



ENUM

# Response to the Consultation

APRIL 2005



The DTI drives our ambition of 'prosperity for all' by working to create the best environment for business success in the UK. We help people and companies become more productive by promoting enterprise, innovation and creativity.

We champion UK business at home and abroad. We invest heavily in world-class science and technology. We protect the rights of working people and consumers. And we stand up for fair and open markets in the UK, Europe and the world.

# Contents

1	Introduction	2
2	Next steps	4
3	Responses to the questions	6
	Q1 How important do you think ENUM is likely to become?	6
	Q2 How keen would you be to add your details to ENUM?	7
	Q3 Is the structure at option iv the best option for the UK market? If not, what alternative would be most suitable? Please give your reasons.	7
	Q4 Are the proposed arrangements likely to be sufficiently effective, transparent and commercially neutral?	8
	Q5 How could the arrangements be improved?	8
	Q6 Which independent organisations would you like to see appointed to the UK ENUM Supervisory Board? Please give reasons.	8
	Q7 Are the proposed principles and methods for selecting and appointing the ENUM Tier 1 Registry appropriate?	9
	Q8 What additional considerations (if any) should be applied in the selection process?	9
	Q9 How could the incentives for good performance by the ENUM Tier 1 Registry be increased?	10
	Q10 Authentication	10
	Q11 Telephone Service Providers and Authentication	11
	Q12 How can the authentication proposals be improved?	12
	Q13 What interest do you have and what uses do you foresee for a UK number range specifically for entries in ENUM and independent of the provision of a telephone service?	13
	Q14 Competing systems	13
4	Other comments	15
	Annex A: The Consultation Process	16
	Annex B: Responses	17
	Annex C: List of Questions in the Consultation Document	18
	Annex D: Further information	19

# 1 Introduction

- 1.1 This paper summarises the responses to the DTI's Consultation on the proposed arrangements for ENUM, which was published in August 2004. The paper also sets out the Government's policy of the further development of ENUM, with the expectation that this will be largely lead by the commercial sector.
- 1.2 ENUM is a proposed international public database that links telephone numbers to Internet names and other Internet related destinations and identities. Any party can interrogate the database with the telephone number of an ENUM subscriber and the database will return a list of identities and Internet related destinations that are associated with the subscriber; examples are the subscriber's email address, mobile telephone number or web page. These identities can then be used to establish various forms of communications with the ENUM subscriber, e.g. the party could send an email to an ENUM subscriber having initially known only their telephone number. The ENUM database can be used both by human users and by electronic processes (applications) that are providing other forms of communications services.
- 1.3 DTI consulted on ENUM because ENUM may become an important element in the process of convergence between the traditional telecommunications world and the Internet world. The arrangements for ENUM necessarily include at least one unique registry function and therefore particular care needs to be taken to prevent abuse.
- 1.4 The three main issues that the DTI consulted on were:
  - The proposed implementation of ENUM in UK including the distinctions in the functions between the single Tier 1 registry and the competing Tier 2 registrars and nameserver providers.
  - The management arrangements for ENUM including the formation of the UK ENUM Committee and the principles for the appointment of the Tier 1 registry and the terms under which the registry will be run.
  - The arrangements for the authentication ENUM entries.
- 1.5 The arrangements had been proposed by an open group of interested UK parties and are based on procedures specified in the European Telecommunications Standards Institute.
- 1.6 DTI was seeking feedback on whether the arrangements meet the needs of an open competitive market and adequately protect the interest of small and medium size enterprises.

- 1.7 A list of those organisations and individuals who responded is in Annex B and a list of the questions posed is in Annex C. DTI wishes to express its appreciation of all the responses received.
  
- 1.8 Copies of the original Consultation Document may be obtained from:  
<http://www.dti.gov.uk/consultations/consultation-1230.html>

## 2 Next steps

- 2.1 The Consultation has provided some very valuable opinions and analysis about the future of ENUM and so has proved a well worthwhile exercise. All interested parties are invited to read the public responses that are available on the DTI website at:

