AUTOMATED BACKUP AND DEPLOYMENT OF RSC VIA FTP (MAIN ROUTER)

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MEP.PH TECHNOLOGIES
NETWORK AND IT SOLUTIONS

INTRODUCTION

Engr. Mark Edward R. Peñaverde

- Owner of MEP.PH Technologies
- BSCpE graduated from Siena College of Taytay
- Certified Mikrotik Network Associate
- Certified Mikrotik User Management Engineer
- Certified Mikrotik Routing Engineer

- ✓MEP.PH Technologies started last November 12, 2016
- ✓ For inquiries and business matters, email us via network@mep.ph or mark@mep.ph

WHAT WE DO

- Network and IT Solutions
- Mikrotik, Juniper and Cisco Networking
- Network and Server Management
- Installation of CCTV IP Cameras and NVR
- Network Monitoring System via VPN (Cacti with own Login Details)

HOW TO DEPLOY ONE RSC INTO TWO OR MORE ROUTERS?

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We can do a automated backup, fetch and deployment via FTP on main branch router.

ADVANTAGES AND DISADVANTAGES OF USING THIS SCRIPT

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ADVANTAGES

- Best for Firewall Configuration and by Part Backup
- Can be used in Firewall Rules, Mangle Rules and Address Lists

DISADVANTAGES

- Not suitable for a whole Configuration Backup and it might cause errors

Note : For Full Backup you can use the .backup file

WHO ARE USING MANUAL BACKUP AND DEPLOYMENT OF RSC?

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BEFORE USING THIS SCRIPT, YOU SHOULD PLAN CAREFULLY

- You must know who will be connecting to the Main Branch Site (Security Purposes)
- Check if it is for a Firewall Update or System Update

- Estimate the time it will be deploying and fetching the specific RSC Script
- Lastly, you should know what RSC Script will be for Urgent Deployment or for Regular Updates

THREE CORE SCRIPTS THAT WILL BE USE

1. Auto-Backup Script
2. Auto-Fetch Script
3. Auto-Deploy Script

- You can download the full script of this via https://proj.mep.ph/auto-deploy-script/Auto-Backup.rsc (This script is working smoothly on Mikrotik Routers)
- This script will be updated on our project post (https://www.mep.ph/network/mikrotik/mum-2018/)
- You will need a FTP Server for this to work.

Note : This is for Full Backup (RSC and .BACKUP)

AUTO-BACKUP SCRIPT

USING FTP SERVER

- You can use the RSC Export Command.
- /path export compact file=filename.rsc
- Ex. : /ip firewall mangle > export compact file=mangle.rsc
- You can use this command on the terminal and save it as script.

