

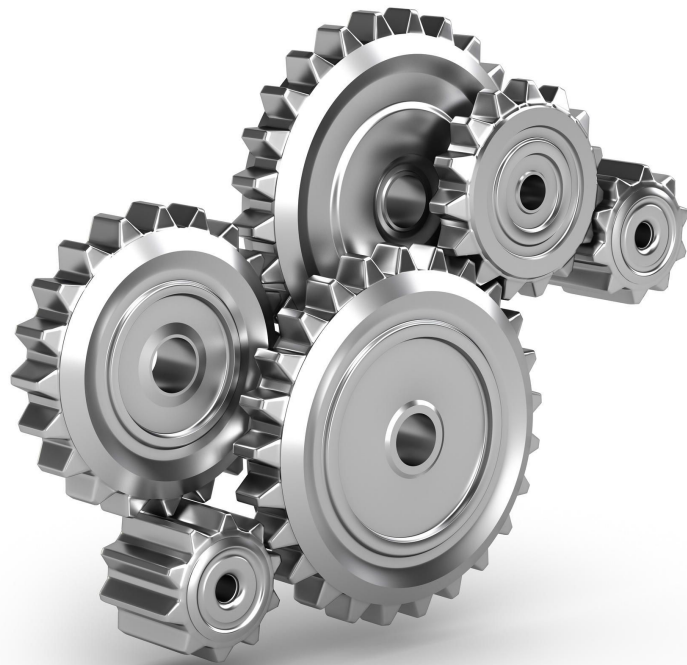


Leveraging Mikrotik in the cloud for fun and profit!

Marc Perea

Workshop

- Who
- Why
- How
- What



Who?

Co-founder of MCP Networks, creators of Aerēz

Discovered Routerboard in 2009

MTCNA + MTCTCE + Trainer certified

BS + MS CS/MIS @ Minot State University, ND

Internet Service Provider Network Engineer for over a decade

Started working on Aerēz based on MikroTik in 2015



Why use the cloud?

- Need a way to validate connectivity from off-net
- Throughput testing
- Idea Proof of Concept (POC) testing
- Off site networking / storage / resources
- Augment services / servers
- It's freakin' cool!



So how do you do it?

1. Get a (*free) Amazon account (or other)
2. Login and find EC2 instances

a.



EC2

3. Launch a new instance

a.

Launch Instance



amazon
web services™

AMI

4. Select AWS Marketplace

5. Search for CHR

6. Select

*Some other user submitted AMIs exist in the community

The screenshot shows the AWS IAM console interface for creating a new instance. The top navigation bar includes 'Services', 'Resource Groups', and a search icon. The main content area is titled 'Step 1: Choose an Amazon Machine Image (AMI)' and includes a description of AMIs. Below the description, there are tabs for 'Quick Start' and 'My AMIs'. The 'AWS Marketplace' tab is selected, showing a search bar with 'chr' and a 'Select' button. The search results show a 'Cloud Hosted Router' by MikroTik, which is 'Free tier eligible' and has a 'Sold' status. The 'Select' button is highlighted with a red box.

Services ▾ Resource Groups ▾ 🔍

1. Choose AMI 2. Choose Instance Type 3. Configure Instance 4. Add Storage 5. Add Tag

Step 1: Choose an Amazon Machine Image (AMI)

An AMI is a template that contains the software configuration (operating system, application server, and applications) required to launch your instance. You can select an AMI provided by AWS, our user community, or the AWS Marketplace; or you can select one of your own AMIs.

Quick Start My AMIs

AWS Marketplace

Community AMIs

▼ Categories

All Categories

Software Infrastructure (1)

Developer Tools (1)

▼ Operating System

Search: chr

1 to 1 of 1 Products

Cloud Hosted Router

★★★★★ (1) | 6.34.1

Free tier eligible

Sold

by MikroTik

Bring Your Own License + AWS usage fees

Linux/Unix, Other

6.34.1 | 64-bit Amazon Machine Image (AMI) |

Select

Instance Size

7. For testing, stick with free!

~200 Mbps throughput

Scales up to 10Gbps (20G?)

Nano, Micro, Small, Medium...

