

# BlueCat Networks

## Why Enterprises Need Centralized IP Address Management

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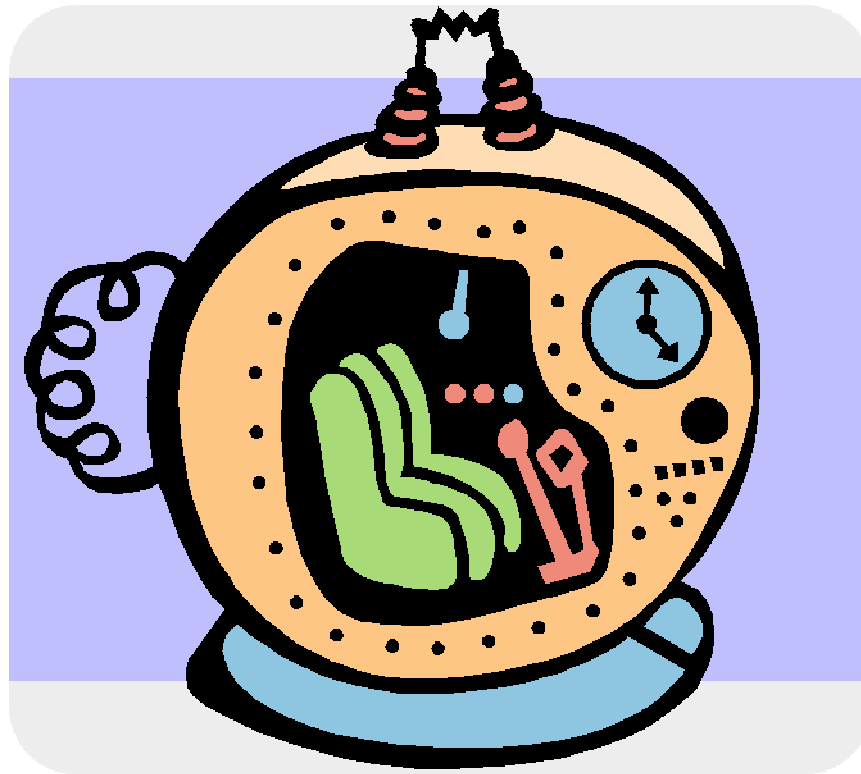


## Drivers behind IP Address Management

- **Explosive growth in IP consumption**
- **Management requires centralization**
- **Service must be distributed**
- **DNS and DHCP are cornerstones for connectivity**
- **IPv6 is around the corner**



Let's go back in time...





## In the beginning...

- **IP addresses were statically assigned to a small number of systems**
- **Names were resolved using “host” files**
- **Host files worked well but failed to scale.**



## DNS to solve the world's problems

- **DNS solved the problem by distributing service**
- **Not a silver bullet:**
  - DNS required configuration files
  - Concepts of authority, replication and reverse records confuse users
  - Security issues and fragmented implementations confuse the public



## Addressing gets dynamic...

- **BOOTP was designed to provide boot files but address allocation wasn't very dynamic!**
- **DHCP built on top of BOOTP– can provide boot files and allocate addresses dynamically**
- **Can be used to reserve an address for a host**
- **DHCP seems like a simple concept but can get complex**



## DHCP meets DNS

- **Naming system is distributed, allocation system is dynamic - Why not integrate?**
- **DHCP updates DNS but relationship is unidirectional**
- **Dynamic DNS makes management complicated**
- **DHCID Resource Record (RFC 4701 Oct. 2006) to help indicate ownership**



## Management complexity increases

- **DNS changes made by multiple people in different business units**
- **How to track address usage**
- **Spreadsheets and ‘pinging’ don’t scale well**
- **IPv6 is all the buzz but contains many unknowns**



