

UVP Technicom PP4 Aktivita 3.1

# Rapid Miner Server & Docker

# Goals

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- Deploy RM processes as services
  - Using Docker containers
- Remote connection to Docker containers
  - Using VNC
- GUI based administration
  - Using Webmin

# Networking Prerequisites

- There various IP addresses assigned to containers running inside Docker, Docker Virtual Machine (in case of Windows & OSX), server host PC & other network devices. This may cause connectivity problems\* with Rapid Miner Server.
- It is recommended to setup a **hostname** to translate *the server* IP address:
  - On Windows & OSX it is the adress of the Docker VM:
    - boot2docker ip
  - On GNU/Linux it is simly the address of the server PC:
    - ifconfig | grep "inet addr:"

\* More information at Rapid Miner forum: <https://rapid-i.com/rapidforum/index.php?topic=3737.0>

# Networking Prerequisites

- Add the following line (**rmserver** hostname):
  - **X.X.X.X** rmserver
- to the local **hosts** file of *the client* PCs:
  - on Windows:
    - C:\Windows\System32\drivers\etc\hosts
  - on GNU/Linux:
    - /etc/hosts
- or setup a **domain name** using DNS server.

*\* IP address X.X.X.X can be obtained using **boot2docker ip** (Win/OSX) or **ifconfig | grep "inet addr: "** (GNU/Linux)*

