

ICAPS IPPC 2014

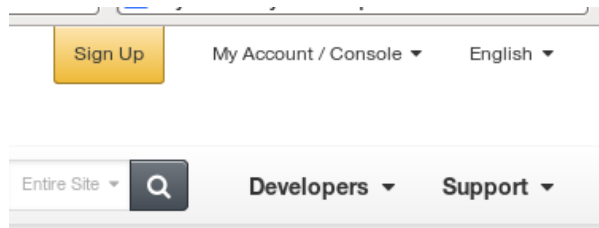
Amazon EC2 Setup Instructions, v3-9-11

Questions/comments to (ippc-2014-discrete@googlegroups.com)

Last Modified: Mar 6, 2014 04:45 PM

Step 1: Create an Amazon EC2 account

<http://aws.amazon.com/ec2/>



Signing up involves receiving an automated phone call, but this is a trivial step. You will also need to enter a credit card.

Select your AWS Support Plan

All customers receive free support. Choosing a paid support plan will allow you to receive one-on-one technical assistance from experienced engineers and access many other support features. [Click here to compare all Support plans.](#)

- ☒ **Basic (Free)**
Contact Customer Service for account and billing questions, receive help for resources that don't pass system health checks, and access the AWS Community Forums.
- ☐ **Developer (\$49/month)**
Get started on AWS – ask technical questions and get a response to your web case within 12 hours during local business hours.
- ☒ **Business (Starting at \$100/month - [Pricing example](#)) - Recommended**
24/7/365 real-time assistance by phone and chat, a 1 hour response to web cases, and help with 3rd party software. Access Trusted Advisor to increase performance, fault tolerance, security, and potentially save money. ([What's this](#))
- ☐ **Enterprise (Starting at \$15,000/month - [Pricing example](#))**
15 minute response to web cases, an assigned technical account manager (TAM) who is an expert in your use case, and white-glove case handling that notifies your TAM and the service engineering team of a critical issue.




[Continue](#)

**You should not need to pay for usage as the EC2 credits you will receive should cover up to 98 hours of large instance usage – more than you will need for the competition. Also, a single EC2 micro-instance is free. Your account details can be found [here](#):*

<http://aws.amazon.com/account/>

Step 2: Login to the AWS Management Console (if not already)

<http://aws.amazon.com/console/>

Entire Site  Developers  Support 

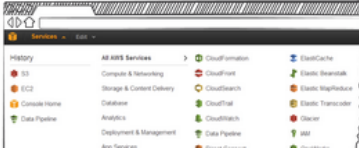
AWS Management Console

Sign in to the AWS Console

Access and manage Amazon Web Services through a simple and intuitive web-based user interface. You can also use the companion [AWS Console for iOS and Android](#) to quickly view resources on-the-go.




Features

Access all AWS services in one place




The AWS Management Console is a single destination for managing all your AWS resources, from EC2 instances to DynamoDB tables. Use the Console to perform any number of tasks, from deploying new applications to monitoring the health of your application.


Select EC2 Virtual Servers in the Cloud.


 Services  Edit 


Amazon Web Services

Compute & Networking

 **Direct Connect**
Dedicated Network Connection to AWS

 **EC2**
Virtual Servers in the Cloud

 **Route 53**
Scalable Domain Name System

 **VPC**
Isolated Cloud Resources

Step 3: Launch a test instance

<https://console.aws.amazon.com/ec2/>



Create Instance

To start using Amazon EC2 you will want to launch a virtual server, known as an Amazon EC2 instance.



Launch Instance

Note: Your instances will launch in the US East (N. Virginia) region

A. Choose an AMI: This will require you to choose an instance type, for uniformity of machine type for the competition, please use either:

**Amazon Linux AMI 2013.09.2** - ami-bba18dd2 (64-bit) / ami-d7a18dbe (32-bit)
The Amazon Linux AMI is an EBS-backed, PV-GRUB image. It includes Linux 3.4, AWS tools, and repository access to multiple versions of MySQL, PostgreSQL, Python, Ruby, and Tomcat.
Root device type: ebs Virtualization type: paravirtual

Select
☒ 64-bit ☐ 32-bit

**Microsoft Windows Server 2012 Base** - ami-814642e8
Microsoft Windows 2012 Standard edition with 64-bit architecture. [English]
Root device type: ebs Virtualization type: hvm

Select
64-bit

The AMI ID may change, but in short you should choose either Basic 64-bit Amazon Linux or Basic 64-bit Windows Server 2012.

