New gTLD Program
Explanatory Memorandum

Resolving String Contention

A Complete Lifecycle Including String Contention Resolution

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Background - New gTLD Program

Since ICANN was founded ten years ago as a not-for-profit, multi-stakeholder organization dedicated to coordinating the Internet's addressing system, one of its foundational principles, recognized by the United States and other governments, has been to promote competition in the domain-name marketplace while ensuring Internet security and stability. The expansion will allow for more innovation, choice and change to the Internet's addressing system, now constrained by only 21 generic top-level domain names. In a world with 1.5 billion Internet users—and growing—diversity, choice and competition are key to the continued success and reach of the global network.

The decision to launch these coming new gTLD application rounds followed a detailed and lengthy consultation process with all constituencies of the global Internet community. Representatives from a wide variety of stakeholders—governments, individuals, civil society, business and intellectual property constituencies, and the technology community—were engaged in discussions for more than 18 months. In October 2007, the Generic Names Supporting Organization (GNSO)—one of the groups that coordinate global Internet policy at ICANN—completed its policy development work on new gTLDs and approved a set of recommendations. Contributing to this policy work were ICANN's Governmental Advisory Committee (GAC), At-Large Advisory Committee (ALAC), Country Code Names Supporting Organization (ccNSO) and Security and Stability Advisory Committee (SSAC). The culmination of this policy development process was a decision by the ICANN Board of Directors to adopt the community-developed policy in June 2008 at the ICANN meeting in Paris. A thorough brief to the policy process and outcomes can be found at http://gnso.icann.org/issues/new-gtlds/.

This paper is part of a series of papers that will serve as explanatory memoranda published by ICANN to assist the Internet community to better understand the Request for Proposal (RFP), also known as *applicant guidebook.* A public comment period for the RFP will allow for detailed review and input to be made by the Internet community. Those comments will then be used to revise the documents in preparation of a final RFP. ICANN will release the final RFP in the first half of 2009. For current information, timelines and activities related to the New gTLD Program, please go to http://www.icann.org/en/topics/new-gtld-program.htm.

Please note that this is a discussion draft only. Potential applicants should not rely on any of the proposed details of the new gTLD program as the program remains subject to further consultation and revision.

Summary of Key Points in this Paper

- This paper provides a summary of the string contention process.
- A detailed explanation is provided of how confusingly similar applied-for gTLDs are identified and how they are grouped together into contention sets.
- A detailed explanation is provided of how string contention is resolved when there is one or more community based applicants in a contention set.
- As a last resort, contention that is not resolved through negotiation among parties or by comparative evaluation must be resolved by other means.

Chapter 1: Introduction

For the introduction of new gTLDs, the Generic Names Supporting Organization (GNSO) has recommended that:

Strings must not be confusingly similar to an existing top-level domain or a Reserved Name. (Recommendation 2, http://gnso.icann.org/issues/new-gtlds/pdp-dec05-fr-parta-08aug07.htm#_ftn26)

The string contention lifecycle was developed to address this concern. There are two main components of string contention. The first involves identifying gTLD strings that are likely to deceive or cause user confusion in relation to existing TLDs or Reserved Names. In addition, proposed gTLDs in a given round must not be likely to deceive or cause user confusion in relation to each other. The identification of applied-for gTLDs that are confusingly similar gives way to the second component of string contention, which is the resolution of the string contention.

This paper will provide detailed descriptions of the distinct aspects of the string contention lifecycle. This paper is divided into five sections:

1. **String Contention Overview** – Provides a summary of the string contention process.
2. **Process Flow** – Provides a graphical representation of the string contention process.
3. **Contention Set Handling** – Provides a detailed explanation of how confusingly similar applied-for gTLDs are identified and how they are grouped together into contention sets.
4. **Comparative Evaluation** – Provides a detailed explanation of how string contention is resolved when there is one or more community based applicants in a contention set.
5. **Auction** – As a last resort, contention that is not resolved through negotiation among parties or by comparative evaluation must be resolved by other means.

The GNSO policy recommendations call for an "efficient" means of resolution. While it is not yet settled, one of those means might be an auction. ICANN commissioned an experienced provider to develop an auction methodology that is described below.

Chapter 2: String Contention Overview

Draft v.1, 20081002

Introduction

This paper summarizes how string contention between applications in the upcoming New gTLD round will be identified, handled and resolved using foreseen contention resolution methods. More in-depth information is available in three separate papers introduced in the text.

1. String confusion and string contention

In the application process step for the round, each applicant will enter its proposed gTLD string. It is possible that strings proposed by different applicants will be identical or confusingly similar. In such situations, choices must be made between applications in order to prevent that gTLDs causing user confusion are allowed to coexist in the Domain Name System.

Applications with identical strings will be directly identified by an algorithm in the software system supporting the application process. The algorithm will score similarities between strings for each pair of applications, as a partial guidance for determination of the likelihood of string confusion.

String confusion is deemed to occur if a string so nearly resembles another visually that it is likely to deceive or cause confusion. For a likelihood of confusion to exist, it must be probable, not merely possible that confusion will arise in the mind of the average, reasonable consumer. Mere association, in the sense that the string brings another string to mind, is insufficient to find a likelihood of confusion.

Two applications are in direct string contention if their proposed strings are identical or so similar that string confusion would occur if both were to be delegated as TLDs. More than two applications might be involved in a direct contention situation: if four applications feature identical strings, they will all be in direct contention with one another.

Two applications are in indirect string contention if they are both in direct string contention with a third application, but not with one another.

2. Determination of string contention and establishment of contention sets

In the Initial Evaluation process step, a String Similarity Panel determines whether the strings proposed in two applications are so similar that they are in direct string contention. Such a determination, based on human judgment assisted by criteria and algorithm outcomes, is performed for each pair of applications. When all applications have been checked in this way, the outcome is a matrix of direct string contentions between pairs of applications. Applications without any string contention can proceed without further action, but contention must be resolved for all others.

Contention sets are established among applications that are directly or indirectly linked by string contention. A contention set consists of at least two applications, but may involve more applications and have complex link structures. A number of such contention sets may be found in an application round. The final contention sets can only be established once the Extended Evaluation and Objection process steps have been

concluded for the applications involved, since some applications may be excluded in those steps, thereby modifying an earlier identified contention set. A contention set could, for example, be split it into two sets or be eliminated altogether as a consequence.

In the Objections process step, any applicant may also file a string confusion objection to assert string confusion between its string and the string of another application. If the objection is upheld by the panel adjudicating the objection, the applications are deemed to be in direct string contention and the relevant contention sets are modified accordingly.

In a paper, *Contention Set Handling*, the establishment and further handling of contention sets is explained in more detail.

3. Contention resolution methods

Once the final contention sets are established they must be resolved. The first option to do that is through **voluntary agreements** between the applicants concerned. Applicants in contention may reach a settlement or agreement that results in withdrawal of one or more applications. This may occur at any stage of the process, once ICANN has posted the applications received. However, applicants may not resolve string contention by changing their applications in any way by, for instance, selecting a new string or replacing the formal applicant by a joint venture.

If not achieved by voluntary means, string contention will be resolved through comparative evaluation or auction, depending on the case at hand. Each contention set will be addressed in its entirety in order to achieve a clear resolution of the string contention.

3.1 Comparative evaluation

Comparative evaluation will only be used if at least one of the applications involved is *community-based and has expressed preference for comparative evaluation*. Moreover, only an application fulfilling those criteria is eligible to be determined a clear winner of a comparative evaluation. The comparative evaluation is an independent analysis and the scores received in the technical and business operational reviews are not brought into this evaluation.

Applicants designating their applications as community-based will be asked to respond to a set of questions during the application phase to provide relevant information for a comparative evaluation case. Before the comparative evaluation begins, all applicants in the contention set may be asked to provide additional information of relevance. A community-based applicant who elects comparative evaluation may be asked to furnish additional information at this stage to substantiate its status.

A panel will review and score the community-based applications that have elected comparative evaluation against the following criteria:

- Nexus between Proposed String and Community
- Dedicated Registration Policies

- Community Establishment
- Community Endorsement

If one application is found to be a clear winner, the application proceeds to the next step and its direct contenders are eliminated. For complex contention sets, there may even be more than one clear winner which can proceed to the next step, provided that they are not in direct string contention. There may also be "lucky losers" among the remaining contenders, for which the outcome has happened to resolve their string contentions. Potential remaining contenders with unresolved string contentions between them will be brought into a residual contention set to be resolved by auction.

