





Module 14: Troubleshooting



What's in This Module



-  **Part 1:** Troubleshooting Steps
-  **Part 2:** AWS Support Options

Module Objectives



Upon completing this module, you will be able to:

- 📦 Troubleshoot common errors.
- 📦 Discover various AWS Support Options available.

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Troubleshooting Common Errors



"My instance connection timed out."

Instance Connection Timed Out



Check your **routes**.

Is your **routing table** configured correctly?

Public subnets need Internet-bound traffic routed to an IGW.

Destination	Target
10.0.0.0/16	Local
0.0.0.0/0	IGW

If you're using a virtual private gateway, is your **VPN** routed correctly?

Make sure you're using the correct routing type for your VPN router (Dynamic or Static).



Instance Connection Timed Out



Check your **security group rules**.

Instances need both **inbound and outbound** rules permitting traffic.

Without rules, security groups deny all traffic, by default.



security group

Don't leave your security group **completely open**.

Publicly accessible hosts should be behind another layer of access that offers control (DNS, AWS WAF, ELB).



Inbound:
0.0.0.0/0

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Instance Connection Timed Out



Check your **network ACLs**.

Verify that your network ACLs allow traffic to and from your computer.

If applicable, check your corporate network's **internal firewall**.

Port 22 for Linux instances and port 3389 for Windows instances must be open to enable remote control via SSH for Linux or RDP for Windows.

Make sure your instance has a **public IP address**.

If you forgot to give it one, you can attach an elastic IP address without having to restart your instance.

Check the **CPU load** on your instance; it may be overloaded.

Use Amazon CloudWatch to check CPU use. If your instance is overloaded, consider scaling up to a larger instance type or scaling out to more instances running in parallel behind a load balancer.

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"My network performance is poor."

Poor Network Performance



Consider changing your **instance type**.

Are you using an instance type with **enhanced networking**?

Enhanced networking provides high performance (packets per second), low latency, and low jitter.



Amazon
EC2

If you're using a **NAT instance** on Amazon EC2, does it need to be scaled up to a larger size?

AWS NAT Gateways is equipped for handling high network throughput needs.



VPC NAT
gateway

Poor Network Performance



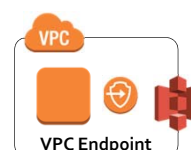
If used, make sure **jumbo frames** are enabled correctly.

If one instance has jumbo frames enabled, make sure all instances (including NAT instances) that it communicates with also have jumbo frames enabled.



Consider **VPC endpoints and AWS PrivateLink** where possible.

Connections between VPC resources and Amazon S3 will likely be faster if they use an Amazon S3 VPC endpoint instead of traversing the internet.



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“My I/O to my Amazon EBS volumes is too low.”



I/O Volume Is Low.



Review your **instance and EBS types**.

Are you using **EBS-optimized** instance types?

EBS-optimized instance types are designed for applications with heavy disk I/O.



Amazon EC2

Are you using an EBS type with high I/O?

***Provisioned IOPS SSDs** can provision up to 32,000 IOPS per volume.*



Amazon EBS

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"The CPU load on my Amazon RDS instances is too high."

CPU Load



Optimize your **queries**.

Determine which of your queries are slowest, and review them to determine if they can be optimized.

Use **read replicas**.

Letting a read replica handle read requests relieves the CPU load on your master RDS instance.

Ensure you're using the **best instance type**.

Your queries might require more CPU or memory. Test your queries against more powerful instance types to see if you should switch.

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"I get 'access denied' when I make a request to an AWS service."

Access Denied



Verify you have **permission** to call the action on that resource.

If any conditions are set, you must meet those conditions, as well.



permissions

Verify **resource policies**, if any, specify you as a principal and grant you access.

Services like Amazon S3, Amazon SNS, and Amazon SQS have resource-based policies.



Amazon
S3

Amazon
SNS



Amazon
SQS

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AWS Support Options



AWS Support Options



The Technical Account Manager provides...

- ✓ A dedicated **voice within AWS** to serve as your **advocate**.
- ✓ **Proactive guidance** and **insight** into ways to optimize AWS through business and performance reviews.
- ✓ Orchestration and access to the full **breadth and depth of technical expertise** across the full range of AWS.
- ✓ Access to resources and **best practice recommendations**.



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Infrastructure Event Management provides...

- ✓ A common understanding of event objectives and use cases through **pre-event planning and preparation**.
- ✓ Resource **recommendations** and deployment **guidance** based on anticipated capacity needs.
- ✓ **Dedicated attention** of your AWS Support team during your event.
- ✓ The ability to immediately **scale down resources** to normal operating levels post-event.

Learn more.

AWS Support Options



The Concierge Service provides...

