Title: SYSTEMS AND METHODS FOR SETTING EPP REGISTRY SERVICE STATUS

Abstract: A system, method, and computer-readable medium enable a domain name or host name registry to effectively manage status codes associated with the domain or host. Status codes are organized into status sets that can be added, removed, activated, or deactivated in accordance with a suitable change request. The status codes corresponding to a removed status set that are also enabled according to other active status sets are not removed when the removal of the status set is processed.
Published:

- with international search report (Art. 21(3))
[001] This application claims priority to U.S. Patent Application No. 12/982,125, filed on December 30, 2010, the disclosure of which is expressly incorporated herein by reference in its entirety.

Technical Field

[002] This disclosure relates to improvements in the managing of provisioned objects, including domain names and host names.

Background

[003] The domain name system (DNS) and domain name registration system have become an integral part of how consumers and businesses conduct activity on the Internet.

[004] One advantage of DNS is that it allows a person to visit a website by typing into a browser a "domain name", that is, a familiar word or group of words, rather than the numeric IP address of the computer on which the website resides. For example, a person desiring to visit the VeriSign website could do so by entering in their web browser the domain name "verisign.com" instead of an IP address, such as "10.10.1.100." Although, the user could enter either the domain name or the IP address, the moniker "verisign.com" is easier to remember than a string of digits. A domain name is an example of a "provisioned object," that is, an object that is assigned or released through an interface.

[005] The DNS system also allows multiple websites to share one IP address when multiple domain names all resolve to (that is, are associated with) the same IP address. A webserver that has been assigned a specific IP address receives, as part of the request for web content, the domain name requested and can then deliver the desired content to the requesting computer. This multiple-website feature is important because there are a finite number of IP addresses of the form 10.10.1.100, so called "IPv4 addresses." Without this ability for multiple websites to share an IP address, the possible IPv4 address space would likely have already been exhausted.

[006] Furthermore, the next version of IP address space, so called "IPv6," includes an even more complicated numeric format. Whereas IPv4 is only 32 bits in binary length, IPv6 is 128 bits. A typical hexadecimal representation of an IPv6 address is 2001:0db8:85a3:0000:0000:8a2e:0370:7334. Because of the increased length of IP address in this format, there are approximately $5 \times 10^{28}$ theoretical addresses available for each one of the 6.8 billion people alive. Although IP address exhaustion will no longer be a concern under the
new addressing scheme, the DNS system remains important so that people can use familiar
domain names rather than long strings of hexadecimal digits to visit websites or access machines
on the Internet.

[007] Domain name registration is the process by which a registrant can reserve or
lease the use of a domain name for a specified period of time from the date of registration. The
domain name registration system consists of various top level domains (TLDs), such as the
traditional .com, .net, .org, .edu, and .gov, as well as the newer .biz, .info, and .name. The
domain name registration system has also evolved to incorporate various country code TLDs
(ccTLDs), each one reserved for use by a particular country, such as .ca, .cn, .tv, and .us,
associated with Canada, China, Tuvalu, and the United States, respectively. The domain name
system and domain name registration system have also evolved to allow the use of alternative
character sets to accommodate foreign languages.

[008] A domain name is reserved by a domain name "registrant." The registrant may
reserve the domain name for at least one year but may reserve the domain name for up to ten
years. Domain names are reserved through domain "registrars." Registrars are entities having
business relationships with domain "registries" that control the domain names for a particular
TLD. Thus, the registrar provides the interface to the registrant to reserve the domain name
from a registry. The registry manages the reserved names and available names for a particular
TLD and makes available the information to the registrar through the Extensible Provisioning
Protocol (EPP). Registrars that are authorized by the registry have the ability to make
reservations and check the state of domain names through the EPP. The registry provides the
EPP as a communications gateway to registrars for such purposes.