The screenshot shows the AWS Management Console interface for creating an EC2 instance. The top navigation bar includes 'Services' and 'Resource Groups'. The breadcrumb trail shows five steps: '1. Choose AMI', '2. Choose Instance Type' (which is the active step), '3. Configure Instance', '4. Add Storage', and '5. Add Tags'. Below the breadcrumb, the title 'Step 2: Choose an Instance Type' is followed by a descriptive paragraph about Amazon EC2 instance types. A 'Filter by:' section contains two dropdown menus set to 'All instance types' and 'Current generation', along with a 'Show/Hide Columns' link. The main content area displays 'Currently selected: t2.micro' with its specifications. A 'Note' states that the vendor recommends using a t2.micro instance or larger. Below this is a table listing instance types. The table has columns for Family, Type, vCPUs, Memory (GiB), and Instance Storage (GB). Two rows are visible: 't2.nano' and 't2.micro'. The 't2.micro' row is selected, indicated by a blue checkbox and a green 'Free tier eligible' badge. At the bottom, there are four buttons: 'Cancel', 'Previous', 'Review and Launch' (highlighted in blue), and 'Next: Configure Instance Details'.

Services ▾ Resource Groups ▾ ⭐

1. Choose AMI 2. Choose Instance Type 3. Configure Instance 4. Add Storage 5. Add Tags

Step 2: Choose an Instance Type

Amazon EC2 provides a wide selection of instance types optimized to fit different use cases. Instances are virtual servers that can run applications. They have varying combinations of CPU, memory, storage, and networking capacity, and give you the flexibility to choose the appropriate mix of resources for your applications. [Learn more](#) about instance types and how they can meet your computing needs.

Filter by: All instance types ▾ Current generation ▾ [Show/Hide Columns](#)

Currently selected: t2.micro (Variable ECUs, 1 vCPUs, 2.5 GHz, Intel Xeon Family, 1 GiB mem)

Note: The vendor recommends using a **t2.micro** instance (or larger) for the best experience with Amazon EC2.

	Family ▾	Type ▾	vCPUs ⓘ ▾	Memory (GiB) ▾	Instance Storage (GB) ⓘ
☐	General purpose	t2.nano	1	0.5	EBS only
☒	General purpose	t2.micro Free tier eligible	1	1	EBS only

◀ ▶

Cancel Previous **Review and Launch** Next: Configure Instance Details

Network

8. Click Next

Free public IP - yay! Static IP?

AWS is very flexible and scalable,
learn more on your own ;-)

Just like MikroTik, AWS has lots of
cool firewall, routing and access
controls

The screenshot shows the 'Configure Instance Details' step in the AWS Management Console. The top navigation bar includes the AWS logo, 'Services', 'Resource Groups', and a star icon. The top right shows a notification bell, the user 'Marc C. Perea', and the region 'Oregon'. The step progress bar at the top indicates the current step is '3. Configure Instance', with other steps being '1. Choose AMI', '2. Choose Instance Type', '4. Add Storage', '5. Add Tags', and '6. Configure Security Group'.

Step 3: Configure Instance Details
Configure the instance to suit your requirements. You can launch multiple instances from the same AMI, request Spot instances to take advantage of the lower pricing, assign an access management role to the instance, and more.

Number of instances ⓘ
1 [Launch into Auto Scaling Group](#) ⓘ

Purchasing option ⓘ
☐ Request Spot instances

Network ⓘ
vpc-55db4730 (default) [Create new VPC](#)

Subnet ⓘ
No preference (default subnet in any Availability Zone) [Create new subnet](#)

Auto-assign Public IP ⓘ
Use subnet setting (Enable)

IAM role ⓘ
None [Create new IAM role](#)

Shutdown behavior ⓘ
Stop

Enable termination protection ⓘ
☐ Protect against accidental termination

Monitoring ⓘ
☐ Enable CloudWatch detailed monitoring
[Additional charges apply.](#)

Tenancy ⓘ
Shared - Run a shared hardware instance
[Additional charges will apply for dedicated tenancy.](#)

At the bottom, there are four buttons: 'Cancel', 'Previous', 'Review and Launch' (highlighted in blue), and 'Next: Add Storage'.

Storage

9. Might as well use all the free storage, change GB to 30!

After free, you pay!

The screenshot shows the AWS Management Console's 'Add Storage' step for an EC2 instance. The 'Size (GiB)' field is highlighted with a red box and set to 30. Below the table, a blue box explains the free tier eligibility.

