Multicast Address Allocation via DHCP

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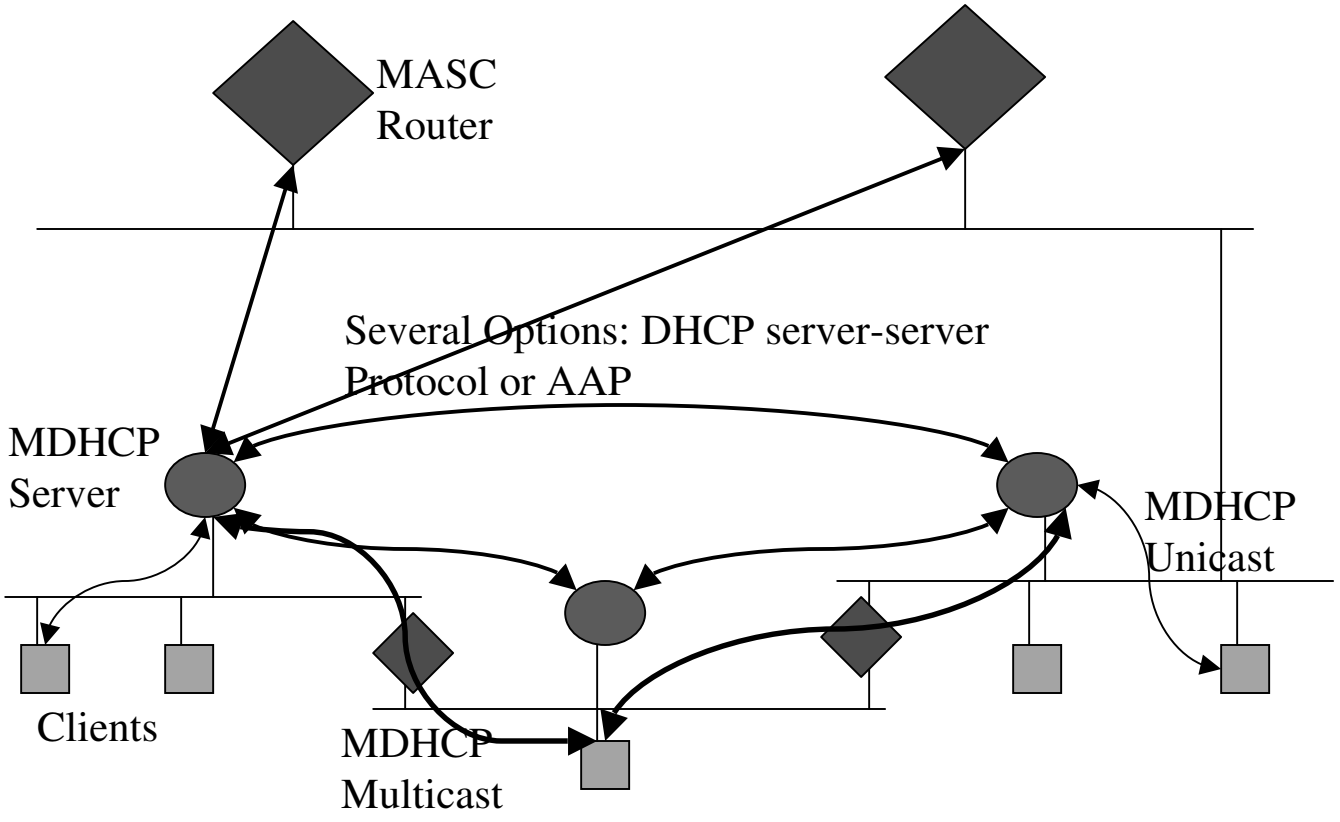
Agenda

- Discuss the role of MDHCP in the overall MALLOC architecture.
- MDHCP protocol specification.
- Client side APIs for requesting multicast addresses - implementation report.
- Status and closing notes.

Overall Architecture.



Purpose of MDHCP

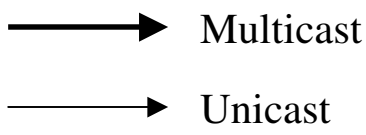
- Common mechanism for Applications to request address(es) from local address allocation server(s).
- Works as part of the wider address allocation architecture using MASC.
- Coordinates address allocation within a domain
  - Can request address ranges from MASC servers.
  - Manages both admin scoped and global address ranges.
  - Applications request addresses via multicasting or unicasting DHCP messages.
  - Provides conflict-free allocation when used with well behaved clients and MASC agents.

