

# Spreadsheets to Modern DDI

UNC Cause 2018 -- October 1, 2018  
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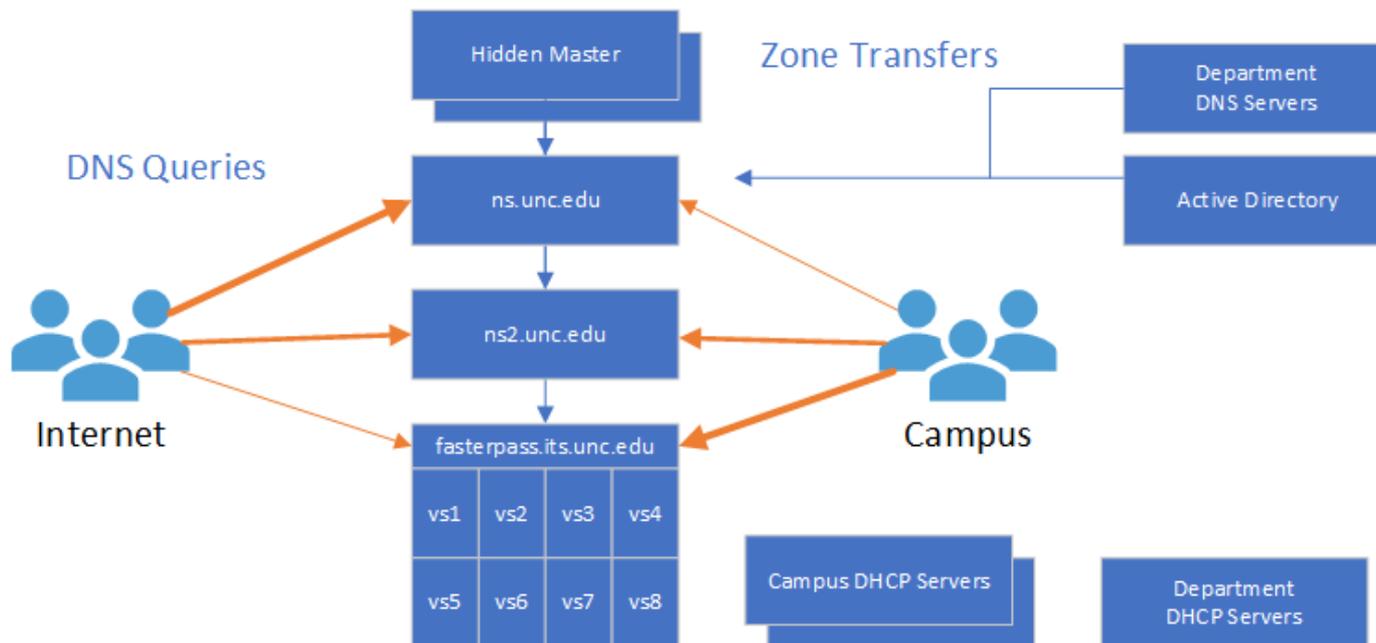
It works, but we can do better.

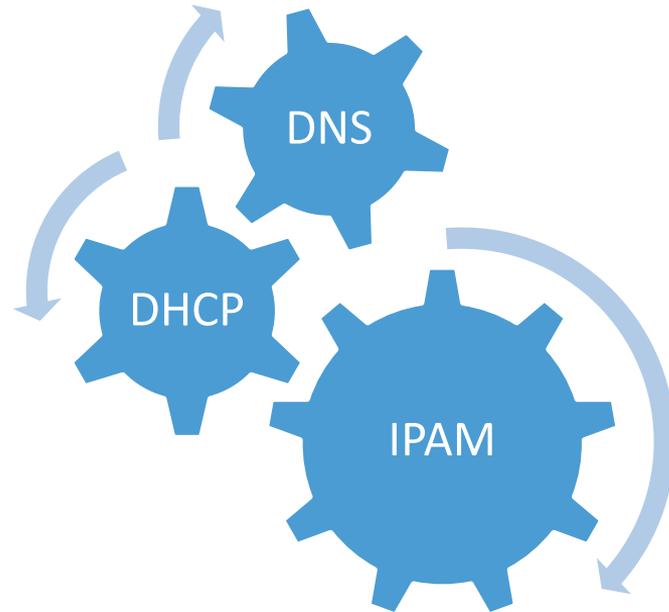
Where we were:



	Data	Infrastructure
IP Network	~ 1771 subnets ~ 1212 vlans ~ 203k public IPs	Spreadsheets on network shares Assorted Wiki pages Text notes in DNS/DHCP config files
DNS	~ 915 primary zones ~ 484 secondary zones	~ 14 Red Hat servers running ISC Bind F5 load balancer running out of support Multiple other groups running servers
DHCP	~ 400 networks ~ 191 shared networks	4 Red Hat servers running ISC DHCP No DHCP failover, just a warm standby Multiple other groups running servers

# Legacy Architecture





## Acronym of Acronyms

- Greater than the sum of the parts

## IP Addresses and Services

- Configure
- Automate
- Integrate
- Administer

The background of the slide is a photograph of a brick building with a gabled roof and a chimney. A semi-transparent blue horizontal band is overlaid across the middle of the image. The title 'Requirements and Design' is written in white serif font within this band. Below the band, the lower portion of the building is visible, featuring a portico with columns and banners.

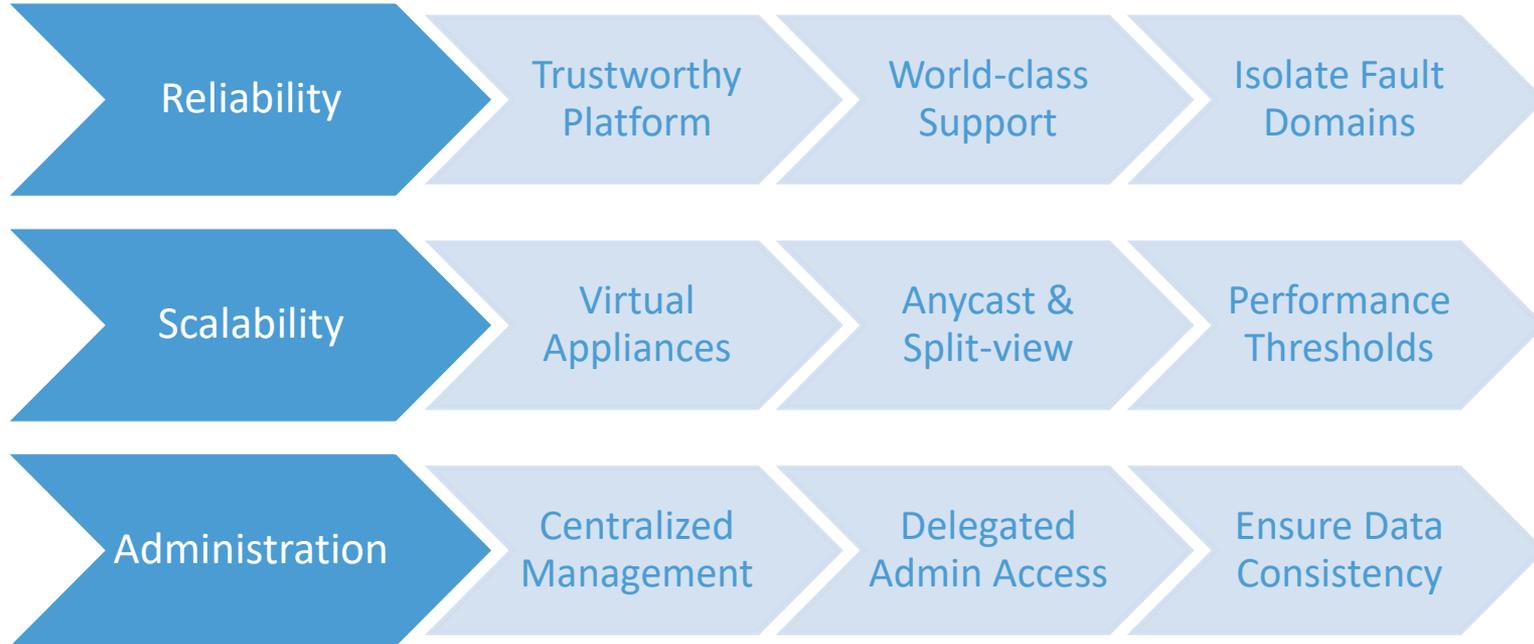
# Requirements and Design

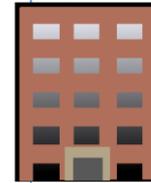
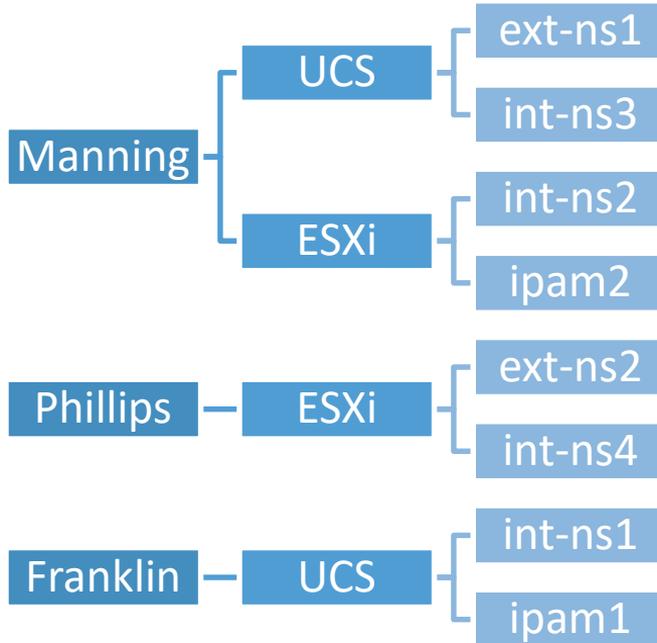
Where we wanted to go:

# Essential Design Goals



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## Three Datacenters



## Two Hardware Setups

- Cisco UCS – standard offering
- Standalone ESXi – dedicated



core-p

int-ns1

int-ns4

core-m

int-ns2

int-ns3

Four Appliances

Load Balancing

- Equal-cost multi-path routing
- Connected to network cores
- Service aware advertisements



# Organize and Cleanup

What we needed to do anyway:



# What about those spreadsheets?

## Leverage an IPAM database

- phpIPAM bridging the gap
- Import sheet data
  - Compare with router configs
  - Compare with DNS/DHCP configs
- Make it the authoritative source

The screenshot shows the phpIPAM web interface. At the top, the URL is 'devel.phpipam.net/1.3/tools/search/10.10.'. The page title is '{phpIPAM} 1'. Below the title, there is a navigation menu with items: VLAN, VRF, Devices, NAT, PowerDNS, DHCP, Locations, and Ra. The main content area is titled 'Search IP database'. There is a search input field containing '10.10.' and a 'search' button. Below the search field, there are checkboxes for 'Subnets', 'IP addresses', 'VLANs', 'VRFs', and 'PSTN', all of which are checked. There is a button