

SUPPORT SERVICES

Hosting

enable[®]

Introduction

Enable has more than 15 years of experience in designing, configuring, and maintaining hosting environments on which our software solutions reside. Enable will look after the specification and configuration of the hosting environment, as well as ongoing system and software updates, ensuring system and application security and stability.





Enable's hosting services integrate directly with its software development and client services to provide ongoing support and to provide a holistic software service.

As designers and developers of software products, Enable is ideally placed to provide the optimum hosting environment for any system. Our knowledge and experience in hosting a variety of software products means we can tailor the hosting configuration to meet any individual requirements, in the short, medium, and long term.

Enable's hosting providers use enterprise class data centres, designed from the ground up to provide high quality and reliable hosting infrastructure, with security, backups, monitoring, N+1 redundancy for power and networking, and full environment managements systems all provided as standard.

Infrastructure

This section describes a typical set of hosting infrastructure components that would be required to host one of Enable's applications. These would generally consist of at least two web servers, a load balancer to distribute the workload across them, a database server, and a processing server.

W E B S E R V E R S

A web server is a computer system that processes requests using HTTP (Hypertext Transfer Protocol). These are generally a lot lighter than the processing and database servers that we use, as they don't require as much RAM or CPU usage to run. Enable uses these to host our web application components. Web servers can be dedicated for a single client or website under a load balancer if necessary.

L O A D B A L A N C E R S

Load balancing is a technique commonly used to optimise the stability and resilience of web sites, applications, databases and other services by distributing the workload across multiple web servers; if one server goes down then the others can pick up the workload.

Generally, Enable will only use load balancing in the production environment through a third-party host. A single load balancer will be used to proxy requests to and from the web servers, supporting both HTTP and HTTPS. The load balancer will be configured with no form of stickiness, meaning each new request from a user will be sent to the least busy web server, irrespective of which one is handled that user's previous request.

DATABASES SERVERS

Enable uses dedicated servers running Microsoft SQL Server to host our application databases. As the web and processing servers will need to query the database, the database server will need to be a suitable size to manage this, usually boasting a significant amount of RAM.

The majority of our clients share multi-tenanted database servers. Enable can however provide a separate database server for clients if requested; this offers a much higher resilience against security breaches and attacks, with the clients' data not being stored side by side with any other companies' data.

PROCESSING SERVERS

Any tasks that are run on a processing server are generally intensive and time consuming. It is therefore important that they are more powerful and isolated from the web servers, on separate hardware resources. This will avoid the overall performance of an application from being affected.

Enable uses processing servers to run any background processes or Windows services. This allows for long running tasks to be completed without risk of timing out and also reduces the load on the web servers.

FIREWALLS

A firewall is a network security system that acts as a barrier between a trusted and an untrusted network. By controlling access to the resources, a firewall only allows traffic onto the network that is defined in the firewall policy, with all other traffic being denied. Enable uses firewalls within all of our hosting environments to help prevent any malicious requests from reaching the hosting server, and protect the network from any unauthorised access and/or threats.

REDIS

Redis is a licensed open source in-memory data structure store which can be used as a database, cache and message broker. One of the main benefits of using Redis and other key-value databases is Redis' ability to store and manipulate high-level data types. It offers high performance and simplicity and is widely used across the industry by developers. Enable uses Redis mainly for caching, which allows us to reduce the load on the database server and also provide some notable benefits in regard to performance.

MICROSERVICES

A microservice is an architecture that promotes the design of a software system to be comprised of a number of granular and distributed intercommunicating services. The promise of microservices is that scale-out can be more easily achieved.

M E S S A G I N G Q U E U E S

Queued messages can trigger processing in another part of the system. This permits us to achieve a higher degree of decoupling between system components. Having more independent components means it is easier to independently redeploy and scale parts of the system that are experiencing bottlenecks. It also opens up possibilities for throttling and prioritisation of messages in the queue.

