Dialogic

Tech Note

Dialogic® PowerMedia™ XMS and Amazon Web Services

Using PowerMedia XMS Licenses with AWS

NETWORK FUEL™

Introduction

This is the second tech note in the series "Dialogic® PowerMedia™ XMS and Amazon Web Services".

The first covered getting a PowerMedia XMS media server running on Amazon Web Services (AWS) using an Amazon Machine Image (AMI), where XMS used the four (4) port trial license built into the image.

This note expands on the last, showing how the same XMS image can be licensed for more ports, thus paving the way for more realistic application trials. Licenses used can be either the ten (10) port trial license offered by Dialogic, or a permanent purchased license. (also from Dialogic)

Currently, an XMS license is tied to a system's physical MAC address. This has some shortcomings in the virtual world, where a unique MAC address is usually invented when an instance is started. The user has no control over the address.

However, if an Amazon Virtual Private Cloud (VPC) is used, it is possible to define a permanent Elastic Network Interface (ENI) with a permanent MAC address. An XMS license can then be issued for that address and used whenever an XMS Instance is brought up with that ENI. In addition, an Elastic IP (EIP) address is used so that the XMS media server's public IP address will remain the same whenever the instance is used.

Setting up a VPC is more complicated than just running an image in AWS' Elastic Compute Cloud (EC2). This tech note will lead the reader though the process.

A working familiarity with AWS on the part of the reader and an AWS account is presumed.

Creating a VPC and Running an XMS Image in it

The order in which the steps are carried out is important, as there are dependencies between the entities created. It is assumed that none of them exist.

Create the VPC and Related Entities

While all of the entities needed to run a VPC may be individually created, this is a complicated procedure. The VPC Wizard available in the VPC Dashboard screen will create most of them automatically, along with the VPC. Their configuration is adequate for an XMS media server without unusual networking requirements.

1. Make sure you are in the desired region
2. Services → VPC → Start VPC Wizard

Use the VPC Wizard as follows:

Step 1: Select a VPC Configuration

Select **VPC with a Single Public Subnet** from the list on the left.

Step 2: VPC with a Single Public Subnet

Give the VPC a name. Other fields can be left at their defaults.

Create VPC will begin the process.
When it is done, go to Services → VPC → Subnets. For later reference, be sure to make a note of the subnet ID created for the VPC.

Create VPC Security Group

A default security group is created as part of running the VPC Wizard. However, it should not be used. A new security group must be created.

Create a security group for XMS as follows:

1. Services → VPC →Security Groups
2. Create Security Group
3. Name tag, Group name and Description – just descriptive; not important
4. VPC – must be the VPC just created
5. Yes, Create to create the group

Once the group is created, inbound rules must be added. Click the Inbound Rules tab and Edit. Add the following rules:

Type	Protocol	Port Range	Source
SSH	TCP	22	0.0.0.0/0, or as desired
HTTP	TCP	80	0.0.0.0/0, or as desired
HTTPS	TCP	443	0.0.0.0/0, or as desired
Custom TCP Rule	TCP	5060	0.0.0.0/0, or as desired
Custom TCP Rule	TCP	1080	0.0.0.0/0, or as desired
Custom TCP Rule	TCP	15001	0.0.0.0/0, or as desired
Custom TCP Rule	TCP	81	0.0.0.0/0, or as desired
Custom TCP Rule	TCP	161	0.0.0.0/0, or as desired
Custom UDP Rule	UDP	5060	0.0.0.0/0, or as desired
Custom UDP Rule	UDP	49152-53512	0.0.0.0/0, or as desired
Custom UDP Rule	UDP	57344-57840	0.0.0.0/0, or as desired

The source IP address can be left as 0.0.0.0/0 (anywhere), or, for security reasons, restricted to certain IP addresses.

Save will save the ports just added to the group.

Create Elastic IP (EIP) Address

The EIP address, along with the Elastic Network Interface (ENI) below, make up a permanent network interface to which the XMS license will be bound. Create the EIP address first:

1. Services → VPC → Elastic IPs
2. Allocate New Address
3. Network platform must be EC2-VPC
4. Yes, Allocate

Create Network Interface

Network interface creation is done back in EC2:

1. Services → EC2 → Network Interfaces
2. Create Network Interface
3. Add a convenient description
4. Select the subnet that was created as part of the VPC
5. Private IP can remain at the default of "auto assign"
6. Select the XMS security group (just created, not the default group) that belongs to VPC
7. Yes, Create will create the interface.

