

Information Technology Administration And Hosting Options

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1. INTRODUCTION

Companies and individuals responsible for planning to provide Information Technology (IT) services must consider how to balance the need to deliver reliable, robust services against finite budgetary limitations. This paper discusses the options available and issues that need to be considered when planning implementation or upgrade of IT services.

2. OVERVIEW

There are three major topics that must be addressed when considering establishment of new computer services or evolutionary maintenance of existing systems and services:

- **Hosting Options**
- **Support Options**
- **Support Provision**

This memorandum will briefly explain what is implied by each topic, and feasible choices that are available to small- to mid-sized companies, including advantages and liabilities. Note that, in keeping with a high-level document, this is not an exhaustive or excessively detailed discussion of such topics; rather, the purpose is to introduce the concepts and categories, and to expose the reader to the types of considerations that must be made when dealing with these issues.

3. HOSTING OPTIONS

Hosting is the term used, in the broadest sense, to describe provision of a service or feature. This may be a logical service—one that “just appears” on the user’s desktop—such as E-mail or a web page; or a physical service, such as the actual database or web server that provides the underlying capability. This is also sometimes referred to as *service outsourcing*.

3.1 APPLICATION/SERVICES HOSTING

Most small or mid-sized companies today are familiar with logical hosting of services—for instance, many rely on an Internet Service Provider (ISP) to actually manage and serve the web pages for the company web site, even if the company webmaster or other employee generates the page content. In a similar manner, many companies simply buy “mailboxes” from an ISP, never worrying about actually managing a mailserver of their own. Such logical hosting can extend to other services, such as database management.

However, this model also can be extended to remote hosting of systems that more traditionally would be found in the computer room of the company itself. The server that maintains company databases, office productivity directories and files (e.g., word processing documents and

spreadsheets), proprietary applications, etc. can be located off-site and maintained and managed by a either the hosting organization or even outsourced to a third party.

3.1.1 Requirements

Off-site application/services hosting may require a communications link with enough bandwidth to handle concurrent utilization by the client staff while maintaining acceptable throughput and providing access to remotely located applications. In the case of hosted applications or services that are targeted at audiences outside the company—most web accesses to a hosted site may be from customers, rather than within the company, for instance—there may be little or no additional communications needs.

3.1.2 Advantages

- The burden of supporting and maintaining the infrastructure necessary to provide relatively complex services, such as mail or web servers, is undertaken by the hosting organization.
- Scaling hosted services—expanding the ability of a web site to handle growing volume, or the mail system to accept additional users or increased storage requirements—is the responsibility of the hosting organization and is usually transparent to the client.
- Detailed information can usually be provided by the hosting organization to the client concerning usage, costs, etc. of the hosted services, permitting better management of costs and determination of benefits provided.

3.1.3 Disadvantages

- Direct control over security, features, and realization of capabilities is in the hands of the hosting organization
- Restrictions may be placed on the range of services or applications due to the need of the host to support multiple environments.

3.2 HARDWARE

Hardware hosting means exactly that—some or all of the company's hardware (and, of course, any software that runs on hosted hardware) is moved off-premises to the hosting company's site. In the extreme case, the only hardware actually on company premises would be that associated with providing broadband off-site connectivity and local network support.

It is not uncommon, however, to find a mixture of on- and off-site hosting; again, the best example is off-site hosting of Web and E-Mail servers, and on-site database, print and file servers.

3.2.1 Common Requirements

All off-site hosting requires a communications link with enough bandwidth to handle concurrent utilization by the client staff while maintaining acceptable throughput, both for normal communication functions (e.g., Internet web browsing, E-Mail access) and the remotely located functions (e.g., loading programs stored on remotely hosted disk storage, I/O from server programs running on remotely hosted servers).

In addition, plans must be made with the hosting site to guarantee procedures are in place for disaster recovery, loss of communications, handling of software installation and maintenance, hardware upgrades/replacement, etc. While these plans should be made for any installation—including a fully owned and self-hosted company site—they are more critical and potentially more

complicated to reconcile when coordination with and concurrence of an additional party is necessary.

