modularity, Extensibility, “Hackability” | 3 | 2 |
| Separation between the user’s test policy/profile, running tests & collecting results, evaluating results and generating reports | 3 | 2 |
| Performance: Optimization of system resources | 4 | 2 |
| Performance: Optimization of network resources | 2 | 1 |
| Multiple points of checking: be able to run, compare and consolidate tests from different end-points | 0 | 0 |
| Multiple input/output interfaces/formats: be able to be used by as many users (several profiles) and programs (for automation) as possible | 2 | 3 |

It turned out that no tool was satisfactory in its current state regarding the abovementioned high-level criteria. That motivated the participants to move on with exploring and discussing viable solutions.

## Identifying scenarios for a viable solution

At this step, the participants tried to first answer the following question: “Would it be doable and acceptable to take either DNSCheck or ZoneCheck tools and incrementally upgrade it (by then way, making the most out of the other tool) so as to get a viable solution?”

Note that both teams prepared some benchmarking documentation (DNSCheck *vs* ZoneCheck) before the meeting and that helped to get a shared assessment on both tools features and performance.

* **“Start from DNSCheck & upgrade” (add the needed features and improve performance):** .SE stated that it would be costly in the long run, especially that there is no guarantee in getting substantial improvements in performance and extensibility/modularity. The idea was that we might get a suboptimal solution by a series of incremental upgrades of DNSCheck, but that would only buy us some time and we would eventually “hit the wall”;
* **“Start from ZoneCheck & upgrade” (add the needed features and improve performance):** AFNIC stated that the main obstacle was that no developer at AFNIC was familiar with Ruby (the programming language for ZoneCheck) and that it was not clear which form a potential collaboration based on ZoneCheck would take. On the other hand, .SE clearly stated that ZoneCheck would be a “non-starter” for them.

That first step led to the elimination of ZoneCheck as a potential starting point for a viable solution for collaboration. Alongside, another scenario consisting in maintaining each, their own tool, with collaboration only on cross-fertilization, was quickly eliminated (both AFNIC and .SE agreed that was not interesting).

The last – but not least – identified scenario was the one **from-scratch**, initially recommended by .SE team and seen by them as much more viable and convenient than the incremental ones.

From that point of the discussion, the participants agreed to do a benchmark between the incremental approach (“start from DNSCheck & upgrade”) and the one from-scratch. The results are summarized next section.

## Benchmark results: “Start from DC & upgrade” vs “Build from scratch”

First, a common (small) set of criteria was defined for assessing both scenarios:

* *Benefits*,
* *Feasibility,*
* *Costs*: both *upfront* (immediate release) and *deferred (future releases, operation and maintenance)*,
* *Risks*.

Here is a matrix summarizing the benchmark results against these criteria:

|  |  |  |
| --- | --- | --- |
| **Criteria** | **“Start from DNSCheck & upgrade”**  (Add needed features and improve performance) | **“Build from scratch”** |
| ***Benefits*** | * Shorter time to Market * Higher likelihood to get a “working” code at the end of the journey (even though still incomplete and not quite well performing) | * Could ultimately fulfill the entire requirements & wishlist with no major technical obstacle * More chance to provide “*THE* *Standard Tool*” and set “*THE* *Reference”* for the industry/ecosystem * AFNIC and .SE collectively have competences for all parts of the project (without relying on parts/code from ZoneCheck or parts from DNSCheck which are old or not good enough) * A better image for the collaboration and symmetry for contributions from both sides just from the beginning * Ease of integrating additional contributors/sponsors if needed/desired (specifications + development) |
| ***Feasibility (timeline: deliverable)*** | * Jul 2013: *“dnscheck-reloaded”* Rel-1.0, non-regression (functionality) and better perf (as much as possible) * Oct 2013: *“dnscheck-reloaded”* Rel-2.0, including a set of new features (selected by importance/feasibility) | * Dec 2013, *NewSoftware* R-1.0, non regression, with MUCH better perf (+50% at least) * Feb 2014: *NewSoftware* 2.0, including the same set of new features |
| ***Costs - upfront*** | * Rel-1.0: ***Moderate*** (having something running already, there’s a choice on what to integrate) :   + 2 p.m. (spec) + 2 p.m. (dev/improvement) * Rel-2.0: 1 p.m. (with, for example, the “multiple checking points” feature included) * ***Upfront costs cumulated: 5 p.m. (~50 k€)*** | * NewSoftware Rel-1.0: ***Relatively Higher.***    + 2 p.m. (spec) + 4 p.m. (dev) * NewSoftware Rel-2.0: ***Much lower.***   + 0.5 p.m. (with, for example, the “multiple checking points” feature included) * ***Upfront costs cumulated: 6.5 p.m. (~65 k€)*** |
| ***Costs - deferred*** | Maintenance is already getting quite costly (currently, 8h/month in average at .SE) and will probably grow if new features and perf improvement are implemented | It must be lower once a stable release is reached |
| ***Risks*** | * Redo this exercise in 2 years time (if/when we “hit the wall”) * Competition from somewhere else to lower the use and usefulness of our checking tool | * Not totally sure we would deliver the new (perfect) tool just on time (Time-to-Market) * Risk of waiting too long before having a new running tool and meanwhile the existing tool becomes unusable |

At the end of the benchmark exercise, the participants proceeded to a final rating of the two alternative scenarios based on 3 known objectives: Strategy, Marketing&Tech, and Economic. Scores vary from 0 to 5. 0 is the worst matching with the objective, while 5 is the best one. Here’s the rating summary:

|  |  |  |
| --- | --- | --- |
| **Objectives** | **“Start from DNSCheck & upgrade”**  (Add needed features and improve performance) | **“Build from scratch”** |
| ***Strategy*** | 3 | 5 |
| ***Marketing&Tech*** | 3 | 5 |
| ***Economic*** | 5 (upfront) – 2 (deferred) | 2 (upfront) - 5 (deferred) |

## Recommended scenario

Based on the benchmarking and rating results, and after a final tour-de-table, participants reached consensus on the fact that the most viable scenario would be the “from scratch” one. There was a consensus on submitting it as the recommended one.

## Additional agreed upon criteria for the collaboration

The participants further agreed on the following criteria for the collaborative work:

* *The common (new) tool MUST be* ***Free Software*** *(License type TBD later),*
* *Both AFNIC and .SE should be* ***familiar with the development environment****, notably the programming language. In that, PERL is a natural candidate but no decision was made at the meeting,*
* *The work on specification will be done as equal-share between AFNIC and .SE regardless of the resources level to put later on development on each side (TBD)*
* *If we receive the “GO” from the management, the specification work can start as soon as Nov-Dec 2012*

## Open questions and further discussion needed

Among the open questions already raised but not extensively discussed (du to lack of time), the following set is worth mentioning at this stage:

* *How to share costs developing costs between AFNIC and .SE? For instance, how much human resources would each partner commit for?*
* *How the project will be organized (project management structure and tools, steering committee, reporting…)?*
* *Would we accept look for additional sponsors/third-party development resources or do we decide to carry on as a two-party project for as long as possible?*