# A SAVI Solution for DHCP

Draf-ietf-savi-dhcp-05

J. Bi, J. Wu, G. Yao, F. Baker

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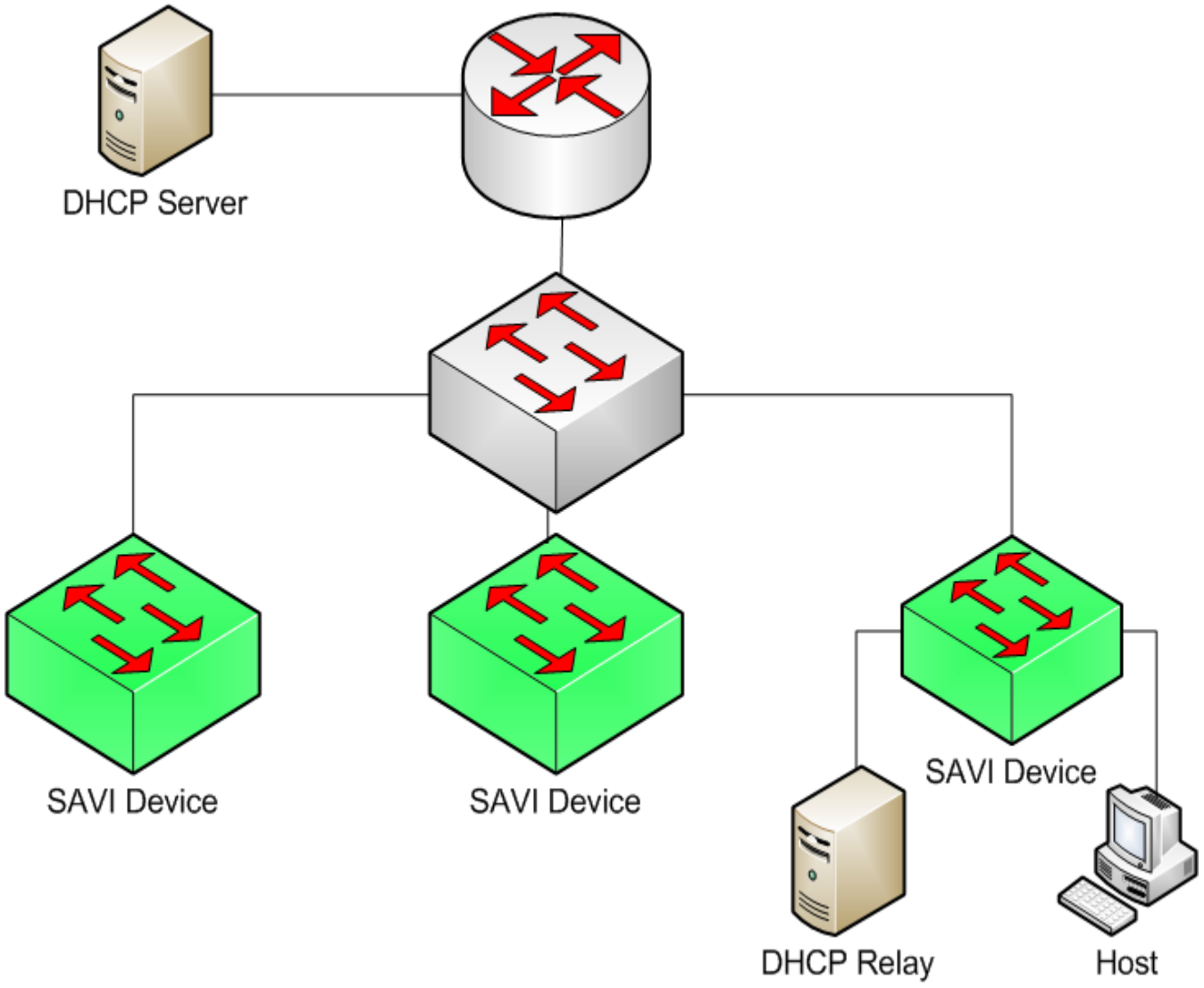
# Outline

- Solution Overview
- Major revision since IETF77
  - Supplemental Binding Process to handle the special case
  - Prefix configuration
  - Some editing changes
- Discussion on mixed address assignment environment
- Next Step

# Solution Overview

# Typical Scenario




The Router or SAVI device may also play the role of DHCP Relay (or even DHCP server) In implementation.

