



LOGICALIS

NEP@L

Cisco NSO Integration

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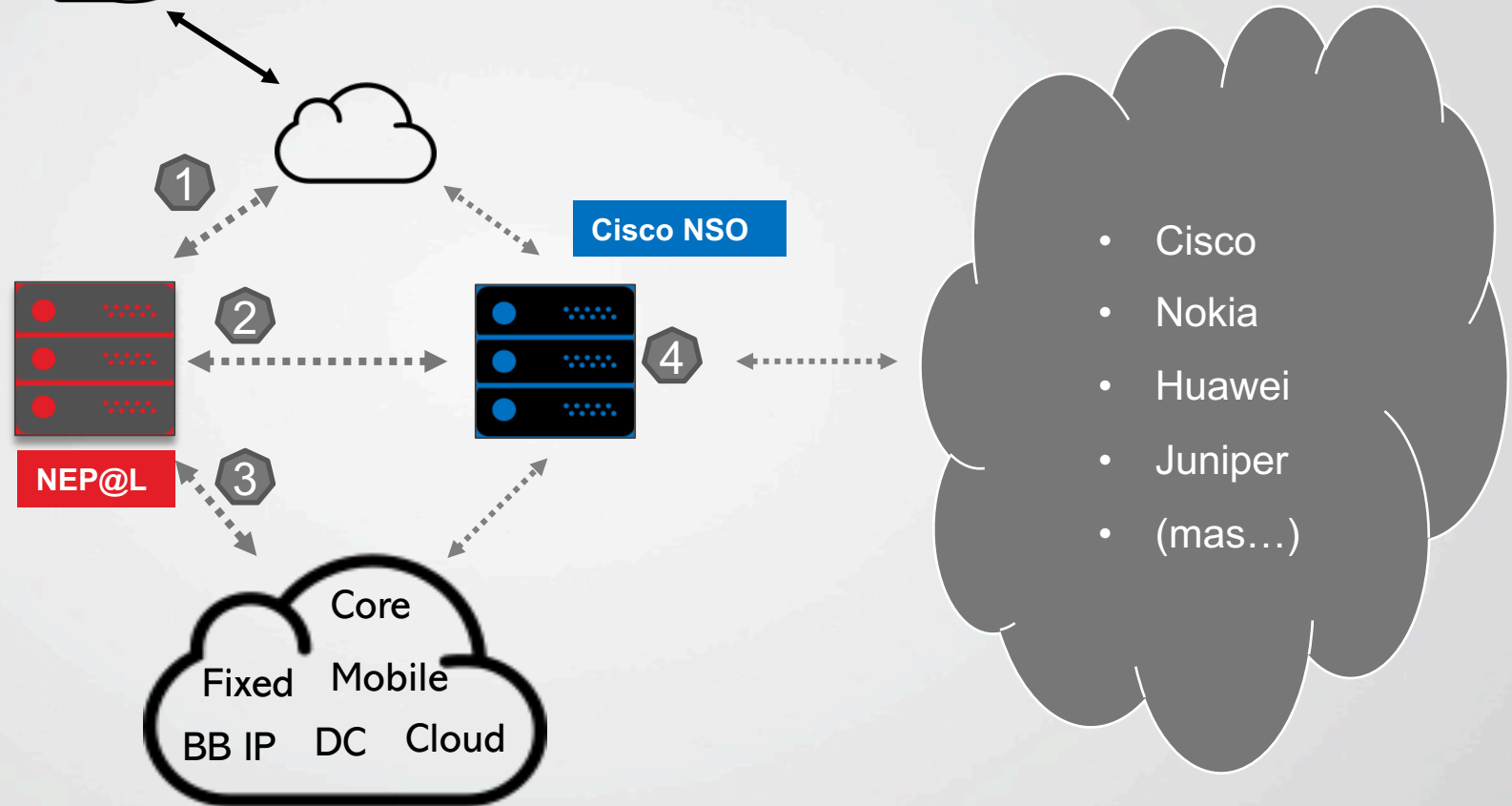
```
function ReplaceString($clientLast || $DbLast - $clientLast)
{
    $DbLast = $clientLast;
    $words = Str_Replace(' ', Str_Replace($DbLast, ' ', $clientLast));
    $explode = explode(' ', $words);
    for ($i = 0; $i < count($words); $i++) {
        if(strlen($words[$i]) > 7){
            $next = $words[$i];
        }
        else if(isset($_POST['get']))
        {
            $id = (int)$_POST['get'];
            if($id > 0)
            {
                echo json_encode($o->GetLinkData($id, false));
            }
        }
        else if(isset($_POST['getM']))
        {
            $id = (int)$result['id'];
            echo json_encode($o->GetLinksData($_POST['getM']));
        }
        else if(isset($_POST['rating']))
        {
            $result = $o->RateLink($_POST['rating']);
            if($result)
            {
                echo "1";
            }
            else
            {
                echo "0";
            }
        }
        else if(isset($_POST['linkClass']))
        {
            $show = htmlspecialchars(stripslashes(mysql_real_escape_string($show)));
            $what = htmlspecialchars(stripslashes(mysql_real_escape_string($what)));
            $where = "1";
        }
    }
}
```