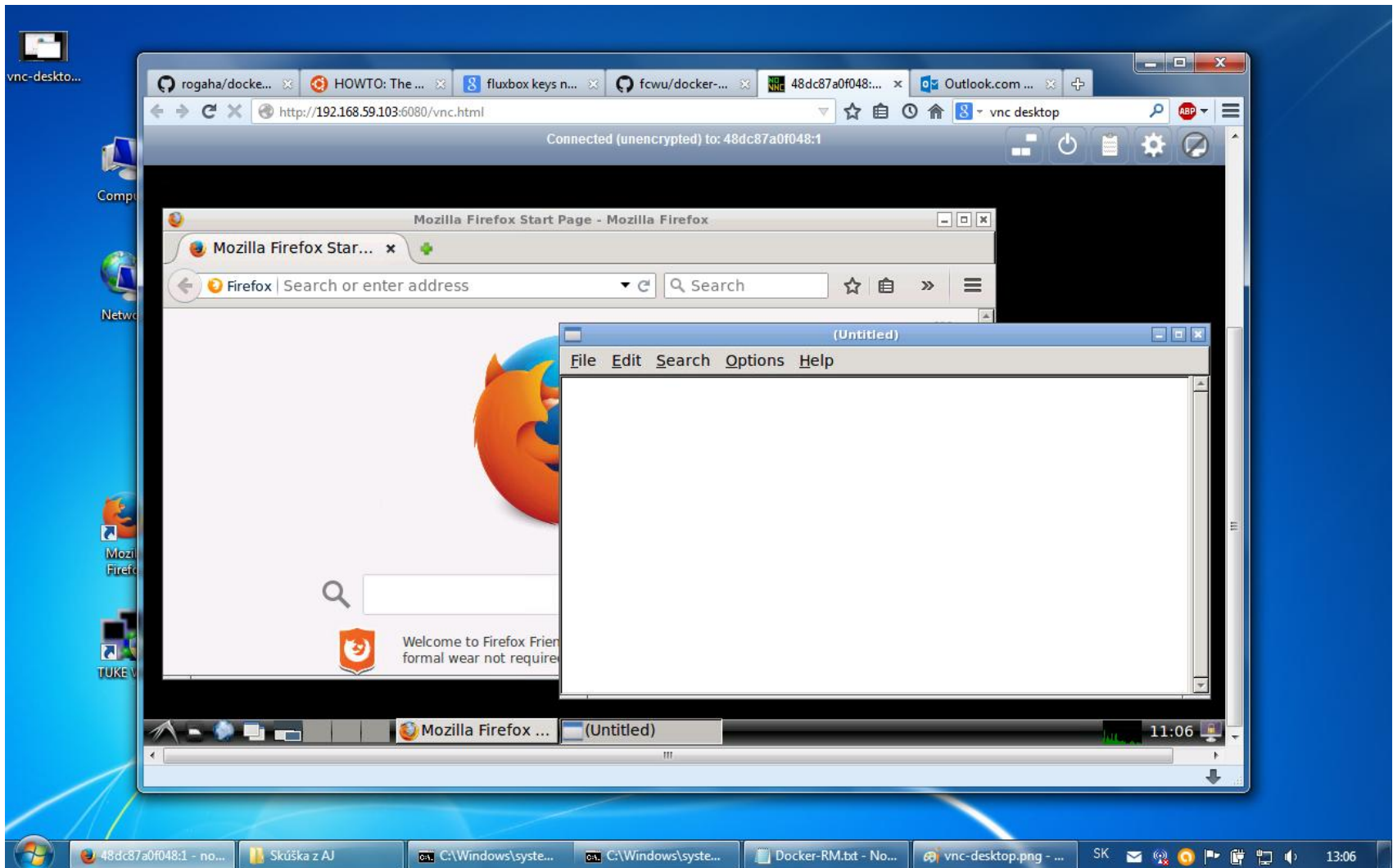
# VNC Remote Desktop

- Instal docker desktop image:
  - `docker pull dorowu/ubuntu-desktop-lxde-vnc`
- Run:
  - `docker run -d -h rmserver -p 6080:6080 -p 8080:8080 -p 10000:10000 dorowu/ubuntu-desktop-lxde-vnc`
- Connect:
  - Browse <http://rmserver:6080/vnc.html>

*\* Option -h changes the hostname of the container to **rmserver***

*\* Ports **8080** and **10000** will be used by other services (Webmin & RM Server) deployed later*

# VNC Remote Desktop



# Webmin Server Administration

- Install Webmin via VNC remote desktop:
  - `sudo apt-get update`
  - `sudo apt-get install software-properties-common`
  - `sudo apt-key adv --recv-keys --keyserver keyserver.ubuntu.com D97A3AE911F63C51`
  - `sudo add-apt-repository "deb http://download.webmin.com/download/repository sarge contrib"`
  - `sudo rm /etc/apt/apt.conf.d/docker-gzip-indexes`
  - `sudo apt-get update`
  - `sudo apt-get install webmin`
- Start service:
  - `sudo service webmin start`
- Connect via browser:
  - at <https://rmserver:10000>

*\* Administrator password in VNC container is "ubuntu".*

# Webmin Server Administration

The screenshot displays the Webmin web interface in a browser window. The browser's address bar shows the URL `https://192.168.59.103:10000/`. The interface includes a left sidebar with a navigation menu and a main content area displaying system information.