[009] In a typical domain name registration example, a registrant may want to reserve
the domain name "example.com." The registrant would contact a registrar that has a business
relationship with the registry that operates the .com TLD. The registrant would query the
registrar as to the availability of the domain name "example" in the .com namespace. The
registrar in turn would query the proper registry through the EPP, then return the results to the
registrant. The registrant may then obtain a registration of the domain name by paying a
registration fee and providing information required by the registry and registrar. The registry
charges the registrar for the domain name registration and the registrar collects the registration
fee from the registrant.

[010] To maintain a domain name in accordance with current regulations, the registry
responsible for a TLD is required to keep a certain minimum amount of information with the
domain name to ensure proper identification, security features, and operability associated with
the domain name. For example, all domain registrants are required to make available to the
registry, current administrative contact information. Also, in order for a domain name to work
correctly, the registry must have nameserver information for the domain to load into its TLD
DNS system to refer outside DNS requests to the proper authoritative DNS servers. Also, to
prevent accidental changes to the domain name settings, certain status codes are available to put
various levels of protection on the domain name.

[011] One problem with the way these standards-based status values are implemented
in the domain name management system is that they do not allow multiple additions of the same
status value for different underlying reasons. For example, a registry adding the necessary status
values to prevent any changes to a domain name record because of a court order ordering them
to prevent changes, cannot later add the necessary status value to prevent transfer of the domain
name record while easily maintain the status values so far as they overlap. The status value to
prevent transfer is among the status values necessary to prevent any changes in accordance with
the court order. Moreover, if the registry later desires to remove the status value corresponding
to the transfer-prevention status value because the underlying reason for adding the status value
was resolved, the registry might not realize that the court order to prevent changes is still active
and that the transfer-prevention status value should be maintained for that reason. Indeed, the
registry might by accident violate the terms of the court order by removing the transfer-
prevention status value. Therefore, a method is needed to help registries manage status values.

[012] Another problem with the way these standards-based status values are
implemented in the domain name management system is that they do not provide granularity for
the registry or entity that sets them. For example, a registry may desire to add the same status
value for multiple underlying reasons. Because the available standards-based status values
cannot be changed, it is difficult for the registry to maintain the multiple underlying reasons for
each time the status value was endeavored to be added. Therefore, a method is needed to allow a
registry or other status setting entity to mange status values so that, from the registry's
perspective, the status value can be added as often as needed in accordance with the underlying
reasons.

SUMMARY

[013] A computer-implemented method of managing status codes of provisioned
objects includes receiving a request to change a status set related to a provisioned object, the
status set corresponding to a group of one or more status codes. The method also includes
receiving a reason to change the status set and changing the status codes according to the change
request.
It is to be understood that both the foregoing general description and the following detailed description are exemplary and explanatory only and are not restrictive of the invention, as claimed.

The accompanying drawings, which are incorporated in and constitute a part of this specification, illustrate one (several) embodiment(s) of the invention and together with the description, serve to explain the principles of the invention.

**BRIEF DESCRIPTION OF THE DRAWINGS**

[016] Figure 1 is an illustration of the interaction between the Domain Registrant, Domain Registrar, and Domain Registry;

[017] Figure 2 is an illustration of a typical domain registration process;

[018] Figure 3 is an illustration of a Domain Registry Server with supporting Registration Programs, including an exemplary registry domain record;

[019] Figure 4 is an illustration of a Domain Registrar Server with supporting Registration Programs, including an exemplary registrar domain record;

[020] Figure 5 is an illustration of the Domain Exchange process;

[021] Figure 6 is an illustration of one step of the Domain Exchange process as found in Figure 5;

[022] Figure 7 is an illustration of another step of the Domain Exchange process as found in Figure 5;

[023] Figure 8 is an illustration of the available server Status Codes and exemplary Status Set definitions;

[024] Figure 9 is an illustration of a process to add a Status Set to a domain;

[025] Figure 10 is an illustration of a process to remove a Status Set from a domain;

[026] Figure 11 is an illustration of a Registry Server with supporting Registration programs, including an exemplary registry status set record; and

[027] Figure 12 is an illustration of a process that manages the status codes when a status set is added or removed.