NEP@L and NSO architecture

Plataformas
+
Integraciones



- 1 Integración con ecosistema de Cliente
- 2 Integración con NSO
- 3 Acceso a la Red Multi Domain - SoT
- 4 Acceso a Multi Plataformas



Modeling the integration – YANG & YAML

```
namespace "http://example.com/mgmt-access-template";
prefix mgmt-access-template;
import ietf-inet-types {
  prefix inet;
}
.
.
import mgmt-access-acl {
  prefix acl;
}
description
  "Bla bla...";
revision 2016-01-01 {
  description
    "Initial revision.";
}
augment /ncs:services {
  list mgmt-access-template {
    description "This is an RFS skeleton service";
    key name;

    leaf name {
      tailf:info "Unique service id";
      type string;
    }
    uses ncs:service-data;
    ncs:servicepoint mgmt-access-template-servicepoint;

    leaf snmp-acl {
      mandatory true;
      type leafref {
        path "/ncs:services/acl:mgmt-access-acl/acl:name";
      }
    }
  }
}
.
.
}
```

NSO

From the abstraction



to an instance

```
Template:
names:
  - name: nepal-template
    snmp_acl: nepal-acl2
    vty_acl: nepal-acl1
    snmp_community:
      - community1
      - community2

ACL:
names:
  - name: nepal-acl1
    hosts:
      - 10.10.10.10
      - 10.10.10.20
    net:
      - ip: 172.16.1.0
        mask: 0.0.0.255
      - ip: 172.16.2.0
        mask: 0.0.0.255
  - name: nepal-acl2
    hosts:
      - 10.10.10.10
      - 10.10.10.20
      - 10.10.10.30
    net:
      - ip: 172.16.1.0
        mask: 0.0.0.255
      - ip: 172.16.3.0
        mask: 0.0.0.255
```

NEP@L

Coding the integration – Python on NSO

```
import requests

# credentials
API_USER = 'admin'
API_PASS = 'admin'

# nso server address
API_BASE = 'http://nso:8080'

# api headers
API_HEAD = {
    'Accept': 'application/vnd.yang.data+xml'
}

api_session = requests.Session()
api_session.auth = (API_USER, API_PASS)

# create nso device from csr1.xml
api_endpoint = f'{API_BASE}/api/running/devices/device/csr1'
with open('nso_template_new_device.xml') as xml:
    api_response = api_session.put(api_endpoint, headers=API_HEAD, data=xml)
print(f' -> PUT: {api_endpoint}')
print(f' -> RESPONSE: {api_response.status_code}')
.
```

Procedural/OOP

- What to do
- How to do

Coding the integration – Ansible and Python on NEP@L

```
# Create ACL SERVICE on NSO.
# By Ed Scrimaglia
---
- name: "Config Service ACL on NSO"
  hosts: localhost
  gather_facts: no

vars_files:
  - ../Service_Model/Service_Model.yaml

tasks:
  - name: include var file
    include_vars:
      file: nso_vars.yaml
      name: nso


  - name: Config ACLs
    nso_config:
      url: "{{nso.nso_url}}"
      username: "{{nso.username}}"
      password: "{{nso.password}}"
      data:
        tailf-ncs:services/mgmt-access-acl:
          - name: "{{item.name}}"
            host:
              "{{item.hosts}}"
            net:
              "{{item.net}}"
            __state: "{{state}}"
    when state == "present"
    loop
      "{{var_service_model.ACL.names}}"
    register salida
```

