VNTP Introduction

draft-gu-nvo3-VNTP-01

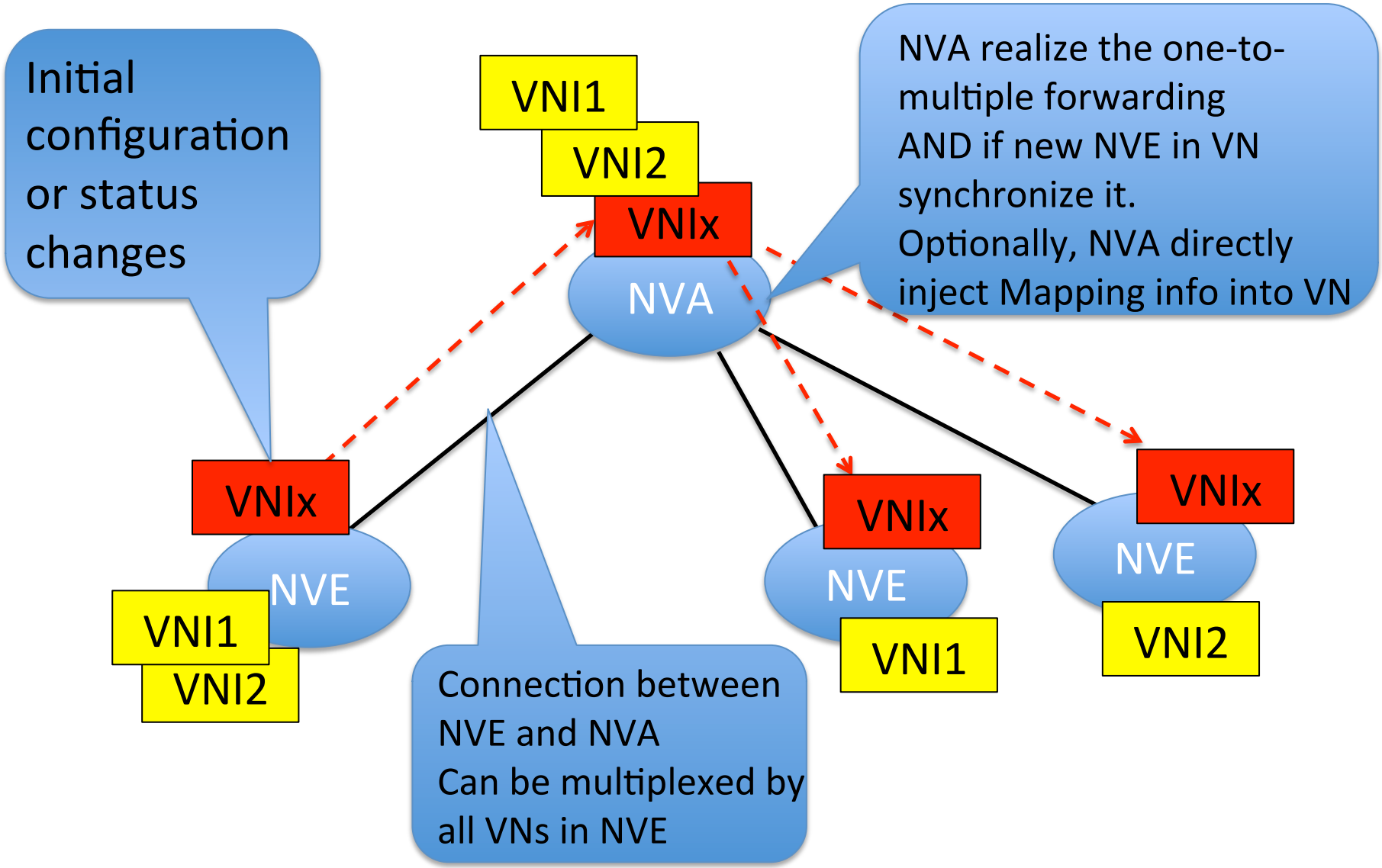
Zhongyu Gu

BhumipKhasnabish(speaker)

Purpose

Outline the VNTP structure and related design considerations etc.

