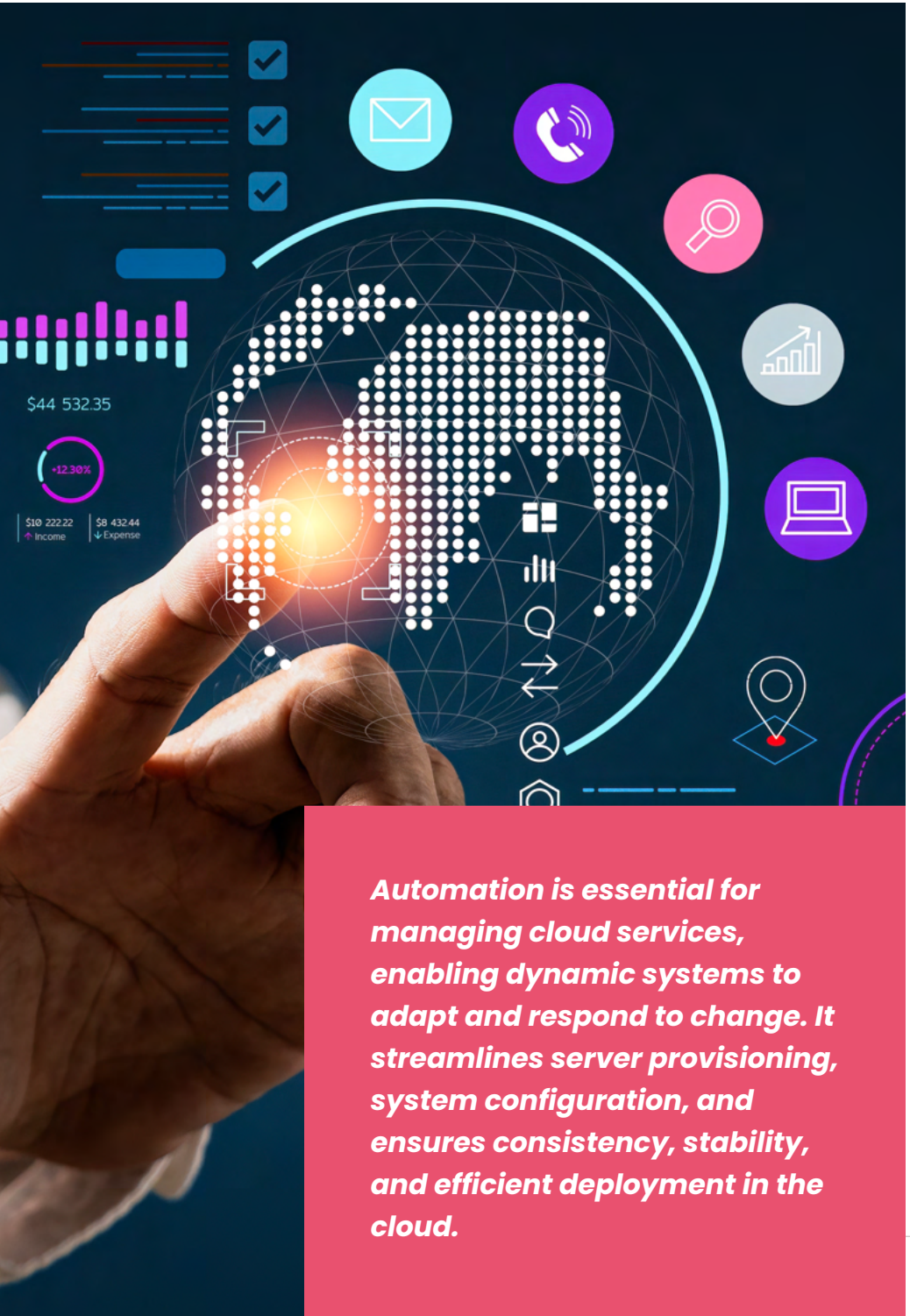
WHITE PAPER

Cloud Automation

A beginner's guide

digital craftsmen



Automation is essential for managing cloud services, enabling dynamic systems to adapt and respond to change. It streamlines server provisioning, system configuration, and ensures consistency, stability, and efficient deployment in the cloud.

What is automation and how does it work?