AUTO-BACKUP SCRIPT

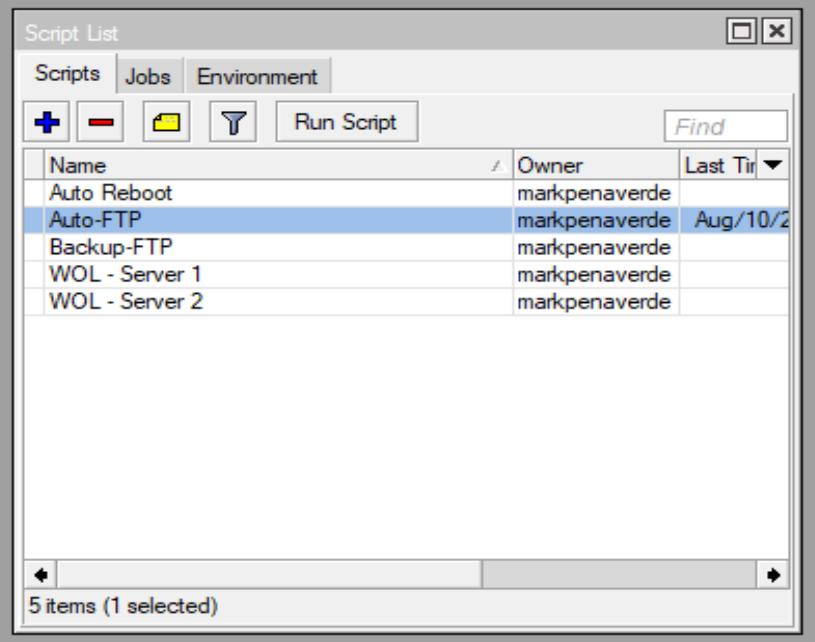
FOR LOCAL BRANCH

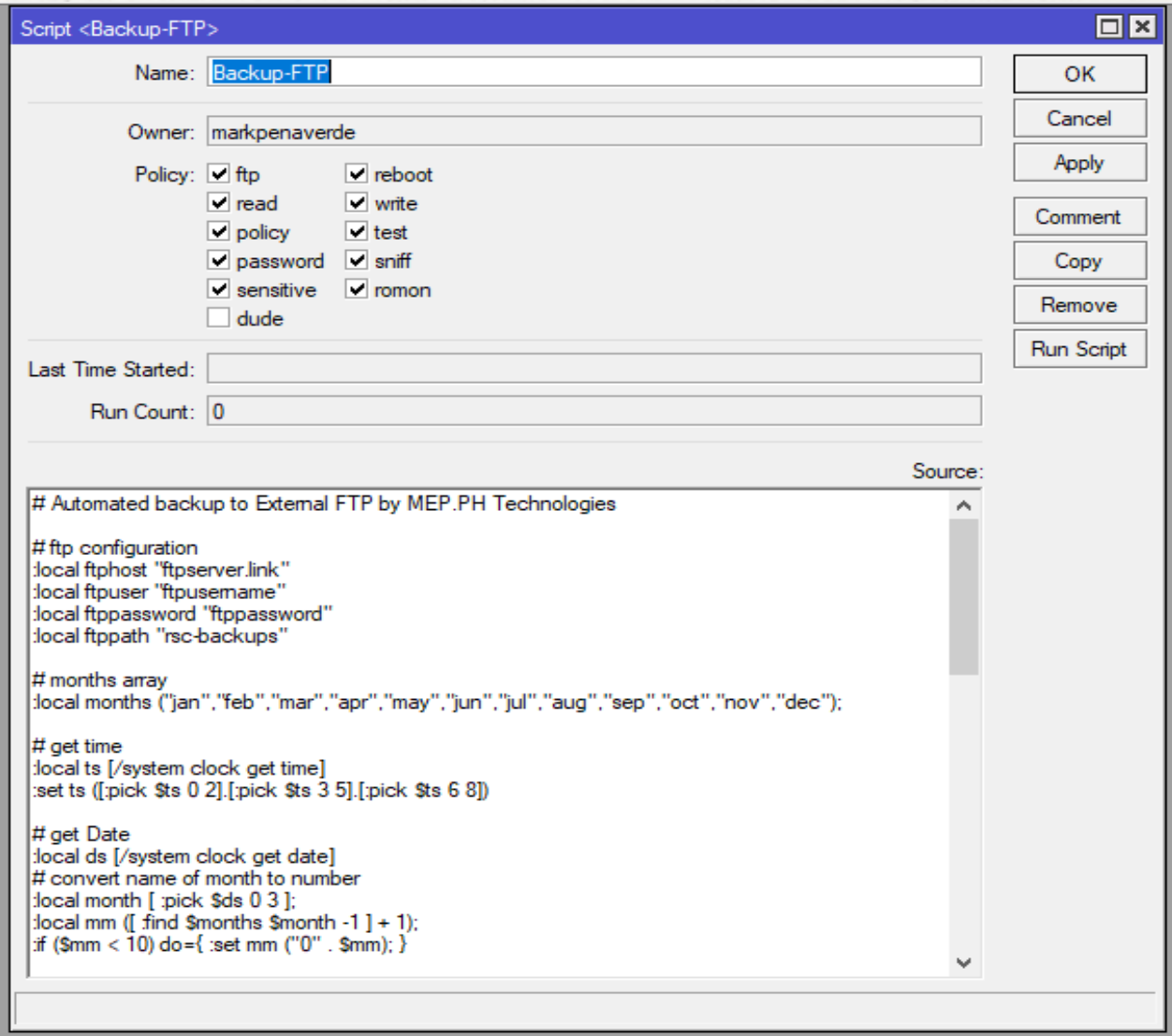
AUTO-BACKUP SCRIPT (USING FTP)

You can deploy the Full Script on Mikrotik Scripts:

- Systems > Scripts
- In the Script List, Click “Add” to add new script
- Then change the FTP Configuration for your FTP Credentials

AUTO-BACKUP SCRIPT (USING FTP SERVER)





We only recommend to edit the FTP Configuration part.

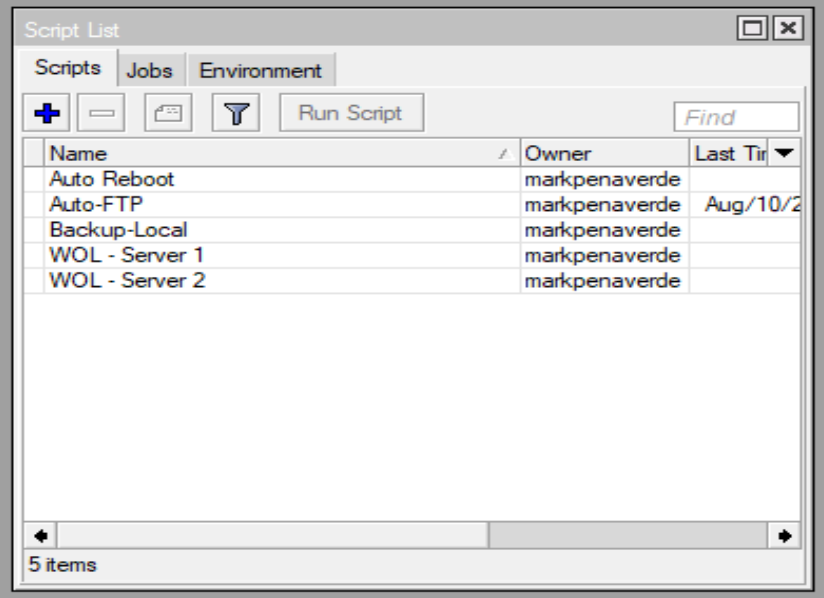
But if you know how to program Mikrotik Scripting then you can play with the codes.