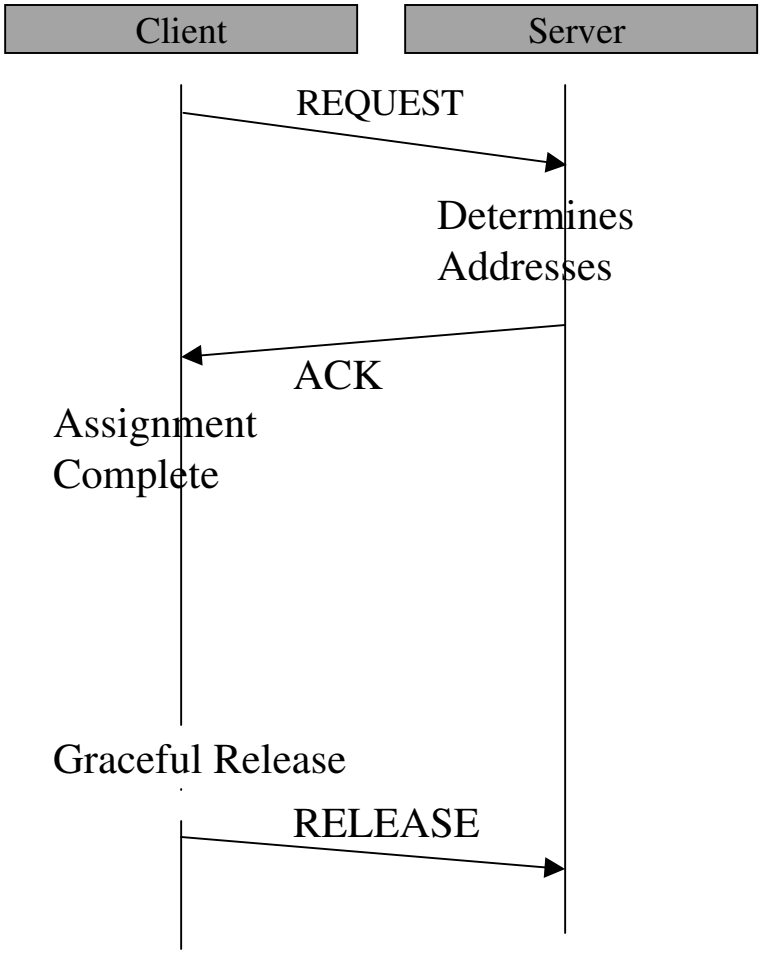
Operation

- MDHCP servers have a well-known multicast address in the admin scope.
- Application obtains a list of multicast scopes either from MDHCP servers via DHCPINFORM packets or from the directory.
- Application selects a scope and requests address(es) from MDHCP servers via normal DHCP message exchanges.
- Each client request also supplies a client identifier to uniquely associate it with the address assignment.
- Application can renew or release addresses as normal DHCP operations.