<http://www.dti.gov.uk/industries/ecomunications/downloads.html>

- 2.2 The Consultation has endorsed the plans of the UK ENUM Group for the structure and different functions for implementing ENUM and the process for the appointment of the Tier-1 Registry.
- 2.3 The Consultation has endorsed the views of the participants in the UK ENUM Group that the validation and authentication of ENUM entries is of the highest importance as are the issues of privacy and the prevention of SPAM in its many different forms.
- 2.4 Views on the prospects for ENUM are strongly divided with some respondents considering that ENUM is an important part of the convergence process and others identifying fundamental problems with ENUM. In general more analysis has been given by the respondents who did not think that ENUM is important than by those who did.
- 2.5 The following are the main issues identified as needing further study if ENUM is to be "brought to market" successfully. These issues were all indicated in the initial consultation, but they are the subset of all the considerations around ENUM that have drawn the most comment. Accordingly they should be priority issues for UKEC:
- Refining the validation and authentication process so that it provides adequate security and yet does not become a major barrier to people entering their data into ENUM.
  - Ensuring that data in ENUM is accurate and up-to-date and that ENUM entries are deleted when service on numbers is ceased.
  - Ensuring that there is adequate subscriber awareness that data entered into ENUM will be open to the public.
  - Clarifying issues concerning ENUM entries for numbers that are shared.
  - Ensuring that premium rate numbers do not lead to abuse in ENUM.
  - Developing more ideas for applications based on ENUM.
  - Finding ways to motivate users to enter their data into ENUM to build critical mass.

- Preventing abuse of the system, ensuring it develops for the public benefit and that these issues are adequately protected within the organisational structure of ENUM.
- 2.6 DTI has always said that ENUM must remain a private sector initiative. The Consultation has confirmed that ENUM is developing along lines that are satisfactory from a public policy perspective and so it is up to the interested parties to decide how they wish to address these issues and take ENUM forward.
- 2.7 DTI now looks to the formation of the UK ENUM Committee (UKEC), the proposed industry lead body for ENUM, to take forward the proposals from the original consultation and to consider in addition the points highlighted in this response document. The DTI wishes to recognise UKEC and grant recognition as the holder of the UK e164.arpa designation as soon as seems viable. DTI will continue to participate in discussions in the UK ENUM Group (UKEG) aimed at this. Along with Ofcom, DTI will take an observer role on the Supervisory Board of UKEC when it is formed, to continue to monitor the evolution of ENUM.
- 2.8 DTI recognises current UK ENUM activity is largely centred on UKEG. In order to speedily resolve the issues in this consultation it would be appropriate for UKEG to stimulate discussion in the first instance. This will enable UKEC to resolve issues as soon as possible after its formation. It is also expected that UKEG will form the nucleus around which UKEC is created.
- 2.9 It is considered that it is principally for industry to evolve policies for the use of ENUM as it develops, and where necessary to consult through UKEC. Only in the unlikely event of significant issues emerging that have not been covered in this consultation would DTI consult further.

## 3 Responses to the questions

- 3.1 In the following information we quote numbers of respondents. These numbers include the confidential responses. Many respondents did not answer all the questions and so for each question the number of responses is less than the total number of responses.

### Q1 How important do you think ENUM is likely to become?

- 3.2 There was a wide range of responses and no consensus.
- 3.3 Five respondents thought that ENUM was definitely important, primarily as an enabler of convergence and as a step towards the use of a single identifier.
- 3.4 Nine respondents thought that ENUM may become important depending on various factors including:
- Effective protection of users from spam.
  - Effective and automated authentication of users.
  - Authentication of the user data, e.g. email addresses.
  - The development of alternative systems such as directories.
  - The development of attractive applications.
  - Changes to charges for traditional telephone calls.
- 3.5 For example, one respondent had concerns about "how the "chicken & egg" conundrum will be broken, that there is little point in querying ENUM/DNS unless there's a high level of probability that a useful response will be received (i.e. the number's populated), yet there's little point in populating a number into ENUM unless someone's going to query it". No one proposed a solution to this problem, but several commented that the use of a separate number range for ENUM would avoid the problem, although it would change the nature of ENUM.
- 3.6 Six respondents thought that ENUM was not important. The reasons given were:
- User fears over privacy that would deter them from putting data into ENUM.
  - Lack on incentives to put data into ENUM so that ENUM never reaches critical mass "it will fail because of lack of input".
  - The development of Instant Messaging services.
  - Decline in the importance of E.164 numbers.

- 3.7 Several respondents considered that they were unable to predict its usefulness.
- 3.8 Several of the those respondents who appeared to have more knowledge of ENUM commented that they foresaw better prospects for individual ENUM-like systems used internally by operators and for systems accessible only to operators to support number to name translations (this is known as "carrier" or "infrastructure" ENUM.)

## Q2 How keen would you be to add your details to ENUM?

- 3.9 Six respondents indicated some keenness to add their details to ENUM, but some of these indicated that interest would be much greater for educated users or business users.
- 3.10 Four respondents were uncertain or qualified in their responses, their main concerns being adequate authentication, privacy and uncertainty about applications that would make becoming an ENUM subscriber worthwhile.
- 3.11 Six respondents were not at all keen to become ENUM subscribers. The main fears were privacy and spam. One considered that the problems outweighed the benefits and another that "the only users will be abusers".
- 3.12 It is clear from the responses that resolution of the concerns about privacy and spam will be important for the success of ENUM.