Note the MAC address of the network interface. This will be used for the XMS trial license.

Launch the XMS AMI

First, log into your AWS account. Note that there is not a publicly available Dialogic account, but rather a public image that may be run under your own account.

Next, find the image in Services → EC2 → AMIs.

Choose an Amazon Machine Image (AMI)

The AMI for XMS is located in these AWS Regions:

- US West (N. California)
- US East (N. Virginia)
- EU (Frankfurt)
- Asia Pacific (Singapore)
- South America (Sao Paulo)

Search IMAGES/AMIs for Public images, AMI Name **dialogic_xms**. Choose the latest release. For example, there may be a dialogic_xms_2.4, a dialogic_xms_2.4_su1 and a dialogic_xms_2.4_su2. The latest would be dialogic_xms_2.4_su2. (XMS release 2.4, service update 2)

Once the image is located, the instance can be started. Do this by either right clicking on the image and selecting Launch or checking off the image and selecting: Actions → Launch.

The steps below correspond to the AWS steps used to launch the AMI.

Step 2: Choose an Instance Type

This tech note assumes that a ten (10) port XMS trial license will be used. This can accommodate ten (10) simultaneous calls. To handle ten (10) video calls in a conference at a VGA (640x480) resolution, an instance type of **c3.2xlarge** or better should be used. The C series of instance types are "compute optimized" and suitable for video media processing.

C3

Features:

- High Frequency Intel Xeon E5-2680 v2 (Ivy Bridge) Processors
- Support for Enhanced Networking
- Support for clustering
- SSD-backed instance storage

Model	vCPU	Mem (GiB)	SSD Storage (GB)
c3.large	2	3.75	2 x 16
c3.xlarge	4	7.5	2 x 40
c3.2xlarge	8	15	2 x 80
c3.4xlarge	16	30	2 x 160
c3.8xlarge	32	60	2 x 320

Important Note:

When using Amazon EC2 instances, there are multiple virtual machine tenants on a single host. There is no way of knowing what the other tenants are doing, how much bandwidth they are using, their clock interrupt needs, etc. An XMS media server, being a real-time application, has stringent clock interrupt needs to successfully handle RTP media packets. For that reason, there may be situations where a fully occupied host does not service XMS's needs well. This may lead to poor video quality and/or video freezing. For a controlled environment, a dedicated host can be used, and may be necessary in a production situation where known level of video quality is needed.

Proceed to the next step by selecting "Next: Configure Instance Details".

Step 3: Configure Instance Details

The settings for this screen are as follows:

Setting	Value	Comment
Number of Instances	1	Leave at default

Purchasing option	unchecked	Leave at default
Network	Choose the VPC that was just created.	
Subnet	The subnet that was automatically created with the VPC will appear here.	
Auto-assign Public IP	Use subnet setting (Disable)	Public IP will come from EIP
Placement Group	No placement group	Leave at default
IAM role	None	Leave at default
Shutdown behavior	Stop	Stop will leave the instance in a non-running state in your list of instances. It can be restarted without losing any XMS license changes. Terminate will destroy the instance and you will need to start again with the public XMS image.
Enable termination protection	unchecked	Leave at default
Monitoring	unchecked	Leave at default
EBS-optimized instance	unchecked	Leave at default
Tenancy	Shared Tenancy	Leave at default. But see the **Important Note** in last section about multi tenancy.
Network Interfaces	Select the ENI just created	Disregard the public IP address warning.
Advanced Details	No changes	Leave at default

Proceed to the next step with Next: Add Storage

Step 4: Add Storage

The default storage allocated (10 GB) with a General Purpose Volume Type is sufficient for an XMS trial.

Proceed to the next step with Next: Tag Instance.

Step 5: Tag Instance

Add a value - something recognizable when looking at AWS console - “XMS-2.4” for example

Step 6: Configure Security Group

This step will open up AWS ports for access to XMS. Keep in mind, this step is not on the XMS system; it is AWS security.

