

# Using Zabbix as an Eye for Cost Controlling in Cloud Environments



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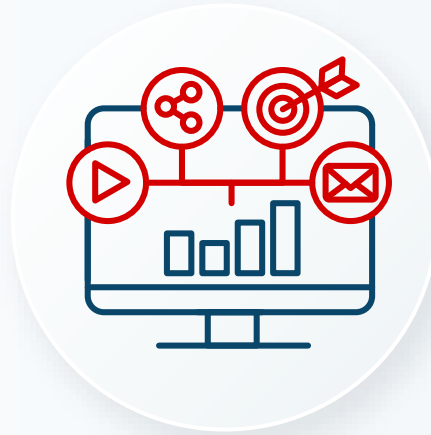
# Why should you monitor Cloud Costs?

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Dynamic  
pricing models



Complex  
services & regions



Direct  
business impact

# Make financial costs visible

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- ▶ Find oversized services
  - Low hanging fruits/fast
- ▶ Identify high-cost services
  - Look for possible alternatives
  - Optimize the system to reduce CPU/IO etc.
- ▶ Resize resources
  - Fit the costs to the needed use case
- ▶ Check Autoscaling and reservation models
- ▶ Use it for decision making
  - Budget planning
  - Forecasting the costs



# Preventing unexpected bills

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- ▶ Timely alerts
- ▶ Early anomaly detection
  - High CPU loads
  - High IO loads
  - High network traffic
  - Unused resources
- ▶ Protection against skyrocketing costs
  - Misconfiguration
  - Misusage (Developer tests on Production environment)
  - Malware
  - Mining software



# Better Decision-Making

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- ▶ Architecture choices driven by analyzing the usage patterns
  - Is it the right service model
  - GPU support needed
  - Own virtual server with Database vs Database as Service
- ▶ Supports you in the selection of pricing models
  - Integrate the costs information websites of your provider
  - Add items and triggers for changes on pricing models
- ▶ Supports you in strategic scaling
  - Use prediction items/trigger
  - Use calculated items with baselining
  - Use Dashboard graphs with multiple datasets and comparison timeframes



# Governance and Compliance

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- ▶ Enforce budgets
  - Compare actual costs to planned costs
- ▶ Historical data for analyzing and prediction
  - Understand why costs are increasing
  - Use prediction to resize when really needed and not before
  - Possibility to check the real availability against the bought availability
- ▶ Historical data for audit reviews





Zabbix – as your assistant



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- [illegible]