S T O R A G E

Enable's applications usually require file system storage for example for user uploaded documents, temporary files, imports and exports. For larger configurations, we may make use of a storage area network (SAN) which provides a higher level of reliability and performance.

B A N D W I D T H

All communication to and from a server will use up bandwidth. This is the measure of the maximum amount of data that can be transferred in a given time. Enable builds web applications with bandwidth usage in mind and compresses response data where necessary. This significantly reduces the amount of data that will be sent to the user.

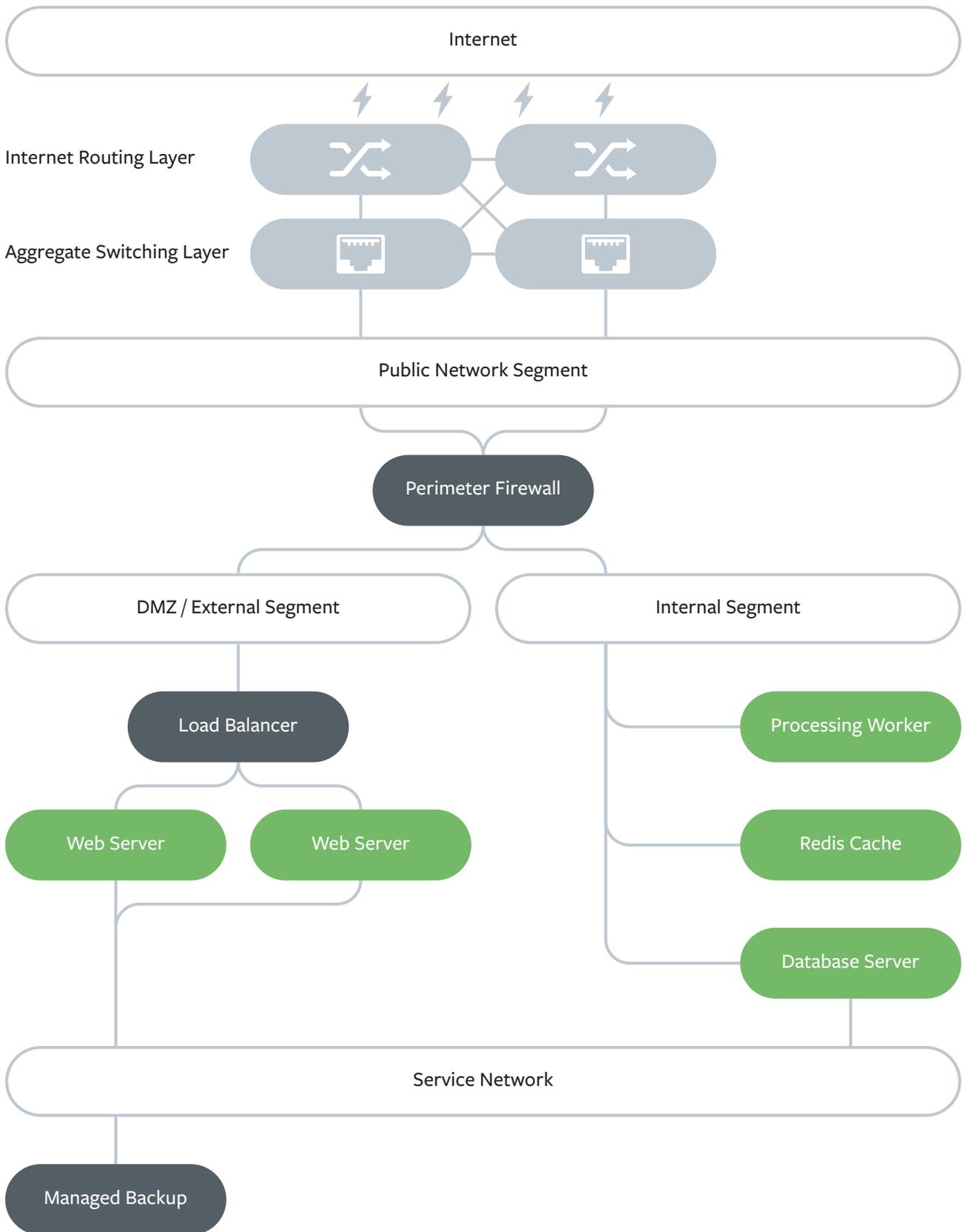
S F T P

Secure file transfer protocol (SFTP) is a popular method of securely transferring files between two remote systems. Often, clients need to exchange data between applications using file-based transfer models. Typically, these files would be either generated by a legacy system for consumption or automatically generated for consumption by other systems, either on an event-based schedule, fixed routine or on-demand.

