



Automatic NBAR Protocol Pack download tool...

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# Problem Statement

Cisco releases NBAR protocol packs every month. Newer protocol packs are needed for enabling additional signatures / bug fixes.

Customer has to download it to each and every device and upgrade / downgrade manually

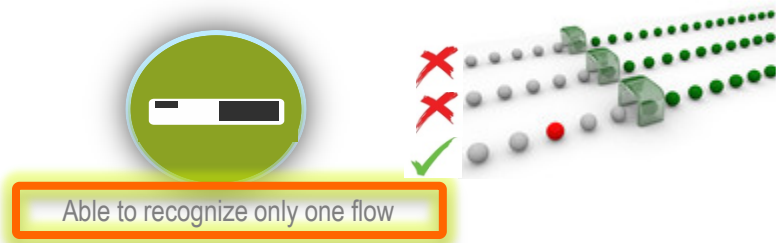
Currently there is no automated download of protocol pack & the effort required to upgrade grows exponential based on the number of devices.

Unavailability of automated upgrade/downgrade for larger deployment leads to delay in adoption / migration to newer protocol packs.

**NOTE :** View this presentation in slide-show mode as it uses animations

# Problem Statement

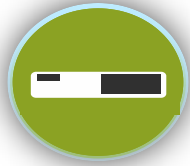
ASR/ISR/CSR - NBAR with **Protocol Pack version 1**



**UPGRADE NBAR PROTOCOL PACK  
TO RECOGNIZE ADDITIONAL FLOWS**

# Problem Statement

ASR/ISR/CSR - NBAR with **Protocol Pack version 1**



Upgrade to Protocol Pack Version 2

## Challenge

For manual download of protocol pack on a single device

- Total no. commands to be issued(avg) : 10
- Time taken (avg) : 3 Minutes

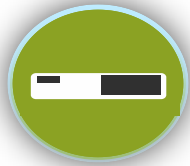
Every month for hundreds / thousands of devices for upgrade

**To upgrade 500 devices,**

$500 * 10$  (Commands) = **5000 Commands**

$500 * 3$  ( Minutes) = 25 Hrs/Month = **3.1 Days/Month**

ASR/ISR/CSR - NBAR with **Protocol Pack version 2**



Based on IOS(NBAR Engine) version,  
Supported Protocol Pack versions would vary.

# Simplified Solution

Can I enable the devices for automatic protocol pack download (at regular interval) & upgrade/downgrade automatically?

I want to upgrade my entire network devices with new protocol pack – using **only one line** change at central server. Is it possible?

Can I simplify from 5000 line of commands typing to 1 line (for 500 devices upgrade) for the upgrade/ downgrade?

Can I eliminate manual upgrade / downgrade?

**YES. Using this solution...**

# Solution

- **Solution is developed using Embedded Event Manager.**
- **The solution contains the below parts in high level**

**The solution is provided as tar file & once it is untar'ed, it will have the below files / supporting directories**

1. Install.txt file (located on central server & copied to device as initial setup)
2. Manifesto file (located on central server & updated with new protocol packs details)
3. EEM TCL Script files (copied to device from central server as part of initial setup)
4. Log directories for devices to place their protocol pack download status logs (located on central server)

## **1. Install.txt**

After updating few parameters(when to try the upgrade, where this tools is located on server etc, this file is copied to running config of the devices for enabling the automatic protocol pack download. This is done only once for enabling the solution on the device.

## **2. Manifesto file**

It gives the details about the mapping of protocol pack for a particular platform running IOS version, Location from which the protocol pack can be downloaded, etc. Devices would download this file at the scheduled date and time & use it for choosing the protocol pack for upgrade/downgrade. User would update this file as and when he/she would like to update the network device with new protocol packs. This is the file used for deploying the protocol pack for the entire network.

## **3. EEM TCL script files**

These EEM scripts would be doing the actual upgrade/downgrade of the protocol pack at the device. These files are copied to devices(as part of solution enablement by initial step) for automatic protocol pack download.

## **4. Log directory Structure on the server**

There is a list of directories created on the server for the device to place their based on the download status. These logs are classified based on the status(success, failure,...) of upgrade/downgrade

# Pre –requisites for solution

- Need a Linux / Solaris server that supports ftp / tftp.
- The tftp server should allow file creation from remote devices. Some tftp service wouldn't allow file creation from remote device.
- Server to device connectivity should work fine.
- Currently supported platforms are ISR2, ASR1K, CSR.
- FTP user name and password is a prerequisite if the user choose to download protocol pack using ftp.

# How to Install/use

- **Enabling the device for Automatic / Manual Download**

- Update the tftp location and cron time on Install file and copy the file to running config.
  - copy tftp://10.64.68.xxx/<path>/Install.txt running-config

- **Once the device is enabled with solution(ash shown above), user has two option to upgrade the NBAR protocol pack**

- **Automatic download**

- **Manual download**

- **Automatic download**

- On the scheduled time(cron), device would download the Manifesto file(located on the central server) which has the details about the package to upgrade/downgrade for a particular IOS version.

- It upgrades/downgrades the device. Capture the pass / failure logs in the tftp in respective logs folders. Also provides a syslog message on device console

- **Manual download of protocol pack**

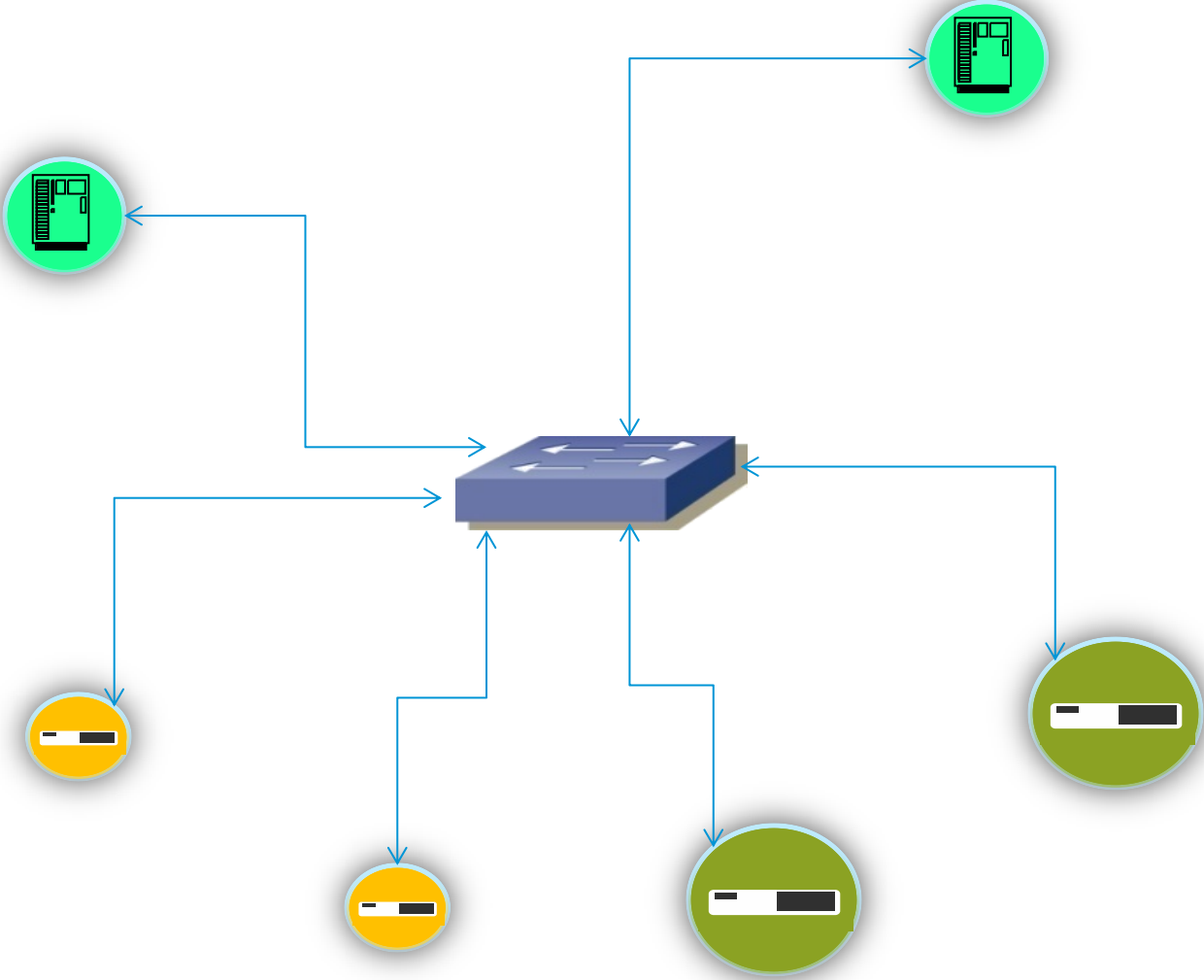
- Issue the below command on the device under privileged user mode
  - UPGRADE-NBAR-PP

- It is going to read a Manifesto file & download the appropriate protocol pack file and install. The 'Manual download' means triggering the protocol pack download activity immediately