If none of the applications is found to be a clear winner, the full contention set will be resolved through auction.

In a further, subsequent paper, *Comparative Evaluation*, the procedure for comparative evaluation and its potential outcomes are explained in further detail.

3.2 Auction

ICANN examined a number of potential mechanisms for resolving string contention, including selection by chance, comparative evaluation, selection by best terms and auctions. As described later in this document, auctions appear to be the best means of resolving contention among competing applications. Resolution of string contention through auction will occur for all contention sets not eligible for comparative evaluation and also for fully unresolved or residual contention sets from comparative evaluation. Therefore, auctions are the contention resolution mechanism of last resort. Auctions will only be used in cases where:

- There is string contention and those who are in contention successfully complete all evaluations,
- Contending applicants elect not to use comparative evaluation, did not have comparative evaluation available, or comparative evaluation did not provide a clear winner, and
- Contending applicants have not resolved the contention among themselves.

The purpose of an auction is to resolve contention in a clear, objective manner. Proceeds from auctions will be reserved until the uses of the proceeds are determined through a community consultation. The proceeds will not go into ICANN's general expense budget but will be separately earmarked.

The foreseen procedure is an ascending-clock auction with successive rounds for increasing price brackets. This implies that applications will exit successively as the bidding level in a round exceeds their respective exit bids.

All auctions will be conducted over the Internet, with bidders placing their bids remotely using a web-based software system. The auction will be carried out in a series of auction rounds with defined starting and ending prices for each round. Exit is irrevocable, meaning that an application that has exited in a previous auction round is not permitted to re-enter a subsequent round. At the end of each round, the contention situations are reviewed and the auction stops when there is no further contention to resolve. This may

imply that more than one application may remain as winners. The winners pay the closing bid and proceed to the next step. Special rules apply, should a winning application default in its obligation to pay the closing bid.

As in comparative evaluations, potential "lucky loser" situations may occur in auctions. In such cases, any residual contention situations are possible to resolve based on the exit bids for the applications concerned.

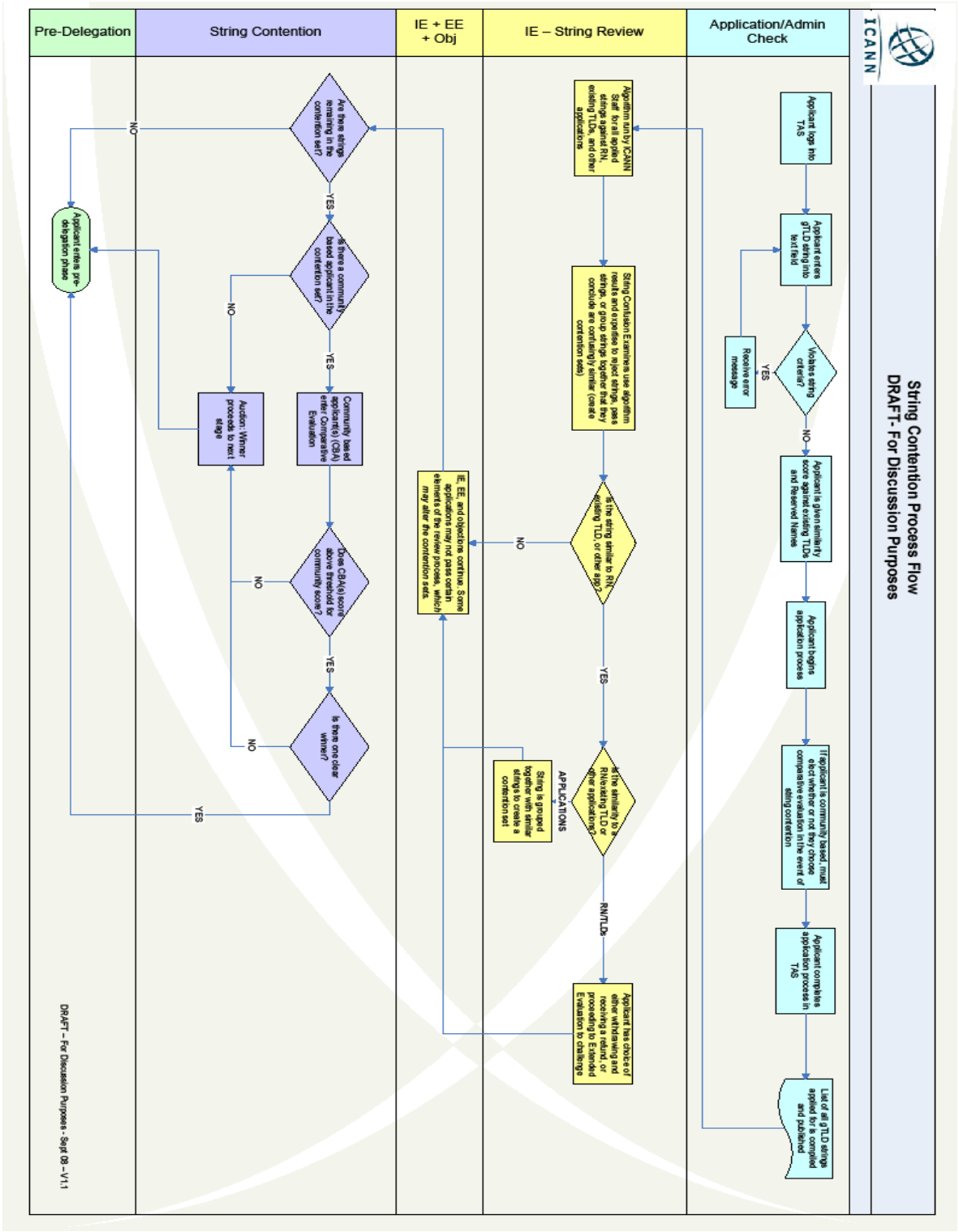
The paper *Auction Design for Resolving Contention for New gTLDs* describes the auction model and its potential outcomes in further detail.

4. Resolution outcomes

Regarding the outcomes for both contention resolution methods, a basic principle is that any application with no string contention situation left to resolve is allowed to proceed, even if it is not an outright winner.

If the strings within a contention set are all identical, the applications are in direct contention with each other and there can only be one winner that proceeds to the next step. However, in a contention set there may be both direct and indirect contention situations and the indirect contention situations may be linked in complex ways. For such contention sets, there may be more than one application that passes contention resolution, as outright winners and/or as "lucky losers". A simple such example is that string A is in contention with B, which in turn is in contention with C, although C is not in contention with A. If A wins the contention, B is eliminated but C survives since C is not in direct contention with the winner and both strings can coexist as gTLDs. The overall outcome of contention resolution will thus depend on the actual topology of the contention set at hand as well as on which application wins the contention.

Chapter 3: Process Flow



Chapter 4: Contention Set Handling

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Summary

Contention sets are groups of applications that feature identical or confusingly similar strings. A String Similarity Panel determines whether the strings proposed in two applications are so similar that they would result in detrimental user confusion if allowed to coexist in the Domain Name System. Such a determination, based on human judgment assisted by criteria and algorithm outcomes, is performed for each pair of applications. When all applications have been checked in this way, the outcome is a number of direct contention relationships between pairs of applications. Applications without any such contention relationships do not need further steps from this perspective, but cases of contention must be resolved for all others. The next step is that contention sets are established among applications that are directly or indirectly linked by contention relationships. A contention set consists of at least two applications, but may involve more applications and have complex link structures. The number of contention sets found in an application round will thus depend on the contention relationships and how the applications are linked by them.

The final contention sets can only be established once the extended evaluation and objection process steps have been concluded for the applications involved, since some applications may be excluded in those steps. The remaining contention sets must then be resolved; through comparative evaluation and/or auction. In this processing, each contention set is addressed in its entirety in order to achieve a non-ambiguous resolution of the contentions.