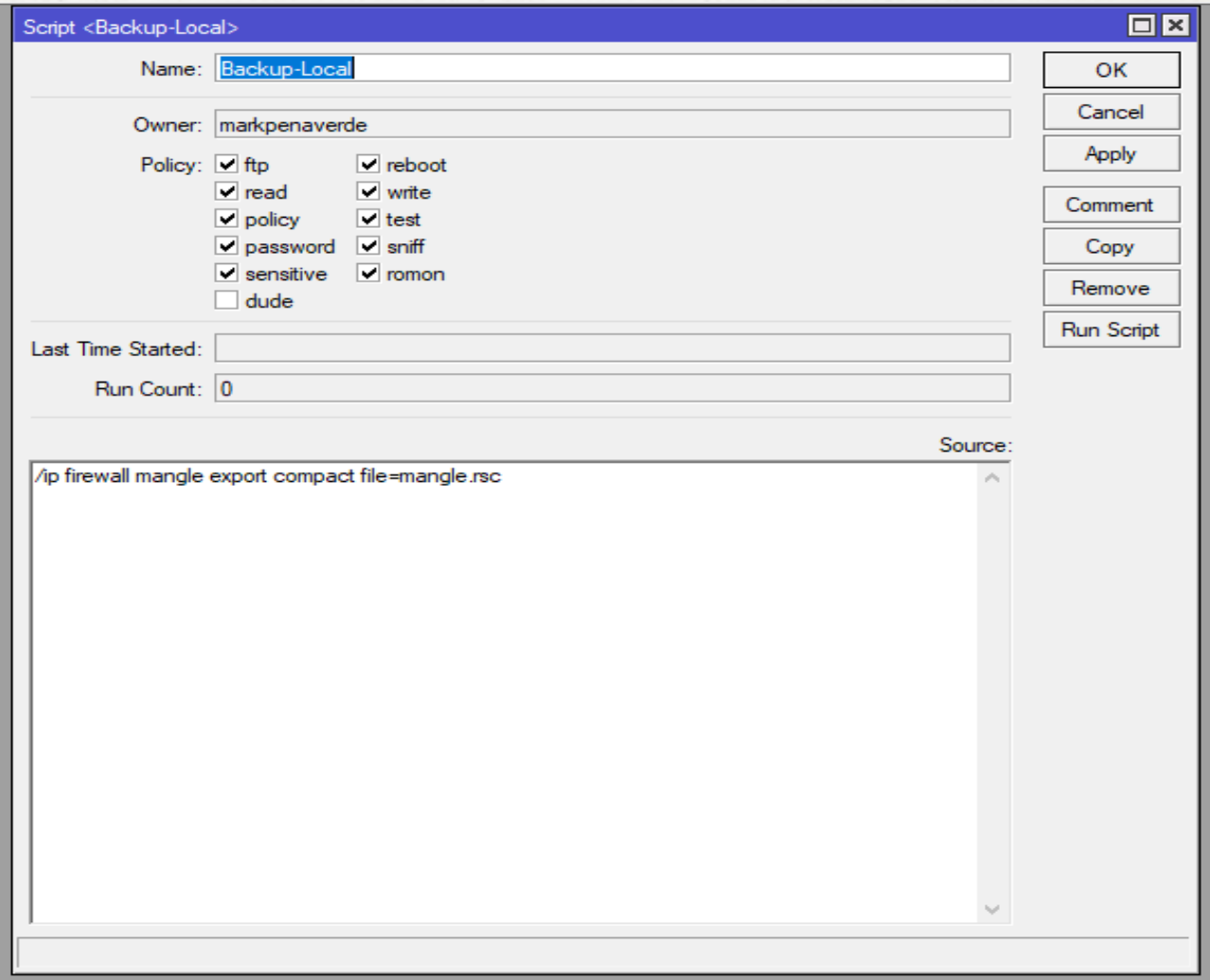
AUTO-BACKUP SCRIPT (LOCAL BACKUP)

You can run this command on the Terminal or save it as a script so you can run it seamlessly.

We recommend to save it on Mikrotik Scripts so it can easily click and deploy.

AUTO-BACKUP SCRIPT (LOCAL BACKUP)





Type the command : /ip firewall mangle export compact file=filename.rsc

- When using this option, please take note that this will backup the whole Mikrotik Configuration otherwise edit the scripting to backup a specific path for deployment.
- Our script are backing up two backup files: .backup and .RSC
- RSC is the one we are using on the Auto-Deploy Script.

NOTES FOR AUTO-BACKUP

FTP SERVER

- When using this option, it will lessen the hassle of editing our script.

- You can just add the command on the script and it will automatically run the command.