Enable recommends the use of SFTP for the transfer of these files. Typically, an SFTP facility would be provided by Enable within the relevant hosting environment. Credentials would then be issued to the appropriate parties on a case-by-case basis.

S M T P

Simple mail transfer protocol (SMTP) is an internet standard for email delivery between servers. It offers a less restrictive sending capability as compared to that of a regular email account with an ISP or a standard email hosting provider, with increased reliability and speed. If any of our applications need to generate and send emails, they are all sent through an SMTP server.



Software platforms

Enable relies on Microsoft platforms to host our applications. This curated blend of tools have been carefully chosen for their maturity and stability.

W I N D O W S S E R V E R

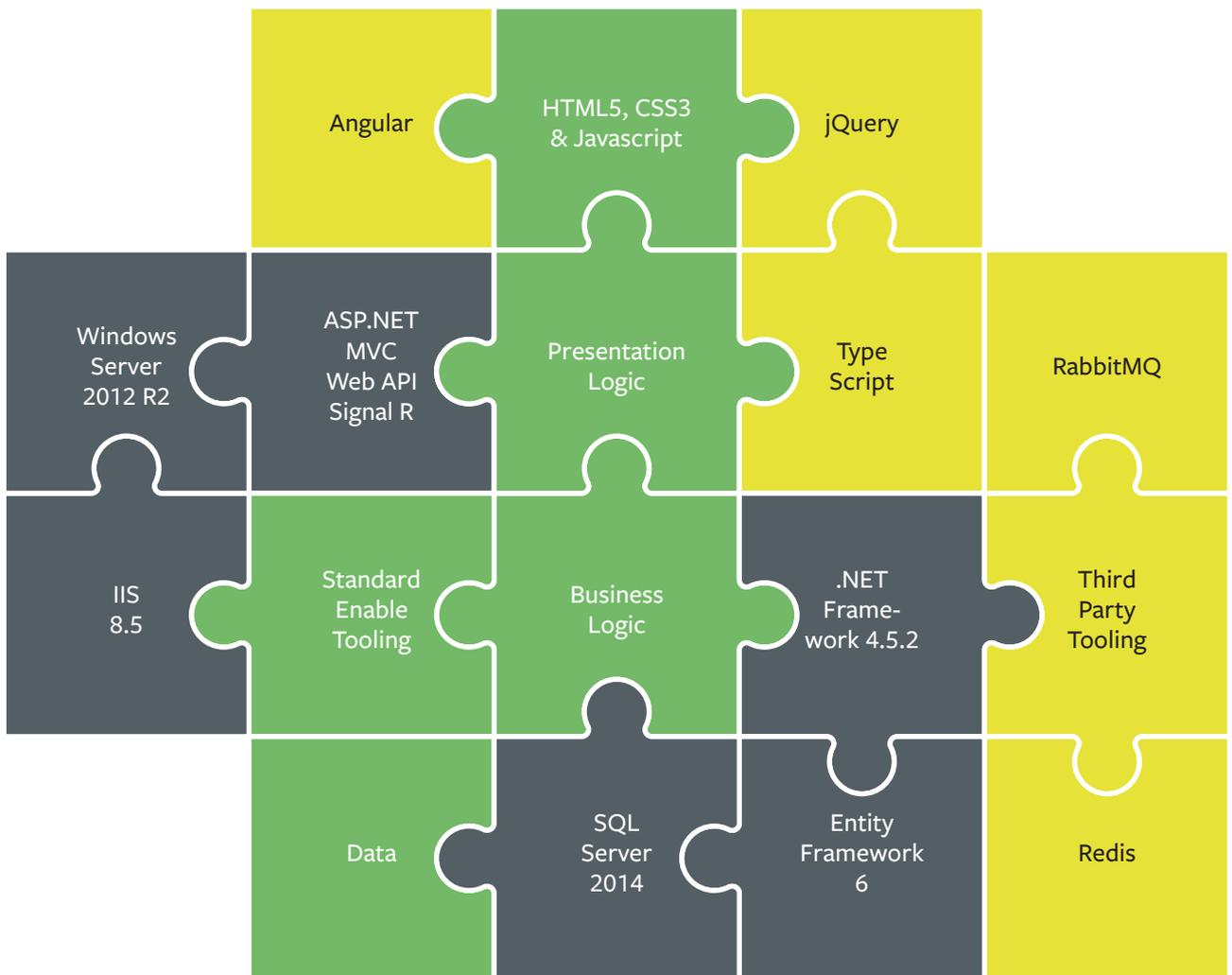
Enable will typically use Microsoft based Windows servers for a variety of purposes across all of our business solutions. The standard platform would normally consist of a database server (using Microsoft SQL Server), a processing server (hosting Windows services) and web servers (hosting web applications within IIS).

