



Cloud and Container Optimization for Microsoft Azure

Automatically determine the cloud and container resources required to reduce cost and maximize performance in Azure. <u>Learn more.</u>

Azure VM Optimization

Densify's machine learning analyzes workload patterns to determine the optimal size and family for your Azure Virtual Machines (VMs), enabling you to:

- Reduce application performance and stability issues associated with under allocating resources to your VMs
- Increase utilization and lower costs by ensuring that you are not overallocating capacity to your VMs
- Avoid leaving CPU, memory or other resources stranded by picking the wrong instance family



Optimization details for your Azure Virtual Machine (VM)





Azure AKS Optimization

Densify's analytics predictively, precisely and continuously determine the appropriate resource settings for your Azure Kubernetes Service (AKS) containers allowing you to:

- Avoid application performance and stability issues
- Visualize the overall resource health of your entire Kubernetes environment with Histograms
- Increase node and cluster utilization by avoiding allocating too much CPU and memory to your applications
- Ensure cluster resource and namespace quotas are constantly aligned with app team requirements

Dens	ify							PUBLIC	CLOUD V	CONTAINERS	MY REPO	rts ~									? P
Kubernetes	Container (Optimization	Details																		
Analysis	Details												Cluster 1	ers Namespa 20	ces Pods 156		Surplus CPU Re 14,847 mCores		Surplus MEM Re 54,036 MB (et Savings (, 160.79 /mo 1 of 2 ← →
		Controller Type	# of Containers	Controller Pod	Container Name	Optimization Type	Current CPU Request (mCores)	Recom. CPU Request (mCores)	Surplus CPU Request (mCores)	Current CPU Limit (mCores)	Recom. CPU Limit (mCores)	Surplus CPU Limit (mCores)	Current Memory Request (MB)	Recom. Memory Request (MB)	Surplus Memory Request (MB)	Current Memory Limit (MB)	Recom. Memory Limit (MB)	Surplus Memory Limit (MB)	Net Savings (\$imonth)	Predicted Uptime (%)	# of Nodes
spreproduseast2 spreproduseast2		Deployment Deployment	1	nfs-deployment audit- deployment	nfs audit	Downsize	9	10	-1	500	10	250	2	10	-8	- 2.048	10	840	-0.06	65.4 95.8	1
spreproduseast2	eksedge-orc	Deployment	1	audit- deployment	istio-proxy	Resize	100	20	80	2,000	1,000	1,000	128	278	-150	1,024	514	510	0.87	95.8	2
spreproduseast2	eksedge-orc	Deployment	1	environment- deployment	environment	Upsize	250	450	-200	250	570	-320	1,024	2,924	-1,900	3,072	3,082	-10	-13.28	95.8	2
preproduseast2	eksedge-orc	Deployment	1	environment- deployment	istio-proxy	Downsize	100	20	80	2,000	1,000	1,000	128	118	10	1,024	514	510	1.65	95.8	2
preproduseast2	eksedge-orc	Deployment	1	loader- deployment	istio-proxy	Downsize	100	100	0	2,000	1,000	1,000	128	88	40	1,024	514	510	0.20	95.8	2
preproduseast2	eksedge-orc	Deployment	1	loader- deployment	loader	Upsize	500	1,500	-1,000	500	1,920	-1,420	1,024	3,064	-2,040	25,600	25,600	0	-29.96	95.8	2
preproduseast2	eksedge-orc	Deployment	3	scheduler- deployment	istio-proxy	Downsize	100	20	80	2,000	1,000	1,000	128	68	60	1,024	514	510	1.89	95.8	6
al esource Utilizat	tion Metrics: Con	tainer	234				156,451	113,514	44,847	276,050	199,380	98,230	303,760	252,084	54,036	508,043	385,782	149,701	1,160.79		
environment-		mCores (Current Set ment: Workload Chart			environment-deploy	zation in mCores (Reo ment_environment: Wor				Mem ironment-deployme	ory Utilization (Cur ent_environment: W	rrent Settings) bridoad Chart (Avg	2.258.42 MB)		environment-depl		ecommended Set ent: Workload Char		5	environment-dep	loyment_er
700 400 500 500 400 400 400 400 4	3 4 5 6 7 8	9 10 11 12 13 14 11 Time of Day	5 16 17 18 19 20 2	CPU Utilization in mCorres (m.		5 6 7 8 9 10 11 Time o		↓ ↓↓↓↓↓ 18 19 20 21 22 2	3.000 (2.500 0.0000 0.0000	0 1 2 3 4 5	6 7 8 9 10 11 Time	12 13 14 15 16 1 of Day	7 18 19 20 21 22 2	3.000 (BW) worthing 1.500 Webser 1.5000 Webser 1			10 11 12 13 14 1 Time of Day	5 16 17 18 19 20	0 21 22 23	14,000,000 12,000,000 8,000,000 4,000,000 2,000,000 0 0 0	1 2 3 4 5