**Navigation Menu (Left Sidebar):**

- Login: ubuntu
- Webmin
- System
- Servers
- Others
- Networking
- Hardware
- Cluster
- Un-used Modules
- Search:
- View Module's Logs
- System Information
- Refresh Modules
- Logout

**Main Content Area:**

The main content area features the Webmin logo and a section titled "System Information". The system information is as follows:

- System hostname: 5360013f0c44 (172.17.0.3)
- Operating system: Ubuntu Linux 14.04.2
- Webmin version: 1.750
- Time on system: Wed Jun 3 10:45:58 2015
- Kernel and CPU: Linux 3.18.5-tinycore64 on x86\_64
- Processor information: AMD Turion(tm) 64 X2 Mobile Technology TL-60, 2 cores
- System uptime: 1 hours, 01 minutes
- Running processes: 31
- CPU load averages: 0.19 (1 min) 0.14 (5 mins) 0.14 (15 mins)
- CPU usage: 3% user, 3% kernel, 0% IO, 94% idle
- Real memory: 1.33 GB used, 1.98 GB total
- Virtual memory: 38.48 MB used, 1.40 GB total
- Local disk space: 10.90 GB used, 18.17 GB total
- Package updates: 13 package updates are available

The browser window also shows several open tabs and a taskbar at the bottom with the following open applications: "Webmin 1.750 on f51...", "Docker-RM.txt - Not...", and "C:\Windows\system...". The system clock in the bottom right corner indicates the time is 12:46.