Volume Type ⓘ	Device ⓘ	Snapshot ⓘ	Size (GiB) ⓘ	Volume Type ⓘ	IOPS ⓘ	Throughput (MB/s) ⓘ	Delete on Termination ⓘ	Encrypted ⓘ
Root	/dev/sda1	snap-e173acb1	30	General Purpose ⓘ	100 / 3000	N/A	☒	Not Encrypted

[Add New Volume](#)

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

[Cancel](#) [Previous](#) [Review and Launch](#) [Next: Add Tags](#)

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Tags and Launch

- 10. It's a good idea to name everything
- 11. Review and Launch!
- 12. You have to hit Launch one more time!

 Services ▾ Resource Groups ▾

1. Choose AMI 2. Choose Instance Type

Step 5: Add Tags

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	MUM2017	
Add another tag		(Up to 50 tags maximum)

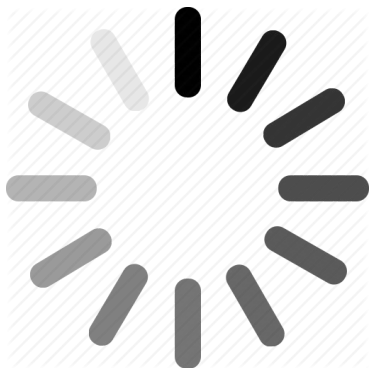
What about security?

Default AWS firewall for this AMI:

TCP 22 allowed from 0.0.0.0/0

Secure? Warning?

12. Download the PEM and Launch
(and wait)



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.

Note: The selected key pair will be added to the set of keys authorized for this instance. Learn more about [removing existing key pairs from a public AMI](#).

Create a new key pair

Key pair name

mum_key_pair

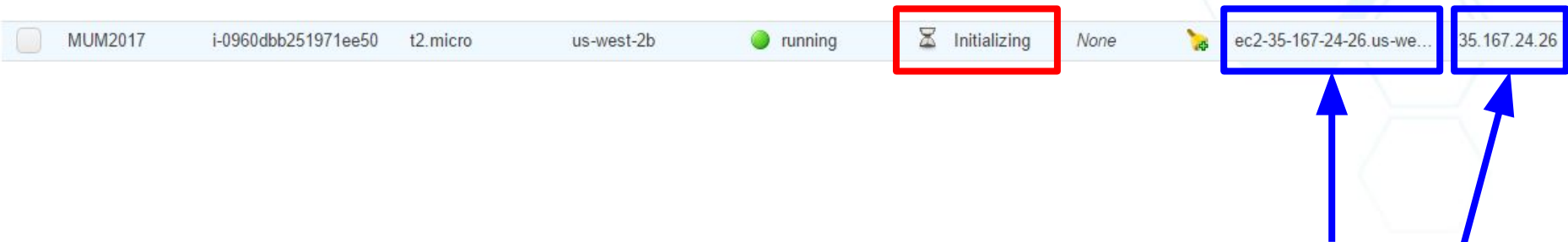
Download Key Pair

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

That's it?



Pretty much, now you need to connect

Go back to EC2 services, check on instances and for several minutes Initializing

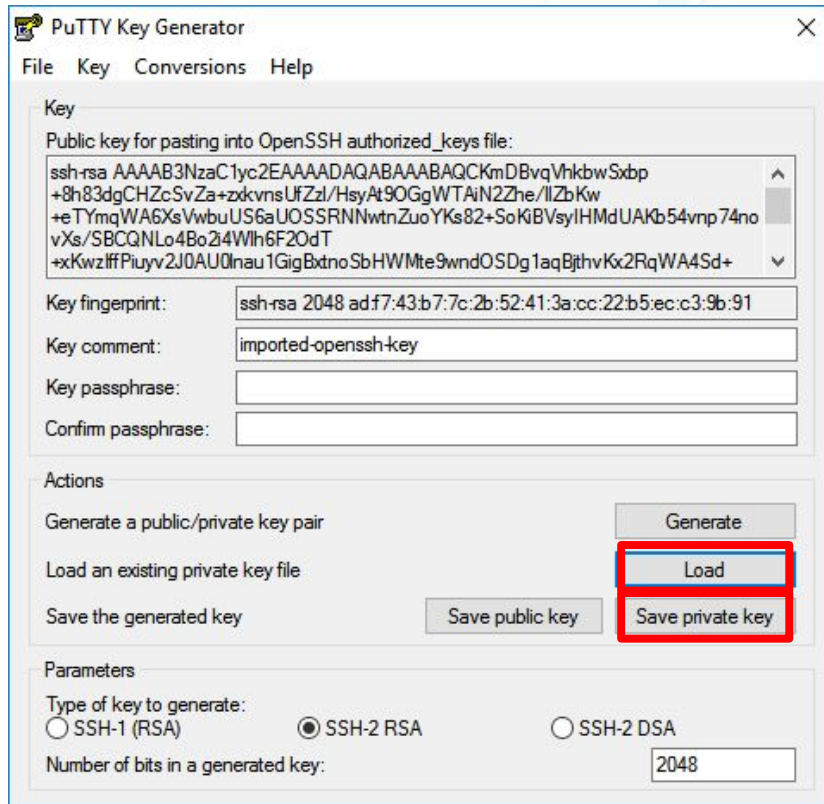
In the meantime, set up your favorite SSH client