- ✓ A primary contact to help **manage AWS resources**.
- ✓ **Personalized handling** of billing inquiries, tax questions, service limits, and bulk reserve instance purchases.
- ✓ Direct access to an agent to help **optimize costs** to identify **underutilized resources**.



Trusted Advisor provides...

- ✓ Insight into how and where you can get the **most impact for your AWS spend**.
- ✓ Opportunities to **reduce your monthly spend** and retain or **increase productivity**.
- ✓ Guidance on getting the **optimal performance and availability** based on your requirements.
- ✓ Confidence that your environment is **secure**.

Cost Optimization



0 0 0 0 0

Performance



1 0 0 0 0

Security



0 2 0 0 0

Fault Tolerance



0 0 0 0 0

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AWS Support Options



The AWS Personal Health Dashboard provides...

- ✓ **Alerts and remediation guidance** when AWS is experiencing events that may impact you.
- ✓ Personalized view of **service health** and the status of the AWS services that power your applications.
- ✓ Forward-looking notifications; you can **set up alerts across multiple channels**, including email and mobile notifications.

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Support Comparison



	Enterprise	Business	Developer	Basic
Customer Service 24x7x365	✓	✓	✓	✓
Support Forums	✓	✓	✓	✓
Documentation, White Papers, Best Practice Guides	✓	✓	✓	✓
AWS Trusted Advisor	Full Checks	Full Checks	Basic Checks	Basic Checks
Access to Technical Support	Phone, chat, email, live screen sharing, TAM (24/7)	Phone, chat, email, live screen sharing	Email (local business hours)	Support for Health Checks
Primary Case Handling	Sr. Cloud Support Engineer	Cloud Support Engineer	Cloud Support Associate	Technical Customer Service Associate
Users who can create Technical Support cases	Unlimited (IAM supported)	Unlimited (IAM supported)	1 (account credentials only)	
Case Severity/Response Times*	Critical: < 15 minutes Urgent: < 1 hour High: < 4 hours Normal: < 12 hours Low: < 24 hours	Urgent: < 1 hour High: < 4 hours Normal: < 12 hours Low: < 24 hours	Normal: < 12 hours Low: < 24 hours	
Architecture Support	Application Architecture	Use case guidance	Building blocks	
Best Practice Guidance	✓	✓	✓	
Client-side Diagnostic Tools	✓	✓	✓	
AWS Support API	✓	✓		
Third-Party Software Support	✓	✓		
Infrastructure Event Management	✓	Available at Additional cost		
AWS Concierge	✓			
Direct access to Technical Account Manager (TAM)	✓			
Prioritized Case Routing	✓			
Management Business Reviews	✓			

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Case Severity and Response Times



	Critical	Urgent	High	Normal	Low
Enterprise Plan (24x7)	15 minutes or less	1 hour or less	4 hours or less	12 hours or less	24 hours or less
Business Plan (24x7)		1 hour or less	4 hours or less	12 hours or less	24 hours or less
Developer Plan (Business hours*)				12 hours or less	24 hours or less

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Pricing



Basic	Developer	Business	Enterprise
Included	Greater of \$29 - or - 3% of monthly AWS usage	Greater of \$100 -or- 10% of monthly AWS usage for the first \$0-\$10K 7% of monthly AWS usage from \$10K-\$80K 5% of monthly AWS usage from \$80K-\$250K 3% of monthly AWS usage over \$250K	Greater of \$15,000 -or- 10% of monthly AWS usage for the first \$0-\$150K 7% of monthly AWS usage from \$150K-\$500K 5% of monthly AWS usage from \$500k-\$1M 3% of monthly AWS usage over \$1M

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Learn more. 

Pricing Examples



Business Pricing Example

For \$85K in AWS monthly usage:

$\$10,000 \times 10\% = \$1,000$
(10% of the first \$0 - \$10K of usage)

+ $\$70,000 \times 7\% = \$4,900$
(7% of usage from \$10K - \$80K)

+ $\$5,000 \times 5\% = \250
(5% of usage from \$80K - \$250K)

+ $\$0 \times 3\% = \0
(3% of usage over \$250K)

Total: \$6,500

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Enterprise Pricing Example

For \$1.2M in AWS monthly usage:

$\$150,000 \times 10\% = \$15,000$
(10% of the first \$0 - \$150K of usage)

+ $\$350,000 \times 7\% = \$24,500$
(7% of usage from \$150K - \$500K)

+ $\$500,000 \times 5\% = \$25,000$
(5% of usage from \$500K - \$1M)

+ $\$200,000 \times 3\% = \$6,000$
(3% of usage over \$1M)

Total: \$70,500

Review



- 📦 Revealed troubleshooting techniques to fix common errors.
- 📦 Reviewed various AWS Support Options available.

Complete: ☒ Knowledge Assessment

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Up Next: Module 15

Design Patterns and Sample Architectures



Thanks for participating!

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