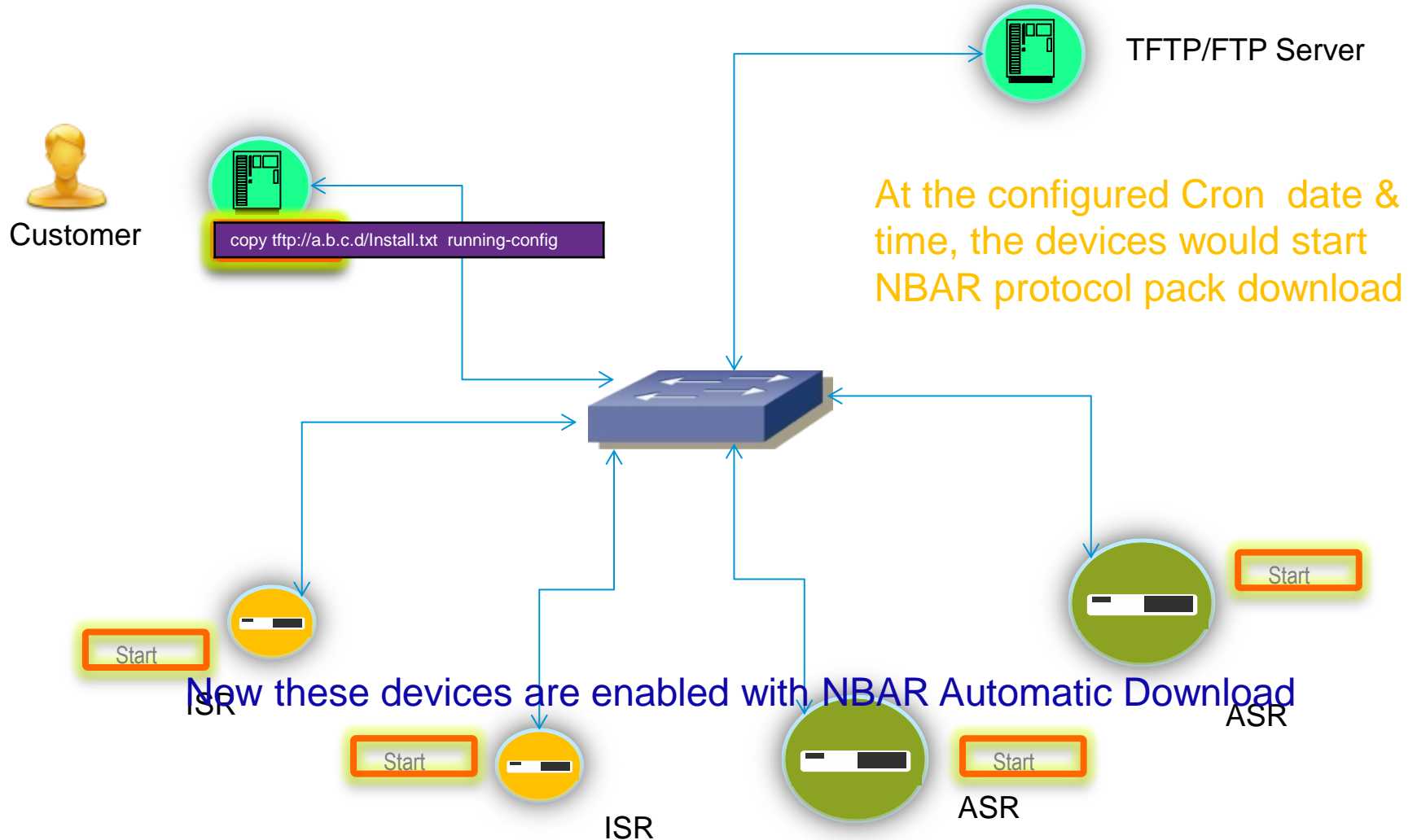


# Sample Network

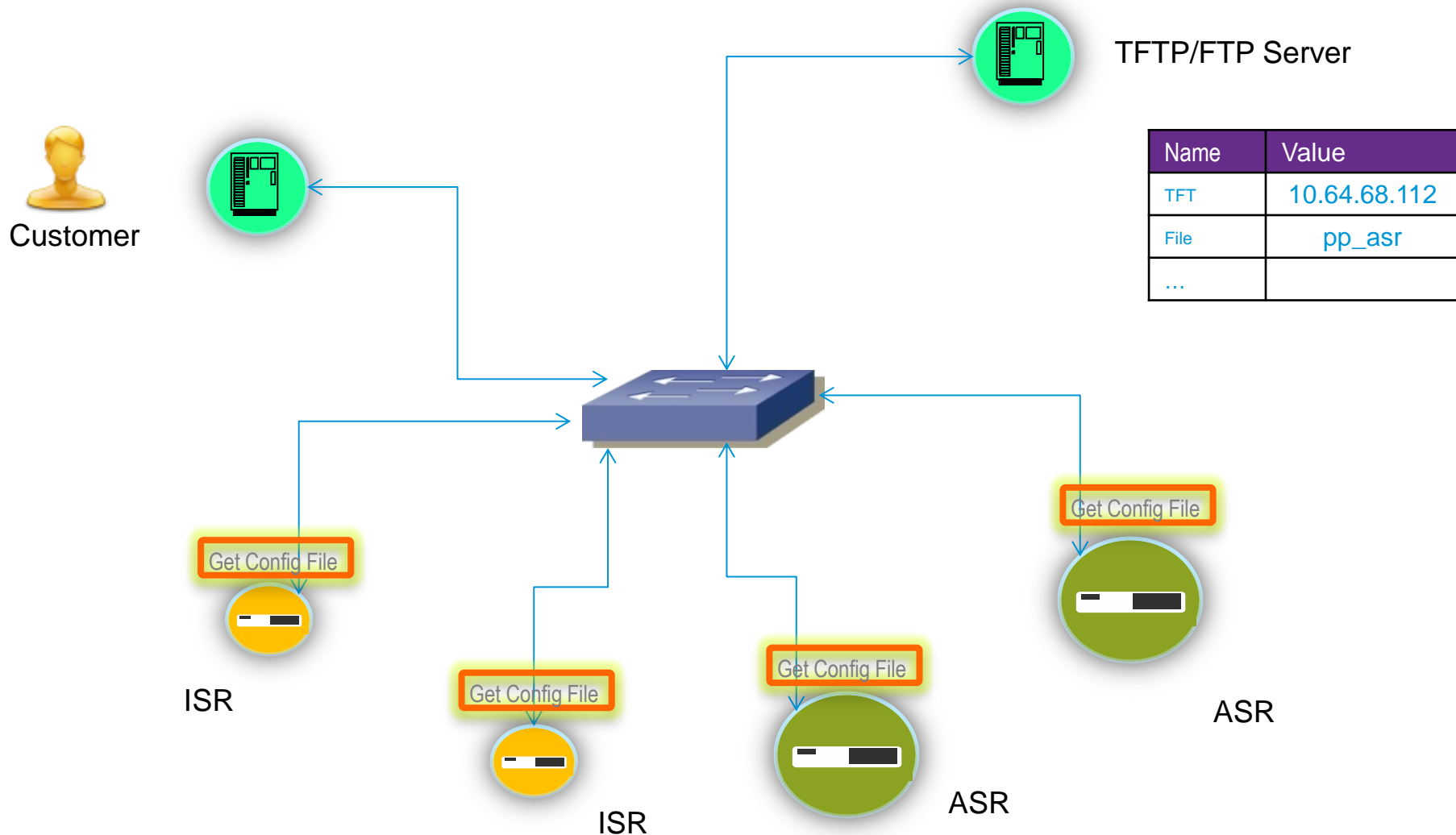
Customer



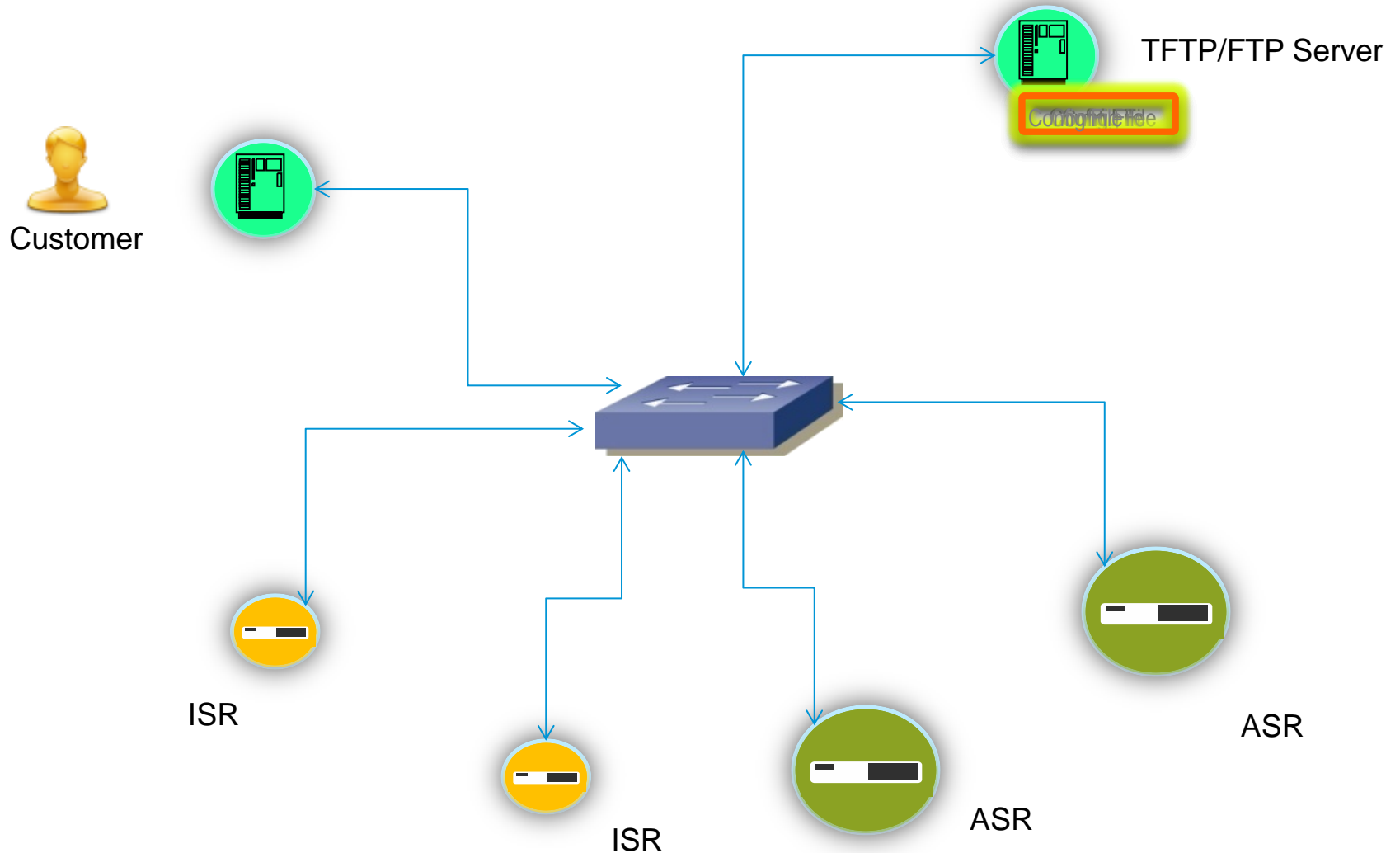
# Installation & Automatic Download



# Automatic Download

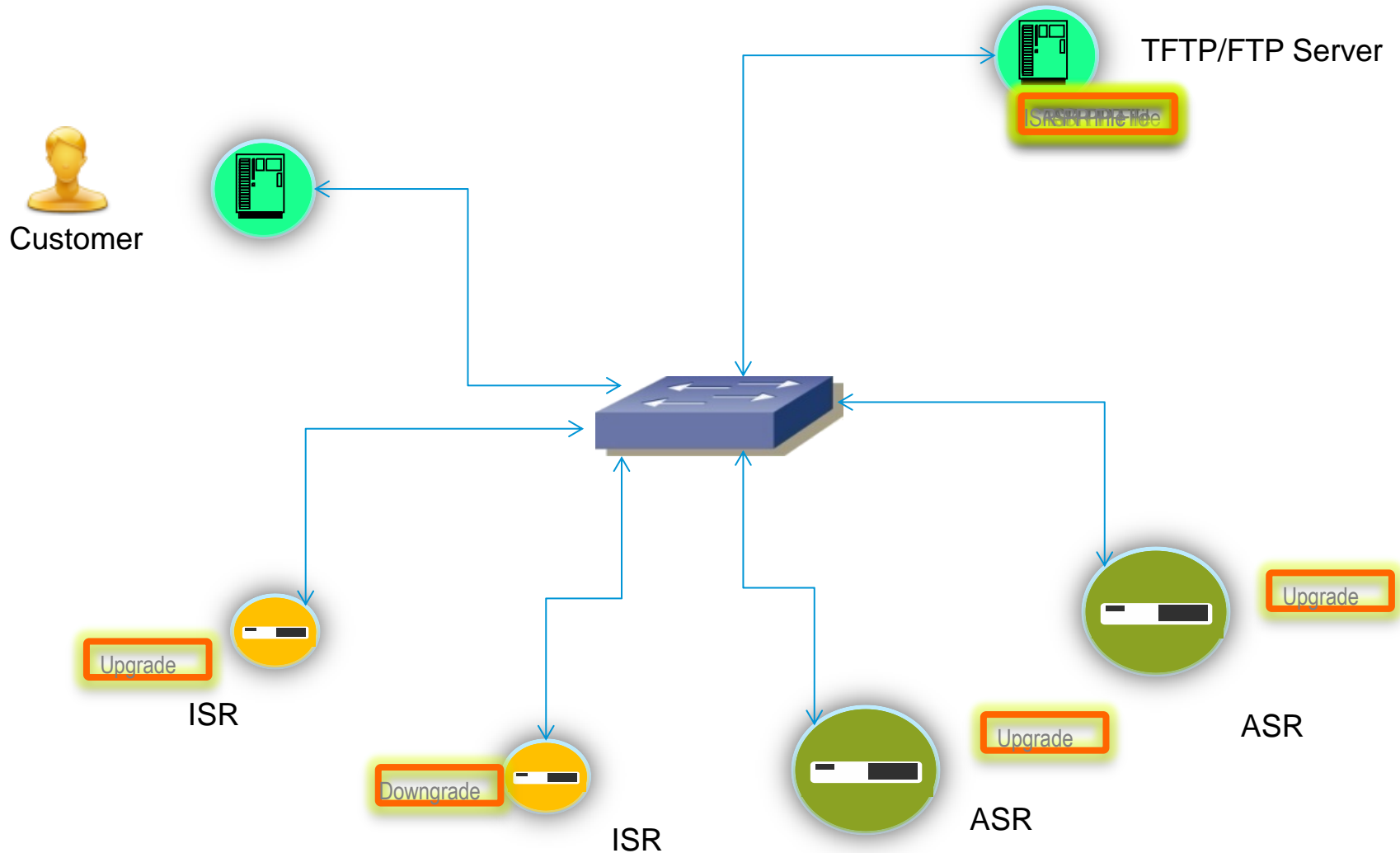


# Automatic Download

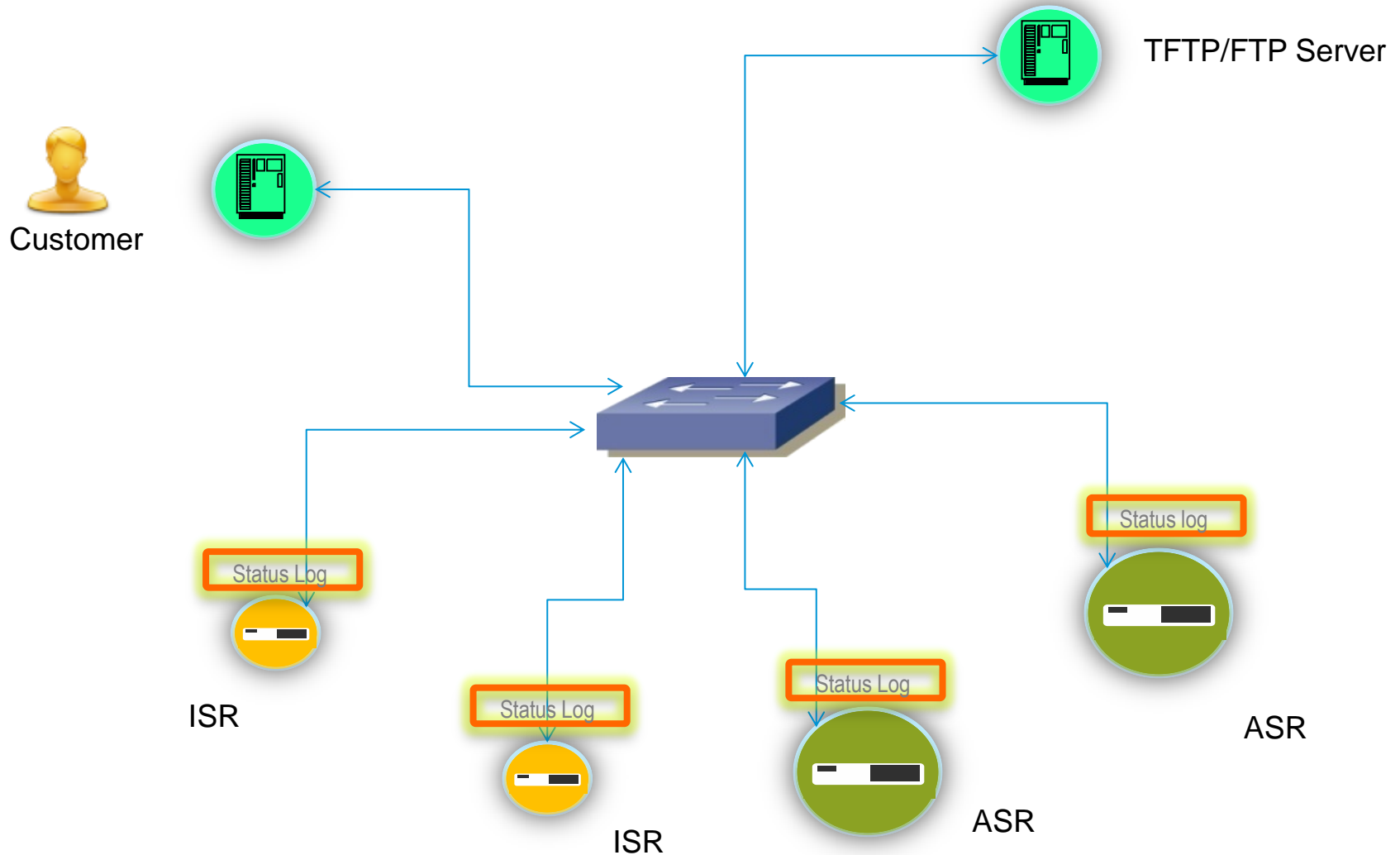




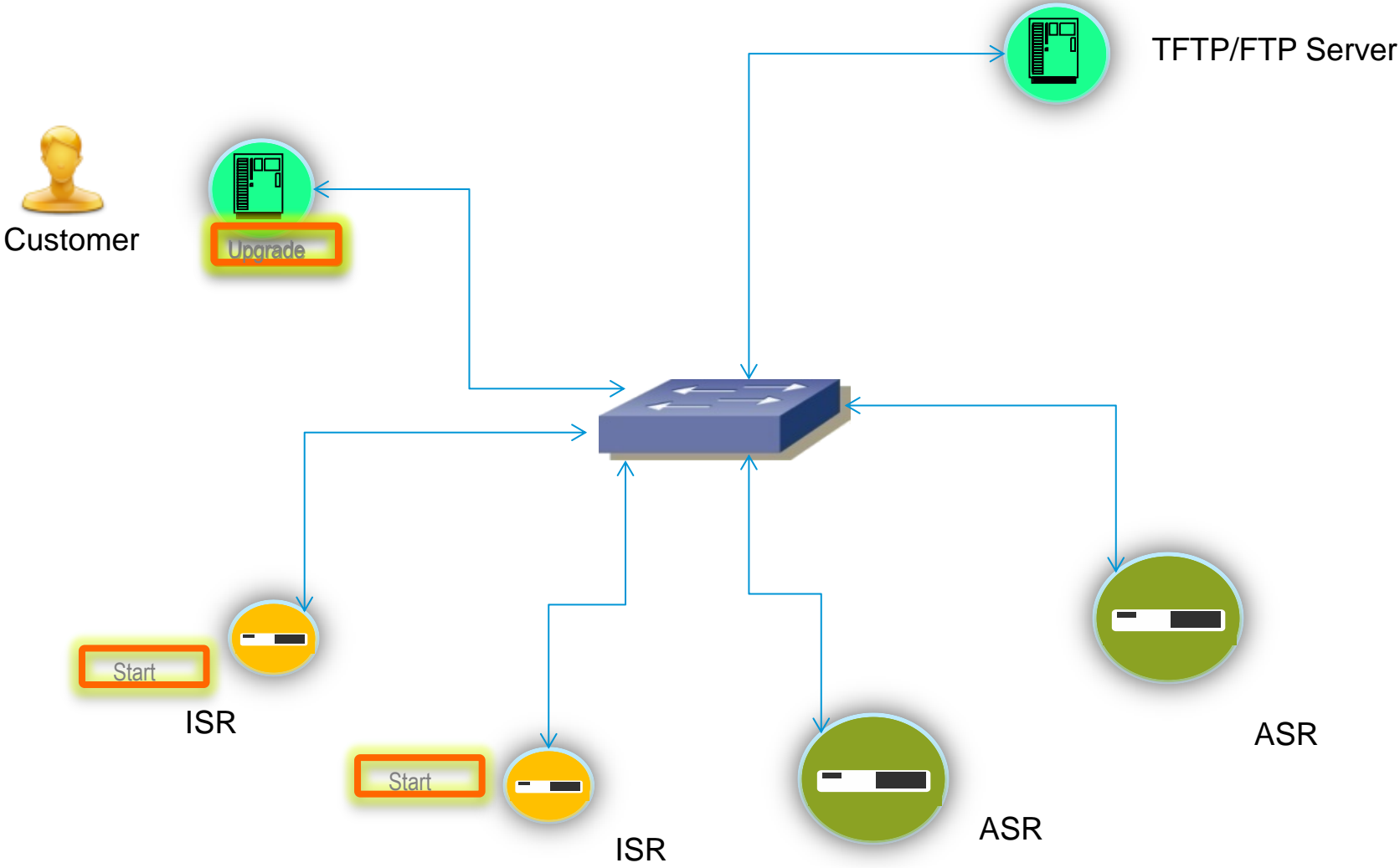
# Automatic Download



# Automatic Download

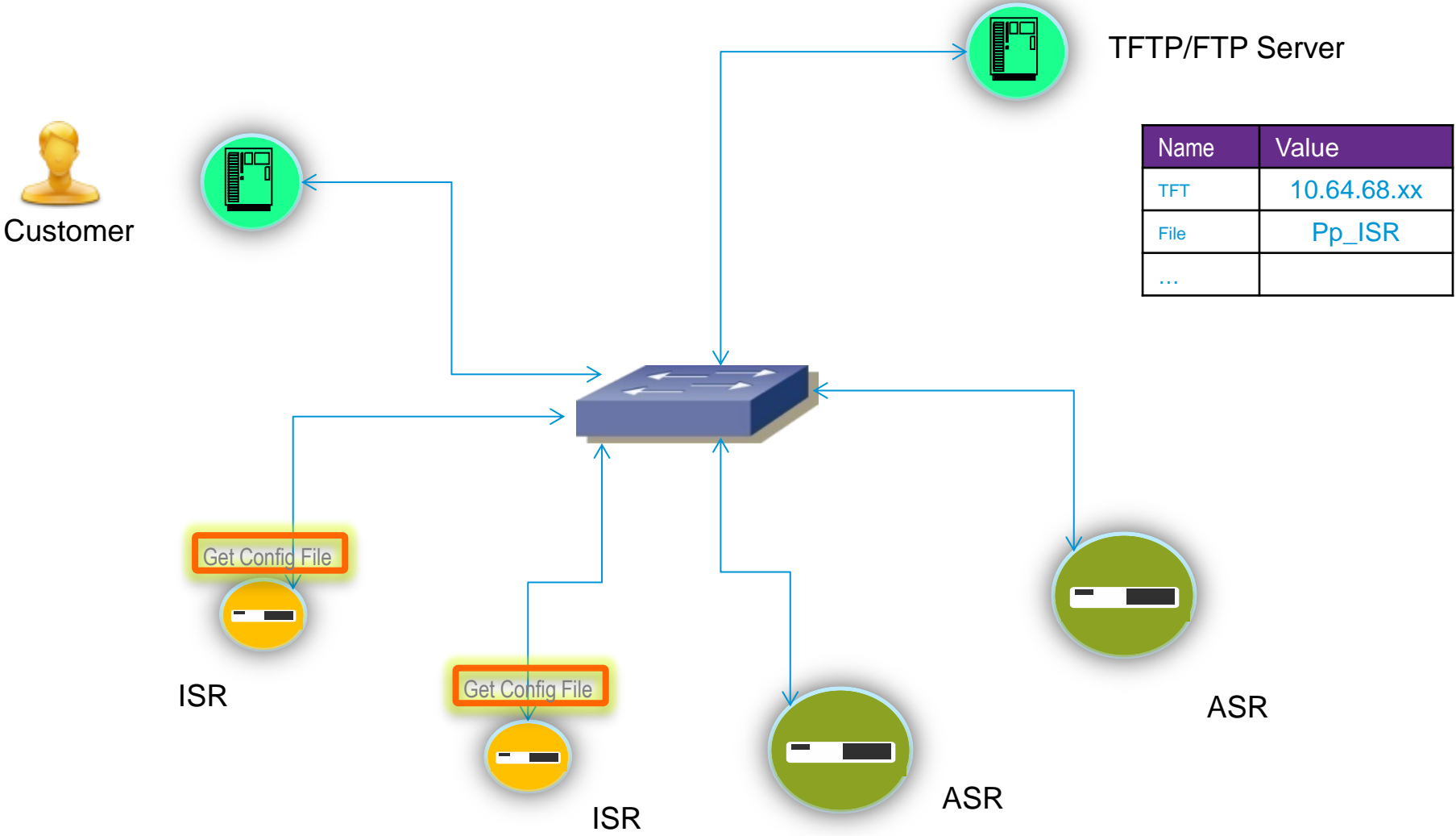


# Manual Download

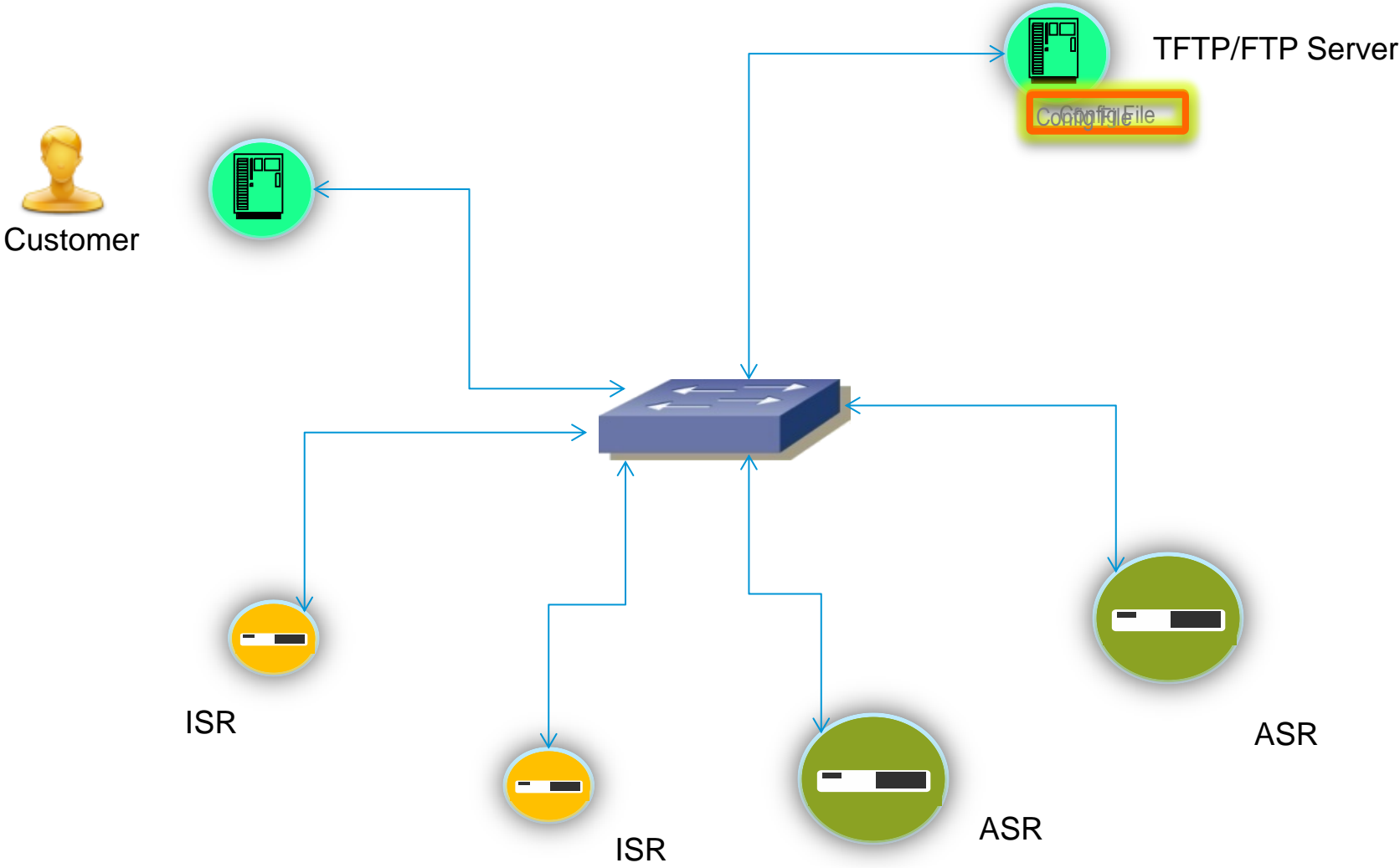




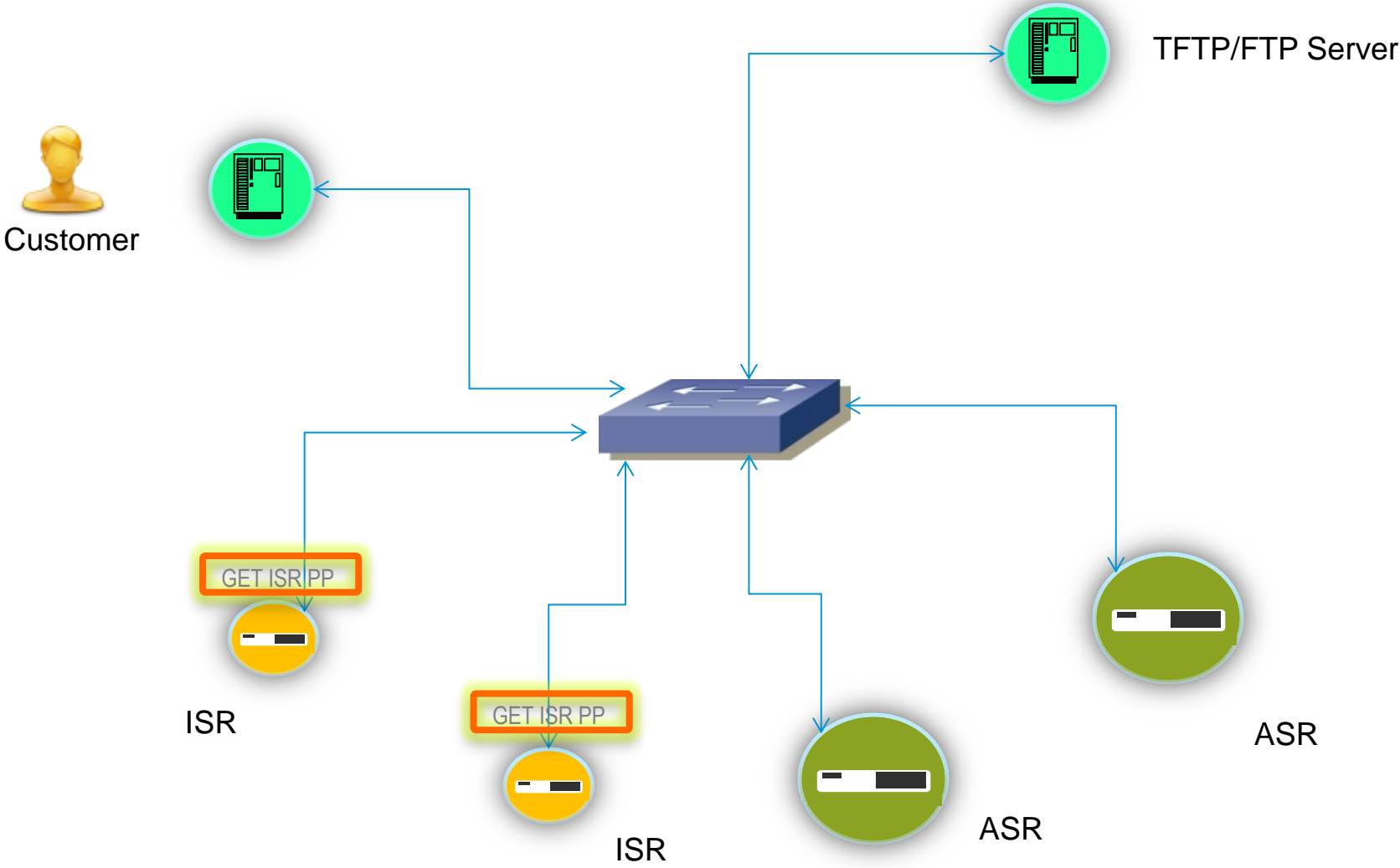
# Manual Download



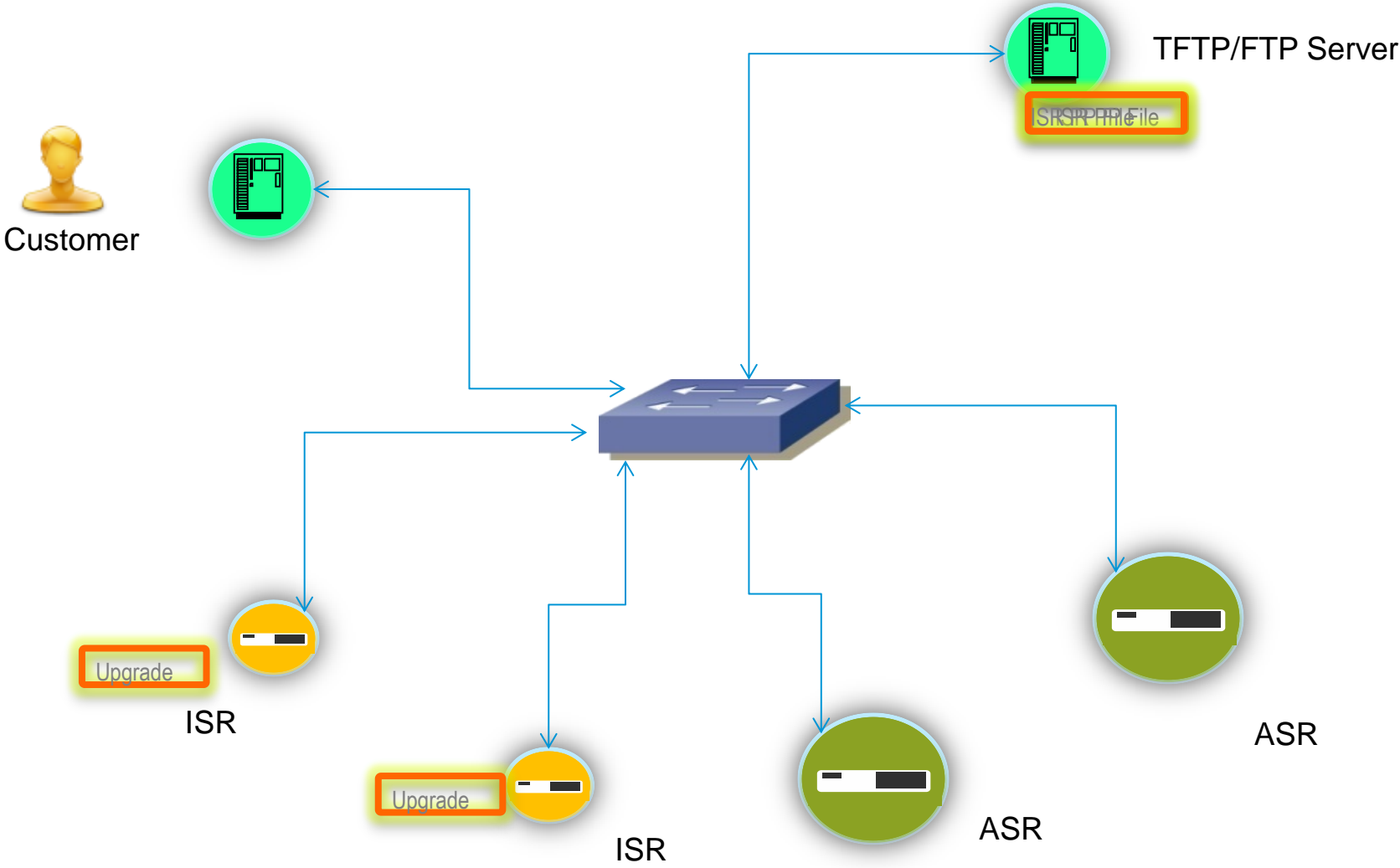
# Manual Download



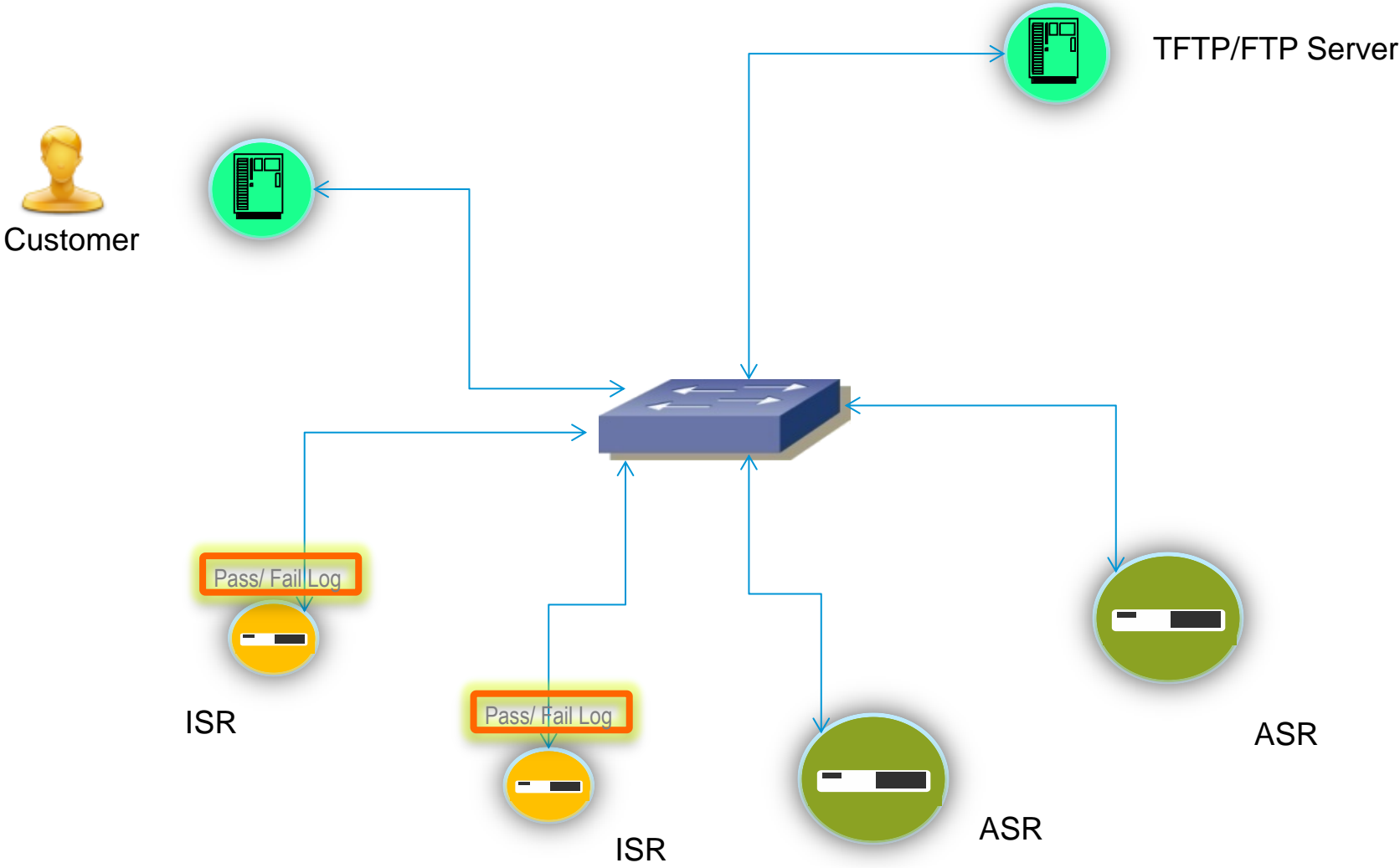
# Manual Download



# Manual Download



# Manual Download



# How it works

## • How it works

1. Devices are enabled for automatic protocol pack download by copying the Install.txt to running config. This is done only once. After this, the device would try for upgrade/downgrade of protocol pack at the specified cron time(provided in the Initial.txt file).