labeled 'Export All results to XLS'. Below this, the text 'Search results (Subnet list):' is followed by a table. The table has columns: Section, Subnet, Description, Master subnet, VLAN, VRF, and Rec. The table contains several rows of data. Below the table, the text 'Search results (IP address list):' is followed by another table. This table has columns: IP address, Description, Hostname, and Devic. The table contains several rows of data, including '10.10.0.1' and 'ENET :: test (10.10.0/24)'. At the bottom right, there is a page number '11' and a footer 'phpIPAM IP address management [v1.27] rev001 | In case of problem'.

devel.phpipam.net/1.3/tools/search/10.10.

{phpIPAM} 1

/ Tools / Search

VLAN VRF Devices NAT PowerDNS DHCP Locations Ra

Search IP database

10.10. search

Subnets  IP addresses  VLANs  VRFs  PSTN

Export All results to XLS

Search results (Subnet list):

Section	Subnet	Description	Master subnet	VLAN	VRF	Rec
Servers	10.10.0.0/16	vpn	Test folder			disa
ENET	10.10.0.0/24	ecledc	/			disa
Servers	10.10.0.0/24	1	10.10.0.0/16	33		disa
ENET	10.10.0.0/30		10.10.0.0/24		test_VRF_VLAN	disa
Servers	10.10.1.0/24	2	10.10.0.0/16	345		disa
Servers	10.10.4.0/24	3	10.10.0.0/16			disa
Ping test	10.10.10.0/24	API	test I1 folder			disa
ENET	10.10.10.0/24	test	/			disa

Search results (IP address list):

IP address	Description	Hostname	Devic
:: (0.0.0.0)			
10.10.0.1			/
ENET :: test (10.10.0/24)			

11

phpIPAM IP address management [v1.27] rev001 | In case of problem



## Data Cleanup

- Lame delegations
- Overlapping zones
- Invalid record types
- Typos in source files

## Measure Performance

- Normal query load
- Peak query load
- Query latency



## Data Cleanup

- Invalid networks
- Invalid ranges
- Fixed address validation
- Server use validation

## Measure Performance

- Normal load
- Peak load
- DHCP latency



# Product Selection

What we had to consider:



## Large IT vendors

- Microsoft
- Cisco
- BT Diamond IP

## Midsized vendors, DDI-centric

- Infoblox
- BlueCat Networks
- Nokia VitalQIP

## Smaller or regionalized vendors

- EfficientIP
- FusionLayer (Nixu)
- Men & Mice



The background of the slide is a photograph of a brick building with a gabled roof and a brick chimney. A large, semi-transparent blue rectangle is overlaid on the image, covering most of the frame. The text is centered within this blue area.

