Requirement and a Reference Model of L2 ACP based ANI

draft-yizhou-anima-l2-acp-based-ani

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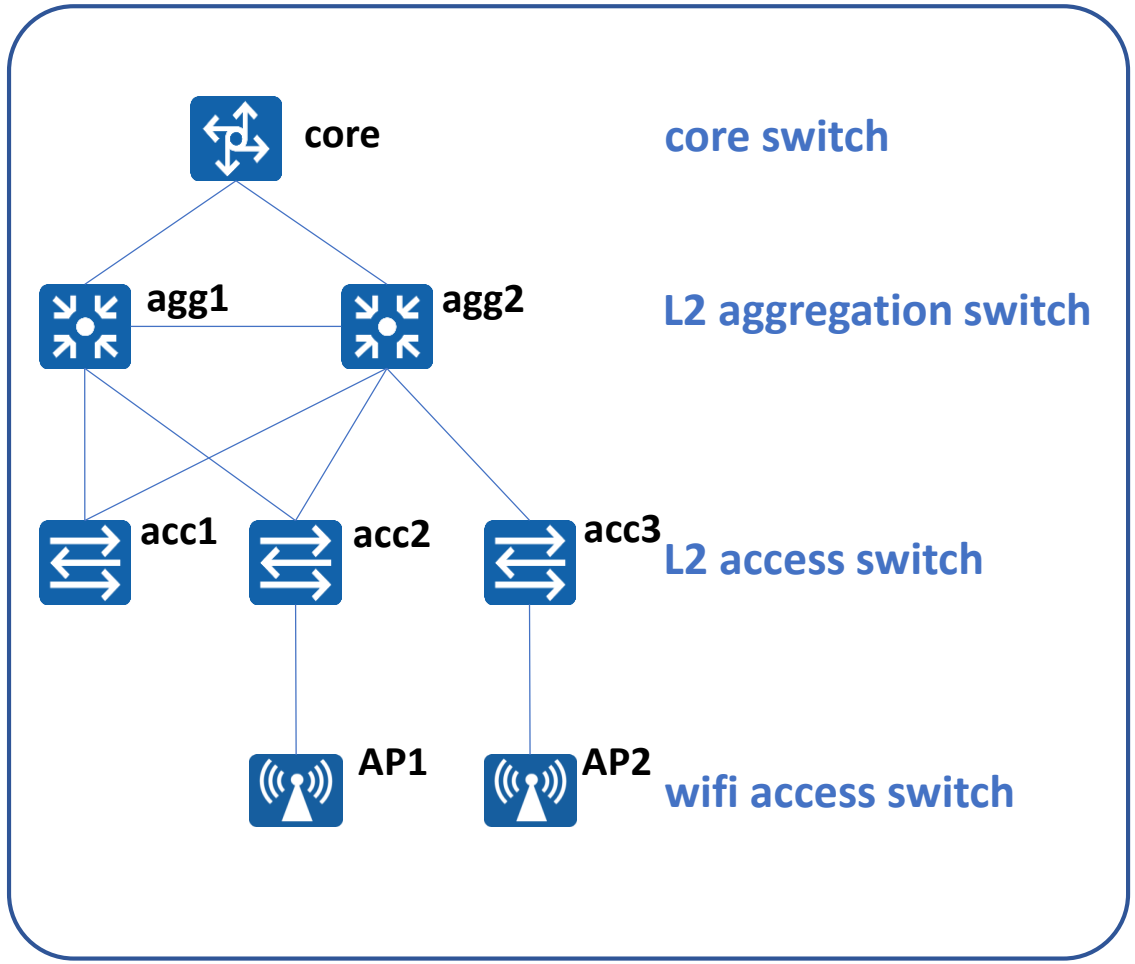
Background of ACP

- **Autonomic Control Plane (ACP)**

  - Autonomic Control Plane(ACP) is a self-managing and as independent as possible of configuration control plane.
  - Autonomic functions communicate over the ACP.
  - It serves as a "virtual out-of-band channel" for Operations, Administration, and Management (OAM)

- **Current ACP implementation in ANI uses IPv6 link-local address based ACP tunnel.**
- **However, there are some cases that require L2 ACP functions in ANI.**
  - Small branch
  - SOHO or SMB case

L2ACP case



The requirement of SOHO /SMB case

- Hosts ≤ 200,and WiFi AP and access switches ≤ 10.
- Contain the different types of equipment, L2 switches, L3 routers, Hybrid L2/L3 switches.
- Some nodes have a fewer resource, like IoT nodes.
- Required to firstly form a local area network disconnected from the Internet.