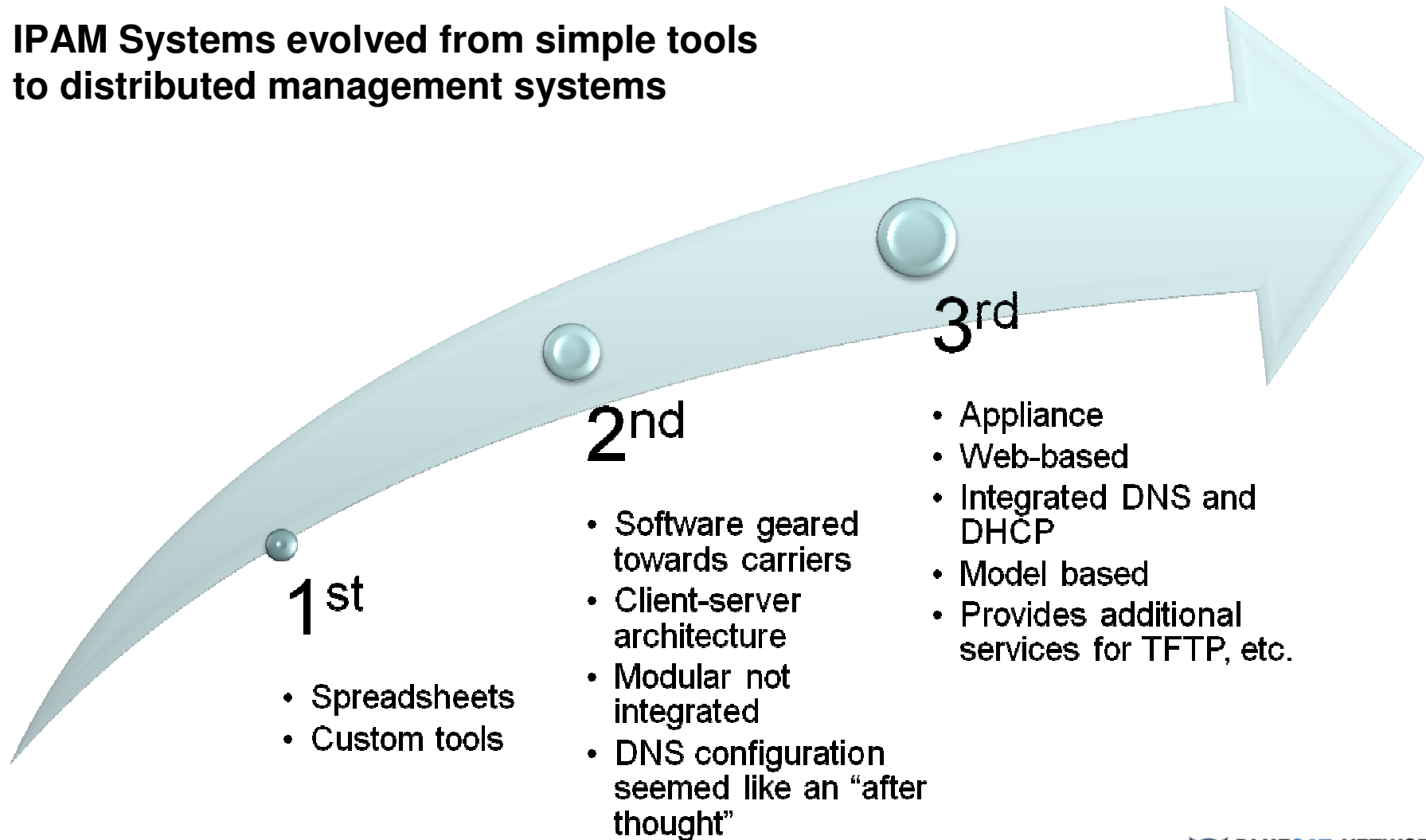
## Introducing IP Address Management (IPAM)

- **System that unifies static and dynamic IP allocation with DNS**
- **Provides the ability to manage an organization's IP space**
- **Managed by many administrators**
- **Ability to track devices**
- **Centralized management with distributed service**



## IPAM Evolution

**IPAM Systems evolved from simple tools to distributed management systems**





## Why didn't everyone starting using IPAM?

- **Limited to the carrier and large enterprise market**
- **Early IPAM software was expensive**
- **Licensing by IP was cost prohibitive**
- **Integration costs high**
- **IPAM ROI makes sense only if the price is right**



## Why IPAM now?

- **Explosive IP consumption in the common enterprise**
- **DHCP and DNS configurations are complicated**
- **Focus on centralized management with distributed service**
- **IPv6 Addressing is not inviting and not going away**
- **Implementation cost lower because of increased demand**
- **Appliances simplify operations**



## Choosing an IPAM Solution

- **Cross platform browser based management**
- **Open architecture (RDBMS vs. embedded database)**
- **Audit trail**
- **IP and namespace should be data centric not server centric**
- **Ability to combine granular control with access restrictions for delegated management**
- **Discover network without disruption**