3.2.2 Data Hosting

Data hosting is, effectively, moving stored data—database tables, office productivity documents, etc.—onto storage maintained off-site by the host. It may, in some cases, actually result in program executables and packages being stored off-site as well; in the case of data hosting, these are loaded across the WAN to local servers where programs are executed. (If the programs are executed on the hosting computer's CPU(s), with input/output directed over the link, this becomes an application hosting scenario.)

Please note that this sounds similar to application hosting. The fundamental difference is that, while programs may reside on the remote storage in a data hosting situation, all programs still run on the client's systems. In an application hosting situation, programs are executed on the systems at the host site, not the client site.

3.2.2.1 Advantages

- The hosting organization usually takes responsibility for providing adequate disk storage, including upgrades and expansion, as well as assuring reliability and adequate backup and recovery procedures.
- Disaster recovery is inherently augmented by the physical separation of the data storage from the client's facility.
- Maintenance of multiple data storage locations (to provide better protection for business continuity planning) is the responsibility of the hosting organization.

3.2.2.2 Disadvantages

- Loss of communications would result in total loss of access to corporate data. (This is usually prevented by requiring multiple communications links.)

3.2.3 Co-Location

If the company retains ownership of the off-site equipment, this is usually referred to as co-location. In such a configuration, the company usually retains responsibility for any equipment upgrades or replacement, as well as arranging for hardware support contracts.

3.2.3.1 Advantages

- The co-location site is responsible for guaranteeing a suitable machine environment, including security, environmental conditioning, fire suppression systems, uninterruptible clean power, and communications services.
- Co-location sites commonly can provide 24x7 on-site operator oversight of the systems under their management.
- Infrastructure—especially communications, access to SANs, etc.—can often provide more capabilities, because they're shared with other systems at the host site, than an individual client could afford in their own IT facility.

3.2.3.2 Disadvantages

- Loss of communications means total loss of capability. Again, this is usually prevented by requiring multiple communications links.

3.2.4 Full Hosting

In full-hosting solution, the host facility owns and provides the servers and storage on which the client's software runs and resides. Effectively, the only equipment resident at the client site is active network components (routers, switches, etc.) necessary to communicate with the host site, individual workstations, and network-linked devices such as printers and scanners.

Usually the host facility is also responsible for all administrative functions, software maintenance (including installation and upgrades), and operations (e.g., adding/removing users, managing security, etc.)

3.2.4.1 Advantages

- All of the advantages of services/application hosting, data hosting, and co-location apply.
- Virtually all requirements for advanced systems administration is removed from the client's site.
- The host assumes responsibility for maintaining current hardware and software configurations, patches, security updates, etc.
- Often services and capabilities that otherwise wouldn't be feasible for a dedicated client facility may be available due to economies of scale at the hosting site.

3.2.4.2 Disadvantages

- Planning is critical. Particularly for existing IT installations, the migration to full hosting may require a period of co-hosting or a hybrid solution until existing equipment and software is amortized or transferred to the hosting organization.
- Response and accountability. Host administrators and personnel are responsible for multiple clients; depending on demand and workload, the client's requests are queued and serviced per the host's priorities and capabilities. It is important that both the host and client negotiate a clear list of expected services and responses to assure expectations are in line with actual

4. SUPPORT OPTIONS

Clearly, support for a company's IT systems and network is going to be affected by how those components are structured, from the extremes of a totally in-house implementation to one fully-hosted off-site.

For the purposes of discussion, it will be assumed the model in question is the current configuration at Harbortown, consisting of in-house servers and communications equipment, with hosted Web and E-mail services.

Provision of support can be accomplished via the following models:

- **Dedicated In-House Support.**
- **Telephone Augmented In-House Support.**
- **Augmented Remote Administration.**
- **Remote Administration.**

Any of the models requiring telephone support or remote administration are generally provided under two payment arrangements:

- **On-Demand/Per Incident**

- **Pre-paid Hours Pool**

Each of these is discussed in more detail in following sections.

4.1 DEDICATED IN-HOUSE SUPPORT

This may delivered via an employee staff or a resident contract staff. Effectively, the organization is self-contained.

