2022

One-Click CAF: Deploy Azure Landing Zones in less than 60 minutes

AUTOMATING THE CLOUD ADOPTION FRAMEWORK FOR THE DEPLOYMENT OF AN AZURE CLOUD SOLUTION

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Content

Management Summary:
Rapid success in the cloud thanks to One-Click-CAF

Interest in migrating to the cloud and thus cloud services is very high. Therefore, the demand for using Microsoft Azure is also growing. However, complexity and lack of expertise delay decisions and projects, preventing many end users from moving to an Azure environment faster.

One-Click-CAF provides the ability for partners to deliver the benefits of Azure cloud infrastructure to their customers on demand by automatically provisioning an Azure Landing Zone in less than 60 minutes. Reliable, proven in the field many times over, and ready to go right out of the box.

A few years ago, Microsoft started to introduce the so-called Cloud Adoption Framework (CAF). This structured approach is intended to help proceed in measurable steps on the cloud journey and thus build up the knowledge and necessary digital assets over a period of time.

One of the central building blocks of this methodology is the creation of a so-called Landing Zone, a foundation that centralizes the construction and management of cloud environments. Within this landing zone are management capabilities and resources, and there are rules for compliance and security standards. The Azure Landing Zone is customizable and based on Microsoft best practices. It is deployed via so-called Blueprints. These are collections of resource templates and policies that can then be rolled out to customers in a specific use case.

By compiling the resource templates based on ARM templates and making the entire collection available in these Blueprints, we believe Microsoft has taken a big step in the right direction. We spent a lot of time testing the Blueprints in different customer scenarios. From this, we came up with the idea of offering a solution that makes it even easier to get started in the cloud.

We have radically simplified the Microsoft concept and are guided by the principle of the Minimum Viable Product (MVP) for this purpose. This makes our concept of the landing zone in One-Click-CAF so simple and understandable that our partners can start working with it immediately.

Infrastructure-as-Code (IaC) is used to create a cloud foundation. Using IaC, the cloud environment that is to be provided can be assembled modularly and flexibly using code building blocks. The One-Click-CAF, the landing zone developed by Ingram, ensures faster cloud adoption through its simplicity and flexibility. The mix of modules and policies, written in an understandable code language, makes it easy to get started even without cloud experience.

One-Click-CAF builds a hub that controls access to all resources (virtual machines, storage, networks, etc.). The actual workloads (applications, databases, etc.) are connected to this landing zone as a spoke.

For easy management there are four resource groups with speaking names in the landing zone created with One-Click-CAF.

We offer you the best service: During a two-day consultation, we fully explain how One-Click-CAF can be customized to meet your customers' needs and provide a reliable, secure environment that enables your customers to take full advantage of Azure cloud infrastructure.

One-Click-CAF is a modular solution based on best practices that can be customized with minimal effort. As a result, One-Click-CAF is so flexible and simple that partners and their customers are sure to have a successful first steps in the Azure Cloud.

