



Network Discovery & Automation for Hybrid Cloud Transformation



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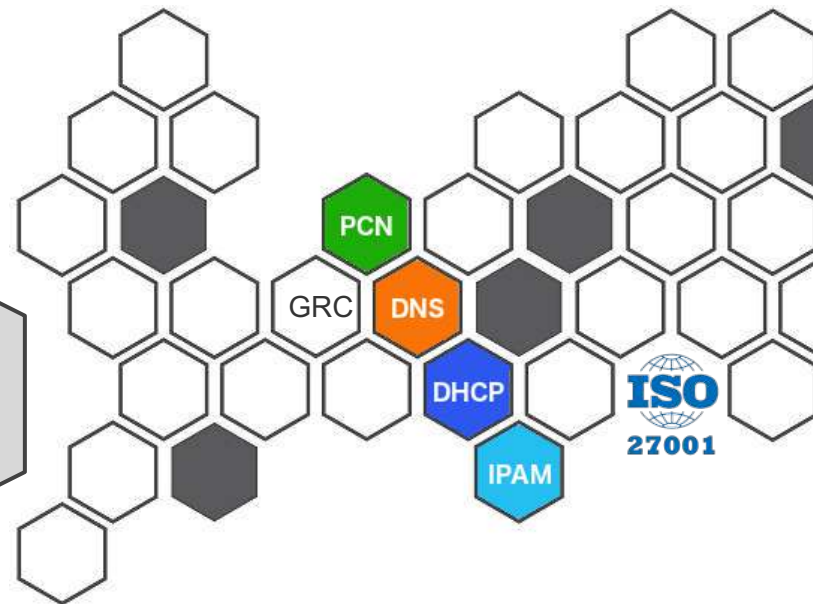
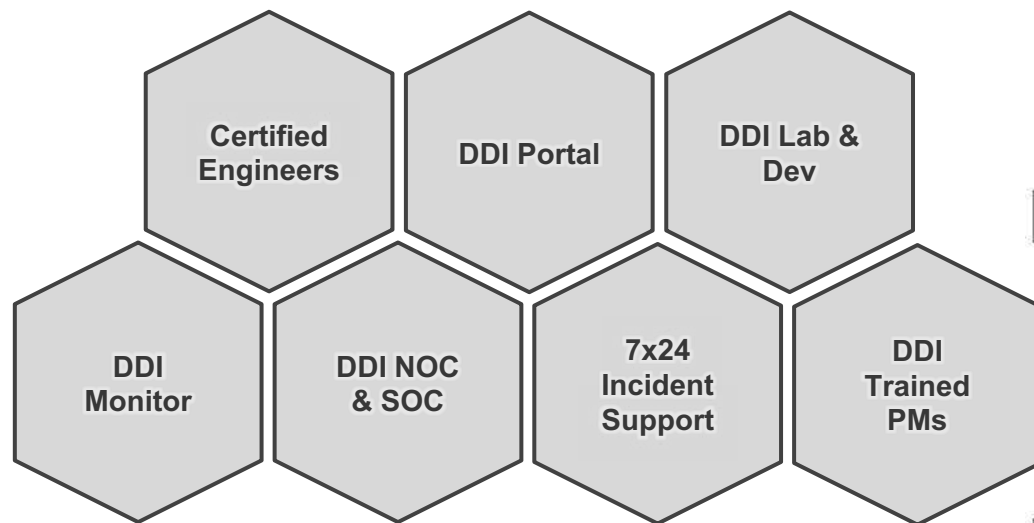


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Who is PCN?

PCN is a recognized industry leader in DDI Managed & Professional Services



Infoblox Experts:

Integration with/migrating from: MS DNS/DHCP, BIND, Kea, ISC DHCP & leading DDI OEM platforms

Global reach: Sales & Service in USA, Canada & United Kingdom

Agenda

On-Premises to Hybrid Technology Transformation

Infoblox Hybrid Cloud Strategy & Vision

Infoblox Cloud Solution & Architecture

Integrations: Private & Public Clouds, Containers & Automation

Demo: vDiscovery & Automation

Q&A & Wrap-Up

Network Priorities & Challenges



- No central public & hybrid network view
- Can't see all services & assets
- Can't assess query & performance history
- Lack of control

- Manual tools & processes
- No AD Sites & Services integration
- No user/IP address mapping
- Unscalable, errors & rework

- Non-integrated systems & platforms
- Departmental silos
- No real-time data sharing
- Operational inefficiencies

1. Infoblox Study: ReRez Research on behalf of Infoblox



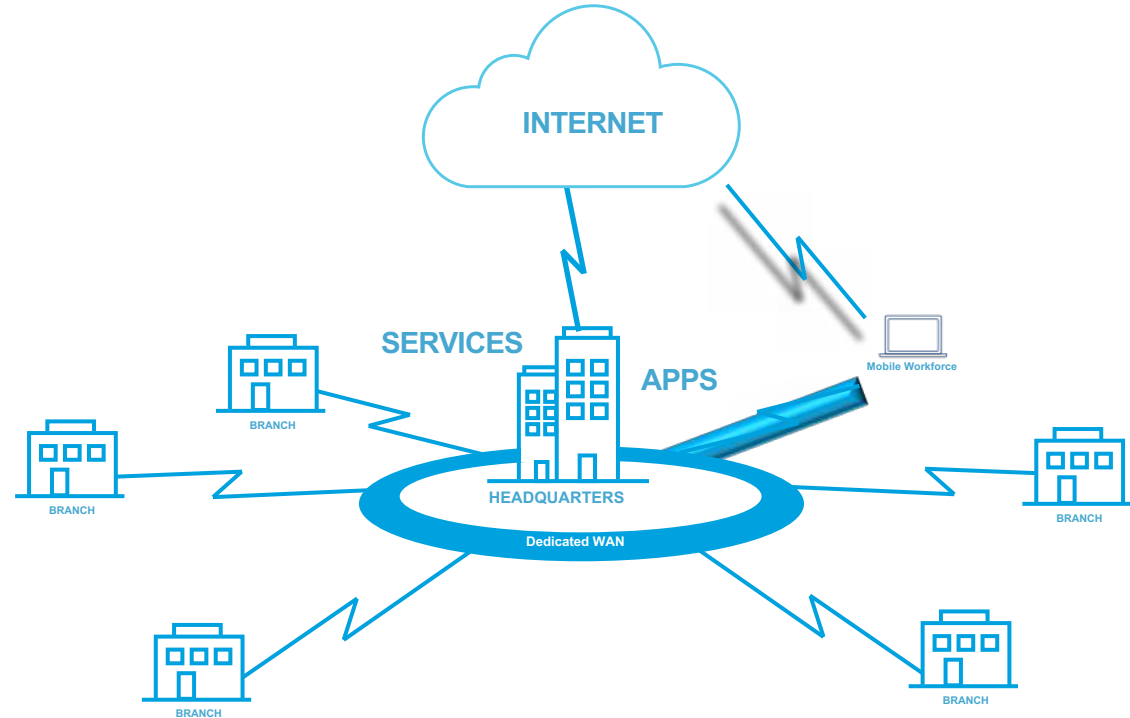
Architecture Evolution: Traditional

Services & Apps hosted in centralized locations

Dedicated WAN backbone

Remote locations Internet 'back haul'

Few remote workers requiring VPN



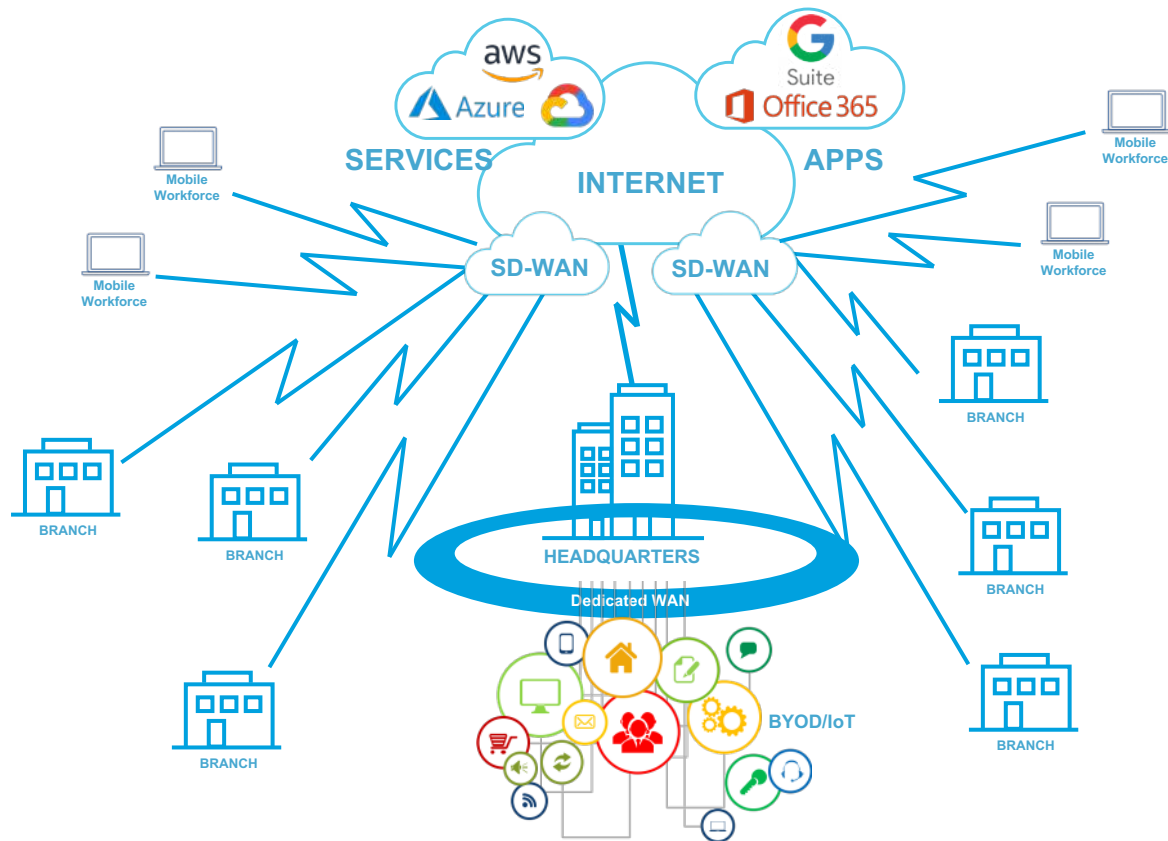
Architecture Evolution: Modern

Enterprise cloud is the new network

Software Defined Networks are enabling the edge

BYOD mobility & IoT are expanding

Teleworking is the new norm!



Polling Question #1

How much authoritative visibility do you have into your existing on-premises or cloud network? (Select the single best answer.)

1. <25%
2. 26-50%
3. 51-75%
4. >75%
5. I don't know



Customer DDI Roadmap – Visibility, Automation & Control

Establish authoritative IPAM in your on-premises & multi-cloud environment -- then automate!