B. Instance Details: This is where you choose the amount of memory. For uniformity in the competition, you are required to use the Large (m1.large, 7.5GB) instance type:

Currently selected: m1.large (4 ECUs, 2 vCPUs, 7.5 GiB memory, 2 x 420 GiB Storage Capacity)

General purpose

General purpose instances provide a balance of compute, memory, and network resources, and are a good choice for many applications. They are recommended for small and medium databases, data processing tasks that require additional memory, caching fleets, and for running backend servers for SAP, Microsoft SharePoint, and other enterprise applications.







| Size | ECUs ⁱ | vCPUs ⁱ | Memory (GiB) | Instance Storage (GiB) ⁱ | EBS-Optimized Available ⁱ | Network Performance ⁱ |
|-----------|-------------------|--------------------|--------------|-------------------------------------|--------------------------------------|----------------------------------|
| m1.small | 1 | 1 | 1.7 | 1 x 160 | - | Low |
| m1.medium | 2 | 1 | 3.7 | 1 x 410 | - | Moderate |
| m1.large | 4 | 2 | 7.5 | 2 x 420 | Yes | Moderate |

However, for **free experimentation** you can choose instead Micro (t1.micro, 613 MB):

Currently selected: t1.micro (up to 2 ECUs, 1 vCPUs, 0.613 GiB memory, EBS only)

Micro instances

Micro instances are a low-cost instance option, providing a small amount of CPU resources. They are suited for lower throughput applications, and websites that require additional compute cycles periodically, but are not appropriate for applications that require sustained CPU performance. Popular uses for micro instances include low traffic websites or blogs, small administrative applications, bastion hosts, and free trials to explore EC2 functionality.

| Size | ECUs  | vCPUs  | Memory (GiB)  | Instance Storage (GiB)  | EBS-Optimized Available  | Network Performance  |
|----------|--|---|--|--|---|---|
| t1.micro | up to 2 | 1 | 0.613 | EBS only | - | Very Low |








Micro instances are eligible for the AWS free usage tier. For the first 12 months following your AWS sign-up date, you get up to 750 hours of micro instances each month. When your free usage tier expires or if your usage exceeds the free tier restrictions, you pay standard, pay-as-you-go service rates.

[Learn more](#) about free usage tier eligibility and restrictions

For *Advanced Instance Options*, just use the defaults:

▼ Advanced Details









| | |
|---|--|
| Kernel ID  | <div>Use default </div> |
| RAM disk ID  | <div>Use default </div> |
| User data  | <div><input checked="" type="radio"/> As text <input type="radio"/> As file <input type="checkbox"/> Input is already base64 encoded</div> |

(Optional)

Add storage.

Step 4: Add Storage

Your instance will be launched with the following storage device settings. You can attach additional EBS volumes and instance store volumes to your instance, or edit the settings of the root volume. You can also attach additional EBS volumes after launching an instance, but not instance store volumes. [Learn more](#) about storage options in Amazon EC2.

| Type  | Device  | Snapshot  | Size (GiB)  | Volume Type  | IOPS  | Delete on Termination  |
|--|--|--|--|--|--|---|
| Root | /dev/sda1 | snap-b4ef17a9 | <input type="text" value="8"/> | <div>Standard </div> | N/A | <input checked="" type="checkbox"/> |

Add New Volume



Free tier eligible customers can get up to 30 GB of EBS storage. [Learn more](#) about free usage tier eligibility and usage restrictions.

It is not necessary to *add tags to your instance*, but you can if you want, e.g.,

Step 5: Tag Instance

A tag consists of a case-sensitive key-value pair. For example, you could define a tag with key = Name and value = Webserver. [Learn more](#) about tagging your Amazon EC2 resources.

| Key (127 characters maximum) | Value (255 characters maximum) |
|------------------------------|--------------------------------|
| Name | IPPC2014-client |

Create Tag (Up to 10 tags maximum)

C. Configure Firewall: you will need to access your instance externally via ssh and perhaps other tools (like remote desktop for Windows via the RDP protocol). So for now you need to open up these ports.