**DETAILED DESCRIPTION**

Reference will now be made in detail to the exemplary embodiments. Wherever possible, the same reference numbers will be used throughout the drawings to refer to the same or like parts.

Figure 1 illustrates the data flow and relationship definition of the three primary parties involved in a domain registration. The registrant 110 is typically an end user of the
domain, but in some cases, may resell the domain to either another registrant in a domain transfer transaction or may retain ownership of the domain but let a third party use it, as when the registrant is a web hosting provider and the third party is a customer of the registrant. Moreover, some registrants never intend to use a domain in a traditional fashion. Some registrants hope to reserve desirable domain names that they can sell for a profit and some registrants reserve names that are slight variations of popular websites, hoping to receive Internet traffic from people mistyping the URL of the popular website. Registrants constantly find new ways to use the domain name system other than for the traditional use of hosting websites associated with the domain name that directs a user to a website.

[030] Registrants 110 reserve domain names from registrars 120. Thus, the registrant's 110 relationship is primarily with the registrar 120. The registrar, however, maintains a relationship with one or more registries 130 that control the TLD for which registration is desired. Typically, large registrars have multiple relationships with many registries to assure they can provide registrants with many TLD domain options when reserving their domains.

[031] Registries 130 control the assignment of domain names. A registry is responsible for assuring that domain information is accurate and up to date. Further, the registry is responsible for providing first level DNS support for the TLD. For example, the registry that manages the .org TLD must provide (or otherwise make available) a DNS server containing nameserver information for a domain name registered through the registry so that when a website is requested via the domain name in a URL, the proper nameserver will eventually respond to the request, by providing a fully resolved domain name (that is, resolved to the IP address of the machine designated as responsible to respond for the domain name). Registrar 120 and registry 130 each comprise one or more computers to implement the functions described herein, and may correspond to functions and structures disclosed below.

[032] A typical domain registration process is illustrated in Figure 2. The process begins when the potential registrant accesses a registrar's domain registration interface 205. The registrant searches for a domain name to reserve 210. The registrar 120, in turn, must query the registry 130 for current registration and availability information on the requested domain 215. The results are returned to the potential registrant 110. If the domain name is available, the potential registrant can proceed with registration from the registrar 220. Finally, if the registrant 110 continues with registration, the domain will be reserved to the registrant for a minimum period of one year from the date of registration and up to a maximum period of ten years.

[033] Figure 3 and Figure 4 contrast the typical kind of data stored by each of the registry 130 and registrar 120. Also, as can be seen in the types of programs, 318 and 418, run in
each, the registry 130 and registrar 120 must perform similar functions, but with different scopes and purposes. For example, whereas the registry 130 implements the Extensible Provisioning Protocol (EPP) so that registrars can make queries of the domain reservation system, the registrar 120 implements a web server to present products and application interfaces to registrants. However, because the two serve fundamentally different purposes, the registry 130 does not need some information used by the registrar and the registrar 120 does not need some information used by the registry. For example, whereas the registry 130 may not require any contact information for the registrant 110 of the domain name, the registrar 120 needs to maintain contact and billing information for the registrant 110. And for example, whereas the registrar 120 may not require information regarding the server status codes applied by the registry, the registry 130 maintains this information to determine what operations are allowed for a domain name by the registrar.

**Domain Name Exchange**

[034] In one embodiment, a service is provided that allows a registrant to exchange a current domain name for a new domain name. In contrast to the typical domain registration process of Figure 2, the domain name exchange service allows the registrant to change domain names without incurring any additional registration fees. In one embodiment, upon activation of the domain name exchange service, the registrant has until the next anniversary date of the domain name registration to make as many domain name exchanges as possible in accordance with domain name exchange business rules.

