IDN Application Guideline
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APPAREA BOF

Yoshiro YONEYA <yone@jprs.co.jp>

http://米谷嘉朗.jp/

http://xn--w4ru01bw7pjno.jp/

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Recognition of Issues

- IDN extends repertoire of characters used in domain names
- Benefit of IDN is to enable domain names to be expressed in a way non-English native Internet users are comfortable with
- Meanwhile, IDN specifications are so general and freewheel use may lead to undesirable confusion
- i.e., IDN specifications allow the use of domain names that are not usually used in real world such as
  - multi-script domain names
  - domain names with marks that don’t belong to any language

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Recognition of Issues (cont.)

- This problem was recognized during IDN standardization and described in its specification
- To avoid this problem, IDN registration guidelines were developed and adopted by many TLDs
  - JET Guideline (RFC3743)
    - http://www.ietf.org/rfc/rfc3743.txt
  - ICANN Guideline
    - http://www.icann.org/general/idn-guidelines-20jun03.htm
- IDN != Non-ASCII Domain Name
  - Original concept of IDN is to accommodate native language representation of domain names
- To make IDN usage / implementation closer to its original concept is guideline’s role

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Recognition of Issues (cont.)

- Registration guidelines do not have full power to be enforced in the whole domain name space
- i.e., unusual multi-script names can be registered
  - in some TLDs
  - as subdomains under domain names that are delegated to registrants
- Recently, this issue was pointed out as “homograph attack”
  - http://www.paypal.TLD/ v.s. http://www.paypal.TLD/
  - http://www.xn--pypal-4ve.TLD/ v.s. http://www.paypal.TLD/

Recognition of Issues (cont.)

- And there is more serious example which existing registration guidelines can not cover
  - http://www.name.TLD⁄search.example.TLD?
v.s.
http://www.name.TLD/search.example.TLD?
  - http://www.name.xn--tldsearch-ng4e.example.TLD?
v.s.
http://www.name.TLD/search.example.TLD?

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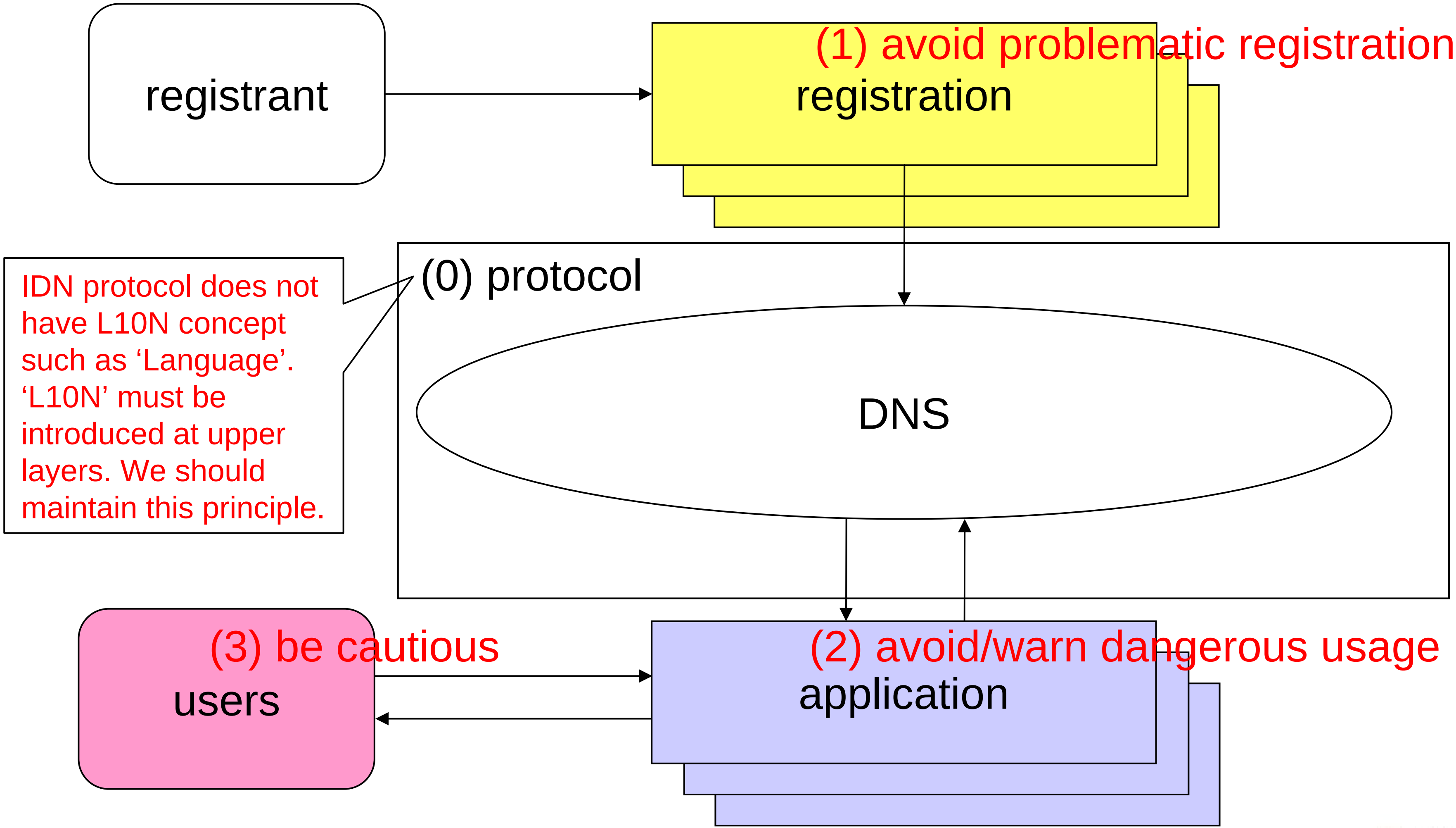
Model of this Issue