# Anchor Attributes

**Attribute**: Configurable features of anchor (e.g. SAVI switch port).

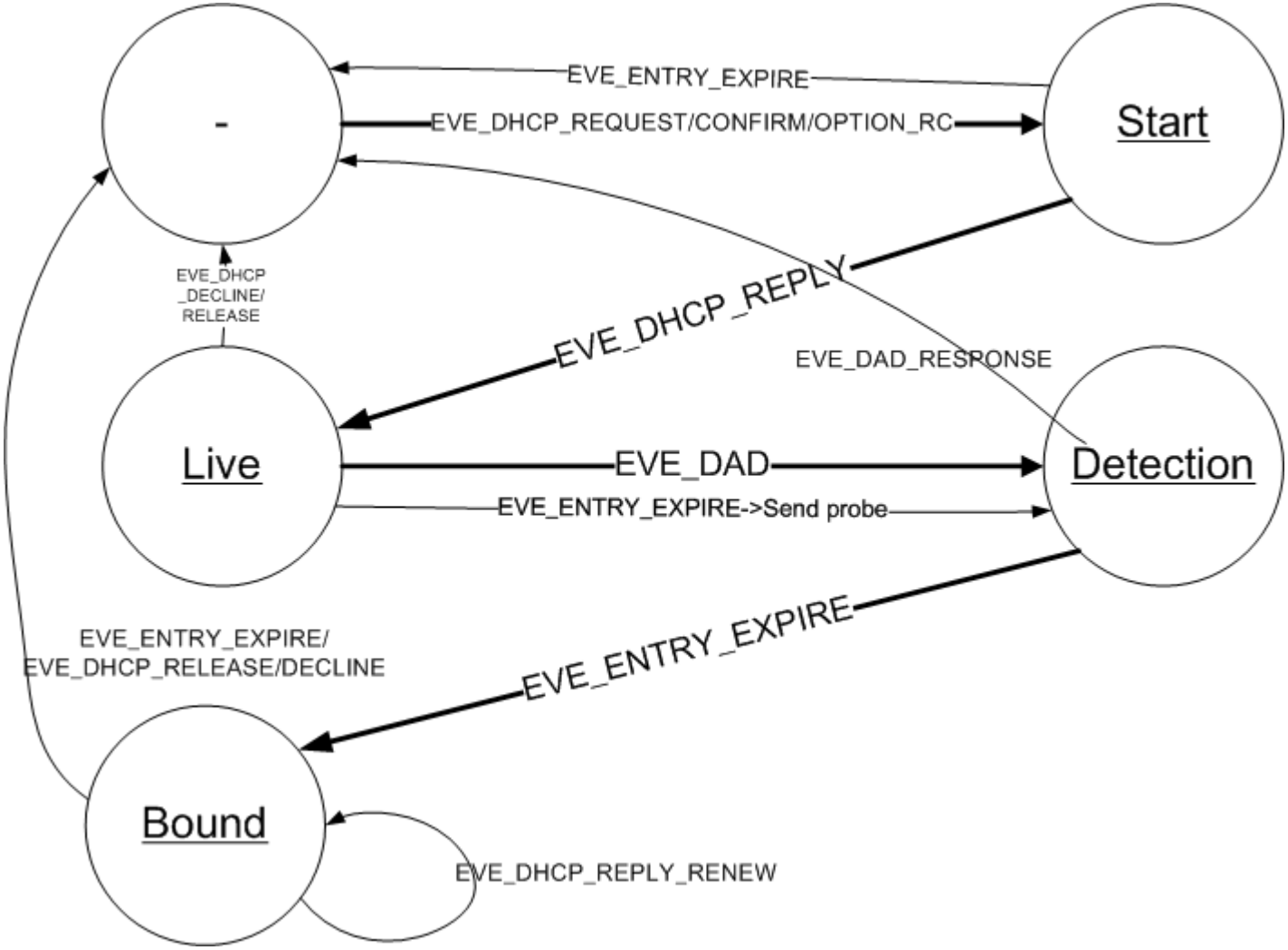
- An anchor may be configured to have one or more compatible attributes, depending on the requirement of administrator.

| Attribute | Action |
|---|---|
| **No attribute(by default)** | Drop DHCP server type message |
| **SAVI-Validation** | Snooping & Filtering |
| **SAVI-SAVI** | No binding and no filtering |
| **SAVI-DHCP-Trust** | Trust DHCP server type message |
| **SAVI-BindingRecovery** | Recovery binding triggered by data packet |
| **SAVI-ExtSnooping** | Recovery binding triggered by other control packets |

# States

- START
  - A DHCP request (or a DHCPv6 Confirm, or a DHCPv6 Solicitation with Rapid Commit option) has been received from host, and it may trigger a new binding.
- LIVE
  - A DHCP address has been acknowledged by a DHCP server.
- DETECTION (enabled when mixed address assignment are used in the local link, e.g. DHCPv6+SLAAC,plug manually configured address)
  - A gratuitous ARP or Duplicate Address Detection NSOL has been sent by the host (or the SAVI device).
- BOUND
  - The address has passed duplicate detection and it is bound with the binding anchor.