# RM Server Prerequisites

- Install Java:
  - `sudo apt-get install openjdk-6-jdk`
- Install MySQL database:
  - `sudo apt-get install mysql-server`
- Start database service:
  - `sudo service mysql start`
- Restart webmin service to register DB module:
  - `sudo service webmin restart`
- Configure database:
  - Browse to Webmin at: <https://rmserver:10000>
  - In left menu open "MySQL Database Server"
  - Create new database named: "**rapidminer\_server**"
  - Add new user with name "**rmUser**" and password "**pswd**"

# RM Server Installation

- Download „RM Server CE 1.3.015“:
  - Option A -> <http://go.rapidminer.com/rm5-community-server-download-full>
  - Option B -> <http://sourceforge.net/projects/rapidanalytics/>
- Extract the archive to any folder:
  - `sudo apt-get install unzip`
  - `unzip downloaded_package.zip`
- Run installer:
  - `java -jar RapidMiner-Server-CE-Installer-1.3.015.jar`
- Follow the wizard to install the server.
  - Choose installation directory:
    - eg.: `/home/ubuntu/rmserver`
  - Set „rmserver“ as Server Hostname.
  - Set „localhost“ as Database Host.
  - Set DB name "**rmUser**" and password "**pswd**" (set during DB configuration).

# JBOSS Hotfix

- Fix JBOSS JMSServer Manager error\*:
  - Open hornetq configuration file:
    - `cd /home/ubuntu/rmserver/default/deploy/hornetq`
    - `sudo leafpad hornetq-configuration.xml`
  - Add the following line to the file:
    - `<journal-type>NIO</journal-type>`
  - Save & close.

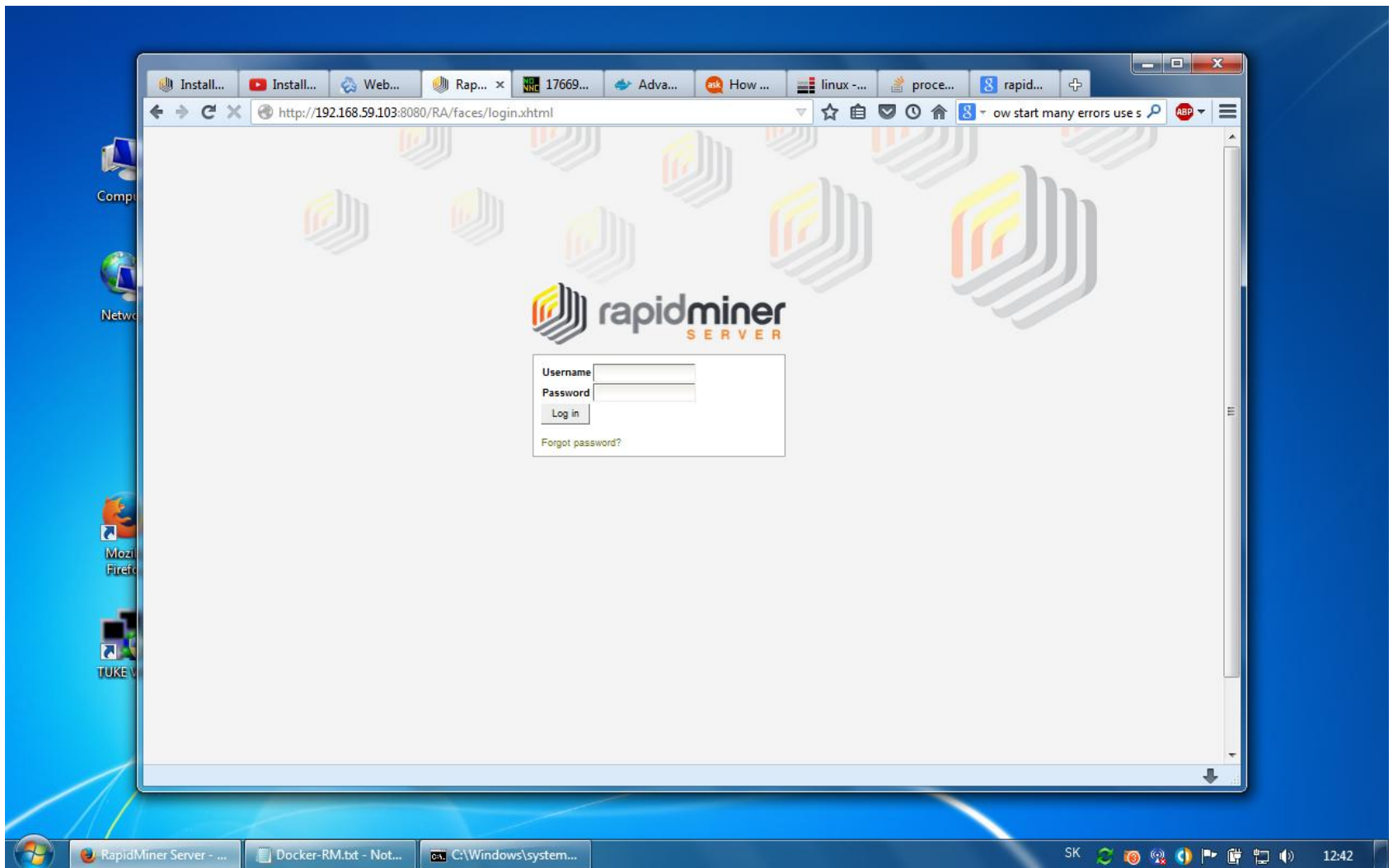
\* More information at: <https://developer.jboss.org/thread/161536?sscc=t#sthash.oCLtLMgP.dpuf>

