Spreadsheets to Modern DDI

UNC Cause 2018 -- October 1, 2018
Will Whitaker – will.whitaker@unc.edu

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It works, but we can do better.

Where we were:

Campus by the Numbers

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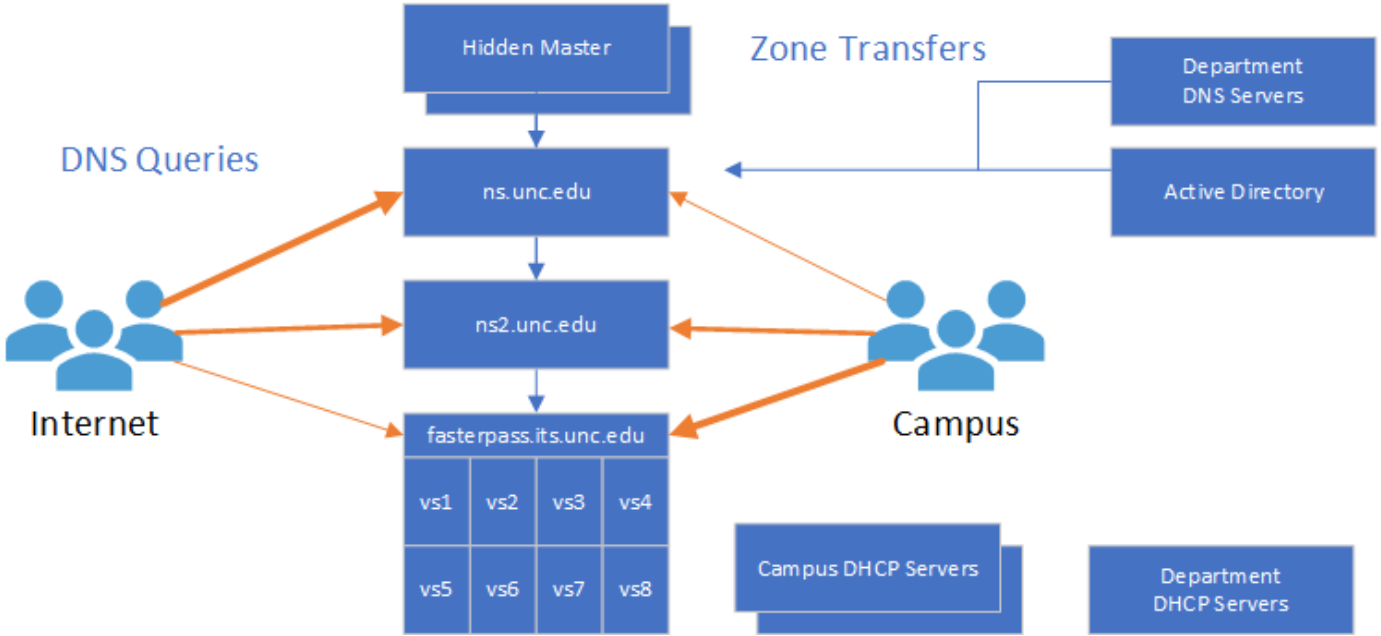
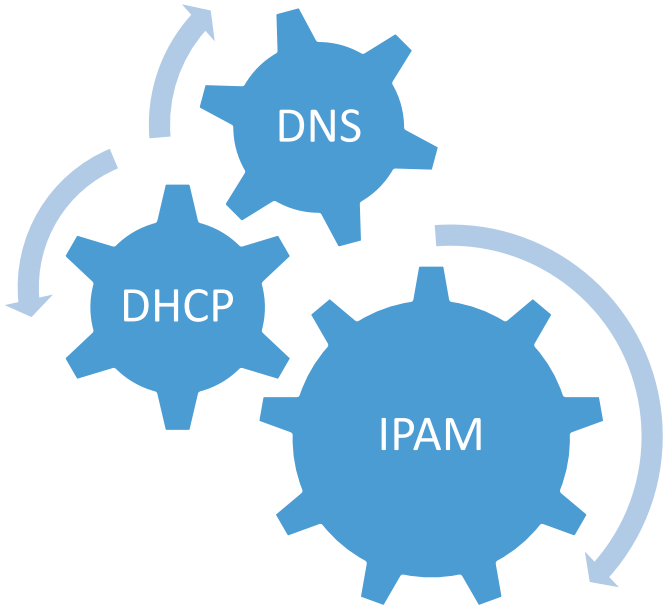
	Data	Infrastructure
IP Network	~ 1771 subnets ~ 1212 vlans ~ 203k public IPs	Spreadsheets on network shares Assorted Wiki pages Text notes in DNS/DHCP config files
DNS	~ 915 primary zones ~ 484 secondary zones	~ 14 Red Hat servers running ISC Bind F5 load balancer running out of support Multiple other 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



