Automated Generation of Forwarding Numbers

Anshul Kothari
Amit Agarwal
Daniel Andersson
Seung Yi
Gaurav Bhaya

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Automatic generation of forwarding numbers

ABSTRACT

Search results, such as Internet search results, often include advertisements in addition to organic search results. Advertisements can include a phone number for the advertiser that may be activated directly. When the number is dialed, e.g., by activating a call button, the number that is displayed in the calling application (e.g., a mobile phone dialer application) may be different from the phone number in the advertisement. The different phone numbers can cause user confusion and result in lower numbers of calls placed to advertisers. This disclosure describes techniques that allow consistent display of phone numbers in the advertisement and a calling application, upon activation of the call button.

KEYWORDS

- Forwarding number
- Online advertisement
- Phone number allocation
- Reserved pool

BACKGROUND

Search results, such as Internet search results, can include advertisements. The advertisements can include a telephone number and/or a call button that can be selected to contact the advertiser. Fig. 1(a), below, shows an example of results of a search query (102) on a mobile device (104) that include advertisements (106) with advertiser phone numbers (108) and call buttons (110). The advertiser can be contacted, e.g., by dialing the number displayed in
the advertisement, or by activating the call button (e.g., with touch or click input). When
the call button is activated, a dialer interface is shown, e.g., dialer interface (112) in Fig. 1(b). The
number (114) seen in the dialer is a forwarding number (FN), which may be different from the
number (108) included in the advertisement. Use of a FN can enable measurement of efficacy
of the advertisement that is displayed in response to the search query. The FN may be selected
out of a finite inventory of FNs. A FN can be recycled among advertisers, or among different
phone numbers for a single advertiser.

![Fig. 1: Web-search resulting in advertisements and organic search results](image)

When FN 114 is not the same as the number 108 displayed in the advertisement, a user
may choose to not place the call or abandon a call, which can result in lower efficacy of the
advertisement.
DESCRIPTION

Techniques of this disclosure enable the number displayed in the online advertisement to be identical to the FN displayed in a calling application. The inventory of FNs is divided into a number of reserved pools. An advertising server can, at the time of generating an ad, select a preferred FN from the reserved pool. A FN allocator attempts to fulfill the request from the advertising server for the preferred FN. The FN allocator ensures consistency in the number displayed in the advertisement and the forwarding number displayed in the calling application.

![Diagram](image)

**Fig. 2: Allocating an FN that is preferred by the ad server**

Fig. 2, above, shows an example of how a preferred FN request from an ad server is processed. Fig. 2 shows an inventory of FNs (202) that is divided into multiple reserved pools.
Further, Fig. 2 shows ad servers (206, 212) that are coupled to FN allocators (208, 214). The inventory of FNs (202) is sliced into several reserved pools (204). One criterion for slicing the inventory of FNs is, for example, to create within the inventory a pool of FNs for each phone number of each advertiser. Fig. 2 illustrates this criterion, advertiser “A”, that has several phone numbers, “P1”, “P2”, etc. gets reserved pools of FNs referred to as A-P1, A-P2, etc. The name of the reserved pool, e.g., A-P1, serves as the slicing key for the FNs of that pool. For example, a request from an ad server for a particular FN must be accompanied by the slicing key for that FN.

Each group of FNs that belong to a particular pool are identified in Fig. 2 by circles of a distinct shade. Some pools may be left unreserved. Additional criteria for slicing the FN inventory into pools include, advertiser type (size, whether the advertiser is an ad agency, etc.), geography, performance of keywords, size of bid, etc. FN inventory slicing can also be performed with manual input. The size and constituents of a reserved pool can be dynamic and updated based upon traffic. FN Pools can be dynamically added or removed.

In an example scenario, an ad server (206) constructs an online ad. A FN allocator (208) allocates FNs. The FN allocator sends the ad server information regarding current state of reserved pools. At the time of ad creation, the ad server sends to the FN allocator (step 1A) a request to reserve a preferred FN. The FN allocator reserves an FN out of the corresponding reserved pool, e.g., A-P1 (step 2A). Reservation of an FN is indicated by the filling-in of the allocation field of the FN with the slicing key, while leaving empty the impression-level details. The ad server renders the ad with the preferred FN, independent of actual allocation of the FN.

If a user clicks on the call button for the ad, then the ad server requests allocation of the preferred FN (step 3A). The FN allocator responds by granting to the ad server the preferred FN.
(step 4A). In this manner, the phone number displayed in the advertisement and the phone number that appears in the displayed calling application (e.g., dialer interface) are consistent, when the FN allocation is successful. When the FN allocator grants the preferred FN, it updates allocation field of the FN with impression-level details. Alternatively, the ad server (206) is provided with a possible list of numbers for a given slice. The ad server picks a number from the list and makes a call to the FN allocator (208, 214) to request the allocation of the number.

In practice, another ad server (212) can request reservation of the same FN at the same time as ad server 206, e.g., as shown in Fig. 2 (step 1B). The corresponding FN allocator (214) attempts to reserve the requested FN, but the reservation attempt results in a collision (step 2B), since ad server 206 has already requested reservation of the same FN. In such a case, when ad server 212 sends an allocation request (step 3B) following the reservation request (1B), FN allocator 214 allocates an FN from an unreserved pool (step 4B) and grants to ad server 212 an FN from the unreserved pool (step 5B). In such a case of collision, the number displayed in the advertisement and the phone number that appears in the dialer may be inconsistent. To mitigate the possibility of collision, sizes of the reserved pools are selected so as to minimize the probability of collision. Also, ad servers are configured to specify preferred FNs in a manner that minimizes collisions.

Slicing of the FN inventory into reserved pools has advantages beyond achieving consistency between displayed advertisement number and forwarding number in a displayed calling application. For example, when reserved pools are used, the likelihood is higher of connecting to the correct advertiser users who place a call to the advertiser substantially later than when the ad is displayed.
CONCLUSION

This disclosure describes techniques to display advertiser phone numbers in online advertisements, where the phone numbers are forwarding numbers. The technique improves the likelihood that the number in the advertisement and the called number are the same by dividing an inventory of forwarding numbers into reserved pools. Further, the technique permits ad servers to request (e.g., at time of ad creation) a preferred forwarding number. The request is handled by a number allocator.