NOTES FOR AUTO-BACKUP

LOCAL BACKUP

AUTO-FETCH SCRIPT

We can use the Fetch Command from Mikrotik Wiki:

- /tool fetch address=ipaddress src-path=filename.rsc user=ftpuser mode=ftp password=ftppassword dst-path=filename.rsc port=21

For Example:

- /tool fetch address=192.168.200.1 src-path=/rsc/mangle.rsc user=admin mode=ftp password=123456 dst-path=mangle.rsc port=21

Note: Please check your FTP port number before using the default port 21.

AUTO-DEPLOYMENT SCRIPT

- This script will be the one to check and deploy the specific RSC File on your Mikrotik devices.

- It will detect if the specific file are available in the file list for deployment.

- If the specific file is available in the file list, it will remove the existing filter rules or configuration with a specific period of time after the removal of the existing configuration. It will be importing the specific RSC file for deployment.
- After the importing and deployment of the specific RSC file or configuration file, it will now remove the specific file on the file list.

AUTO-DEPLOYMENT SCRIPT

```
# Declare list name including its extension (has to be .rsc)
:local listName "mpl7.rsc";
# Check if the list file is present
:if ([:len [/file find name="$listName"]] > 0) do={

                        #Remove Firewall Filters
                        :log info "Removing existing Firewall Rules";
                        /ip firewall filter remove [find];
                        :delay 5
            }
                        # Import new entries from list file
                :log info "$listName: Importing new entries";
                /import file-name=$listName;
            :delay 5

            # Finally the local copy is removed in order to minimize the number
                        # of write cycles to the local flash memory.
                /file remove $listName;
            } else={
                # Log a warning if the list file exists but is smaller than 1KB in size
            :log warning "WARNING: $listName is < 1KB. Not attempting to replace existing entries.";
        }
        } else={
        # Log a warning if the list file isn't present and don't attempt to remove or replace any existing entries
        :log warning "WARNING: File $listName doesn't exist - keeping existing entries!";
        :log warning "This script was created and maintained by MEP.PH TECHNOLOGIES";
    }
}
```

We added a mini comment before the actual codes and conditions.
You can change the delay time to your specific delay time of execution.

AUTO-DEPLOYMENT SCRIPT

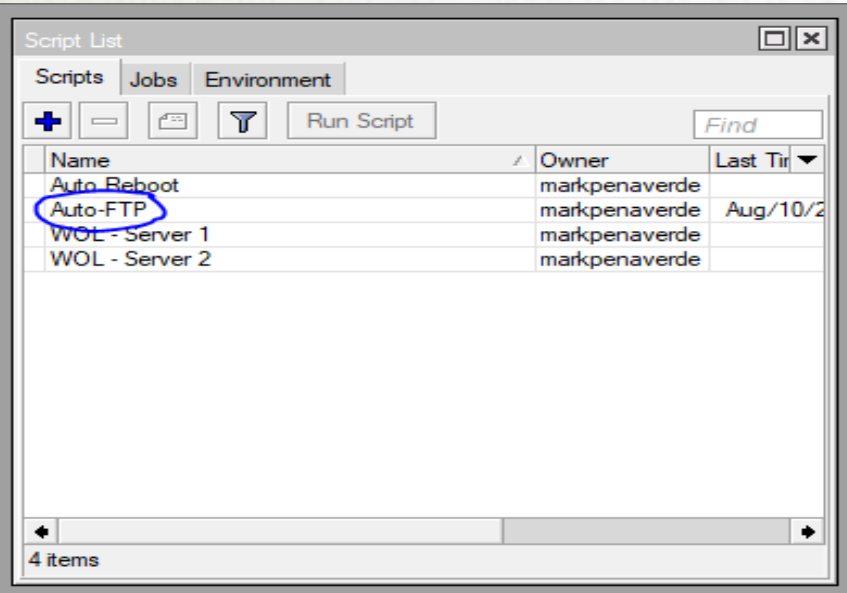
- Listname = Filename of the Script.
- After the Do Condition, you can change it to your specific path and change the removal delay.
- After the removal of the existing configurations, it will import and deploy the new configuration.
- After deployment, it will automatically delete the RSC file on the file list.

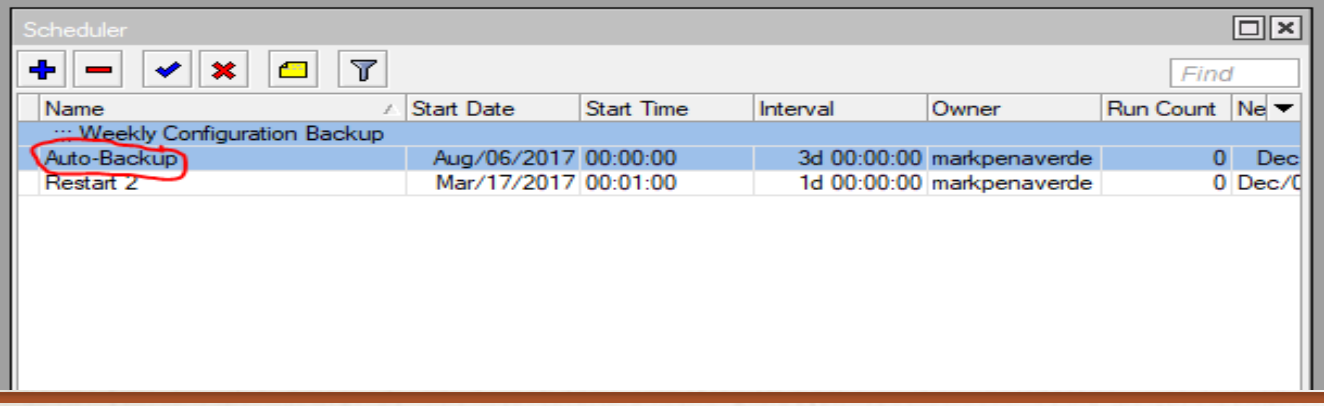
WHAT'S NEXT?