VNTP Overview

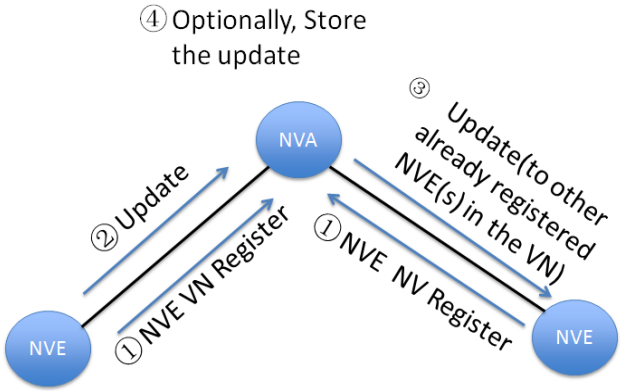


VNTP Overview

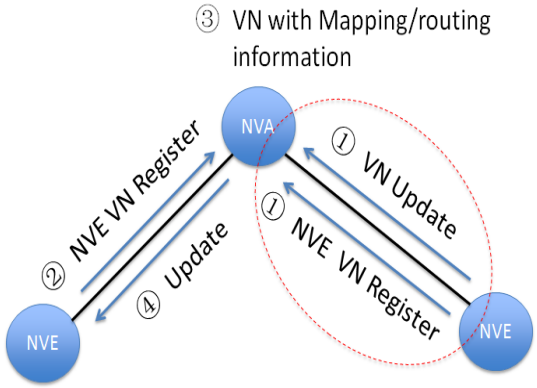
- Initial NVE configuration and Register NVE to NVA
- Update VN's entry to other NVEs in the VN through NVA
- Multiplex between different VN
- If VN already exist, synchronize to other NVE, NVA works
- NVA forward update request to other NVE, or NVA store the VN mapping information, direct response to this NVE
- The requested NVE through NVA response with update information, or direct response to the requesting NVE
- Optional, NVA can inject mapping info into VN
- Result message responses to each command message
- Status exchange between NVA and NVE, and related processing

VNTP procedures examples

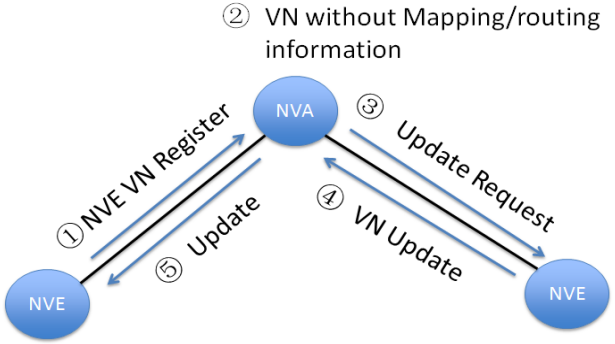
VNTP Procedures: NVE VN Update(1)



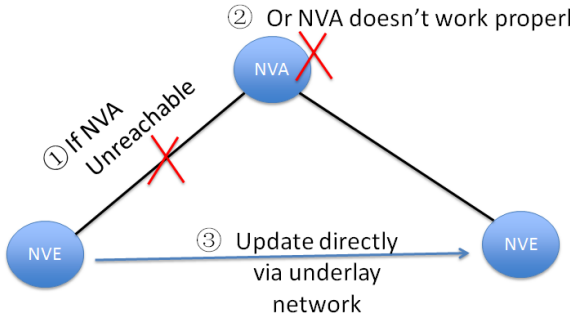
VNTP Procedures: NVE VN Update(2)



VNTP Procedures: NVE VN Update(3)

