

HRG Insight: Analysis of Unplanned Outages

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

Harvard Research Group is pleased to share with you some of the results of past surveys:

The respondents represented a statistical sampling categorized as:

- ✓ Corporate demographics: in 1998-1999 the mid two-thirds of the sample had approx. 300 to 20,000 employees and a total annual corporate revenue of \$60 to \$10 billion. In 2000, the mid two-thirds of the sample had approx. 250 to 15,000 employees and a total annual corporate revenue of \$50 million to \$10 billion.
- ✓ 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, Sun, and Dell (not necessarily ordered by representation)
- ✓ In 1998 and 1999, operating system representation was approximately UNIX 30%, NT 30%, and proprietary O/S 35%. In the 2000 results, UNIX was approaching 40%, NT remained relatively constant, and proprietary systems dropped to approximately 28%.
- ✓ Diverse usage across industries and applications
- ✓ Geographically dispersed across the U.S.

Reasons for Unplanned Outages

Cause	1998	1999	2000
Hardware	42.9%	28.9%	47.4%
Software	22.4%	44.7%	39.5%
Operator error	18.4%	9.2%	2.6%
AC Power	12.2%	17.1%	7.9%
Other	4.1%	0.1%	2.6%

Observations and Conclusions

- ✓ Consecutive surveys show significant variations in the reasons for system failures. Harvard Research Group believes that many of the reasons for the variation may be attributable to the timing and implementation of major initiatives, i.e. Y2K remediation, implementing new web based systems and services, changing development tools and Q/A procedures.
- ✓ As the number of annual failures drops to only a few per year, a single occurrence has an extremely high impact in percentage.
- ✓ The frequency of system failures overall is dropping.
- ✓ Opportunities remain for making selective, justifiable investments in order to achieve further reductions in the frequency of failures.

Discussion

The results from our 1998, 1999 and 2000 studies indicate that there are significantly wide variations in the yearly percentages measuring the reasons for system failures. As a guideline, one might categorize the causes of system failures as coming 35% to 40% from hardware, 35% to 40% from software, 10% to 15% from operational/manual error, and 10% from power/environmental considerations.

During the terms of these surveys, many of the respondents cycled through numerous initiatives both in hardware and software. As an example, in 1998, the respondents indicated that 60% of the servers were one to three years old and nearly three-quarters of all servers were upgraded one to three times during the year. Dynamic growth, the addition of intensive on-line applications such as ERP or CRM, web/Internet servers, and dramatic increases in usage helped violate every rule of controlled growth for IT departments. The pace was only to accelerate in 1999 with yet another significant issue affecting operating systems, middleware, and applications, namely Y2K.

In spite of the turmoil, IT departments are to be commended. In 1998, 63.0% of our respondents reported five or fewer outages during the year. (The balance of 37% had more than five.) In 1999, a similar percentage as in 1998, 67.9%, reported three or fewer outages. (In 1999, the balance of 32.1% had more than three outages.) Harvard Research Group attributes this success to maturity of the staff, additional planning and allocation of resources, the inclusion of consultants as required, and a lot of hard work by all involved.

In absolute values, the number of reported outages was extremely low. Seemingly minor changes in the number of outages reported on an individual basis can result in significant percentage changes overall. Factored with the dynamics of growth described above, Harvard Research Group considers the numbers reported to be within acceptable tolerances.

Needless to say, the goal for production systems is to experience no unplanned outages. While this may not be a reasonable expectation for many environments, Harvard Research Group firmly believes that there are affordable products and techniques available toward this goal. One of the first steps is to understand the true impact of system failures upon the enterprise and all of its extended members. The total cost of downtime will be addressed in a future paper.