Infoblox Authoritative IPAM

On-Premise

Multi-cloud Automation



Grid



Microsoft
Management



Cloud Network
Discovery &
Automation



Security
Ecosystem



Network
Discovery



Reporting &
Analytics



Authoritative IPAM – Automated Accuracy & Reliability

- What IP & MAC
- When did it appear
- What Subnet/VLAN
- Device Attributes
- DNS Records
- User
- Where has it been

Network / Microsoft

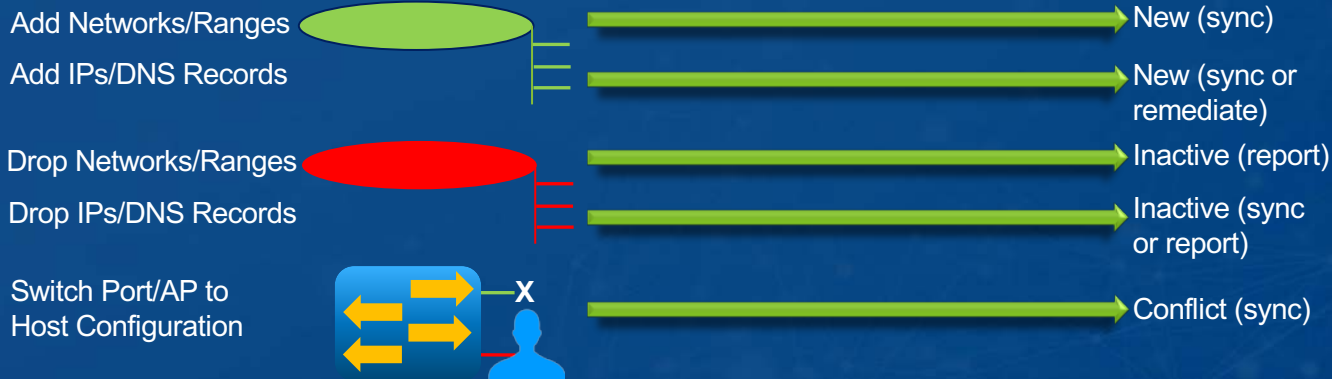


Discovery
Ensuring Accuracy

IPAM



Platform Agnostic – On Premises, Private, Public, Hybrid or Multi-Cloud

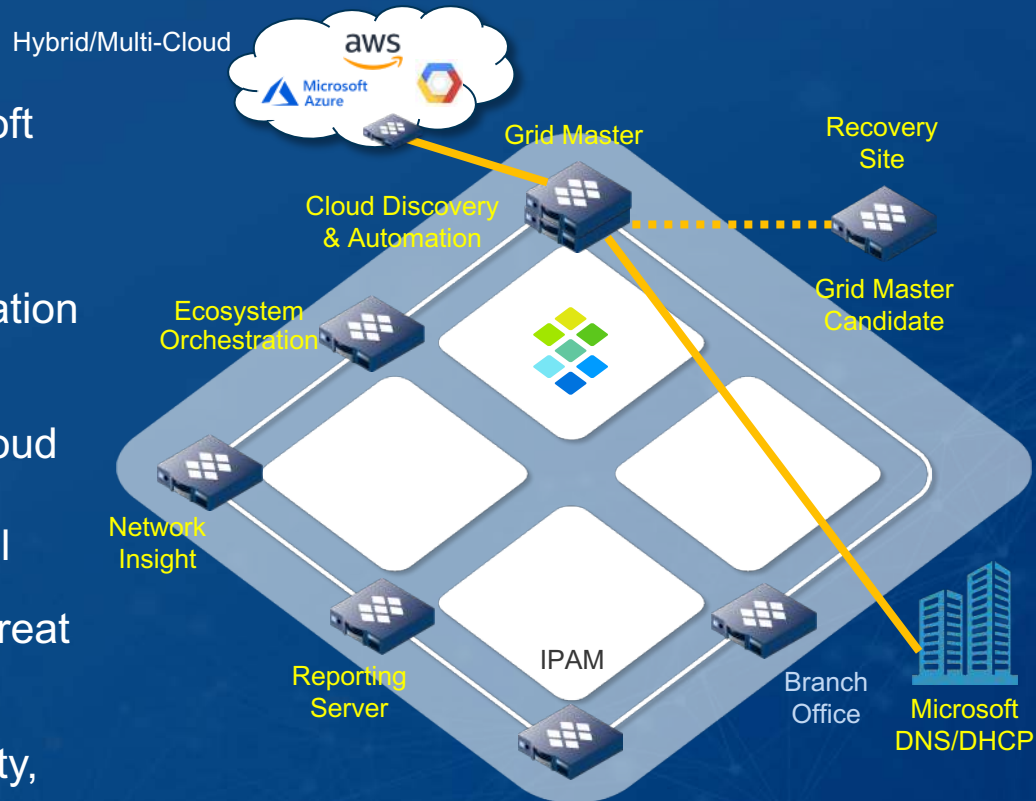


Single
Source-of-Truth



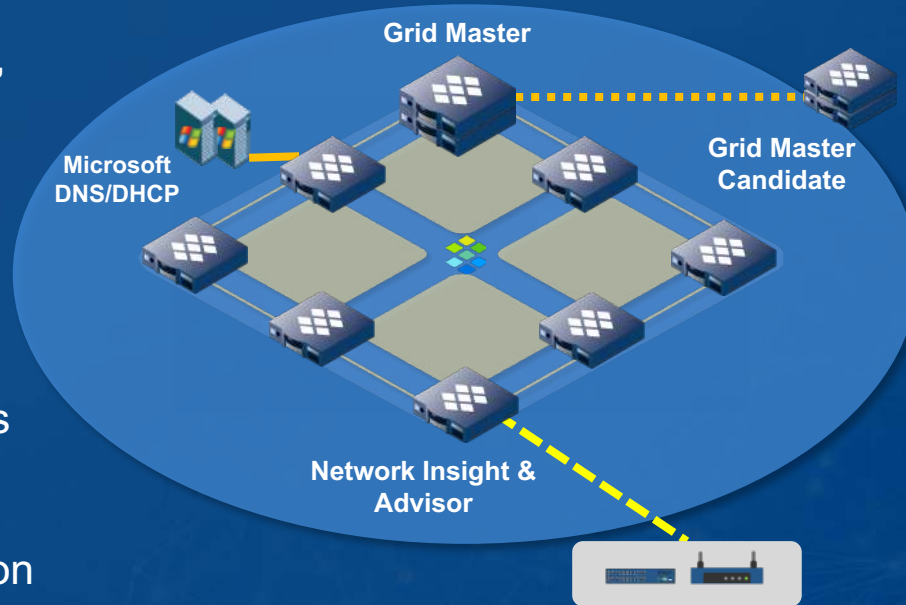
Authoritative IPAM – Empowering Network & Cloud Teams

- **IPAM:** Infoblox Grid, IPAM & Microsoft Management overlay & integration
- **On-Premises Discovery:** Network Insight for discovery, conflict remediation & provisioning
- **Hybrid, Multi-Cloud Discovery:** Cloud Network Automation & Plugins for endpoint visibility, efficiency & control
- **Ecosystem Integration:** Security threat discovery, sharing & remediation
- **Reporting & Analytics:** Data visibility, alerting, audit, compliance & planning



Network Insight & Advisor – On-Prem Discovery & Control

- Integrated L2 & L3 discovery & visibility
- IPAM sync—devices, end-hosts & network ports
- Switch-port management
- Reporting & Analytics
- Lifecycle, security & compliance notification



- Detection of rogue & compromised assets
- Resolves conflicts across devices & network ports
- Adds security alerts for end-of-service assets



Infoblox Hybrid Cloud Strategy & Vision

Policy-based insight for app infrastructure in hybrid cloud

Hybrid Multi-Cloud

Application-Aware Visibility

Policy-Based Insight

- Visibility into cloud apps implemented on any architecture – VMs, Networks, VPCs, etc.
- Connect across multi-cloud environments – Private, Public, Containers & Automation

Cloud Management Platform



openstack



NUTANIX



Google Cloud



kubernetes



ANSIBLE



Terraform

Platform Agnostic – On Premises, Private, Public, Hybrid or Multi-Cloud



Cloud Network Automation – Multi-Cloud Discovery & Control

- Automated DDI management
- Spans private, hybrid & public clouds
- Open API support
- Auditing & reporting across clouds for DHCP leases, DNS records & IP addresses



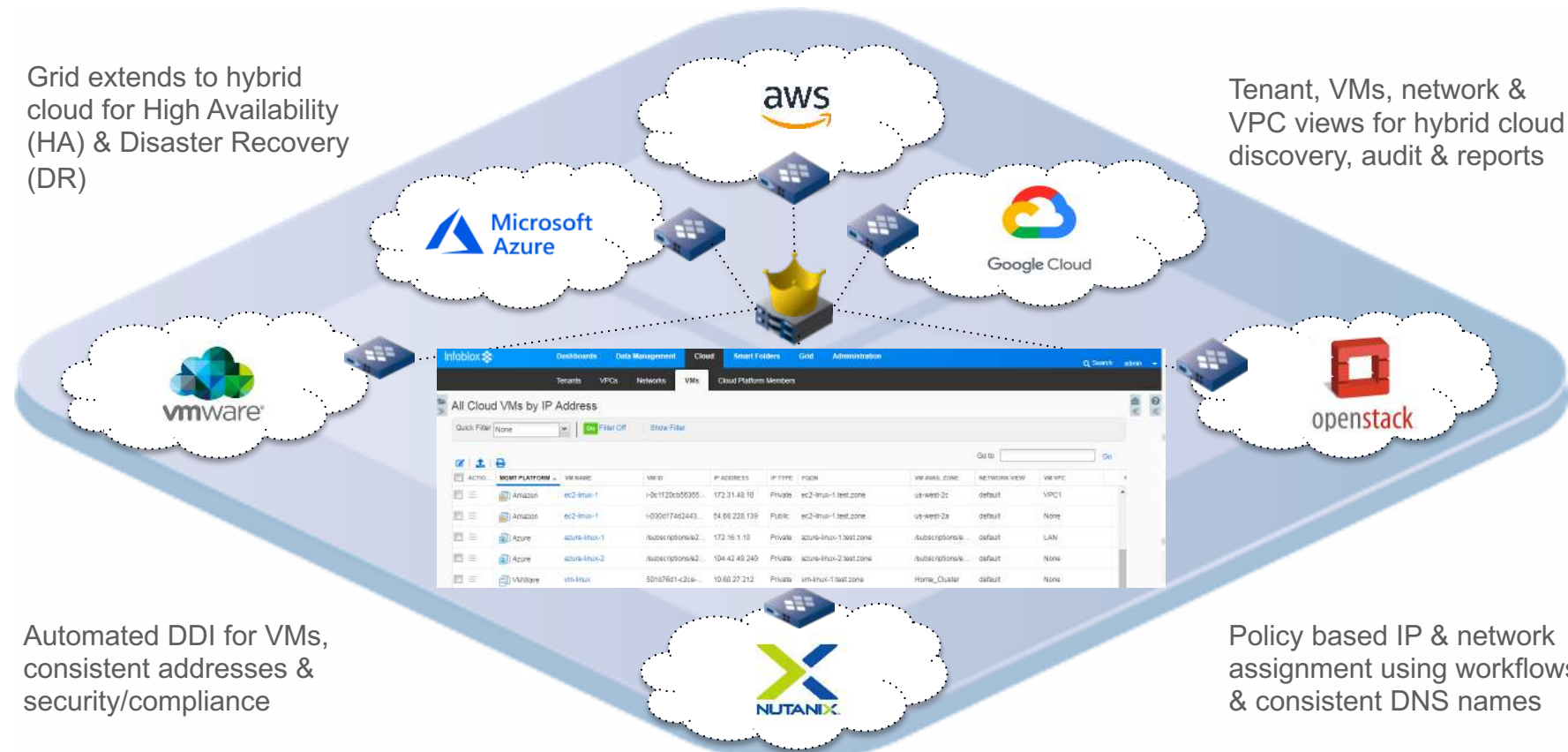
- Saves time, reduces errors
- DDI for multi-cloud environments
- Integrate with array of orchestration tools
- Single control plane management