[035] In one embodiment, the business rules may specify that a domain name may only be exchanged at least 30 days after a previous domain name exchange and at least 30 days after the initial domain name registration. In another embodiment, the business rules may allow any number of days between exchanges and any number of days before a first exchange can be made. The business rules may be changed as the needs and goals of the business determine. In another embodiment, the business rules may allow a registrant to purchase a domain name exchange per exchange request for a fee in a transaction that somewhat resembles a domain registration, but that is less than a new domain name registration and retains the data in the existing domain name record, such as the expiration date and nameserver information.

[036] Figures 5 through 7 illustrate the domain name exchange process 500 of one embodiment. The registrant accesses a domain name exchange service (step 505) provided through their registrar. The registrant selects a new domain name using registrar-provided domain search tools, and requests that the new domain name replace the existing domain name (step 510). The registry will verify that the existing domain name is eligible for domain name exchange (step 515). If the domain name exchange service 520 is already enabled for the
domain name record 330, then the domain name exchange (step 535) takes place, otherwise, a fee for the service is charged (step 525) to the registrar and the domain name exchange service is enabled for that domain record identifier 530, 330, and then the domain name exchange takes place (step 535).

[037] Figure 6 illustrates step 515 from Figure 5 in greater detail. In particular, Figure 6 illustrates the steps of a process to determine whether an existing domain name will be allowed to be exchanged for a new domain name. The particular number of days reflected in the following steps may be adjusted or omitted according to the business rules of the entity implementing such a system.

[038] The registry verifies that the new domain name is available for registration (step 605), and that any domain name status codes that would prevent changes to the domain name are not active (step 610). In one embodiment, the business rules specify that registrants are allowed to exchange a domain name only after 30 days and then only every 30 days after that, as in steps 615 and 620.

[039] Figure 7 illustrates the steps of a process 700 to perform the domain exchange by the registry and is a detailed breakdown of step 535 from Figure 5. The domain name is replaced in the domain registration records of the registry (step 705). Referring again to Figure 3, the Registry Domain Record 330 is updated with the new domain name, and the domain record identifier, as found in 330, remains the same. The replacement is recorded for tracking and reporting purposes (step 710). Replacement entries into the registry's DNS for the TLD are generated (step 715). If the domain name utilizes DNS Security protocols (DNSSEC), then new DNSSEC information is received and also incorporated into replacement entries into the registry's DNS for the TLD, including the Delegation Signer (DS) Resource Record associated with DNSSEC. The changes are pushed to the DNS servers operated by the registry for the TLD associated with the domain name (step 720). Finally, the existing domain name is processed to make available to future registrants (step 725). For example, the domain name could be released into the pool of available domain names for immediate registration, the domain name could be released into the pool of available domain names according to a schedule, or the domain name could be held for a time period before being released for open-registration while being made available for registration in an auction-type setting.

[040] In one embodiment, the records of the domain name exchange that are recorded in 710 can be accessed by a user through a search function in which the registry receives a search request based either on the domain record identifier or on one of the domain names in the exchange history of the domain record identifier. The registry, in response to the request, sends
information regarding the domain name history associated with the domain record identifier or
domain name.

[041] It will be apparent to those skilled in the art that many of the preceding steps can
be performed in a different order to achieve the same end result, and therefore none of the
preceding steps should be construed to be required to be performed in the order as presented.

Setting Registry Service Status

[042] Domain names are assigned, released, and managed using the Extensible
Provisioning Protocol (EPP). The EPP is a flexible protocol designed for allocating objects
within registries over the Internet. Other objects currently provisioned using EPP are host names
and contact information. The motivation for the creation of EPP was to provide a flexible
communication protocol between registrars and registries. Although EPP is widely adopted by
many registries, the term "provisioned objects," as that term is used herein, should be understood
to include the provisioned objects as described in the standards that define EPP. Examples of
standard "provisioning objects" include domain names in RFC 5731, host names in RFC 5732,
and contacts in RFC 5733. A "provisioning object" includes the standard EPP objects as
existing or yet-to-be-developed objects following the EPP standard.