This paper describes the establishment and handling of contention sets in hypothetical situations, provides two examples of contention sets as well as how these contention sets would be resolved. The paper elaborates on resolution through comparative evaluation as well as auction for both examples given. A main conclusion drawn is that the overall outcome of the contention resolution will depend on the actual topology of the contention set at hand as well as on which application wins the contention. Resolution of a contention set may result in multiple "winners" and also "lucky losers" that all may proceed to delegation.

1. Establishment of contention sets

Contention sets are sets of applications featuring identical or confusingly similar strings, as established by the String Similarity Panel, based on algorithm outcomes, criteria and human judgment. Let's assume that there are 10 applications in total, "a" - "k" and that the algorithm has scored the pair-wise similarity between their proposed TLD strings as shown in Table 1 below (assuming an algorithm threshold at 60%, meaning that scores below 60% come out as zeroes). Scores in the example are illustrative only and not indicative of any string confusion threshold to be applied by ICANN.

Table 1. Hypothetical similarity scores

Application	a	B	c	d	e	f	g	i	j	k
A		73%	0	93%	0	98%	0	70%	0	0
B	73%		88%	0	85%	0	93%	0	0	0
C	0	88%		99%	75%	72%	0	0	0	0
d	93%	0	99%		93%	0	88%	0	0	0
e	0	85%	75%	93%		85%	0	62%	0	0
f	98%	0	72%	0	85%		80%	0	0	0
g	0	93%	0	88%	0	80%		0	0	0
i	70%	0	0	0	62%	0	0		87%	0
j	0	0	0	0	0	0	0	87%		80%
k	0	0	0	0	0	0	0	0	80%	

Note that the similarity scores are commutative, thus if "a" is 97% similar to "b", then "b" is 97% similar to "a" and the table shows mirror symmetry around the diagonal.

Guided by the scores above, the String Similarity Panel inspects all string pairs with scores above a certain percentage threshold (TBD), applies criteria and decides whether each string pair is confusingly similar. The outcome is shown in Table 2 below, where "1" in a cell of the table indicates that the corresponding strings are in contention (identical or confusingly similar) while a "0" indicates no contention situation for that particular string pair. In reality, the contention cases are expected to be fewer and simpler than illustrated here - this hypothetical case is exaggerated on purpose to illustrate complexities.

Note 1

String confusion exists where a string so nearly resembles another visually that it is likely to deceive or cause confusion. For a likelihood of confusion to exist, it must be probable, not merely possible that confusion will arise in the mind of the average, reasonable consumer. Mere association, in the sense that the string brings another string to mind, is insufficient to find a likelihood of confusion.

Table 2. String contentions

Application	a	b	c	d	e	F	g	i	j	k
a		1	0	1	0	1	0	0	0	0
b	1		1	0	1	0	1	0	0	0
c	0	1		1	0	1	0	0	0	0
d	1	0	1		1	0	1	0	0	0
e	0	1	0	1		1	0	0	0	0
f	1	0	1	0	1		1	0	0	0
g	0	1	0	1	0	1		0	0	0
i	0	0	0	0	0	0	0		1	0
j	0	0	0	0	0	0	0	1		1
k	0	0	0	0	0	0	0	0	1	

In this case, for example, the applications c and d are in string contention (denoted by a "1"), while those of c and e are not ("0"). The output from the String Similarity Panel is presented in such a format, covering all pairs of proposed strings, to facilitate the establishment of contention sets. Note that the Panel has found "a" to be in contention with "b", in spite of a lower score (73 %) than for "c" versus "e" (75 %), although the latter are deemed to be not in contention. Again, this is for illustration purposes only and not to be taken as indicative of any importance of these imaginary percentage values.

None of the applications has only zeroes in its row (and its column). Such a situation would indicate that there is no contention situation to resolve and that the application could proceed directly to the next step. In the present hypothetical case, all applications have at least one "1" in their rows and must be brought into contention sets. A contention set consists of all applications that are linked by string contention to one another, directly or indirectly.

Contention sets can be established manually with relative ease in a table like the one above, by applying "by applying a manual recursion method" (in practice, the contention sets will be established using a software program).In this case there are two contention sets; a simple set with the three applications i, j and k, and a more complex set consisting of a, b, c, d, e, f and g. The set i-k is easy to identify in the table; i and k are both in contention with j, but not with each other. The complex contention set a-g needs a closer look, though. To identify that one, proceed like this:

1. Mark the first column where a "1" appears, in yellow below
2. For each "1" in that column, mark the corresponding row in blue-green
3. For each "1" in each of these rows, mark the corresponding column, unless marked already, in red
4. For each "1" in each of these columns, mark the corresponding row unless marked already (etc, alternating between rows and columns in this way until no further steps required). In this case, they are all marked already, meaning that the contention set is exhausted and consists of the applications that have either a column or a row marked. (Note that the "1"s in the columns b, d, f and rows a, c, e, g just replicate what has already been found!)

Table 3. Finding contention set a-g

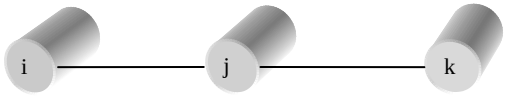
Application	a	b	c	d	e	f	g	i	j	k
a		1	0	1	0	1	0	0	0	0
b	1		1	0	1	0	1	0	0	0
c	0	1		1	0	1	0	0	0	0
d	1	0	1		1	0	1	0	0	0
e	0	1	0	1		1	0	0	0	0
f	1	0	1	0	1		1	0	0	0
g	0	1	0	1	0	1		0	0	0
i	0	0	0	0	0	0	0		1	0
j	0	0	0	0	0	0	0	1		1
k	0	0	0	0	0	0	0	0	1	

This set can be brought into a table of its own. To get a more focused view, see below:

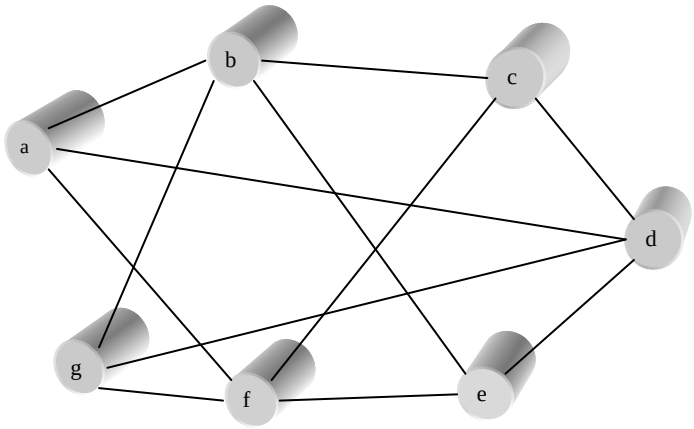
Table 4. Contention set a-g

Application	a	b	c	D	e	f	g
a		1	0	1	0	1	0
b	1		1	0	1	0	1
c	0	1		1	0	1	0
d	1	0	1		1	0	1
e	0	1	0	1		1	0
f	1	0	1	0	1		1
g	0	1	0	1	0	1	

In order to get a visual image of the contention situations, the sets can be illustrated graphically as follows, with the applications as nodes and connector lines showing the contention situations:



The "simple" contention set i - k



The "complex" contention set a - g

The latter is a "meshed" contention set where each application happens to be in contention with three or four others, although none is in contention with every other application.

2. Handling the "simple" contention set i-k

2.1 Comparative evaluation

Comparative evaluation only occurs if at least one of the contending applications is community-based and has expressed preference for comparative evaluation. Moreover, only an application fulfilling those criteria is eligible to be elected a clear winner of a comparative evaluation. In a case when the applications in the contention set all fulfill these criteria, there are three principally different outcomes:

- Where application j is a clear winner (in green), both i and k are eliminated (red), as illustrated below:

- Where application i is a clear winner, j is eliminated, so k would also survive (grey) since there is no contention situation left following the elimination of j :

  A variant of this type of outcome would occur if k is a clear winner, j is eliminated and I survives.

- Where none of the community-based applications in the contention set is found to be a clear winner, the full contention set continues to an auction process to resolve the contention.

