# EFM OAM
# Need To Transmit

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# Contents

- List the types of OAM PDUs that can be transmitted

- List the timers used

- Describe the Need To Transmit State Machine

# OAM PDUs

- Status

- Event Notification

- Loopback Control

- Ping Request

- Ping Response

- Variable Request
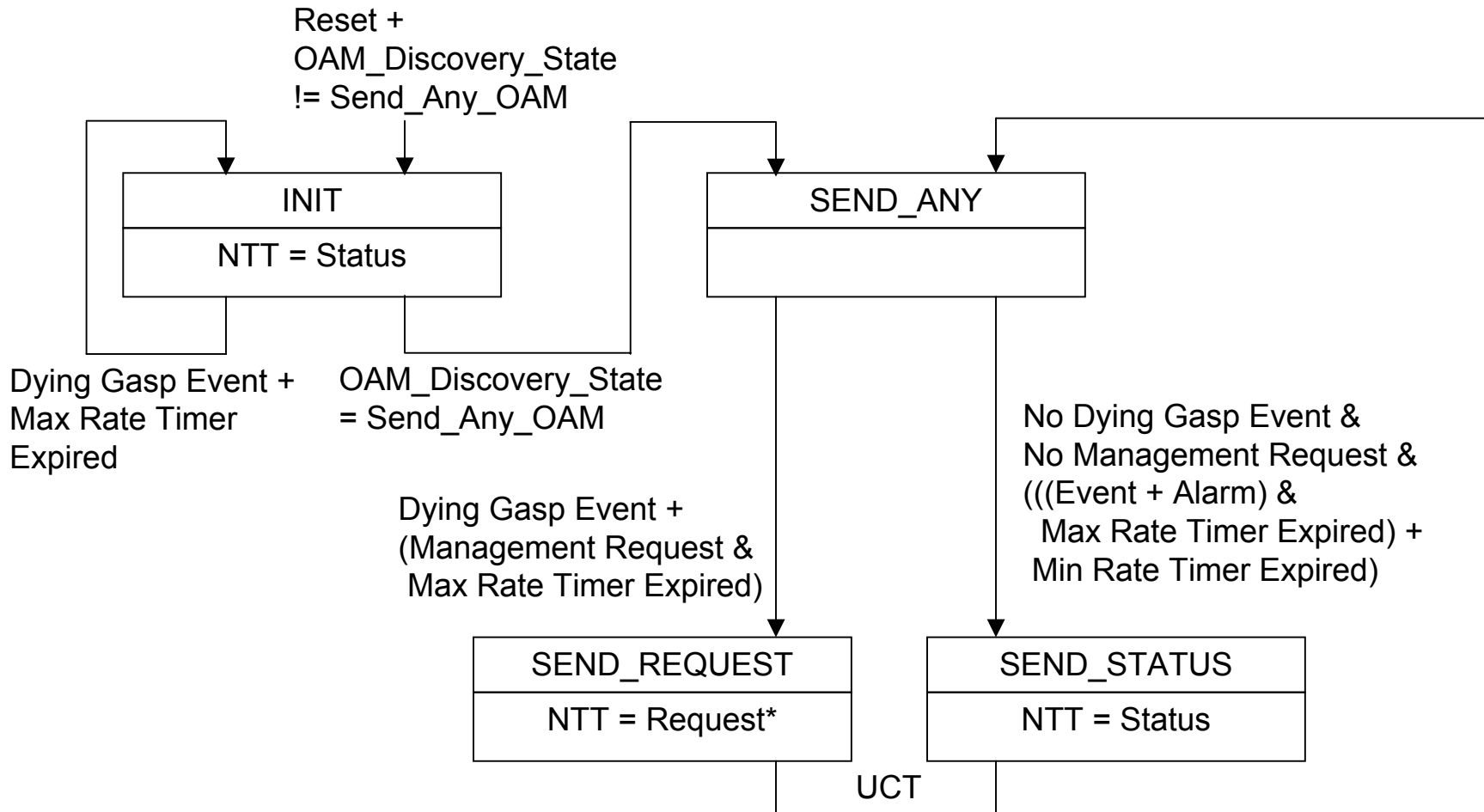
- Variable Response

# OAM Timers

- **Max Rate Timer – 100 msec max**

  **Reset upon OAMPDU transmission**

  **Used to inhibit OAMPDUs from being sent too often**

  **Send OAMPDU at expiration only if there is a reason to do so**

- **Min Rate Timer – 1 sec max**

  **Reset upon OAMPDU transmission**

  **Used for Keep Alive function**

  **If this expires, there was no reason to transmit at the maximum rate so send Information OAMPDU to keep the link alive**

- **Link Lost Timer – 5 sec min**

  **Reset upon OAMPDU reception**

  **Upon expiration, sends OAM Discovery Capability state machine back to "Send Local Only" state**

**IEEE802.3ah EFM Task Force**
**September 2002**

# Need To Transmit

- **At reset:**

  **Queue a Status OAMPDU**

- **Until OAM_Discovery_State=Send_Any_OAM:**

  **If Dying Gasp Event, immediately send requested OAMPDU**

  **Else, Queue a Status OAMPDU upon every expiration of Max Rate Timer**

- **While OAM_Discovery_State=Send_Any_OAM:**

  **If Dying Gasp Event, immediately send requested OAMPDU**

  **Else, if management requests a specific OAMPDU, queue it upon expiration of Max Rate Timer**

  **Else, if there is an Event or an Alarm, queue a Status OAMPDU upon expiration of Max Rate Timer**

  **Else, queue a Status OAMPDU upon expiration of Min Rate Timer**

# Need To Transmit State Machine

Reset +
OAM_Discovery_State
!= Send_Any_OAM

| INIT |
|------|
| NTT = Status |

| SEND_ANY |
|----------|
|          |

Dying Gasp Event +
Max Rate Timer
Expired

OAM_Discovery_State
= Send_Any_OAM

Dying Gasp Event +
(Management Request &
 Max Rate Timer Expired)

No Dying Gasp Event &
No Management Request &
(((Event + Alarm) &
  Max Rate Timer Expired) +
 Min Rate Timer Expired)

| SEND_REQUEST |
|--------------|
| NTT = Request* |

| SEND_STATUS |
|-------------|
| NTT = Status |

UCT

Request = Any OAMPDU requested by management

# OAM Discovery State Machine

Reset + Restart + Link Loss Timer Expired

```
┌─────────────────────────┐          ┌─────────────────────────┐
│   Send Local Only       │          │  Send Local + Far_End 2 │
├─────────────────────────┤          ├─────────────────────────┤
│   LOCAL_STATE <=        │          │   LOCAL_STATE <=        │
│   UNSTABLE              │          │   STABLE               │
└─────────────────────────┘          └─────────────────────────┘
```

Received FAR_END Status PDU

FAR_END_STATE = STABLE

```
┌─────────────────────────┐          ┌─────────────────────────┐
│  Send Local + Far_End 1 │          │    Send Any OAM         │
├─────────────────────────┤          ├─────────────────────────┤
│   LOCAL_STATE <=        │          │   LOCAL_STATE <=        │
│   UNSTABLE              │          │   STABLE               │
└─────────────────────────┘          └─────────────────────────┘
```

Management Satisfied & Link_Fault=FALSE

FAR_END_STATE = UNSTABLE

Management Unsatisfied + Link_Fault=TRUE