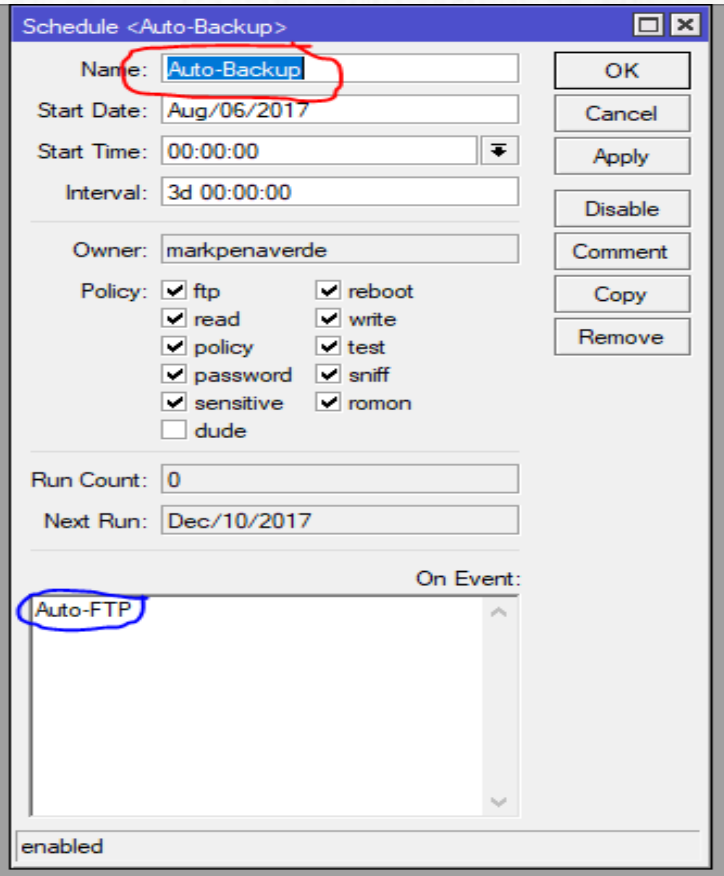
- We will now do the SCHEDULING OF THE SCRIPT
- We must know what are the PREFFERED TIME FOR BACKUP, FETCH AND DEPLOYMENT
- Always FOCUS ON THE PLAN, it can affect your network if you deploy it in a wrong time.
- UPTIME IS CRITICAL TO A NETWORK!
- You can set it on a Urgent, Daily, Weekly or Monthly Basis