Check off Select an **existing** security group. The two security groups belonging to the VPC will be listed. Select the group that was created to open up XMS ports, rather than the default group. The next step is Review and Launch.

Step 7: Review Instance Launch

There will be warnings about improving your instances' security and the instance not being eligible for free usage tier. It is okay to ignore them.

Check information entered. If all looks as expected, start the instance with Launch.

Remember that a public/private key pair must be associated with each new instance. Create a new one if you do not already have one, or you can use an existing key pair. Note that the key pair is used to connect via ssh directly to the XMS system and will likely not be needed. However, it is not possible to start an instance without confirming that you have a valid key pair.

Either "Choose an existing key pair" or "Create a new key pair".

"Your instance is now launching" should now be seen. Check the Instances listing to see when the XMS instance is up and running.

Attach Elastic IP Address

While the instance is launching, the Elastic IP (EIP) address can be attached.

Services → EC2 or VPC → Elastic IPs

Select Elastic IP just created and then Associate Address.

Choose either instance just started or Network Interface just created and the EIP will be attached to the running instance.

Starting Multiple Instances

If multiple XMS instances are started, each must have its own network interface and EIP address. It is possible, for example, to just duplicate a running instance. But unless a known network interface with a known MAC and a license tied to it is used, AWS will create a new network interface with a random MAC address. XMS licensing will fail.

Reaching the XMS System Using ssh

It should not be necessary to directly log into the XMS system using ssh; however; to do so, use the private key that corresponds to the public key attached to the instance:

```
> ssh -i my-private-key.pem <xms_ip_addr>
```

and log in as user “ec2-user”. Once in the system, commands requiring root privileges may be run using “sudo”.

Obtaining a Higher Density Trial License

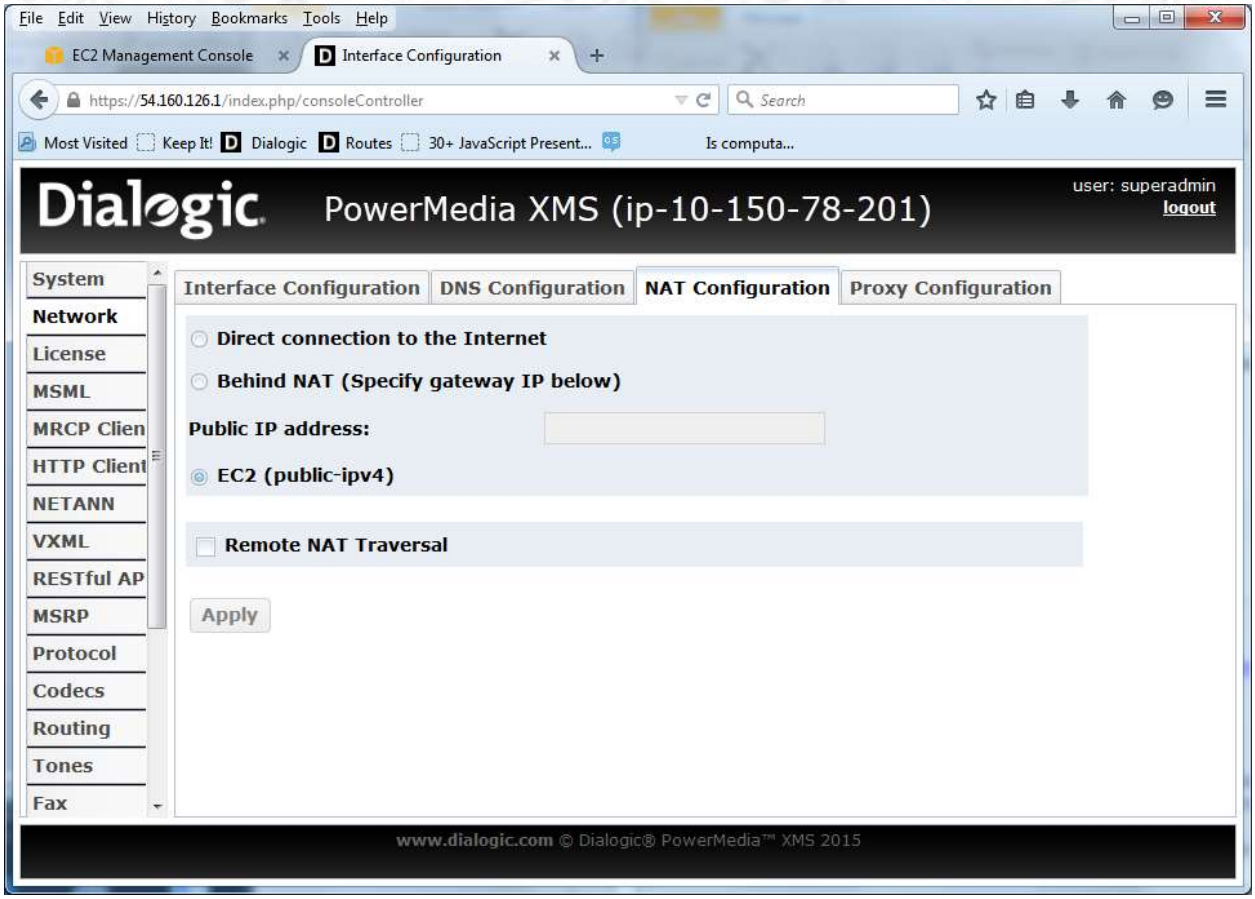
Now that the XMS system is up and running, a higher density license can be put in place. If you do not already have a permanent license from Dialogic, a time sensitive trial license for 10 ports of everything may be downloaded here.

