ADDRESS SPACE MANAGEMENT PROPOSAL
AGENDA

➢ Why do we need a new IPAM service?
  ▪ Issues with traditional approach

➢ The new approach
  ▪ Vision
  ▪ Requirements
IPAM – TRADITIONAL APPROACH

➢ IP Address Management
  ▪ Usually none or little context for address allocation
    - No knowledge of who and why an address is allocated
    - No knowledge of how address is to be used
  ▪ Uncoordinated address pool management
    - Lack of single pane of glass for pool and address resource utilization
    - Different solution for physical and virtual networks
    - Different solution for different services
      • BNG, Mobility, Managed services
  ▪ Lack of built-in multi-tenancy
    - Different business entities in same organization have different approach
  ▪ Lack of integration with address services
    - DNS
    - DHCP
    - Address translation (NAT)
ADDRESS SPACE MANAGEMENT – VISION

- Meta data driven interface
  - Between address pool management system and upper layers
    - OSS/BSS, SDN Controller, Admin
- Built-in multi-tenancy for centralized management
  - Instead of manual address pool division
- Single solution for wide-variety of use-cases
  - Networking & security devices (switches, routers, firewalls)
  - Physical or virtual
  - Servers and end-points
  - Services (BNG, 3GPP, managed services, multicast such as IPTV)
- Integration with other address management services
  - A complete solution approach to addressing
- Single pane of glass for visibility into resource utilization
  - Complete network/application/workload view
ADDRESS SPACE MANAGEMENT – REQUIREMENTS ...1/2

- Interface for address allocation
  - Driven by user attributes and specific requirements
    - Device attributes (switch, router, firewall, server, end-point)
    - Form-factor attributes (virtual, physical)
    - Interface attributes (transit, end-point, management)
    - Network segment identifier (e.g., VLAN)
    - Network segment type (P2P, MP, loopback)
    - Addressing scope (Private, Public, VPN/VRF, unicast, multicast)
    - Address request (specific or any address, block size)
    - Tenant identification
    - Ability to define and customize new attributes
ADDRESS SPACE MANAGEMENT – REQUIREMENTS ... 2/2

罽Interface for address pool management
  ▪ Driven by user requirements
    - Private and Public IP address
    - Allocation schemes (map addresses to requirements)
    - Allocation priorities (order in which pools are considered)
    - Lease duration for each pool
    - Pool fragmentation rules (how pool can be sub-divided)

罽General requirements for interface definition
  ▪ Multi-tenancy, Authentication, Security
  ▪ Query available and allocated resources
  ▪ Notification when a resource depletion threshold is reached

罽Interface for integration with other address management services
  ▪ DHCP server pool initialization
  ▪ NAT pool initialization
  ▪ DNS mapping
  ▪ Address interoperability (IPv4 & IPv6)
ADDRESS SPACE MANAGEMENT – ARCHITECTURE

Enterprise

- Branch/Campus
- Data Center

Service Provider

- BNG/3GPP
- Managed Services

ADDRESS SPACE MANAGEMENT SYSTEM

- Pool Management
- Address Management
- Address Records Management

Address Helper Plug-ins

- DNS Servers
- NAT
- Address Mapping System
- DHCP Server

Interface for Logs, DHCP, DNS, NAT, Address allocation records

Interface for managing address space and pools

Interface to helper functions for managing address records
References

➢ Open source work
  ▪ http://phpipam.net
  ▪ http://spritelink.github.io/NIPAP/
  ▪ https://sourceforge.net/projects/teemip/
  ▪ https://github.com/digitalocean/netbox

➢ IETF Work
  ▪ ?