Migration to the Azure cloud appears complex and time-consuming

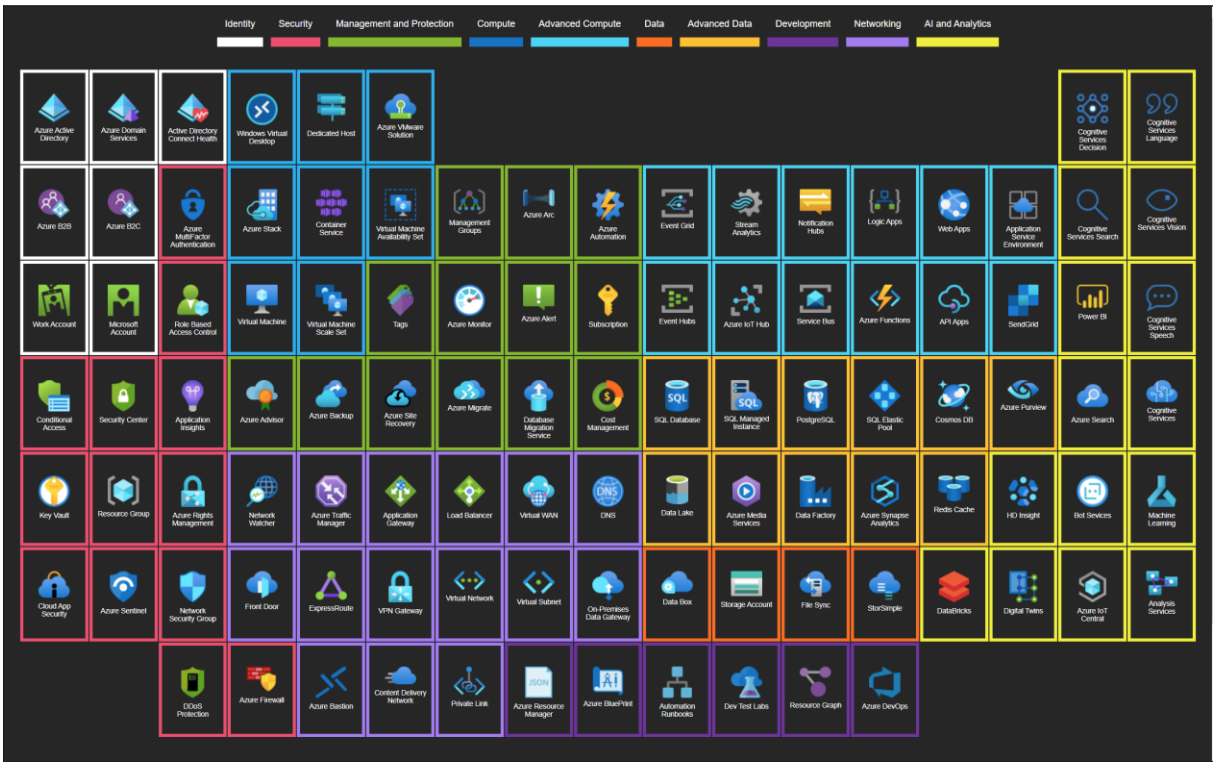
The fundamental interest in cloud services is high. Results from surveys appear regularly, according to which approximately two-thirds of all companies would like to migrate to the cloud with their IT infrastructure in two years. This desire to migrate from an on-premises environment to the cloud results from communication about the great technical benefits of cloud services, including cost savings and "foolproof" management. This makes the decision to "go to the cloud" easy for enterprises.

It is less easy for partners to accompany their end customers on the way to the cloud. It is true that Ingram Micro offers a variety of webinars, boot camps and certification opportunities in which the functionalities of Azure services are explained, trained in labs and know-how is tested. But between the imparting of theoretical knowledge and its application in practice, there is sometimes a gap resulting from the customer's specific use case.

This gap between theory and practice results from high complexity with scarce time resources.

Complexity: What are the right cloud services?

The complexity is already evident from the fact that the choice of services on hyperscalers such as Microsoft Azure is almost endless, as the following screenshot shows:



Quelle: https://azureperiodic.data3.com

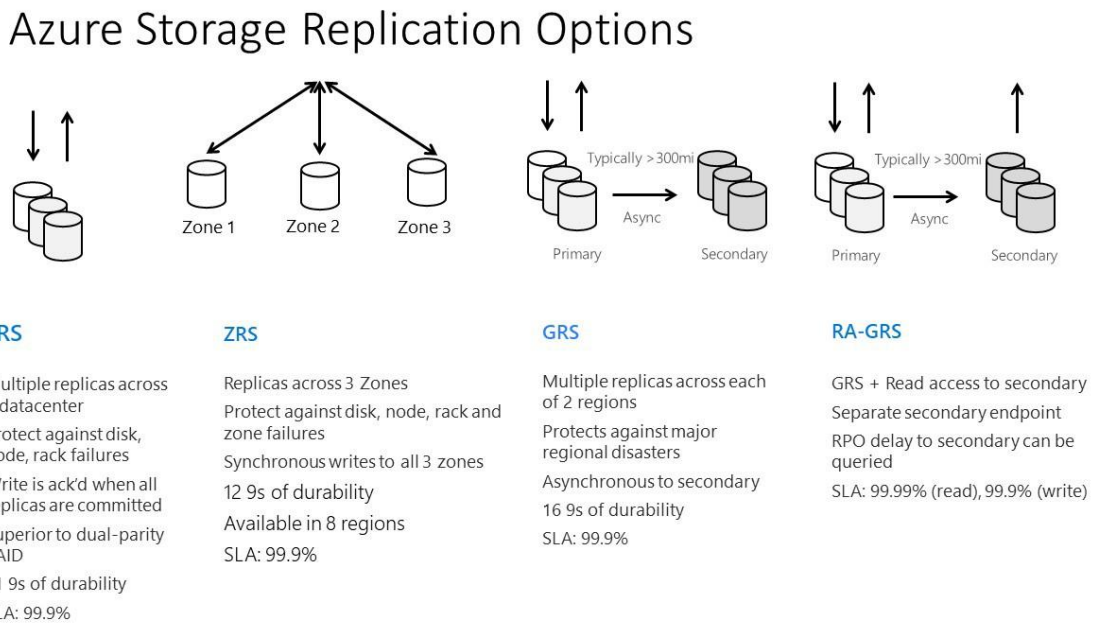
Microsoft offers over 200 different services, and the number is constantly growing. This oversupply makes it difficult to make valid decisions. The important question of how and with which services workloads can be brought into the cloud is almost impossible to answer without profound expert knowledge. Moreover, seemingly every four weeks a new service is added or an existing one is changed, renamed, or moved.