## What's the difference between DNS/DHCP software and IPAM

### **DNS/DHCP Software**

Server centric – configured separately

Integration is limited and manual

Tracking of changes is non-existent or limited

### **IPAM**

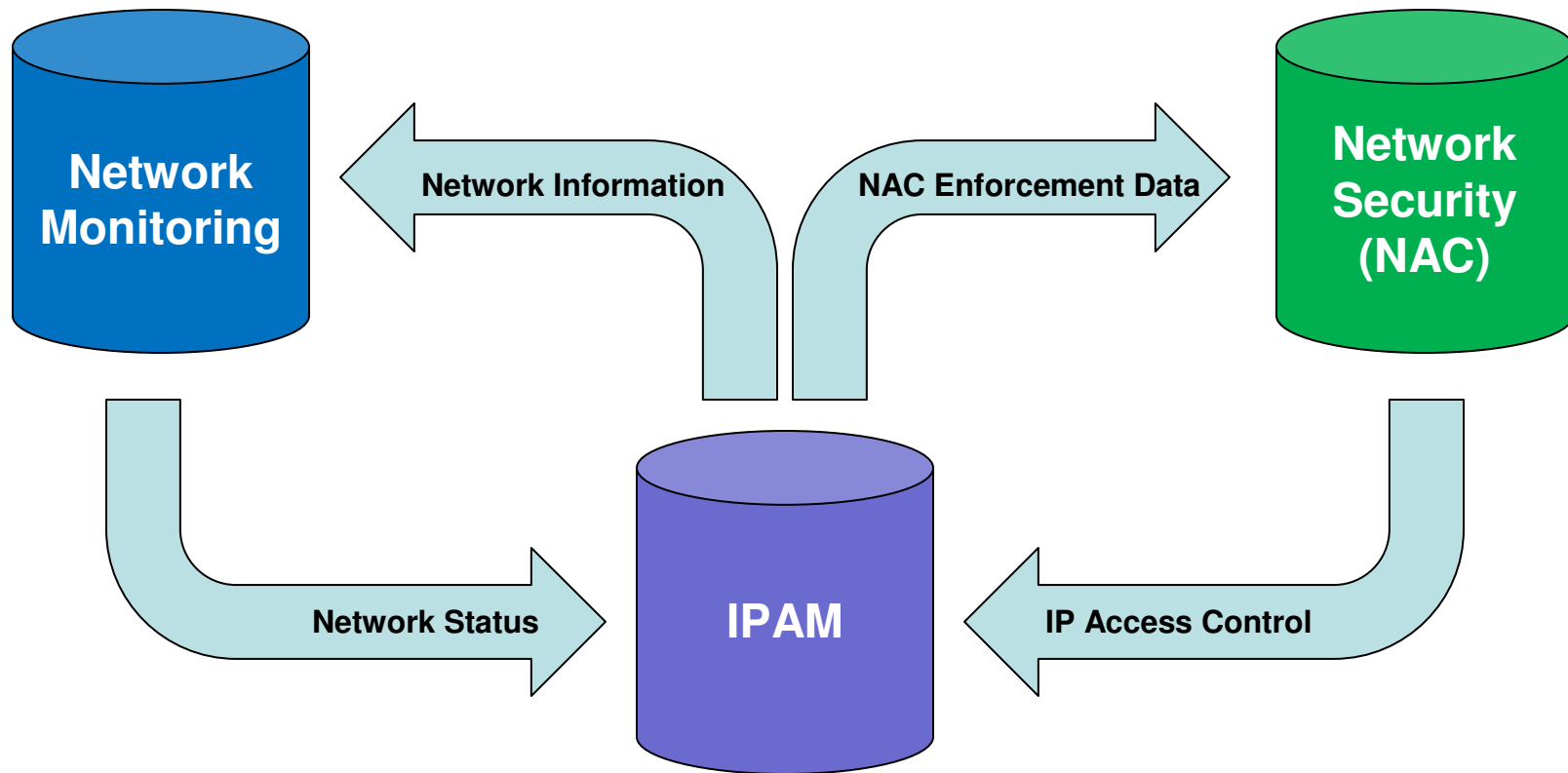
Data centric – modeled name and IP space

Relationship based – fully integrated

Audit trail tracks all changes across relationship



# How does IPAM work with other management systems?





## IPAM and VoIP

- **Handsets depend on DHCP for address and boot files**
- **Require custom DHCP options (e.g. 176)**
- **Boot images can be versioned inside IPAM system**
- **Provide support for ENUM protocol**
- **Ability to make audited en-masse changes quickly**



## IPv6 Auto assigned addresses – do we still need IPAM?

- **Neighborhood discovery + MAC to create unique address**
- **Violate privacy requirements because MAC can be tracked easily**
- **Randomized MAC addresses (RFC 3041) provide privacy but create a management nightmare**
- **Auto assigned address require DHCP6 to learn about services**
- **DNS PTR records are difficult to maintain**



## IPAM helps ease the transition to IPv6

- **DNS names will most likely stay the same**
- **Manage IPv4 and IPv6 together for same host**
- **Global addresses can be generated when MAC is known**
- **Controls DHCP6 information**



## What about zero configuration networking – won't it replace IPAM?

- **Zero configuration networking has been around for longer than IPAM – Apple had such a technology 20 years ago (Appletalk)**
- **Works well for small networks but geared towards consumer devices/networks**
- **Automatically assigned IPv4 addresses must be within 169.254/16 range. IPv6 uses auto configured addresses.**
- **Systems manage their own DNS via multicasting**
- **Works the opposite way to how existing configurations are currently operating**
- **Great for local-link case but routable cases still have issues**



## Do I really need IPAM

- ✓ Multiple networks
- ✓ Multiple administrators
- ✓ Audit compliance requirements
- ✓ Centralized management requirements
- ✓ Requirements for simplified DNS/DHCP
- ✓ Complicated network structure



## How will IPAM Evolve

- **Tighter integration into network management and security systems**
- **Focus on network automation**
- **Provide information for applications about the topology of the network**
- **Integration point for managing network services**
- **Perform configuration management of switches, routers and other network gear**



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