Use Cases

(A) Personal Area networks (PANs)

(B) Classic home or 'hotspot' networks (single exit router, one logical link, single admin domain)

(C) Advanced home and small business networks [RFC7368]

(D) Enterprise networks

(E) Higher Education network

(F) Mesh networks such as RPL/6LoWPAN

REQ1-REQ3

REQ1: For use cases A, B, and C, there should be a Zero Configuration mode of operation. This implies that servers and clients should be able to automatically determine a default Scope of Discovery in which to advertise and discover services, respectively.

REQ2: For use cases C, D, and E, there should be a way to configure Scopes of Discovery that support a range of topologically-independent zones (e.g., from department to campus-wide). This capability must exist in the protocol; individual operators are not required to use this capability in all cases -- in particular, use case C should support Zero Configuration operation where that is desired. If multiple scopes are available, there must be a way to enumerate the choices from which a selection can be made. In use case C, either Zero Configuration (one flat list of resources) or configured (e.g., resources sorted by room) modes of operation should be available.

REQ3: As stated in REQ2 above, the discovery scope need not be aligned to network topology. For example, it may instead be aligned to physical proximity (e.g., building) or organizational structure, (e.g., "Sales" vs. "Engineering").

REQ4-REQ7

REQ4: For use cases C, D, and E, there should be an incremental way to deploy the solution.

REQ5: SSD should leverage and build upon current link scope DNS-SD/ mDNS protocols and deployments.

REQ6: SSD must not adversely affect or break any other current protocols or deployments.

REQ7: SSD must be capable of operating across networks that are not limited to a single link or network technology, including clients and services on non-adjacent links.

REQ8-REQ11

REQ8: It is desirable that a user or device be able to discover services within the sites or networks to which the user or device is connected.

REQ9: SSD should operate efficiently on common link layers and link types.

REQ10: SSD should be considerate of networks where power consumption is a critical factor and, for example, nodes may be in a low power or sleeping state.

REQ11: SSD must be scalable to thousands of nodes with minimal configuration and without degrading network performance. A possible figure of merit is that, as the number of services increases, the amount of traffic due to SSD on a given link remains relatively constant.

REQ12-REQ14

REQ12: SSD should enable a way to provide a consistent user experience whether local or remote services are being discovered.

REQ13: The information presented by SSD should closely reflect the current state of discoverable services on the network. That is, new information should be available within a few seconds and stale information should not persist indefinitely. In networking all information is necessarily somewhat out-of- date by the time it reaches the receiver, even if only by a few microseconds, or less. Thus timeliness is always an engineering trade-off against efficiency. The engineering decisions for SSD should appropriately balance timeliness against network efficiency.

REQ14: SSD should operate over existing networks (as described by use cases A-F above) without requiring changes to the network at the physical, link, or internetworking layers.