Multi-Cloud Architecture – Single Control Plane

Grid extends to hybrid cloud for High Availability (HA) & Disaster Recovery (DR)

Tenant, VMs, network & VPC views for hybrid cloud discovery, audit & reports



Automated DDI for VMs, consistent addresses & security/compliance

Policy based IP & network assignment using workflows & consistent DNS names



Infoblox DDI Cloud Integrations

IPAM Integration
for orchestration &
automation



vNIOs deployments
on Cloud Platforms



Supported
Hypervisors

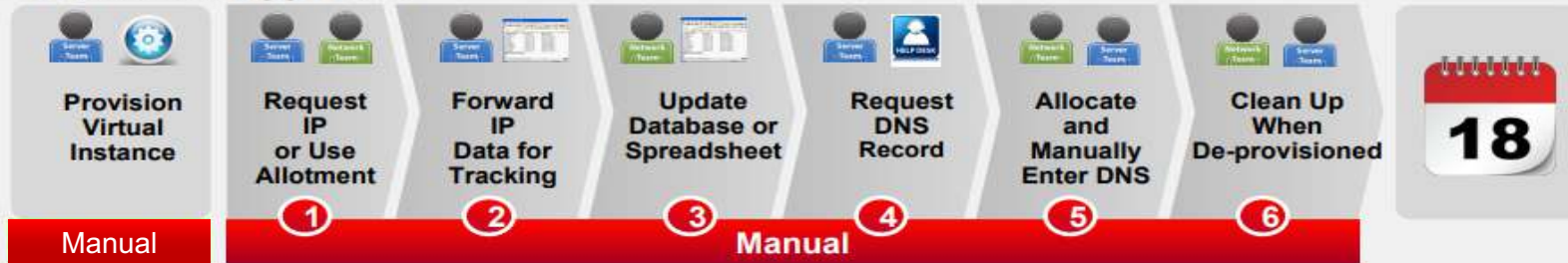


Value of Discovery – Enables Automation & Reliability

PCN offers Managed Services for ITIL Change Management Processes

The Power of Cloud Network Automation

Traditional Approach



Infoblox Cloud Network Automation



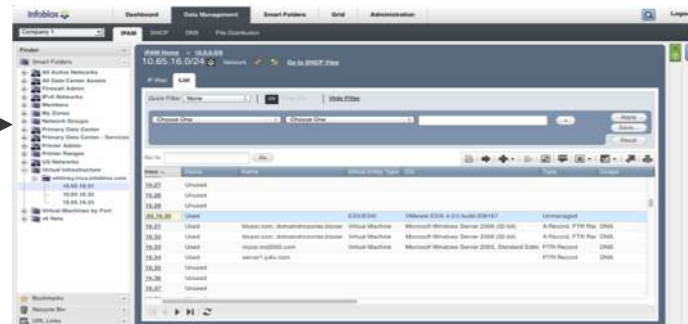
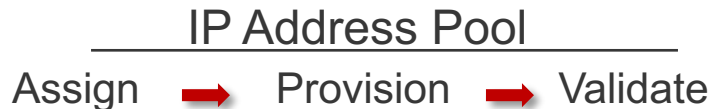
- ✓ Implement change anytime
Eg: DNS names, IP addresses
- ✓ No tickets between network, server teams for DNS, IP
- ✓ Automatic reclamation of resources upon spin down

See the [Network Automation Video](https://infoblox.com/resources/network-automation-video) on [Infoblox.com/resources](https://infoblox.com/resources)



Private Cloud: VMware Integration



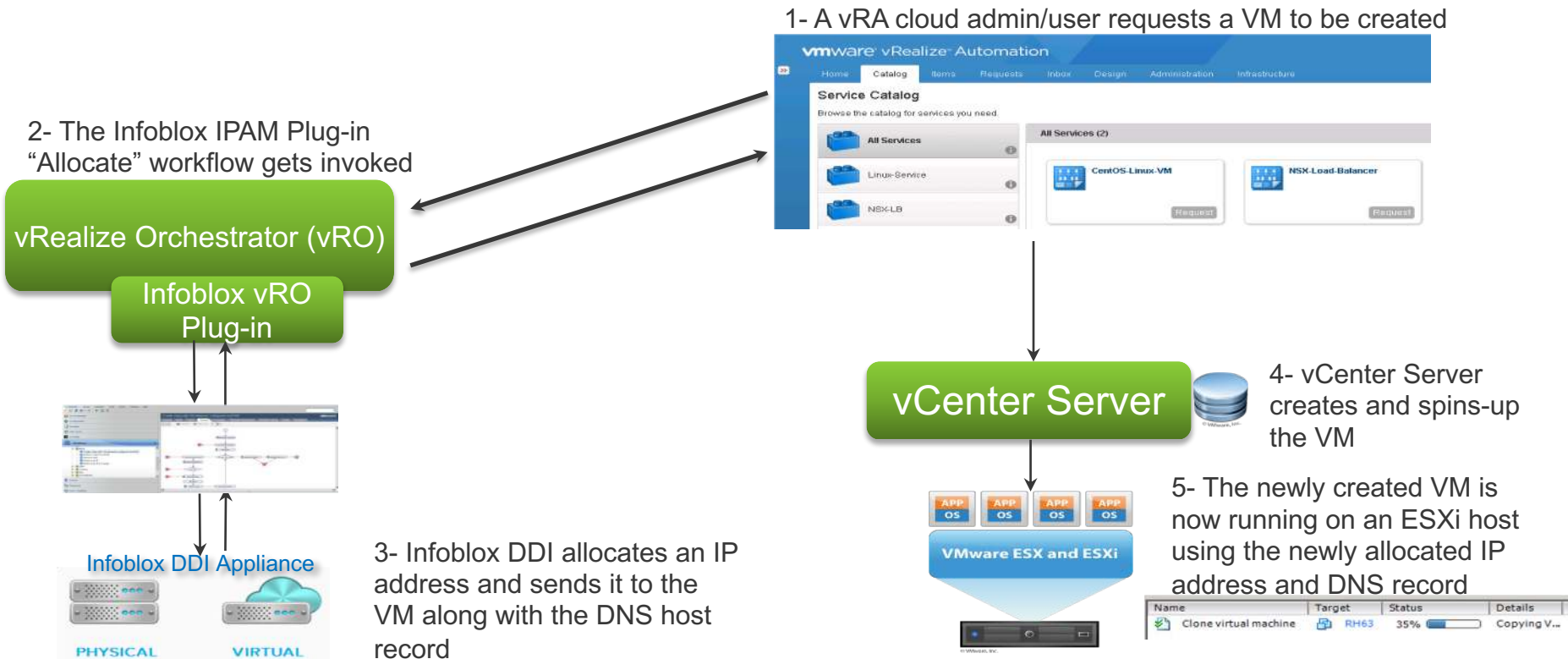


© VMware, Inc.

Supports vRA/vRO 7.5
(vRA 8.1 in process)

- ## Plug-in benefits
- Saves time
 - Saves money
 - Automates tasks

Provisioning a VM Using vRealize Automation & the IPAM Plug-in



Deprovisioning a VM Using vRealize Automation & the IPAM Plug-in

1- A vRA cloud admin/user requests a VM to be destroyed



2- The Infoblox IPAM Plug-in
"Release" workflow is invoked

vRealize Orchestrator (vRO)

Infoblox vRO
Plug-in



Infoblox DDI Appliance



3- Infoblox DDI releases the IP
address & deletes the VM
DNS host record

vCenter Server



4- vCenter Server
shutdowns and deletes
the VM



Infoblox DDI on Public Clouds



Benefits of Infoblox DDI on Public Clouds

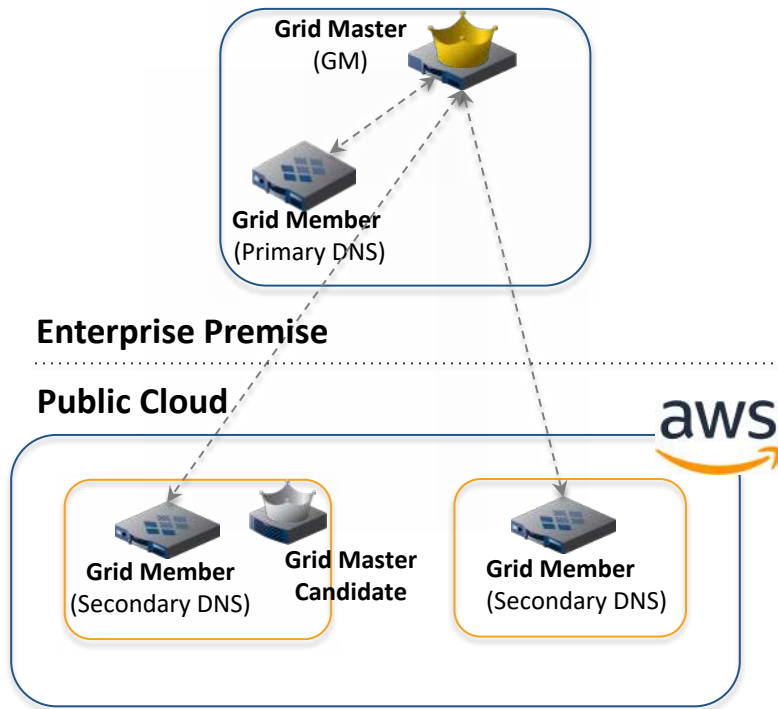
- Gain complete visibility into your network resources
- Automate network management
- Accelerate VM provisioning & deprovisioning
- Scale & extend your enterprise network to public clouds
- Establish uniform DNS naming & IP address provisioning policy across hybrid clouds



Public Cloud: Amazon Web Services Integration



Enterprise-grade DNS on AWS

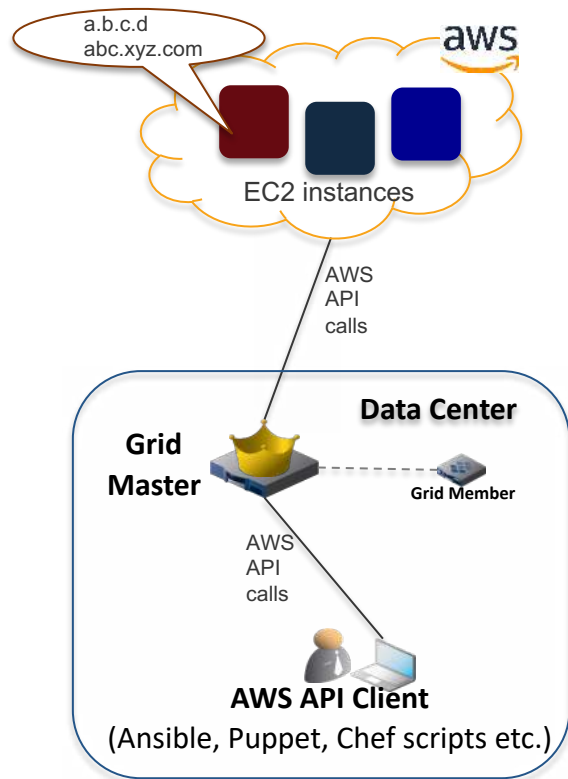


- Infoblox AMIs are available on AWS
- Hardened virtual appliance for secure DNS
- Deploy Infoblox DNS servers in AWS VPCs
- Use for External DNS or Internal DNS
- Fault tolerance with support for Disaster Recovery
- Hybrid or multi-cloud deployment options



AWS Automation Example

Agile Deployment with DNS & IPAM Automation



- Automate creation/deletion of VPCs, networks, VMs
- IP address assignments & reclamations
- Provisioning/de-provisioning of DNS records
- Configurable DNS names

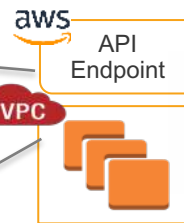
Automation for AWS Instances (API Proxy)

2. GM reserves next available IP in network **10.10.0.0/16** for **VPC-Dev** and inserts into API request

1. API: Create EC2 Instance in **VPC-Dev** for network **10.10.0.0/16**

| VPC ID | Network | IP |
|---------|--------------|--------------|
| VPC-Dev | 10.10.0.0/16 | 10.10.10.101 |

3. API: Create EC2 Instance in **VPC-Dev**



4. EC2 Instance spun up with **10.10.10.101** in **VPC-Dev**

5. API Response: Success

| VPC ID | Network | IP | DNS record |
|---------|--------------|--------------|-------------------|
| VPC-Dev | 10.10.0.0/16 | 10.10.10.101 | dev1.internal.com |

6. GM updates Host records for EC2 Instance

7. API Response: Success

AWS API Client

(Eg: Ansible, Puppet, Chef scripts etc.)