Declarative
- What to do

NEP@L gives CI/CD to the integration

Pipeline NSO_SERVICE_ACL

NEP@L CI/CD:NSO-Service-ACL configuration



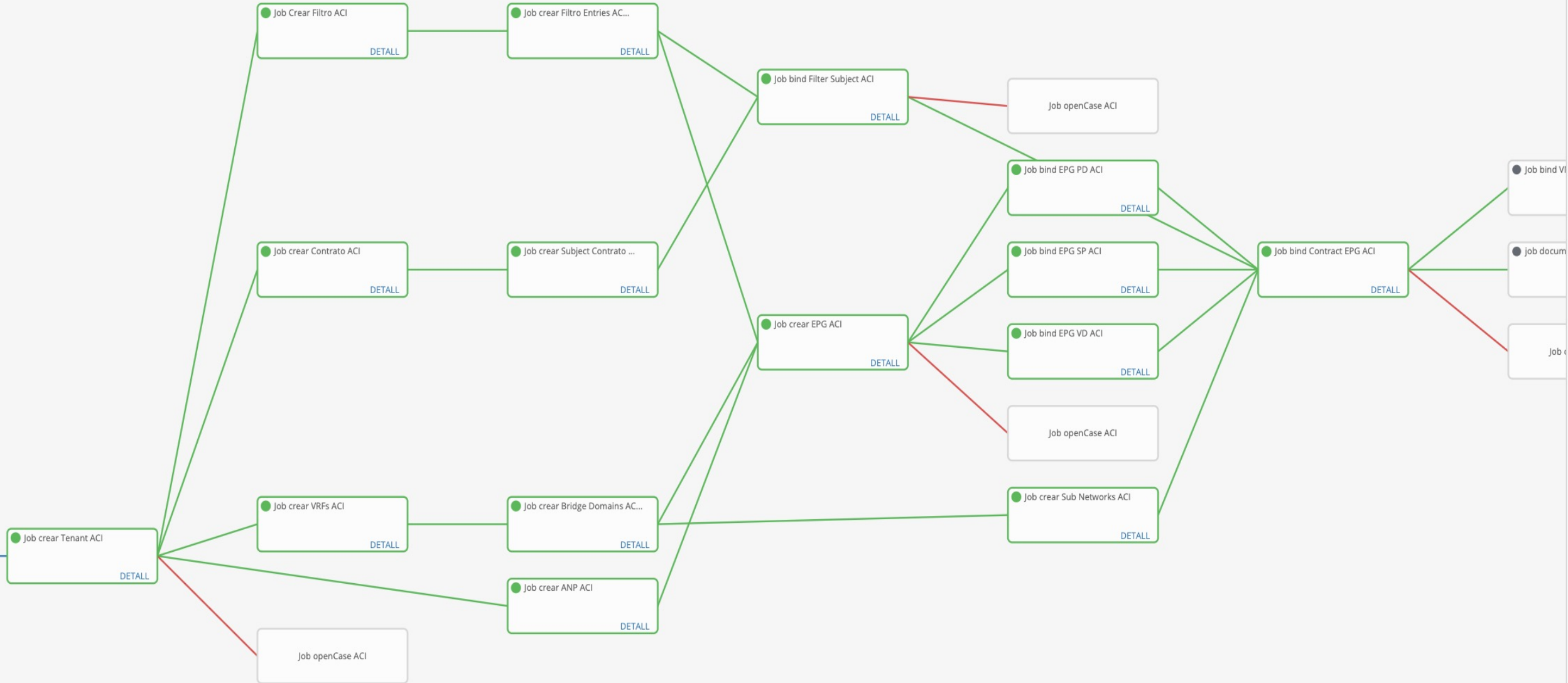
[Recent Changes](#)