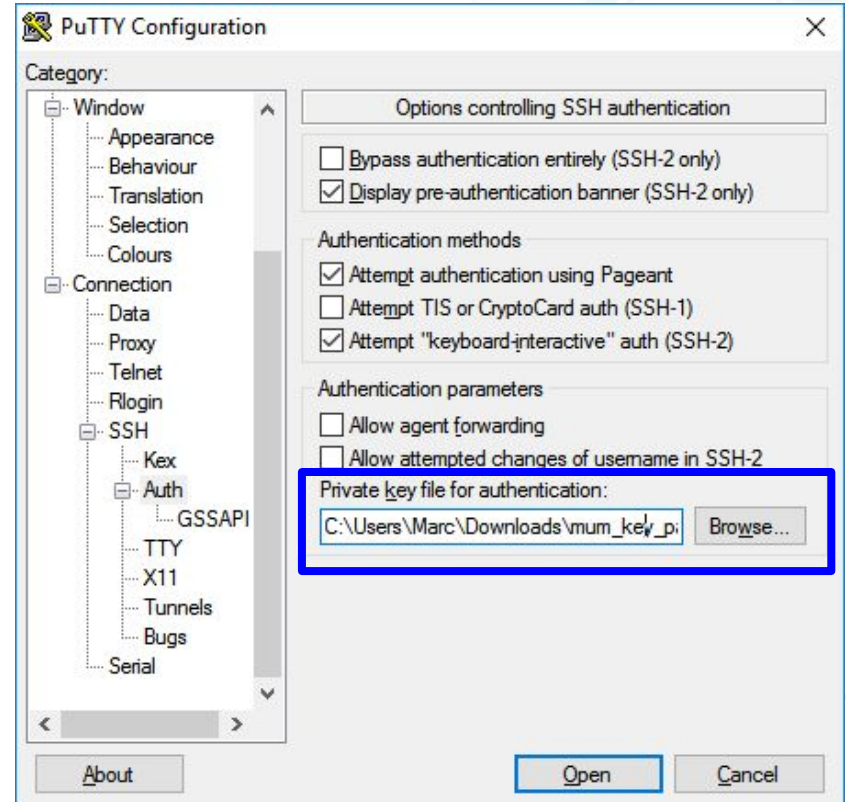
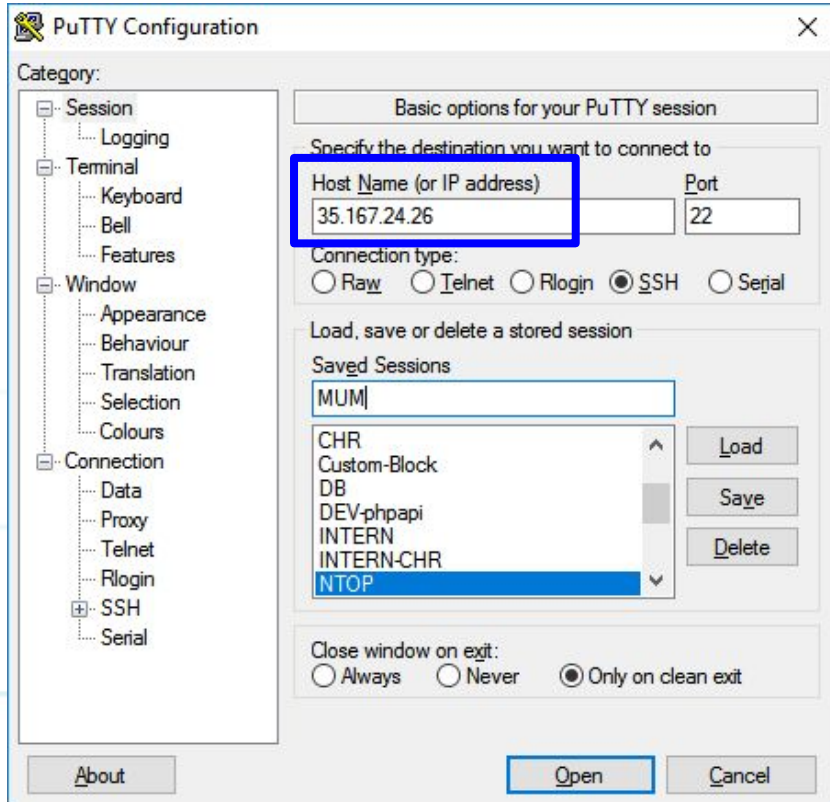
MAC/Linux G2G - putty can't use PEM

