International Telecommunication Union

ETS Support In H.323

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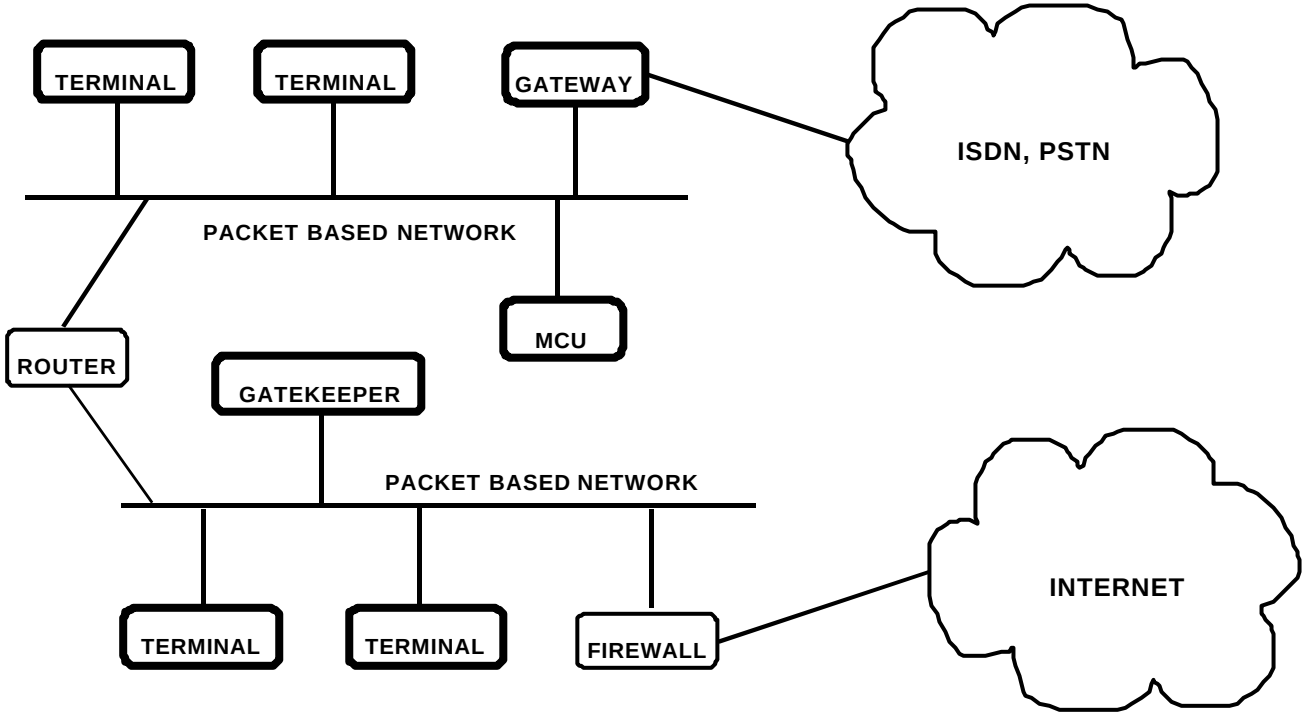
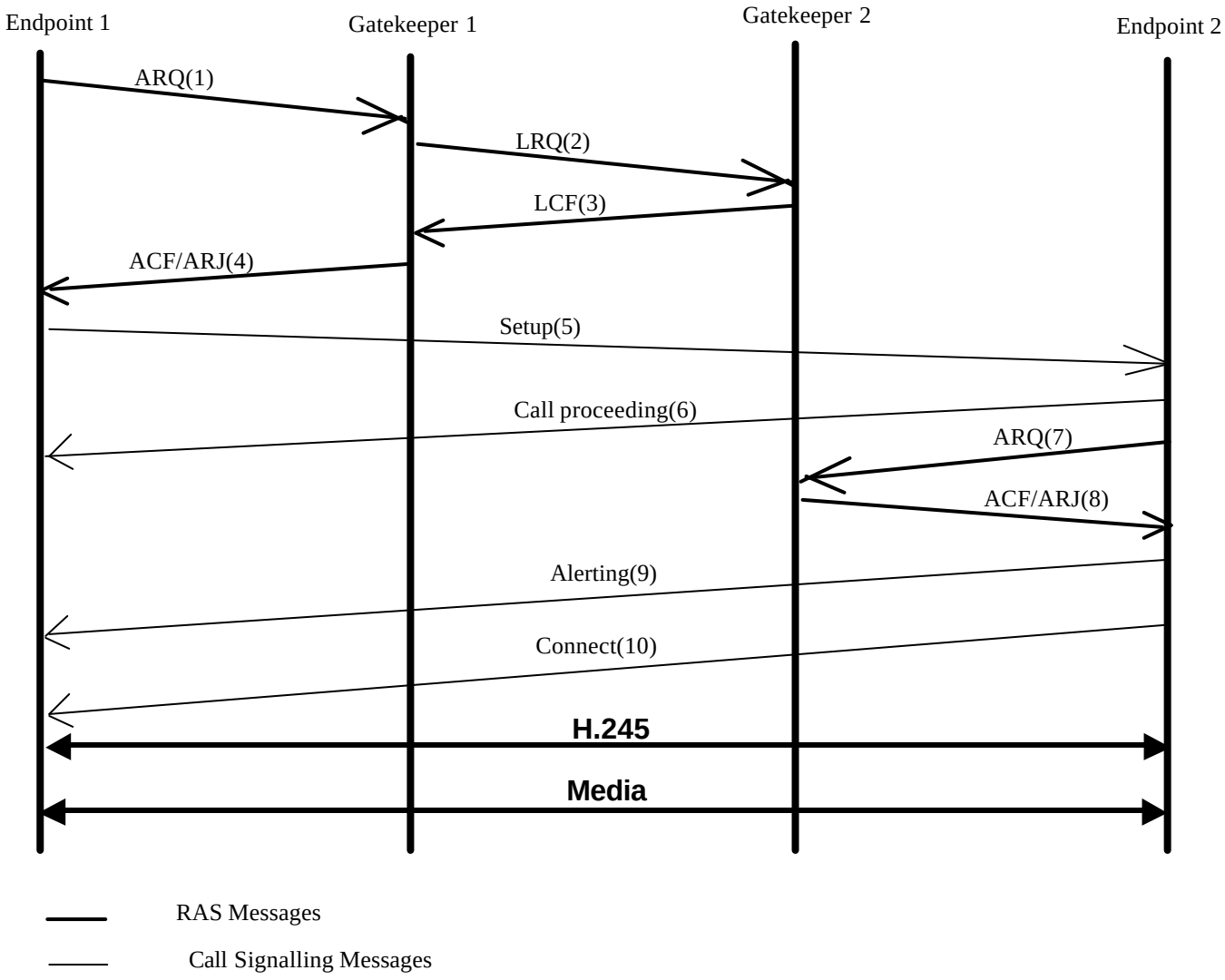
H.323 Overview