2.2 Auction

For resolution of the contention set through auction, it should first be noted that the anticipated procedure is an ascending-clock auction, which implies that applications exit successively as the bidding level in a round exceeds their respective exit bids. In contention resolution through auction, the first two outcomes mentioned above are the only possibilities; either j wins, eliminating both the others, or one of the other applications (i or k) wins, eliminating j and saving the other (k or i, respectively) since there is no contention situation left when j is out. More in detail, the auction process with ascending-clock rounds will have the effect of first eliminating one contender when the auction reaches the first exit bid. If that resolves all contention situation (as is the case if the bid level exceeds the exit bid of j), the auction stops, both remaining contenders i and k pay the same "closing bid" (bid level at the time contention is eliminated) and proceed to the next step. Conversely, if contention remains (as is the case if i exits first) the auction continues until the bid level exceeds the exit bid of one of the remaining contenders. If that one is k, j remains as the sole winner, pays the closing bid and proceeds to the next

step. If j is the one exiting first of the two, k is the winner, pays the closing bid and proceeds to the next step. Moreover, i survives due to lack of contention with k, pays his exit bid and proceeds to the next step.

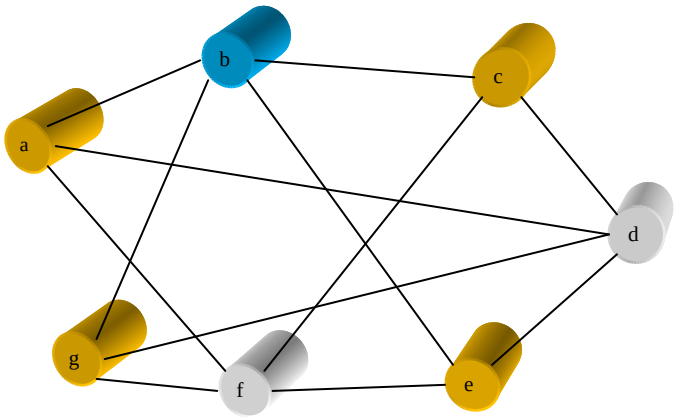
Thus, regardless of whether comparative evaluation or auction is applied to resolve the contention, the overall outcome will depend not only on which application wins but also on the topology of the contention set to be resolved, provided any application with no contention situation left to resolve is allowed to survive, even if it is not the outright winner.

3. Handling of the "complex" contention set a - g

For the "complex" contention set, let's first consider some potential cases for comparative evaluation.

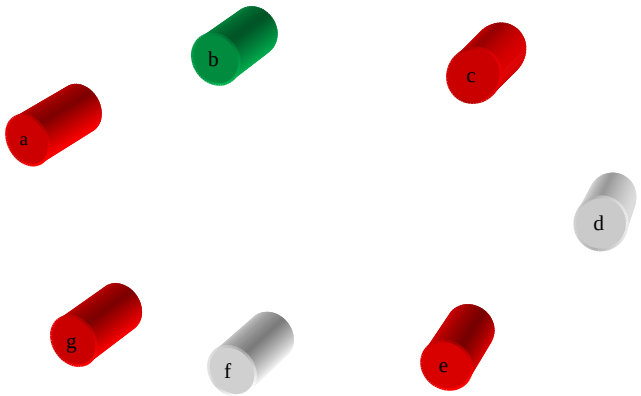
3.1 One community application

Let's assume that "b" is a community-based application and that the applicant has opted for comparative evaluation. All the others are "open" applications (or community-based applications not opting for comparative evaluation). The comparative evaluation should focus on b (blue) and those in contention with b, notably a, c, e and g (orange).



Different outcomes of the comparative evaluation will play out as follows:

- If b wins (green) the comparative evaluation, a, c, e and g are rejected (red), as illustrated below:



With b accepted and a, c, e and g disappearing, all the previous contention relationships have been resolved. It follows that d and f would survive and proceed to the next step, without any further steps in this regard.

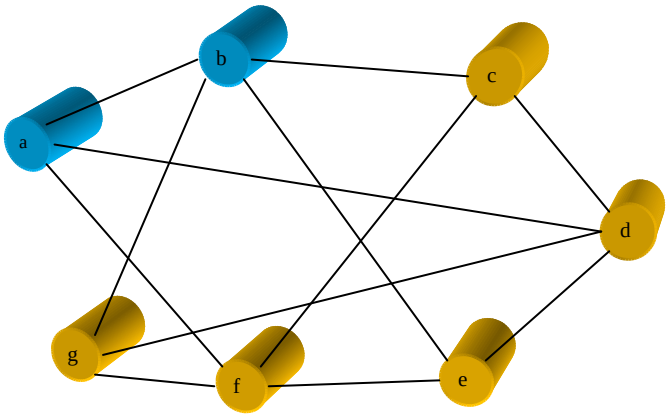
- The alternative is that "b" is not a clear winner. The consequence of that situation is that the contention set in its entirety will be resolved through an auction.

3.2 Two community applications

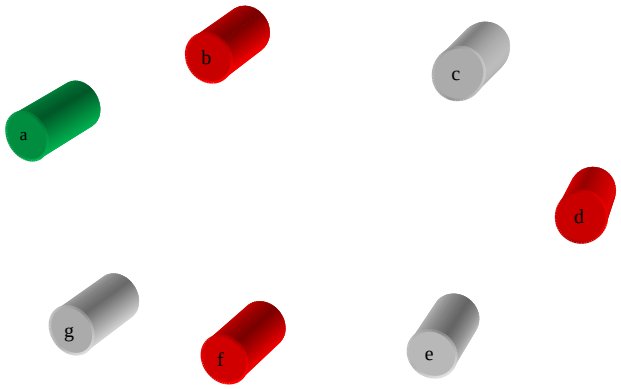
Assume that the contention set contains two community applications and both have requested comparative evaluation. There are two cases to analyze depending on whether these applications are in direct contention or not.

3.2.1 Direct contention

Assuming that "a" and "b" are the community applications (blue), all the others will be in contention (orange) with either or both, as follows:

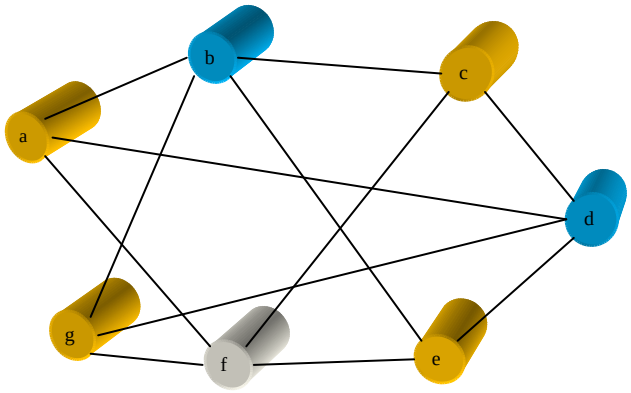


It is then reasonable to handle the situation by including all in the comparative evaluation at the same time. Regardless of whether "a" or "b" is found to be a clear winner, all the others would seem to lose at first sight. However, among those there will be some that are not in contention with the winner and could coexist with it. Say that "a" wins, then "b", "f" and "d" would be eliminated (red), while "g", "e" and "c" would survive (grey) since they have no remaining contention situations.