4.1.1 Advantages

- The organization has known and predictable IT administrative staff costs.
- Personnel become intimately familiar on a day-to-day basis with the corporate infrastructure and applications, as well as corporate policies and needs.
- Investment in staff training remains with the company, providing increasingly experienced personnel.

4.1.2 Disadvantages

- Specialized knowledge or skills either must be acquired through experience or training, or contracted on an ad-hoc basis.
- Personnel management issues must be handled, including security and information sharing, salary and benefits, etc.

4.2 TELEPHONE AUGMENTED IN-HOUSE SUPPORT

In this model, external advisory and information support is provided to resident staff, although actual administrative tasks are undertaken by the resident staff only. Also referred to as advisory help desk services.

It is common to specify the *Contact Response Time* when contracting for such service—that is, how long the external support organization may take to respond to a request from the client. This is usually stated in terms of hours or days, e.g., 4-hour or 1 day response. Faster response time may be priced accordingly, depending on the arrangement reached with the provider. Support is usually only provided during normal working hours, as agreed upon between the client and support organization. Out-of-hours support may or may not be available, usually for additional cost.

4.2.1 Advantages

- The client gains immediate cost-effective access to issue-specific expertise from trained and experienced personnel when needed, even if such skills aren't currently available through existing personnel.
- Costs are readily controlled through such methods as tiered response times and frequency of use.

4.2.2 Disadvantages

- Actual response and/or implementation of solutions or issue resolutions must still be carried out by on-site personnel, with concomitant impact on schedules and other task assignments.
- Personnel must have enough familiarity with the infrastructure and adequate skill sets to understand and implement solutions.

- Investigation and determination of issues can be a protracted process for complex issues, since requests for information are brokered through the on-site staff.

4.3 AUGMENTED REMOTE ADMINISTRATION

Not only may resident staff call on external support for advice and information, but also administrative and remedial tasks may be undertaken remotely under direction and approval of in-house personnel. This is also often referred to as *help desk support services* and *partial administrative outsourcing*.

This solution requires functional remote administration capabilities be in place, and adequate access provided to the remote support personnel. This is generally a good idea even if only used by internal support staff, as it allows flexibility in scheduling and a broader window of support than that provided by only on-site administrative access.

As with telephone augmented support, it is not unusual to specify the *Contact Response Time* when contracting for such service—that is, how long the external support organization may take to respond to a request from the client. In the case of augmented remote administration, there are usually at least two different types of response—request for non-critical administrative action, and request for assistance or response with critical events, e.g., loss of communications. As described before, contact response levels are usually defined in terms of maximum permissible hours or days until a response (and work on resolution begins), with faster response tiers costing more.

Agreed-upon administrative tasks are often carried out out-of-hours, usually scheduled by the support organization with the cooperation of the client. Unscheduled event response is out-of-hours is usually available, although non-emergency issues may be billed at a different rate than during normal business hours.

4.3.1 Advantages

- As with telephone-augmented support, immediate cost-effective access to issue-specific expertise from trained and experienced personnel.
- Remote personnel can carry out auditing and issue resolution investigation and implementation directly instead of having to direct on-site personnel.
- Tasks can be delegated to off-site personnel, easing task loads on in-house personnel.
- Site support can be provided even during times when on-site personnel are unavailable (off-duty, vacation, illness, etc.)

4.3.2 Disadvantages

- “Hands-on” tasks still require an on-site presence.
- On-site staff must manage task assignments, e.g., determine what to handle locally and what to hand off to the external support organization.

4.4 REMOTE ADMINISTRATION

Effectively, there is no resident staff, either employee or contract. Rather, all auditing and administrative functions are effected remotely. This may necessitate low-level involvement by an on-site “pair of hands” for simple mechanical operations—e.g., tape changes, cable changes, etc. This is also sometimes referred to as *administration outsourcing*.

As with previously discussed models, it is not unusual to specify the *Contact Response Time* when contracting for such service. In the case of remote administration, this usually not only

applies to contact from the client, but also specifies notification of the client of detection of any of a list of agreed-upon situations and/or events, e.g., a server crash or loss of a communications link. As described before, contact or event response levels are usually defined in terms of maximum permissible hours or days until a response or notification, respectively (and work on resolution begins), with faster response tiers costing more.

