

1 – Introduction

“Push Technology” is the ability to transfer information as a reaction into event occurrence.

In push technology, data can be sent to users without having them specifically ask for it. The advantage of push is straight forward.

2 – What is push-based?

When a request is received at a server, the information of interest and is located by the server and returned to the clients. This request-response style of operation is pull-based - the transfer of information from servers into clients is initiated by a client pull.

3 – What is pull-based?

Push-based data delivery involves in sending information to a population of clients in advance of any specific request. With push-based delivery, the transfer is initiated by the server.

4- The way to data delivery

First, push is just one dimension for the larger design source of data delivery mechanisms. Second, networked information system employs different data delivery options between different sets of information producers and consumers.

We have identified three main characteristics that can be used to

compare data delivery mechanisms: (1) push vs. pull; (2) periodic vs. aperiodic; and (3) Unicast vs. 1-to-N. We have found that these three characteristics provided a good initial basis for discussing about many popular approaches.

In particular, we argue that all these three characteristics must be considered to make the intelligent choices about delivery mechanisms for specific situations.

The figure 1 below shows those characteristics and the relationship between them and several common mechanisms.

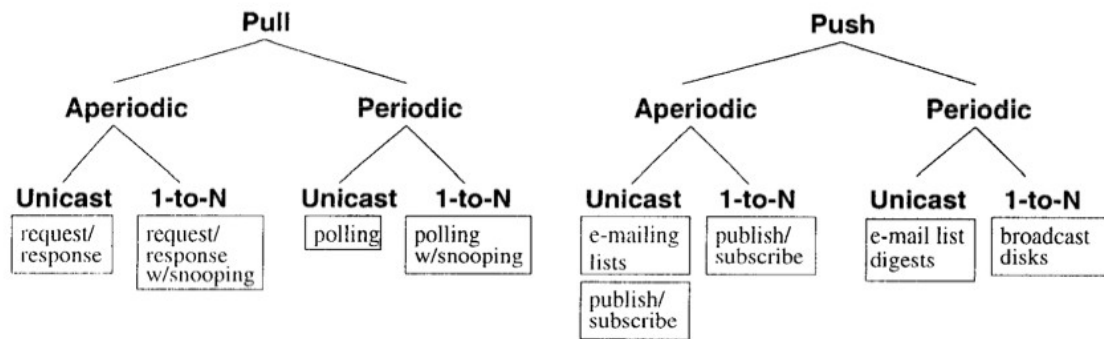


Figure 1: Data Delivery Options

Aperiodic delivery: is event-driven-a data request (for pull) or transmission (for push) is triggered by an event such as a user action (for pull) or data update (for push).

Periodic delivery: is performed according to some prearranged schedules. These schedules may be fixed or generated by some degrees of randomness.

Unicast communication: is the data items sent from a data source (e.g., a single server) to one other machine.

1-to-N communication: allows multiple machines to receive the sent data by a data source. Two types of 1-to-N data delivery can be distinguished:

- ⌚ Multicast: data is sent to a specific subset of clients who have indicated their interests in receiving the data. Network proto can be developed, which guarantees the eventual delivery of the message to all clients who should receive it.
- ⌚ Broadcasting sends information over a medium which an unidentified and possibly unbounded set of clients can listen to.

Aperiodic Pull: Traditional request/response mechanisms use aperiodic pull over a unicast connection. If a 1-to-N connection is used instead, then clients can “snoop” on the requests made by other clients, and obtain data that they have not explicitly asked for.

Periodic Pull: a system may periodically send requests to other sites to obtain status information or to detect the changed values. Most existing Web or Internet -based “push” systems are actually implemented using Periodic Pull between the client machines and the data sources.

Aperiodic Push: Publish/subscribe protocols are becoming a popular way to disseminate information in a network. In a publish/subscribe system, users provide information which indicates the types of

information they wish to receive. Publish/subscribe is push-based; data flow is initiated by the data sources, and is aperiodic, as there is no predefined schedule for sending data. Publish/subscribe protocols are inherently I-to-N in nature. However, due to limitations in current Internet technology, they are often implemented using individual unicast messages to multiple clients.

Periodic Push: has been used for data dissemination in many systems. An example of Periodic Push using unicast is Internet mailing lists that send out “digests” on a regular schedule.

5 - End to end considerations:

In general, a distributed information system can be thought of as having three types of nodes:

1. Data sources, which provide the base data that is disseminated.
2. Clients, which are net consumers of information
3. Information brokers that acquire information from other sources, add value to that information. Then, distribute this information to other consumers. By creating hierarchies of brokers, information delivery can be tailored to the needs of many different users.

4 – Conclusion:

In summary, push is currently a hot topic, but it is essential that it can be placed in the proper context. Despite the fact that many existing push-based products are based on periodic pull over unicast connections, push is one choice for data delivery in distributing information systems. In our work on data dissemination, we have advocated a new look at the construction of distributed information systems, which allows a seamless integration of all data delivery mechanisms, but not limited to the various forms of push. We believe that this is a fertile area of work for the database community since the use of careful data management techniques in this context can have a significant impact on overall system performance and usability.

5 – References

- Push Technology Personalization Through Event Correlation (Asaf Adi, David Botzer, Opher Etzion, Tali Yatzkar-Haham IBM Research Laboratory in Haifa)
- “Data In Your Face”: Push Technology in Perspective (Michael Franklin Stan Zdonik University of Maryland Brown University)