• Lower your cloud bill by deploying fewer nodes for the same containers

Densify automatically analyzes thousands of containers to determine optimal settings

Enable Collaboration with Product & Application Owners

Densify automatically produces Impact Analysis and Recommendation Reports to share with stakeholders, letting you:

• Clearly articulate details for every optimization recommendation, including predicted utilization, effort level, and cost impact





• Include as an attachment to ITSM change tickets or integrate into business collaboration and approval workflows using Densify's API

Dens	, , , , , , , , , , , , , , , , , , ,	Effort: Low			Resource Utilization Impact					
2	2022 -	Rule Description	Impact on	Property	Utilization Metrics	standard_d2_v2 (Current)	standard_dc2s (Recommended)	Change		
his report provides details about the inst					CPU Utilization (%)	71.2	55.1	↓ 16 N/A —		
osts and policies. The report also includes then the recommendations are applied. F		Changing into Different Instance Family and Same Generation	Small (2%) Catalog Model - Instanc		Memory Utilization (%)	80*	70			
nd Recommendation Report.		Memory Utilization Metric Not Available Info (0%) Sizing Notes		Sizing Notes	Network IO Throughput (MB/s)	<0.1	<0.1			
Summary					* The current memory utilization is based o	n user-defined policy settings to b	ackfill missing memory usage data.			
System Name	st01-dev-kotl-413	Cost Impact		_	Resource Allocation Comparison					
System ID	st01-dev-kotl-413	Current Monthly Cost		\$16	Resource Type	standard_d2_v2 (Current)	standard_dc2s (Recommended)	Change		
Public Cloud	AZURE	Recommended Cost	Cost is	s based on on-demand price a \$157	CPU Count	2	2	-		
Subscription Name	Mobile Services (Pay-Go)		Cost is	s based on on-demand price a	CPU Benchmark	62.2	80.3	↑ 18.1		
System Type	Virtual Machine instance	Monthly Savings	\$5.18		Memory Allocation (GB)	7	8	1		
Instance Type	standard_d2_v2	Savings %	3.2%		Max Network IO Throughput (MB/s)	178.8	178.8	-		
Instance OS	Windows	Predicted Uptime %	88.7%	i	Local Storage Size (GB)	100	100	-		
Instance Type Recommendation	Change the instance type Optimal Family].		stande	ard d2 v2 (Current)	Max Local Disk IO Throughput (MB/s)	88.7	48	↓ 40.7		
	88.7%	On-Demand (S/Month)	163.15		Max Local Disk IO Operations (IOPS)	4,000	3,200	↓ 800		
Predicted Uptime %	The system has been runn of 7 days (168 hours).				CPU Utilization - Predicted Day	(Current Instance)	CPU Utilization - Predicted Day (Recommend	ed Instance		
Policy	Azure (Mobile_prod) This policy reflects best pr production environments Instance resource utilizati memory usage metrics an When downsizing instance exceed 50% and 60% resp cost savings.						$\begin{array}{c} \pm 1 + 4 + 4 + 2 + 4 + 4 + 4 + 4 + 4 + 4 + 4$			
Optimization Benefits						5 14 15 16 17 18 19 20 21 22 23		18 19 20 21 22		
Estimated savings of \$5.18 per month	n (3.2%)				Time of Da		Time of Day	1		
Run workload on newer generation h	osting infrastructure				 Min/Max = Sustained Activity = 	High Laivic BD	 Min/Max = Sustained Activity = High Diric II 	1		
Run workload on instance family with	well suited compute and memory r									

The Densify Impact Analysis Report for Azure communicates the projected impact of recommended changes to app owners to help with approvals

Integrate With CI/CD Pipelines & Automation Tools

- Free your teams from manually selecting resources
- Eliminate errors use APIs to tie directly into infrastructure as code templates like Terraform or Azure Resource Manager
- Ensure Performance by continuously aligning resources with application requirements

Learn more about Managing Container Infrastructure & Performance.



Integration with Automation API's and IaC





Why Continuous Cloud Optimization?

Learn how one of Densify's large Managed Service Provider (MSP) clients utilized a crawl-walkrun approach for implementing Azure VM optimizations. Read this article <u>The Path to</u> <u>Continuous Cloud Optimization</u>.