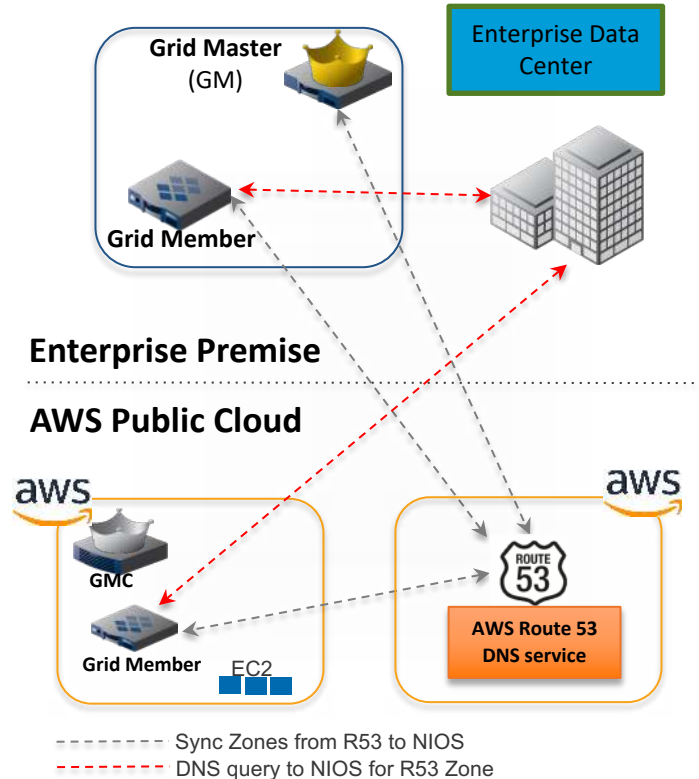
Notes:

- Amazon API calls can be directed to either the Grid Master or Cloud Platform Appliances
- GM performs vDiscovery of AWS instances to ensure no duplicate addresses are assigned
- AWS instance tags assigned as metadata in Infoblox database
- Policy based IP address assignment via metadata passed in AWS APIs



Amazon Web Services Route 53 Integration

Unified DNS management across the hybrid cloud



Challenge

- **Unified Management** – Unified view of DNS across on-premise & AWS
- **Limited internal/private DNS** – Route 53 private hosted zone cannot resolve any resource outside the VPC or respond to queries outside VPC

Solution

- **Visibility** – Unified view of DNS & IPAM for Route 53 in NIOS
- **Hybrid DNS** – Apply DNS Security & IPAM for Route 53 Records in NIOS by serving Route 53 Zones through NIOS

Benefits

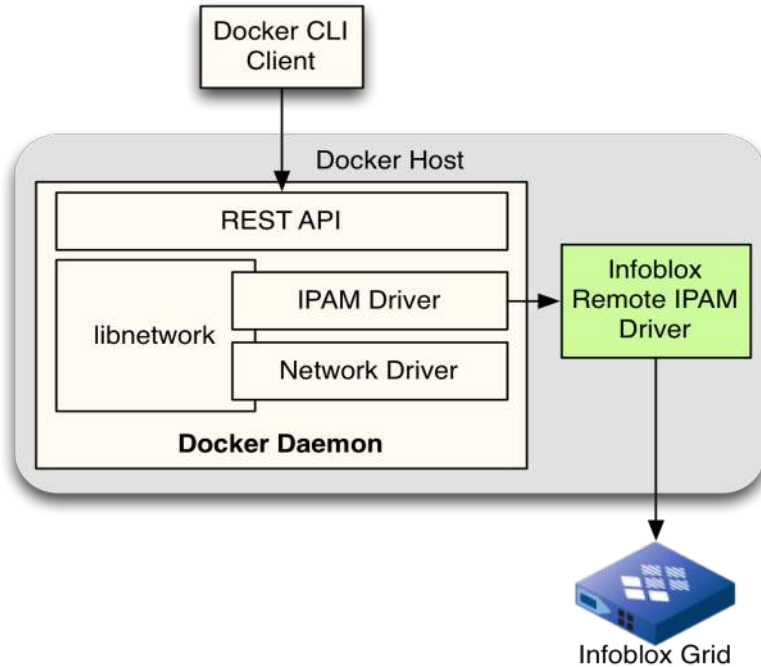
- **Seamless migration** path to Hybrid Cloud by bridging gap between Enterprise IT & Cloud teams
- **Ease off complexity** by presenting the user a single console to view on-premise & Route 53 Public Cloud DNS
- **Automated Migration** from Route 53 to Infoblox DNS
- **Tighter integration** between Route 53 & NIOS by offering performance & resilience



Containerization: Docker Integration



Infoblox Docker integration



Challenges

- Lack of visibility into the network resources
- Manual, tedious & time intensive IP address (de)provisioning across containers
- Multi-network containers can make IPAM more difficult

Solution

- The Infoblox IPAM Docker libnetwork driver interfaces with Infoblox DDI to provide centralized IPAM services

Benefits

- Helps maintain consistency in a dynamic multi-container environment
- Infoblox IPAM plugin for Docker automates the IP saving time & effort
- Provides visibility into the network resources from a single control plane



Infoblox Docker Container IPAM Plugin

Infoblox IPAM driver V1.1.0

- For arbitrary network driver (bridge, overlay, etc.)
- Flexible configuration with separate or combined address space per host or overlay
- Docker certified – Supports Docker Swarm mode
- Facilitates extensibility
- Accelerates new feature delivery
- Protects infrastructure investment

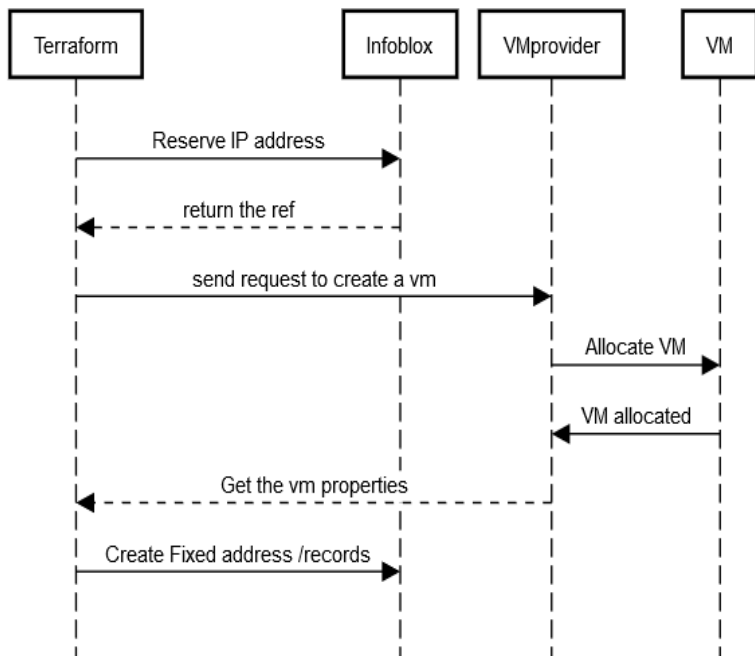


Automation: Terraform Integration



Infoblox Terraform IPAM integration

Provisioning a VM



Challenges

- Complex access administration
- Difficult building, changing & versioning hybrid cloud infrastructure
- Operational inefficiencies

Solution

- The Infoblox Terraform IPAM plug-in provides centralized IPAM and DNS services in VMware & Azure Cloud

Benefits

- Streamlines & simplifies access administration
- Automates the IP saving time & effort in building a Service Provider or Cloud Platform
- Provides visibility into the network resources from a single control plane



Polling Question #2

**What is your biggest challenge with automating cloud integration?
(Select the single best answer.)**

1. Internal expertise
2. Departmental governance
3. Platform standardization
4. Other
5. I don't know



Infoblox Hybrid/Multi-Cloud

Cloud vDiscovery & Automation Demo

Multi-cloud Visibility, Accuracy & Efficiency

Multi-Cloud vDiscovery

- AWS & GCP network discovery
- Virtual network utilization
- Individual IP host data

Terraform Automation

- Creation/Deletion of IPv4 Network in NIOS appliance
- Allocation/Deallocation of IP Address
- Association/Dissociation of IP Address for a VM
- Creation/Deletion of an “A” record



Visibility into Network Resources

The screenshot displays the Infoblox Cloud Management Platform interface. The top navigation bar includes tabs for Dashboards, Data Management, Cloud, Smart Folders, Grid, and Administration. Below this, a secondary navigation bar shows Tenants, VPCs (selected), Networks, VMs, and Cloud Platform Members. The main content area is titled 'VPCs' and features a table with columns: ACTION, MGMT PLATFORM, VPC NAME, NETWORKS, NETWORK VIEW, NETWORK, VMs, TENANTS, CLOUD USAGE, and CLOUD REGION. Three red arrows point from labels 'VPCs', 'Subnets', and 'VMs' to the corresponding columns in the table. The table lists four entries: three Amazon VPCs (VPC1, VPC2, VPC3) and one Azure LAN. A right-hand sidebar contains a 'Toolbar' with options like 'Grid Cloud API Properties', 'vDiscovery', 'Restart Services', and 'IDN Converter'.

| ACTION | MGMT PLATFORM | VPC NAME | NETWORKS | NETWORK VIEW | NETWORK | VMs | TENANTS | CLOUD USAGE | CLOUD REGION |
|--------|---------------|----------|----------|--------------|---------------|-----|---------|---------------|--------------|
| | Amazon | VPC1 | 4 | default | 172.31.0.0/16 | 3 | 1 | Used by cloud | us-west-2 |
| | Amazon | VPC2 | 2 | default | 172.32.0.0/16 | 0 | 1 | Used by cloud | us-west-2 |
| | Amazon | VPC3 | 1 | default | 172.33.0.0/16 | 0 | 1 | Used by cloud | us-west-2 |
| | Azure | LAN | 2 | default | 172.16.0.0/16 | 1 | 1 | Used by cloud | westus |

