Webinar: Dynamic DNS service

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Motivation

• VMs in EGI Federated Cloud are usually accessed only via IP addresses

• But hostnames are often required
  – for getting SSL certificates
  – for user-friendly access
  – for hiding complexity of clouds

• Dynamic DNS service was developed to address the issue
Dynamic DNS service

• With Dynamic DNS service, users can:
  – register sensible, memorable hostnames in supported domains
  – attach the hostnames to hosts/VMs in Cloud
  – then access services deployed in the VMs via the hostnames
• Full automation, self-service, immediately available, easy to use
• Independent, no additional requirements (software, support from Cloud providers or site admins)
Service architecture

- **Primary DNS server (IISAS)**
  - Update DNS records
  - Sync with Secondary DNS server

- **Secondary DNS server (LIP)**
  - Verify DNS records

- **NS-update server**
  - Register hostnames
  - Assign/update IPs
  - Update DNS records

- **API**

- **Users**

- **EGI CheckIn**
  - Authentication

- **16/06/2021 EGI Webinar**
Standards and compliance

• All communications between components are supported by standards:
  – OIDC authentication (NS-update – EGI CheckIn)
  – dyndns2 protocol (command-line client – NS-update)
  – RFC 2136 standard (NS-update – BIND9 server)

• All relationships are many-to-many, e.g.
  – One NS-update server – many OpenID identity providers
  – One NS-update server – many DNS servers (one portal for many domains)
  – Many NS-update servers – one DNS server (many portal for one domain)
Usage

- Register a hostname via [https://nsupdate.fedcloud.eu/](https://nsupdate.fedcloud.eu/)

- Assign/update an IP address to the hostname (attach the hostname to the server with the IP)
Features

Hostname registration:
- via GUI portal [https://nsupdate.fedcloud.eu](https://nsupdate.fedcloud.eu)
- authentications via EGI Check-in
- hostnames in subdomains of fedcloud.eu and fedcloud.eosc-synergy.eu

IP assignment:
- via GUI portal or via API
- no limitation of IP ranges => can be used anywhere
- no user credentials required => improved security
- TTL (Time-to-Live) is set to 60s
  - flush DNS cache on client if need to refresh immediately
Live demo

IPv4: 78.30.21.223
rDNS: static.masmovil.com

IPv6: 
rDNS:

fedcloud.eu — the Dynamic DNS service for EGI Federated cloud
 Explicit IP assignment

• By default, IP assignment can be done implicitly by execute the following command on targeted VMs/hosts:
  curl https://<hostname>:<secret>@nsupdate.fedcloud.eu/nic/update

• But the API enables also explicit IP assignment:
  curl "https://<hostname>:<secret>@nsupdate.fedcloud.eu/nic/update?hostname=<hostname>&myip=<ipaddress>"

• Explicit IP assignment is useful:
  – assign IP addresses from client without logging in VMs
  – assign private IP addresses
Usage scenarios

• User-friendly, sensible, memorable service names instead of IP addresses
• Getting SSL host certificates
• Configuring clients/servers before deployment
• Migrating services between different cloud sites without changing clients
• Configuration of complex systems with several services connected together

• And mainly, no need to remember IP addresses
Example of usage scenarios

• Testing and development
  – Register a hostname and assign it to local server
  – Develop/configure/test the service on local server using the hostname
  – Move the service to cloud and assign the hostname to host in Cloud
  – No additional changes in configurations (both clients and servers)
Ongoing development

- API for registering hostnames
  - for better integration with automation tools
- Integration with UPV Infrastructure Manager
  - User can give hostname via IM and completely ignore IP address
- IPv6 support
  - User can access services via hostnames instead of looooolong IPv6 addresses
More information

• GUI portal: https://nsupdate.fedcloud.eu

• Documentation: https://docs.egi.eu/users/cloud-compute/dynamic-dns/

• GGUS support unit: Dynamic DNS at https://ggus.eu/

• Contact: viet.tran@savba.sk

• support, feature requests, suggestions for improvements, bug reports, comments, critics, … all are welcomed
Thank you!

Contact: viet.tran@savba.sk
Website: https://nsupdate.fedcloud.eu