Partners and their customers are trying to build expertise within their own organizations in the form of certifications and proof-of-concepts. One example is experienced server administrators using on-premises expertise to try to build a cloud infrastructure. This is because most resource naming is identical: we talk about virtual machines, storage, networks, and backup both on-premises and in Azure.

Azure Cloud: Much more than a data center.

The obvious comparison of a cloud environment to a data center leads to wanting to provision and administer cloud services in the same way. However, the complexity of an Azure environment increases when the systematics for managing DNS, for example, are unknown.

A simple example: Storage is always offered in Azure in a very high availability, so there are at least three copies of the data - see the following graphic: this is rarely the standard in the data center.



Quelle: https://setumo.medium.com/az104-azure-storage-data-replication-c7150698ad27

While the general know-how about on-premises virtual machines is also very helpful for the administration of virtual machines in the Azure Cloud, this only applies at first glance to the setup of networks in Azure. This is because Azure provides customers with virtual networks that only appear to

function as one might be used to, but in their mode of operation they are to be understood as Software-Defined-WAN (SD-WAN). This creates another level of abstraction and thus more complexity.

An example of this is the use of public IPs, i.e., public Internet addresses under which a resource, such as a virtual machine, can be reached from the Internet. Actually, quite simple. To create a virtual machine in the Azure Portal, a public IP is offered. The administrator can choose between the Basic and Standard options. The Basic option is free - so the admin chooses Basic. This seems logical and simple. But it is not that simple. Because the decision for a certain option leads in the background to some consequences, which the administrator is not aware of in the first moment. Here is a brief comparison of the Basic and Standard options when using public IPs in Azure:

Public-IP Basic	**Public-IP Standard**
Dynamic or static	Static
Open by Default	Closed by Default

Incidentally, this complexity exists for very many services, such as VPN gateways, app services, or the selection of the hard disk for the virtual machines to be created. Without knowing the benefits of a deployment option, the probability of getting an undesired result during deployment is very high. Customers expect their partners to provide flawless advice, including fully understanding the impact of deployment options in advance of a migration project. But who has the time?

Scarce time resources: meeting customer expectations without risk

Complexity causes decisions about Microsoft Azure or cloud service installation to slow down significantly.

However, customers want a fast migration to the cloud and therefore expect a manageable implementation time that is as short as possible.

The sometimes reactive and therefore unstructured build-up of know-how and the risky execution of migration projects in trial-and-error mode are ways of dealing with the increased demand. This is understandable, but especially the second of the listed options can cost a lot of money. Then there's the annoyance of seemingly expensive, difficult-to-administer and confusing cloud services.

Is there a solution that can close the gap between theory and practice in an ad hoc manner to implement Azure services quickly and according to requirements?

Yes: One-Click-CAF allows partners to deliver the benefits of Azure cloud infrastructure to their customers on demand by automatically provisioning an Azure Landing Zone in less than 60 minutes. Reliable, proven in practice many times over and ready for immediate use.