# Connect to RM Server

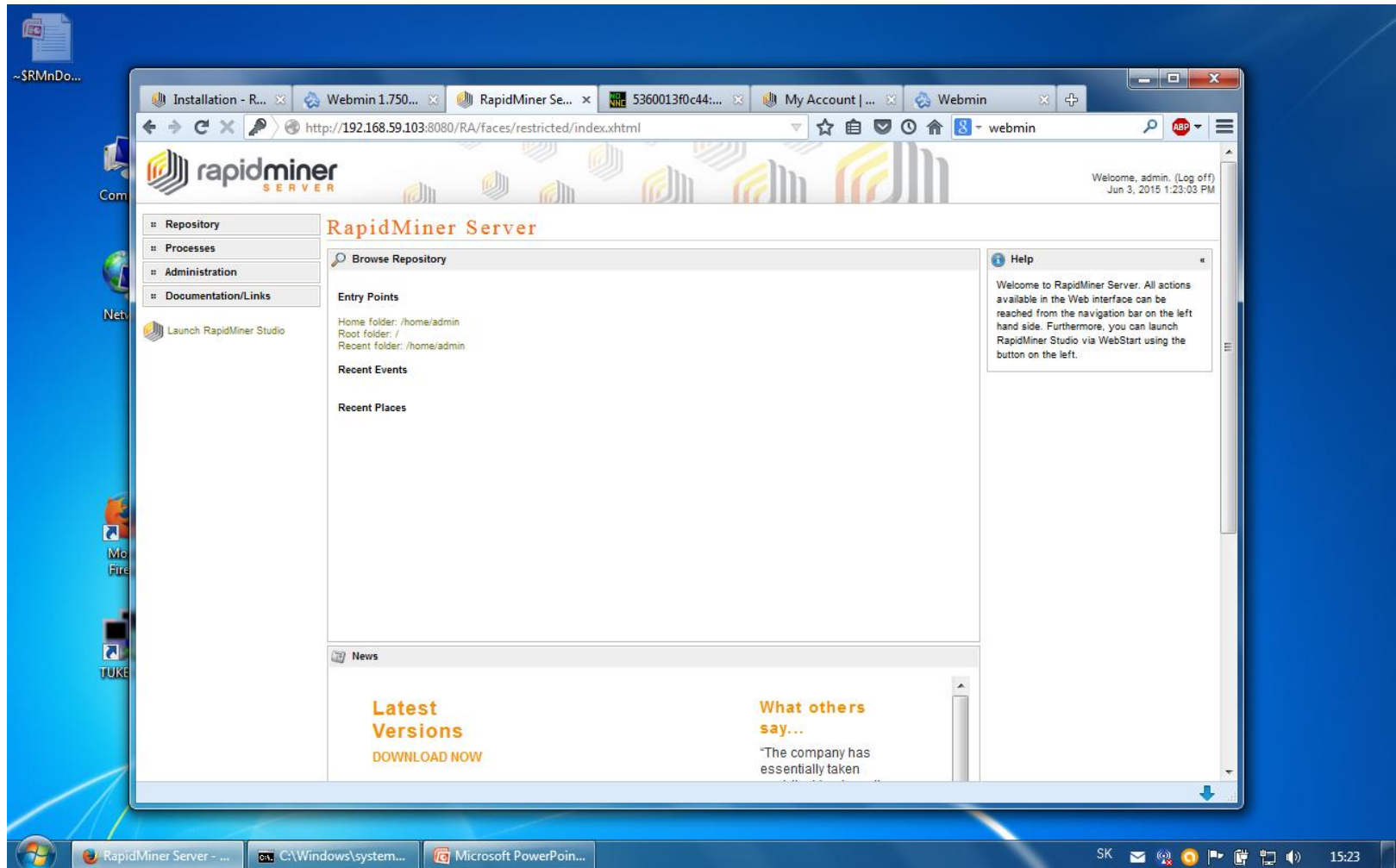
- Start the server:
  - `sudo /home/ubuntu/rmserver/bin/run.sh -b 0.0.0.0`
    - *(be patient, this takes 3 to 5 minutes...)*
- Connect via browser:
  - at: <http://rmserver:8080>
- Login:
  - username: "admin"
  - password : "changeit"
- Finish the installation and set the directory paths:
  - Plugins: /home/ubuntu/rmserver/plugins
  - Upload: /home/ubuntu/rmserver/tmp