2. At the specified cron time, this tool (that is on the device) would download the 'NBAR\_PROTOCOL\_PACK\_DETAILS.txt' file(referred as manifesto or config file) from `_nbar_init_file_location` and parse for details. If the device is configured with some other manifesto file using `_nbar_config_file` on the device, it will be downloaded from the server instead of the default manifesto file - 'NBAR\_PROTOCOL\_PACK\_DETAILS.txt'
3. It will parse the manifesto file and find-out the protocol pack for the 'Current IOS Version'. It would choose it for upgrade/downgrade. If there is no protocol pack is listed for the current IOS version, then the process is stopped and creates a log on the central server saying there is no matching protocol pack for this IOS.
4. If the device already has the same protocol pack, it just creates a log on the central server saying the device is already has the same version. If the device is excluded from upgrade/downgrade, then it wouldn't proceed further, but creates a log indicating this device is excluded.
5. If it finds a new protocol pack, It performs the upgrade /downgrade with specified protocol pack.
6. Sends the status logs to the respective directory of the tool's installation directory in server. There are five sub-directories under the "Logs/DEFAULT" (This 'Logs' directory would be in the base directory of this tool installation)
  1. Success : This directory will have the logs for the device what has performed successful upgrade / downgrade
  2. Failure : Logs of the devices that could NOT complete the upgrade/downgrade due to some error condition
  3. No-Matching-PP : If there is NO matching protocol pack is found (for the Current IOS version) on the Manifesto file.
  4. Same-PP-Version : If the device is having the same version of protocol pack already on the device.
  5. Upgrade-Disabled : The automatic upgrade solution is disabled on the device / via Manifesto file.