S Q L S E R V E R

Microsoft SQL Server is a relational database management system developed by Microsoft. As a database server, its primary function is storing and retrieving data as requested by other software applications, which may run either on the same computer or on another across a network. Enable uses Microsoft SQL Server on the database server for every application that we develop. We generally have one or sometimes more databases for each application. An application does not share a database with any other application unless specified to do so by the requirements.

I I S

Internet Information Services is an extensible web server created by Microsoft which supports a number of standardised formats such as but not limited to HTTP, HTTPS, FTP and web sockets.



Vendors:

Microsoft Azure

Microsoft Azure is a popular cloud service used by Enable for hosting applications through a globally available network of Microsoft managed data centres. Enable look to use Microsoft Azure proactively, as this offers a secure, modern hosting platform with powerful features, such as the automatic provisioning of additional processing power during periods of high demand.

B E N E F I T S

Some of the major benefits of using Microsoft Azure include:

- That it meets a range of regulatory requirements and is designed with security in mind;
- Configurations for high availability and reliability that are enabled by default for many Microsoft Azure offerings;
- Strong BI and analytics support;
- A “pay as you use” model which can unlock cost saving;
- Auto-scaling capabilities that are available out of the box to meet ever changing workloads.

Of these benefits, the auto-scaling capabilities are the most exciting. These allow Enable to easily scale up (provision more powerful machines) or scale out (provision multiple instances of a machine, e.g. to balance traffic amongst multiple web servers) with the click of a button. This means we spend more time delivering features and less time managing environments to cope with changing workloads.

STANDARD COMPONENTS USED BY ENABLE

A standard Microsoft Azure environment consists of:

- Azure SQL databases;
- App Services for hosting web applications;
- Virtual Machines for hosting background processing services and other services, such as SMTP servers;
- Storage accounts, used to share files between our web applications and background processing services;
- Service Bus, a message broker used to distribute messages between application components;
- Redis, a cache for storing regularly accessed data.

DATA CENTRE LOCATIONS

Enable makes use of Azure services located in:

- Virginia, USA for North American clients;
- West UK, for European clients.

Vendors: Rackspace

Rackspace is a popular cloud computing and managed hosting company founded in 1998 initially to host applications and websites for users and companies who did not want the hassle of on-premise hosting.