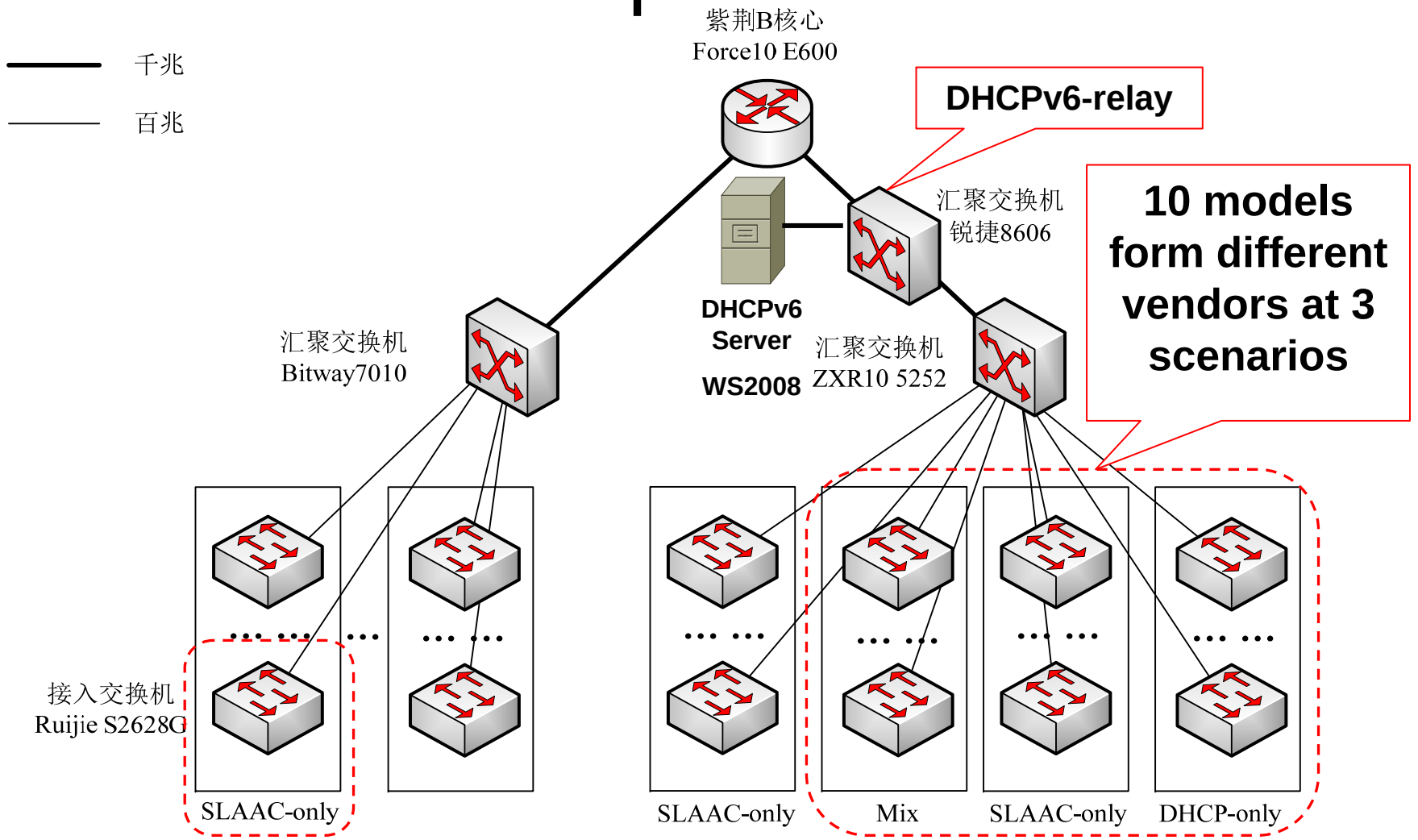
# State Transit Diagram(No change)



# Implemented, tested, and deployed

- It become feature of multiple vendors: ZTE, Huawei, H3C(3Com), Ruijie, Digital China, Bitway, Centec
- CERNET had formally tested those implementations: Conformance, Performance, Interoperability, and testing in production network after deployment
- More details in CNGI-CERENT2 deployment update PPT