One-Click-CAF: Reducing the complexity of building an Azure cloud infrastructure

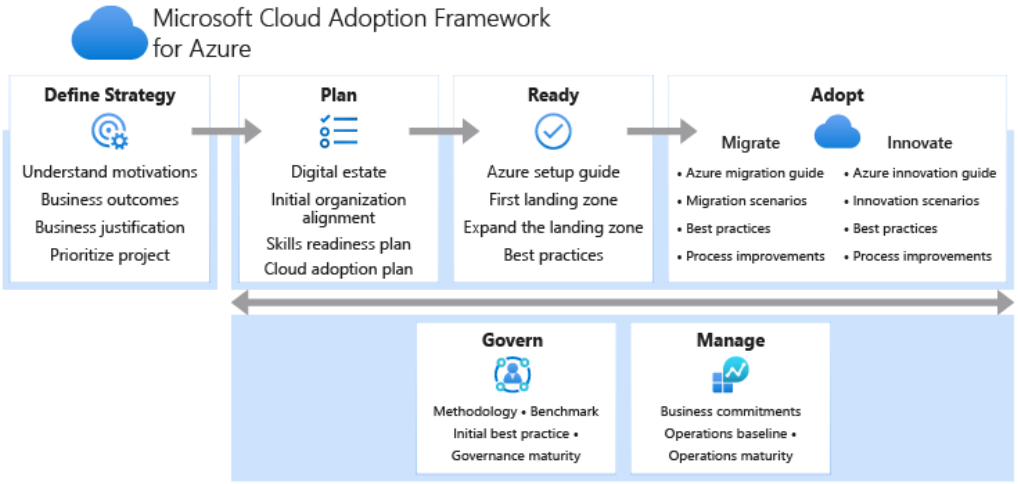
In many conversations with our partners and their end customers, we have learned that the difficulties in migrating to the cloud arise from a lack of know-how and resulting uncertainty. The "journey" to the cloud is started with a "bad gut feeling" or postponed altogether.

The IaaS team at Ingram Micro has set out to make it as easy as possible for our partners. Customers quickly reap the benefits of an Azure environment, via best practices, automated and reliable.

To do this, we didn't reinvent the wheel. However, One-Click-CAF makes it much easier to burn some rubber.

From Cloud Adoption Framework to One-Click-CAF

A few years ago, Microsoft began introducing what it calls the Cloud Adoption Framework (CAF). This structured approach is intended to help proceed in measurable steps on the cloud journey and thus build up the knowledge and necessary digital assets over a period of time. The procedure in the four milestones "define strategy", "plan", "ready" and "adopt" is methodical and comprehensible.



picture: Microsoft

One of the central building blocks of this methodology is the establishment of a so-called landing zone, a foundation that centralizes the setup and management of cloud environments. This landing zone contains management capabilities and resources, and there are rules for compliance and security standards. The Azure Landing Zone is customizable and based on Microsoft best practices. It is deployed via so-called Blueprints. These are collections of resource templates and policies that can then be rolled out to customers in a specific use case.

With the compilation of the resource templates on the basis of ARM templates and the provision of the entire collection in these blueprints, Microsoft has, in our opinion, taken a big step in the right direction. In exchanges with our partners, we could see that the Blueprints concept, however, requires significant expertise, both in the Azure client hierarchy and in understanding the code to be applied. Also, the necessary customization of the templates to the specific use case at the client was perceived by the partners as very cumbersome.

We spent a lot of time testing the blueprints in different customer scenarios. From this, the idea was born to offer a solution that makes getting started in the cloud as easy as possible.

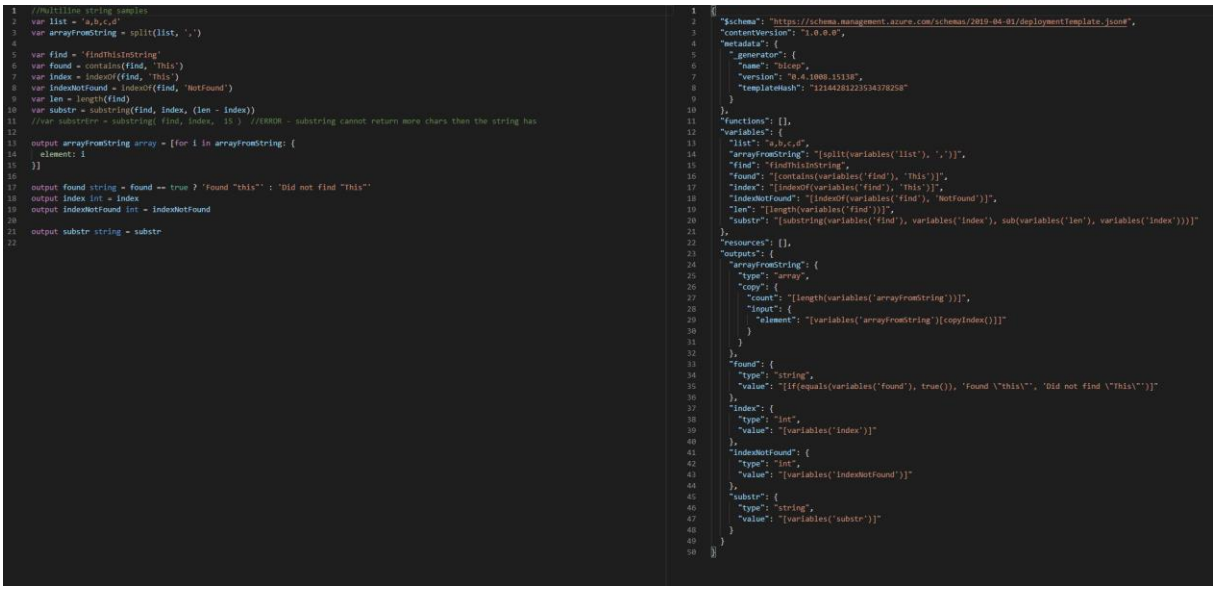
We find that "the better is the enemy of the good" and are convinced that One-Click-CAF will support the work of our partners even more.

