Visbo ReST Server and UI Update on AWS

Here is a description of some key topics the Operations admin has to do:

- Update the Visbo Servers to a new Version from GIT
- Start a new ReST Server instance, if required
- Stop a ReST Server instance, if required

Update the Visbo Server to a new Version from GIT

The procedure is done by upgrading one server after the other. To make it easy, even if there are several servers running, this can be done with the System Manager from AWS Console.

Step-by-step guide

These are the required steps to do:

1. Go to the AWS Console https://eu-central-1.console.aws.amazon.com/console/home?region=eu-central-1#
    a. Go to the System Manager / State Manager
    https://eu-central-1.console.aws.amazon.com/systems-manager/
    b. select the update Script **for the plattform you want to update** and execute "Apply association now""
    this will execute the update script on all the instances, one after the other and stops if one is failing.
    c. refresh the page to see the progress, at the end it should show that all have terminated successful.
    if not there are logs available that shows the console output of the update script.
    In case the update script has changed in the new release, the update scripts fails and to allow to run the new update script, by doing the update again.

Monitoring the Update

During the update different Logs were written:

- AWS Log for the State Manager
  Each time the Update Command is executed, the Output of the Log files gets stored into S3, so that you could verify it from AWS Console.
  Do not go to S3 directly, as this is difficult to see where the newest Log entries are stored, you can go directly from State Manger Execution History to the right place in S3.
- Use CloudWatch to verify what has happened. (Does not work with State Manager only with the Run Command)
  https://eu-central-1.console.aws.amazon.com/cloudwatch/home?region=eu-central-1#logs:
- AWS Cloud Watch Log have a configured expiration, so the get deleted if they are outdated.
- Monitoring the System Software Compliance
  At the moment we have no automatic software update for Linux and its components. The system checks for security issues on a regular base and reports the results to the System Manager Compliance Console. This has to be verified every 2 weeks. Would be great to get a Slack notification if the System recognizes an issue.
  https://eu-central-1.console.aws.amazon.com/systems-manager/compliance?region=eu-central-1

Upgrade the Launch Template to reflect the new Version

After a major upgrade on the running instances of the ReST Server, the next step is to configure a new version of the Launch Template that is used during scale up of the ReST Server. This Launch Template references an AMI with a specific state of the whole system (Linux / ReST Version / ...).

If a new instance is started from a template an update is eventually necessary to have the same Version on all instances. As the UI update is in the meantime fast, we do this during boot, that the update script runs automatically. So a new Launch Template is not absolutely necessary, but my proposal is to do this every few months.

Step-by-step guide

These are the required steps to do:

1. Go to the AWS Console https://eu-central-1.console.aws.amazon.com/console/home?region=eu-central-1#
    a. Go to the EC2 instances and select the one with the upgraded status.
    b. Create a new Image from that instance and name it i.e. 2019-09-11_VisboDevAMI
    c. After the image was generated, create a new Version of the Launch Template that is used during autoscaling
    No Security Group is required, Encryption and SnapShot Settings canbe kept unchanged (no issues anymore)
    d. Set the new Version as the default Version for this Launch Template

Old Stuff that might be worth to know or might be needed in special situations

Start a new ReST Server Instance without AutoScaling

The assumption is that we have an ReST Server that runs on multiple Appl. Servers in the AWS environment. We have also a Launch Template that is used to start a new EC2 instance.
To start a new instance of the ReST Server, we do the following steps:

- Create new EC2 instance from Template without assigning it to Load Balancer
- Assign it to the Load Balancer

Step-by-step guide

These are the required steps to do:

1. Go to the AWS Console https://eu-central-1.console.aws.amazon.com/console/home?region=eu-central-1#
    a. Go to the Launch Templates and select the one you want to use
    b. create an instance from the Template
        i. select the latest version
        ii. adopt the instance tags name "VisboDev-X" by "VisboDev-5" where 5 is the next available number to see same app server groups
    c. upgrade it with the System Manager / State Manager update "VisboDev-Update" to run the upgrade to all instances assigned to VisboDev one after the other
2. Monitoring is not copied from the template
    a. add CPU Utilisation above 20% in the last two 5 minutes interval to avoid that an upgrade will deliver an alarm
    b. add Status Check (any) failed in the last minute in 2 consecutive 1 min intervals
3. add them to the Target Group of the Load Balancer
    a. select the load balancer Target Group
    b. show the Targets
    c. edit the Target Group List
    d. add the new instances
    e. and wait until they get healthy

Create a new Template to avoid major upgrades during starting an additional instance

This has not to be done each time but might be a good idea to do it with major version changes or in case of major changes of the operating system

- Create new EC2 instance from Template without assigning it to Load Balancer
- update to the new version and test that the server works
- Create a new AMI Image from this Instance
- Create a new version of the Launch Template
- Create new EC2 instances from the Launch Template and assign it to the Load Balancer
- Remove the old Versions of the EC2 instances from Loadbalancer
- Delete the old instances
- Adopt monitoring that is based on AMI IDs

Step-by-step guide

These are the required steps to do:

1. Go to the AWS Console https://eu-central-1.console.aws.amazon.com/console/home?region=eu-central-1#
    a. Go to the Launch Templates and select the one you want to use for upgrade
    b. create an instance from the Template
        i. select the latest version
        ii. adopt the instance tags name "VisboDev-X" by "VisboDev-5" where 5 is the next available number to see same app server groups
    c. ssh to the instance is done with the same SSH Key as defined in the template.
2. Access your Ubunut system with SSH/Putty
   i.e. **ssh -i "$HOME/.ssh/DevVisboAWS.pem" ubuntu@ec2-18-185-136-195.eu-central-1.compute.amazonaws.com**
3. Optional Get updates of existing packages and install additional ones
    a. /usr/lib/update-notifier/apt-check -p // get the update list
    b. apt-get -s dist-upgrade |grep "^Inst" |grep -i securi // get the list of security upgrades
    c. sudo unattended-upgrade -d --dry-run // a dry run of security updates
    d. sudo unattended-upgrade -d // execute security updates
    e. sudo apt update && apt list --upgradeable // get the list of upgradable packages with version info
    f. sudo apt-get update // check for updates available
    g. sudo apt-get upgrade // executes the updates/upgrades
    h. sudo apt-get full-upgrade // includes components like NGINX
    i. lsb_release -a // get the ubuntu release info
4. Set Timezone to CET
    a. sudo timedatectl set-timezone CET
5. Update Versions for ReST Server and UI my.visbo.net (Compact, Scripts have moved to $HOME/bin)
    a. **update-rest** // in Home Directory of the Visbo User
    b. **update-ui** // in Home Directory of the Visbo User
6. Test the new Server with local curl
7. Create a new Image of the Server and use it as AMI
    a. name it with current date and name of are. i.e. 2019-08-14 VisboDev
    b. deregister old AMI Version to avoid mistakes as soon as the new AMI has prooved to work
8. Create a new Version of the Launch Template from this server
    a. configure the Name Tags for Instance and Volumes with -X again
9. Create two new instances from this template
    a. wait until they are ready and running
    b. Monitoring is not copied from the template
        i. add CPU Utilisation above 20% in the last 5 minutes
        ii. add Status Check (any) failed in the last minute in 2 consecutive intervals
    c. add them to the Target Group of the Load Balancer
        i. select the load balancer Target Group
        ii. show the Targets
        iii. edit the Target Group List
        iv. add the two new instances
        v. wait until the status has changed from init to healthy
        vi. remove the old ones from the target group
            they get status draining, means they get no new request but the old ones were still executed, this is typically done in less than a second but not more

than 5 secs.

d. terminate the old ReST Servers Instances

10. Delete the newly created instance that was used for updating the AMI and also the old instances based on the old AMI to have all new instances created from the template
    a. select the instance
    b. switch instance state to terminate (the machine and also the volume will be deleted

Here are some hints to verify if everything runs fine:

1. Server is not running and reports an Nginx error
   Execute on the server in terminal the command "**curl localhost:3484**"
   Result:
   a. "You should not visit this page", proves that the ReST Server is running, so the problem is Nginx related
   b. "no answer / timeout: shows that the ReST server is not running.
2. Server is not running but the problem is not Nginx related
   You have to check pm2 if the ReST Server was started or not.
   execute on the server in terminal: **pm2 list**
   Result:
   - "VisboReST" shows up with a reasonable status
     - status: Online
     - restart: in best case 0 but not a very high number
     - uptime: the time since last Restart a few seconds after upgrade
   - "VisboReST" does not show up
     The pm2 configuration and setup is corrupt, check the installation guide to redo the operations for pm2
3. Server is not running but pm2 shows the VisboReST component as running or restarting constantly
   You have to check the ReST Server Log files, to identify the problem. Execute the command **pm2 logs** to see the last logs including new ones that come up.
   During Start, the Rest Server shows two entries
   Starting in Environment production
   Starting Version V 2019-02-25 09:49:59 +0100
   and afterwards you can see ReST Calls if someone already executes them from Browser or Client
   Result:
   a. DB Connection issue shows up
      Please verify .env Konfiguration file to have the correct credentials for the Mongo DB Access
   b. Crash shows up and server starts again
      Some Bug in Code has to be fixed by Development

Here are detailed steps for Upgrading the ReST Server and the UI, they are combined in the above update scripts.

1. Update Versions for ReST Server my.visbo.net (Detailed, step by step)
   a. cd $HOME/GitHub/visbo-server-rest
   b. git status
   c. git stash // in case of local changes
   d. git pull (User: stashReader)
   e. `git stash pop // to put the changes back in place`
   f. npm install // to get the latest versions of modules
   g. // adopt .env file if required compare with env-empty
   h. apidoc -i routes -o public/apidoc
      (perhaps it is necessary to upgrade: execute following: **sudo npm install apidoc -g**)
   i. pm2 list // to get the list of running processes including uptime and restarts
   j. pm2 restart VisboReST // the id of the ReST Server
2. Update Version for UI my.visbo.net (UI)
   a. cd $HOME/GitHub/visbo-server-ui
   b. git status // check for local changes
   c. git stash // in case of local changes
   d. git pull
   e. sudo rm -rf /var/www/visbo-web-ui/*; sudo cp -r dist/* /var/www/visbo-web-ui // rm & copy the files to an nginx location
3. my.visbo.net/apidoc (REST)
   a. is upgraded during the update-rest procedure and is afterwards served through NGINX directly

For the full installation guide please check this page Visbo ReST Server Installation