Service for elective out-of-hours administration requests may be available, although they may be billed at a higher rate than requests submitted during normal working hours.

4.4.1 Advantages

- All the advantages of Augmented Remote Administration apply.
- On-going costs of maintenance and auditing are lower than those requiring dedicated staff, since these typically don't require dedication of resources full-time.
- The entire pool of expertise available to the support organization is available as issues arise—effectively, an entire team of specialists is available on demand.

4.4.2 Disadvantages

- Some tasks require an on-site presence that may necessitate dispatch of personnel, with resultant additional delay and fees.
- Issue resolution (troubleshooting) usually requires costs above and beyond planned maintenance fees. This can be alleviated through such techniques as maintenance retainers and pre-paid hours pools (see next section).

5. SERVICE PROVISION

Particularly for administrative services, it is necessary to determine both how the services should be provided, and how they are to be billed. There are effectively three methods of managing costs associated with service provision:

- **Ad-Hoc/On Demand**
- **Retainer with Ad-Hoc/On Demand Service**
- **Pre-paid Hours Pool**

In the following discussion, please keep in mind that virtually any specific is negotiable, as are combinations and permutations of the basic schemes.

5.1 AD-HOC/ON DEMAND

Expenses accrue on a per-incident basis, usually with a minimum (typically 1 hour). Rates are higher per-incident than with other pricing schemes, but overall costs may be lower if usage is infrequent. There may or may not be a scheduled annual, semi-annual or quarterly contract maintenance fee, which is typically nominal.

This model is common with help desk advisory support and services, particularly for sites that have an on-site staff and only use the service to resolve issues that can't be handled locally.

This model typically precludes ongoing remote administration for recurring tasks, such as systems/network auditing and maintenance.

5.2 RETAINER WITH AD-HOC/ON DEMAND SERVICE

An agreed-upon set of recurring tasks, such as systems/network auditing and specific maintenance tasks, is contracted to be carried out remotely for a fixed fee. In addition, there may or may not be a scheduled annual, semi-annual or quarterly contract maintenance fee, which is typically nominal. Incidents outside the agreed-upon set are handled as for ad-hoc/on demand services; if the need to report an incident is detected by the remote administrative personnel, client authorization is required to activate the incident as a billable event.

This model is common with augmented and full remote administrative arrangements.

5.3 PRE-PAID HOURS POOL

A negotiated pool of support hours is pre-purchased by the client, typically at a notably reduced rate from that applied to ad-hoc rates; these are usually allocated and expended on monthly basis. Pool hours are expended on a per-incident basis over the course of the month, with any unused hours rolling over and accruing in the pool. There is usually an expiration period associated with rollover hours, typically one calendar quarter (3 months). Recurring tasks may be handled by a separate retainer agreement, or may be figured into the hours pool.

When pool hours are expended within a period and incidents require additional time, this is billed as for ad-hoc/on-demand incidents.

This model is common with augmented and full remote administrative arrangements. A useful approach that gets maximal use of pre-paid hours is to work out a list of desired tasks with the support organization. Near the end of the period—usually the last week of the month—if there are pool hours remaining for the period, the support organization notifies the client and they mutually agree that the hours are to be expended accomplishing one or more tasks from the list.

Of course, if any tasks requires more time that remains in the pool, there are several options:

- ü If the task is interruptible, only carry out as much as can be accomplished until the current pool hours are expended, and pick up the task later.
- ü Bank the hours over one or more periods until enough hours have been saved to complete the task.
- ü With the agreement of the support organization, borrow against future pool hours.
- ü Expend a mixture of pre-paid and ad-hoc hours to complete the task. (Clearly, this is the least desirable option.)

6. CONCLUSION

There are a number of viable alternatives to the traditional IT model of maintaining all systems and services in-house, with all in-house staff; each offers advantages in the appropriate environment. Careful analysis of the needs of the client site, coupled with selection of the support and service model most applicable to the needs of the client, can result in excellent service and performance at a very acceptable price.