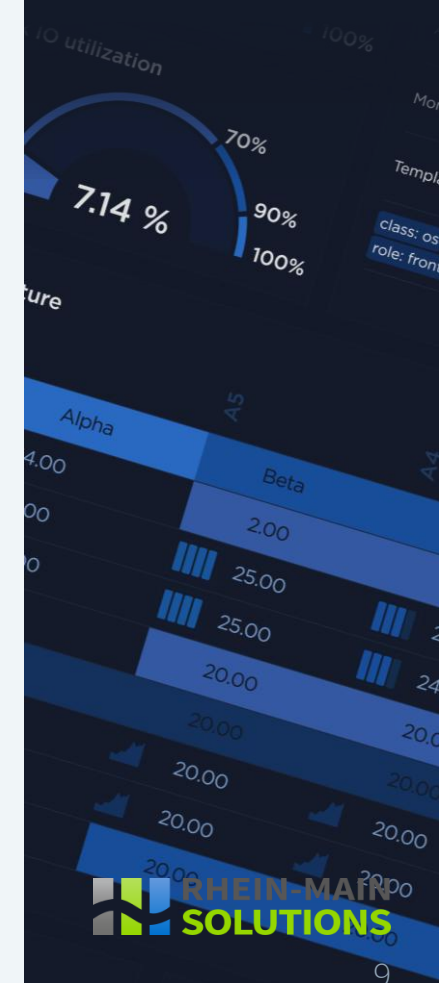


# AWS Monitoring with Zabbix

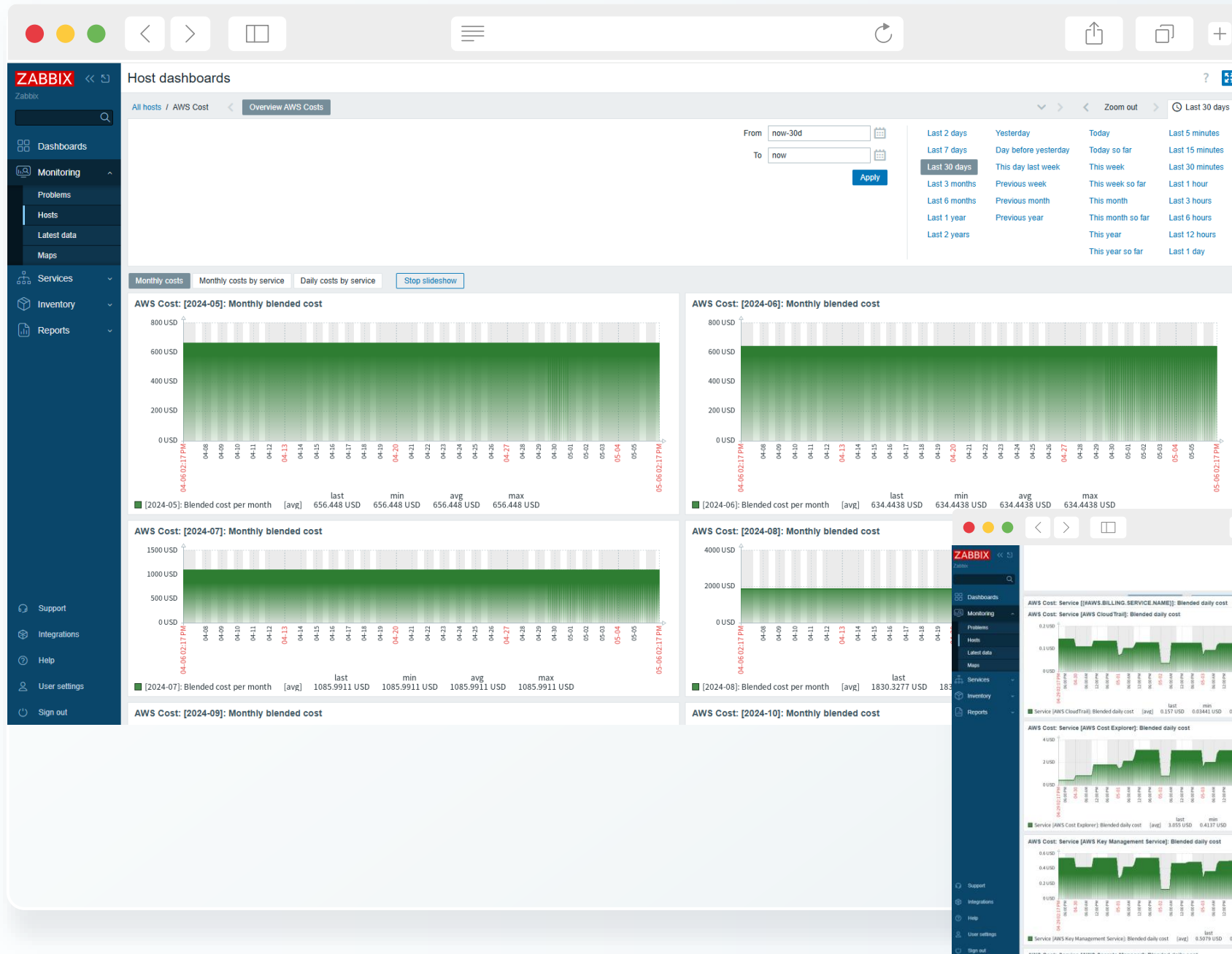
- ▶ Templates [AWS by HTTP](#) (AWS Cost Explorer by HTTP)
- ▶ Cost template available
  - Customize it to your needs