SCHEDULING OF THE SCRIPT

- NOTE THAT YOU MUST CREATE A SPECIFIC SCHEDULE FOR EVERY BACKUP, FETCH AND DEPLOYMENT



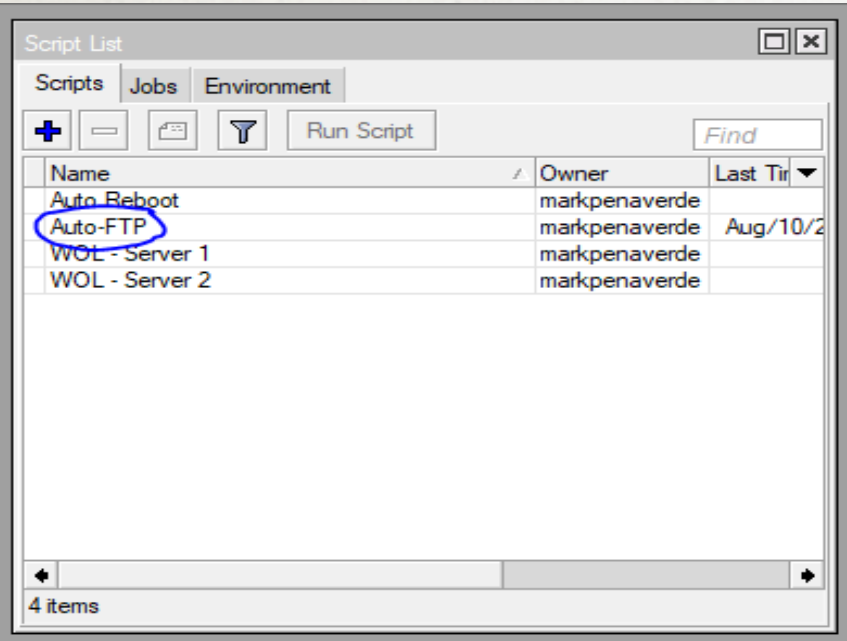


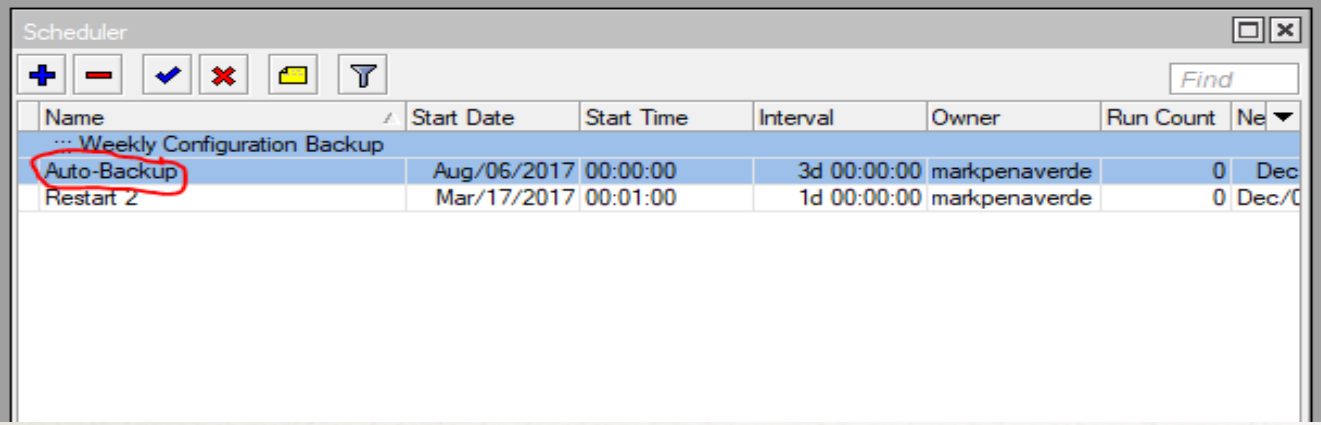


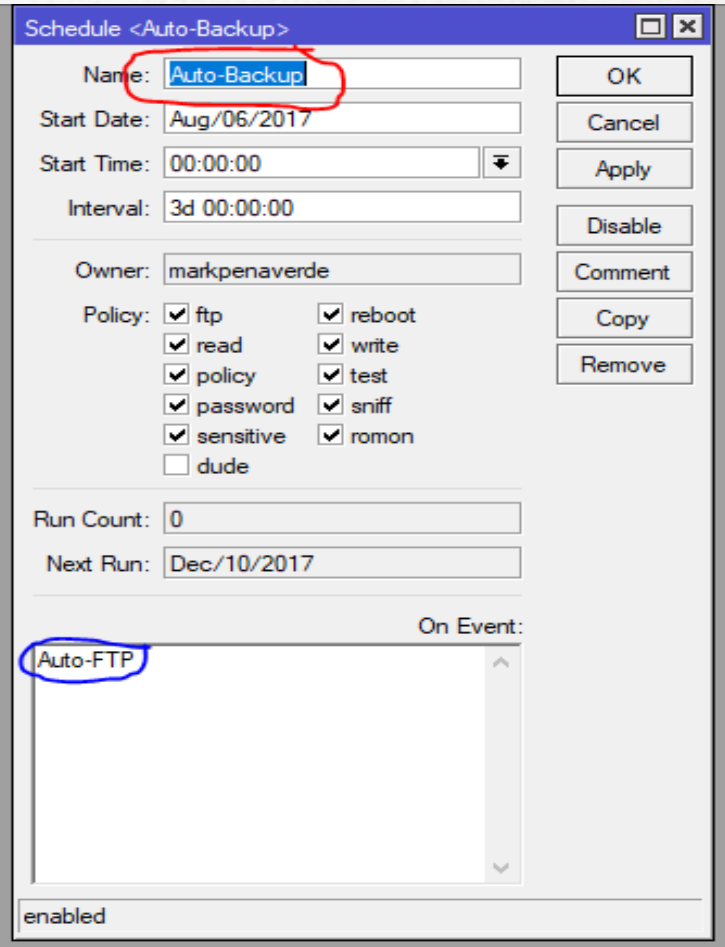
SCHEDULING THE SCRIPT

- First, make a schedule for the Backup Script. It will be your call if you want to have a regular backup but for an urgent one I recommend at least make a separate script for urgent fetch and deploy.
- Second, make a schedule to fetch the specific file for deployment after the regular backup time.
- Third, make a schedule to run the script on a specific file to check if there is any file for deployment.

SCHEDULING THE SCRIPT







TIPS ON MAKING A SCHEDULE FOR AUTO-BACKUP AND DEPLOY SCRIPTS

- Make sure that it will not affect any packets when the network is on its peak hours.
- Make a plan.
- Schedule it if possible every lunch/noon time if it is urgent or needs to deploy for Firewall Rules and Filtering.