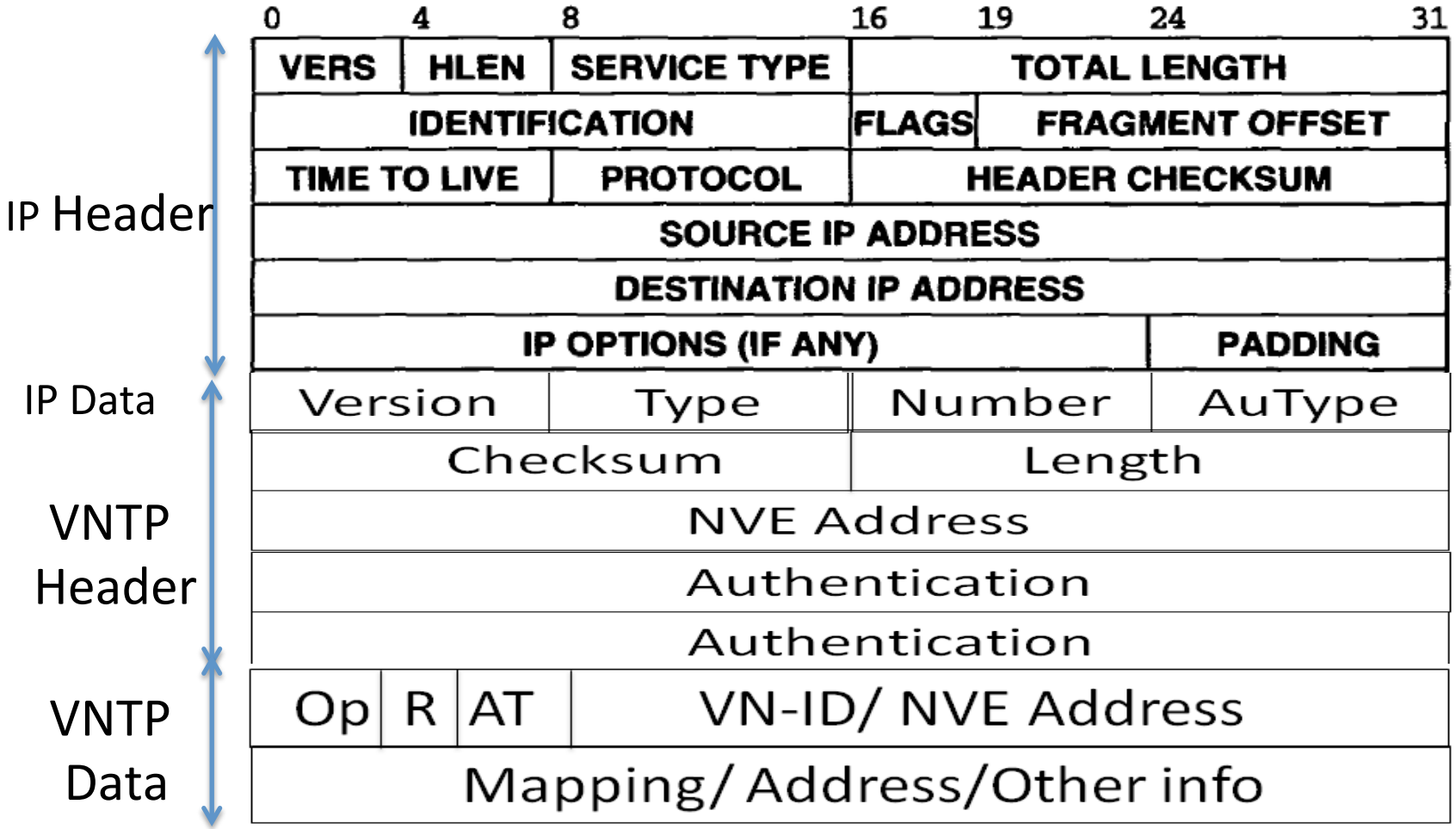


VNTP Procedures: NVE VN Update(4)

