REPORT

Client: Chiara Giovannini
ANEC
European Association for the Co-ordination of Consumer Representation in Standardisation.

Av. De Tervueren 32,
Box 27,
B- 1040 Brussels

Report issued by:

Intertek ETL SEMKO
Research & Performance Testing

Davy Avenue
Knowlhill
Milton Keynes
MK5 8NL

Tel. +44 (0)1908 857777
Fax. +44 (0)1908 857830

AUTHORISED FOR ISSUE: ..... Wendy Brown
Operations Manager

DATE: January 2006

REPORT AUTHORS: Roy Brooker
Nicola King

62745.2 Issue 2

Internet Content Filtering: A Case for Standardisation

CONTENTS

1 Introduction

In a recently commissioned research project Intertek investigated the work that has been carried out regarding the use and performance of Internet access filters intended for consumer use[1]. This additional report identifies the specific filter parameters that should be standardised and the technical issues involved.

The main findings and conclusions from the research report were:

- Several recent research projects on the way children use the internet revealed that children are often exposed to known risks on the internet, and also that parents are concerned about their children's use of the internet and do attempt to control access and impose rules. However, there is a lot of confusion and misunderstanding about filters generally.

- Results from the various consumer tests carried out in recent years appeared to show a wide variety of performance and scope between different filter products on the market.

- Internet penetration and the understanding of the use of Internet access filters vary significantly between the different European countries surveyed. Additionally, the range of products available in these countries varies, with very few targeted for individual European regions or languages.

- The report found that there is widespread support for some form of standardisation for Internet filtering tools among consumer organisations and other organisations involved in Internet safety issues in Europe.

In conclusion it was identified that standardisation of filtering product and services would

- help consumers avoid the worst products more easily;

- would help raise awareness of filters in countries where they are hardly used;

- it would help non-governmental organisations give advice to families about how best to use the internet safely; and,

- give consumers added confidence.

[1] The Standards Requirements for Consumer Internet Filtering Tools. Intertek Research Report 62745

2 Parameters for Standardisation

The following Internet access parameters and the technologies involved in providing access control are of concern to parents. This summary (Table 1) is not intended to be comprehensive, but is to give an idea of the scope a standard would have to address.

Parameter	**Technology**
Web page (URL) filtering	Various technologies exist. Local or remote bad URL list Local or remote bad word list. Intelligent agent (scans web page and makes a calculated judgement on its content) Web page image
Data entry blocking (stops child entering address or credit card details, etc)	Interrogates data entered via keyboard. The administrator defines the required fields.
Walled garden (Limited access to internet or a customised intranet - usually for very young children). Ideally such a list should reflect local, ethnic, educational and social tastes.	Local or remote 'good list'
SPAM filtering	Various technologies exist based on local detection and re-routing or remote detection and re-routing
Newsgroup filtering	Complete blocking of access to news blocking of selected newsgroups (bad list) Word or content filtering. Moderated conferences
Search engine filtering	Usually a filtering tool provided by the search engine
Email	Email *filtering* has privacy and human rights implications. Tools to *manage* email messages using an 'allowed' list of friends and relations can be set up with most email clients. Blocked mail can be redirected to a parent. These tools exist but most parents do not know about them or how to use them.

Parameter	Technology
Chat rooms	Complete blocking of access Moderated chat rooms for children.
Anti-Virus software. Technically not usually associated with Internet access filtering but considered by consumers to be an internet issue	Dedicated software to detect incoming viruses, to scan computers for existing viruses and to 'repair' damage.
Firewalls Not usually directly associated with Internet access filtering but a firewall can play a part in preventing malicious bypassing of a filter.	In its simplest form a firewall only allows access to a network via pre-define ports. Thus it stops unauthorised access to your computer through the 'back door'. It can also be configured to restrict outgoing information.

Table 1 Internet filtering or blocking parameters

3 Technical Issues.

To produce a standard to measure the performance of Internet filters is a technical challenge if all filtering parameters are to be addressed and if the measured results are to give reliable and repeatable results.

The research report identified two significant initiatives that go some way in addressing these problems: The Joint Research Centre report (discussed below) which looked at filtering web content; and the work being currently undertaken by BSI who are drafting a document for the basis of a 'kite-marking' system for filtering products (BSI PAS 74). It is considered that the work of both these projects could contribute to the development of a European standard.