Later you will also need to open up custom ports for the competition server... this is easy to do in a later configuration window, but for some reason this initial configuration does not permit custom ports, so don't worry about this now.

For now I recommend just opening up the SSH, RDP, for now... maybe also HTTP or HTTPS if you need to access the web from your instance (e.g., installing software on your Windows image). Note that your instance incurs charges for Internet usage, but if your AWS account is new, you get *15Gb transfer in/out free per month for one year*.

Step 6: Configure Security Group

example, if you want to set up a web server and allow Internet traffic to reach your instance, add rules that allow unrestricted access to the HTTP and HTTPS ports. You can create a new security group or select from an existing one below. [Learn more](#) about Amazon EC2 security groups.

Assign a security group: ☒ Create a new security group
☐ Select an existing security group

Security group name: launch-wizard-1

Description: launch-wizard-1 created on Friday, February 28, 2014 11:51:23 PM UTC-5

| Type | Protocol | Port Range | Source |
|-----------------|----------|------------|--------------------|
| SSH | TCP | 22 | Anywhere 0.0.0.0/0 |
| Custom TCP Rule | TCP | 0 | Custom IP |

Add Rule

Warning

Rules with source of 0.0.0.0/0 allow all IP addresses to access your instance. We recommend setting security group rules to allow access from known IP addresses only.

D. Review and Launch Instance:

Step 7: Review Instance Launch

Please review your instance launch details. You can go back to edit changes for each section. Click **Launch** to assign a key pair to your instance and complete the launch process.

▼ AMI Details

[Edit AMI](#)

Amazon Linux AMI 2013.09.2 - ami-bba18dd2

The Amazon Linux AMI is an EBS-backed, PV-GRUB image. It includes Linux 3.4, AWS tools, and repository access to multiple versions of MySQL, PostgreSQL, Python, Ruby, and Tomcat.

Root Device Type: ebs Virtualization type: paravirtual

▼ Instance Type

[Edit instance type](#)

| Instance Type | ECUs | vCPUs | Memory (GiB) | Instance Storage (GiB) | EBS-Optimized Available | Network Performance |
|---------------|---------|-------|--------------|------------------------|-------------------------|---------------------|
| t1.micro | up to 2 | 1 | 0.613 | EBS only | - | Very Low |

▶ Security Groups

[Edit security groups](#)

▶ Instance Details

[Edit instance details](#)

▶ Storage

[Edit storage](#)

▶ Tags

[Edit tags](#)[Cancel](#)[Previous](#)[Launch](#)

If you do not have any key pairs, you will be asked to create one.

E. Create Key Pair: for secure access to a running instance, you need to create a key pair. Just choose a name you'll remember, click the button, and save the file; you'll need this file later to access your instance via *ssh* or *remote desktop*.

Step 7: Review Instance Launch

Please review your instance launch details. You can go back to edit changes for each section. Click **Launch** to assign a key pair to your instance and complete the launch process.

▼ AMI Details

[Edit AMI](#)

Free tier
eligible

▼ Instance Type

Instance Type

t1.micro

► Security Groups

► Instance Profile

► Storage

► Tags

[Edit instance type](#)[Edit network Performance](#)[Low](#)[Edit security groups](#)[Edit instance details](#)[Edit storage](#)[Edit tags](#)

Select an existing key pair or create a new key pair



A key pair consists of a **public key** that AWS stores, and a **private key file** that you store. Together, they allow you to connect to your instance securely. For Windows AMIs, the private key file is required to obtain the password used to log into your instance. For Linux AMIs, the private key file allows you to securely SSH into your instance.

Choose an existing key pair



Select a key pair

No key pairs found



No key pairs found

You don't have any key pairs. Please create a new key pair by selecting the **Create a new key pair** option above to continue.

Cancel

Launch Instances

Cancel

Previous

Launch

Step 7: Review Instance Launch

Please review your instance launch details. You can go back to edit changes for each section. Click **Launch** to assign a key pair to your instance and complete the launch process.

▼ AMI Details



Free tier
eligible

▼ Instance Details

Instance

t1.micro

► Security Groups

► Instance Profile

► Storage

► Tags

[Edit AMI](#)

[Edit instance type](#)

[Edit network performance](#)

[Edit security Low](#)

[Edit security groups](#)

[Edit instance details](#)

[Edit storage](#)

[Edit tags](#)

Select an existing key pair or create a new key pair



A key pair consists of a **public key** that AWS stores, and a **private key file** that you store. Together, they allow you to connect to your instance securely. For Windows AMIs, the private key file is required to obtain the password used to log into your instance. For Linux AMIs, the private key file allows you to securely SSH into your instance.