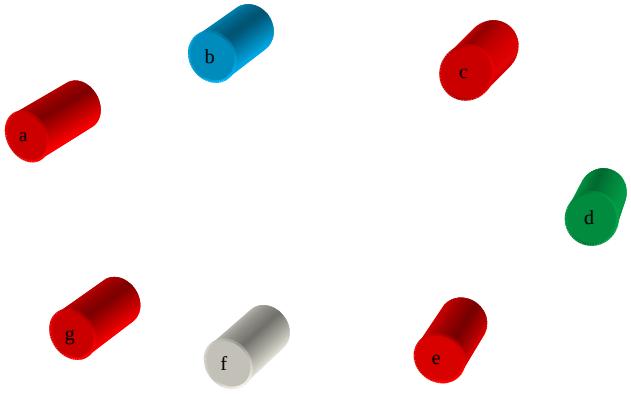


3.2.2 No direct contention

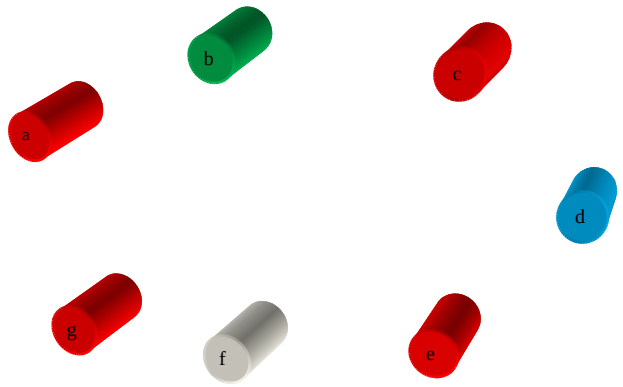
With b and d as the community applications, there is no contention between the two, but all the others except “f” have contention with either or both, as illustrated below:



Since b and d could coexist if they both would survive resolution of the contentions, there is a rationale for regarding this situation as two direct contention sets to resolve with two comparative evaluations, one for “d” and those in contention with “d”, and one for “b” and its contenders. Say that the “d” set is evaluated first and that d wins, then a, c, e and g are rejected, all contentions are resolved and “b” survives as well as “f” with no need for further steps, as follows:



If “d” doesn’t win, the set is left unchanged and comparative evaluation for “b” is undertaken. If “b” wins that one, “a”, “c”, “e” and “g” are eliminated while both “d” and “f” survive, without remaining contention, as follows:

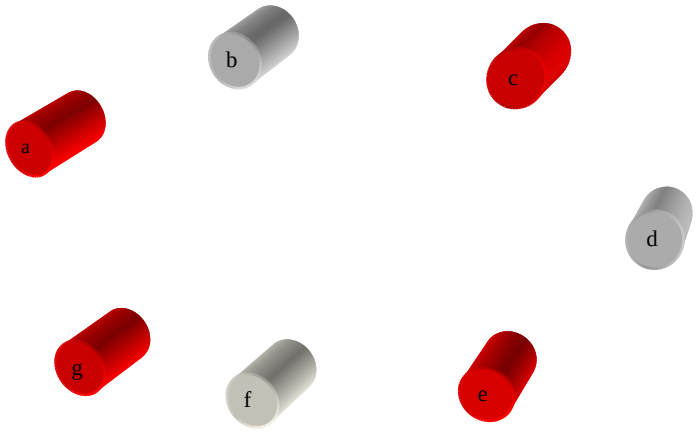


If "b" is not deemed a clear winner either, the whole contention set will be resolved through an auction process.

Note that whether the "b" contention or "d" contention is addressed first will not affect the outcome.

3.3 Auction

In an auction for the "complex" contention set, the whole set is participating and one or more winners emerge. As mentioned earlier, an ascending-clock auction implies that applications exit successively as the bidding level in a round exceeds their respective exit bids. For each bidding round when one or more applications have exited, the remaining contention situations are reviewed and the auction process stops as soon as all contention situations have been resolved. Suppose that the auction has reached a point where a, c, e and g have exited (red) and the situation is as follows:



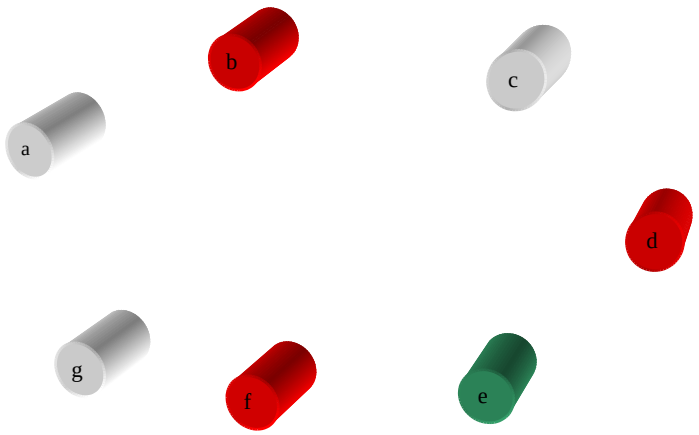
There are no more contention situations left for b, d and f. They all pay the same closing bid (equal to the bidding level at the time when the contentions are finally resolve) and proceed to the next step.

With a complex contention set, the effect of applications exiting in a successive manner may also result in survival of some applications that have exited early, depending on which application(s) win(s) and the topology of the contention set. Assume that f exits first, and then a, c, e and g. By then, all contentions are resolved; b and d are winners,

pay the closing bid and proceed to the next step. However, the final outcome will be the same as for the graph above; a, c, e and g are eliminated since they are in direct contention with either or both of the winners, but f has no direct contention with any of the winners and will survive, so f pays its exit bid and proceeds to the next step.

Regardless of which the winners are, there will be applications among those exiting early that have no contention situation with the winners and would survive—and there may also be remaining contentions to resolve among such "lucky losers". Such residual contentions could be resolved by comparing the exit bids among the "lucky losers", appointing a winner among them (and if necessary by repeating that process until all contentions are effectively resolved).

If, for example, e wins overall, the situation is as follows:



So, b, d and f are eliminated, and thereby the contention situations for a, c and g are eliminated as well, meaning that they survive, regardless of when and in which sequence they exited the auction.

As for the "simple" contention set, although even more obvious for this "complex" case, the overall outcome will depend on both who wins and on the topology of the contention set, provided those ending up without contention are allowed to survive, in spite of not being the overall winners.

4. Conclusion

Resolution of complex contention sets, either through comparative evaluation or auction, may result in multiple winners that have no direct contention relationships between them. They can thus all proceed to delegation.

A comparative evaluation where (at least) one clear winner is found may also result in certain other applications surviving as well, as "lucky losers", since each of them individually could coexist in the DNS with the winner(s). Such surviving applications may have residual contention cases between them that need to be resolved through auction. Conversely, if no clear winner is found, the full contention set will have to be resolved through auction. The same kind of potential "lucky loser" situations may occur in

auctions, where any residual contention situations are possible to resolve based on the exit bids for the applications concerned.

Provided that it is deemed acceptable to allow those applications to survive which have no contention situations left to resolve, which seems reasonable, the overall outcome of the contention resolution will depend not only on which application wins, but also on the actual topology of the contention set at hand.

Chapter 5: Comparative Evaluation/New gTLDs

Draft v.13

5.1 Background

Comparative evaluation is foreseen to play an important role as selection method in a particular case for new gTLD applications, notably to resolve string contention (defined below) in a case when at least one application is community-based and has explicitly opted for comparative evaluation as the method to resolve string contention. The basis for this approach is found in Implementation Guideline F in the GNSO's New gTLD Final Report:

> *"If there is contention for strings, applicants may:*
>
> *i) resolve contention between them within a pre-established timeframe*
>
> *ii) if there is no mutual agreement, a claim to support a community by one party will be a reason to award priority to that application. If there is no such claim, and no mutual agreement a process will be put in place to enable efficient resolution of contention and;*
>
> *iii) the ICANN Board may be used to make a final decision, using advice from staff and expert panels."*

String contention occurs when the strings of two or more applications are identical or found to be so similar that delegation of both will create a threat of user confusion. Applications in string contention are aggregated into contention sets during Initial Evaluation. As a first option, it is foreseen that applicants with applications in string contention may negotiate among themselves to resolve the contention voluntarily, through withdrawal of one or more applications without material changes of any application. If contention remains after all other stages have been completed, the first method available to resolve contention (in cases where there are one or more community-based applicants) will be comparative evaluation. This paper provides considerations and describes the approach for processing comparative evaluations in the given context.

5.2 Considerations

As stated above, the GNSO Final Report advises that some preference be given to community-based applications in string contention cases. The chosen comparative evaluation approach features criteria to validate the community-based designation and assess the relative added value to the namespace among the applications in a contention set.

The applicant will designate the application as open or community-based at the time of application. If it makes a designation as community-based, the applicant will be asked to respond to a set of questions to demonstrate that the application is intended for and supported by the relevant community. The applicant will also be asked whether a comparative evaluation is the preferred method to resolve any string contention the application may encounter. Comparative evaluation will take place if one or more community-based applications in a contention set features such a preference. The

comparative evaluation process will include all the applications in the relevant contention set. Applicants might be asked to furnish additional information before the comparative evaluation to substantiate community representation.