- Voice and multimedia communications over Packet Based Networks
- Basis for many evolving Voice over IP (VoIP) networks
- Gatekeeper function provides tight management controls for network access, bandwidth allocations, and resource usage
- Gateway function provides interworking with other network types such as PSTN

Typical H.323 System



H.323 Call Establishment



ETS Goals In H.323

- Assure priority access to the network
- Provide relief from restrictive management controls
- Assure priority access to network resources such as Gateways
- Provide signaling to allow the use of lower level network priority and QOS mechanisms
- Enable authentication of priority service request
- Simplify interworking with PSTN ETS support

ETS Support Layers

- Application Layer Support – provide ETS support within the H.323 Protocol. This work is being done within the ITU-T SG16.
- Network Layer Support – provide ETS support within the Packet Based Network Protocol. This work is being done within the IETF.

H.460.4 Call Priority Designation for H.323 Calls

- Approved Oct 02
- Indicates the desired priority of a call
- Signaled by calling endpoint, called endpoint, or third party
- Signaled per endpoint or per call
- Does not require special ETS endpoint capability

H.460.4 Signaling

- Priority Level (Type)
  - Emergency Authorized (ETS)
  - Emergency Public (911, 999, etc)
  - High Priority (Commercial, MLPP)
  - Normal
- Priority Extension
  - Provides discrimination within a priority type.
- Tokens
  - Provides a mechanism for exchanging authentication information.

H.460.4 Signaling

- Endpoint to Gatekeeper
  - Priority admission to network
  - Relief from admission, bandwidth policy
- Gatekeeper to Gatekeeper/Boarder element
  - Priority access determined by third party
  - Priority access determined by destination
  - Invoke network level QOS mechanisms
- Endpoint to Gateway
  - Priority access to external networks (ISDN, PSTN)

H.460.4 work to be done

- Define an Annex to H.460.4 that defines the procedures required to use H.460.4 for ETS applications
- Look into applying H.460.4 to H.248 Gateway Control Protocol providing broader support for Voice over IP

H.246 Annex C H.323 Interworking with ISUP

- Provides mapping between H.323 and ISUP signaling
- Work in SG11 to modify Q.761-764 (ISUP) to support signaling for ETS
- Continuing work in SG16 to map H.460.4 ETS signaling to the new ISUP ETS signaling
- To be approved in 5/03

BACKUP SLIDES

What is H.323?