- Single control plane to view VMs instances, VPCs & subnets
- Periodic discovery of modifications to your cloud environment
- Detailed view of VPCs and subnets
 - VMs in a VPC and their attributes
 - Extensible Attributes imported as configurable metadata

Note: IPAM vDiscovery does not require the CNA License



On-Premises View, Network Discovery

Cisco ACI data from Network Insight

Infoblox

Dashboards Data Management Smart Folders Grid Administration

MGMT - MGMT IPAM VLANs Super Host Devices DHCP DNS File Distribution

IPAM Home

16.16.16.0/24 IPv4 Network Go to DHCP View

IP Map List

Quick Filter None Filter On Show Filter

Go to

| | IP Address | Status | Type | First Discovered | Last Discovered | Bridge Domain | Tenant | EPG | Discovered MAC Addr... | Discoverer | Attached Devic... | Attached Devic... | Attached Devic... |
|-------------------------------------|-------------|--------|--------------|-------------------------|-------------------------|---------------|-------------------|------------------|------------------------|-----------------|-------------------|-------------------|-------------------|
| <input type="checkbox"/> | 16.16.16.0 | Used | IPv4 Network | | | | | | | | | | |
| <input checked="" type="checkbox"/> | 16.16.16.1 | Used | Unmanaged | 2020-03-10 14:48:34 UTC | 2020-03-10 22:13:31 UTC | qa_br_domain | qa_baremetal_t... | qa_bare-metal... | 00:22:bd:f8:19:ff | Network Insight | | | |
| <input type="checkbox"/> | 16.16.16.2 | Unused | | | | | | | | | | | |
| <input type="checkbox"/> | 16.16.16.3 | Unused | | | | | | | | | | | |
| <input type="checkbox"/> | 16.16.16.4 | Unused | | | | | | | | | | | |
| <input type="checkbox"/> | 16.16.16.5 | Unused | | | | | | | | | | | |
| <input type="checkbox"/> | 16.16.16.6 | Unused | | | | | | | | | | | |
| <input type="checkbox"/> | 16.16.16.7 | Unused | | | | | | | | | | | |
| <input type="checkbox"/> | 16.16.16.8 | Unused | | | | | | | | | | | |
| <input type="checkbox"/> | 16.16.16.9 | Unused | | | | | | | | | | | |
| <input type="checkbox"/> | 16.16.16.10 | Unused | | | | | | | | | | | |
| <input type="checkbox"/> | 16.16.16.11 | Unused | | | | | | | | | | | |
| <input type="checkbox"/> | 16.16.16.12 | Unused | | | | | | | | | | | |
| <input type="checkbox"/> | 16.16.16.13 | Unused | | | | | | | | | | | |



On-Premises View, Individual IP Host Data

IP host discovery data from Network Insight

Infoblox Master Grid Dashboards Data Management Cloud Smart Folders Reporting Grid Administration Search

Company 1 (default) IPAM VLANs Super Host Devices Network Users DHCP DNS File Distribution Security Threat Analytics

IPAM Home > 172.16.0.0/16 > 172.16.10.0/24

172.16.10.2 IPv4 Address

Type: Host MAC Address: Name: swr-c-02.demo1.com

Comment:

Discovered Data

| | |
|--|---|
| NetBIOS Name: | OS: 12.3(14)YT1 |
| Discovered MAC Address: | Last Discovered: 2020-03-05 09:31:01 PST |
| Task Name: | First Discovered: 2014-01-10 16:16:39 PST |
| Discovered Name: swr-c-02.infoblox.com | Bridge Domain: |
| Tenant: | EPG: |
| Discoverer: Network Insight | Attached Device Address: 172.16.40.3 |
| Attached Device Contact: | Attached Device Description: Cisco Internetwork Operating System Software IOS (tm) C2950 Software (C2950-I6Q4L2-M), Version 12.1(22)EA10a, RELEASE SOFTWARE (fc2) Copyright (c) 1986-2007 by cisco Systems, Inc. Compiled Tue 24-Jul-07 17:13 by antonino |
| Attached Device Location: | Attached Device Model: catalyst295024G |
| Attached Device Name: sw-c-03.infoblox.com | Attached Device Port Description: Connection to swr-c-02.infoblox.com on interface FastEthernet5 |
| Attached Device Port Name: Fa0/1 | Attached Device Port ID: 5784262039985192204 |
| Attached Device Vendor: Cisco | Attached Device Port: 1 |
| Attached Device Type: Switch | Device Contact: |
| Device Location: | Device Vendor: Cisco |
| Device Model: 1812 | Device Management IP: 172.16.10.2 |



Hybrid Central View, Microsoft DHCP

Microsoft DHCP discovery data

The screenshot displays the Infoblox Hybrid Central View interface. The top navigation bar includes tabs for Master Grid, Dashboards, Data Management, Cloud, Smart Folders, Reporting, Grid, and Administration. The left sidebar shows a Finder with Smart Folders, Bookmarks, Recycle Bin, and URL Links. The main content area is titled 'IPAM Home' and shows a network view for 28.29.30.0/24. A table of IP addresses is displayed, with a red box highlighting the range 28.29.30.10 to 28.29.30.19. A red arrow points from the text 'Microsoft DHCP discovery data' to this table.

| IP ADDRESS | NAME | MAC ADDRESS | STATUS | TYPE | USAGE | LEASE ST... | FIRST DISCOVERED | LAST DISCOVERED | ADVISOR EOL STA... | ADVISOR END OF ... | ADVISOR END OF ... | ADVISOR EOL BULL... |
|-------------|------|-------------|--------|-----------------|-------|-------------|------------------|-----------------|--------------------|--------------------|--------------------|---------------------|
| 28.29.30.5 | | | Unused | | | | | | | | | |
| 28.29.30.6 | | | Unused | | | | | | | | | |
| 28.29.30.7 | | | Unused | | | | | | | | | |
| 28.29.30.8 | | | Unused | | | | | | | | | |
| 28.29.30.9 | | | Unused | | | | | | | | | |
| 28.29.30.10 | | | Used | IPv4 DHCP Range | DHCP | Free | | | | | | |
| 28.29.30.11 | | | Used | IPv4 DHCP Range | DHCP | Free | | | | | | |
| 28.29.30.12 | | | Used | IPv4 DHCP Range | DHCP | Free | | | | | | |
| 28.29.30.13 | | | Used | IPv4 DHCP Range | DHCP | Free | | | | | | |
| 28.29.30.14 | | | Used | IPv4 DHCP Range | DHCP | Free | | | | | | |
| 28.29.30.15 | | | Used | IPv4 DHCP Range | DHCP | Free | | | | | | |
| 28.29.30.16 | | | Used | IPv4 DHCP Range | DHCP | Free | | | | | | |
| 28.29.30.17 | | | Used | IPv4 DHCP Range | DHCP | Free | | | | | | |
| 28.29.30.18 | | | Used | IPv4 DHCP Range | DHCP | Free | | | | | | |
| 28.29.30.19 | | | Used | IPv4 DHCP Range | DHCP | Free | | | | | | |



Hybrid Central View, Sites & Services

The screenshot displays the Infoblox Hybrid Central View interface. The top navigation bar includes tabs for Master Grid, Dashboards, Data Management, Cloud, Smart Folders, Reporting, Grid, and Administration. Below this, a secondary bar lists various services like Grid Manager, Upgrade, Licenses, HSM Group, Microsoft Servers, Amazon, Device Support, and Ecosystem.

On the left, the 'Servers' section is active, showing 'Active Directory Domains'. A list of domains is displayed, with 'ad.infobloxdemo.com' highlighted. A red box labeled 'AD domains' points to this list.

In the center, a modal window titled 'Burlington (Active Directory Site Properties)' is open. It shows the site name 'Burlington' and a list of networks. A red box labeled 'Sites' points to the site name, and another red box labeled 'Networks for site replication' points to the network list. The network list includes 'ADDRESS', '1.0.0.128/25', and '1.0.2.0/24'.

On the right, a search bar is visible with the text 'Go to' and a search icon. A red box labeled 'Also populates User data' points to the search bar.



Cloud Central View, Multi-Tenant

vDiscovery from Cloud Network Automation

Infoblox Master Grid Dashboards Data Management Cloud Smart Folders Reporting Grid Administration

Tenants VPCs Networks VMs Cloud Platform Members

All Cloud VMs by IP Address

Quick Filter: None Filter On Show Filter

Go to [] Go

| ACTIONS | MGMT PLATFORM | VM NAME | VM ID | IP ADDRESS | VM AVAIL ZONE | NETWORKS | VM VPC | VM TENANT | PORT ID | NETWORK VIEW | ACTIVE USERS | FQDN | IP ADDRESS OBJE... | IP TYPE |
|---------|---------------|---------------------|------------|---------------|-----------------|----------|----------------|------------|--------------|-------------------|--------------|--------------------|--------------------|----------|
| | Amazon | demo-infoblox-h... | i-a2ceb235 | 172.31.5.249 | ap-southeast-2a | 1 | None | Accounting | eni-f67b2f90 | Australian SE Lab | 0 | | None | Private |
| | Amazon | infoblox-se-6789... | i-ca330447 | 52.16.77.92 | | 3 | None | Sales | eni-0e2b5d54 | Company 1 | 0 | infoblox-se-678... | Host | Fixed |
| | Amazon | infoblox-se-6789... | i-ca330447 | 172.19.3.18 | | 3 | vpc-se_project | Sales | eni-0e2b5d54 | Company 1 | 0 | infoblox-se-678... | Host | Fixed |
| | Amazon | infoblox-se-6789... | i-ca330447 | 172.19.3.162 | | 3 | vpc-se_project | Sales | eni-0e2b5d54 | Company 1 | 0 | infoblox-se-678... | Host | Fixed |
| | Amazon | infoblox-se-6789... | i-d9b58454 | 172.19.3.148 | | 3 | vpc-se_project | Sales | eni-bd2654e7 | Company 1 | 0 | infoblox-se-678... | Host | Floating |
| | Amazon | infoblox-se-6789... | i-d9b58454 | 172.19.3.59 | | 3 | vpc-se_project | Sales | eni-bd2654e7 | Company 1 | 0 | infoblox-se-678... | Host | Floating |
| | Amazon | infoblox-se-6789... | i-d9b58454 | 52.49.147.196 | | 3 | None | Sales | eni-bd2654e7 | Company 1 | 0 | infoblox-se-678... | Host | Floating |
| | Amazon | infoblox-se-6789... | i-7ffb29f3 | 52.48.138.65 | | 3 | None | Sales | eni-590c8804 | Company 1 | 0 | infoblox-se-678... | Host | Floating |
| | Amazon | infoblox-se-6789... | i-7ffb29f3 | 172.19.3.190 | | 3 | vpc-se_project | Sales | eni-590c8804 | Company 1 | 0 | infoblox-se-678... | Host | Floating |
| | Amazon | infoblox-se-6789... | i-7ffb29f3 | 172.19.3.21 | | 3 | vpc-se_project | Sales | eni-590c8804 | Company 1 | 0 | infoblox-se-678... | Host | Floating |
| | Amazon | infoblox-se-6789... | i-83d48d0e | 172.19.3.137 | | 3 | vpc-se_project | Sales | eni-faa631a0 | Company 1 | 0 | infoblox-se-678... | Host | Fixed |
| | Amazon | infoblox-se-6789... | i-83d48d0e | 52.31.221.40 | | 3 | None | Sales | eni-faa631a0 | Company 1 | 0 | infoblox-se-678... | Host | Fixed |
| | Amazon | infoblox-se-6789... | i-83d48d0e | 172.19.3.6 | | 3 | vpc-se_project | Sales | eni-faa631a0 | Company 1 | 0 | infoblox-se-678... | Host | Fixed |
| | Amazon | infoblox-se-6789... | i-05062a88 | 172.19.3.186 | | 3 | vpc-se_project | Sales | eni-4b80e111 | Company 1 | 0 | infoblox-se-678... | Host | Fixed |
| | Amazon | infoblox-se-6789... | i-05062a88 | 172.19.3.47 | | 3 | vpc-se_project | Sales | eni-4b80e111 | Company 1 | 0 | infoblox-se-678... | Host | Fixed |