Verifying XMS Operation

Note the public IPv4 address (x.x.x.x) of XMS once it is started. This can be seen in the AWS Instance console.

Browse to x.x.x.x. You will likely see a warning about this being an untrusted connection. Click through and confirm that this is a security exception. Then, login using superadmin/admin for username/password. From the GUI, confirm XMS is started in System→ Services and all Status indicators (except faxservice and cdrservice) are green/Running.

While it is already in place for this AMI, there is one important setting pertaining to AWS. The XMS server is behind a NAT firewall. Its private IP address is different than the public address used to access it externally. This must be taken into account when delivering the RTP (media) address to the WebRTC endpoint. The Network → NAT Configuration screen (shown below) must have the EC2 button checked to take this into account.



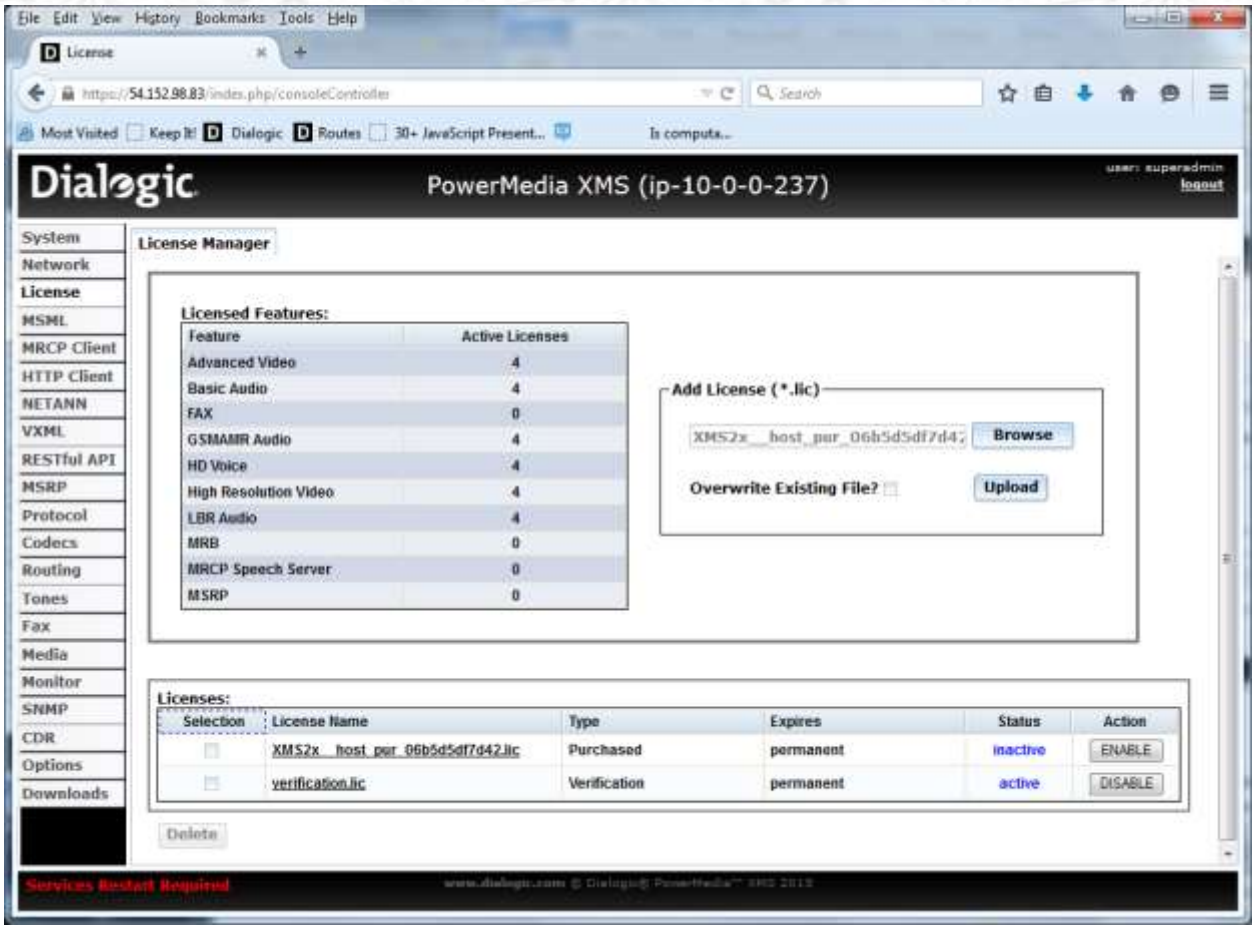
This will automatically determine the external IP address and use it for media connections.

Please note that XMS officially supports RHEL/CentOS 6.4, while this image uses RHEL/CentOS 6.5. This may cause an issue if this AMI is used for upgrading to a XMS future release.

