

HRG Insight:

Reasons for and Analysis of Scheduled System Downtime

Harvard Research Group provides custom research to its clients in select areas including High Availability and Fault Tolerant systems. One of the on-going activities in this practice is to survey users of high availability systems and determine their needs, preferences, and the manner in which these systems are being utilized to support business activities.

Harvard Research Group is pleased to share with you some of the results of these surveys.

The respondents represented a statistical sampling categorized as:

- ✓ Corporate demographics: the mid two-thirds of the sample had approx. 300 to 20,000 employees and a total annual corporate revenue of \$60 to \$500 million.
- ✓ Moderate to larger IT installations, i.e. at least 50% have ten or more servers. (Some of these may be divisional/subsidiary operations)
- ✓ All running production systems, minimal development efforts included
- ✓ Predominant server manufacturers were IBM, HP, Compaq and Sun (not necessarily ordered by representation)
- ✓ Operating system representation approximately UNIX 30%, NT 30%, and proprietary O/S 35%
- ✓ Diverse usage across industries and applications
- ✓ Geographically dispersed across the U.S.

Reasons for and Frequencies of Planned Outages

Reason	1998 % taking system down	1998 Frequency Times/Year	1999 % taking system down	1999 Frequency Times/Year
Disk Backup	44.7%	52	41.5%	52
New/Upgrade Applications	40.9%	2	71.7%	3-4
H/W Upgrades and Repairs	64.9%	2	69.8%	2
O/S Upgrades and Repairs	43.6%	1	67.3%	1
D/B Re-organization	31.9%	12	32.1%	12
Preventive Maintenance	35.1%	12	34.0%	12

Note: Frequency in times per year is expressed as mode, i.e. the most common answer because of a relatively wide variation and some skew in the distribution.

Key Observations and Conclusions

While disk and/or database backups may generally be done during production hours, there is still a very significant number of users who prefer to schedule this activity during a guaranteed quiescent period to insure the integrity of backup result.

Quiescent periods also help insure the completion of backups and database reorganizations within a limited and scheduled window.

The increase in the percentage of respondents adding/upgrading applications, hardware and operating systems in 1999 over 1998 is likely attributed to remediation for Y2K as well as dramatic growth in internet servers and on-line services.

Users are quite dedicated to performing database reorganizations and preventive maintenance on a monthly basis.

Discussion

The results from our 1998 – 1999 surveys indicate that most systems are being managed in a very traditional/conservative manner with respect to backups and upgrades to the systems. Major backups are being performed at least every week and in many cases every day with the systems being off-line for approximately one to two hours per period. Generally, this time allocation is sufficient to backup all files/databases as approximately 80% of all respondents had 110 GB of storage or less under management. The off-line status of the system, while not absolutely necessary, helps insure the successful, but more importantly, the timely completion of the backup. Files being backed up are assured to be in a consistent state and fully accessible.

Storage requirements continue to grow dramatically. While the industry average is in the range of 30%, it is not uncommon to experience increases in storage demands in excess of 100% per year. The implementation of on-line/Internet services, increases in subscribers, and new data intensive applications such as data mining, CRM and extended supply chain management features are the primary drivers of the increases. Depending upon the environment and the anticipated growth, IT management might be advised to consider modifications to the backup procedures which allow for more on-line backups and parallel streams.

Over 80% of all respondents were diligently scheduling reorganizations of databases at least on a monthly basis. The intention is to insure the integrity of the structure as well as maximizing efficiency and throughput to users.

Slightly surprising is the observation that a schedule for preventive maintenance is being observed more faithfully. The percentage of respondents indicating a scheduled event at least every month has risen from approx. 80% to just over 90% in consecutive surveys. While HRG has not probed the detailed reasons for the increase, we anticipate that it is a very simple risk/benefit analysis: the incremental cost is negligible relative to the cost of a single failure.