Stage View

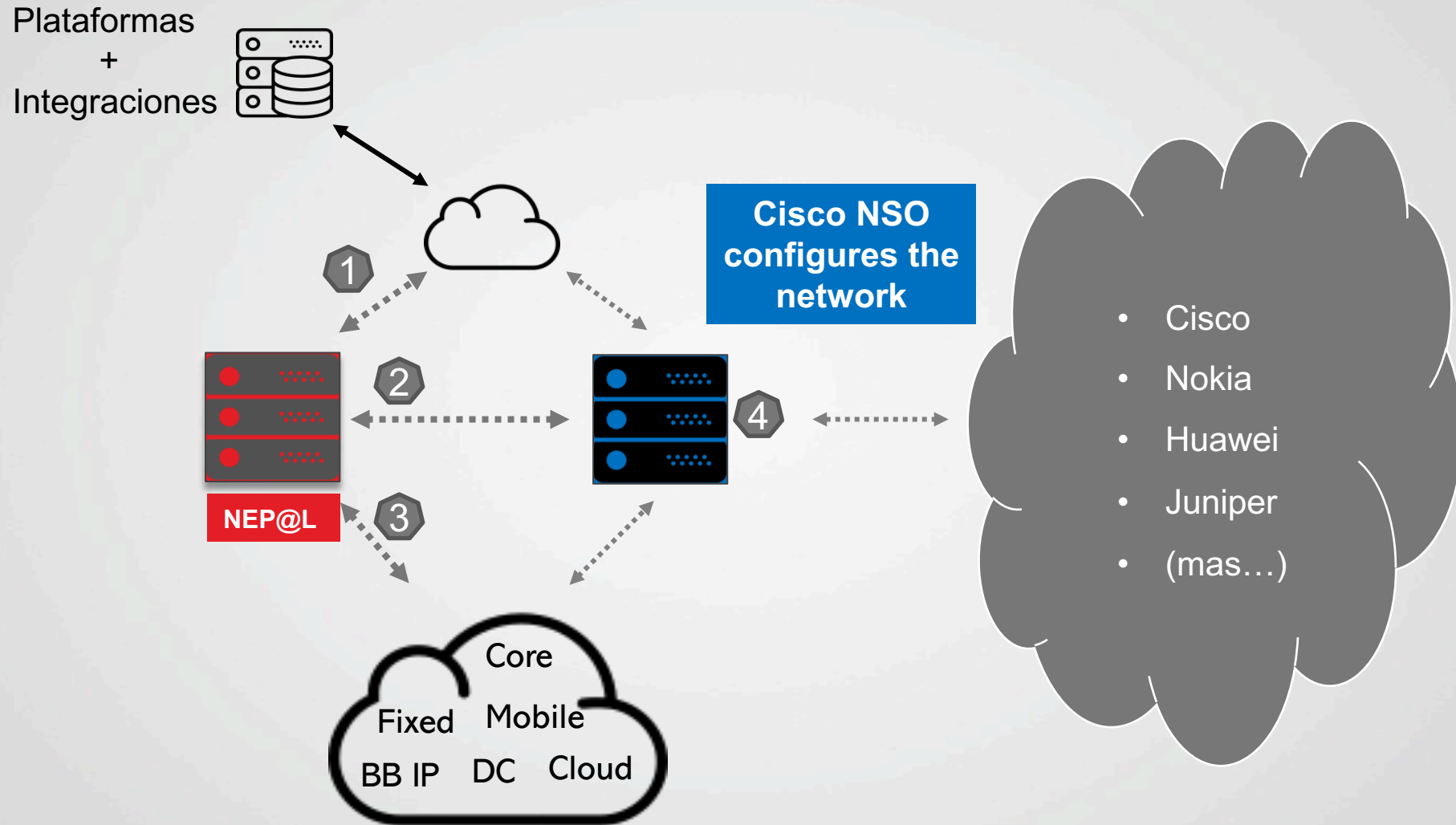
Average stage times:
(Average full run time: ~4min 6s)

	Declarative: Checkout SCM	Code Review	Configuring Devices	Configuring ACLs	Configuring Templates	Testing	NSO Deployment	Delivery	Declarative: Post Actions
#211	2s	620ms	48s	5s	4s	4s	33s	19s	39s
Jul 03 16:12 1 commit	2s	629ms	58s	6s	5s	6s	58s	34s	1min 11s
#210	2s	476ms failed	40ms failed	37ms failed	38ms failed	36ms failed	46ms failed	37ms failed	88ms

NEP@L gives a workflow manager to the integration



NSO is the Configuration Manager, NEP@L does Workflow and CI/CD





LOGICALIS

Thanks

NEP@L Framework

```
function ReplaceString($clientLast || $DbLast - $clientLast)
{
    $DbLast = $clientLast;
    $words = Str_Replace(' ', Str_Replace($DbLast, ' ', $clientLast));
    $explode = explode(' ', $words);
    $check = explode(' ', $explode);
    for ($i = 0; $i < count($words); $i++) {
        if(strlen($words[$i]) > 7){
            $next = $words[$i];
        }
        else if(isset($_POST['get']))
        {
            $id = (int)$_POST['get'];
            if($id > 0)
            {
                echo json_encode($o->GetLinkData($id, false));
            }
            else if(isset($_POST['getM']))
            {
                $result = mysql_fetch_assoc(mysql_query("SELECT MAX(id) as id FROM table"));
                echo json_encode($o->GetLinksData($_POST['getM']));
            }
            else if(isset($_POST['rating']))
            {
                function query($show, $what, $where, $parameters)
                {
                    $result = $o->RateLink($_POST['rating']);
                    if($result)
                    {
                        echo "1";
                    }
                    else
                    {
                        echo "0";
                    }
                }
            }
        }
    }
}
```