B E N E F I T S

Some of the major benefits of Rackspace include:

- Dedicated hosting approaches;
- Broad infrastructure solutions;
- A choice of multiple service levels;
- Cross-technology expertise;
- Public, private, and hybrid cloud solutions.

S T A N D A R D C O M P O N E N T S U S E D B Y E N A B L E

A standard Rackspace environment consists of:

- Hardware firewall;
- Load balancer;
- Web servers;
- Database server;
- Background processing server.

DEDICATED HARDWARE

Rackspace offer the option of providing dedicated physical devices to form a hosting environment. Network hardware such as load balancers, IDSs, firewalls, servers and storage can be configured according to client requirements.

Rackspace provide a 100% network uptime guarantee and a one-hour hardware repair or replacement guarantee that covers hardware in the event of a fault arising.

RACKSPACE CLOUD

Rackspace is a world leader in providing managed cloud solutions, providing their expertise across multiple cloud platforms to offer technical assistance and support. Rackspace cloud servers are used by Enable in the production environments for the scalability and flexibility they afford. Cloud servers can be resized simply, deployed quickly, and used in a variety of ways to provide a high-quality production hosting environment.

Installation

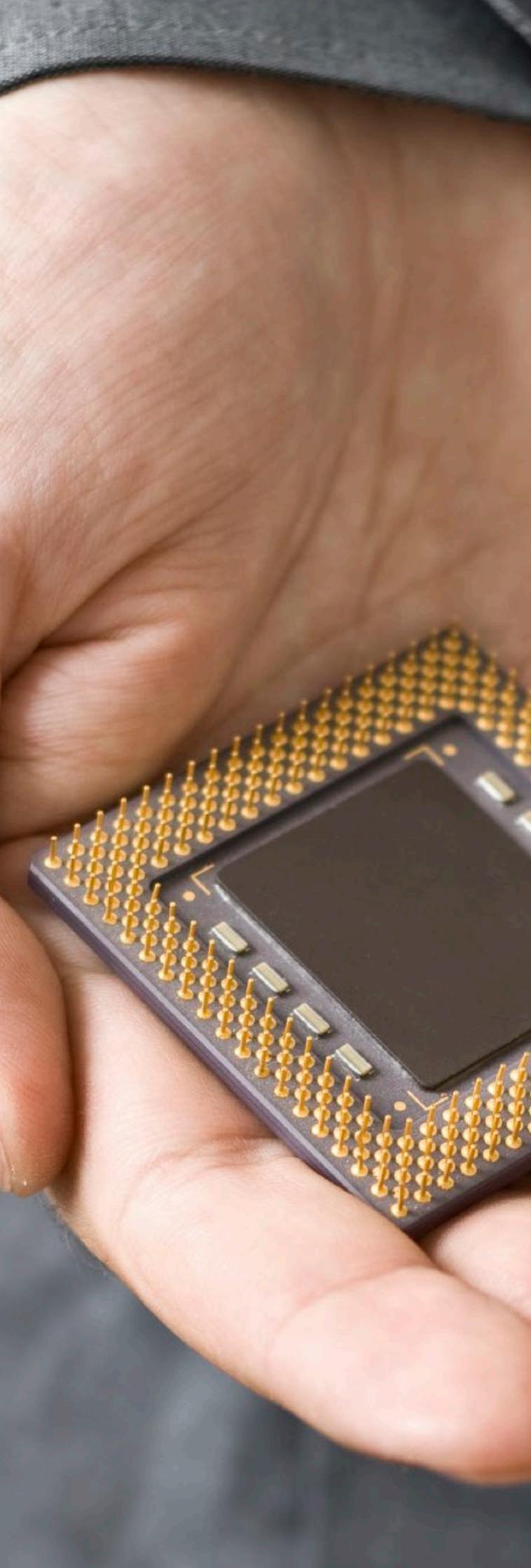
The installation of a software solution provided by Enable involves the provisioning of a hosting environment, the configuration of that environment, and the deployment of software to that environment. This section looks at each of these tasks and related considerations which affect the implementation of a hosting environment.

