

Real Business Processing Meets the Web

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1. BACKGROUND

Charles Schwab and Co, Inc. is a major web trader generating a large proportion of its revenue from the Web. That revenue is based on both having a site with lots of useful facilities and also the speed of execution, ability to cope with peaks in demand volumes, and the reliability of the site and its underlying services. James Chong, VP Architecture and Planning at Schwab, will talk about the fundamental infrastructure that supports the Web trading, and his plans for its evolution.

2. CURRENT ARCHITECTURE

The volume of trading generated by Schwab's sites has increased by an order of magnitude in 9 months. That scalability has been achieved with a three-tier structure in which the Web server acts as a client, and there are two tiers of transactional application serving, one UNIX (RS/6000) and one host (S/390). The application server that we use for both tiers is IBM's CICS Transaction Server. In order to produce a fully scalable, reliable system, we deployed and enhanced the standard product in several ways.

The CICS AIX product was deployed on a set of 'farms' of 'cloned' UNIX machines, so that extra capacity can be achieved by merely adding additional 'clones', and component failures can be masked from the users. In addition we have some data on the middle tier (to map between the Web user space and the host user space and to manage the essentially stateless HTTP conversations), and a copy of this data exists at each 'farm'.

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The extensions Schwab wrote cover workload balancing from the Web Server, client code performance in the Web Server, and asynchronous data replication at the middle (UNIX) tier. These extensions will be described in the talk.

3. THE NEXT STEP

Schwab's web trading system acts as an additional channel for its corporate data systems. The exposure of those systems to the Web, which is a fundamentally 24 hour, 7 days a week service, puts extra demands on the core systems which formerly had to cope with a more relaxed availability requirement. In addition, the unchecked growth of web trading is making a strong case for consolidating the middle and bottom tiers to improve management and reduce the cost of trading. Those requirements are also causing Schwab to re-engineer the system (non-disruptively) so that it can be available 24x7, scale and also be manageable.

A core premise is that complexity is diametrically opposed to reliability. That implies that using one component layer instead of two will give a more reliable and manageable result, all else being equal. Now that all else is more equal in price/performance the manageability, reliability and built-in scalability of the host environment means that consolidating into a two-tier (client on Web Server and host) physical model (while retaining a three tier logical model) is sensible.

The talk will further describe the rationale and approach.