Create a new key pair ▼

Key pair name

jppckeypair

Download Key Pair



You have to download the **private key file** (*.pem file) before you can continue.

Store it in a secure and accessible location. You will not be able to download the file again after it's created.

Cancel

Launch Instances

Cancel

Previous

Launch

Launch Status



Your instance is now launching

The following instance launch has been initiated: [i-c156b0e2](#) [View launch log](#)



Get notified of estimated charges

[Create billing alerts](#) to get an email notification when estimated charges on your AWS bill exceed \$0.0 (in other words, when you have exceeded the free usage tier).

How to connect to your instance

Your instance is launching, and it may take a few minutes until it is in the **running** state, when it will be ready for you to use. Usage hours on your new instance will start immediately and continue to accrue until you stop or terminate your instance.

Click **View Instances** to monitor your instance's status. Once your instance is in the **running** state, you can **connect** to it from the Instances screen. [Find out](#) how to connect to your instance.

▼ Here are some helpful resources to get you started

- [How to connect to your Linux instance](#)
- [Amazon EC2: User Guide](#)
- [Learn about AWS Free Usage Tier](#)
- [Amazon EC2: Discussion Forum](#)

While your instances are launching you can also

[Create status check alarms](#) to be notified when these instances fail status checks. (Additional charges may apply)

[Create and attach additional EBS volumes](#) (Additional charges may apply)

[Manage security groups](#)

[View Instances](#)

Step 4: Get your software running on the test instance

View your running instances by clicking on *Instances in the* navigation pane

☐ INSTANCES

| **Instances**

Spot Requests

Reserved Instances

on the main console page

<https://console.aws.amazon.com/ec2/>

On the instances page, click the checkbox for your running instance (in this case I had previously called it IPPC2014-Client). When you do this, the bottom pane will display information. What's important for making a connection is the **Public DNS** name:

| <input type="checkbox"/> | Name | Instance ID | Instance Type | Availability Zone | Instance State | Status Checks | Alarm Status | Public DNS | Public IP | Key Name |
|-------------------------------------|-----------------|-------------|---------------|-------------------|----------------|---------------|--------------|------------------------|--------------|-------------|
| <input checked="" type="checkbox"/> | IPPC2014-client | i-c156b0e2 | t1.micro | us-east-1a | running | Initializing | None | ec2-54-84-148-30.co... | 54.84.148.30 | ippckeypair |

Instance: **i-c156b0e2 (IPPC2014-client)** Public DNS: **ec2-54-84-148-30.compute-1.amazonaws.com**

| | | | |
|----------------|--|------------|------|
| Description | Status Checks | Monitoring | Tags |
| Instance ID | i-c156b0e2 | | |
| Instance state | running | | |
| Public DNS | ec2-54-84-148-30.compute-1.amazonaws.com | | |
| Public IP | 54.84.148.30 | | |

You connect to your running instance just as you would connect to any remote server. How you do this depends on what machine you are connecting from (Linux/Mac or Windows) and what EC2 instance you are connecting to (Linux or Windows). For simple instructions on each of these cases, please refer to page 3 here:

<http://awsdocs.s3.amazonaws.com/EC2/latest/ec2-gsg.pdf>

Page 5 tells you how to connect to a Linux EC2 instance from various local machines. Pages 3-5 tell you how to connect to a Windows EC2 instance from a local Windows machine. You can probably use *rdesktop* as well if your local machine is Linux.

Example: Assuming that your private key file is named *keypair.pem* (your key file was created and downloaded to your local machine in Step 3E), in Linux you can use the following command to connect to your instance

```
ssh -i keypair.pem ec2-user@ec2-XX-XX-XXX-xx.compute-1.amazonaws.com
```

where *ec2-XX-XX-XXX-xx.compute-1.amazonaws.com* should be replaced by the DNS name of your instance.

We have not worked with the Windows system yet, but if you have a remote desktop connection and http/https firewall access on your EC2 instance, installing packages and transferring files should be the same as if it were your local computer.