Hybrid Central View, Security Forensics

Single IP DNS & network discovery data

The screenshot shows the Infoblox IPAM interface. The top navigation bar includes tabs for Master Grid, Dashboards, Data Management, Cloud, Smart Folders, Reporting, Grid, and Administration. The left sidebar contains a Finder section with Smart Folders, Bookmarks, Recycle Bin, and URL Links. The main content area displays the IPAM Home view for the 192.168.0.0/16 network. A table lists IP addresses, their names, MAC addresses, status, type, usage, lease status, first and last discovered dates, attached devices, and port status. A red box highlights three rows of data, and a red arrow points from the text 'Single IP DNS & network discovery data' to the highlighted rows.

| IP ADDRESS | NAME | MAC ADDRESS | STATUS | TYPE | USAGE | LEASE ST | FIRST DISCOVERED | LAST DISCOVERED | ATTACHED DEVIC... | ATTACHED DEVIC... | ATTACHED DEVIC... | PORT S |
|--------------|------------------|-------------------|--------|----------------------|-------|----------|-------------------------|-------------------------|--------------------|-------------------|-------------------|--------|
| 192.168.4.20 | reserved for ... | | Unused | IPv4 Reserved Range | | Free | | | | | | |
| 192.168.4.21 | gc_msdcs.a... | | Used | A Record, PTR Record | DNS | | 2015-11-17 14:03:47 PST | 2020-03-05 03:12:45 PST | Cisco IOS Softw... | | | Up |
| 192.168.4.22 | dc2-infoblox... | | Used | A Record, PTR Record | DNS | | 2015-11-18 12:36:55 PST | 2020-03-05 03:12:45 PST | Cisco IOS Softw... | | | Up |
| 192.168.4.23 | | | Unused | | | | | | | | | |
| 192.168.4.24 | | | Unused | | | | | | | | | |
| 192.168.4.25 | | | Unused | | | | | | | | | |
| 192.168.4.26 | | | Unused | | | | | | | | | |
| 192.168.4.27 | | | Unused | | | | | | | | | |
| 192.168.4.28 | | | Unused | | | | | | | | | |
| 192.168.4.29 | | | Unused | | | | | | | | | |
| 192.168.4.30 | testdemo.inf... | 12:34:56:12:34:54 | Used | Host | DNS | | | | | | | |
| 192.168.4.31 | | | Unused | | | | | | | | | |
| 192.168.4.32 | | | Unused | | | | | | | | | |
| 192.168.4.33 | | | Unused | | | | | | | | | |
| 192.168.4.34 | | | Unused | | | | | | | | | |



Automation: Infoblox Terraform Provider for IPAM

Allocating the IP address & creating the IPAM record for a new VM

```
resource "infoblox_ip_allocation" "demo_allocation" {  
  network_view_name = "default"  
  vm_name = "aws-tf-demo"  
  cidr = infoblox_network.network_2.cidr  
  tenant_id = "AWS-Corp"  
}
```

Automation benefits

- Consolidates labor-intensive manual workflows in seconds
- Automatically updates the Infoblox Grid as the single-source-of-truth

The screenshot displays the Infoblox IPAM (IP Address Management) interface. The top navigation bar includes 'Dashboards', 'Data Management', 'Cloud', 'Smart Folders', 'Grid', and 'Administration'. The 'Administration' tab is selected, and the 'IPAM' sub-tab is active. The main content area shows a list of IP addresses, with the first entry highlighted: '172.25.1.104' (IPv4 Address). The details for this IP are shown on the right, including the MAC Address '06:4d:9a:be:3e:19', Name 'aws-tf-demo', and DHCP Fingerprint. Below the IP details, there is a section for 'Discovered Data' and 'Cloud' information. The 'Cloud' section shows 'Cloud Usage: Cloud from adapter' and 'Owned By: Cloud adapter'. At the bottom, there is a table of 'Related Objects' with columns for Name, Type, Comment, and Site. The table lists two objects: 'aws-tf-demo' (IPv4 Fixed Address) and 'aws-tf-demo.bxdemo.com' (A Record).

| Name | Type | Comment | Site |
|------------------------|--------------------|---------|------|
| aws-tf-demo | IPv4 Fixed Address | | |
| aws-tf-demo.bxdemo.com | A Record | | |



Automation: Infoblox Terraform Provider for DNS

Creating an "A" record for a new VM

```
resource "infoblox_a_record" "demo_record"{  
  network_view_name = "default"  
  vm_name = infoblox_ip_allocation.demo_allocation.vm_name  
  cidr = infoblox_network.network_2.cidr  
  ip_addr = infoblox_ip_allocation.demo_allocation.ip_addr  
  dns_view = "default"  
  zone = "ibxdemo.com"  
  tenant_id = "AWS-Corp"  
}
```

Automation benefits

- Automates manual DNS record provisioning in seconds
- Ensures immediate availability for new services

The screenshot shows the Infoblox web interface. The top navigation bar includes 'Dashboards', 'Data Management', 'Cloud', 'Smart Folders', 'Grid', and 'Administration'. The 'DNS' tab is selected under 'Data Management'. The left sidebar shows a 'Finder' with 'Smart Folders', 'Bookmarks', 'Recycle Bin', and 'URL Links'. The main content area shows the configuration for the 'ibxdemo.com' zone. The 'Records' tab is active, displaying a table of DNS records.

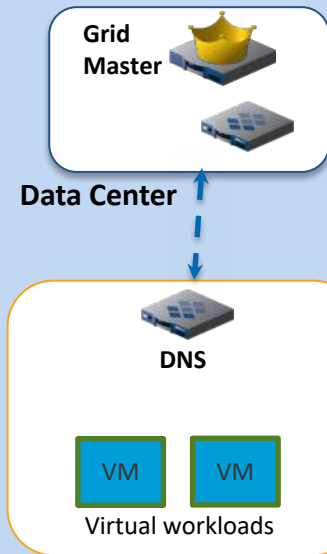
| Name | Type | Data | Record Source | Principal | Monitored Since | Last Queried |
|-------------|------------|--|---------------|-----------|-----------------|---------------|
| | SOA Record | Serial: 110 MNAME: gm.ibxdemo.co RNAME: please_set_email.absolutely.nowhere Refresh: 10800 Retry: 3600 Expire: 2419200 Negative Caching TTL: 900 | System | | Not Monitored | Not Monitored |
| | NS Record | gm.ibxdemo.co | System | | Not Monitored | Not Monitored |
| aws-ti-demo | A Record | 172.25.1.4 | Static | | Not Monitored | Not Monitored |



Flexible Deployment Options

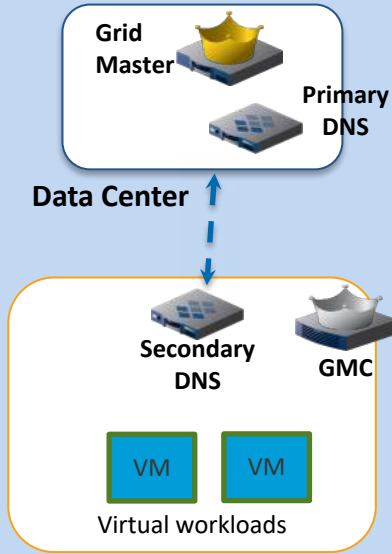
DDI for Hybrid Cloud

- GM in DC, single touch point to manage members in public cloud
- Grid members distributed across Private and Public Cloud



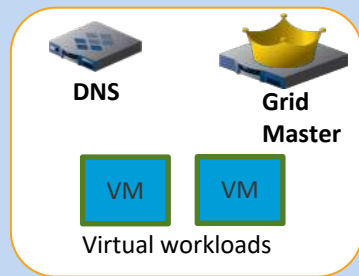
DDI for Fault Tolerance

- GM in DC and GMC in public cloud
- Primary DNS in Private and Secondary DNS in public cloud

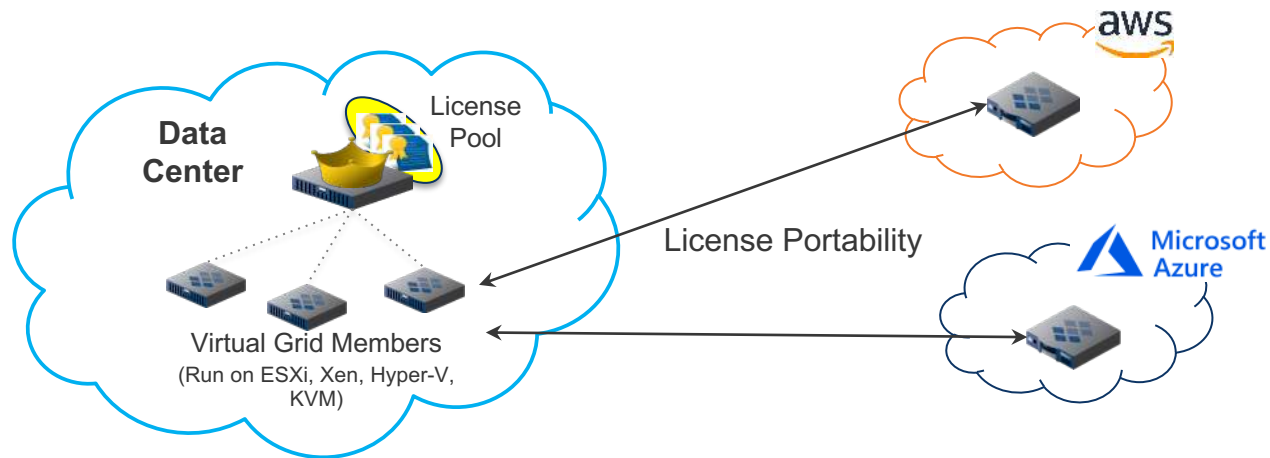


DDI for Full Public Cloud

- Entire Grid, including GM and members in public cloud
- Grid members distributed across different VPCs



Flexible Licensing



Elastic

Launch new grid members as needed automatically & assign licenses from a pool

Portable

Move appliance license between Private & Public Cloud; no new SKUs

Future Ready

Purchase multiple service/feature licenses for future cloud deployments



Why Infoblox Hybrid Cloud Transformation?