- If updating an Firewall Rules, NAT, Mangle and Address-List you must have the most complete and updated needed on your network because it has a part that will remove the existing configuration and deploy the new one.
- For urgent deployment, you can schedule the fetch and deploy script every 1 hour.
- The best practice on using this script is Backup a specific part (Mangle, Firewall Filters) to be safe.
- Plan a specific Filename that will be used on the scripts. At least a Global Filename for your RSC file.

INTRODUCTION ON MIKROTIK SCRIPTS

BONUS PART

INTRODUCTION TO MIKROTIK SCRIPTS

- You can do Basic Scripts
- You can do Advance Scripts
- You can trigger scripts

MIKORITK SCRIPT

- You can automate any task with user defined scripts
  - You can run it on Terminal
    - Can use to configure the router
  - And the fun part is you can run it triggered events
    - System Scheduler
      - It will run the scripts at specific time and specific intervals
    - Traffic Monitoring
      - Scripts will run when it crosses the specific threshold
    - Netwatch
      - Scripts will run depending on the monitored hosts (ICMP Triggered)

DIFFERENT MIKROTIK SCRIPTS

- Base Configurations
- Feature Configuration
- Apply Scripts
- Create Scripts

MIKROTIK SCRIPTS > BASE CONFIGURATION

- Standard Configuration for Routers that are for deployments
- You can customize it for the parameters like Wireless SSID, System Password and etc.

MIKROTIK SCRIPTS > BASE CONFIGURATION

- Example

```
:global wlanpass mikrotikmum
:global company MEP.PH
:global location SBCoffeeMakati
:global user mark
:global pass 1234
:global myip 192.168.250.1/24
/ wireless interface
set [find name = wlan1] band = 2ghz-b / g / n disabled = no mode = \
   station ssid = ClassAP radio-name = $company-$location
/ interface wireless security-profiles
set [find default = yes] authentication-types = wpa-psk, wpa2-psk group-ciphers = \
   tkip, aes-ccm mode = dynamic-keys supplicant-identity = MikroTik \
   unicast-ciphers = tkip, aes-ccm wpa-pre-shared-key = $wlanpass \
   wpa2-pre-shared-key = $wlanpass
/ ip neighbor discovery set wlan1 discover = yes
/ ip dhcp-client add disabled = no interface = wlan1
/ ip address add address = $myip interface = ether1
/ ip firewall nat add action = masquerade chain = srcnat out-interface = wlan1
/ ip route add distance = 1 gateway = 10.1.1.1
/ ip dns set allow-remote-requests = yes servers = 10.1.1.1
/ user add name = $name group = full password = $pass
/ system identity set name = $name_$company-$location
```

MIKROTIK SCRIPTS > FEATURE CONFIGURATION

- Are the configuration for Firewall, Mangles and others that are need to be automated or triggered

MIKROTIK SCRIPTS > FEATURE CONFIGURATION

- Example

```
/ip firewall layer7-protocol
add comment="LAYER7 FOR FACEBOOK" name=FB regexp="^.+(facebook.com).*\$"
add comment="LAYER7 FOR STREAMING" name=STREAM regexp=\
    "^.+(youtube|dailymotion|metacafe|mccont).*\$"
add name=STREAMING regexp=videoplayback|video
add comment="LAYER7 FOR DOCUMENTS" name=Document regexp=\
    "^.+(pdf|doc|docx|xlsx|xls|rtf|ppt).*\$"
add comment="LAYER7 FOR TORRENT" name=TORRENT regexp="^(\\x13bittorent protoco\
    l|azver\\x01\$|get/scrape\\?info_hash=get/announce\\?info_hash=|get/clie\
    nt/bitcomet/|GET/data\\?fid=)|d1:ad2:id20:|\\x08'7P\\)[RP]"

/ip firewall mangle
add action=mark-packet chain=forward comment="ONLINE GAMING PORTS" \
    new-packet-mark=Game-Packet passthrough=no port=\
    5340-5352,6000-6152,10001-10011,14009-14030,18901-18909 protocol=tcp
add action=mark-packet chain=forward new-packet-mark=Game-Packet passthrough=\
    no port=47611,16666,20000,5105,29000,18901-18909,9015 protocol=tcp
add action=mark-packet chain=forward new-packet-mark=Game-Packet passthrough=\
    no port=40000,9300,9400,9700,7342,8005-8010,37466,36567,8822 protocol=tcp
add action=mark-packet chain=forward comment="L.O.L - TCP" new-packet-mark=\
    Game-Packet passthrough=no port=8393-8400,2099,5222-5223,20,466,910,21,33 \
    protocol=tcp
add action=mark-packet chain=forward comment="L.O.L - UDP" new-packet-mark=\
    Game-Packet passthrough=no port=20,466,910,21,33,5000-5500 protocol=udp
add action=mark-packet chain=forward comment="DOTA2 - UDP" new-packet-mark=\
    Game-Packet passthrough=no port=27015-28999 protocol=udp
add action=mark-packet chain=forward new-packet-mark=Game-Packet passthrough=\
    no port=27005-27020,13055,7800-7900,12060-12070 protocol=udp
add action=mark-packet chain=forward new-packet-mark=Game-Packet passthrough=\
    no port=8005-8010,9068,1293,1479,9401,9600,30000 protocol=udp
add action=mark-packet chain=forward new-packet-mark=Game-Packet passthrough=\
    no port=14009-14030,42051-42052,40000-40050,13000-13080 protocol=udp
add action=mark-packet chain=forward comment="RAGNAROK - TCP" \
    new-packet-mark=Game-Packet passthrough=no port=5000-5500 protocol=tcp
add action=mark-packet chain=forward comment="DRAGON NEST - TCP" \
    new-packet-mark=Game-Packet passthrough=no port=1,430,14,301,700,10,0 \
    protocol=tcp
add action=mark-packet chain=forward comment="RAN ONLINE - TCP" \
    new-packet-mark=Game-Packet passthrough=no port=500,155,25,105 protocol=\
    tcp
```