- H.323 is a multimedia conferencing protocol, which includes voice, video, and data conferencing, for use over packet-switched networks.
- It is officially ITU-T Recommendation h.323: Packet-based multimedia communications systems

H.323 Components

- Endpoints
  - Terminal
  - Multipoint Control Unit
  - Gateway
- Entities
  - Gatekeeper
  - Multipoint Controller
  - Multipoint Processor

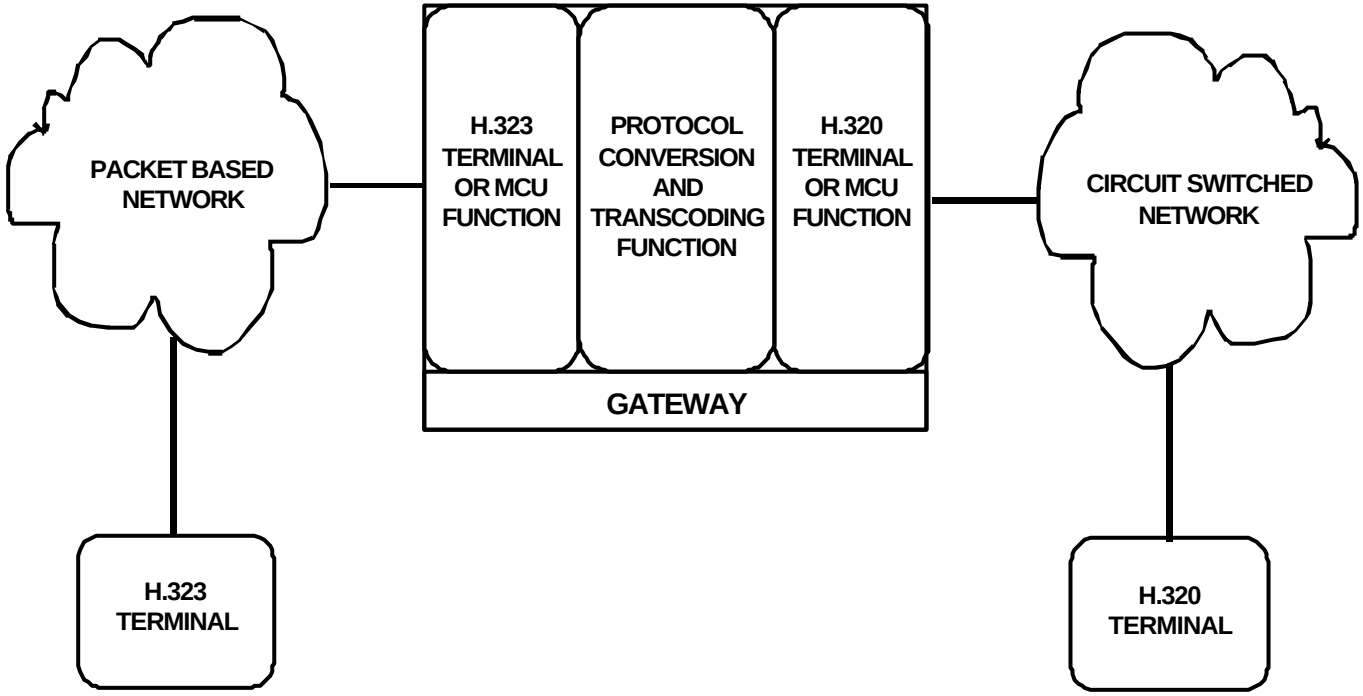
Terminal Features

- Audio, video, and/or data communications.
- Computer based or Stand alone.
- Hardware or software based codecs.
- High quality, high speed operation on lightly loaded networks.
- Multipoint capability without an MCU.

Gateway Features

- Provide a mechanism for calling between the Packet Based Network and the Switched Circuit Networks.
- Provides inter-working between different H.3xx terminal types on dis-similar networks according to H.246.