  6. Tool-Removed : Log entry will be created once this tool is removed from the device

# Advantages

- One line CLI for enabling solution on the device.
- One line configuration needs to be updated for upgrade/downgrade the entire network devices.
- Random timer to upgrade the devices in staged manner during Maintenance window
- Protocol pack Download status logs are uploaded to central server with classification based on status.
- Flexibility to re-schedule download
- Provision to start the download manually. This is also a one line CLI & starts the activity immediately.
- Provision to enable debugs on the device to view the progress of an protocol pack upgrade/downgrade.
- Provision to disable the protocol pack download at device level and central server's manifesto file level
- Provision to include / exclude set of devices from protocol pack download
- Download works via FTP and TFTP
- Provision to configure separate configs & logs files for each customers(for service provider scenario)
- Tool removal can be controlled from manifesto file.
- No Scale issues as the solution is on the devices

# How to...



# How to...

- **How to install this tool on the server?**

Untar the NBAR.tar file in a /tftpboot/ or any sub directory under /tftpboot on a central server. This tool can be enabled on cisco devices via tftp / ftp.

Please ensure the tftp / ftp server is accessible to the devices that has needs to be enabled for automatic protocol pack download

- **Pre-requisites on TFTP Server's behavior?**

Ensure that the tftp service allows the devices to create a file from remote devices. In other words, copy a file from device to tftp should work fine(without the need for the file with the same name to be present on server already). If it is not enabled, then better to use ftp.

- **Pre-requisite on device for using FTP as transport**

Ensure that the devices are configured with valid 'ftp user name' and 'ftp password' already.

