Introduction – Your First Network Program

Example Network Device Program

Network program overview:

- **CLI**-based application (using the **pexpect** library)

Program walkthrough:

- Gets list of devices from file
- For every device:
  - Read device version
  - Print device version
- Write device versions to file

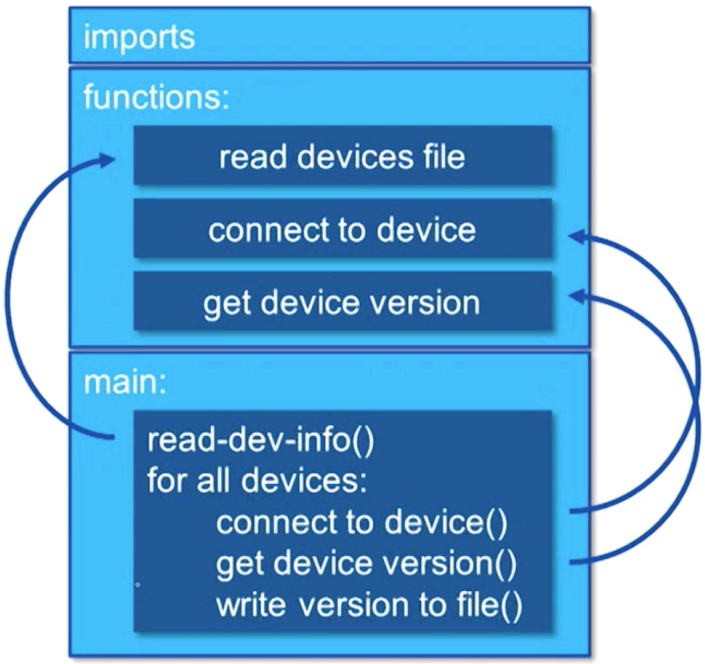
Demonstrate:

- Importing external device libraries
- Defining functions
- Reading device info from a file
- Connecting to devices
- Running CLI command on devices
- Parsing device output
- Printing parsed output
- Writing device data to a file

Program Structure

General Conventions:

- **Top**: Imports, constant values, global variables
- **Middle**: Function definitions
- **Bottom**: Main application code



Code Sample:

```
import pexpect

#---------------------------------------------------------------------
def get_devices_list():

    devices_list = []
    file = open('devices', 'r')

    for line in file:
        devices_list.append( line.rstrip() )

    file.close()

    print 'devices list:', devices_list
    return devices_list
#---------------------------------------------------------------------
def connect(ip_address, username, password):

    print 'establishing telnet session:', ip_address, username, password
    telnet_command = 'telnet ' + ip_address

    # Connect via telnet to device
    session = pexpect.spawn('telnet ' + ip_address, timeout=20)
    result = session.expect(['Username:', pexpect.TIMEOUT])

    # Check for error, if so then print error and exit
    if result != 0:
        print '!!! TELNET failed creating session for: ', ip_address
        exit()

    # Enter the username, expect password prompt afterwards
    session.sendline(username)
    result = session.expect(['Password:', pexpect.TIMEOUT])

    # Check for error, if so then print error and exit
    if result != 0:
       print '!!! Username failed: ', username
       exit()

    session.sendline(password)
    result = session.expect(['>', pexpect.TIMEOUT])

    # Check for error, if so then print error and exit
    if result != 0:
        print '!!! Password failed: ', password
        exit()

    print '--- connected to: ', ip_address
    return session
```

```
#-------------------------------------------------------------------------
def get_version_info(session):

    print '--- getting version information'

    session.sendline('show version | include Version')
    result = session.expect(['>', pexpect.TIMEOUT])

    # Extract the 'version' part of the output
    version_output_lines = session.before.splitlines()
    version_output_parts = version_output_lines[1].split(',')
    version = version_output_parts[2].strip()

    print '--- got version: ', version
    return version
```

```
#=========================================================================
# main application code
#

devices_list = get_devices_list()    # Get list of devices

version_file_out = open('version-info-out', 'w')

# Loop through all the devices in the devices list
for ip_address in devices_list:

    # Connect to the device via CLI and get version information
    session = connect(ip_address, 'cisco', 'cisco')
    device_version = get_version_info(session)

    session.close()  # Close the session

    version_file_out.write('IP: '+ip_address+'  Version: '+device_version+'\n')

# Done with all devices and writing the file, so close
version_file_out.close()
```