Cloud Provider Feature Matrix

		AWS	Azure	GCP
Strengths	General	Established and familiar; the option with the greatest brand awareness	Popular in Europe	Innovative, exploring machine learning options such as Tensorflow
		More people have experience with AWS than with its competitors		Open-source tools
		AWS was named a leader in IaaS by Gartner's Magic Quadrant		Although GCP is young, Google has engine maturity
		Broad geographic reach		Leader in capacity
		AWS has the greatest market share		Born from education
		Widest range of service offerings with many diverse options		"Follower" advantage as newer of the three
		Fewest "strings attached"		
	User Experience	Feature rich and reliable	User-friendly interface	Easy to set up
		Free, robust test accounts		User-friendly interface
		User-friendly interface		
		Strong and flexible API		
	IAM and Enterprise	Highly extensible and flexible identity model	Greater license flexibility and portability leads to cost savings	Ability (with Forseti) to set and force policy compliance across your entire Google domain
		Organizations are separate from accounts	Adding Azure to existing contracts with Microsoft is less trouble than creating a new contract and existing federated Microsoft accounts can be used	Ability to view activity across your entire Google domain
		Direct connect via Internet2 organizational billing	Strong identity management tools	IAM stack tightly integrated with Gsuite
		Control Tower automates setup of multi-account AWS environments, governance, guardrails (policy management), and dashboard visibility into OU, accounts, and guardrails.	Very good understanding of enterprise computing issues	Flexibility in contracting
			Active Directory Federation Service makes connecting to the Active Directory easier	Gsuite accounts are already provisioned for Gsuite users
	Integrations	Broad 3rd party support with more partners than its competitors	Tight integration with on-premise Microsoft Technology, including SQL and Exchange.	Supports Kubernetes and Docker
		Platform offerings can be easily migrated from on-premise LAMP stacks (MySQL -> Amazon Aurora, etc.)	Platform offerings can be easily migrated from on-premise Microsoft tools (MSSQL -> Azure SQL, etc.)	Google created Kubernetes, so the integration is very tight
		Serverless (AWS Lambda) supports Java, Node.js, Python, Java, C#, Go, Powershell and Ruby. Integrated with so many Amazon services making it accessible and powerful.	Azure container service allows deployment of DC/OS, Swarm, and Kubernetes clusters	Google docs accessibility, integration, and collaborative editing
		VMware Cloud on AWS provides hybrid cloud for VMware customers. Possible use cases include HA, DRA, host remediation, autoscaling, and disaster recovery.	IAM Stack tightly integrated with Office 365	
		A large amount of training and documentation; lots of learning resources are available	Microsoft has lots of man-power they can apply to Azure	Support offers cohesive solutions
		Large user community	There is a growing community for Azure	Reasonably transparent
		Strong front office with solutions and architects	Knowledgable sales team	
		Support web chat	Existing accounts team	

	Documentation, Support, and Community	Community mindshare		
		Re:Invent Conference, Public Sector Summit, and various local Meetups		
		Mature documentation and whitepapers around federal/HIPAA /etc. compliance		
	Sensitive Data and Security	Does Business Associate Agreements for restricted data such as HIPAA.	Very willing to do Business Associate Agreements for restricted data such as HIPAA	Does Business Associate Agreements for restricted data such as HIPAA. BAA includes list on a website that grows over time - pioneered this approach.
		Glacier is government compliant and cost effective		
		FISMA compliant option	Government platform is Department of Justice certified	
	Cost and Billing	Cost effective	Enterprise Billing tools from Microsoft (rather than a 3rd party)	Cheaper than AWS for most services
		Storage is cheap	Leverages investment in Microsoft licencing	Easy billing through Orbitera
		More advanced, granular billing	Often cheaper and willing to negotiate	
		Better forecasting tools		
		AWS Egress Waiver available for higher education		
	Unique or Desirable Features	Elastic search	Azure recovery services	Ability to add 1-n GPUs onto a commodity VM
		Scaling	Built in regional failiure prevention	Ability to choose your own instance
		AWS Direct Connect	Integration with SOAP	Seemingly unlimited compute
		Container management service is easy to deploy and fast	Azure Virtual Data Center	
		IPv6 support	Scalability	
			Big Compute: HPC and Batch	
	Innovation	Fast-paced innovation and development of new services		Big query and Tensorflow access for advanced machine learning
		Leaders in machine learning and other cutting edge technologies		Custom processor
	General	Limitations on OS varieties available	Network access can be be prohibitive	Can be difficult to contain GCP project proliferation within your domain
		"Divide and conquer" mentality is monopolistic	Issues with VPN support and bandwith management	"Marketplace" ecosystem is far less mature than AWS and Azure
		Some services lack depth and granularity	There are often problems when scaling to very large cores	Being later to the market means that GCP is less widely adopted
		It isn't possible to point loads to an external IP address	Uses hypervisor which is more knowledge-specific	Product offerings are often unknown and are not marketed well
		Procurement through 3rd party retailers can be complicated	Centered around stacks	"Follower" disadvantage
			Procurement through 3rd party retailers can be complicated	Storing data solely in the USA is not an option
			You need to have professional services even to just test something out or "play around"	Google is constantly rearranging cloud area, such as when they merged Gsuite and GCP
			Some faculty are anti-Azure	Setup can be complicated
			They are Microsoft, so all the pros are there, but so are all of the cons	A smaller number of services is available and GCP has a smaller ecosystem compared to its competitors