## Q3 Is the structure at option iv the best option for the UK market? If not, what alternative would be most suitable? Please give your reasons.

- 3.13 There was almost complete consensus that Option iv represents the best option for the UK market.
- 3.14 One respondent considered that more attention should have been given to option ii and another proposed that something else should be done.
- 3.15 Another respondent emphasised the need that arrangements by a business such as a telecommunications operator to act as registrar for its customers should not prevent those customers choosing to use a different organisation as registrar.

3.16 DTI is therefore satisfied that Option iv meets the public interest requirements. It offers the best balance between achieving an open market, stability for all players and users, and minimising abuse.

#### Q4 Are the proposed arrangements likely to be sufficiently effective, transparent and commercially neutral?

3.17 There was again almost complete consensus that the arrangements proposed are effective, transparent and commercially neutral.

#### Q5 How could the arrangements be improved?

3.18 A variety of interesting suggestions were made including:

- UKEC should be subject to oversight by Ofcom.
- There should be an independently audited report on UKEC.
- A dispute resolution process should be defined.
- More user and non-industry participation.
- Establish interim arrangements while the longer-term arrangements are finalised.
- Prepare detailed terms of reference for each board.
- The Chair of the Policy Board should be a member of the Supervisory Board to ensure effective liaison.
- A separation may be needed between technical and policy and legal matters.
- More involvement of telecommunications service providers.

3.19 DTI would like UKEC to consider these proposals further.

#### Q6 Which independent organisations would you like to see appointed to the UK ENUM Supervisory Board? Please give reasons.

3.20 A number of suggestions were made including:

- Large businesses (in their role as users.)
- Office of the Information Commissioner.
- The Office of Fair Trading.
- Nominet.
- A representative of the Small & Medium size Enterprise (SME) community, for example the Institute of Directors or the British Chambers of Commerce.
- The All Party Internet Group.
- Fixed and mobile operators because of their general expertise in the area.

- 3.21 Several people thought that Ofcom should not be limited to observer status.
- 3.22 A number of people suggested ICSTIS but questioned their ability to take this role as they have been created and are funded for a specific purpose that does not include ENUM-like activities.
- 3.23 DTI would like UKEC to consider these proposals further, but notes that it may not be appropriate for the Office of the Information Commissioner or the Office of Fair Trading to provide permanent board members although their advice and inputs should be taken fully into account.

### Q7 Are the proposed principles and methods for selecting and appointing the ENUM Tier 1 Registry appropriate?

- 3.24 Nearly all respondents considered that the proposals were satisfactory and this aligns with the DTI's view. It is thus proposed that the suggested principles are those followed.
- 3.25 There were however comments from some parties that:
- The timescales are too optimistic.
  - A not-for-profit organisation should be preferred.
  - Competitive tendering is not necessarily the best method of selection, but no alternative was proposed.

### Q8 What additional considerations (if any) should be applied in the selection process?

- 3.26 Relatively few suggestions were given as respondents seemed to be generally content with the proposals.
- 3.27 Three respondents thought that the registry should be based in the EU and so be subject to EU privacy and other legislation, and one that the Registry should be based in UK and all data kept in the UK.
- 3.28 One thought that the selection process should give greater emphasis to security: "The selection process should assess:
- Appropriate security and vetting to ensure private individuals' data will be kept and used at all times within the requirements of the proposed system.
  - The operational procedures for defending the 'Tier 1' operation against 'Dictionary' attacks by those seeking to assemble large collections of valid e-mail (and other) addresses.

- How protection against 'Distributed Denial of Service' (DDoS) attacks can best be managed.
- 3.29 Another thought that an interim appointment of the Tier-1 registry should be made.
- 3.30 There was also a suggestion that the Tier-1 registry should function as a "registrar of last resort": "The principle of "non-competition" is maintained in other Registries by requiring the Registry Operator to charge for Registrations at a higher rate than other Registrars. Thus the goal of avoiding a "multi-tier monopoly" is maintained whilst allowing potential subscribers to receive service regardless of the choices made by other providers. We believe that this principle should also be applied in the case of the U.K. ENUM Tier 1 Registry Operator; they should be willing to provide a "Registrar of last resort" function, but they must not compete with specialist ENUM Registrars.
- 3.31 DTI would like UKEC to consider these proposals further on their merits especially the proposal for a registrar of last resort.