3.1 Test methods

The research identified only a few technical testing projects, and these were primarily carried out by consumer bodies with modest budgets[2]. These tests necessarily have to confine the testing to specific issues (typically the filtering of 'web' pages) and have not addressed other communication issues or broader social issues in any detail. As such they should not form the basis of a performance standard for Internet access filters.

[2] Consumer magazines in Europe, tests carried out for the CISA project, tests carried out by BECTA in the UK.

The research report also consulted a representative from a major UK supplier and they explained that brand-leading companies use a large team to collect the database for their 'bad list' and to carry out performance testing of their products and services. They are more interested in how their product compares with a rival's than in absolute performance ratings (in other words, they use their product as the benchmark). However, in their tests they would expect to obtain 95% success in blocking unwanted sites, this seems to be a significantly better result than those obtained by the various consumer tests. However, there may be good reasons for this and these are discussed in section 4.2 below.

3.2 Other technical reports

Technical reports discussing web filters were also difficult to find, but this may be explained by the fact that in technical terms, blocking a web page or other web content is not regarded as a significant technical challenge, it is seen as a particular implementation of firewall packet inspection technology. They (the filters) reconstruct the flow of traffic and look for key markers and code [3].

The EU funded 'Joint Research Centre' report[4] "Benchmarking of filtering software and services - Definition of the Evaluation Criteria" concerns itself with benchmark performance measurement methods and not how they work technically. However, this work looks interesting and could be a useful contribution to developing the test method of a standard.

A good technical description of SPAM can be found from the following Microsoft link:
http://download.microsoft.com/download/a/9/1/a91c80b3-f762-4b32-8d2c-8cf74056b735/E2k3_Intelligent_Message_Filter_Deployment_Guide.exe
This document describes a particular Microsoft filter but in doing so gives useful general information.

3.3 Overview of consumer requirements

Consumers require a filter to work with all aspects of Internet communications, including, for example, email and mobile use. This is because, as a general rule, consumers do not differentiate between the different internet technologies involved, indeed, many are confused by them[5] and so look for a complete, one-stop, solution. However, their filtering requirements for these various technologies and applications will differ and this has tended to mean that any testing has focussed on only one or two aspects of a product. Similarly, because the different types of filtering require different technologies, filter providers tend to see the different requirements as appertaining to different products and may only concentrate on one area. For

[3] Quote from computer consultant Jon Honeyball
[4] http://www.sistemapiemonte.it/scuole/idd2001/cd/sicurezza/materiali/UE/benchmarkfilters.pdf
[5] Based on Intertek RPT experience in talking to consumers.

example the technologies involved in web page filtering are quite different from those required for spam blocking and walled gardens and are marketed as separate products or services.

To meet consumer requirements, there needs to be some means of dealing with this issue and making it clear to consumers what the scope of a particular product is, as well as its performance. Similarly, any performance standard needs to identify the different aspects that need filtering and provide test methods for each one as appropriate. Standardisation in the way filtering products are defined and measured will be of help to the consumer.

4 Test Methods for Measuring Filter Performance

It is beyond the scope of this report to develop test methods for evaluating the performance of filters. However, it is clear that some standardised approach is needed to ensure consistency of results.

During our research the following test methods have been identified for measuring web filtering performance.

4.1 Basic approach

The cost effective solution is to gather a selection of “undesirable” web pages, install the filter and see how many they successfully block. This is the basis of most consumer tests. This can be acceptable for ‘comparative’ testing but there are inevitable limitations and inaccuracies for the following reasons:

- The sample of undesirable pages is usually an ad-hoc selection. Without specialist knowledge it can be difficult to find certain categories such as violence, social intolerance, etc so inevitably the tests tend to focus on the easier to locate ‘adult’ sites.

- The number of sites used to test the filter is often judged intuitively, to give enough results for comparative testing. As far as we know, no detailed statistical analysis has been done to determine the optimum number of sites (per category) to give accurate results.

Tests to measure over-blocking and security of the filter are also done using an ad-hoc selection of pages and methods.

One advantage of the method is that the test sites are likely to be both ‘current’ and challenging.

4.2 Advanced methods

Within the industry and other agencies there is access to libraries of undesirable sites. These can be used as part of an automated test. These libraries are very large and so this arguably tackles the statistical sample requirements discussed above. However there are potential flaws in this approach:

- These libraries can quickly become out of date and contain many 'dead' sites[6] and may not contain 'new' sites unless they are kept up to date.