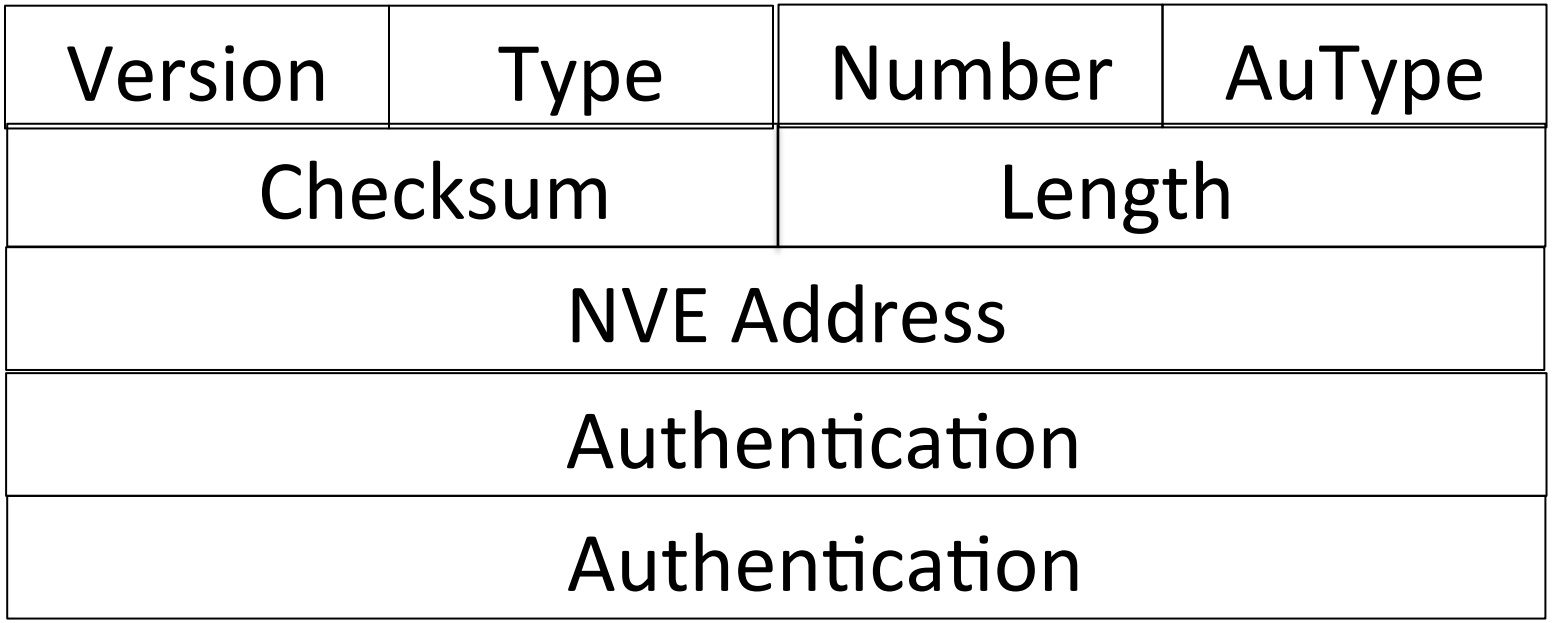


VNTP packet format

- IP as VNTP transport protocol, TCP or UDP optional



VNTP Packet Header (1)



- Version: VNTP version
- Type: command or result definition
- Number: data field item/entry number
- AuType & Authentication: for packet authentication
- Checksum: checksum of all packet except authentication field
- Length: total packet octets including header
- NVE/NVA Address: source NVE/NVA address

VNTP Packet Header (2)

- E/A: set to 1, NVE->NVA; set to 0, NVA->NVE
- C/R: 1, CMD/RSP represents Command;

  0, CMD/RSP represents Response/Result
- AdrType

  000: IPv4

  001: IPv6

  010-111: Reserved

VNTP Packet Header (3)

- C/R = 1, CMD/RSP Command;
- E/A = 1 , NVE Command
  - 000: NVE registration
  - 001: NVE deregistration
  - 010 Update
  - 011-111: Reserved for future use
- E/A = 0 , NVA Command
  - 000: NVE Mapping information request
  - 001: NVE Mapping nullification/NVE deregistration
  - 010: (NVE initiated) update
  - 011-111: Reserved for future use

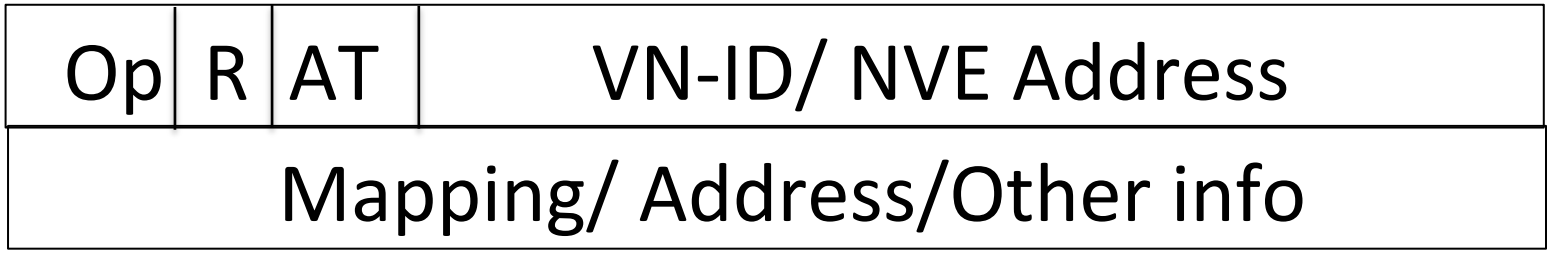
VNTP Packet Header (4)