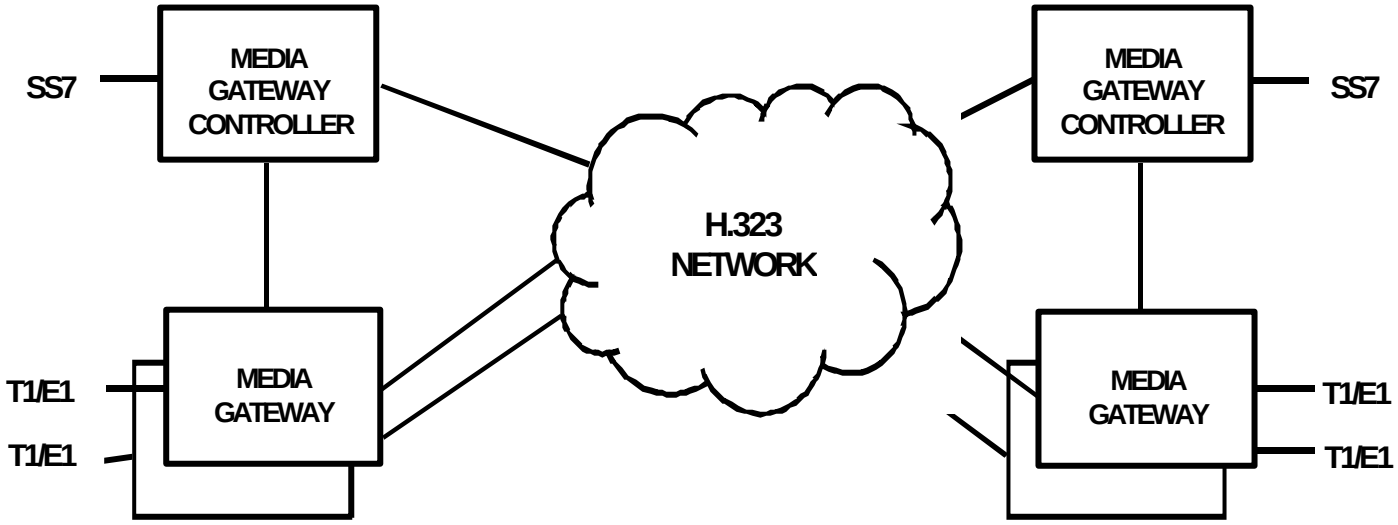
Gateway Diagram



Gateway Decomposition

- Allows central control element to control many distributed media processing elements
- Separate control processing from media processing
- Improves the scalability of H.323 for use in the public telephony backbone
- Uses H.248 Gateway Control Protocol between decomposed elements

Typical Decomposed Gateway Implementation



Gatekeeper Features

- Optional control entity.
- Usually a software program running on some computer on the network.
- May be physically co-located with any of the other H.323 components.
- Without it there is very little control over the video traffic on the network.

Gatekeeper Functions

- Admissions control
- Address translation
- Bandwidth control
- Zone Management
- Routing of Call Signaling
- Central management

Admission Control

- Permission for H.323 access to the network.
  - Can I make a call? Can I accept a call?
- Criteria for access is left to the manufacturer, but may include:
  - Is the terminal authorized to place a call?
  - Can the terminal use a Gateway? An MCU?
  - Is there bandwidth available?
  - Are there too many active calls?

Address Translation

- Convert Alias addresses to network (IP) addresses.
  - Joe@Purchasing >>> 196.123.235.43
  - (215) 657-5270 >>> 196.123.235.38
- Gatekeeper gets translation information from:
  - Registration process.
  - Public directory service lookup (DNS, LDAP, ILS).