Automation means controlling the setup, configuration and management of cloud services. Automation is vital for any dynamic system or one which needs to respond to change or self-heal.

For example, by setting up load balancers in the environment, you can automatically provision new servers when the load increases to provide more capacity or scale down when no longer required. If a virtual machine fails or needs to be replaced, automation can provision a new machine without the delays of human interaction so you have enough capacity when needed.

Automation also helps you quickly build and configure systems that are consistent and repeatable — leading to immutable architecture and all of the advantages that delivers; stability, preventing configuration drift, advanced deployment methods, zero downtime deployments, consistent environments alongside efficient and effective Disaster Recovery options.

With automation, you can rapidly move from physical infrastructure to deploying secure production environments in the cloud with the leading cloud service providers, including Amazon Web Services, Google Cloud Platform, and Microsoft Azure.

When did a need for automation start?

Historically, servers were physical and automation was rarely needed, provisioning times and processes were costly and may have taken months to complete. Lifecycles of servers were typically tied to warranty periods, usually 3 to 5 years.

This led to mutable architecture or systems which change or mutate over time to meet new requirements. Such systems are regularly altered as new software updates and changes to configuration are performed.

Without automation or configuration management; most administrators were left with unique 'snowflake' mission-critical systems where configuration drift was a large issue.

Restoration of such systems can be time-consuming and problematic, the opposite from which your company needs in Disaster Recovery mode.

How has automation changed?

When Amazon's Web Services (AWS) appeared, one of their key features was on-demand computing. You started up a computer, could use it for long as you want, then shut it down in again when it was no longer in use.

This on-demand computing is not subject to the same provisioning timescales and costs and for the first time it became possible to deliver immutable architecture with Virtual Machines; unchanging systems that get replaced when changes are made instead of mutating or evolving.

Immutable systems can be turned into highly resilient and stable systems, removing most of the downtimes caused by configuration drift and the unexpected consequences of change.

Automation is essential for such systems, managing configurations, scaling resources as required and orchestrating various components of your system. Human scaling and configuration management simply does not work on today's 24/7, always on internet.

With automation and immutable systems, you can destroy Virtual Machines and recreate them as necessary which enables administrators to eliminate the biggest cause of downtime on all systems, deployments. No longer do deployments need to be performed during unsociable hours or incur drops in system availability.

Green / Blue, rolling and canary deployments are all made possible through immutable architecture and the Digital Craftsmen team is available to help you deliver a robust, highly available and modern system your customers deserve.

What are the benefits of automation?

There are several business benefits to implementing cloud automation:

1. **Reduced management costs:**
Your developers spend more time on the strategic work, with automation handling the day-to-day aspects of provisioning, configuration, security and network monitoring.

2. **Improved security:**
By removing the human error aspects of cloud services, you can be sure that your servers will have a level of security that is automatically deployed no matter how many machines you are deploying. They'll have the same security levels - every time.

3. **Improved time to market:**
Rather than having your business units individually go to your IT team to request new servers, deployment can be pushed to business users and less technical users. This allows them to be up and running with their own servers in a much-reduced time, saving your company much-needed resources.

4. **Peace of mind:**
Particularly when operating in the cloud, business users need to be confident that data is secure. Automating the monitoring, log analysis, configuration and deployment, capacity management of your environment is key. The combination of Automation services provides peace of mind and confidence that you're doing the job properly, that your environments are safe, secure and performant.

5. **Reduced reputational risk:**
By automating the monitoring of your systems, you will know of issues before they become business-affecting. This in turn reduces the risk to your reputation if any issues do happen, as your managed services provider will be able to quickly rectify any service or security incidents.

How do I get started with automation?

To get started with automation, you need to plan your system and infrastructure based on your business requirements; your approach to automation and your objectives will differ depending on your RTO/RPO, existing internal processes or simply the size of your system. To do this efficiently and effectively, you need to talk to the experts - like Digital Craftsmen, who have done this many times before and can help you get automation right first time.

The Automation services from the likes of Amazon Web Services are fully featured and well documented but you will encounter issues and common pitfalls during the start of your automation journey.

For example, your teams will need to control the configuration of machines, provisioning new systems, orchestrate updates / patches and deployment processes. Additionally, to deliver a robust system, the traditional system administrator tasks need to be worked into your systems such as Security Management, Log Management, Monitoring, Backups and Restorations.

