# How to never have a public S3 bucket

Teri Radichel Follow
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I was creating a simple website for my nephew's painting business in Tigard, Oregon in an S3 bucket, and also handled a consulting call on this topic today, so I thought I'd write a quick blog post about it. Do you ever need a public S3 bucket? In a large company, I would say no.

If you aren't aware, you can host a website in an S3 bucket. It's really simple and by doing so you don't have to set up a server. It works well for static websites that don't need a back end web server or pushing out static files from a dynamic website. You can set up a domain name and point it at the bucket. In this case, I set up http://rodmyre-house-painters.com to display files from a bucket with the same name. With just a couple of configuration changes the website is up and running. At this moment, I'm waiting for the

DNS to propagate so by the time you read this, the website might not yet be available. By the way, when I said simple website I wasn't kidding. I just got it online and told my nephew he can learn HTML if he wants to change it and I would help him out. Motivation!

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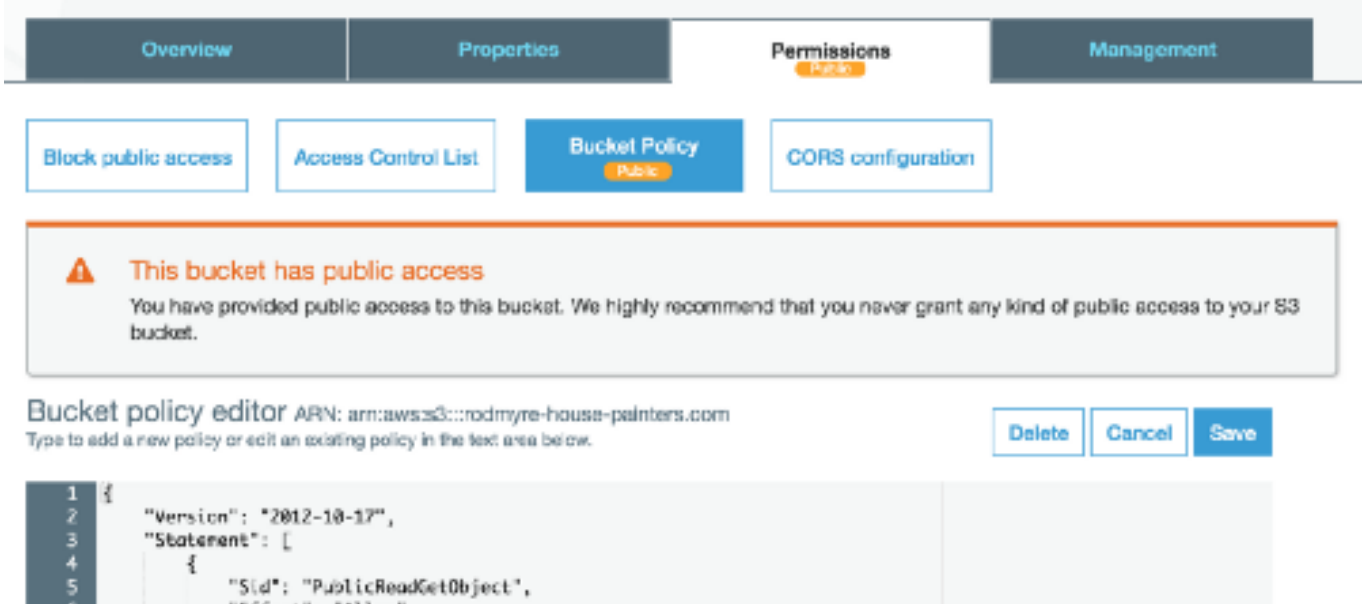
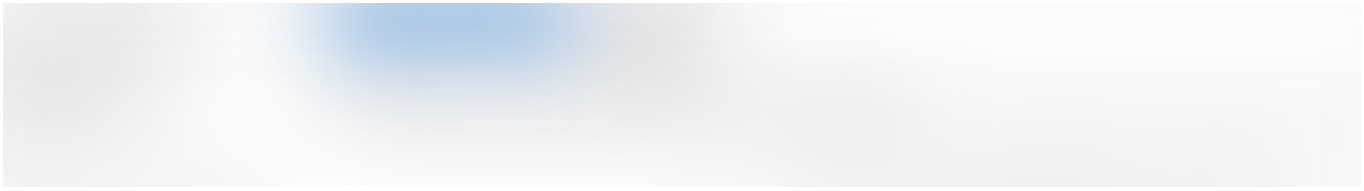
For this site, I did use a public bucket. First of all, my nephew is in college and painting houses over the summer through a company called College Pro. I'm not sure if he's going to continue doing it after this summer. He doesn't need CloudFront to distribute the content closer to web site visitors or the expense. After all, the bucket is in us-west-2 (Oregon) where his customers exist, so I figure the latency will be fine. He's not targeting people outside that area. There will only be a couple of people accessing the account and access to edit the bucket configuration is limited. So in this very simple case, perhaps a public S3 bucket to host his web site is fine, but only for reading files, of course.



```
            "Effect": "Allow",
            "Principal": "*",
            "Action": "s3:GetObject",
            "Resource": "arn:aws:s3:::rodmyre-house-pointers.com/*"
        }
    ]
}
```

As you can see in the image, AWS is giving me a big warning that this bucket is accessible from the Internet by telling me that I should never grant public access to my S3 bucket. Consider a larger organization where you need some governance to maintain your desired level of risk. In this case, I would say you never need a public S3 bucket. In that scenario, I could have put **CloudFront** in front of my S3 bucket to act as a **CDN**. I could create a bucket policy that only allows access from CloudFront. I could even put an AWS **WAF** in front of my bucket if it is hosting dynamic content. No one from the Internet would ever have direct access to the bucket, and the website would be more secure.

