

Copyright 2001 ACM 1-28113-348-8/01/0001...\$2.00.  
 220C.01 July 8-8, 2001, Heronizsog, Cret, Cretce.  
 permission and/or a fee.

reprints, to post on servers or to redistribute to lists, requires prior specific  
 permission and the full citation on the first page. To copy otherwise, to  
 not make or distributed for profit or commercial advantage and that copies  
 personal or classroom use is granted without fee provided that copies are  
 permission to make digital or print copies of all or part of this work for

visiting Microsoft.

010350E. Part of this work was done while this author was  
 randall@cc.gatech.edu. Supported in part by NSF CCR-  
 Georgia Institute of Technology, Atlanta GA. Email:  
 College of Computing and School of Mathematics,  
 of Washington at Seattle and Microsoft.

work was done while this author was visiting the University  
 ORSA Cedex, France. Email: kenyon@lri.fr. Part of this  
 FRI NMB 8033, Université Paris-2nd, Bat. 400, Edif02  
 Science Foundation (BSE).

EIA-0810140 and a grant from the U2-Israel Binational  
 kenj@cs.washington.edu. Supported in part by NSF  
 ing, University of Washington, Seattle, WA. Email:  
 Department of Computer Science and Engineer-

dominated online algorithm that achieves a competitive ratio

and a Barncard that entitles the traveler to a 20% discount  
 the German Deutsche Bundesbahn, where one can opt to  
 The Barncard problem models online ticket purchasing in

## The Barncard problem

equivalent to the original problem.

studied, but it is easy to see that for our purposes it is  
 and one wishes to minimize  $\sum_{i=1}^n w_i \text{latency}(i)$  was also

The variant of the problem where backet  $i$  has weight  $w_i$   
 ratio achieved by the deterministic algorithm.

randomized algorithm was known to beat the  $\gamma$ -competitive  
 A matching upper bound remained elusive, and in fact no  
 itive ratio of randomized online algorithms for this problem.  
 Noz [11] obtained a lower bound of  $\epsilon/(1-\epsilon)$  on the competi-  
 ratio of  $\gamma$ . Surprisingly, Ziden [13], and independently  
 equals the cost of the acknowledgment plus a competitive  
 waits until the latency since the previous acknowledgment

Doyle et al. showed that the natural algorithm which  
 without knowledge of when future arrivals will occur.

practice the acknowledgment times must be chosen online  
 the latency cost of the algorithm on that input. Of course in  
 called the acknowledgment cost and  $\sum_{i=1}^n \text{latency}(i)$  is called  
 (It is required that  $\epsilon^u \geq \sigma^u$  and  $\epsilon \geq 1$ .) The parameter  $\epsilon$  is