- C/R = 0, CMD/RSP Response/Result;
- E/A = 1 , NVE Response/Result
- E/A = 0 , NVA Response/Result

  000: command executed successfully
  001-011: Reserved for future definition
  100: command execution failed
  101: command execution partially successful (Optional reasons)
  110-111: Reserved for future definition

VNTP Packet Data Format (1)

- Depends on Command
- For Register/Deregister Command
  - Each entry, one VN-ID
- For Update Command
  - Each entry, including
  - 3bit: Op for Operation Code
  - 3bit: AT for Address Type
  - 2bit: R for Reserved



VNTP Packet Data Format (2)

- Op field definition
  - 000: Update add
  - 001: Update delete
  - 010: Update set to migration status
  - 011: Update set to normal/non-migration status
  - 100-111: Reserved for future use
- AT field definition
  - 000: IPv4
  - 001: IPv6
  - 010: MAC
  - 011-111: Reserved

VNTP NVE Operations Overview

- 1), If a VNI is created, the NVE will send Register command to NVA to register the VNI/NVE in the VN.
- 2), If a VNI is being deleted, the NVE will send update information to NVA to inform all the NVE related VN entry will be invalid. Or the NVA gets this information through the keep alive message, then nullify the all entries from this NVE's VN.
- 3), If entries in the NVE have changed, for example, a new entry added or an existing entry deleted or become invalid, then the NVE will send update information to the NVA. Individual or batch update are supported.
- 4), And further, NVE also support tenant system migration.
- 5), The NVE accepts the updates from NVA and update the VRF table. The commands may be individual update or updates resulted from NVE failure.
- 6), Keep alive. Monitor the connection between NVE and NVA.
- 7), if the command not properly executed retransfer the command again for pre-setting times.
- 8), When NVA is unavailable or the NVA connection lost, optionally the NVE can connect other NVEs in the VN directly to keep the VN synchronized.
- 9), Security functions. Authentication is provided. Others TBD.

VNTP NVA Operations Overview

- 1), VNI creation
- 2), Form list of NVEs in the VN based on NVE Registration.
- 3), Accept updates from NVE and forward these updates to all other NVEs in the VN. Optionally, NVA store the update information for late use.
- 4), If NVE not register but update accepted, NVA may register it and forward the update to other NVEs.
- 5), if NVE registering after some updates then NVA will forward the stored updates to this NVE. Or NVA send request message to all other registered NVE for update if the previous updates not stored in NVA. And the NVA controls the updates only to this NVE other than all registered NVEs in the VN.
- 6), Keep alive. Monitor the connection between NVE and NVA.
- 7), if the command not properly executed NVA can retransfer the command again for pre-setting times.
- 8), When NVE in the VN is unavailable or the NVE connection lost, optionally the NVA can flush the NVE's routing unreachable information to all other NVEs in the VN to keep the VN synchronized.
- 9), VNI delete. If there are not any VM or NVE in the VN, or the customer doesn't need the VN anymore then the NVA delete the VNI and release all the resources occupied by this VN.
- 10), Security functions. . Authentication is provided. TBD.

draft-ietf-nvo3-nve-nva-cp-req-03 (expired?) (NVE-NVA CP Requirements) Compliance

No	Characteristics/Requirements	VNTP compliance
1	Minimize the amount of state	OK
2	Fast acquisition of needed state	OK/N.A.
3	Fast detection/update of stale cached state information	OK/N.A.
4	Minimize processing overhead	OK
5	Highly scalable	OK
6	Minimize the complexity of the implementation	OK
7	Extensible	OK
8	Simple protocol configuration	OK
9	Do not rely on IP Multicast in the Underlying Network	OK.VNTP is flexible to support multicast using reserved resources
10	Flexible mapping sources	OK
11	Secure	OK. VNTP flexible to support mentioned security mechanisms
*	Reliable	OK
*	Resilience	OK

IANA considerations

- New type of protocol for IP packet for VNTP

Next Step…

- Comments collecting and further discussions
- Accept by the group
- ……