On Linux, you can copy over your files with *scp*. You may also need to install packages (e.g., *javac* or *gcc* if you want to compile on the EC2); for the Amazon Linux instances, the package manager is *yum*. Here are quick examples of *yum* usage (output in yellow):

```
sudo yum install emacs
```

```
yum whatprovides */javac
```

```
Loaded plugins: priorities, update-motd, upgrade-helper
1:java-1.6.0-openjdk-devel-1.6.0.0-62.1.11.11.90.55.amzn1.x86_64 : OpenJDK Development Environment
Repo      : amzn-main
Matched from:
Filename  : /usr/lib/jvm/java-1.6.0-openjdk-1.6.0.0.x86_64/bin/javac

1:java-1.6.0-openjdk-devel-1.6.0.0-65.1.11.13.56.amzn1.x86_64 : OpenJDK Development Environment
Repo      : amzn-updates
Matched from:
Filename  : /usr/lib/jvm/java-1.6.0-openjdk-1.6.0.0.x86_64/bin/javac
```

sudo yum install java-1.7.0-openjdk-devel-1.7.0.45-2.4.3.2.32.amzn1.x86_64

Running transaction check

Running transaction test

Transaction test succeeded

Running transaction

Installing : libfontenc-1.0.5-2.6.amzn1.x86_64

1/8

Installing : libXfont-1.4.5-3.8.amzn1.x86_64

2/8

Installing : 1:xorg-x11-font-utils-7.2-11.5.amzn1.x86_64

3/8

Installing : lcms2-2.3-2.2.amzn1.x86_64

4/8

Installing : ttmkfdi-3.0.9-32.1.5.amzn1.x86_64

5/8

Installing : xorg-x11-fonts-Type1-7.2-9.1.5.amzn1.noarch

6/8

Installing : 1:java-1.7.0-openjdk-1.7.0.45-2.4.3.2.32.amzn1.x86_64

7/8

Installing : 1:java-1.7.0-openjdk-devel-1.7.0.45-2.4.3.2.32.amzn1.x86_64

8/8

Verifying : xorg-x11-fonts-Type1-7.2-9.1.5.amzn1.noarch

1/8

Verifying : libXfont-1.4.5-3.8.amzn1.x86_64

2/8

Verifying : 1:java-1.7.0-openjdk-1.7.0.45-2.4.3.2.32.amzn1.x86_64

3/8

Verifying : ttmkfdi-3.0.9-32.1.5.amzn1.x86_64

4/8

Verifying : 1:xorg-x11-font-utils-7.2-11.5.amzn1.x86_64

5/8

Verifying : lcms2-2.3-2.2.amzn1.x86_64

6/8

Verifying : 1:java-1.7.0-openjdk-devel-1.7.0.45-2.4.3.2.32.amzn1.x86_64

7/8

Verifying : libfontenc-1.0.5-2.6.amzn1.x86_64

8/8

Installed:

java-1.7.0-openjdk-devel.x86_64 1:1.7.0.45-2.4.3.2.32.amzn1

Step 5: Connect your IPPC client to the RDDLSim Server

We will have one server running on a *dedicated port for each competition entrant*. Please ensure that you connect to your dedicated port. If you believe the server for your port has crashed, email Scott (ssanner@gmail.com) and Marek (mgrzes@cs.uwaterloo.ca) to reset it.

| Group Members | SERVER_PORT |
|---------------|-------------|
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A. Configure Firewall: to connect to the RDDLSim server you need to unblock the appropriate ports in the range 2300-2316.

View your security groups by clicking on *Instances* in the navigation pane



Select the security group assigned to your instance. Then add a *custom* TCP port corresponding to your assigned SERVER_PORT in the table above, for example:

Create Security Group

Delete

...

↶

⚙

?