One-Click-CAF - the modular foundation for the Azure Cloud

The goal was to create a modular solution that could be customized without much effort. Ingram Micro's IaaS team wants to use this solution to help partners "build a house" in the cloud for their customers. And for a house to be stable, you need a foundation.

Our partners should be able to provide the right foundation for each customer without any effort. With this clear goal in mind, the decision was made very soon that we wanted to follow the cloud adoption framework, especially the concept of the landing zone. However, working with our partners - as explained above - it became clear very quickly that the Blueprints concept was too complicated and not flexible enough for our requirements.

In our search for a modular and flexible method to build a "cloud foundation", we came across Infrastructure-as-Code (IaC). Using IaC, the cloud environment to be deployed can be assembled through code building blocks. Comparable to "Lego building blocks" for cloud services. There are several applications available on the market for this type of deployment, Terraform from Hashicorp is probably the best known. In an extensive trial, we found that Terraform did not provide the seamless support for Azure modules that we were looking for. So it was an opportune circumstance that Microsoft recently released Bicep, its own language for building IaC that seamlessly supports all Azure resources. Bicep is, as they say, "human readable" and all the code is very compact, as the following excerpt shows.



```
//Multiline string samples
var list = 'a,b,c,d'
var arrayFromString = split(list, ',')

var find = 'findThisInString'
var found = contains(find, 'This')
var index = indexOf(find, 'This')
var indexNotFound = indexOf(find, 'NotFound')
var len = length(find)
var substr = substring(find, index, (len - index))
//var substrErr = substring( find, index,  15 )  //ERROR - substring cannot return more chars then the string has

output arrayFromString array = [for i in arrayFromString: {
  element: i
}]

output found string = found == true ? 'Found "this"' : 'Did not find "This"'
output index int = index
output indexNotFound int = indexNotFound

output substr string = substr
```

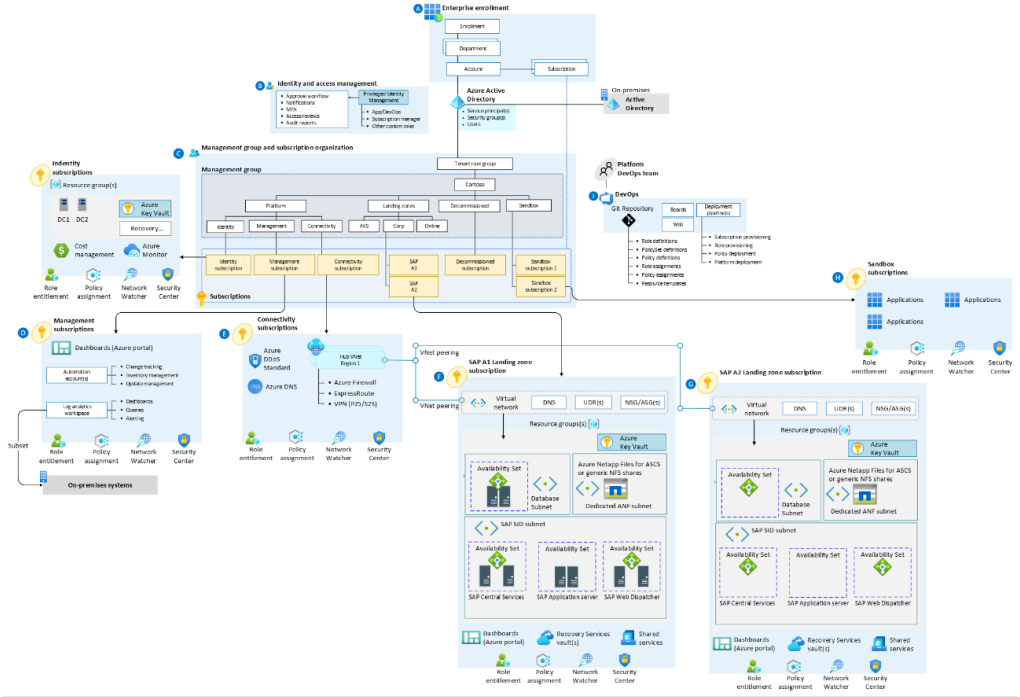
```
{
  "$schema": "https://schema.management.azure.com/schemas/2019-04-01/deploymentTemplate.json#",
  "contentVersion": "1.0.0.0",
  "metadata": {
    "_generator": {
      "name": "bicep",
      "version": "0.4.1008.15138",
      "templateHash": "12144281223534378258"
    }
  },
  "functions": [],
  "variables": {
    "list": "a,b,c,d",
    "arrayFromString": "[split(variables('list'), ',')]",
    "find": "findThisInString",
    "found": "[contains(variables('find'), 'This')]",
    "index": "[indexOf(variables('find'), 'This')]",
    "indexNotFound": "[indexOf(variables('find'), 'NotFound')]",
    "len": "[length(variables('find'))]",
    "substr": "[substring(variables('find'), variables('index'), sub(variables('len'), variables('index')))]"
  },
  "resources": [],
  "outputs": {
    "arrayFromString": {
      "type": "array",
      "copy": {
        "count": "[length(variables('arrayFromString'))]",
        "input": {
          "element": "[variables('arrayFromString')[copyIndex()]]"
        }
      }
    },
    "found": {
      "type": "string",
      "value": "[if(equals(variables('found'), true()), 'Found \"this\"', 'Did not find \"This\"')]"
    },
    "index": {
      "type": "int",
      "value": "[variables('index')]"
    },
    "indexNotFound": {
      "type": "int",
      "value": "[variables('indexNotFound')]"
    },
    "substr": {
      "type": "string",
      "value": "[variables('substr')]"
    }
  }
}
```