IDN protocol does not have L10N concept such as ‘Language’. ‘L10N’ must be introduced at upper layers. We should maintain this principle.

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When do users have interface with IDN?

- Basically, there are two situations
  - Domain name registration
  - Typing, copy-n-pasting and clicking in application
- The former is already covered by IDN registration guidelines, which will be enhanced where necessary
- The latter is already pointed out by IDNA
  - cf. RFC3490, Security Consideration
  - But the solution is not yet developed
  - Time to develop well-described “common experiences” for applications

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IDN aware application implementation guidelines

- Guidelines for registration cannot block all the problematic IDNs to be registered
- Guidelines for application implementation as well as guidelines for registration needed
- To reduce “homograph attack” possibility in application side
- This should be developed in IETF as well as guidelines for registration

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What can be done in application?

- Combination of followings should be guided
- Extra mapping
  - This may be effective for homographs of mathematical operators widely used in protocol elements
    - ex. −(U+2212), ∕(U+2215) and ∶(U+2236)
- Extra prohibiting
  - This may be effective for homographs of symbols
    - Such as marks and symbols in U+2000-U+2AFF
    - ex. – (U+2013), T(U+252C), ✕(U+2715), etc.
- Visually highlighting
  - Above extras may lead to protocol violation
  - Highlighting will attract users’ attention

Visually highlighting

- Indicating NON-ASCII characters with:
  - Color, Bold, Italic, and / or Another Encoding such as Punycode or %-Encoding
- IDN in anchor
  - Highlight in status bar and/or pop-up dialogue
- IDN in address bar
  - Highlight in background color and/or ICON such as SSL/TLS session
- IDN in certificate
  - CN (Common Name) should be displayed in Punycode

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Example

> Dear customer,
>
> We decided to enforce our security level much higher than before.
> Your password seems weak so please change ASAP.
>
> You can change your password from following page:
> http://www.paypal.TLD/
>
> Sincerely Yours,
>
> Customer support

