# 2009/2010 AFCOM Data Center Trends Survey Results & Analysis

**The Respondents:**

Number of Respondents: 436 AFCOM member data center sites

From: 27 Countries worldwide
83.3% in the U.S.
16.7% Overseas

Representing:

| | |
|---|---|
| Private Industry | 84.5% |
| Government Agencies | 8.1% |
| Colleges or Universities | 7.4% |

Respondent's Primary Areas of Responsibility:

| | |
|---|---|
| IT | 59.5% |
| Facilities | 31.1% |
| Other | 9.4% |

Respondent's Personal Budget Responsibility:

| | |
|---|---|
| $3M+ | 41.9% |
| $5M+ | 29.3% |
| $10M+ | 19.4% |

**Areas Surveyed:**

1) Greening
2) Data Center Consolidation
3) Emerging Technologies
4) Performance Monitoring
5) Current and Future Mainframe Usage
6) Data Center Facilities: Growth/Expansion/Relocation
7) Changing Storage Requirements
8) Cyber Terrorism

**Significant Findings: Greening**

Greening of the data center is no longer just a concept – it is actually taking place, and on a large scale, with 71.3% of all respondents indicating that they are actively engaged in Greening. It is interesting to note that while 71.3 % are, in fact, engaged in Greening, only 42.2% have a "formal" Greening Initiative.

According to respondents, the most important results they have experienced as a result of implementing Green measures are:

1) Power Efficiency (using less power) 60.8%
2) Cooling Efficiency 51.4%

In addition to power and cooling efficiencies, 11.5% also report a significant savings in water usage.

The major obstacles data centers have faced in implementing Greening techniques have been:

1) 39.4% reported not having enough money in their budget to purchase more efficient servers, HVAC, etc.

2) 29.6% blamed procrastination (simply paying lip service but not going forward)

3) 22.7% have not been able to get a commitment from senior management

4) 20.4% report that the lack of a clear definition of Greening has been a problem

**Significant Findings: Data Center Consolidation**

1) Data Center consolidation has historically been cyclical in this industry. As the economy suffers, more and more companies have traditionally looked to consolidation as a method of saving money. The economic downturn we are experiencing today is no exception, with 62.1% of all respondents either already in the process of consolidating one or more data centers, or seriously considering it.

2) More than half of these respondents (52.1%) plan to relocate their newly consolidated data center to another existing facility, or build an entirely new one to accommodate the additional requirements.

3) In determining the location of these new facilities, the number 1 consideration reported was:

    a) The availability of sufficient power (67.1% reported this as their #1 concern)

    b) Susceptibility to local natural disasters: fire, earthquake, flooding, hurricanes, etc. (46.6% reported this as their #1 concern))

    c) Proximity to other company facilities (this was #1 for 30.3%)

    d) Availability of sufficient water supply (this was #1 for 20.5%)

    e) Availability of local work force (17.1% reported this as their #1 concern)

**Significant Findings: Emerging Technologies**

1) The technologies with the highest levels of adoption in today's data centers are:

    a) Virtual Processing (implemented by 72.9% of all respondents)

    b) Web Applications (70.4%)

c) Automation (54.8%)

d) Cluster Computing (50.0%)

e) Cloud Computing (14.9%)

2) Surprisingly, in addition to the 14.9% actually utilizing Cloud Computing, this technology has been considered by an additional 46.3%, but never implemented. To put this in perspective, following are the percentage of data centers considering, then rejecting the others from above:

a) Automation: 15.4%

b) Cluster Computing: 11.7%

c) Virtual Processing: 9.6%

d) Web Applications: 4.8%

3) Due to the significant rejection of Cloud Computing at this point (only 14.9% of all data centers have adopted this technology), and considering the claims made for it, AFCOM's Data Center Institute (DCI) has undertaken an in-depth research project on the myths and realities surrounding Cloud Computing. The questions to be addressed in this study are: Why has Cloud Computing not yet been accepted on a wider scale? Will it ever be? What kind of impact might Cloud Computing have on the data center industry? Or, will this be something that just goes away?

**Significant Findings: Performance Monitoring**

1) Performance monitoring in the data center is finally coming into its own, with many critical systems and components under 24/7 scrutiny. As the consequence of error in the data center has risen so dramatically (with the entire company dependent on all systems being continually available), the need to find and correct any and all malfunctions on the fly has become a necessity. In many cases, automated performance monitoring helps fulfill that need.