<input type="checkbox"/> Name ▲	Hosts	Items	Triggers	Graphs	Dashboards	Discovery	Web	Vendor	Version	Linked templates	Linked to templates	Tags
<input type="checkbox"/> AWS by HTTP	Hosts	Items	Triggers	Graphs	Dashboards	Discovery 6	Web	Zabbix	7.2-1			class: cloud target: aws
<input type="checkbox"/> AWS Cost Explorer by HTTP	Hosts	Items 2	Triggers	Graphs	Dashboards 1	Discovery 3	Web	Zabbix	7.2-1			class: cloud target: aws target: cost
<input type="checkbox"/> AWS EC2 by HTTP	Hosts	Items 29	Triggers 10	Graphs 4	Dashboards	Discovery 2	Web	Zabbix	7.2-2			class: cloud target: aws target: ec2
<input type="checkbox"/> AWS ECS Cluster by HTTP	Hosts	Items 13	Triggers 4	Graphs 3	Dashboards 1	Discovery 2	Web	Zabbix	7.2-2			class: cloud target: aws target: ecs
<input type="checkbox"/> AWS ECS Serverless Cluster by HTTP	Hosts	Items 15	Triggers 4	Graphs 4	Dashboards 1	Discovery 2	Web	Zabbix	7.2-2			class: cloud target: aws target: ecs
<input type="checkbox"/> AWS ELB Application Load Balancer by HTTP	Hosts	Items 32	Triggers 4	Graphs 4	Dashboards 1	Discovery 2	Web	Zabbix	7.2-2			class: cloud target: alb target: aws ...
<input type="checkbox"/> AWS ELB Network Load Balancer by HTTP	Hosts	Items 36	Triggers 2	Graphs 15	Dashboards 1	Discovery 2	Web	Zabbix	7.2-2			class: cloud target: aws target: elb ...
<input type="checkbox"/> AWS Lambda by HTTP	Hosts	Items 14	Triggers 2	Graphs 9	Dashboards 1	Discovery 1	Web	Zabbix	7.2-2			class: cloud target: aws target: lambda
<input type="checkbox"/> AWS RDS instance by HTTP	Hosts	Items 50	Triggers 10	Graphs 7	Dashboards	Discovery 4	Web	Zabbix	7.2-2			class: cloud target: aws target: rds
<input type="checkbox"/> AWS S3 bucket by HTTP	Hosts	Items 6	Triggers 2	Graphs	Dashboards	Discovery 2	Web	Zabbix	7.2-2			class: cloud target: aws target: s3