- They are also 'self perpetuating' - The industry can (and do) claim up to 95% success in blocking these pages, this is not surprising as the filters can be tailored specifically for these tests.

One interesting approach is that proposed by Joint Research Council (JRC). A technical description is given at: http://np1.net-protect.org/en/WP4-D4.1-v1.0.pdf. (Section 2.2) This tool is not fully explained but it appears that it enables you to test the blocking/overblocking capability by directly comparing the filter output to a simultaneous unfiltered feed. This requires a third party service to provide the web pages. What is not clear is the source of the 'test' web pages but in theory they could be randomly generated. A more detailed investigation into this method is suggested.

It is generally accepted that no filter will give 100% performance. Therefore any standard to evaluate filters will have to determine a minimum performance standard. This minimum (likely to be around 90 – 95%) may have to be determined empirically The use of statistical analysis will be required to determine the minimum number of web sites (or SPAM hits) required to measure the filters performance and to determine the measurement error of any chosen test method.

4.3 Potential problems in developing a standard.

From discussions with some industry technical experts and standards experts research has identified two issues which may have tended to inhibit the development of a standard.

Web filters and SPAM filters in particular are unlikely to ever be 100% effective. For some standards development groups the idea of a technical standard to measure something that cannot be accurately defined is seen as a problem. However it is felt that it should not be regarded as such. Standards do exist where variability is taken into account using statistics, in particular the application of "Analysis of Variance" (ANOVA). Using such tools it is possible to give a value for the confidence of the results.

---

[6] Confidential comment by consultant

Some non-technical parameters, in particular, ease of use, clarity of instructions, presentation of scope, etc pose special problems and are sometimes seen as a barrier to producing a standard. However ergonomics and Quality of Service standards can and are produced so this should not be a barrier. We would suggest that this aspect of the work be handled by a standards group who are less constrained by the technical issues.

In view of these two aspects we would recommend that a standard should have two parts that could be developed by two teams: a standard defining a minimum performance specification; and a technical standard dealing with the methods of measurement and statistics.

5 Other Parameters to be Considered

There are many other parameters that need to be taken into consideration for products destined for the consumer market. The following is just a selection. For a *standard* these parameters will need to be quantified in some way to allow repeatable measurement of assessment to be made. It may be that some parameters where a subjective element is asked for will prove difficult to introduce into a standard.

- Ease of installing (and removal)
- Ease of comprehending and configuring the various options
- Configurability and customisation (for different age groups, special requirements, etc)
- Filter security (to prevent bypassing, removal of filter)
- Performance and relevance of any ‘walled garden” service
- Performance of SPAM filter.
- Scope of the filter (what internet parameters it will and will not cover)
- Additional features (e.g. time limiters, data entry filters/blockers, parental monitoring)
- Provision of general advice to the consumer.
- Ability to report filtering failures.
- How filter is kept up-to-date (subscription requirements, downloading update)

- Provision for authorized person to override the filter
- Provision of general consumer advice.

Many of these parameters have been addressed by the BSI PAS 74 project (see research report) and so this PAS could provide a good starting point for the development of a complete standard.

6 Conclusion

It is considered that there is enough evidence and sufficient consumer demand for the development of a performance standard for Internet filtering products and services.

Protection of children is of prime concern but consideration for the special requirements of all users should be taken into account.

The research report and this report have identified several, non-technical, issues surrounding Internet filter products. In particular, ease of use, clarity of instructions, presentation of scope, etc. To produce standards to assess such parameters poses special problems. However ergonomics and Quality of Service standards can and are produced so this should not be a barrier. We would suggest that a standards group who are less constrained by the technical issues handle this aspect of the work.

From the study of the technical issues we would further suggest that such standardisation would also have to include some very detailed technical issues, in particular with measuring the performance of the product.

Another issue that can impede the development of the technical part of a standard is the inclusion of different technologies. SPAM filtering and mobile Internet access pose quite different problems to basic web filtering.

Therefore it is suggested that a standard be tackled in two parts that would have to be progressed in tandem, with the technical section further divided to tackle specific issues, some of which could be tackled at later times.

1 The setting of minimum performance criteria that would also tackle how the ‘scope’ of such product and services should be presented

2 Methods of measuring minimum performance standards.

- 2.1 Computer based internet services excluding email
- 2.2 Computer based internet email services (including SPAM)
- 2.3 Mobile service.