If successful in a comparative evaluation, an applicant with a community-based application will be constrained in the operation of the TLD to serve that community, according to provisions incorporated into the registry agreement between ICANN and the registry operator.

The comparative evaluation process requires a clear objective outcome and is designed to avoid the effects of subjective aspects by focusing on situations where the benefits of one of the applicants clearly outweigh the other contenders. Therefore, a comparative evaluation that does not produce a clear winner will be declared inconclusive. The string contention should then be settled in a subsequent process as described in the RFP. It should be noted that a comparative evaluation for a contention set with complex topology may result in more than one clear winner that all can proceed to delegation.

5.3 Procedure

1 In the application phase, each applicant that declares its gTLD application as community-based also expresses any preference for comparative evaluation, should string contention arise. Applicants become aware of identical or confusingly similar strings once the entire group of applications received is posted.

2 Formal objections may be filed once the applications are posted.

Note 2

Prior to any comparative evaluation taking place, communities also have the opportunity to formally object to applications that might inappropriately adopt as a TLD label the name of the respective community. Given that a community-based applicant may use that opportunity to oppose a potential string contender rather than await resolution by comparative evaluation, the standards of the objection procedure and comparative evaluation are logically consistent so that, where appropriate, they will provide consistent outcomes for each given case.

3. During the Initial Evaluation period, the analysis of the String Similarity Panel results in contention sets. These contention sets are published at the conclusion of Initial Evaluation.

4. Some applications may not pass Initial or Extended Evaluation and would be eliminated during these stages. Some applications may not prevail in a dispute resolution proceeding and would be eliminated during this stage. Some contention sets may be resolved through voluntary agreement among applicants.

5. At the start of the Contention Resolution stage, contention sets are re-configured among the applications that have passed all previous stages. For all contention sets where there is a community-based application with preference for comparative evaluation, the comparative evaluation starts.

6. For each direct contention subset within the contention set, a panel appointed by the comparative evaluation provider will review and score the one or more community-based applications with preference for comparative evaluation against the following criteria:

a. Nexus between proposed string and community

3 = string is name or well-known abbreviation of community institution

2 = string is relevant to applicant's area of interest but also has other well-known associations

1 = no connection

b. Dedicated registration policies

3 = Registration eligibility is strictly limited to members of the pre-established community identified in the application. Registration policies also include name selection and use requirements consistent with the articulated scope and community-based nature of the TLD. Proposed policies include specific enforcement measures including investigation practices, penalties, takedown procedures and appeal mechanisms.

2 = Registration eligibility is predominantly available to members of the pre-established community identified in the application, and also permits people or groups informally associated with the community to register. Policies include some elements of the above but one or more elements are missing.

1 =No dedicated registration policies.

c. Community establishment

3 =Clearly identified, organized and pre-established community of considerable size and longevity.

2 =The community addressed fulfills some but not all the requirements above.

1 =No community addressed.

d. Community endorsement

3 =Endorsement by a recognized institution or by member organizations, including evidence of support such as meeting minutes, voting records, or divisional or sub-organizational member endorsements.

2 = Endorsement by some groups with apparent relevance, but also some opposition by groups with apparent relevance.

1 = Assorted endorsements from individuals or groups of unknown relevance—or—no endorsement by any community.

If no applicant scores 11 or more, there will not be a clear winner .If only one applicant scores 11 or more, it will be declared the winner.

If more than one applicant scores 11 or more and they are not in direct contention they will be declared winners. If they are in direct contention, there will be no clear winner.

7. Following the comparative evaluation described above, ICANN will review the results and reconfigure the contention set as needed. For remaining direct contention subsets involving any community-based application that has elected comparative evaluation, the same procedure described in Step 6 occurs. If none such are left in the contention set, remaining applications in contention will

proceed to a subsequent contention resolution process. Applications with no contention remaining will then be able to proceed toward delegation.

Chapter 6: Auction

Auction Design for Resolving Contention for New gTLDs

10 September 2008

Executive Summary

Auctions are the contention resolution mechanism of last resort. Auctions will only be used only in cases where:

- There is string contention and those who are in contention successfully complete all evaluations,
- Contending applicants elect not to use comparative evaluation, did not have comparative evaluation available, or comparative evaluation did not provide a clear winner, and
- Contending applicants have not resolved the contention among themselves.

The purpose of an auction is to resolve contention in a clear, objective manner. Proceeds from auctions will be reserved until the uses of the proceeds are determined through a community consultation. The proceeds will not go into ICANN's general expense budget but will be separately earmarked.

This paper describes a proposed auction design for resolving contention among competing applicants for new generic TLD strings. The following features are present in this design:

- Simultaneous ascending-clock auctions with discrete rounds and irrevocable exit;
- Contending (identical or confusingly-similar) strings give rise to a "graph" structure;
- An applicant needs to continue to bid until all applications with which it contends have exited;
- Information is provided as to the number of competing applications remaining after each round, but not their identities; and
- Bids need to be legally-binding commitments and, to that end, bidding deposits are required.

6.1 Background

ICANN is preparing implementation plans for the new gTLD process. Staff is working from the GNSO New gTLD recommendations and input from Internet community to guide the implementation. This document has been prepared by Power Auctions LLC, auction design consultant retained by ICANN, in close consultation with ICANN staff.

Note 3

The current document has the sole purpose of recommending an auction design for resolving contention among competing applicants for new generic TLD strings, and it does not provide any recommendation of auction design for any other purpose.

A separate but related document, "Economic Case for Auctions in New gTLDs" (8 August 2008, see http://www.icann.org/en/topics/economic-case-auctions-08aug08-en.pdf)describes the rationale for using auctions as a tie-breaking mechanism for resolving contention among competing applicants for new generic TLD strings. The current document describes specific aspects of the auction model that is proposed.

This document does not describe any potential use of funds resulting from an auction process. A separate document, including a proposed budget for the new gTLD process, will describe potential uses of funds.

6.2 Triggering of the auction process

Two applications that survive ICANN's evaluation process will be said to ***in contention*** with each other if the generic TLD strings that they propose are identical or "confusingly similar" to one another. A surviving application for a new gTLD will be subject to auction only in the event that it is in contention with another surviving application.

A successful community-based application is in contention with one or more other applications; the community-based application may request that it and the contending application(s) be subject to a comparative evaluation process instead of an auction. However, in the event that the evaluator for ICANN determines that there is unlikely to be an adequate basis for selecting one of these applications over the other(s), then these applications will also be entered into the auction process.

6.3 Consideration of the available auction models

Power Auctions LLC, as auction consultant for ICANN, began its analysis by reviewing the available auction models. The basic alternatives considered were:

Note 4

For a longer review of the available auction models, see: "Auctions (Theory)," New Palgrave Dictionary of Economics, Second Edition (2008) (Lawrence M. Ausubel), downloadable at http://www.powerauction.com/docs/auction-theory-new-palgrave.pdf.

- First-price auction: Bidders submit sealed bids, in advance of a deadline; the highest bidder wins the item and pays the amount of its bid.
- Second-price auction: Bidders submit sealed bids, in advance of a deadline; the highest bidder wins the item and pays the amount bid by the second-highest bidder.
- Ascending-bid auction: Bidders dynamically submit bids at successively higher bids; the final bidder wins the item and pays the price at which it became the final bidder.
- Dutch auction: The auctioneer starts at a high price and announces successively lower prices, until some bidder expresses its willingness to purchase the item by bidding; the first bidder to bid wins the item, and pays the current price at the time of its bid.

Generally, the second-price auction and ascending-bid auction are regarded as enabling the simplest bidding strategies for bidders and as leading to the efficient auction outcome. In particular, if bidders have pure private values for a single item being

auctioned, the optimal bidding strategy in either is simply to "bid what the item is worth to you." Since achieving an efficient allocation of new gTLD applications, rather than maximizing revenues, is a principal objective of ICANN, second-price or ascending-bid auctions are the natural choices for auctions of new gTLDs.

By contrast, the formulation of a bidding strategy in a first-price auction is relatively complex. The bidder, in addition to assessing what the item is worth to it, must assess the competitive situation and then "shade" its bid accordingly. In addition, bidders tend particularly to dislike bidding in first-price auctions in which, for reasons of transparency, the amounts of the losing bids are revealed after the auction. A bidder in a first-price auction will feel particularly foolish if, for example, it submits a winning bid of $250,000 whereas the second-highest submitted bid was $50,000. It will be evident to all parties that a bid of $50,001 was sufficient to win and that the bidder "overbid" by $200,000. Each of these difficulties can be avoided by using a second-price or ascending-bid auction instead.