Displaying 10 of 10 found



# Sample for AWS costs template



# Azure Monitoring with Zabbix

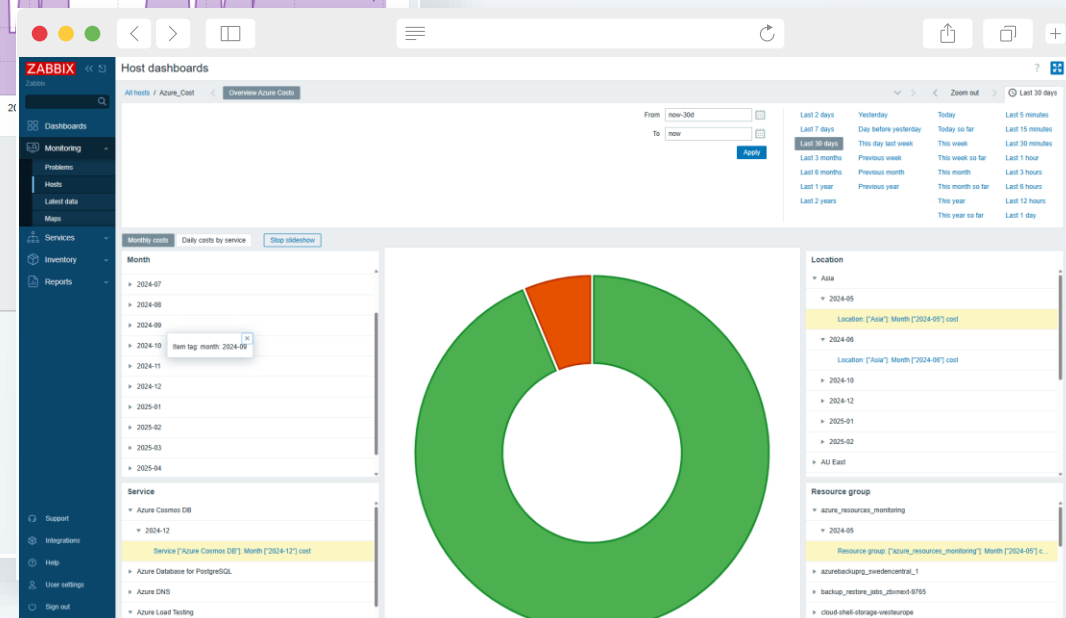
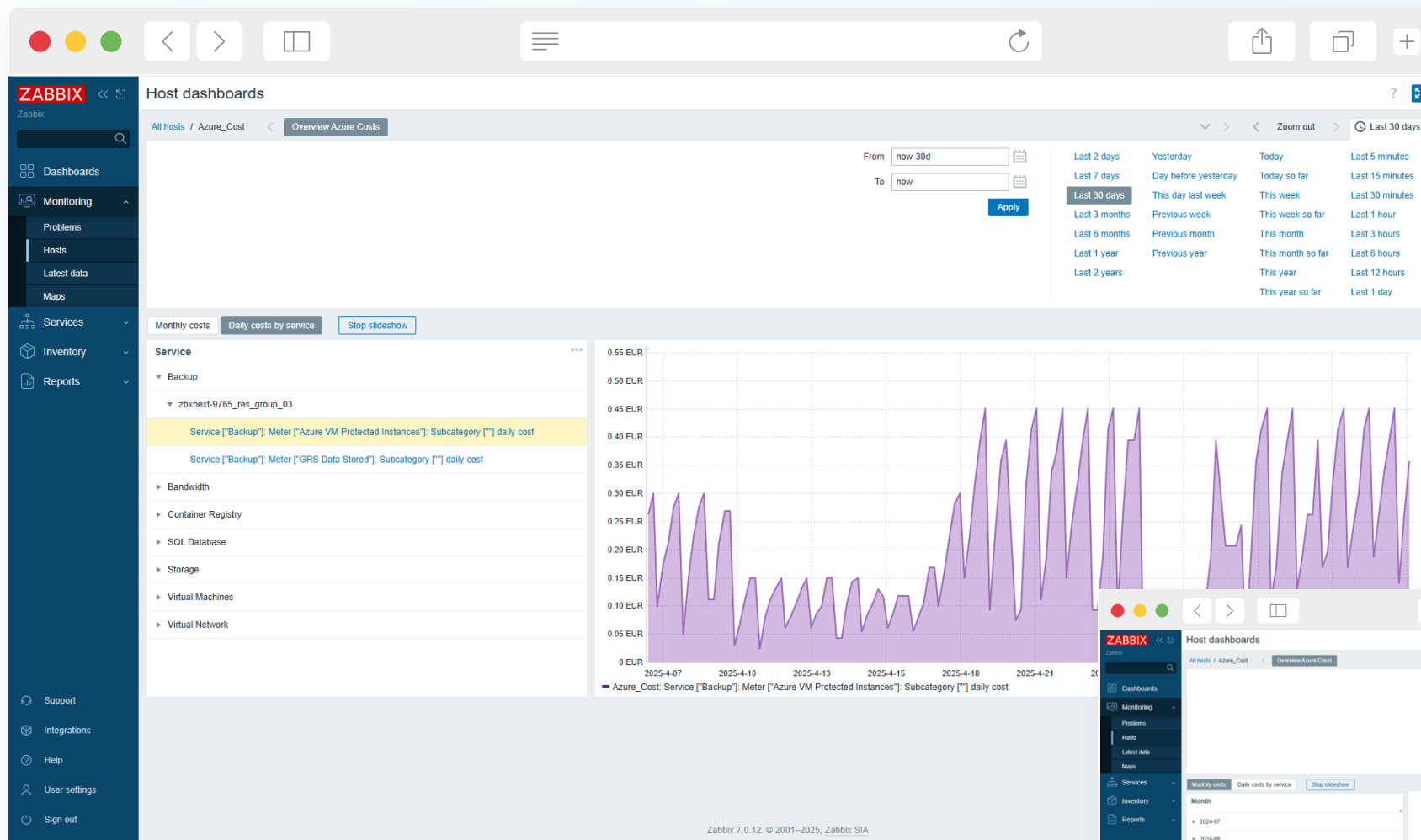
- ▶ Template [Azure by HTTP](#) (Azure Cost Management by HTTP)
- ▶ Cost template available
  - Customize it to your needs

