IEEE 802.11 Distribution System Services Functionality

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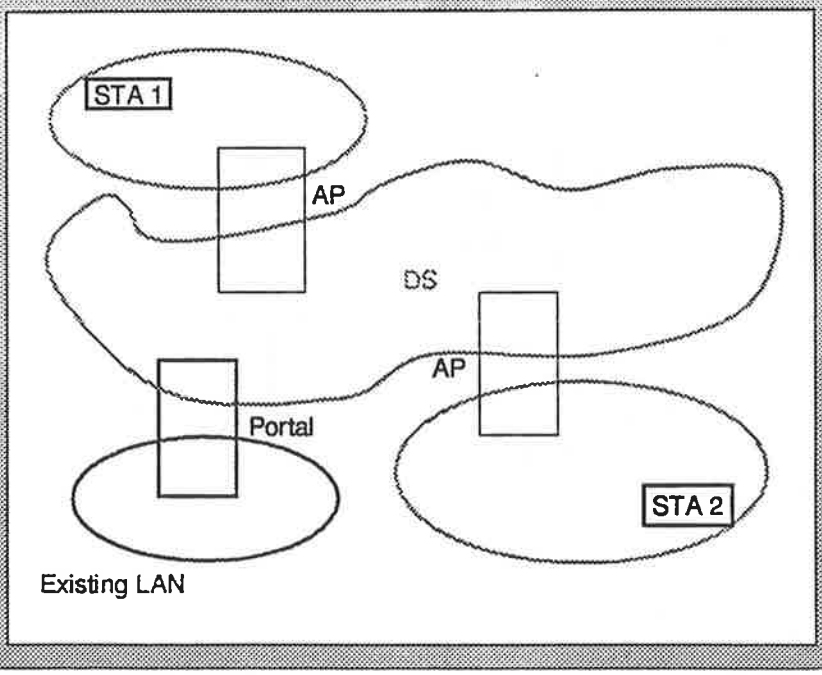
Simplified 802.11 Architecture



Distribution System Definitions

- Distribution System (DS): A system used to interconnect a set of BSSs to create an ESS.
- Distribution System Medium (DSM): The medium used by a DS (for BSS interconnections).
- Distribution System Services (DSS): The set of services provided by the DS which enable the MAC to transport MSDUs between BSSs within an ESS.
- Access Point (AP): Any entity that has STA functionality and provides access to the DS.
- DSMI: Distribution System Medium Interface.

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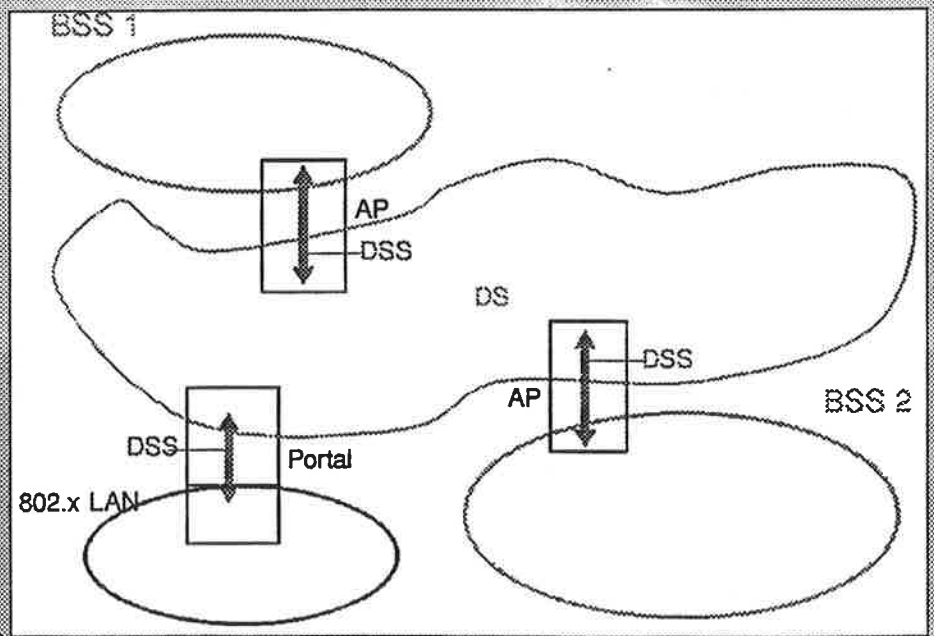
Simplified DS Services



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Distribution System Services

- Association:
  - The service which enables the establishment of an initial Association between a STA and an AP.
- Reassociation:
  - The service which enables an established Association (of a Station) to be transferred from one AP to another AP.
- Disassociation:
  - The service which removes an existing Association.
- Distribution:
  - The service which (by using Association information) delivers MSDUs within the DS.

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Distribution System Services

- Authentication:
  - The service used to establish the identity of Stations and APs to each other.
- Privacy:
  - The functionality used to prevent the contents of messages from being read by other than the intended recipient.
- Integration:
  - The service which enables delivery of MSDUs between the DS and an existing network.
- Network Management
  - TBD.

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Conceptual Station States

- Stations start out life as Unassociated
- Requirements for creating an Association
  - Association service
    - » Need to let DS know of the new Association
  - Authentication service
    - » Must establish mutually acceptable authentication
    - » Failure = remain unassociated.
  - Privacy service
    - » Negotiate mutually acceptable privacy level
    - » Failure = remain unassociated

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Conceptual Station States

- Associated State
  - STA can now exchange MSDUs with it's associated AP
    - » and with other stations
      (Indirectly via the Distribution Service)
    - » and existing networks
      (Indirectly via the Integration Service)
- Reassociation
  - Station simply returns to the Associated state
  - only now the association is with a different AP
- Disassociation
  - Let DS know the Association is terminated
  - Station returns to the Unassociated state

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Ad-Hoc & Infrastructure DS Services

- The DS Services are equally applicable and needed for both Infrastructure and Ad-Hoc networks.
- Consider a simple two STA ad-hoc case:
  - Each STA looks like an AP to the other STA.
    (which matches our definition of an AP being a STA)
  - Services which are the same:
    - » Association, Authentication, Privacy, Disassociation
  - Services which are Null in an Ad-Hoc network:
    - » Distribution, Reassociation, Integration.

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An important Question

- Question: What will customers want to use for their DS?
- Answer: Whatever type of network they already have!

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We Should Not Define the Distribution System Internals.

- We can not specify the internal details of the DS without being overly constrained.
- We need only to specify the functionality and interfaces of the DS.
- DSS functionality need not be in any particular physical part of a DS.
  - Could be either in a physical AP, running on a machine inside the DS, or completely distributed.
  - This provides enormous flexibility, allowing both distributed and centralized DS to be created.

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