MIKROTIK SCRIPTS > APPLY SCRIPTS

- Scripts that will add some functions that can be automated or triggered
- Some of this are Upgrade of Mikrotik Version and Restart on a specific time

MIKROTIK SCRIPTS > APPLY SCRIPTS

- Example

```
# Set primary and secondary ntp servers to be fetched from
# pool.ntp.org. This automatically ensures that ntp servers
# are installed that are located within Philippines
# of the router
/system script add name="MEP.PHNtpServers" source={
:global SystemNtpPrimary "t.mep.ph";
:global SystemNtpSecondary "t1.mep.ph";
}

# Create scheduler to execute script at boot time
/system scheduler add name="SetGlobalNtpServers" on-event="/system script run MEP.PHNtpServers" start-time=startup

# Define script to configure ntp servers
/system script add name="ConfigureGlobalNtpServers" source={

# Make global variables available within the local scope
:global SystemNtpPrimary
:global SystemNtpSecondary

# Resolve the first ip address of each pool
:local NtpIpPrimary [:resolve $SystemNtpPrimary];
:local NtpIpSecondary [:resolve $SystemNtpSecondary];

# Store the currently configured ip addresses
:local NtpCurPrimary [/system ntp client get primary-ntp];
:local NtpCurSecondary [/system ntp client get secondary-ntp];

# Debug output
:put ("Primary (old): " . $NtpCurPrimary . " Primary (New): " . $NtpIpPrimary);
:put ("Secondary (old): " . $NtpCurSecondary . " Secondary (New): " . $NtpIpSecondary);

# Change primary if required
:if ($NtpIpPrimary != $NtpCurPrimary) do={
   :put "Changed address of primary ntp server";
   /system ntp client set primary-ntp="$NtpIpPrimary";
   }

# Change primary if required
:if ($NtpIpPrimary != $NtpCurPrimary) do={
   :put "Changed address of primary ntp server";
   /system ntp client set primary-ntp="$NtpIpPrimary";
   }

# Change secondary if required
:if ($NtpIpSecondary != $NtpCurSecondary) do={
   :put "Changed address of secondary ntp server";
   /system ntp client set secondary-ntp="$NtpIpSecondary";
   }
}

# On a daily basis fetch and install most recent ntp servers from given pools
/system scheduler add interval=1d name="ConfigureGlobalNtpServers" on-event="/system script run ConfigureGlobalNtpServers" start-date=jan/01/1970 start-time=59:59:00

# After successful installation

# Declare global ntp servers (avoids reboot)
/system script run MEP.PHNtpServers

# Implement configuration
/system script run ConfigureGlobalNtpServers

# Make sure ntp client is enabled
:system ntp client set enabled=yes

# Make globally declared ntp servers available within local scope
:global SystemNtpPrimary
:global SystemNtpSecondary

:put "The following ntp pools are configured on this system:"
:put "----------------------------------------"
:put "Primary -> $SystemNtpPrimary"
:put "Secondary -> $SystemNtpSecondary"
:put "----------------------------------------"
```

MIKROTIK SCRIPTS > CREATE SCRIPTS

- Scripts that export specific script file for deployment

MIKROTIK SCRIPTS > CREATE SCRIPTS

- Example

/ip firewall mangle export compact file=mangle.rsc

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MORE MIKROTIK SCRIPTS AT

- https://wiki.mikrotik.com/wiki/Scripts
- https://www.mep.ph/category/network/mikrotik/

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BY THE WAY!

I'M STILL LEARNING THE MIKROTIK SCRIPTING. IF YOU WANNA LEARN MORE ON COMMAND SCRIPTING YOU CAN USE "?"

Using "?" in Terminal feels like configuring other Network Devices

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BEFORE I END MY PRESENTATION, I JUST WANNA SAY HI TO ALL AND TO ALL WHO ATTEND SPECIALLY

- MIKROTIK LATVIA
- MIKROTIK PHILIPPINES (UNITEDPLEXUS)
- CYGNAL TECHNOLOGIES
- SIENA COLLEGE OF TAYTAY
- AMA UNIVERSITY SYSTEM
- TELMARC CABLE CORPORATION

MEP.PH TECHNOLOGIES

NETWORK AND IT SOLUTIONS

THANK YOU!

MEP.PH TECHNOLOGIES

NETWORK AND IT SOLUTIONS

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