*\*This option may be necessary for RM Server to respond to all hosts (other than localhost).*

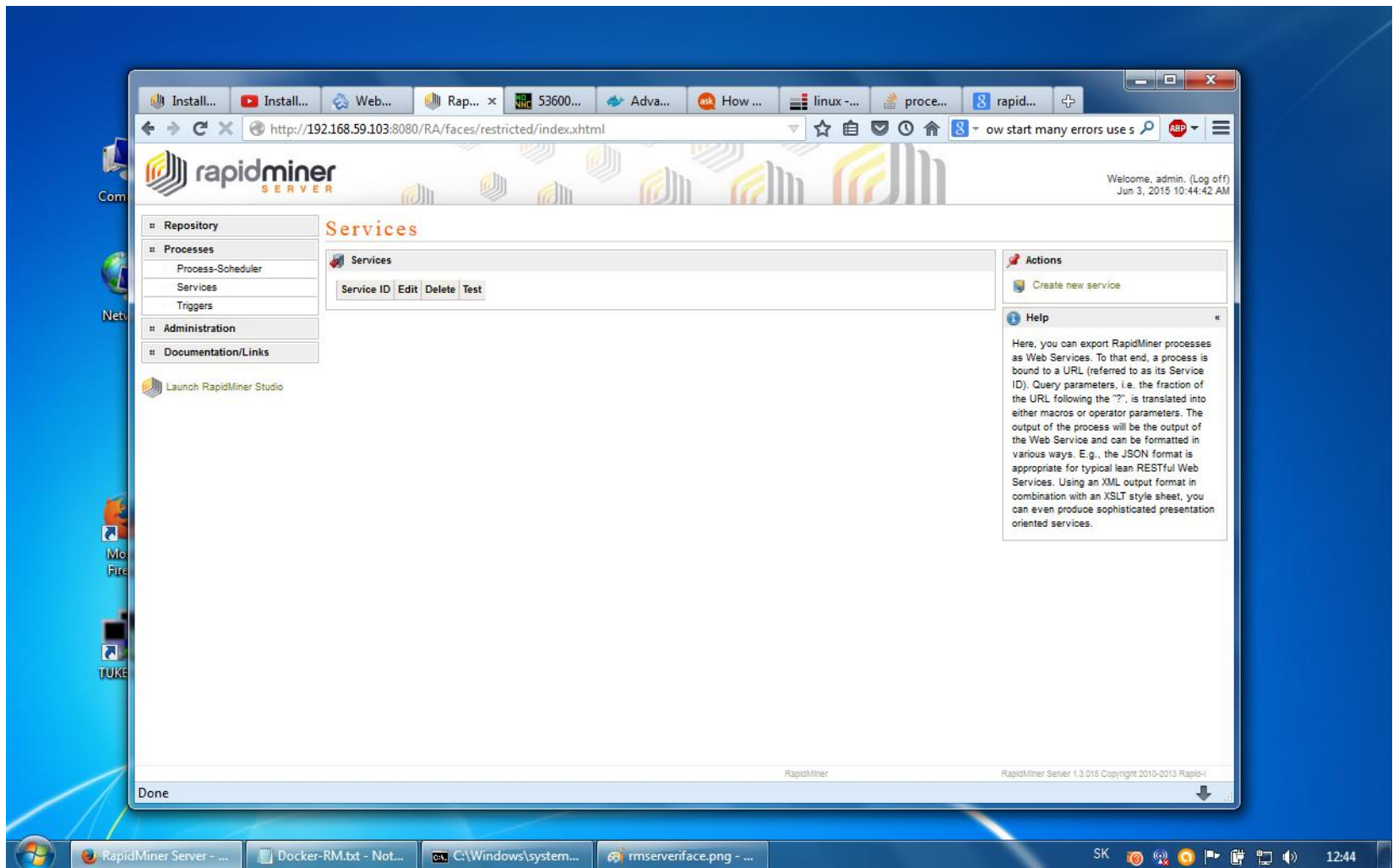
# Connect to RM Server



# Connect to RM Server



# Connect to RM Server



# Update Container Startup Script

- Update container startup script to run services automatically:
  - Add the following lines to the **"/startup.sh"**:
    - #start MySQL service
    - sudo service mysql start
    - #start Webmin service
    - sudo service webmin start
    - #start Rapid Miner server
    - sudo /home/ubuntu/rmserver/bin/run.sh -b 0.0.0.0 &



# Update Docker Image

- Commit changes made within container to new image:
  - Get your CONTAINER\_ID :
    - `docker ps`
      - (only first few letters are necessary, e.g. "70d5aE")
  - Commit container delta to new image:
    - `docker commit CONTAINER_ID rmserver`
  - You can now stop running container:
    - `docker stop CONTAINER_ID`

# Congratulations

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*You have successfully created standalone*

***Rapid Miner Server Docker image !!!***

# RM Server Startup

- Now you can start\* your RM server as a new Docker container using any of the following commands:
  - `docker run -d -h rmserver -p 6080:6080 -p 8080:8080 -p 10000:10000 rmserver`
    - (-d opens container in detached silent mode.)
  - `docker run -it -h rmserver -p 6080:6080 -p 8080:8080 -p 10000:10000 rmserver`
    - (-it opens container in interactive mode.)

*\* Remember to wait 3-5 minutes until RM Server actually starts!*

# Connection Recap

- VNC remote desktop:
  - Browse to: <http://rmserver:6080/vnc.html>
- Server administration via Webmin:
  - Browse to: <https://rmserver:10000>
- Rapid Miner Server:
  - Browse to: <http://rmserver:8080>

# TODO

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- Connect RM client to server
- Create remote repository on server
- Expose process as service

Thank you for your attention!

# Resources

- VNC:
  - <https://github.com/fcwu/docker-ubuntu-vnc-desktop#docker-ubuntu-vnc-desktop>
- Rapid Miner Server installation video tutorial:
  - <https://www.youtube.com/watch?v=r1OC3xmVwso&list=PLoA5BD7FAEoEC6D3C>
- RM database setup:
  - [http://docs.rapidminer.com/server/installation/creating\\_mysql\\_db.html](http://docs.rapidminer.com/server/installation/creating_mysql_db.html)
- RM Server installation documentation:
  - <http://docs.rapidminer.com/server/installation/>
- Docker commands:
  - <https://docs.docker.com/reference/commandline/cli/>
- Networking in Docker:
  - <https://docs.docker.com/articles/networking/>
- Docker IP address in Windows & OSX:
  - <http://webiphany.com/technology/2014/06/12/what-ip-do-i-access-when-using-docker-and-boot2docker.html>