[043] Domain names, as provisioned objects, have status codes associated with them.
Status codes are designations that can be assigned and removed by the registry to define what
operations are allowed for a domain name by the registrar and to define whether a domain name
should resolve in DNS. Status codes may also provide security for a domain name to prevent,
for example, the domain name from being accidently transferred or deleted. The available status
codes that can be returned by the EPP system for domain name provisioning are defined as
"status values" in the standards described in RFC5731 and RFC5732, respectively (collectively,
"the standards"). Some of these status codes are shown in Figure 8 at 810.

[044] However, for internal use, some registries may implement status codes in
addition to those specified in the standards. For example, a registry could apply a status code
called "AccountDecredited" to a domain name, serviced by a registrar, that is in arrears. The
status code "AccountDecredited" would be returned whenever the registry itself checks the
status of that domain name. However, to remain compliant with the standards as mentioned
above (or future standards of a similar nature), the registry may respond to an EPP status query
for a domain name from an outside entity, such as from a registrar, by returning a status code of
similar or related meaning, which is specified in the applicable standard.

[045] Although most status codes defined in the standards can be applied only by the
registry, some status codes can be applied by a registrar. For example, the server status codes
listed in 810 that have counterparts prefixed with "client" instead of "server" may be applied by
the registrar (or even by a registrant through an interface provided by the registrar). Therefore, the embodiments described herein may be adapted for use by registrars, registrants, or any entity needing to establish status management capabilities consistent with the claims.

[046] In one embodiment, a tool is provided to help registries manage server status codes. This tool can also be adapted for use by registrars to manage client status codes. This tool can be further adapted by other entities performing similar management techniques on other provisioned objects.

[047] In one embodiment, the server status codes 810 can be logically grouped into functional status sets 820. For example, the "Court Order Hold” status set 825 includes the status codes serverUpdateProhibited 811, serverDeleteProhibited 812, serverTransferProhibited 813, and serverHold 815. In one embodiment, server status sets may also be grouped in logical opposite pairs, such as with "Registry Lock" 830 and "Registry Unlock.” These status sets, as pairs, may be defined as mutually exclusive, such that one is prohibited from assignment to a domain name while the other is also assigned 920.

[048] Figure 9 illustrates an exemplary process 900 for assigning a status set to a domain name. This process can be adapted to also apply to a host name or other provisioned object. A domain name is entered for which the status set will be assigned (step 905). The status set is added to a database along with a service reason number, and a note with further detailed information may optionally be entered (step 910). In the case of the "Court Order Hold" status set 825, for example, the jurisdiction and related case information of the court issuing the "Hold Order” may be recorded, along with information specifying the length of time during which the "Hold Order” is effective.

[049] In one embodiment, upon attempting to add the status set, the system determines that the status set has not already been added (step 915) and, if so, will not add the status set (step 930). The system also determines whether a status set pair corresponding to the currently added status set has already been added (step 920), such as discussed above with respect to mutually exclusive status sets. If one part of a status set pair is already active, then the status set will not be added (steps 920 & 930); otherwise the status set will be added (step 925).

[050] Figure 10 illustrates an exemplary process 1000 for removing a status set from a domain name. This process can be adapted to also apply to a host name or other provisioned object. A domain name is entered specifying the domain name for which the status set will be removed (step 1005). The status set to be removed is also specified, along with a service reason number (step 1010). The operator may also enter a note containing specific information surrounding the removal request. In one embodiment, the system checks that the specified status set is actually assigned (step 1015), and, if not, the status set is not removed (step 1030).
Otherwise, the system determines whether a valid removal reason was supplied by the operator (step 1020). If so, the status set is not removed (step 1025). If not, the status set is removed (step 1030).