The code on the left is in the Bicep language; the code on the right creates an ARM template in JSON. Fun Fact: On closer inspection, Bicep is a translation language for the JSON-based ARM templates. This makes ARM simpler and less error prone.

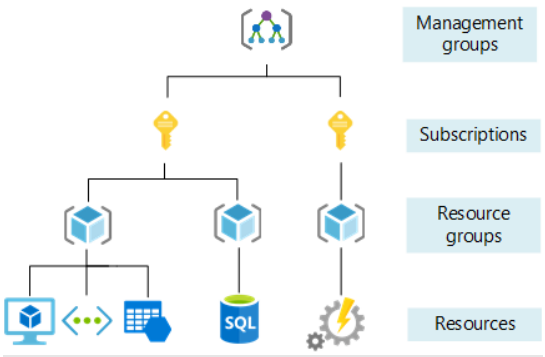
Since there are already a lot of ARM templates for Azure, existing templates can be converted to Bicep with a simple command. See also here https://github.com/Azure/azure-quickstart-templates

Bicep is thus the basis for the modularity of the cloud foundation. The next step was to adopt the Azure Landing Zone concept in a way that makes it easy and fast for our partners to deploy.

Microsoft has developed an enterprise-scale landing zone, which we believe is still quite complex.



picture: Microsoft



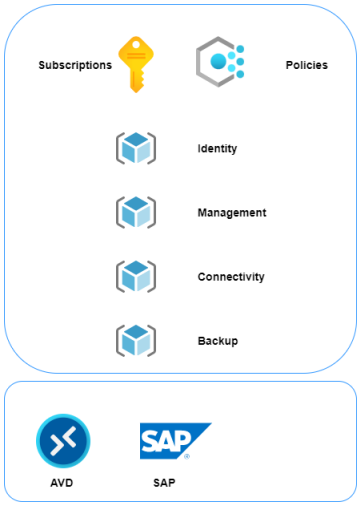
picture: Microsoft

Microsoft builds the landing zone at the subscription level.

To simplify management, One-Click-CAF builds the landing zone at the resource group level. This significantly reduces operational overhead.

One-Click-CAF automatically creates an Azure Landing Zone.

We want to provide our partners with a solution that is both quick to deploy and easy to manage. This allows us to support partners who have just started their cloud journey.



Standard Landing Zone

one subscription with 4 resource groups

One-Click Deployment.