Load the key pair
downloaded from AWS

Save the private key PPK to
use with putty!



Login and enjoy!

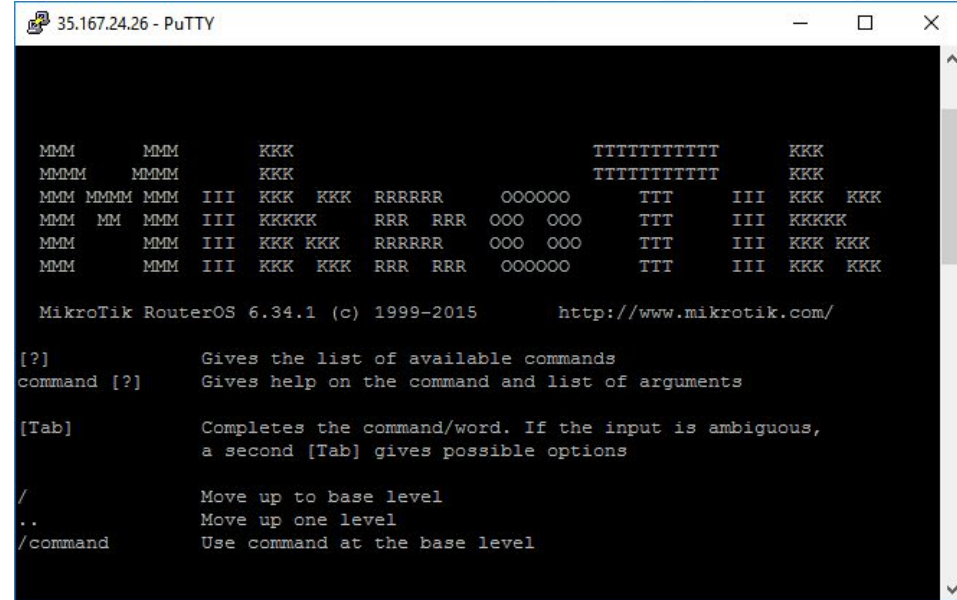


Add security

Firewall + Firewall (AWS & ROS)

Tips:

- Use wimi.com
- Toggle winbox from your IP
- Elastic IP = Static IP



```
35.167.24.26 - PuTTY

MMM      MMM      KKK                               TTTTTTTTTT      KKK
MMMM     MMMM     KKK                               TTTTTTTTTT      KKK
MMM MMMM MMM III  KKK KKK RRRRRR      OOOOOO      TTT      III  KKK KKK
MMM MM  MMM III  KKKKKK      RRR RRR  OOO OOO      TTT      III  KKKKKK
MMM      MMM III  KKK KKK RRRRRR      OOO OOO      TTT      III  KKK KKK
MMM      MMM III  KKK KKK RRR RRR  OOOOOO      TTT      III  KKK KKK

MikroTik RouterOS 6.34.1 (c) 1999-2015      http://www.mikrotik.com/

[?]          Gives the list of available commands
command [?]  Gives help on the command and list of arguments

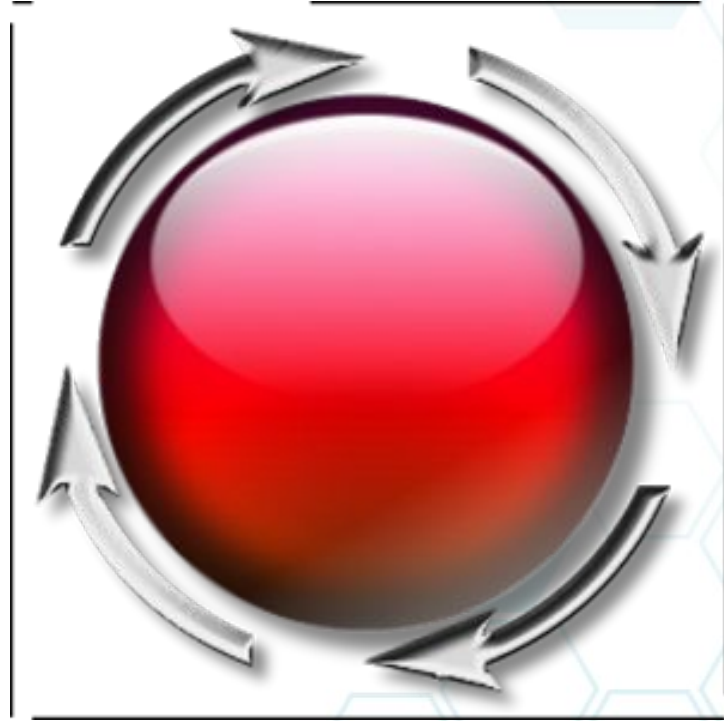
[Tab]        Completes the command/word. If the input is ambiguous,
              a second [Tab] gives possible options

/            Move up to base level
..          Move up one level
/command     Use command at the base level
```

Cool, but now what can I do?

The Dude server

- Bandwidth test
- Remote polling
- Charts
- Troubleshoot, etc



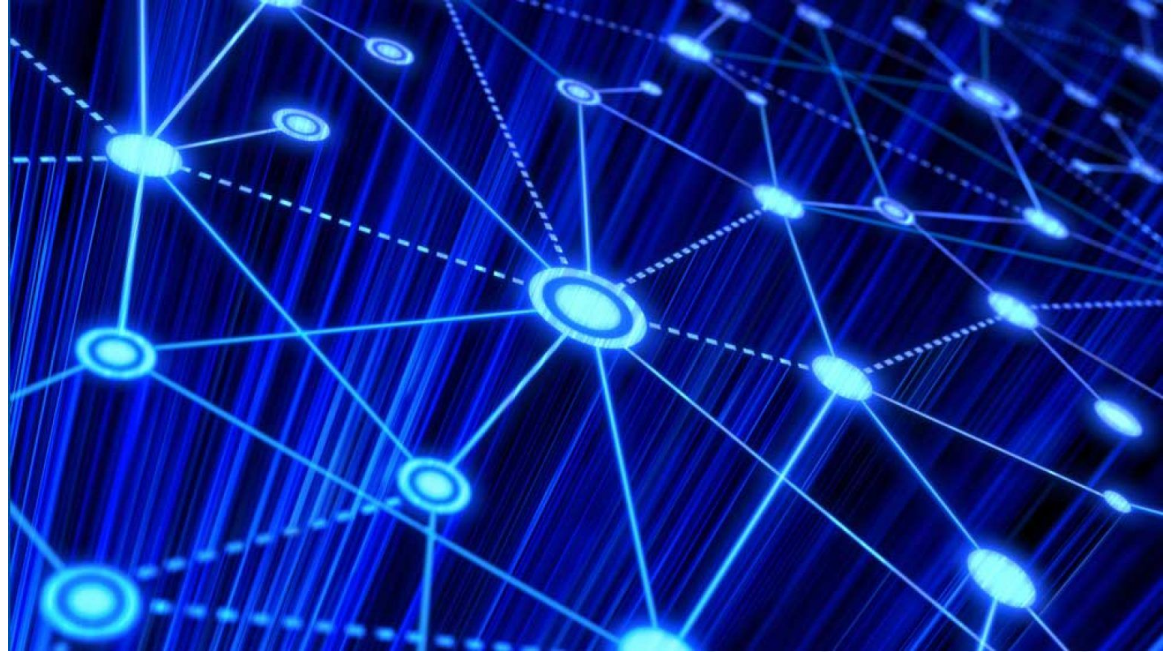
Lab environment!