[051] In one embodiment, the processes of 900 and 1000 can be adapted to accommodate activating and deactivating an assigned status set, rather than adding and removing the status set. For example, the "Registry Lock" 830 might normally be assigned to a domain name. However, if the registrar through which the domain name was registered were to go out of business, the domain name may need to be transferred to another registrar. Temporarily setting the "Registry Lock" to inactive, for the purposes of the transfer, would preserve the settings and notes as originally applied, yet still allow the transfer.

[052] Figure 11 illustrates for one embodiment, some of the possible data fields 1130 associated with the implementation of a status set as applied to a domain name.

[053] Figure 12 illustrates an exemplary process 1200 by which status codes may be managed when a status set is added or removed. When a status set is added to a domain, the process determines which status codes are already enabled (step 1210) and which status codes still need to be enabled (step 1230). The process then specifies only the status codes that need to be enabled (step 1240). Likewise, when a status set is removed, the process determines which status codes should be retained (step 1250) (perhaps because they are part of another active status set) and only removes the status codes that may safely be removed (step 1260).

[054] In one embodiment, a custom status set may be added to the available status sets comprising any combination of available status codes. The status codes may consist of designations specified by the entity implementing them. For example, the entity may want to use the status set functionality to add and remove other account locking features. For example, if a web hosting provider’s customer was delinquent in paying a bill, a status set managed by the web hosting provider could be added that controls a suspension of web hosting services, a client status lock on the domain (applied through the registrar), and automatic email generation regarding the state of the customer’s account.

[055] In one embodiment, a status set may specify a self-expiration time after which the status set would automatically be removed, or would automatically be changed from active to inactive or vice versa.

[056] In one embodiment, the method, as it is applied to "provisioning objects," can also be applied to other resources or objects that have permission characteristics associated with rules. For instance, one embodiment may provide a method of selectively applying the most restrictive of a plurality of rules. A data structure may be provided that includes indicators of permissible or prohibited operations. The data structure represents a logical grouping of such
permissible or prohibited operations. The method performs logical operations among a group of one or more data structures to form a resulting set of operational limitations based on the indicators associated with the data structures. The method applies the operational limitations to operations capabilities or permission characteristics associated with a resource or object in accordance with the group of one or more data structures that are associated with the resource or object. Such logical operations include the redefining of the permission characteristics or operations capabilities of the object or resource as data structures are added, removed, suspended, or reinstated. Thus, records of all current permission characteristics or operations capabilities associated with a resource or object are maintained through data structures that group indicators of permissible or prohibited operations, as well as the proper realized permission characteristics and operational capabilities as defined by the most restrictive set of rules defined by the data structures associated with the object or resource.

[057] Other embodiments of the invention will be apparent to those skilled in the art from consideration of the specification and practice of the invention disclosed herein. It is intended that the specification and examples be considered as exemplary only, with a true scope and spirit of the invention being indicated by the following claims.
WHAT IS CLAIMED IS:

1. A computer-implemented method of managing status codes of provisioned objects, comprising:
   receiving, by a computer, a request to change a status set related to a provisioned object, the status set corresponding to a group of one or more status codes;
   receiving, by the computer, a reason to change the status set; and
   changing, by the computer, the status codes associated with the provisioned object, according to the change request.

2. The method of claim 1, wherein the request to change comprises one of add, remove, activate, or deactivate.

3. The method of claim 1, wherein changing comprises ensuring that status codes existing in another active status set added to the provisioned object are not removed.

4. The method of claim 3, wherein changing comprises:
   in response to receiving the change request, setting the changing to occur at a scheduled time subsequent to the receiving.

5. The method of claim 3, comprising:
   receiving, by the computer, if the request to change is one of remove or deactivate, a valid reason for the change request.

6. The method of claim 3, comprising:
   performing automatically, by the computer, an action in response to the status change.