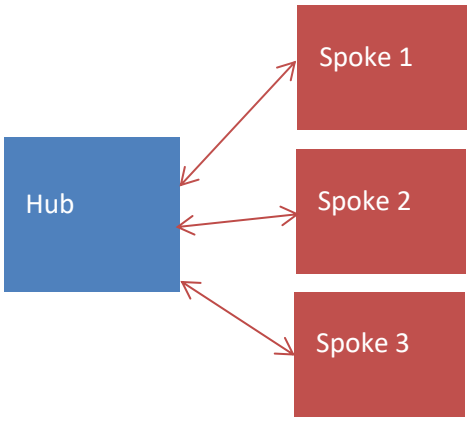
Extension of Landing Zone

Extending the landing zone with AVD, SAP, etc.

We have radically simplified the Microsoft concept and based it on the principle of the Minimum Viable Product (MVP). This makes our Landing Zone concept so simple and understandable that our partners can work with it immediately.

picture: Ingram Micro Deutschland

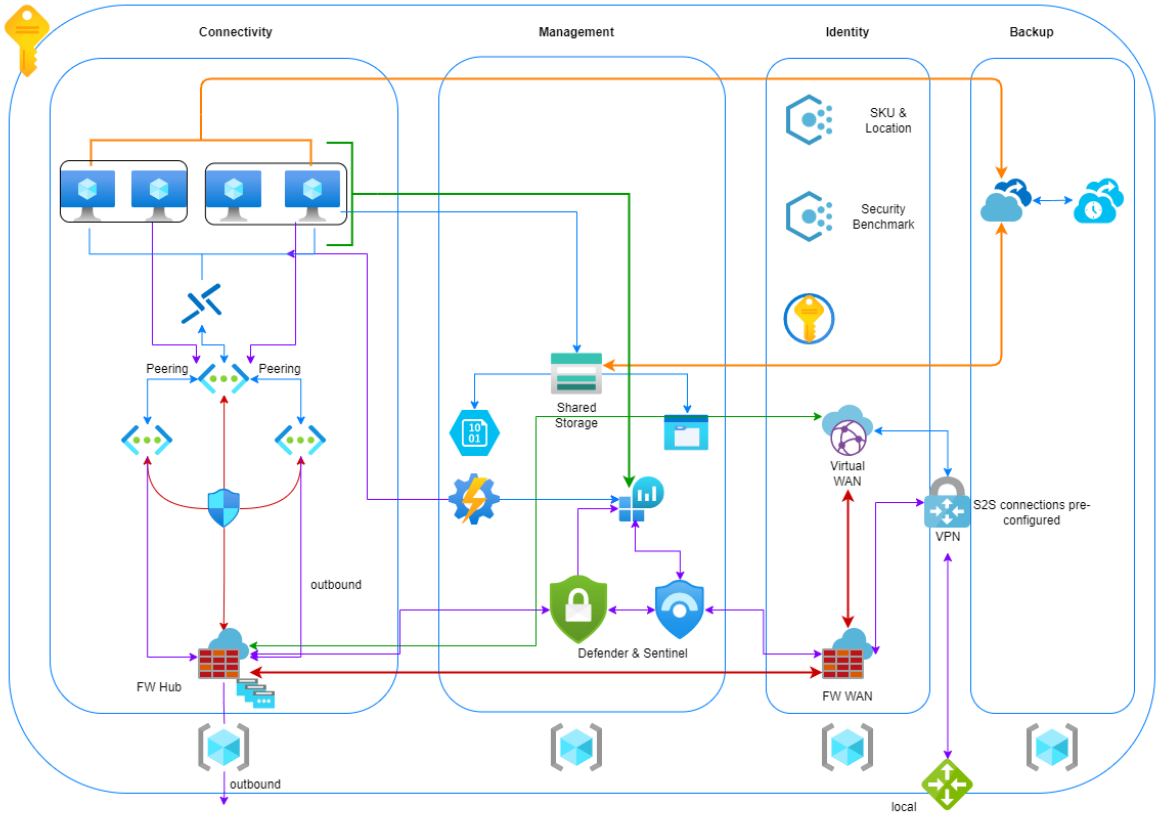
With One-Click-CAF, a hub is created that contains all relevant resources. Access to all resources (virtual machines, storage, networks, etc.) is controlled in the hub. The actual workloads (applications, databases, etc.) are connected to this landing zone as a spoke. The hub & spoke principle has proven to be very efficient.



picture: Ingram Micro Deutschland

Each spoke is connected to the hub. However, the individual Spokes are not in interaction. This means that an administrator can change, remove or add a spoke at any time without changing the overall construct. The hub can be used to control how the individual Spokes can be accessed. This increases the security of the cloud environment because accesses can be blocked in the hub.