- **How to configure a router for Automatic NBAR protocol pack download capability?.**

1) Update the below parameters in the file(prior to issuing the 'copy tftp://10.64.68.xxx/<path>/Install.txt running-config' command). This Install.txt is located at the base directory of this tool.

```
event manager environment _nbar_init_file_location tftp://10.64.68.152/NB
```

```
event manager environment _nbar_cron_timer 22 6 * * *
```

```
event manager environment _nbar_upgrade_window 30
```

```
event manager environment _nbar_save_run_to_start No
```

# How to..

2) Copy the Install.txt to running config from privileged user exec mode using the below command

```
copy tftp://<ULR where the install file is located >/<path/Install.txt running-config
```

After successful copy, it would start configuring the router after 10 seconds

You should use 'logging console' or 'terminal monitor' if you want to see the syslog messages. Below configs are added to the running config as part of this solution.

```
event manager environment _nbar_init_file_location tftp://10.64.68.152/NB
event manager environment _nbar_policy_storage <storage media>
event manager environment _nbar_upgrade_window <time configured in Install.txt file>
event manager environment _nbar_cron_timer <Cron timer configured in Install.txt file >
event manager directory user policy <storage media>"
event manager policy Refresh_Cron.tcl authorization bypass
event manager policy Nbar.tcl authorization bypass
event manager policy Nbar_Cron.tcl authorization bypass
```

These configurations are vital for this tools operation & they are referred during scheduled download. Hence it should be modified as appropriate. It shouldn't be removed from the running-config.

## AT THIS POINT THE DEVICE IS ENABLED WITH THE SOLUTION

The same Initial.txt file is copied to all the devices in the network. The devices would be automatically configured to start the protocol pack download operation during the specified cron time + random number added to cron timer's minutes value (generated between 0 to \_nbar\_upgrade\_window)

# How to...

- **Meaning of the EEM variables(in Install.txt file)?**

event manager environment \_nbar\_init\_file\_location **fttp://10.64.68.152/NB**

- This tool's base directory location of this tool. I.e the location where the NBAR.tar is untar'ed at central server.
- Status logs(Success/Failure/Same-PP-Version/No-matching-PP/Tool-Removed) will be placed under 'Logs/DEFAULT' sub-directory of the above path by default.
- The protocol(highlighted in red) in the above URL specifies which protocol should be used for downloading the Manifesto file, protocol packs to device and sending logs from device to server. In the above example, it is 'fttp'.

event manager environment \_nbar\_cron\_timer 30 6 \* \* \*

- This is the cron timer value for starting the protocol pack upgrade/downgrade.
- The Upgrade / downgrade activity would start automatically at the specified date/time. The format is same as Unix Cron.

Here is the format : <minutes> <Hour> <Date> <Month> <Day of week>.

The above one(30 6 10,20 \* \*) signifies 6:30 AM on 10 and 20<sup>th</sup> of every moth.

- Customer can generate the cron format using the web site :

<http://www.openjs.com/scripts/jslibrary/demos/crontab.php>

**NOTE: The first two fields(minutes and hour) CANNOT be \*. We have added this restriction in the tool.**

# How to...

## event manager environment `_nbar_upgrade_window 30`

- This is a maintenance window period during this time duration window the Cisco devices should try to perform the upgrade/downgrade.

- To enable a staggered upgrade, during this tool installation(as part of copy of Install.txt to running-config) a random value from 0 to `< _nbar_upgrade_window >` will be generated and added to the cron timer's minutes(`_nbar_cron_timer`). So that the devices would start at random time during the maintenance period. For the above example, it would add a random value of 0 – 30 to the minutes of the cron timer's minutes field.

- Please note, the cron timer's minutes overflow due to addition of random value(i.e beyond 60 seconds) will update the Hours accordingly. Not beyond that( means, date/month etc).

## event manager environment `_nbar_save_run_to_start No`

- Once you install this tool, it would add few configuration in the running config for this tool operation. As part of this installation you wanted to save the running-config to startup –is indicated by the above variable.

- The default value is 'No'. Means, the saving the running config needs to be done by the end user.

- If the user changes to 'Yes' (without quotes), it will copy the running-config to startup config as part of this installation. The

- **Where to specify the protocol pack details?.**

Protocol pack details are updated in – `NBAR_PROTOCOL_PACK_DETAILS.txt` file(This is the default manifesto file). It has to be updated with appropriate details. It is discussed in subsequent slides. This file is located at the base directory of this tool. This file is referred as 'Manifesto' file / 'Config' file in this preso. User can also create some other file name and specify that one as Manifesto file.

# How to..

- What are the details in the Manifesto file?

URL\_TO\_DOWNLOAD\_PP      URL that specifies the base location of the protocol pack

E.g

URL\_TO\_DOWNLOAD\_PP      tftp://10.64.68.152/anbv/PP

FORCE\_UPGRADE      To force upgrade / downgrade NBAR protocol pack.

E.g

FORCE\_UPGRADE      No

COPY\_RUN\_TO\_START      Whether to issue 'copy running-config startup-config' after upgrade / downgrade

E.g

COPY\_RUN\_TO\_START      No

NBAR\_PP\_ISR      To specify protocol pack for ISR2 platforms

E.g

NBAR\_PP\_ISR      15.3(3)M      pp-adv-isrg2-153-3.M-16-6.0.0.pack

NBAR\_PP\_ISR      15.4(1)T      pp-adv-isrg2-153-2.T-14-7.0.0.pack

NBAR\_PP\_ASR      To specify protocol pack for ASR platforms

E.g

NBAR\_PP\_ASR      15.3(1)S      pp-adv-asr1k-152-4.S-13-6.2.0.pack

# How to..

- **What are the details in the Manifesto file ... continued**

NBAR\_PP\_CSR                      To specify protocol pack for CSR platforms  
E.g  
NBAR\_PP\_CSR                      15.3(1)S                      pp-adv-asr1k-152-4.S-13-6.2.0.pack  
NBAR\_PP\_CSR                      15.3(2)S                      pp-adv-asr1k-152-4.S-13-7.2.0.pack

UNLOAD\_INACTIVE\_PP              To specify whether to remove any inactive protocol packs prior to  
upgrade/downgrade with new protocol pack  
E.g  
UNLOAD\_INACTIVE\_PP    Yes

PROTOCOL\_PACK\_FOR\_FUTURE\_USE    To specify the new protocol pack is for future use or not.  
Supported values are < Yes | No >

The value 'Yes' indicates that the protocol pack that is getting installed should be INACTIVE after the installation. If it is Active, then it is treated as failure.

The value 'No' indicates that the new protocol pack should be ACTIVE after the installation

# How to..

- **What are the details in the Manifesto file ... continued**

APPLICABLE\_ONLY\_FOR Supported values are < ALL | Hostname1[,HostName2,...] >

User can enter ALL (OR) the list of hostnames(NOT BOTH) that **\*\*should\*\*** undergo an upgrade / downgrade operation.

This is like **enabling** upgrade / downgrade for selected devices. Each line can take multiple host names separated by COMMA

If the list is empty, then it is assumed as the upgrade/downgrade applicable for All devices and there is no restriction

E.g

APPLICABLE_ONLY_FOR	ALL
APPLICABLE_ONLY_FOR	ISR-2921, ASR-1,ISR-2951
APPLICABLE_ONLY_FOR	ASR-EDGE1

Values for an APPLICABLE\_ONLY\_FOR should be in same line & cannot span across multiple lines.

But user can use multiple APPLICABLE\_ONLY\_FOR entries and corresponding value entries in the manifesto file.

# How to..

- **What are the details in the Manifesto file ... continued**

NOT\_APPLICABLE\_FOR                      Supported values are < ALL | Hostname1[,HostName2,...] >

User can enter ALL (OR) list of hostnames (NOT BOTH) that should not perform an upgrade / downgrade operation.

This is like **disabling** upgrade / downgrade for that device / list of devices. Each line can take multiple host names separated by COMMA

If the list is empty, then it is assumed as there is no restriction

E.g

NOT_APPLICABLE_FOR	ALL
NOT_APPLICABLE_FOR	ISR-2921, ASR-1,ISR-2951
NOT_APPLICABLE_FOR	ASR-EDGE1

Values for an NOT\_APPLICABLE\_FOR should be in same line & cannot span across multiple lines.

But user can use multiple NOT\_APPLICABLE\_FOR entries and corresponding value entries in the manifesto file.



# How to..

- **What are the details in the Manifesto file ... continued**

## REMOVE\_THIS\_TOOL\_FROM\_DEVICES

Supported values are : <Yes | No >.

It is for removing this tool from devices. The list of devices from which the tool needs to be removed is indicated in UNINSTALL\_FROM\_DEVICES

## UNINSTALL\_FROM\_DEVICES

User can enter ALL (OR) the list of hostnames(NOT BOTH) from which the tool needs to be UN-INSTALLED.

If this list is empty, then none of the device would under go removal.

# How to...

- **Will it have any side effect / impact to other EEM Script on the device?**

No. It will not impact any existing EEM Scripts

- **Has it been tested?**

Yes it has been tested with 2921 and ASR 1006 model(with dual supervisor)

- **Protocols can be used / Tested**

Tested using tftp and ftp.

- **If device has the ftp user name and password already, Can I use it,**

Yes, By default, it would use the existing ftp user name / password that is configured already on the UUT.