DISCOVERY & VISIBILITY

Discover all network resources & see what's happening everywhere (datacenters, multi-cloud, containers, IOT, branch)



WORKFLOW AUTOMATION

Accelerate VM provisioning & deprovisioning, & improve efficiency & productivity through automated workflows via a single control plane



SCALE YOUR NETWORK TO THE HYBRID MULTI-CLOUD

Save time & money, extend your network to public clouds & ensure uniform DNS naming & IP address provisioning across hybrid clouds



PCN DDI Professional & Managed Services

Professional Services

Consulting, Health Checks & Assessments

- Architecture, Operations & Security Audit
- Current State, Vulnerability & Functionality
- Data discovery, Analysis & Reporting
- Best Practices – Design, Audit, Governance & Control
- Discover and Evaluate Current, Planned & Desired DDI Services and Functionality

Architecture, Engineering, and Project Management

- Draft Conceptual-, High- & Low-Level Designs to Meet Current & Future Requirements
- Upgrades, Patching & Custom Script Development
- Installation, Configuration & Data Migration
- Transformation of Existing Solutions
- Development & Implementation of Test Plans
- Customer & Solution Specific Project Plans

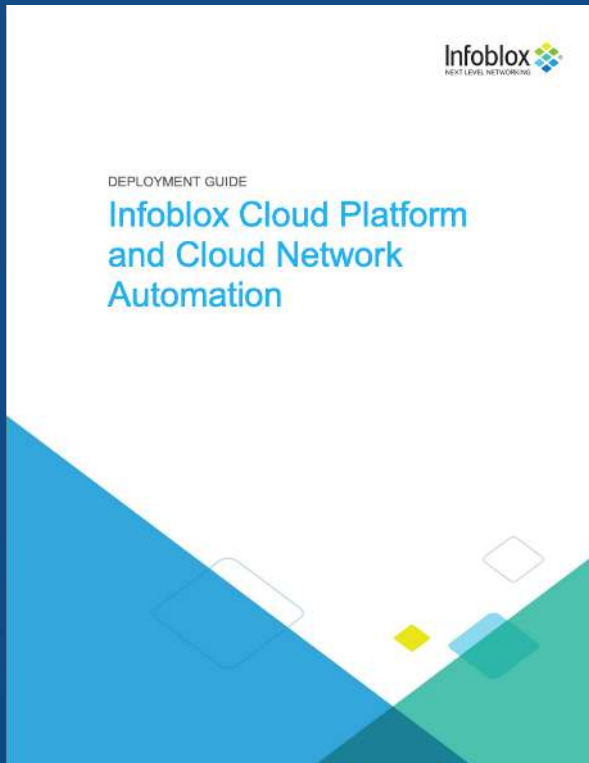
Transition & Transformation

- Operational Level Agreement
- Project & Test Plans
- Business-to-Business Connectivity & Ticketing
- Existing Environment Assessment
- High- & Low-Level Designs
- Solution Deployment, Testing & Migration Execution

Day 2 Delivery

- Monitoring & Incident Management
- OEM & RMA Liaison
- Database Backups, Reporting & Capacity Planning
- Software Updates & Upgrades
- Self-Service Portal
- Business-as-Usual Changes
- Technical Account Management

Next Steps



Deployment Guide: Infoblox Cloud Platform and Cloud Network Automation

Infoblox Resources

- [Datasheet – DDI for Cloud and Virtualization](#)
- [Solution Note – vNIOS for Nutanix Acropolis Hypervisor](#)
- [Blog – Top 6 vNIOS Use Cases for Optimizing Public Cloud Investment](#)
- [Deployment Guide – Infoblox Cloud Platform and Cloud Network Automation](#)
- [Infoblox Provider for Terraform User Guide](#)

1.408.986.4000 | info@Infoblox.com

PCN Resources

- [New Website](#)
- [VAR Pro and Managed Services One Pager](#)
- [DDI Portal One Pager](#)

1.267.236.0015 | info@pcn-inc.com

Contact PCN for additional Infoblox information and special deals





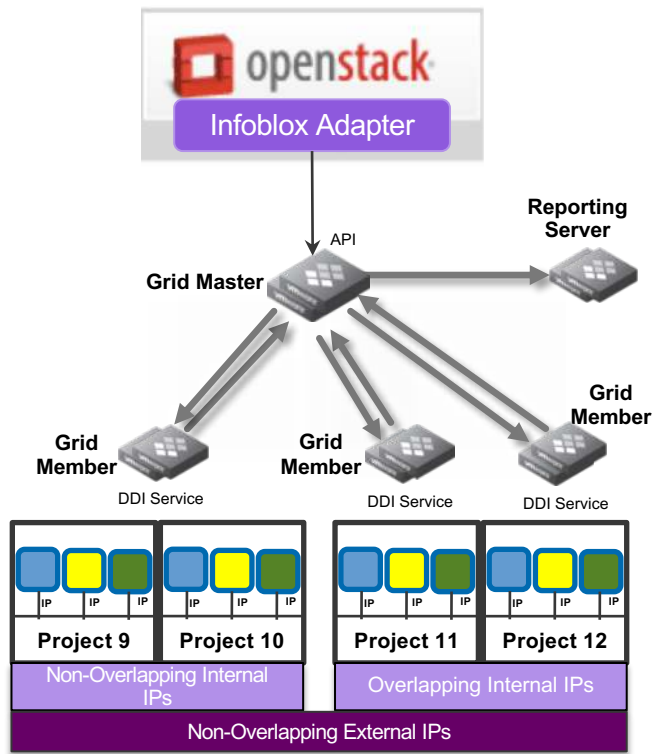
Q&A

[illegible]

Private Cloud: OpenStack Integration



Infoblox OpenStack Adapter



Enables Infoblox Grid to provide DNS, DHCP, and IPAM (DDI) for OpenStack Networks & VMs

Infoblox Grid

- Manages network creation/deletion
- Allocates/De-allocates IP addresses for VMs
- Automatically creates/deletes DNS records for IPs
- Provides DNS & DHCP services to VMs

Benefits

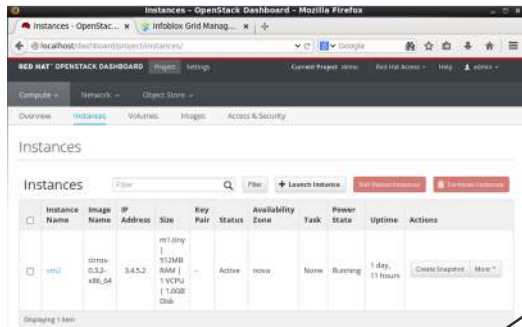
- Centralized cross-platform (private & public) DDI
- High Availability
- Operational efficiency
- Lower migration cost (physical to virtual to cloud)



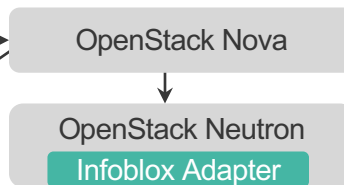
Provisioning a VM using OpenStack with Infoblox Integration

BR/DC

1 - A cloud admin/user requests a VM to be created through OpenStack Horizon UI



2 - OpenStack Nova (Compute) calls the Infoblox Adapter code in OpenStack Neutron (Networking)



3 - Infoblox Adapter contacts NIOS via WAPI for Next Available IP and creates DNS Records for VM



Infoblox Grid Master

4 - GM synchronizes Host record or Fixed Address/ + A/AAAA/PTR with Grid Member

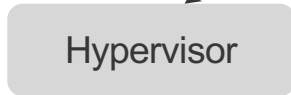


Infoblox Grid Member DNS/DHCP

6 - VM starts up and makes DHCP Request to Member (Fixed Address)



5 - OpenStack Spins up VM on Hypervisor (e.g., KVM)



Hypervisor



End User

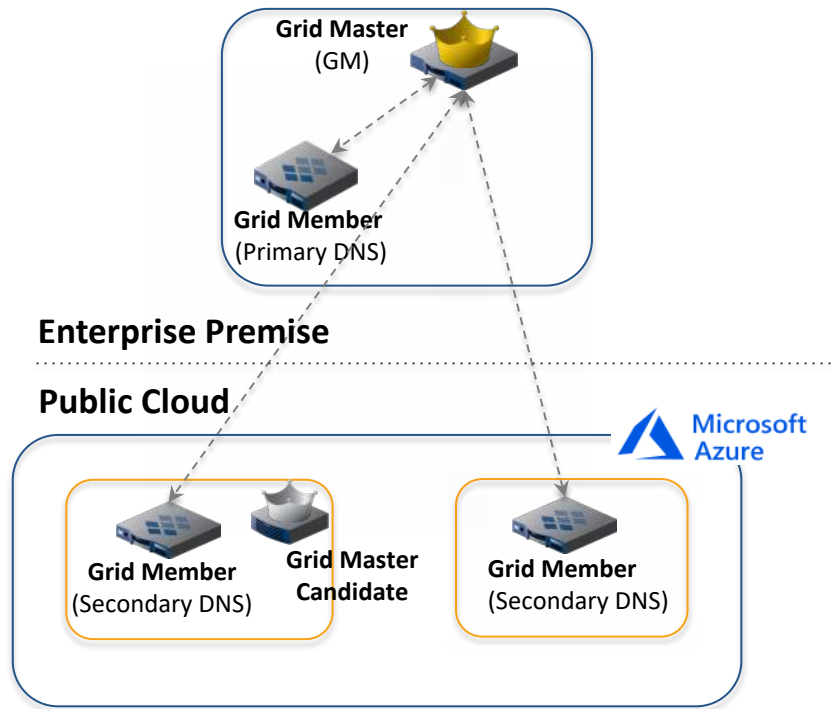
7 - End User accesses VM using DNS FQDN



Public Cloud: Microsoft Azure Integration



Enterprise-grade DNS on Azure



- Infoblox images/scripts are available on Azure
- Hardened virtual appliance for secure DNS
- Deploy Infoblox DNS servers in VNets
- Use for External DNS or Internal DNS
- Fault tolerance with support for Disaster Recovery
- Hybrid or multi-cloud deployment options



Visibility Into Azure Resources

The screenshot shows the Infoblox Cloud Management Platform interface. The top navigation bar includes 'Dashboards', 'Data Management', 'Cloud', 'Smart Folders', 'Grid', and 'Administration'. The 'Cloud' tab is active, showing sub-tabs for 'Tenants', 'VPCs', 'Networks', 'VMs', and 'Cloud Platform Members'. The 'Tenants' sub-tab is selected, displaying a table of tenants. The 'Azure' tenant is highlighted with a red box. A red arrow points from this tenant to a detailed view of its VM instances.

| MGMT PLATFORM | NAME | ID | VMS | NETWORKS | CREATED | LAST UPDATED |
|---------------|--------------------|--------------------|-----|----------|--------------------|--------------------|
| Azure | ccf6dc4a-9fe9-4... | ccf6dc4a-9fe9-4... | 1 | 3 | 2019-02-13 13:0... | 2019-02-13 13:0... |
| Amazon | 915693437317 | 915693437317 | 3 | 10 | 2019-02-13 14:2... | 2019-02-13 14:2... |

- Single pane of glass view of Azure VM instances, VNets, and networks
- Automatic discovery of modifications to Azure environment
- Detailed view of Azure VNets and networks