Weaknesses

		Often playing "catch up" with AWS	Container focused
			Ability to support legacy is limited
			Not as trusted
			Services come and go
			Fewer direct connect points
			Higher education engagement could be better
User Experience	The user interface can be confusing until you are used to it		
IAM and Enterprise	Reseller often usurps enterprise organization (parent AWS account) layer	It is not possible to customize the Active Directory in Azure	Immature "custom roles" function means sticking with "out of the box" IAM roles.
	There is no global view of activity across the range of accounts	IAM through InCommon can be a challenge	Limited ability to manage as an administrator
	Microsoft license reuse is a minefield	Licensing is complex	Permissions can be complicated
	Inflexible contract for state enterprise entities	Active directory federation service can be a hassle	IAM through InCommon can be a challenge
	No official service level agreement	Vendor lockin means you need to commit to Azure if you're going to use it	GCP has a weaker understanding of enterprise needs than its competitors
	SAML support is often lacking and expensive where it is present	Requires going through a VAR - not a value add in the cloud context.	
	The vendor locks in IAM		
	IAM is not well integrated		
	Permissions and account structure is complicated		
Integrations	Doesn't always play well with integrations and has a set way to do things		No seamless integrations
	There are not any directly integrated apps		
Documentation, Support, and Community		Lack of technical expertise	You have to escalate a ticket to support, which takes a while
		Unsophisticated networking	There is no phone to directly contact them; if you do get given a way to phone, you will be put on hold for a while
		Less documentation makes learning harder	Relationship management needs strengthening -- who do you talk to?
		Mixed experiences with SME	Front office is a "hot mess" and not very helpful
Sensitive Data and Security	Services often require a great deal of manual configuration to be properly secured		
	Getting HIPAA Business Associate Agreements in place can be challenging		
	Department of Justice did not approve AWS		
	Compliance challenges with GovCloud		
	The actual cost is often not articulated clearly and billing can be hard to understand	Level of education discount varies widely based on workload and can be difficult to determine	
	The billing structure can make it hard to download information because there is so much of it	Multiple enrollments and entitlements (and billing) can be complex	

	Cost and Billing	Oracle licensing adds expense	Rebilling subscriptions is a challenge	
		There is not a large enterprise discount	Inflexible contract with regards to Business Associates Agreement and government compliance	
		Pricing is unpredictable and often changes	Pricing model with SKU, forecasting and charge back leads to risk	
		There is no predetermined total cost of ownership		
	Unique or Desirable Features	Widest range of service offerings leads to a feature overload	Poor IPv6 support	Few developer support features for databases
		Limitations on EC2 customizations	SQL server is only in beta as a PaaS service	Lacking Windows infrastructure
			Default logging	Some overlap in products and features
				There is a collection of tools with little cohesion and no clear strategy
	Innovation	Tools keep being developed and changed at a rate that is hard to keep up with for support purposes and is confusing and intimidating for users	Rollout of changes is often a surprise and there is little warning; the roadmap for the future is often unclear	Roadmap for the future is typically opaque
			Missing some of the more advanced tools that its competitors have	
	General	How do regions failover?	What do they do better than other cloud providers? When use Azure vs. others?	What do they do better than other cloud providers? When use GCP vs. others?
		How will they exercise their dominate market position?	Will the open-source commitment continue?	How do you keep up with a vendor that wil need a "catch-up" release cycle?
		Why do people find them so trustworthy?	How do they compare to others with API support?	What migration services are available? Is there a migration readiness assessment?
		How do you go beyond just storing and computing?	Can it host Linux workloads as well as its competitors?	What is the commitment to current services and products?
		Is AWS as effective for research as its competitors?	What is their roadmap? Where are they going?	What is their roadmap? Where are they going?
		Why have so many people opted to use AWS?		What are they? What are their goals?
		Does it have the greatest geographic diversity?		Where do the services that they provide fit into Google's overall plans?
		How does its architecture work?		What is their product strategy? (Both GCP's and Google's as a whole)
		Is it the greatest source of spam?		
		What do they do better than other cloud providers? When use AWS vs. others?		
	User Experience			
	IAM and Enterprise	How do you create cohesive institutional deployment?	How does Azure licensing fit with MS licensing?	How do you do a POC on GPC? Is it possible?
				How do you manage an organization on GCP?
	Integrations		Will Office365 - Azure communication improve?	

Questions				
	Documentation, Support, and Community			
	Sensitive Data and Security	How much more security effort is it to secure something now vs. after the campus has become more experienced?		Will HIPAA compliance become available?
		How good is Cloudtrail for security?		
		How easy is it to get a Business Associate Agreement?		
	Cost and Billing	Do you have to pay extra for redundancy?		
		Why can't AWS disassociate master billing agreements in single universities for reporting?		
		Is it the most expensive option?		
		Is it expensive to get data out?		
		How do costs compare, especially for specific features?		
		How do we get to pricing predictability?		
	Unique or Desirable Features		Does Azure support DNSSEC?	
			What are their plans for IPv6 support?	
	Innovation		How is Azure pushing the limits on high performance computing?	What other changes are coming?