- **How to copy 'Install.txt' file via FTP (after the IP address, there is a double slash '/' in the absolute URL)**

Assume the tool is installed under /tftpboot/anbv/NBAR/ directory. Below would be the URL

copy ftp://aa.bb.cc.dd//tftpboot/anbv/NBAR/Install.txt running-config

- **How to copy 'Install.txt' file via TFTP (should provide the URL without 'tftpboot')**

copy tftp://aa.bb.cc.dd/anbv/NBAR/Install.txt running-config

# How to...Continued

- **Once the tool installation is successful, to upgrade/downgrade the devices to newer version of protocol pack(PP), what needs to be done**
  - Just download the new version of protocol pack from cisco site & place it under the location indicated by URL\_TO\_DOWNLOAD\_PP in the manifesto file
  - Update the manifesto file with protocol pack for the respective Platform & IOS version. If the EEM variable `_nbar_config_file` is configured on the device, then the file name that is specified by `_nbar_config_file` is used as manifesto file. If the above variable is not configured with any file name, then Default manifesto file is `NBAR_PROTOCOL_PACK_DETAILS.txt`.
- During the next execution of this tool, devices would pickup the details from the above manifesto file and upgrade/downgrade to the specified version(provided it is applicable for them).
- **Can we downgrade also**

Yes. User need to update manifesto file with the appropriate protocol pack details. The word 'upgrade' in the EEM variables / CLIs means changing of protocol pack to some other version(it can be upgrade / downgrade).

## **In my network, We have multiple versions of Cisco IOS are running. Can this tool for upgrade/downgrade with different versions of IOS with different protocol packs.**

Yes, it can upgrade various version of IOS in the network. You need to have multiple entries in manifesto file. Devices would choose the protocol pack that corresponds to the current IOS version on the device.

- **How can I identify the logs from a particular device on the server?**

The log files are created using the host-name of the device and the date,time it was exported from the device. Hence, by using the file name, the user can identify the log from which device and when it got exported. E.g `0256-ASR1K_Thu_24_Apr_2014_01.30.30_status.txt`

# How to...Continued

## Can I give multiple protocol packs in the Manifesto file?

Yes, you can give. Each device would parse the file and find-out the 'Protocol Pack' for the 'current IOS Version'. It would choose it for upgrade/downgrade.

## How to make the device to skip a protocol pack entry from the parsing(i.e Commenting)

If you prefix any line with hash (#), it is considered as coment & will be skipped from parsing. In the below example, the second entry would be skipped as it is prefixed with '#'.  
#

E.g

NBAR_PP_ISR	15.3(3)M	pp-adv-isrg2-153-3.M-16-6.0.0.pack
#NBAR_PP_ISR	15.4(1)T	pp-adv-isrg2-153-2.T-14-7.0.0.pack
NBAR_PP_ISR	15.4(1.16)T	pp-adv-isrg2-152-4.M1-13-5.0.0.pack

If more then one protocol pack indicated for the same IOS version, then the bottom most entry from the manifesto file will be used for upgrade/downgrade

# How to...Continued

- **Can I run this tool manually on demand?**

Yes. You can run it.

- **How to run this tool manually?**

Issue the below command from Privileged user exec mode. Then it would read the manifesto file (default is NBAR\_PROTOCOL\_PACK\_DETAILS.txt) for the details and upgrades / downgrades the device.

```
0342-ASR1K#UPGRADE-NBAR-PP
```

- **Can I change the cron timer after the tool installation.**

Yes, You can change it from config mode of the router as shown below. Enter the details WITHOUT any quotes. Please follow the Unix Cron timer specification format. Once it is applied successful. Next time onwards, the upgrade tool would trigger based on the new cron time

```
0342-ASR1K(config)# event manager environment _nbar_cron_timer 1 18 * * *
```

- **What is the significance of \_nbar\_upgrade\_window parameter?**

When the cron timer(\_nbar\_cron\_timer) is configured/updated, then a random number will be generated using \_nbar\_upgrade\_window (range from 0 - <\_nbar\_upgrade\_window>). It will be added to the minutes of the cron timer. This is to ensure the devices in the network are upgrade at different time intervals and NOT at the same time.

If the \_nbar\_upgrade\_window is 30. It means, that the cron timer itself will be updated with a random number generated between 0 to 30. So that the devices in the network would undergo upgrade for the window period of 30 minutes.

# How to...Continued

- **Do I get the success / failure status of protocol pack upgrade/downgrade on the device?**

Yes. Syslog message will be printed on console(provided logging console is configure). If it is a vty 'terminal monitor' is the command to view the syslog on the script.

Since it is a syslog message, you can check the messages on syslog server also(if configured)

- **Do I have any option to see the progress(debug options) of the upgrade/ downgrade?**

Yes. If you want to see the progress on a particular device while doing the upgrade / downgrade, enable the following EEM variable(i.e configure the below command in config mode). Supported values are Yes / No. Use 'no' command to remove it & stop the debug prints.

[no] event manager environment \_nbar\_debug\_verbose Yes

- **Do I have any option to disable the automatic upgrade / downgrade on any particular device?**

Yes. There are two possible ways,

- Disabling from device
- Disabling from manifesto file(located on central server).

## **Disabling from device**

Configure the below command on that particular device. It would NOT undergo upgrade / downgrade (either automatic / manual). It would place a long on central server saying the device is disabled from automatic upgrade /downgrade. Use 'no' command to remove it.

[no] event manager environment \_nbar\_upgrade\_disabled

# How to...Continued

## **Disabling from manifesto file**(located on central server)

Provide the list of device hostname(s) that needs to be disabled from upgrade / downgrade using the NOT\_APPLICABLE\_FOR option. This option can be used for disabling for multiple devices at a the central server. Please note, user should update the correct manifesto file(if they have many files).

- **Do I have any option to upgrade/downgrade only set of devices(even though the tool is enabled on all devices in my network)?**

Yes. Provide the list of device hostname(s) that needs to be upgraded / downgraded using the APPLICABLE\_ONLY\_FOR option. Only these devices would perform upgrade/downgrade during the next triggered update. For other devices in the network, it is assumed as not applicable.

- **Do I have any option exclude set of device(s) from upgrade/downgrade (even though the tool is enabled on all devices in my network)?**

Yes. Provide the list of device hostname(s) that SHOULD NOT to be upgraded / downgraded using the NOT\_APPLICABLE\_FOR option. These devices will not perform any upgrade / downgrade. Rest of the devices would undergo upgrade/downgrade.

- **Can I remove this tool from devices from using the central manifesto file?**

Yes. Provide the REMOVE\_THIS\_TOOL\_FROM\_DEVICES option as 'Yes' and the list of hosts from which this tool needs to be removed is specified in UNINSTALL\_FROM\_DEVICES

As part of the next triggered update, this tool will be removed that particular host is in this list.

- **Do we have any scalability limitation?**

No. Since, the scripts are executing on individual devices, there is no limitation.

# How to...Continued

- **Do I have any option to provide FORCE upgrade/downgrad?**

Yes. Specify FORCE\_UPGRADE with appropriate value in the manifesto file.

- **Can I remove any inactive protocol packs prior to upgrade/downgrade?**

Yes. Provide the UNLOAD\_INACTIVE\_PP option as 'Yes'

As part of the next update, this tool will be removing any inactive protocol packs(prior to performing any upgrade/downgrade).

- **If my ASR is having dual supervisor, would it copy the protocol pack to standby as well?**

Yes, it does it as part of the protocol pack copy operation.

- **After the upgrade/downgrade, can this tool save the running-config to startup-config?**

Yes, User has to specify COPY\_RUN\_TO\_START with 'Yes' in the manifesto file.

- **Can I run multiple copies of this tool on the same server.?**

Yes, It will not have any issue. When you clone multiple setup, the Install.txt file needs to be updated with the respective installation location.



# How to..

- I would like to keep separate Install.txt file, Manifesto file & and log files for each customer. How do I do that?

Add these two lines in the Install.txt file (prior to copy to that Install.txt to the device). Then copy 'Install.txt' to running-config as usual. You can create multiple copies of Install.txt files(i.e one per customer) and have these lines updated with appropriate values. For example, we want to create separate Manifesto file for BT and Logs

```
event manager environment _nbar_log_base_directory BT
event manager environment _nbar_config_file BT_PP.txt
```

The first variable '`_nbar_log_base_directory`' indicates the directory(under 'Logs' directory) where the logs should be placed. For the above example config, devices would try to place the logs under 'Logs/BT/'. Please note, BT and rest of the sub-directory structures(Success, Failure...) should be there under 'Logs' directory & it has to be created **MANUALLY** on the server. User can clone the 'DEFAULT' directory with new name. Hence, the directory 'BT' needs to be created at same level as Log/DEFAULT. Hence the Logs for the above case would be 'Logs/BT'

The second variable '`_nbar_config_file`' indicates the Manifesto file (that has the protocol pack details). If the device is having this EEM variable, then it would download this file(BT\_PP.txt) as manifesto file and use it for choosing the protocol pack for upgrade/downgrade. This(BT\_PP.txt) file should be present at the location pointed by '`_nbar_init_file_location`' which would be configured on the device as part of the initial enablement of this solution(via Install.txt file). You can use any file name for manifesto file.

If the above variables are defined, it will take the precedence over the default values. Default location of log is 'Logs/DEFAULT' and config file is : NBAR\_PROTOCOL\_PACK\_DETAILS.txt. The above two EEM variables would override them if it is defined on the device.

**If you need any clarification/ suggestion / face any issue, please drop a mail to [anbv@cisco.com](mailto:anbv@cisco.com)**

**Thanks!**