<input type="checkbox"/> Name ▲	Hosts	Items	Triggers	Graphs	Dashboards	Discovery	Web	Vendor	Version	Linked templates	Linked to templates	Tags
<input type="checkbox"/> Azure by HTTP	Hosts	Items 4	Triggers 2	Graphs	Dashboards 1	Discovery 8	Web	Zabbix	7.2-3			class: software target: azure
<input type="checkbox"/> Azure Cosmos DB for MongoDB by HTTP	Hosts	Items 21	Triggers 2	Graphs 3	Dashboards 1	Discovery	Web	Zabbix	7.2-1			class: software target: azure target: cosmosdb ...
<input type="checkbox"/> Azure Cost Management by HTTP	Hosts	Items 4	Triggers 2	Graphs	Dashboards 1	Discovery 5	Web	Zabbix	7.2-1			class: software target: azure target: cost
<input type="checkbox"/> Azure Microsoft SQL Database by HTTP	Hosts	Items 28	Triggers 7	Graphs 3	Dashboards 1	Discovery	Web	Zabbix	7.2-1			class: software target: azure target: mssql
<input type="checkbox"/> Azure Microsoft SQL DTU Database by HTTP	Hosts	Items 27	Triggers 8	Graphs 3	Dashboards 1	Discovery	Web	Zabbix	7.2-0			class: software target: azure target: mssql
<input type="checkbox"/> Azure Microsoft SQL Serverless Database by HTTP	Hosts	Items 27	Triggers 7	Graphs 3	Dashboards 1	Discovery	Web	Zabbix	7.2-1			class: software target: azure target: mssql
<input type="checkbox"/> Azure MySQL Flexible Server by HTTP	Hosts	Items 20	Triggers 8	Graphs 3	Dashboards 1	Discovery	Web	Zabbix	7.2-1			class: software target: azure target: mysql
<input type="checkbox"/> Azure MySQL Single Server by HTTP	Hosts	Items 19	Triggers 9	Graphs 4	Dashboards 1	Discovery	Web	Zabbix	7.2-1			class: software target: azure target: mysql
<input type="checkbox"/> Azure PostgreSQL Flexible Server by HTTP	Hosts	Items 25	Triggers 8	Graphs 3	Dashboards 1	Discovery	Web	Zabbix	7.2-1			class: software target: azure target: postgresql
<input type="checkbox"/> Azure PostgreSQL Single Server by HTTP	Hosts	Items 20	Triggers 8	Graphs 4	Dashboards 1	Discovery	Web	Zabbix	7.2-1			class: software target: azure target: postgresql
<input type="checkbox"/> Azure SQL Managed Instance by HTTP	Hosts	Items 15	Triggers 11	Graphs 6	Dashboards 1	Discovery	Web	Zabbix	7.2-0			class: software target: azure
<input type="checkbox"/> Azure Virtual Machine by HTTP	Hosts	Items 61	Triggers 5	Graphs 11	Dashboards 1	Discovery	Web	Zabbix	7.2-1			class: software target: azure
<input type="checkbox"/> Azure VM Scale Set by HTTP	Hosts	Items 54	Triggers 6	Graphs 12	Dashboards 1	Discovery	Web	Zabbix	7.2-1			class: software target: azure

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# Sample for Azure costs template

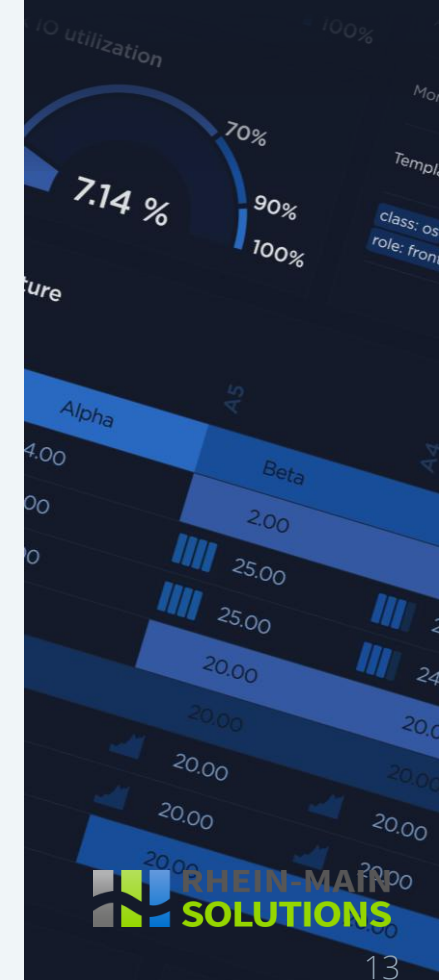


# GCP Monitoring with Zabbix

- ▶ Template [GCP by HTTP](#)
- ▶ No cost template until now
- ▶ Cost Estimation API deprecated
- ▶ [GCP Pricing API documentation](#) (new)
- ▶ [Billing Budget API documentation](#) (new)
- ▶ Could be implemented with own Template