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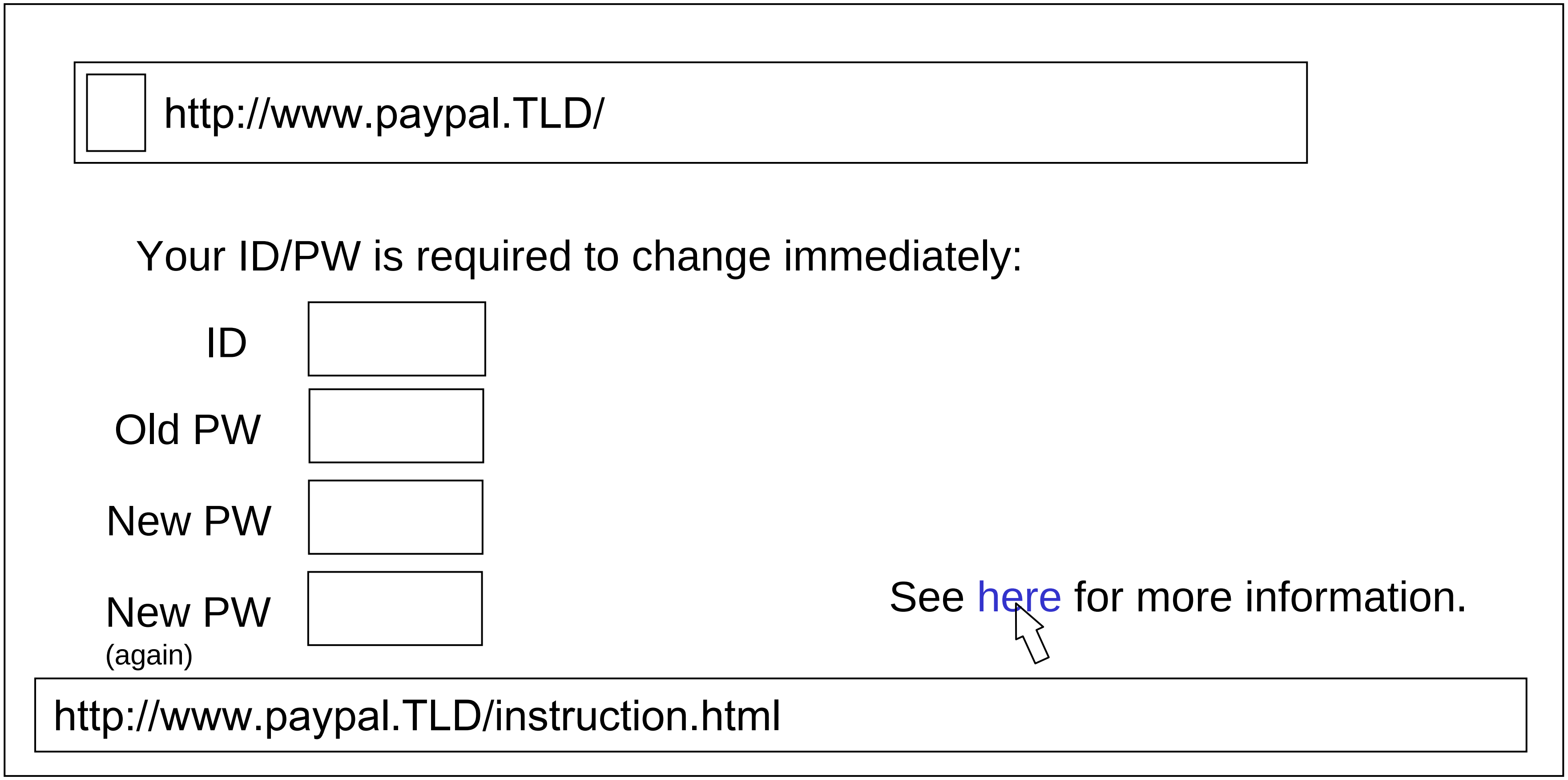
Example1



http://www.paypal.TLD/

Your ID/PW is required to change immediately:

ID	
Old PW	
New PW	
New PW (again)	

See here for more information.