In addition to those options, you could configure permissions in your account to limit who can make buckets public. AWS made this easier by adding a new screen in S3 that allows you to lock down the ability to create public **bucket policies** or change **S3 ACLs** to allow public access. You can limit who has permission to change these settings and prevent any changes that would cause a bucket to become public and expose data.



What else could a large company do to prevent unwanted changes to S3 buckets? There's a feature called **VPC endpoints** (formerly I have referred to these as S3 endpoints as that was the first service that used them). You can set up VPC Endpoints to restrict access to all your S3 buckets from your AWS account over the AWS network and restrict access to the bucket only from specific endpoints. The endpoints could be configured by a team that understands networking and security, while developers would be allowed to create new buckets through restrictive IAM policies and **segregation of duties** with security checks that enforce VPC Endpoints to access S3 buckets.

S3 buckets used to require traversal over the Internet to access files in them. While on the Capital One cloud team, I helped manage the feature requests. One of them was private access S3 buckets. VPC Endpoints is the solution to that problem. VPC endpoints limit the traffic to the AWS backbone. You can also create restrictions in **VPC endpoint policies** on top of your **IAM policies** that can restrict which buckets a user or application can access, and S3 bucket polices that limit who can access the bucket.

In summary, if you set up your policies correctly and leverage all the tools provided by AWS, you can implement automated governance to prevent people from making mistakes, and any malware that might gain developer or application credentials from opening up private S3 buckets to the Internet. The same principles apply to similar services with different names on Azure and GCP. There's a lot more to a solid governance and deployment strategy, but those are a few things that will get you headed down the right path!

Teri Radichel — Follow me: @teriradichel

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WRITTEN BY

**Teri Radichel**

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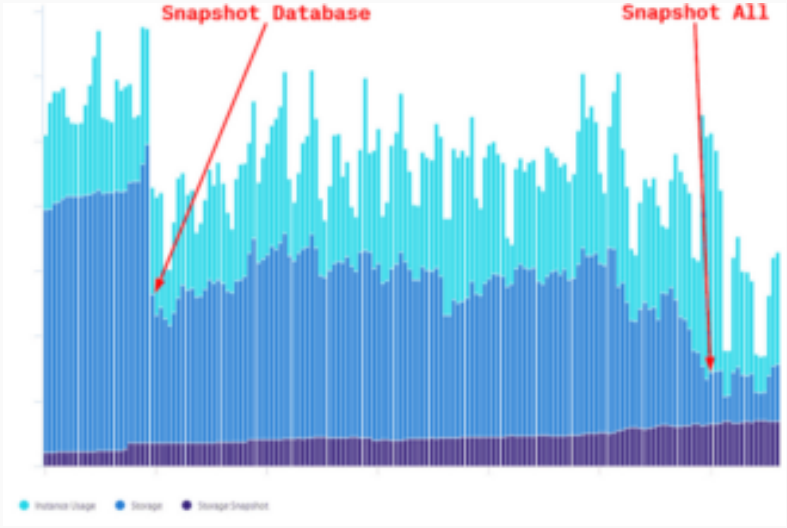


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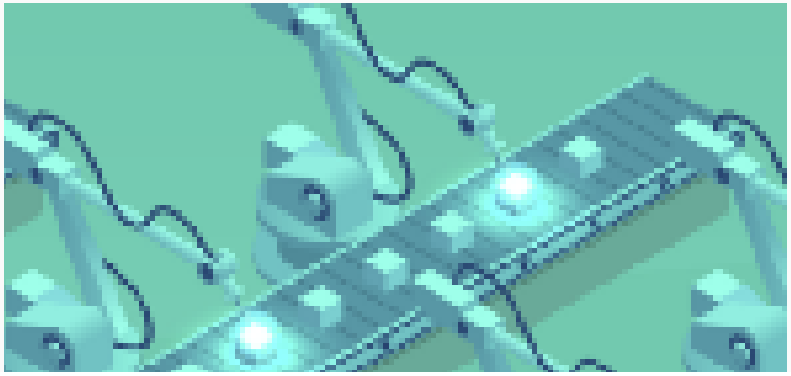

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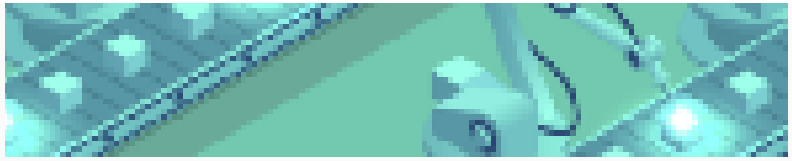

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