The Need: DDI Solution



Acronym of Acronyms

- Greater than the sum of the parts

IP Addresses and Services

- Configure
- Automate
- Integrate
- Administer

Requirements and Design

Where we wanted to go:

Essential Design Goals

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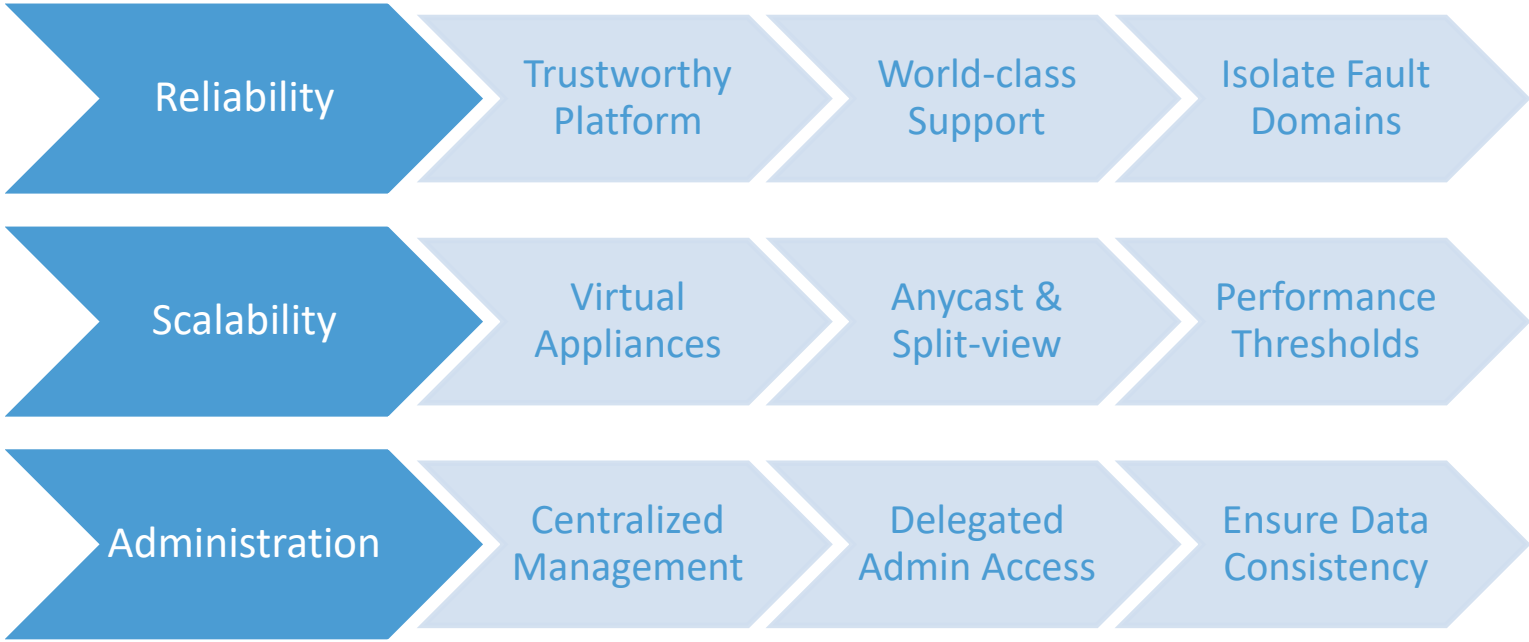
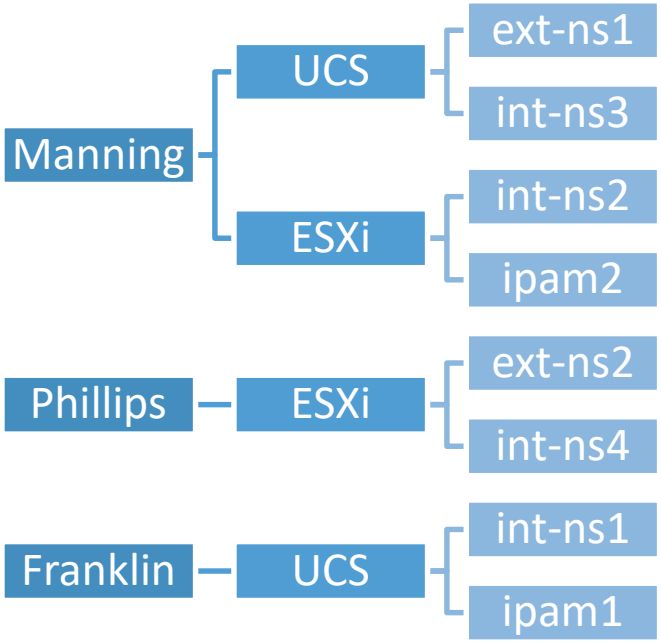
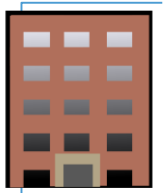