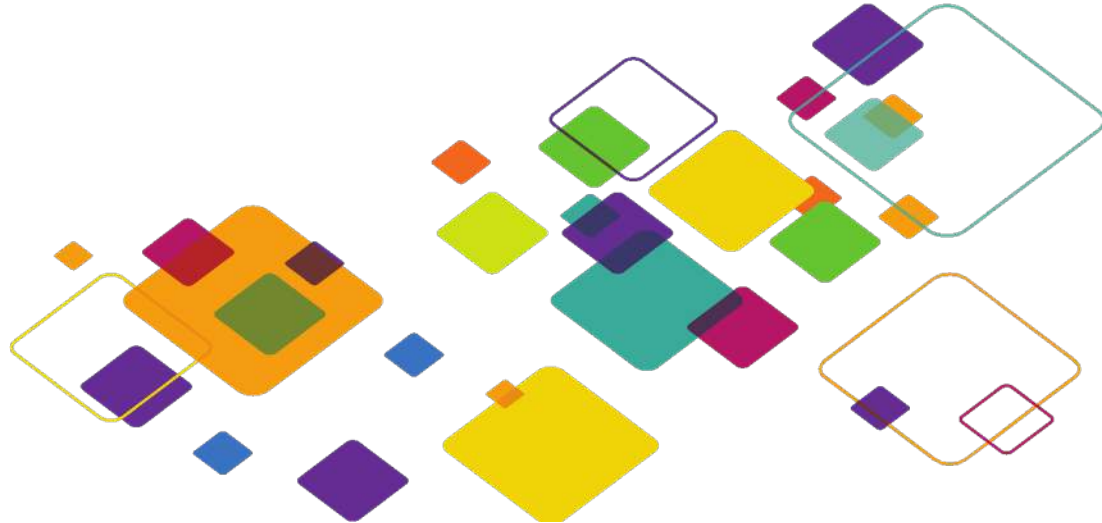
| MGMT PLATFORM | VM NAME | VM ID | IP ADDRESS | IP TYPE | FQDN | VM AVAIL ZONE |
|---------------|-------------------|----------------------|---------------|---------|-----------------------------|---------------------|
| Azure | pfsense-singlenic | /subscriptions/e2... | 172.16.1.10 | Private | pfsense-singlenic.test.zone | /subscriptions/e... |
| Azure | pfsense-singlenic | /subscriptions/e2... | 104.42.49.240 | Private | pfsense-singlenic.test.zone | /subscriptions/e... |



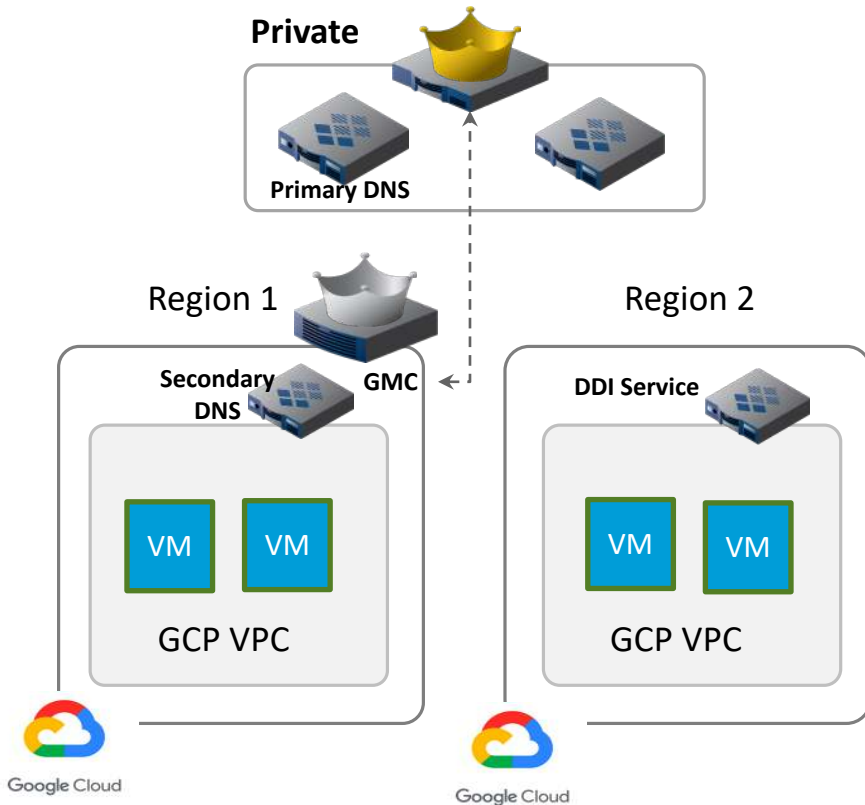
Public Cloud: Google Cloud Platform (GCP)



Google Cloud



Enterprise-grade DNS in GCP



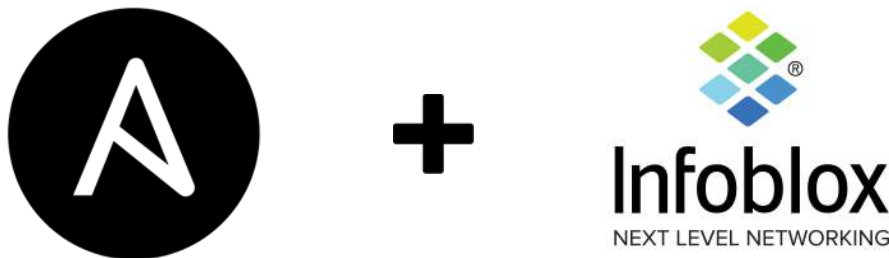
- Deploy DNS servers in GCP VPCs
- Leverage internal and/or external DNS
- Fault tolerance with support for disaster recovery
- Integrates with traditional networks or hybrid cloud for consistency



Automation: Ansible Integration



Infoblox Integration with Ansible



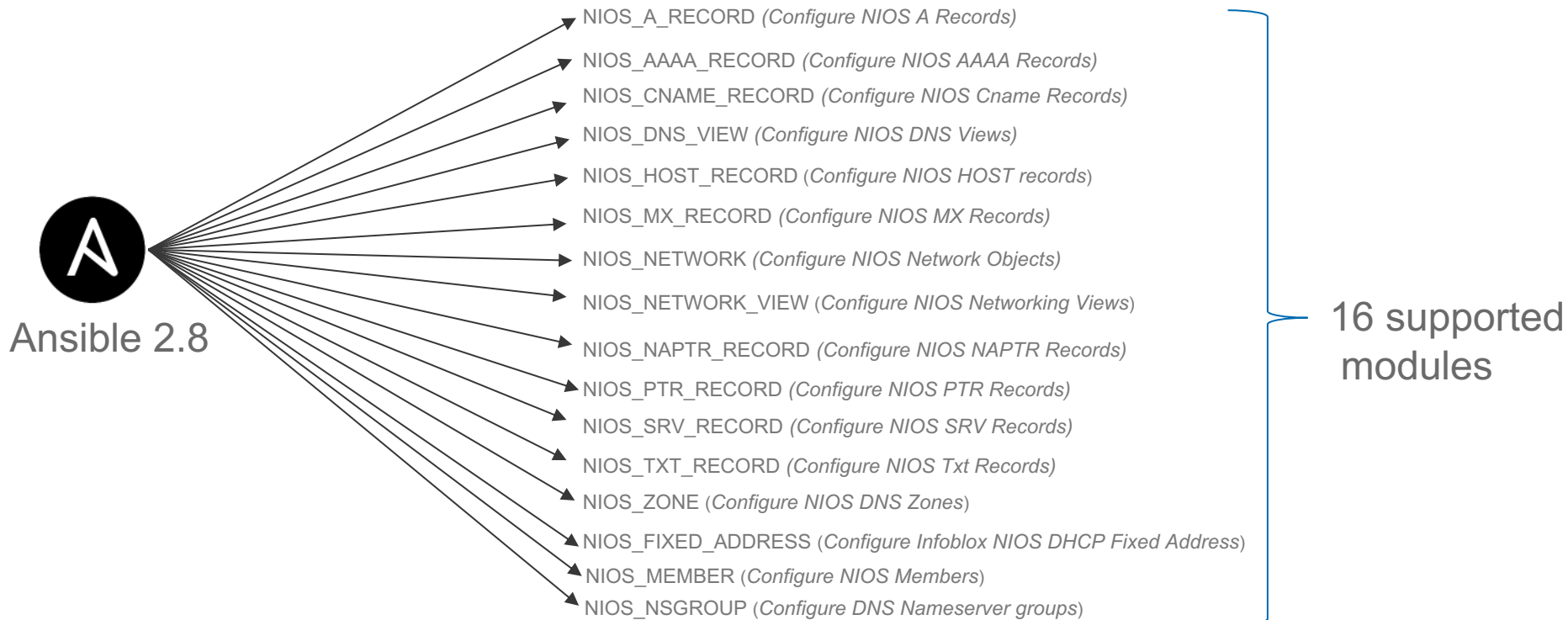
Ansible includes following Infoblox NIOS enablement:

- Sixteen modules
- Lookup plug-in (for querying Infoblox NIOS objects)
- Dynamic inventory script

Scenario guide: https://docs.ansible.com/ansible/devel/scenario_guides/guide_infoblox.html



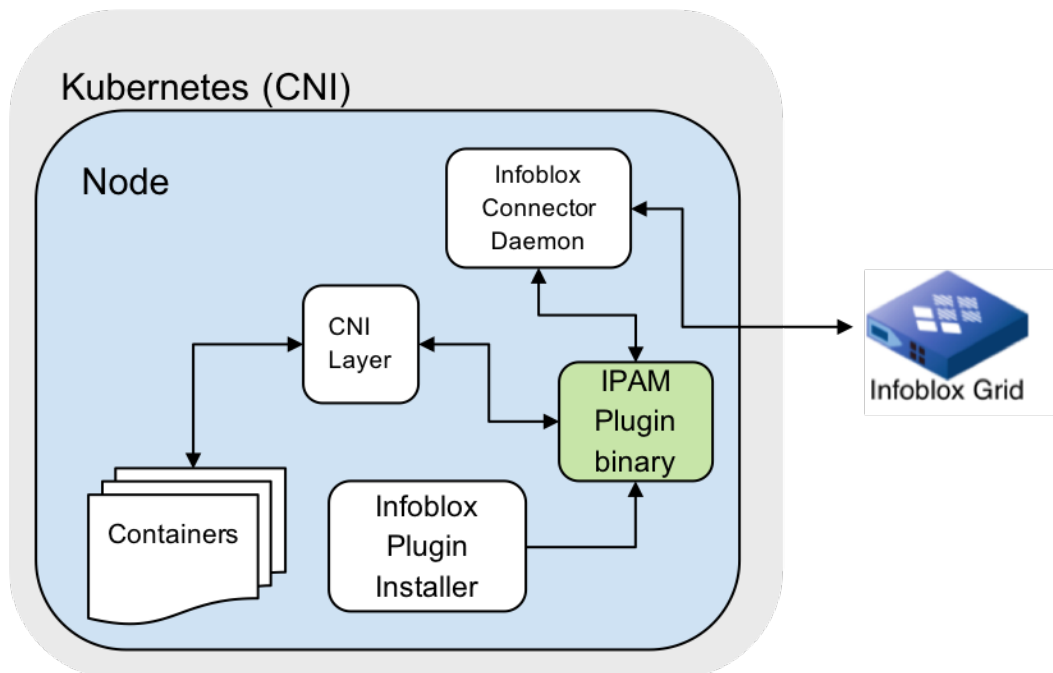
Ansible-Infoblox Modules



Containerization: Kubernetes Integration



Infoblox integration with Kubernetes



Challenges

- Manual (de)/provisioning of IP addresses across multiple containers is time intensive and tedious.
- Moreover, containers can be spread across multiple networks making IPAM even more difficult.
- Lack of visibility into the network resources.

Solution

- **Infoblox IPAM Plugin:** CNI executes this plugin and receives the configuration and context data.
- **Infoblox IPAM Daemon:** Does the heavy lifting and interfaces with the Infoblox via WAPI to perform IPAM functions.

Benefits

- Solution provides IP address management via NIOS for pods/containers deployed by Kubernetes.