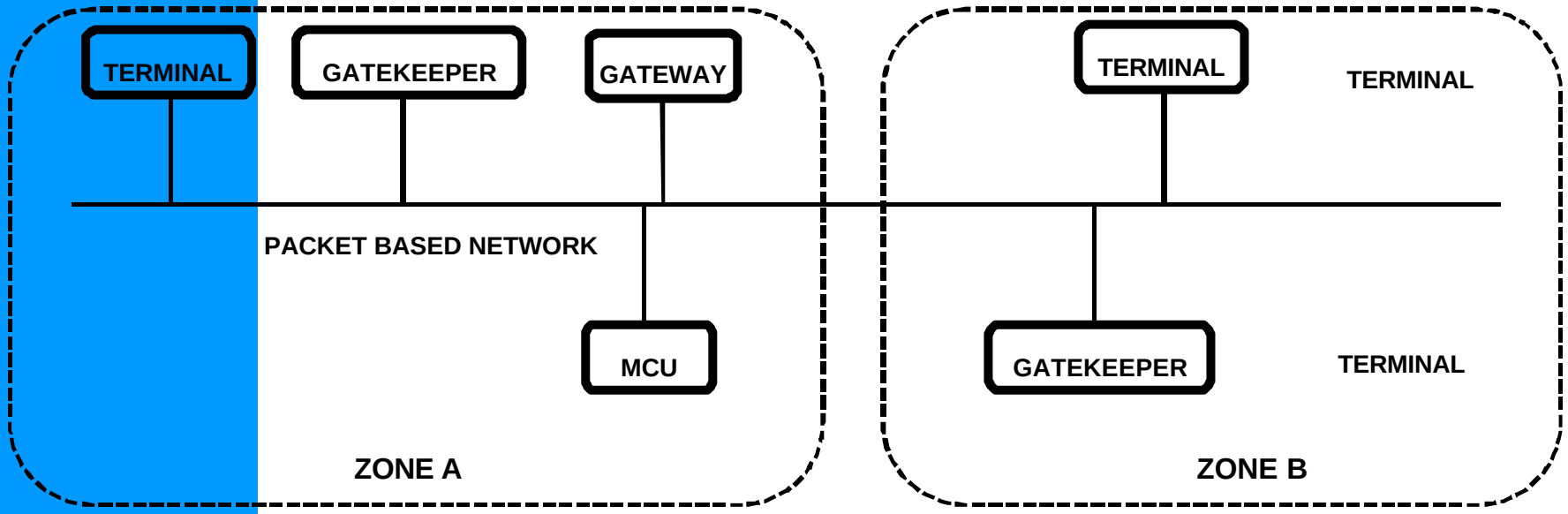
Bandwidth Management

- Static bandwidth management.
  - Can my call use 768 Kbps? No, use 256 Kbps.
- Criteria for bandwidth allocation left to the manufacturer, but may include:
  - High or low bandwidth modes.
  - Control total bandwidth of all active calls.
  - Request bandwidth changes during call.

Zone Management

- Hide location of network resources such as Gateways and MCUs from the users to simplify accessing.
- Allows addition of Gateways and MCUs without reconfiguring all of the terminals.
- Gatekeeper to Gatekeeper coordination.

Gatekeeper Zones



Call Signaling Routing

- Terminal to terminal call signaling and control channel information is routed through the Gatekeeper.
- Allows the Gatekeeper to provide services.
  - Routing to MC or MCU for ad hoc conferencing.
  - May provide supplementary services.
  - PBX-like functions.

Central Management

- Manufacturer specific management functions:
  - Call statistics and accounting.
  - Access rights.
  - Directory services.
  - Resource reservation requests.

H.460.4 Messages

- Priority Designation Request
  - Request a specific priority for a call or endpoint
- Priority Designation Confirm
  - Accept priority request or indicate alternative priority being allocated

H.460.4 Message Detail

```
CALL-PRIORITY {itu-t(0) recommendation(0) h(8) 460 4 version1(0)} DEFINITIONS AUTOMATIC TAGS ::=
BEGIN
IMPORTS
        ClearToken,
        CryptoToken
    FROM H235-SECURITY-MESSAGES;

CallPriorityInfo  ::= SEQUENCE     -- root for Call Priority related asn.1
{
    priorityValue               CHOICE
    {
        emergencyAuthorized     NULL,
        emergencyPublic         NULL,
        high                    NULL,
        normal                  NULL,
        …
    },
    priorityExtension           INTEGER (0..255)   OPTIONAL,
    tokens                      SEQUENCE OF ClearToken OPTIONAL,
    cryptoTokens                SEQUENCE OF CryptoToken OPTIONAL,
    rejectReason                CHOICE
    {
        priorityUnavailable     NULL,
        priorityUnauthorized    NULL,
        priorityValueUnknown    NULL,
        …
    }   OPTIONAL,          -- Only used in CallPriorityConfirm
    …
}

END     -- of ASN.1
```

H.460.4 Message Fields

- **CallPriorityInfo**
  - Allows specification of call priority parameters within RAS and Call Signaling messages.
- **priorityValue**
  - Identifies the priority of the call. This is used to indicate a specific probability of call completion. emergencyAuthorized is expected to be used for local, national, or other government emergency communications. emergencyPublic is to be used for public access to emergency services such as 911. High may be used for calls related to service level agreements that guarantee a specific probability of completion. Normal is used for calls that do not have a priority request.
- **priorityExtension**
  - Allows subdivision or sub-grouping of the specified priority levels.
- **rejectReason**
  - Used only in the Call Priority Confirm message to indicate why the requested priority is not provided. PriorityUnavailable is used when the element cannot provide the requested priority. PriorityUnauthorized is used when the element cannot authorize the requested priority. PriorityUnknown is used when the element does not recognize the requested priority.
- **token, cryptoToken**
  - These fields may contain tokens which indicate the authority to use or request specific Call Priorities.