<input type="checkbox"/> Name ▲	Hosts	Items	Triggers	Graphs	Dashboards	Discovery	Web	Vendor	Version	Linked templates	Linked to templates	Tags
<input type="checkbox"/> GCP by HTTP	Hosts	Items 12	Triggers 1	Graphs	Dashboards 1	Discovery 5	Web	Zabbix	7.2-2			class: cloud target: gcp target: google-cloud-pl...
<input type="checkbox"/> GCP Cloud SQL MSSQL by HTTP	Hosts	Items 42	Triggers 11	Graphs 7	Dashboards 1	Discovery 3	Web	Zabbix	7.2-2			class: cloud target: cloudsql target: gcp ***
<input type="checkbox"/> GCP Cloud SQL MSSQL Replica by HTTP	Hosts	Items 7	Triggers	Graphs 1	Dashboards 1	Discovery	Web	Zabbix	7.2-1			class: cloud target: cloudsql target: gcp ***
<input type="checkbox"/> GCP Cloud SQL MySQL by HTTP	Hosts	Items 31	Triggers 11	Graphs 6	Dashboards 1	Discovery	Web	Zabbix	7.2-2			class: cloud target: cloudsql target: gcp ***
<input type="checkbox"/> GCP Cloud SQL MySQL Replica by HTTP	Hosts	Items 8	Triggers	Graphs 1	Dashboards 1	Discovery	Web	Zabbix	7.2-1			class: cloud target: cloudsql target: gcp ***
<input type="checkbox"/> GCP Cloud SQL PostgreSQL by HTTP	Hosts	Items 27	Triggers 11	Graphs 6	Dashboards 1	Discovery 1	Web	Zabbix	7.2-2			class: cloud target: cloudsql target: gcp ***
<input type="checkbox"/> GCP Cloud SQL PostgreSQL Replica by HTTP	Hosts	Items 10	Triggers	Graphs 2	Dashboards 1	Discovery	Web	Zabbix	7.2-1			class: cloud target: cloudsql target: gcp ***
<input type="checkbox"/> GCP Compute Engine Instance by HTTP	Hosts	Items 31	Triggers 6	Graphs 4	Dashboards 1	Discovery 1	Web	Zabbix	7.2-2			class: cloud target: compute-engine target: gcp ***

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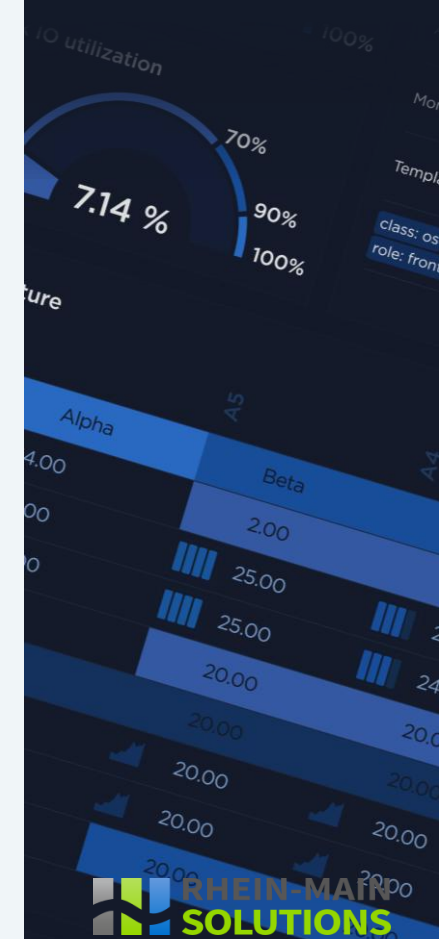