http://www.paypal.TLD/instruction.html

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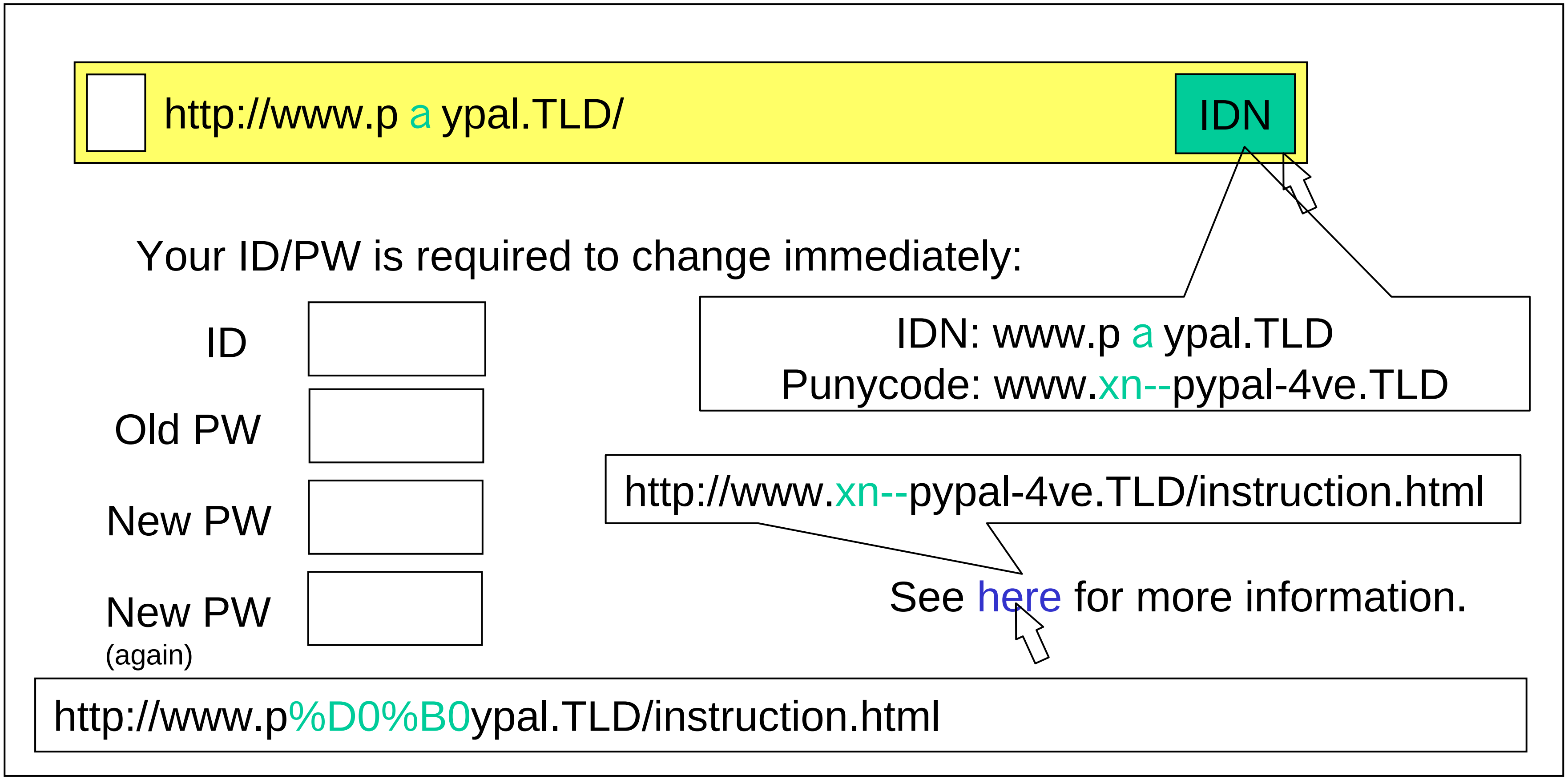
Example2



http://www.p a ypal.TLD/

Your ID/PW is required to change immediately:

ID

Old PW

New PW

New PW
(again)

IDN: www.p a ypal.TLD
Punycode: www.xn--pypal-4ve.TLD

http://www.xn--pypal-4ve.TLD/instruction.html

See here for more information.