Scenarios requiring

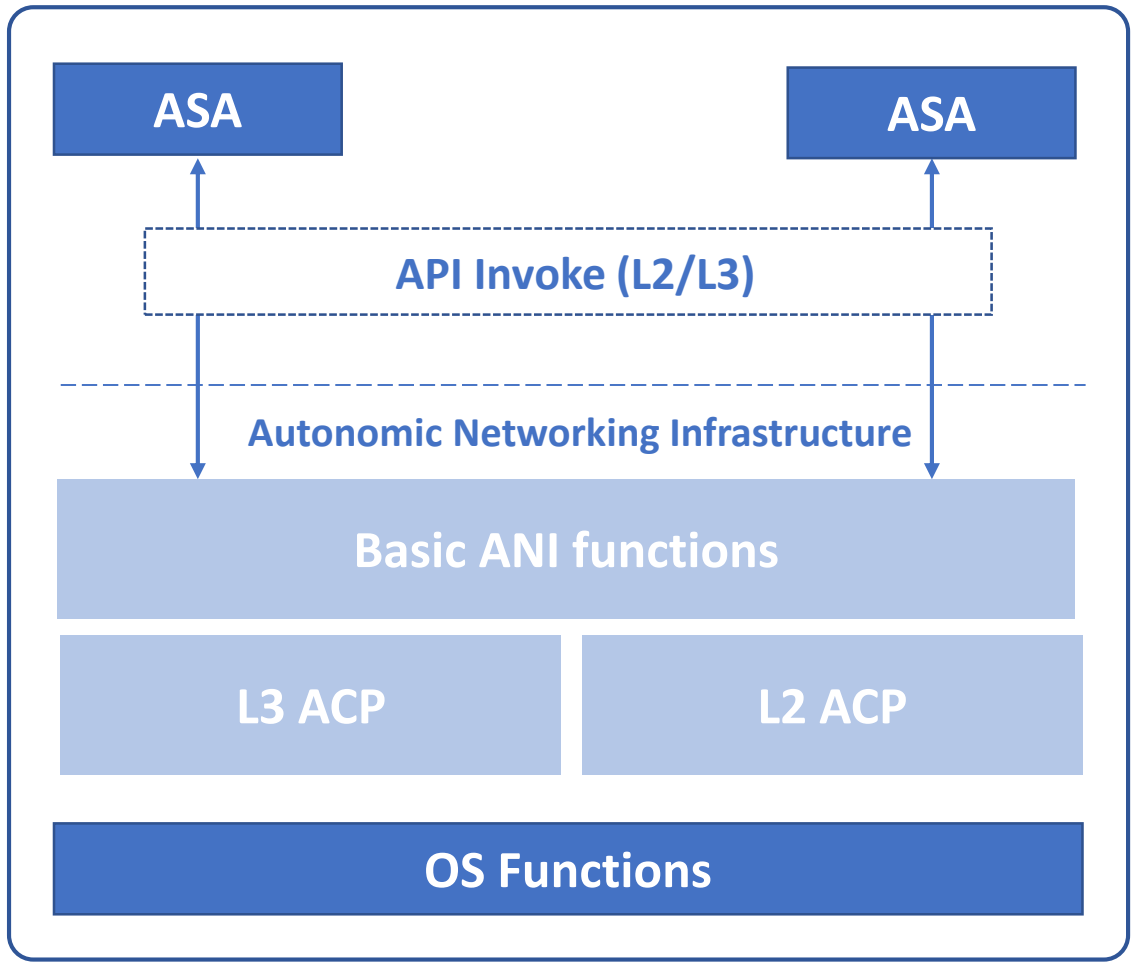
- **The managed network is a small layer 2 network where the network nodes have no L3 physical interfaces and have fewer resource.**
  - The interface cannot or is not configured to automatically get IP address without any external exchange.
  - Network nodes like some IoT services have fewer resource.

- **The network manager would like to use and verify the L2 topology and reachability first for some management purpose.**

Requirements for L2 ACP

1. IP addresses of the node and its interface may not be available upfront.
2. L2 ACP construction can be based on L2 available information and/or mechanisms, such as MAC address, VLAN or physical port information. It should not rely on the IP addresses of the interface.
3. Adjacent node discovery should be carried as L2 frame.
4. It is desired to reuse GRASP messages as much as possible. GRASP messages should be able to be carried by L2 transport substrate.
5. L2 ACP module should provide API to the upper layer to allow ASA to invoke L2 based functions.
6. Physical connectivity and topology information should be able to be collected via L2 ACP for verification.
7. Routing in L2 ACP should support L2 loop-free logical topology creation.
8. Minimal manual configuration is required.
9. Re-use of the existing well-known multicast MAC addresses is desired.

Reference Model



Allowing the ASAs to communicate with other ASAs by invoking a set of L2 transport based functions

- Similar functions as L3 API
- Without requiring the L3 address

L2 ACP provide

- Neighbour Discovery with L2 GRASP DULL
- Addressing and reachability
- Topology collection and loop-free creation
- GRASP with L2 extension in L2 ACP

Conclusion

- **There are some scenarios require L2 ACP.**
- **L2 ACP : L2 based ACP rather than ACP on L2 port**

L2ACP in the document tries to describe a need of a separate control plane reachable using traditional layer 2, without requiring IP addresses

- with MAC address,
- physical port number

A loop-free mechanism coupled with L2ACP can be used for this separate plane.

The real data forwarding can still use STP for loop-free forwarding.

Others

- **Security Considerations**
  - The network leverages the L2 ACP and the related functions are usually small to medium size network in a single or very closed physical locations. Therefore physical security to prevent access by unauthorized persons can be used to protect against interlopers and eavesdroppers.
  - It is not completed. Further discussions are needed.

Next Step

- Welcome to comment and contribute to it!
- Revise the document based on the comments
- Suggestion are welcome to the mailing list

Thank you!