The four resource groups in One-Click-CAF



Overview of One-Click-CAF; picture: Ingram Micro Deutschland

For easy management there are four resource groups with speaking names in the landing zone created with One-Click-CAF. The full names according to the template follow the syntax "[prefix]-connectivity-rg". This makes it easier to assign resources, which are outlined below.

Connectivity

- Hub & Spoke virtual networks connected by peering.
- In each spoke network there are two virtual machines (Prod / Dev).
- In the Hub network there is a bastion host to securely allow admin access.
- In the hub network there is a firewall to control the internet access.

Management

- There is a shared storage, as file storage for further installations.
- There is a log analytics workspace to collect telemetry data from the compute resources.
- The security analysis service Sentinel is present in this resource group - connected to Log Analytics Workspace.
- Defender for Cloud also accesses this workspace.
- An Automation Account is available to control automation.

Identity

- The Virtual WAN is used for connection management and access control.
- There is a firewall for the virtual WAN.
- There is a Key Vault to store certificates, secrets, and keys.
- There is a pre-configured VPN gateway to connect to an on-premises environment.

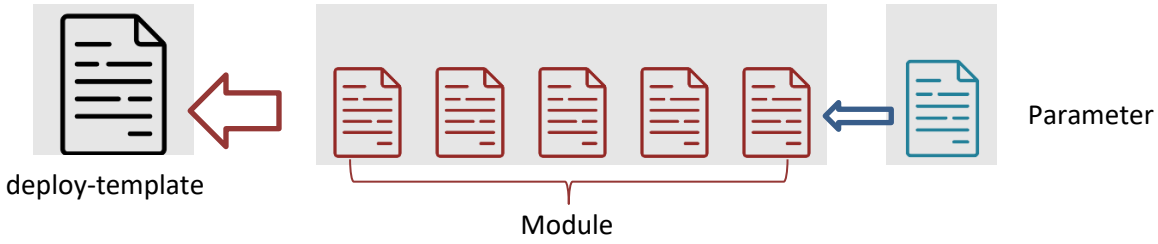
Backup

- Deploys a Recovery Vault with a preconfigured backup policy

Deployment of One-Click-CAF in different templates

One-Click-CAF is offered in three sizes (S, M, L). The sizes differ primarily in the size of the deployment. The figure above shows the largest deployment. In the smaller sizes, among other things, the virtual WAN has no firewall (M), and in the smallest size, the virtual WAN is omitted, and instead a NAT gateway is offered in combination with a load balancer to regulate Internet access.

The deployment in Azure is done via a "deploy-template". This template is connected to other templates via modules to trigger the desired actions. This allows the appropriate deployment to be added, omitted or modified at any time.



Similar to Hub & Spoke, modifications to the modules do not result in any changes to the deploy-template. To further increase flexibility and thus the possibilities of our partners to perfectly adapt One-Click-CAF to their end customers, the necessary parameters (name, network area, SKU, etc.) can be adapted via an additional parameter file without changing deploy-template or the modules.

Thus, we have achieved our goal: One-Click-CAF is a modular solution based on best practices that can be customized without much effort. This makes One-Click-CAF so flexible and simple that for our partners and their customers, the first steps in the Azure cloud are sure to be successful.

One-Click-CAF: Invest two consulting days

Partners receive One-Click-CAF as part of a two-day consultation. The consultation includes:

- A comprehensive introduction and training on One-Click-CAF.
- Explanation of the criteria for applying the most appropriate templates or size tiers (S, M, L) for proper Azure Landing Zone sizing.
- Application of One-Click-CAF, i.e., the complete deployment of an Azure Landing Zone.
- Outlining best practices for possibly extending the Azure Landing Zone created with One-Click-CAF to connect, for example, the Azure Virtual Desktop, a backup solution, or an SAP environment.
- Explanation of the possibilities to adapt to requirements in customer projects.

Consulting is provided remotely or in presence and in German language.

One-Click-CAF is offered via templates as infrastructure-as-code. After the initial deployment to customers, partners can purchase the usage rights of One-Click-CAF for further deployments. Alternatively, with the support of Ingram Micro Germany, you can migrate any of your customers to the cloud. The cloud architecture used is based on the Cloud Adoption Framework provided and recommended by Microsoft.

We fully explain how One-Click-CAF can be customized to your customers' needs and, in less than 60 minutes, provide a reliable, secure environment that enables your customers to take full advantage of the Azure cloud infrastructure.

One-Click-CAF can be requested through the Azure Marketplace. Or email IaaS team of Ingram Micro in Germany: de_iaas@ingrammicro.com