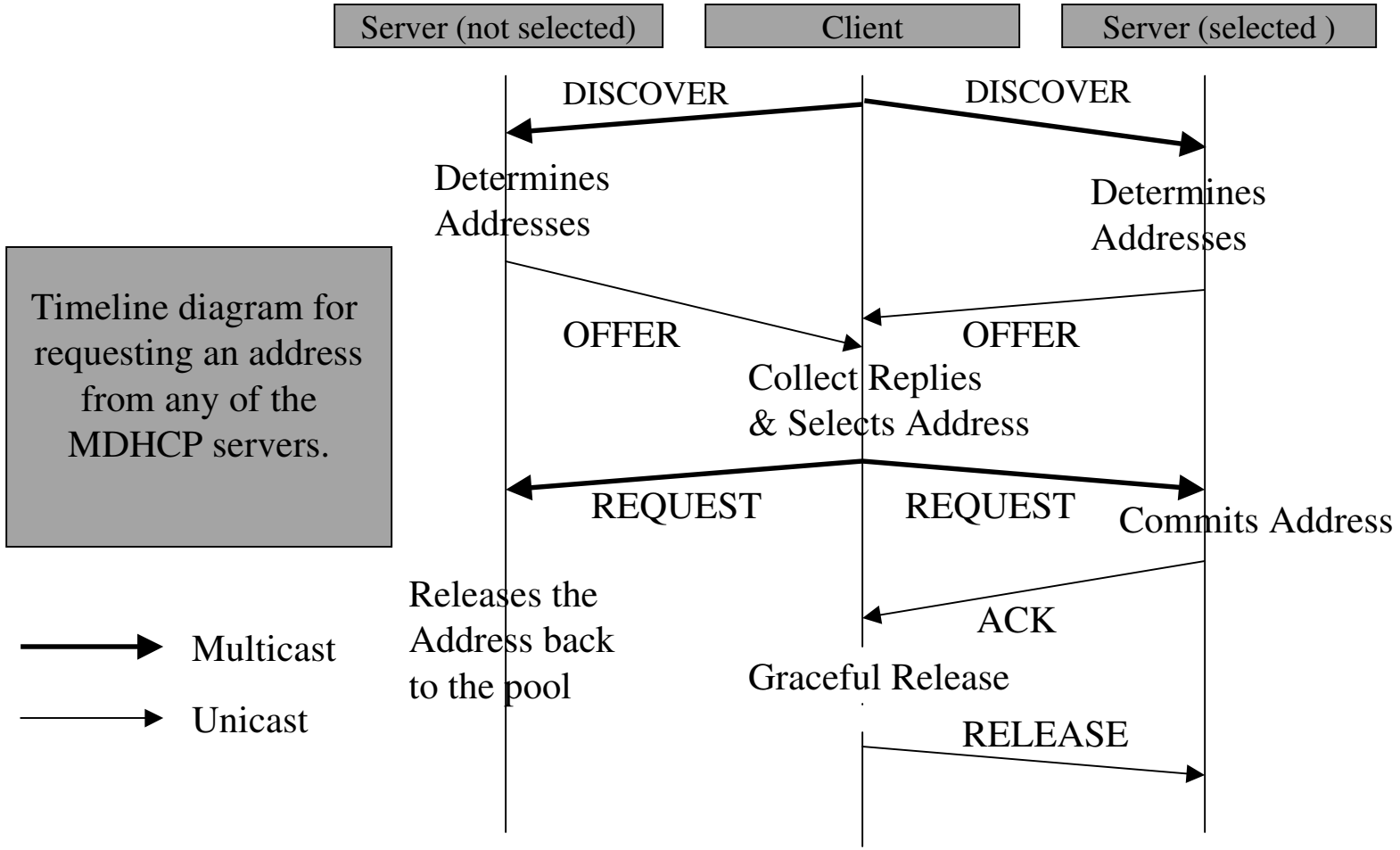
Protocol (I)

Timeline diagram for requesting an address from a specific MDHCP server.





Protocol (II)


Server (not selected)
Client
Server (selected)
DISCOVER
DISCOVER
Determines Addresses
Determines Addresses
OFFER
OFFER
Collect Replies & Selects Address
REQUEST
REQUEST
Commits Address
Releases the Address back to the pool
ACK
Graceful Release
RELEASE
Timeline diagram for requesting an address from any of the MDHCP servers.
Multicast
Unicast

Options

- The following additional options can passed with client requests.
  - Multicast Scope
  - Number of addresses requested.
  - Lease start time and end time.
- The following options can be supplied with server responses.
  - List of address ranges allocated.
  - TTL of the address(es).

Client APIs. (I)

- The following abstract APIs are not part of the protocol but illustrate what we have implemented.

Enumerating the scopes:

```
int
MDhcpEnumerateScopes(
   IN   OUT     SCOPE           *ScopeList,
   IN   OUT     int             *ScopeListLen,
        OUT     int             *ScopeCount
);
where SCOPE is
SCOPE {
   int          ScopeId;
   IP_ADDR      ServerIpAddress;
   STRING       ScopeDescription
};
```

Client APIs. (II)

Requesting Address:

```
int
MDhcpRequestAddress(
   IN   OUT     REQUEST_ID      *RequestUID,
   IN           SCOPE           *Scope,
   IN           LEASE_INFO      *AddrRequest
   IN   OUT     LEASE_INFO      *AddrResponse
);
where LEASE_INFO is
LEASE_INFO {
   TIME         StartTime,EndTime;
   int          TTL;
   int          AddrCount;
   IP_ADDR      Address[1];
};
```

Client APIs. (III)

Renewing and Releasing Address(es):

```
int
MDhcpRenewAddress(
   IN           REQUEST_ID     *RequestUID,
   IN           SCOPE          *Scope,
   IN           LEASE_INFO     *RenewRequest
   IN   OUT     LEASE_INFO     *RenewResponse
);
int
MDhcpReleaseAddress(
   IN           REQUEST_ID     *RequestUID,
   IN           int            *Scope,
   IN           LEASE_INFO     *ReleaseRequest
);
```

Status

- The update of the following two drafts have been submitted.
  - draft-ietf-dhc-mdhcp-03 - protocol description.
  - draft-ietf-dhc-multopt-02 - options for getting the scope list.
- Microsoft implementation of the protocol as per the above drafts and the APIs are slated for NT5 Beta2.