- Proof of Concept
- Learn protocol interaction
- Test code versions
- Interop testing with other vendors



VPN services gateway

- Concentrator
 - PPTP
 - L2TP
 - openVPN
 - SSTP
 - IPSEC

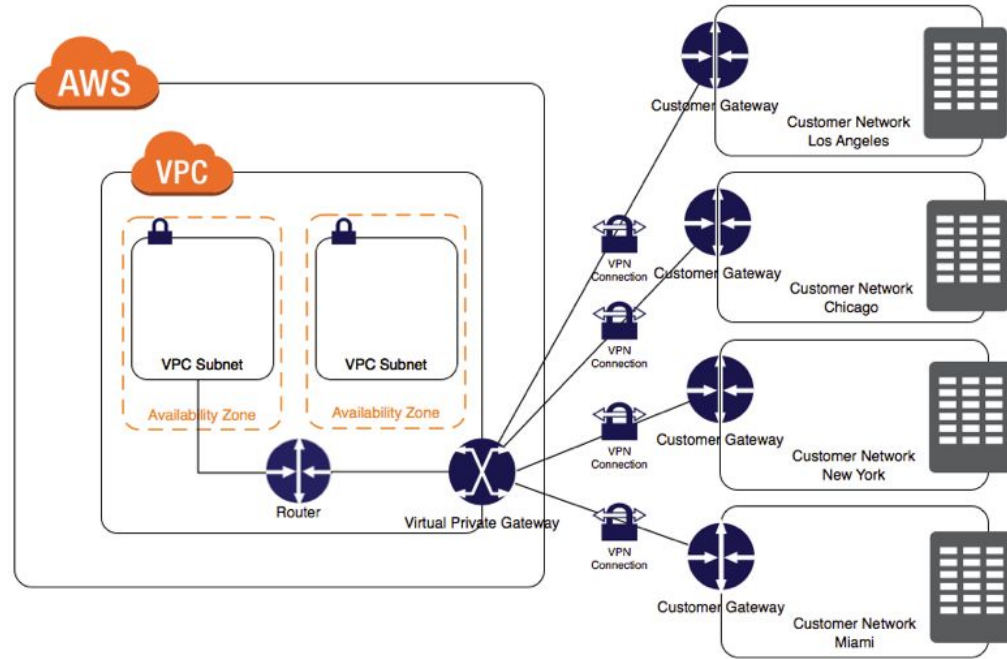


Offsite data center

- Spin up more servers
- Use CHR as your whole

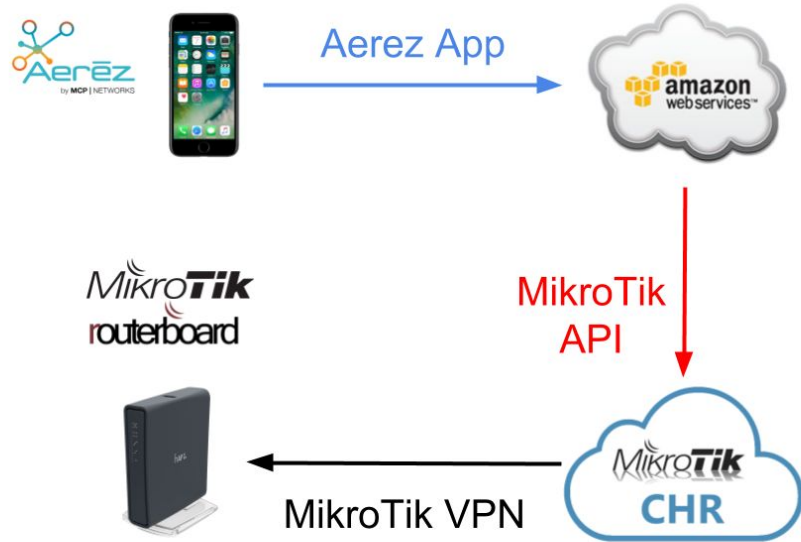
AWS Gateway!

- Backups
- Redundant services



API Services Gateway

- Securely tunnel traffic with VPN
- Leverage MikroTik API
 - Automation &
 - Scale



Enjoy the MUM!

- Any issues/questions?
- Visit my booth: Aerez
- Thanks for attending!