## Q9 How could the incentives for good performance by the ENUM Tier 1 Registry be increased?

- 3.32 A few suggestions were made including:
- Service level agreements.
  - Efficiency metrics and targets.
  - Independent audit of quality.
  - Penalties.
  - Possible increase in the period of the contract.
- 3.33 DTI would like UKEC to consider these proposals further.

## Q10 Authentication

- a. To what extent are the proposed authentication methods justified?
- 3.34 Authentication was clearly a major concern to most respondents because of the risks of fraud and also of spam. No one questioned the need for authentication but one respondent thought that the current proposals were unworkable.
- 3.35 Several respondents wanted to see not only the ENUM subscriber being authenticated but also all the data that they enter into ENUM (i.e. the

NAPTR records). One drew attention to the danger of a number being included as a result of a typing error.

3.36 Attention was drawn to the issue of how to authenticate unregistered pre-pay customers, but this could be handled through checks on possession of the number through making a call to the subscriber or checking their CLI.

b. Do they represent an unreasonable disincentive to potential ENUM subscribers?

3.37 Four respondents thought that the authentication system would be a disincentive, but commented that it was needed.

3.38 A question was raised about the problems of keeping information up-to-date and concerns were expressed about the cost of a paper based system with several commenting that the system should be automated as far as possible.

c. How much effort would be reasonable for the registration process?

3.39 This question did not elicit any very clear answers, but several respondents said that the process should be automated and made as simple as possible.

3.40 DTI considers that these responses emphasise the importance of making registration as straightforward as possible whilst ensuring adequate authentication. Judgement on this issue will be a critical commercial factor in the success of ENUM. UKEC and participating provider organisations will need to make careful consideration of systems that are used in order to balance cost effectiveness with adequate safeguards.

## Q11 Telephone Service Providers and Authentication

a. What role should telephone service providers play in authentication?

3.41 Most respondents commented that the telephone service providers could play an important role in authentication, but the operators emphasised the need for this to be purely voluntary and one indicated that they would be reluctant to be involved.

3.42 The UKCTA commented: "However, at a stage of the development of ENUM where it is unclear what the volume of numbers to be populated will be, it would be a brave telephone service provider that would

commit resources to developing a bespoke authentication system for ENUM. It is for this reason that UKCTA members have pushed for the ENUM community to meet its needs via changes to the existing number portability processes. We are disappointed that, despite facilitating meetings between the ENUM and number portability groups, little progress has been made on this and the current approach appears to be that telephone service providers will devise their own process."

b. [Should they be required to authenticate ENUM entries?](#)

3.43 Most respondents thought that participation by the telephone service providers should be voluntary and Ofcom expressed doubts about the legal basis for establishing a requirement for them to support authentication.

3.44 Four respondents, however, thought that the telephone service providers should be required to authenticate, although one expressed doubts about the legal basis for this.

3.45 DTI concludes that it would be inappropriate to place any requirements on the telephone service providers to support ENUM authentication.

## [Q12 How can the authentication proposals be improved?](#)

3.46 There were a few suggestions including:

- Electronic enablement of signatures and validation, as well as voice or web based subscription services.
- Checking all identifiers by communicating with the subscriber.
- Establishing a code of practice.
- Further clarification of the data protection issues.
- Establishing a generic process between the ENUM community and the telephone service provider community.

3.47 DTI would like UKEC to consider these proposals further.

### Q13 What interest do you have and what uses do you foresee for a UK number range specifically for entries in ENUM and independent of the provision of a telephone service?

- 3.48 Opinions were quite strongly divided. Some respondents did not see any purpose in the proposal.
- 3.49 Six respondents, however, saw the proposal as a means of facilitating authentication and solving the "chicken and egg problem" because it would provide a range of numbers where the probability of entries in ENUM is high. One suggested that the UK should follow the Austrians who have allocated a number range for ENUM use. Another commented that a separate number range would solve the problems of shared lines because each person could have their own ENUM entries.
- 3.50 Ofcom wishes to see sound evidence of the extent of the market demand for a range of telephone numbers to be allocated exclusively for use as ENUM identifiers, before such an allocation is considered. UKCTA emphasised the need for any number allocation to be technologically neutral and considered that at most range of 100,000 numbers is needed. Ofcom also considers that the use of existing UK telephone number ranges (or sub-ranges within existing ranges) must be fully explored as a possible way of meeting any demand that is established. DTI notes that the issue of telephone numbers is a matter for Ofcom, and invites them to consider the matter along the lines they propose.

### Q14 Competing systems

- a. Do you consider that there is a role for more than one such system in the market?
- 3.51 Most respondents did not object to the entry of other broadly similar systems into the market and several commented that such systems already exist.
- 3.52 Two respondents thought that a monopoly was better and one of them objected strongly to the existence of alternative systems. Another thought that the arguments for having competing systems were flawed but that they should not be stopped.