# DDI Migration

How we deployed a solution:

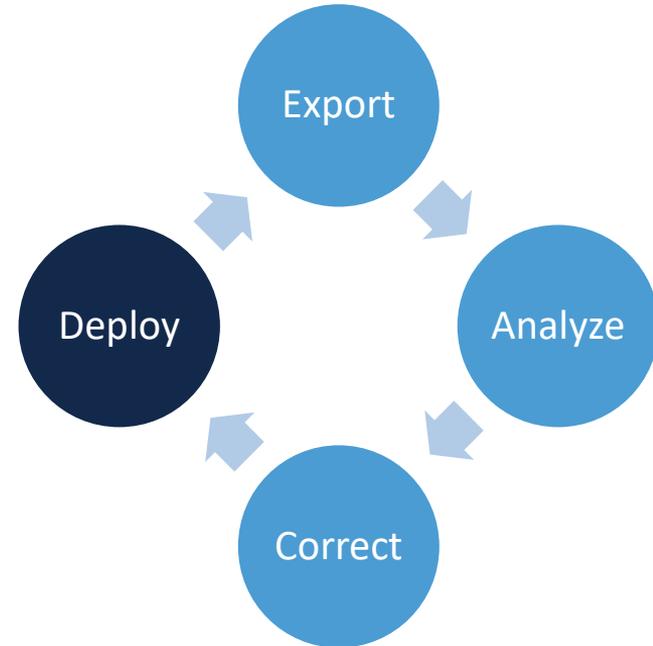


## Professional Services

- Migration planning
- Analyze exported data

## Cutover Rehearsal

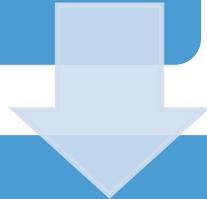
- Export phpIPAM CSV
- Export DNS/DHCP configs
- Run Data Import Wizard
- Start and stop key services





## Before Cutover

- ISC DHCP on
- Infoblox DHCP off



## After Cutover

- ISC DHCP off
- Infoblox DHCP on

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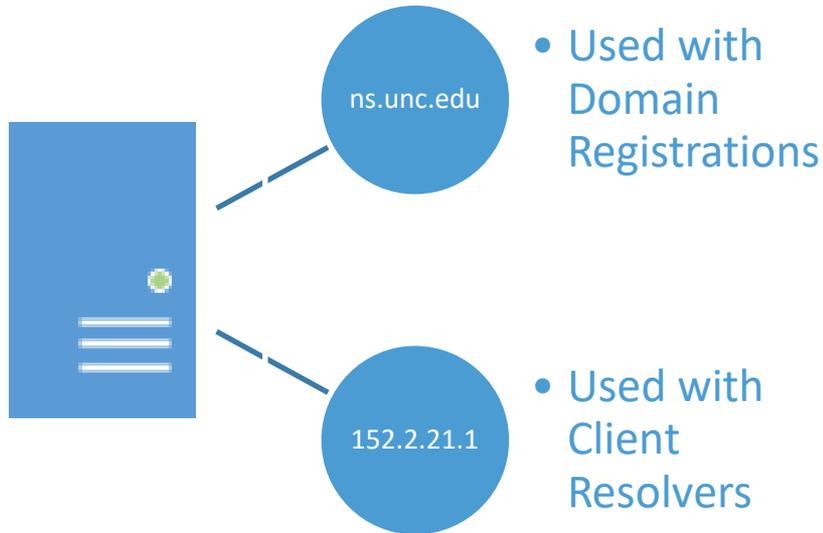
Populate routers ip-helpers

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Leave Infoblox DHCP off

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Step down lease timers



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Shift published names to new external Infoblox addresses

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Shift published IP address to new internal Infoblox Anycast

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Free up old hardware



# Campus Adoption

Where we are now:





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## Options for Departments

Access to manage data already in Infoblox

Potential to replace department servers

New service features

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## Streamline Existing Processes

Domain registration and hosting

Security work flows

Automate and integrate where possible

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## Dynamic DNS

- Enabling DDNS affected Windows AD
- Option 81 was needed

## User's Learning Curve

- Well known IP addresses live on
- Split-view DNS is new and confusing

Questions?

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