2) Following are the most monitored systems and components as reported by survey respondents:

a) Power Consumption (monitored by 68.1% of all respondents)

b) Network Traffic (monitored by 65.8%)

c) Storage Capacity (64.4%)

d) Server Utilization (61.7%)

e) Web Security (54.1%)

3) All other systems/components combined that are being monitored only add up to 4.8%While there has been significant progress, there is still a ways to go in how these system/components are being monitored:

a) Software monitoring tools are being used by 81.9% of all data centers

b) Hardware monitoring devices are being used by 55.0%

c) A full 45.6% of all data centers are still doing some monitoring manually (walking by and checking things from time to time)

4) In addition to monitoring, regular, periodical testing and maintenance is performed on the following critical devices:

a) UPS Systems ( 85.6% report regular testing and maintenance on their UPS Systems)

b) Backup Generators (78.0%)

c) Fire Suppressant Systems (72.5%)

d) Servers (50.2%)

e) Storage Devices (43.6%)

f) Water Detectors (42.9%)

g) Mainframes and associated I/O devices (28.0%)

h) EPO Buttons (18.8%)

5) Summary

a) More than 4 out of 5 data centers with EPO buttons installed, do not test them on a regular basis

b) Server maintenance is performed on a regular basis by almost twice the number of data centers that have them than is regular maintenance of their mainframe equipment

c) Over 97% of all data centers have a UPS system installed

d) 87.4% of all data centers have Backup Generators

e) 86.9% of all data centers have under (raised) floor Water Detecters

**Significant Findings: Current and Future Mainframe Usage**

1) Based on all survey respondents only 39.6% of all data centers worldwide still operate Mainframe computer systems today.

2) In data centers that have Mainframes installed, the median number they have is 2.0

3) Of all the data centers that have mainframes installed, almost half (45.7%) expect to replace one or more of them in the next two years

4) Of those that are expecting to replace their mainframes during the next two years, more than two out of three (67.1%) will be replacing them with new Mainframes, and 32.9% will be replacing them with Servers or other alternatives

Summary/Conclusions:

1) The number of data centers using Mainframes today versus 5 and 10 years ago, is going down, and the future will continue this trend.

2) Approximately one-third (32.9%) of all existing Mainframe data centers will no longer use Mainframes in the future.

3) Of all data centers with no installed mainframes today, 38.2% report that they did have them 10 years ago and another 27.2% had them five years ago. And, according to respondents, five years from now, an additional one-third of those with Mainframes today will no longer have them.

**Significant Findings: Data Center Facilities - Growth/Expansion/Relocation**

1) More than half (60.3%) of all respondents report that they expect to require additional data center space within the next five years.
2) Most expect to handle the growth and need for additional space by physically adding to and/or upgrading existing facilities (32.6%) or actually relocating to a new facility (30.0%)
3) 22.0% will utilize a co-location center to meet their increased space requirements
4) 13.8% will use Managed Hosting services

5) 11.2% will add Pods or Data Centers in a Box

**Significant Findings: Changing Storage Requirements**

1) Almost two out of three data centers (63.0%) worldwide report a 'dramatic' increase in their storage requirements over the past five years

2) Another 35.0 9% report a 'slight' to 'moderate' increase

3) Only 2.0% of all data centers saw their storage requirement decrease

4) Somewhat surprisingly, only 8.3% report that the main cause of their increased storage needs has been government regulations – while a whopping 77.5% attribute it to business growth

5) In order to deal with this huge growth of data, a number of technologies are being employed on a larger and larger scale, with SAN being favored over NAS and RAID by an almost 2 to 1 margin::

   a) 77.1% of all respondents have now implemented SAN

   b) 41.7% have implemented NAS and,

   c) An almost equal number (41.3%) are using RAID

**Significant Findings: Cyber Terrorism**

1) Cyber terrorism has raised its ugly head numerous times in the past few years.

   As early as 1999 hackers attacked NATO computers. The computers flooded them with email and hit them with a denial of service (DoS). The hackers were protesting against the NATO bombings in Kosovo.

   In April 2007, Estonia was subjected to a mass cyber-attack in the wake of the removal of a Russian World War II war memorial from downtown Talinn. The Estonian government accused Russia of launching a cyber-war after a number of its websites crashed. The Russian government denied any involvement.

   In October 2007, the website of Ukrainian president Viktor Yushchenko was attacked by hackers. A radical Russian nationalist youth group, the Eurasian Youth Movement, claimed responsibility

In 2008, Chinese hackers were accused of attacking CNN's website following its broadcasts of Tibetan protests.

As recently as July 2009, there were cyber attacks on government websites such as the Pentagon and the White House in the United States and government agencies in South Korea.

These are just a few examples of the many, many attempted and successful cyber attacks on websites and data centers across the globe.

2) Respondents to our questions on this topic report that 60.9% of all data centers worldwide officially recognize cyber terrorism as a threat they need to deal with.
3) Even with so many data centers officially recognizing the Cyber Terrorism threat, only a little over one-third (34.4%) have included it in their Disaster/Recovery Plans (their best defense if attacked)
4) Only one in four (24.8%) have addressed cyber terrorism in their Policies and Procedures manuals and only 60.2% even have a written Policies and Procedures Manual
5) And less than 1 in 5 (19.7%) provide any Cyber Terrorism employee training
6) On the positive side, 82.4% of all respondents report that they do perform background security checks on all potential new employees