http://www.p%D0%B0ypal.TLD/instruction.html

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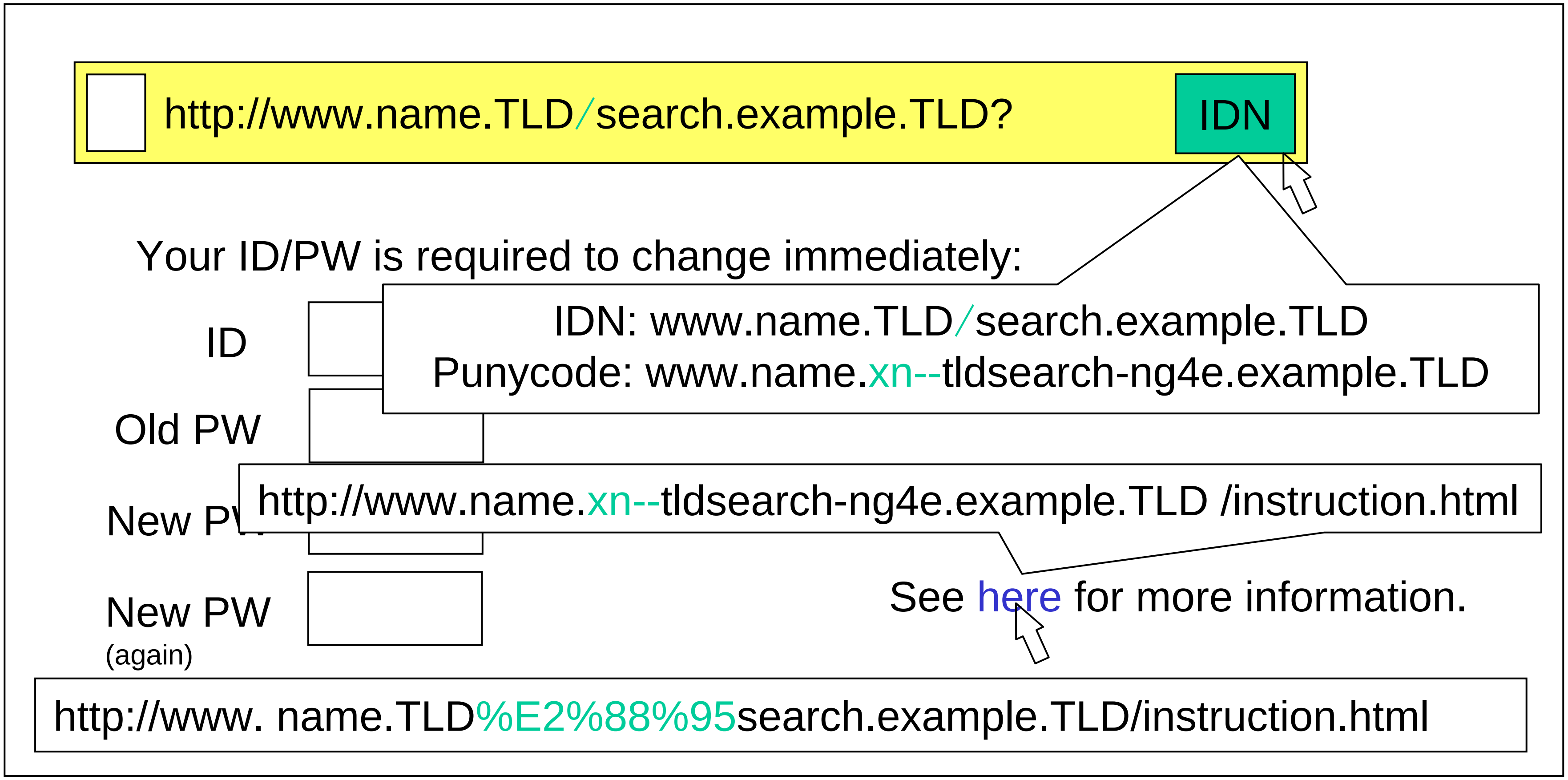
Example2



http://www.name.TLD/search.example.TLD?

Your ID/PW is required to change immediately:

ID

Old PW

New PW

New PW
(again)

IDN: www.name.TLD/search.example.TLD
Punycode: www.name.xn--tldsearch-ng4e.example.TLD

http://www.name.xn--tldsearch-ng4e.example.TLD /instruction.html

See here for more information.

http://www. name.TLD%E2%88%95search.example.TLD/instruction.html

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Existing Implementations

- Firefox 1.0.1
  - IDN is enabled
  - IDNs are displayed in Punycode
    - To display IDN, need to change configuration
  - http://www.mozilla.org/products/firefox/releases/
- Opera 8.0 beta2
  - IDN is enabled
  - IDNs are displayed in IDN or Punycode
    - TLD based whitelist
  - http://www.opera.com/pressreleases/en/2005/02/25/

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