It is well understood that the Dutch auction is strategically equivalent to the first-price auction. Its only advantage is that the losing bids are never submitted and so their amounts never become known, avoiding the last problem described in the previous paragraph. However, as in the first-price auction, the formulation of bidding strategy is relatively complex and the auction is less likely to produce the efficient allocation, again favoring a choice of a second-price or ascending-bid auction.

See "Counterspeculation, Auctions and Competitive Sealed Tenders," Journal of Finance 16, pp. 8-37, (1961) (William Vickrey).

Note 5

For resolving contention among competing applicants for new gTLD strings, the ascending-bid auction offers three decisive advantages over the second-price auction. First, ascending-bid auctions offer the greatest transparency and, by contrast, sealed-bid auctions are comparatively opaque. Second, in explaining why ascending-bid auctions are quite prevalent while second-price auctions are comparatively rare, it has been observed that bidders will be reluctant to reveal their private values truthfully in an auction if either there may be cheating by the auctioneer or there will be subsequent auctions or negotiations in which the information revealed can be used against them. By contrast, an ascending-bid auction avoids these problems, as it does not require the high-value bidder to reveal its value—the bidding stops as soon as the second-highest bidder exits. Third, the ascending-bid auction format scales particularly well to a simultaneous auction of multiple items, which is discussed further in the next section.

See "Why Are Vickrey Auctions Rare?" Journal of Political Economy, 98(1), pp. 94–109 (1990) (Michael H. Rothkopf, Thomas J. Teisberg, and Edward P. Kahn).

Note 6

6.4 Ascending-clock auction structure, generally

We recommend that the ascending-clock auction be the basic component of the auction design. The ascending-clock auction is a particular version of the ascending-bid auction recommended in Section 3. In an ascending-clock auction, the auctioneer starts

at a low price and announces successively higher prices. At every price (or range of prices), each bidder is asked to indicate its willingness to purchase the item. The price continues to rise so long as two or more bidders indicate interest. The auction concludes at the first price such that fewer than two bidders indicate interest, and the item is awarded at this final price.

Note 7

For background information on ascending-clock auctions in theory and practice, see the Auctions (Theory) entry of the New Palgrave Dictionary of Economics, referenced in footnote 2, and "Auctioning Many Divisible Goods," Journal of the European Economic Association, Vol. 2: No. 2-3, pp. 480-493 (April-May 2004) (Lawrence M. Ausubel and Peter Cramton), downloadable at http://www.powerauction.com/docs/auctioning-many-divisible-goods.pdf

Thus, an ascending-clock auction is similar to the standard Sotheby's or eBay auction, except that the pace of the auction is not driven by prices that bidders propose. Rather, the auctioneer announces prices (or ranges of prices) that increase over time, and bidders' responses are limited to indicating whether they are "in" or "out" at the announced prices. This design is increasingly being used in auctions of high-valued items, and it has several strengths. First, it is well suited to an Internet auction with discrete bidding rounds, where no advantage is given to submitting bids at the latest possible moment ("bid-sniping") or at the earliest possible moment. This provides bidders with adequate time to make reasonably considered decisions in bidding for high-valued items and it avoids favoring bidders in any particular time zone. Second, the auction can then employ the following "activity rule": a bidder needs to have been "in" at early prices in the auction in order to continue to stay "in" at later prices. (In other words, exit from the auction is irrevocable.) Bidders are informed of the number of contending applications that have remained "in" after each round, but not their identities; with the specified activity rule, this demand information has real significance, as a competitor who has exited the auction cannot later re-enter. Third, the auctioneer has the ability to pace the speed at which prices increase. This facet has greatest importance if related items are auctioned simultaneously, as their prices can then be paced to increase together in relation to the level of demand.

Note 8

The reason why information is provided about the number of contending applications that have remained "in", but not the identities of the remaining applications, is that it strikes an appropriate balance, providing bidders with the numbers information that will be most useful to them during the auction, but without providing the information about remaining bidders' identities that would most facilitate collusion.

Indeed, it is proposed that, as much as possible, the auctions for various contending applications occur simultaneously. This has the advantage of providing bidders with information about the level of demand for other new gTLDs—and hence the value of a new gTLD—while the auction is still in progress. One of the benefits of the auction process is that it will generate information concerning the value of new gTLDs; some of this information will effectively become available to participants during the auction and it will be useful to them in making their subsequent decisions in the auction. Moreover, as will be discussed in Sections 7 and 8 below, it is essential that a given application be auctioned simultaneously with all other contending applications—as well as simultaneously with all applications that are in contention with any contending application, etc.

Note 9

For example, if there are four contending applications for .bank and three contending applications for .store, we suggest that, to the extent reasonably feasible, the auctions for .bank and for .store occur simultaneously and that information concerning the progress of each of these auctions is provided to participants in the other auctions. The benefit of the simultaneity is that it would enable participants in each of these auctions to gain additional information about the value of new gTLDs *in general*, which should assist the participants in deciding how high they should bid.

6.5 Additional aspects of the recommended ascending-clock auction structure

6.5.1 Intra-round bidding

In the simplest description of an ascending-clock auction structure, the auctioneer announces a single price associated with each round and bidders indicate whether they are "in" or "out" at that price. For example, the price for Round 1 might be $50,000 and the price for Round 2 might be $100,000. Since price ascends in discrete steps, this introduces a reasonable likelihood of ties. For example, Bidders A and B might both indicate that they are "in" at $50,000, but "out" at $100,000.

The performance of this auction model can be drastically improved using a technique known as **intra-round bidding**. The technique adds very little to the complexity of the auction, while increasing the ability of applicants to express their valuations in the auction and reducing the probability of ties. Each round of the auction has a "Start-of-Round Price" and an "End-of-Round Price", and bidders indicate whether they are "in" or "out" at all prices within that range. For example, in Round 1, the Start-of-Round Price might be $0 and the End-of-Round Price might be $50,000; while in Round 2, the Start-of-Round Price might be $50,000 and the End-of-Round Price might be $100,000. Assuming that a bidder stayed "in" for Round 1, it has the following alternatives available in Round 2:

- It may stay "in" through the End-of-Round Price for the current round (i.e. $100,000); or
- It may submit an "exit bid" (a number strictly between $50,000 and $100,000).

As an example, Bidder A might submit an exit bid of $83,000, while Bidder B might submit an exit bid of $92,500. If these are the only two bidders, then $83,000 is the first price at which fewer than two bidders remain. Thus, the auction ends and Bidder B wins the item, at a final price of $83,000.

If instead, both Bidders indicate that they are "in" through $100,000, then the auction progresses to Round 3. The Start-of-Round Price for Round 3 equals the End-of-Round Price for Round 2, while the Auctioneer announces an End-of-Round Price of perhaps $150,000 for Round 3.

Ties remain possible, but now become extremely unlikely. In order to avoid any possibility of a tie, bidders will be randomly assigned "priority numbers" before the auction. In the unlikely event that all of the remaining bidders submit identical exit bids, the winner will be deemed to be the exiting bidder with the highest priority number. Of course, any bidder can avoid having the priority numbers determine whether it wins by judicious choice of its exit bid, for example by submitting an exit bid of an odd amount such as $83,017 instead of using a round number such as $83,000.

As in the basic description of the ascending-clock auction, the Auctioneer announces after each round the number of bidders who remained "in" at the End-of-Round Price, but not their identities. Exit is irrevocable; a bidder who submits an exit bid in Round 2 can no longer participate if the auction progresses to Round 3.

6.5.2 Bidding units (currency)

In order for bids to be comparable, given currency fluctuations, it is necessary for all bids in the auction to be submitted in a single currency. Given that the application fee will be stated in US dollars, the currency for all bids in the auction will also be US dollars. Bids may be submitted in any integer (whole) number of US dollars.