7. The method of claim 3, wherein:
   the status set is associated with a second status set; and
   no more than one of the status set and the second status set may be active at the same time.

8. A system of managing status codes of provisioned objects, comprising:
   a non-transitory memory storing instructions; and
   a processor executing the instructions to cause the system to perform a method comprising:
   receiving, by a computer, a request to change a status set related to a provisioned object, the status set corresponding to a group of one or more status codes;
   receiving, by the computer, a reason to change the status set; and
   changing, by the computer, the status codes associated with the provisioned object, according to the change request.
9. The system of claim 8, wherein the request to change comprises one of add, remove, activate, or deactivate.

10. The system of claim 8, wherein changing comprises ensuring that status codes existing in another active status set added to the provisioned object are not removed.

11. The system of claim 10, wherein changing comprises:

   in response to receiving the change request, setting the changing to occur at a scheduled time subsequent to the receiving.

12. The system of claim 10, comprising:

   receiving, by the computer, if the request to change is one of remove or deactivate, a valid reason for the change request.

13. The system of claim 10, comprising:

   performing automatically, by the computer, an action in response to the status change.

14. The method of claim 10, wherein:

   the status set is associated with a second status set; and

   no more than one of the status set and the second status set may be active at the same time.

15. A non-transitory computer-readable storage medium containing instructions which, when executed on a processor, perform a method comprising:

   receiving, by a computer, a request to change a status set related to a provisioned object,

   the status set corresponding to a group of one or more status codes;

   receiving, by the computer, a reason to change the status set; and

   changing, by the computer, the status codes associated with the provisioned object,

   according to the change request.

16. The computer-readable storage medium of claim 15, wherein the request to change comprises one of add, remove, activate, or deactivate.

17. The computer-readable storage medium of claim 15, wherein changing comprises ensuring that status codes existing in another active status set added to the provisioned object are not removed.

18. The computer-readable storage medium of claim 17, wherein changing comprises:

   in response to receiving the change request, setting the changing to occur at a scheduled time subsequent to the receiving.

19. The computer-readable storage medium of claim 17, comprising:

   receiving, by the computer, if the request to change is one of remove or deactivate, a valid reason for the change request.

20. The computer-readable storage medium of claim 17, comprising:
performing automatically, by the computer, an action in response to the status change.

21. The computer-readable storage medium of claim 17, wherein:
the status set is associated with a second status set; and
no more than one of the status set and the second status set may be active at the same
time.
FIG. 1

Domain Registrar

Domain Registry

Domain Registrant
FIG. 2

1. Start
2. Registrant Accesses Registrar Domain Registration Interface
3. Registrant Requests Domain Name from Registrar
4. Registrar Checks Registry for Availability
5. If Available, Registrant Processes Registration with Registrar
6. Domain is Registered to Registrant
7. End
Start

Access Domain Exchange Tool

Request a New Domain Name to Replace Existing Domain Name.

Registry Verifies Domain Can Be Exchanged

Is Domain Exchange Enabled?

Yes

Charge for Service

Enable Service on Account

Make the Domain Exchange

End

No

FIG. 5
Start

Is the Domain Name Available?
  Yes
  Are Any Status Sets Preventing Domain Exchange?
    Yes
    Has It Been at Least 30 Days Since Registration?
      Yes
      Has It Been at Least 30 Days Since Last Domain Exchange?
        Yes
        Make the Domain Exchange
        625
        Refuse to Exchange Domain
        630
    No
    No
    No
  No
End

FIG. 6
Start

Replace Domain Name in Record

Log Replacement Event

Generate New DNS Information

Push Changes to DNS Servers

Process the Old Domain Name

End

FIG. 7
Example Status Codes

- serverUpdateProhibited
- serverDeleteProhibited
- serverTransferProhibited
- serverRenewProhibited
- serverHold
- Account Suspended