Common configuration management frameworks that help you manage the configuration of cloud automation are Puppet, Chef and Ansible. Each of these frameworks have advantages and disadvantages and selecting the most appropriate ones will be dependent on your existing systems and future business plans for extending your business systems.

Configuration management is really important in the cloud for two reasons:

1. **Consistency:** Ensuring your configuration and cloud service policies are consistently delivered across hundreds of cloud services and configuration management will reduce risk and deliver reliability. Automation makes sure that the configuration of your virtual machines is consistent across each one.

2. **Security:** Keeping control of all of your machines is important and making sure that they shut down when you no longer use them is key. Automation covers this kind of security hole so that you can be confident in your cloud environment.

Automation provides real-time visibility into virtual machine states, simplifies cloud provisioning for non-technical users, automates network monitoring and security management, and enables instant issue response for faster problem resolution.

How does automation help with security?

There are several ways that automation helps keep your cloud systems secure:

1. **Machine States:**
With Automation, you have the ability to know what state your virtual machines are in alongside a whole range of information about each Virtual Machine. This source of truth is updated in real time and allows your teams and administrators to get a fully accurate view of your estate, the Virtual Machine configuration and key metrics in an instant.

2. **Cloud provisioning:**
A secondary purpose of Automation from a security point of view is that it allows users with less technical skills to deploy new machines. In an enterprise environment when you might have transferred some of the responsibility for application deployment to other business units, these business units can spin up new machines and deploy them without IT support. With automation, you know that these new servers will be safe and secure thanks to the auto configuration you have in place.

3. **Network Monitoring:**
AlienVault is a service that automates security management in the cloud. AlienVault monitors all traffic in network and blocks malicious traffic from accessing your network. It can also automate log analysis and automate monitoring, as you're getting a computer to do something that you would be doing, saving you valuable time and money.

4. **Issue response:**
As well as using AlienVault, issue response is built into automation monitoring systems, so you can take instant action when an issue occurs. For example, when an app server grinds to a halt, you can automatically restart that service. Historically, you would get an alert and then have to manually log in the machine and restart the server. This service can now be automated by firing off an event handler when the issue alert comes in. Once we identify the problem we'll build an event handler that can respond to any future issues like this. Putting automation in place reduces the impact of these issues from a few hours, down to a few minutes.

How can Digital Craftsmen help?

Digital Craftsmen can offer strategic design for your current cloud services setup. We can help you plan an automation strategy and, if you have no automation today, we can help you implement automation. If you're thinking of moving to the cloud, Digital Craftsmen can guide you through the process. We can provide automation as part of our managed cloud services offering, so you're set from the start.

Digital Craftsmen offers the following Automation services:

Core Implementation:

Automation is a core piece of the managed cloud services that Digital Craftsmen offer and we believe Automation is essential for managing cloud services. If you're moving to the cloud, we can look at how you're managing your cloud infrastructure and discuss how configuration management can improve your business practices.

Virtual Machine Scheduling:

Part of using a platform like AWS means running several servers at the same time. But what if you could turn those systems on and off on a schedule? In a dev environment, you could have machines worked on by developers during the working day, but then turn them off in the evening and weekends. If you have a testing environment that you only use during working hours, you can save over 60% of your costs.

Optimisation and improvement:

If you have an established cloud infrastructure, Digital Craftsmen can help you improve the automation and configuration you have deployed, including rolling out automation configuration management, matching of machines, and really getting control over your machines. Companies can save approximately 60% of their usual running costs for AWS servers through automation.

Why work with Digital Craftsmen?

Digital Craftsmen are a trusted advisor in the cloud automation space. We can help you demystify the automation process and help explain in plain English exactly how you can begin to automate your environment and reap the business benefits. Our approach to automation enables Digital Craftsmen to provide your business with cost effective managed services. We use automation to make our internal systems more efficient which allows our business to devote resources where they are needed.

The result of this approach?

Our support team is now more customer-focused than ever before, we can provision and manage new systems rapidly and our clients are happy to see cost savings reflected in our competitive pricing.

Contact Digital Craftsmen

Digital Craftsmen offer strategic automation design for your current cloud services setup. We can help you plan an automation strategy and – if you have no automation today – we can help you implement automation throughout your organisation.

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