6.5.3 Post-default procedure

If full payment of the final price is not received from the winning bidder within 10 business days after the conclusion of the auction, or if the winning bidder fails to enter into the prescribed registry agreement with ICANN, the winning bidder will be subject to being declared in default. Once declared in default, the winning bidder will be subject to immediate forfeiture of its position in the auction and assessment of the default penalties described in Section 5d. After a winning bidder is declared in default, the relevant gTLD would be offered to other bidders, one at a time, in descending order of their exit bids.

6.6 Practicalities of participation in an ascending-clock auction

This section will provide an informal introduction, from the applicant's perspective, to the practicalities of participation in an ascending-clock auction. Please note that it is intended only as a general introduction and it is only preliminary.

The auction will be conducted over the Internet, with bidders placing their bids remotely using a web-based software system designed for the auction. Auction participants will receive instructions for access to the online auction site. The auction software system will be compatible with current prevalent Internet browsers, and will not require the local installation of any additional software. Access to the site will be password-protected and bids will be encrypted via SSL. The auction will generally be conducted in such a way as to conclude quickly, ideally in a single day.

The auction will be carried out in a series of auction rounds. The sequence of events will be as follows:

- For each round, the auctioneer will announce in advance: (i) the Start-of-Round Price; (ii) the End-of-Round Price; and (iii) the starting and ending times of the round. In the first round, the Start-of-Round Price for all applications in the auction will be $0 US; in subsequent rounds, the Start-of-Round Price will be its End-of-Round Price from the previous round.

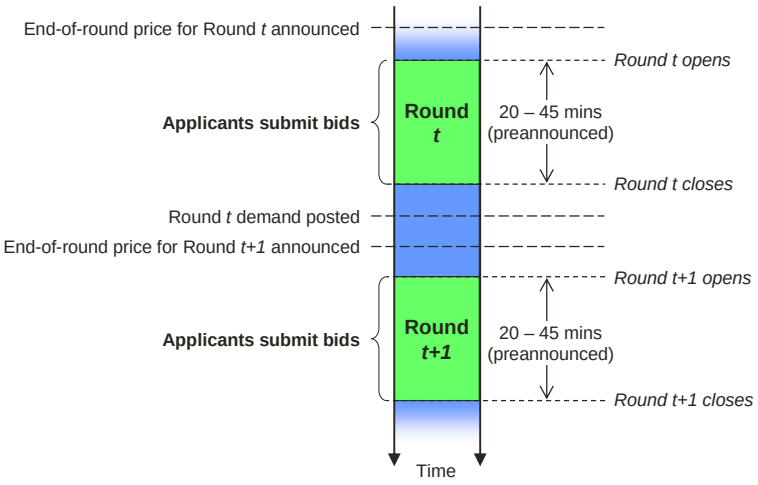
- The End-of-Round Price will be set in relation to the number of contending applications and the configuration of the "graph" (see following sections) of contentions.

- During each round, applicants will be required to submit bid(s) concerning their willingness to pay within the range of intermediate prices between the Start-of-Round and End-of-Round Prices. In this manner, an applicant may indicate its willingness to "stay in" the auction at all prices through and including the End-of-

Round Price, or its wish to exit the auction at a price less than the End-of-Round Price ("exit bid").

- Exit is irrevocable. If an application exited the auction in a previous round, the application is not permitted to re-enter in the current round.
- Applicants may submit their bid(s) at any time during the round.
- After each round, the auctioneer will disclose the aggregate number of contending applications that remained in the auction at the End-of-Round Prices for the round, and will announce the prices and times for the next round.

The sequence of events during the auction is illustrated as follows:



In each round, a bid is required to be submitted for each application remaining in the auction. The bid indicates the applicant's demand for the application at all prices between the Start-of-Round and End-of-Round Prices, as follows:

- Each bid consists of a single price associated with the application, such price required to be greater than or equal to the Start-of-Round Price.
- If the bid amount is strictly less than the End-of-Round Price, then the bid is treated as an exit bid at the specified amount, and it signifies the applicant's binding commitment to pay up to the bid amount if its application is approved.
- If the bid amount is greater than or equal to the End-of-Round Price, then the bid signifies that the applicant wishes to remain in the auction at all prices in the current round, and it signifies the applicant's binding commitment to pay up to the End-of-Round Price if its application is approved. Following such bid, there is no possibility of the application being eliminated within the current round.
- To the extent that the bid amount exceeds the End-of-Round Price, then the bid is also treated as a proxy bid that will be carried forward to the next round. The applicant will be permitted to change the proxy bid amount in the next round; and the amount of the proxy bid will not constrain the applicant's ability to submit any valid bid amount in the next round.

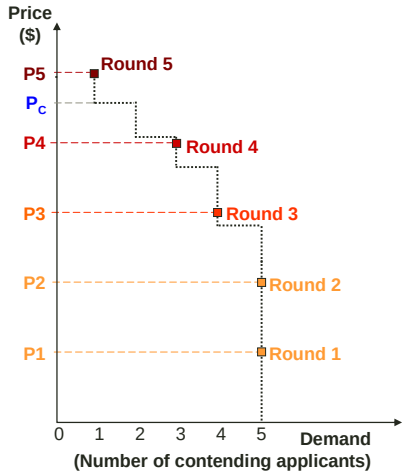
- The bid amount for an application is not permitted to exceed the financial limit established for the application, such limit based on the financial deposit received from the respective applicant in accordance with the Auction Rules.
- A bid is not permitted to be submitted for any application for which an exit bid was received in a prior round.
- If no valid bid is submitted within a given round for an application that remains in the auction, then the bid amount is taken to be the amount of the proxy bid (if any) carried forward from the previous round or, if none, the bid is taken to be an exit bid at the Start-of-Round Price for the current round.

This process continues, with the auctioneer increasing the price range associated with each given TLD string in each round, until there is at most one contending application at the end-of-round prices. After a round in which this condition is satisfied, the auction will conclude, and the auctioneer will determine the clearing price(s). The last remaining application(s) will be deemed the successful application(s), and the associated applicant(s) will be obligated to pay the clearing price(s).

In the case of *n* mutually-contending applications, the successful application and the clearing price are determined by the following process.

At the end of each round, the auction software aggregates the bids of individual applicants to determine the level of demand for a TLD string. If the number of remaining bidders exceeds one, applicants are notified of the aggregate demand at the End-of-Round Prices, and applicants are notified of the prices and timing details for the next round. If the aggregate demand is not greater than one, the auction software identifies the lowest price at which such an outcome occurs (i.e. the exit bid of the penultimate applicant). This price is deemed the clearing price, and the remaining application is deemed the successful application. In the unlikely event that all of the remaining applications exit at the clearing price, then the application exiting at the clearing price which has the highest priority number is deemed to be the successful application.

The diagram and description, below, illustrate how an auction for five (5) mutually-contending applications might progress:



- Before the first round, the Auctioneer announces the End-of-Round Price P1.
- During Round 1, a bid is submitted for each application. In the diagram shown, all five applicants submit bids of at least P1. Since the aggregate demand exceeds one, the auction proceeds to Round 2. The auctioneer discloses that five contending applications remained at P1 and announces the End-of-Round Price P2.
- During Round 2, a bid is submitted for each application. In the diagram shown, all five applicants submit bids of at least P2. The auctioneer discloses that five contending applications remained at P2 and announces the End-of-Round Price P3.
- During Round 3, one of the applicants submits an exit bid at slightly below P3, while the other four applicants submit bids of at least P3. The auctioneer discloses that four contending applications remained at P3 and announces the End-of-Round Price P4.
- During Round 4, one of the applicants submits an exit bid midway between P3 and P4, while the other three remaining applicants submit bids of at least P4. The auctioneer discloses that three contending applications remained at P4 and announces the End-of-Round Price P5.
- During Round 5, one of the applicants submits an exit bid at slightly above P4, and one of the applicants submits an exit bid at Pc (midway between P4 and P5). The final applicant submits a bid greater than Pc. Since the aggregate demand at P5 does not exceed one, the auction concludes in Round 5. The application associated with the highest bid in Round 5 is deemed the successful application. The clearing price is Pc, as this is the lowest price at which aggregate demand can be met.

The successful bidder will be offered the base registry agreement and a certain period of time to come to terms. If terms cannot be agreed, the agreement will be offered to the second place bidder.