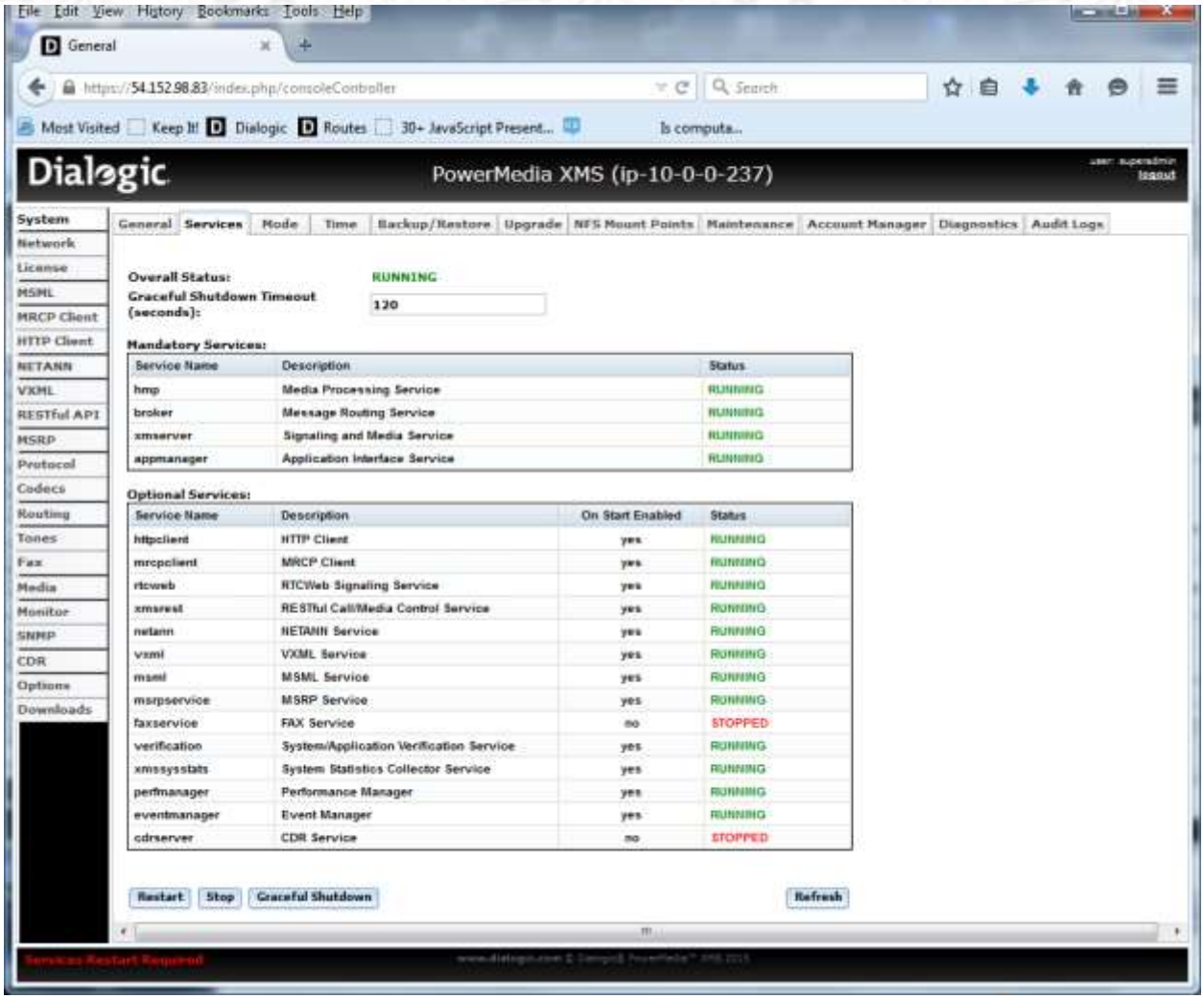
Activating the New License

Once the new license is ready and on the system running the browser, it can be applied to the XMS image.

On the XMS admin console, go to the License tab and Browse to the new license. Then Upload the license:



Disable the verification license and Enable to new license. Next, restart XMS services in the System → Services screen:



XMS services will be restarted and the system will have the new license applied. This can be verified in the License screen or the Monitor Dashboard, which will show Available/Used/Free licenses.

Running the XMS Verification Demos

Play Demo

Run this simple demo from Chrome or Firefox by doing the following:

- http://<x.x.x.x>/rtcweb/webrtc.html
- Please enter your login Name: “any name” Hit Login button.
- Be sure to Allow the browser access to camera and microphone.

- Name of person to call: “play_demo” Hit Call button.
- You should see and hear a short auto racing video clip.

Conference Demo

This demo mixes up to nine (9) full duplex video conferees into a single conference at VGA resolution. More than one conference may be run simultaneously. Each conference needs a unique ID.

Run this demo from Chrome or Firefox by doing the following:

- http://<x.x.x.x>/rtcweb/webrtc.html
- Please enter your login Name: “any name” Hit Login button.
- Be sure to Allow the browser access to camera and microphone.
- Name of person to call: “conf=<unique_id>@xms” For example, “conf=1234@xms”. Hit Call button.
- You should see yourself and any other conferees in conference 1234 on the screen. Audio from other conferees should also be heard.
- As new conferees enter, the video tiles on the screen will automatically adjust to accommodate them, up to nine (9) tiles. (Assuming at least a 10 port trial license has been activated.)

Stopping or Terminating the Modified XMS Instance

If the newly-licensed XMS Image is stopped, it will retain its licensing when the instance is restarted. If the instance is terminated, all licensing changes will be lost. If the original XMS image is used again, the license must be re-downloaded and re-activated.

The licensing can also be preserved if a private image/snapshot is made of the instance before it is terminated.

Next Steps

This tech note covered configuring and running XMS on AWS with a trial or permanent license. It is intended to be used for test purposes only, not for production. In considering XMS as part of an AWS media server solution, you will likely want to try it with your own application server, cloud-based or otherwise, and at densities suitable for a production situation. Future planned tech notes will outline how to configure and run additional XMS AMIs and services in your testing.

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