# Deployment Example: Tsinghua Univ. Campus Network




高机房，共4组，每组10台组成1个子网

低机房，共4组，每组10台组成1个子网

# H3C(3COM): DHCPv6-only
# Digital China: DHCP-SLAAC-mix

```
[ZJ14-L01-F-01]display ip check source ipv6
Total entries found: 5
 MAC Address     IP Address                          VLAN  Interface      Type
 001c-b3ab-6162  FE80::21C:B3FF:FEAB:6162             1     GE1/0/5        ND-SNP
 940c-6d74-c244  FE80::960C:6DFF:FE74:C244            1     GE1/0/7        ND-SNP
 0022-156c-ba34  FE80::222:15FF:FE6C:BA34             1     GE1/0/9        ND-SNP
 0011-2517-fe6b  2402:F000:5:C801:3463:B3D8:E63      1     GE1/0/14       DHCPv6-SNP
                 C:8FC8
 001f-d0a1-45ed  FE80::AD55:DE48:DDC9:2EDB           1     GE1/0/17       ND-SNP
```

```
ZJ14-L05-F-05#show savi ipv6 check source binding

Static binding count: 0
Dynamic binding count: 8
Binding count: 8

MAC               IP                                      VLAN Port          Type    State     Expires
-------------------------------------------------------------------------------------------------------
90-e6-ba-78-f2-06  2402:f000:5:ca01:d999:3fae:bf36:4178    1    Ethernet1/14  dhcp    BOUND     1012389
90-e6-ba-78-f2-06  fe80::14df:55e9:2639:43ba             1    Ethernet1/14  slaac   BOUND     4374
90-e6-ba-78-f2-06  2402:f000:5:ca01:14df:55e9:2639:43ba  1    Ethernet1/14  slaac   BOUND     14276
90-e6-ba-78-f2-06  2402:f000:5:ca01:2840:a378:d686:fc0b  1    Ethernet1/14  slaac   BOUND     14276
c8-0a-a9-41-b5-a1  2402:f000:5:ca01:639b:f7c8:7999:13c8  1    Ethernet1/21  dhcp    BOUND     1036459
c8-0a-a9-41-b5-a1  fe80::d1d8:1aa5:45b2:b883             1    Ethernet1/21  slaac   BOUND     14058
c8-0a-a9-41-b5-a1  2402:f000:5:ca01:d1d8:1aa5:45b2:b883  1    Ethernet1/21  slaac   BOUND     14058
c8-0a-a9-41-b5-a1  2402:f000:5:ca01:8c12:15a3:553e:f8a5  1    Ethernet1/21  slaac   BOUND     14058
```

# Major revision since IETF77

# Review and Revision

- After IETF77, there were at lease two detail reviews from Christian Vogt, and Joel Halpern and some discussions
- After taking comments from Christian,  e.g., remove the prefix configuration at DHCP (but we propose to have prefix conf. at savi-slaac), and the supplemental binding for binding recovery is also updated based on poll in the mailing-list, then we generated savi-dhcp-04
- After taking comments from Joel, we generated savi-dhcp-05

# Discussion on mixed address assignment environment

# Question Raised

- There is some discussion recently in the mailing-list on if savi needs to work for mixed address assignment
  - Static configured address is necessary when using DHCPv6
  - Joel Halpern proposed to not support SAVI-SLAAC and SAVI-DHCPv6 in the same link
- In our opinion, SAVI needs to support dhcpv6-slaac mixed environment; Based on the vendors implementation, it's not heavy cost , not too complicated to implement

# Our Opinion

- In reality, the operators are widely using slaac when using dhcpv6
  - E.g., in CNGI-CERNE2 IPv6 campus networks, it's a common case.
- Not every user has the right  dhcpv6 client software to interoperate with dhcpv6 server, then those users needs SLAAC to access IPv6.
  - we had interoperability testing on different OSes with different dhcpv6 servers, e.g. the linux with dibbler can not work well with Win 2008 server.
- The dhcp-slaac-mixed is allowed by standard RFCs, so if SAVI supports dhcp-slaac-mixed, then it will make the solution more deployable.

# Next Step

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- Consider  the suggestion from Joel, one way is to make DETECTION state optional, another way is to simplify the sate machine to make the savi-dhcp-05 only work for dhcpv6-only, and move the functions of dhcp-slaac mixed environment to savi-framework or additional document
- Ask for last call
- China Telecom and China mobile had asked vendors to upgrade switch software and will enable the function in their IPv6 networks

Thank you very much!

# Back up

# Events

- **Timer expiration event**
  - EVE_ENTRY_EXPIRE: The lifetime of an entry expires
  - **Control message arriving event**
  - EVE_DHCP_REQUEST
  - EVE_DHCP_CONFIRM
  - EVE_DHCP_OPTION_RC
  - EVE_DHCP_REPLY
  - EVE_DHCP_REPLY_NULL
  - EVE_DAD
  - EVE_DAD_RESPONSE
  - EVE_DHCP_DECLINE
  - EVE_DHCP_RELEASE
  - EVE_DHCP_REPLY_RENEW