Virtual Appliance Design - Diversification



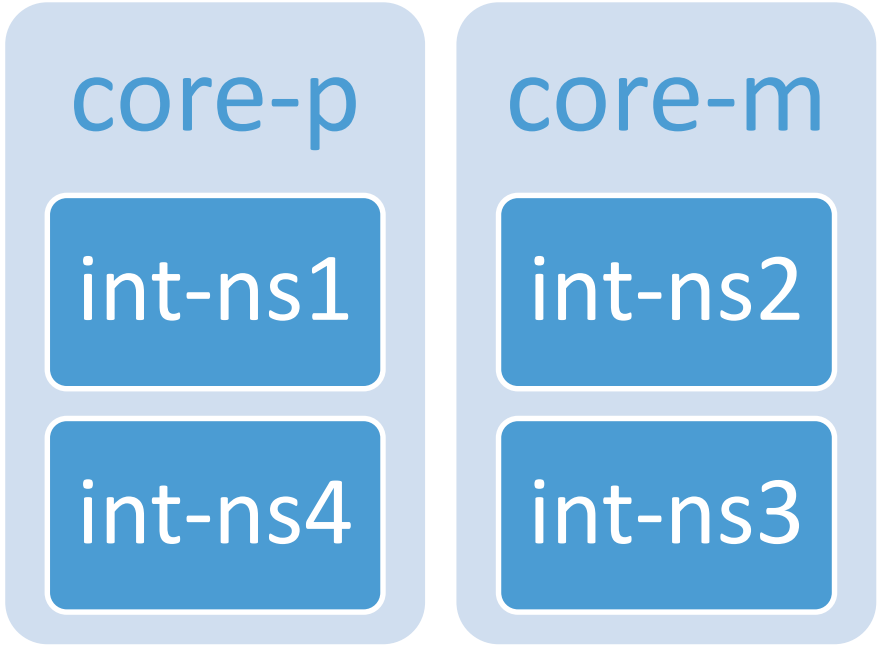


Three Datacenters

Two Hardware Setups

- Cisco UCS – standard offering
- Standalone ESXi – dedicated

Anycast for Campus



Four Appliances

Load Balancing

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

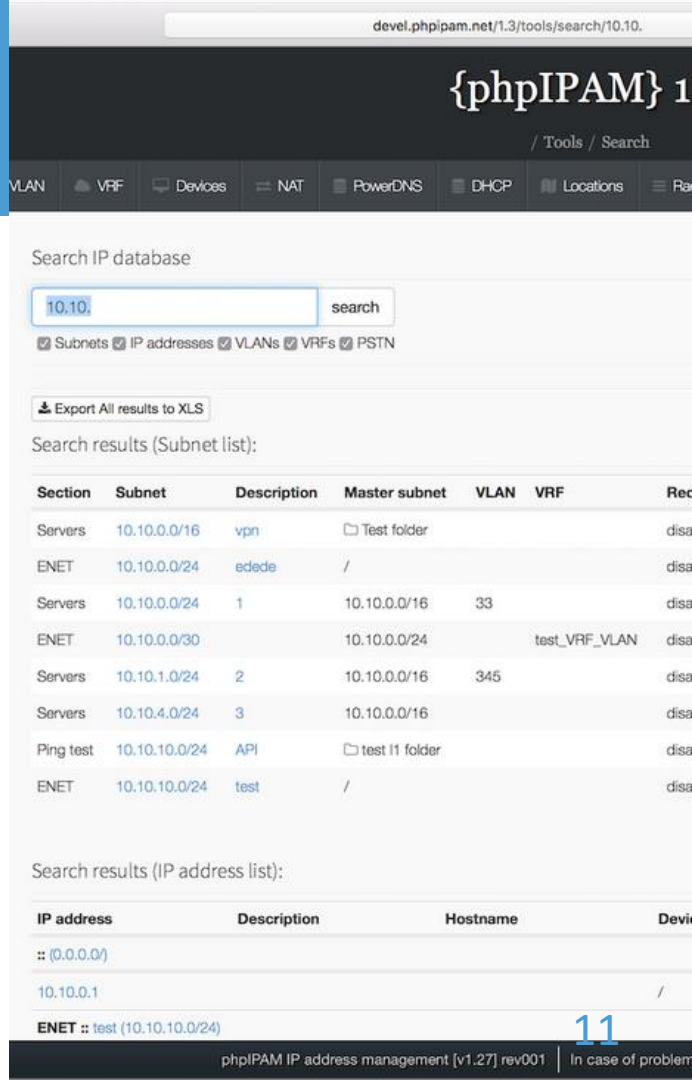
Organize and Cleanup

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



Looking at DNS

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Data Cleanup

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

Measure Performance

- Normal query load
- Peak query load
- Query latency

Looking at DHCP

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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:

Various Types of DDI Vendors

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Large IT vendors	Midsized vendors, DDI-centric	Smaller or regionalized vendors
• Microsoft • Cisco • BT Diamond IP	• Infoblox • BlueCat Networks • Nokia VitalQIP	• EfficientIP • FusionLayer (Nixu) • Men & Mice

Decision Process

DDI Migration

How we deployed a solution:

Infoblox Migration

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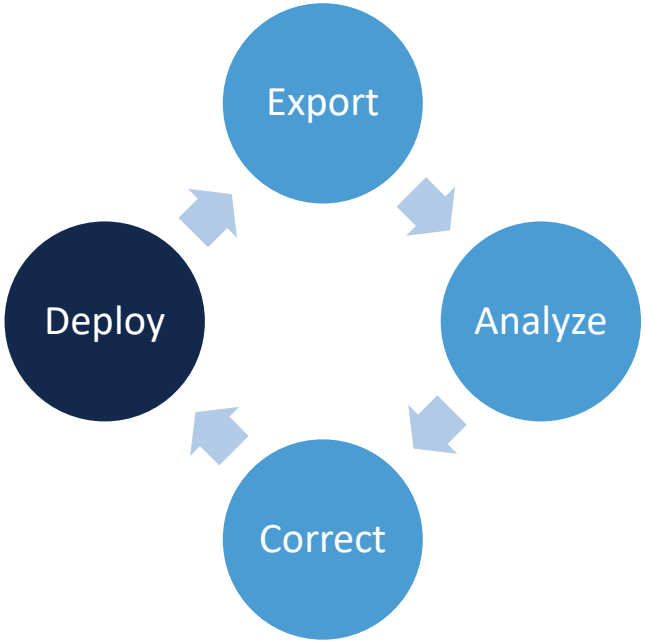