SOFTWARE DESIGN AND ARCHITECTURE

The architecture of a hosting environment is heavily informed by the design of the software that environment will be used to host. Aspects of software design such as the web front end, background processing, file data storage, and application databases all logically lend themselves to be provided by individual hosting components. Application performance, capacity, and resilience are also factors which have a bearing on the architecture of a hosting environment, for example the use of load balanced web servers to provide redundancy, increased performance, and also future-proofing with the ability to scale performance capacity horizontally.

UAT, STAGING AND LIVE EQUIPMENT

The segregation between UAT, staging, and live environments can be configured in several ways. Separate physical or cloud devices can be provided for each individual environment if that is preferred, or at the other end of the scale, logically separated software versions and data can share the same equipment and resources. A hybrid approach is also possible, where certain devices (a database server for example) are shared between environments but other devices (for instance web servers) are dedicated to a specific environment. Whatever the requirements, a tailored solution can be put in place to provide the environments a client needs.



STEPS INVOLVED

Once the servers for a new environment have been provisioned they undergo a standard configuration process, according to industry best practice. The process is customised for the role each server will have, as different software and configuration is required for web servers and database servers, for example. Server hardening is included as standard, as is the configuration of backups, monitoring systems, and perimeter firewalls. Any custom software or configuration specific to a certain software solution is also put in place once the standard server configuration has been completed.

Ongoing management

Enable employs numerous measures to provide ongoing management of production hosting environments. These encompass application monitoring, monitoring of servers and server resources, operating system and software updates, documentation, disaster recovery planning and testing, and application data and database backups and their verification.

P A T C H I N G

All servers in Enable's hosting environments are manually updated on a weekly basis, with preferences set to 'download but not install'. This gives Enable a chance to inspect and decide what updates are required and also prepare for any downtime that it may cause. Updates are only applied once they have been manually approved. Updates to other pieces of software are reviewed on a monthly basis. Their installation on Enable's servers is only undertaken once they have undergone proper planning. Updates to application and web site code are performed by authorised members of Enable staff only, once they have been fully tested and approved.

M O N I T O R I N G A N D N O T I F I C A T I O N S

Automated monitoring tools are configured to continually check that applications are online and not returning an error. Furthermore, servers' resources are monitored in real time, covering CPU and memory usage, disk consumption and performance, and network performance.

Enable are alerted automatically when configured performance thresholds have been exceeded. Therefore, if a server is receiving an unusually high level of usage, or is experiencing a fault, Enable will be informed. Enable's team will manually investigate and take appropriate action.



EXCEPTION TRACKING

In order to monitor errors and key pieces of functionality, Enable make use of an exception tracking tool. This allows us to view exceptions as they occur in real-time across our applications so that we can proactively address any potential issues. If any problems are identified, we will schedule a task to investigate and resolve the issue.

BACKUPS

Enable has a tiered approach to its application and server backup process, which is configured as follows:

- Databases, fully, every evening;
- Database transaction logs, every four hours;
- App files, differentially, nightly;
- App files, fully, weekly;
- Cloud server images, weekly
- Backups are encrypted;
- Backups are not stored on source servers;
- Offsite backups are taken on a weekly basis;
- Backup procedures are reviewed quarterly;
- Backup procedures are monitored on a daily basis, or at an interval that is applicable to the backup's frequency.