- b. What controls should be applied to other systems to ensure that they are run in a responsible manner?
- c. How should such controls be applied?

3.53 There were very few answers to these questions but the general view was that any controls should be "light touch" and that such systems should be treated in the same way as ENUM.

3.54 DTI considers that the possible entry into the market of another ENUM-like systems should be left open.

## 4 Other comments

- 4.1 Several responses contained valuable additional comments and they included the following:
- The Office of the Information Commissioner thought that not only should the principle of opt-in apply but also the public should be made clearly aware that data in ENUM would be made public.
  - Ofcom questioned whether use of the number portability process for validating numbers is possible as this process involves the cooperation of the telcos.
  - Identification needs to be kept separate from validation, because identification is not always essential since entries for un-registered (anonymous) pre-pay mobiles could be accepted if a CLI check indicated proof of ownership of the number.
  - Periodic re-authentication seems to be the only solution to the problem of ensuring that only live numbers are used in ENUM.
  - Serious concern was raised about the use of premium rate 09 numbers in NAPTR records in case services or functions using ENUM forward calls to these numbers without the user being aware that a higher than normal charge is being incurred.

# Annex A: The Consultation Process

Twenty-six public responses and three confidential responses were received. A public workshop was held on 4 September 2004 at which various presentations were given about ENUM, many questions were answered and a lively discussion took place. The DTI presentation and notes of the workshop are available at:

<http://www.dti.gov.uk/industries/ecomunications/downloads.html>

Bilateral meetings were held with several parties.

# Annex B: Responses

Public responses were received from:

Atlas Internet  
British Computer Society  
Berkshire Healthcare Trust  
BT plc  
Communications Management Association  
Information Systems Audit and Control Association (ISACA)  
IEE  
Office of the Information Commissioner  
InterViVo Networks Ltd  
Internet Telephony Service Providers Association (“ITSPA”)  
MCI International Affairs  
Neustar Inc  
Mr Nigel Hoult  
Nominet  
O2 plc  
Ofcom  
Peoples World Limited  
Political Intelligence  
Rhye Internet Solutions Limited  
Roke Manor Research  
Mr Richard Stastny of Oefeg, Austria  
T-Mobile  
UK Competitive Telecommunications Association  
UKERNA  
Vodafone plc  
Wave Telecom

In addition three confidential submissions were received, two from telecommunications operators and one from a telecommunications manufacturer.

The DTI would like to thank all concerned for their responses.

# Annex C: List of Questions in the Consultation Document

The following questions were asked in the consultation:

- 1 How important do you think ENUM is likely to become?
- 2 How keen would you be to add your details to ENUM?
- 3 Is the structure at option iv the best option for the UK market? If not, what alternative would be most suitable? Please give your reasons.
- 4 Are the proposed arrangements likely to be sufficiently effective, transparent and commercially neutral?
- 5 How could the arrangements be improved?
- 6 Which independent organisations would you like to see appointed to the UK ENUM Supervisory Board? Please give reasons.
- 7 Are the proposed principles and methods for selecting and appointing the ENUM Tier 1 Registry appropriate?
- 8 What additional considerations (if any) should be applied in the selection process?
- 9 How could the incentives for good performance by the ENUM Tier 1 Registry be increased?
- 10 Authentication.
  - a. To what extent are the proposed authentication methods justified?
  - b. Do they represent an unreasonable disincentive to potential ENUM subscribers?
  - c. How much effort would be reasonable for the registration process?
- 11
  - a. What role should telephone service providers play in authentication?
  - b. Should they be required to authenticate ENUM entries?
- 12 How can the authentication proposals be improved?
- 13 What interest do you have and what uses do you foresee for a UK number range specifically for entries in ENUM and independent of the provision of a telephone service?
- 14 Competing systems.
  - a. Do you consider that there is a role for more than one such system in the market?
  - b. What controls should be applied to other systems to ensure that they are run in a responsible manner?
  - c. How should such controls be applied?

# Annex D: Further information

The original consultation document may be downloaded from the Department's website:

<http://www.dti.gov.uk/consultations/consultation-1230.html>

Printed copies are no longer available

If you have any comments or complaints about the way this consultation has been conducted, they should be sent to:

Nick Van Benschoten,  
DTI Consultation Co-coordinator,  
Room 723,  
1 Victoria Street,  
London,  
SW1H 0ET,

Or e-mail him at: [Nick.van\\_benschoten@dti.gsi.gov.uk](mailto:Nick.van_benschoten@dti.gsi.gov.uk)