Viewing:

All Security Groups

Search

1 to 2 of 2 Items

| | Group ID | Name | VPC ID | Description |
|-------------------------------------|-------------|-----------------|--------------|--|
| <input type="checkbox"/> | sg-e100d384 | default | vpc-a1dd2cc4 | default VPC security group |
| <input checked="" type="checkbox"/> | sg-9104d7f4 | launch-wizard-1 | vpc-a1dd2cc4 | launch-wizard-1 created on Friday, February 28, 2014 11:51:23 PM UTC-5 |

1 Security Group selected

Security Group: launch-wizard-1

Details

Inbound

Outbound

Create a new rule:

Custom TCP rule

Port range:

(e.g., 80 or 49152-65535)

Source:

0.0.0.0/0

(e.g., 192.168.2.0/24, sg-47ad482e, or 1234567890/default)

Add Rule

Apply Rule Changes

TCP

| Port (Service) | Source | Action |
|----------------|------------------|--------|
| 22 (SSH) | 99.236.19.126/32 | Delete |
| 3389 (RDP) | 99.236.19.81/32 | Delete |

B. Connect your client to the EC2 RDDLSim server: if you copy over the RDDLSim repository to EC2 (tgz or zip it first!), you should be able to execute the following sample client command (example for Linux):

```
./run rddl.competition.Client
files/test_comp/rddlSERVER_NAMEYourClientNamerddl.policy.SPerseusSPUDDPolicy
SERVER_PORT123456sysadmin_inst_mdp__1
```

Here you need to replace SERVER_NAME with the name of the server sent by Scott via email and SERVER_PORT by the appropriate port assigned above. If running this is successful, then the Server will log all of your interactions and you are ready to compete!

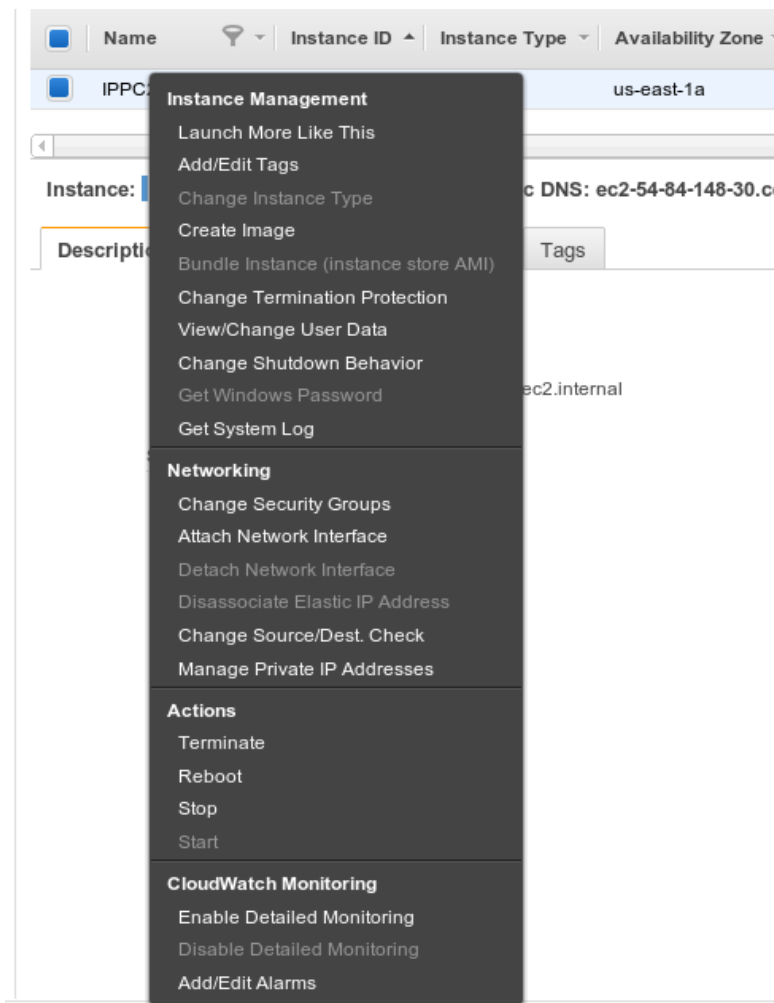
Step 6: Terminate your instance

If you are using anything other than the free Amazon Linux Micro-instance, you need to stop or terminate your instance to avoid using credits or paying for Amazon EC2 usage when not needed.

View your running instances by clicking on **Instances** in the navigation pane



Now right click on your instance and select either Stop or Terminate.



If you Terminate, **all modifications** to that machine such as package installations and all data on the virtual hard drive **will be lost**. Hence Stopping is better if you want to return to that particular instance and your saved data. When Starting again, note that the public DNS address you use to access the instance has probably changed.