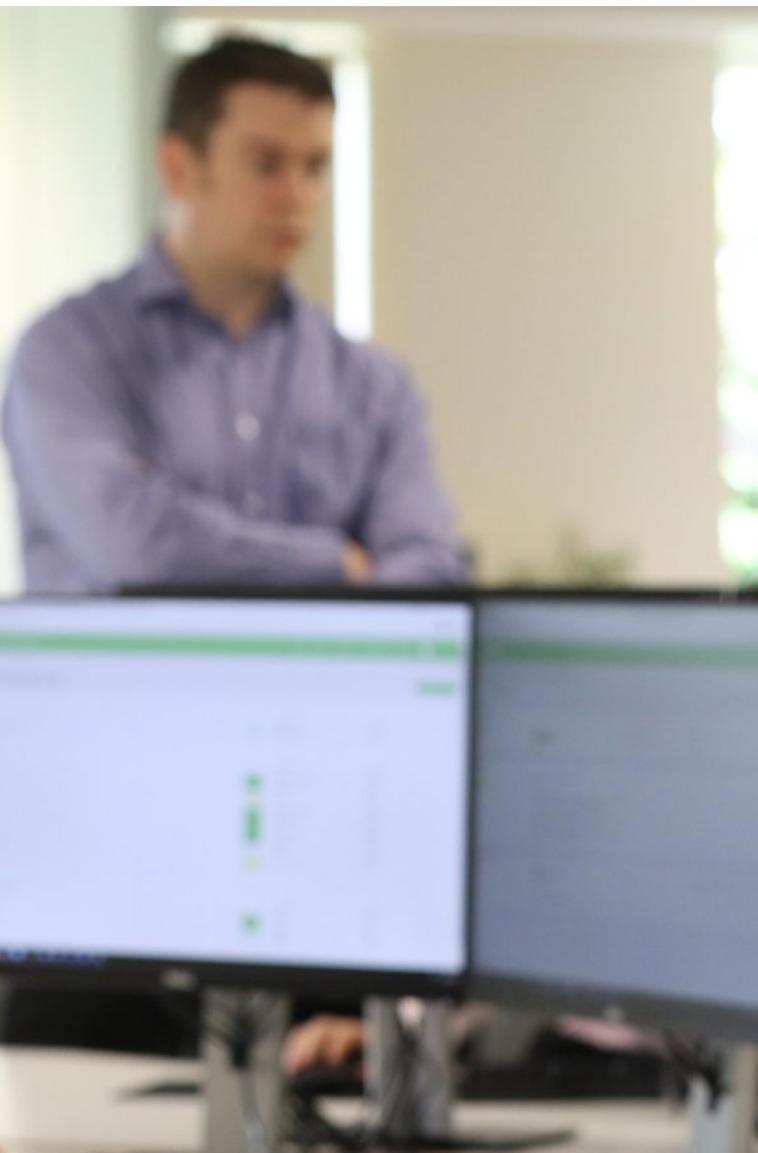
DEPLOYING APPLICATIONS

Enable uses an automated deployment tool called Octopus Deploy to move release candidates into the hosting environments.

Using automated deployments greatly reduces the risk of downtime around a deployment and helps decrease the time required to perform a release. Octopus Deploy also benefits by having a built-in rollback procedure, so that if anything goes wrong during a deployment it will be able to return to a previous state. Release candidates are deployed at a date agreed upon with the client, which helps to reduce any issues while upgrading to the latest release candidate.

Once configured, new builds of the software are released in the same way every time, which removes the risk of any human error when copying files across to the production environments.





CAPACITY PLANNING

Through many years of experience in hosting software products and an understanding of a client's usage and data requirements, Enable can specify resource levels for devices and servers in a hosting environment which will ensure high levels of application performance and stability.

Once a solution has gone live, Enable's monitoring systems allow staff to keep on top of the hosting environment's wellbeing and ensure it remains performant and fit for purpose. If necessary, Enable will liaise with clients to organise hardware or hosting capacity improvements in-line with growing application performance and data requirements.

RECOMMENDATIONS

Enable will generally suggest proactive recommendations, allowing the client and Enable to jointly focus on risks and opportunities that involve the technical underpinnings of a solution. Topics that are commonly covered by this process include technical modernisation, application performance, security, refactoring and user experience design.

Each recommendation will have a context as to why it has been raised and how it can be addressed.