# OpenStack Monitoring with Zabbix

- ▶ Template [OpenStack by HTTP](#)
- ▶ No cost template, because not possible
- ▶ Multiple cloud providers use OpenStack
- ▶ Must be implemented with own template
  - Check the available APIs of your Cloud provider
  - Use AWS/Azure cost template as orientation
  - Create items/trigger that could be used in MultiCloud Dashboard
- ▶ If you are having your own OpenStack environment
  - Make the internal costs visible

<input type="checkbox"/> Name ▲	Hosts	Items	Triggers	Graphs	Dashboards	Discovery	Web	Vendor	Version	Linked templates	Linked to templates	Tags
<input type="checkbox"/> OpenStack by HTTP	Hosts	Items 1	Triggers	Graphs	Dashboards	Discovery 1	Web	Zabbix	7.2-0			class: cloud target: openstack
<input type="checkbox"/> OpenStack Nova by HTTP	Hosts	Items 15	Triggers 6	Graphs 3	Dashboards 1	Discovery 5	Web	Zabbix	7.2-1			class: cloud target: nova target: openstack

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# How to with Zabbix – Oracle Cloud

- ▶ Template [Oracle Cloud by HTTP](#)
- ▶ No cost template until now
- ▶ Resource Usage Cost API deprecates/not available
- ▶ [Cost Analysis API](#) (new)
- ▶ Could be implemented with own Template

<input type="checkbox"/> Name ▲	Hosts	Items	Triggers	Graphs	Dashboards	Discovery	Web	Vendor	Version	Linked templates	Linked to templates	Tags
<input type="checkbox"/> Oracle Cloud Autonomous Database by HTTP	Hosts	Items 40	Triggers 10	Graphs 22	Dashboards 1	Discovery	Web	Zabbix	7.2-3			class: cloud target: oci target: oracle-cloud-inf...
<input type="checkbox"/> Oracle Cloud Block Volume by HTTP	Hosts	Items 10	Triggers 2	Graphs 3	Dashboards 1	Discovery	Web	Zabbix	7.2-2			class: cloud target: oci target: oracle-cloud-inf...
<input type="checkbox"/> Oracle Cloud Boot Volume by HTTP	Hosts	Items 10	Triggers 2	Graphs 3	Dashboards 1	Discovery	Web	Zabbix	7.2-2			class: cloud target: oci target: oracle-cloud-inf...
<input type="checkbox"/> Oracle Cloud by HTTP	Hosts	Items	Triggers	Graphs	Dashboards	Discovery 6	Web	Zabbix	7.2-1			class: cloud target: oci target: oracle-cloud-inf...
<input type="checkbox"/> Oracle Cloud Compute by HTTP	Hosts	Items 14	Triggers 6	Graphs 9	Dashboards 1	Discovery 1	Web	Zabbix	7.2-2			class: cloud target: oci target: oracle-cloud-inf...
<input type="checkbox"/> Oracle Cloud Networking by HTTP	Hosts	Items 2	Triggers 2	Graphs	Dashboards	Discovery 1	Web	Zabbix	7.2-2			class: cloud target: oci target: oracle-cloud-inf...
<input type="checkbox"/> Oracle Cloud Object Storage by HTTP	Hosts	Items 12	Triggers 1	Graphs 6	Dashboards 1	Discovery	Web	Zabbix	7.2-2			class: cloud target: oci target: oracle-cloud-inf...

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# Challenges

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- ▶ Multi-cloud complexity
- ▶ Different accounting/billing models
  - Could be a challenge to make it comparable
- ▶ Different accounting/billing currency
  - Make it comparable
  - Define which currency should be used in Dashboards
  - Use calculated items for it
- ▶ Deprecation of APIs by Cloud providers
  - Could break... everything!
- ▶ Defining KPIs to make it comparable
  - Prerequisite for cross-cloud Dashboards



# Conclusion

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- ▶ Monitoring is critical
- ▶ Foundation for a sustainable cloud strategy
- ▶ Supports smart innovation
- ▶ Cloud loads are highly dynamic
- ▶ It is your job to create Cross Cloud Dashboards
  - Make data comparable by creating your own KPIs
  - Make sure to use LLDs to map your monitoring to thy dynamic resources



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