Professional Services

- Migration planning
- Analyze exported data

Cutover Rehearsal

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



DHCP Shell Game

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Before Cutover

- ISC DHCP on
- Infoblox DHCP off

After Cutover

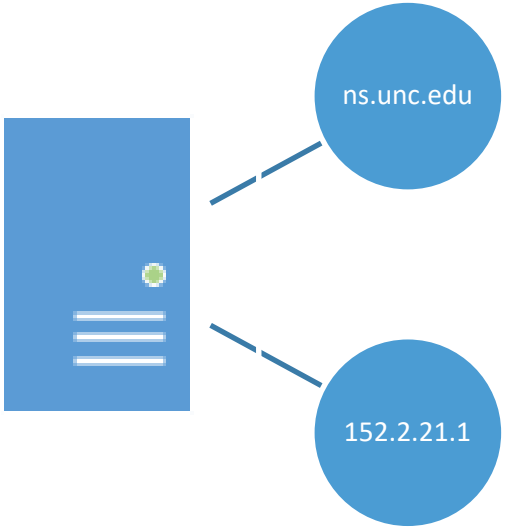
- ISC DHCP off
- Infoblox DHCP on

Populate routers ip-helpers

Leave Infoblox DHCP off

Step down lease timers

DNS Shell Game



- Used with Domain Registrations
- Used with Client Resolvers

Shift published names to new external Infoblox addresses

Shift published IP address to new internal Infoblox Anycast

Free up old hardware

Campus Adoption

Where we are now:

Ongoing Goals

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Options for Departments	Access to manage data already in Infoblox
	Potential to replace department servers
	New service features
Streamline Existing Processes	Domain registration and hosting
	Security work flows
	Automate and integrate where possible

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?

Will Whitaker

will.whitaker@unc.edu

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