FIG. 8

Example Status Set Definitions

- Court Order Hold
  - serverUpdateProhibited
  - serverDeleteProhibited
  - serverTransferProhibited
  - serverHold

- Registry Lock
  - serverUpdateProhibited
  - serverDeleteProhibited
  - serverTransferProhibited

- Transfer Dispute Lock
  - serverUpdateProhibited
  - serverDeleteProhibited
  - serverTransferProhibited

- Server Renew Prohibited
  - serverRenewProhibited
Start

Receive Domain Name to be managed

Receive Status Set to be added with Service Reason and optional note

Is Status Set Already Assigned?

Yes

Status Set Not Added

End

No

Is Status Set Pair Currently Assigned?

Yes

Status Set Added

No

FIG. 9
Start

1005

Receive Domain Name to be managed

1010

Receive Status Set to be removed with Service Reason and optional note

1015

Is Status Set Assigned?

Yes

1020

Is Valid Removal Reason Given?

Yes

Status Set Removed

1025

No

Status Set Not Removed

1030

End

FIG. 10
Start

Determine which status codes are enabled by other status sets

Addition/Removal

Addition

Compare to status codes in the status set that will be added

Add the status codes that are not yet enabled

End

Removal

Compare to status codes in the status set that will be removed

Remove the status codes that no longer need to be enabled by any active status set.
INTERNATIONAL SEARCH REPORT

A. CLASSIFICATION OF SUBJECT MATTER
INV. H04L29/12

ADD.

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
H04L

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)
EPO-Internal, PAJ, WPI Data, INSPEC

C. DOCUMENTS CONSIDERED TO BE RELEVANT

<table>
<thead>
<tr>
<th>Category</th>
<th>Citation of document, with indication, where appropriate, of the relevant passages</th>
<th>Relevant to claim No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>X</td>
<td>SULLIVAN AFI LIAS A: &quot;Some experiences from implementing the Extensible Protocol; draft-sul 1ivan-epp-experience-OO. txt&quot; , 20050701, 1 July 2005 (2005-07-01) , XP015040065 , ISSN : 0000-0004</td>
<td>1,2,8,9,15,16</td>
</tr>
<tr>
<td>A</td>
<td>Chapter 3.</td>
<td>3-7,10-14,17-21</td>
</tr>
</tbody>
</table>

X Further documents are listed in the continuation of Box C. X See patent family annex.

* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance
"E" earlier document but published on or after the international filing date
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
"O" document referring to an oral disclosure, use, exhibition or other means
"P" document published prior to the international filing date but later than the priority date claimed

**"T"** later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"Z" document member of the same patent family

Date of the actual completion of the international search

14 March 2012

Date of mailing of the international search report

21/03/2012

Name and mailing address of the ISA/

European Patent Office, P.B. 5818 Patentlaan 2
NL - 2280 HV Rijswijk
Tel. (+31-70) 340-2040, Fax: (+31-70) 340-3016

Authorized officer

Nocenti Ilario
<table>
<thead>
<tr>
<th>Category</th>
<th>Citation of document, with indication, where appropriate, of the relevant passages</th>
<th>Relevant to claim No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>HOLLENBECK VERISIGN S ET AL: &quot;Extensible Provisioning Protocol (EPP) Domain Name Mapping; rfc3731 .txt&quot;, 20040301, 1 March 2004 (2004-03-01), XP015009511, ISSN: 0000-0003 cited in the application paragraphs [02.3], [3.2 .5]</td>
<td>1-21</td>
</tr>
<tr>
<td>Patent document cited in search report</td>
<td>Publication date</td>
<td>Patent family member(s)</td>
</tr>
<tr>
<td>---------------------------------------</td>
<td>-----------------</td>
<td>-------------------------</td>
</tr>
<tr>
<td>US 2010106650 A1</td>
<td>29-04-2010</td>
<td>NONE</td>
</tr>
</tbody>
</table>