

H.323

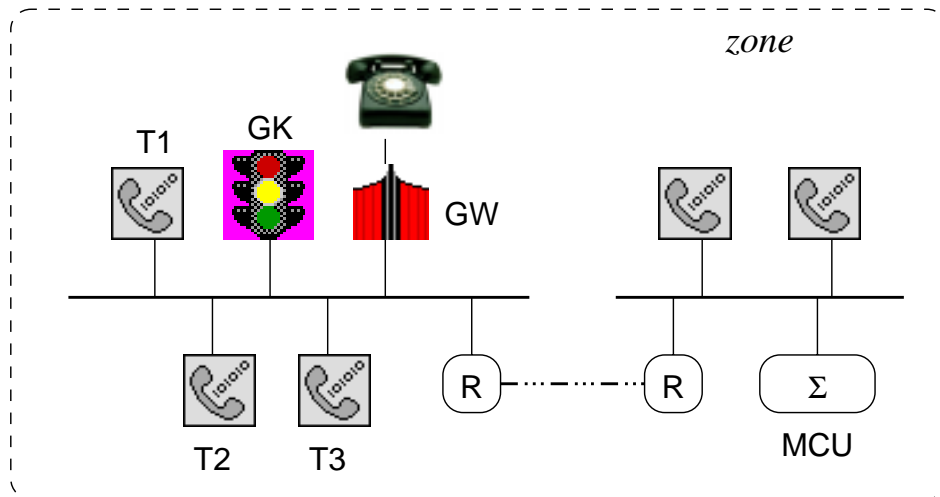
H.323/1

H.323

- derived from H.320 (ISDN multimedia)
- components:
 - H.323:** overall architecture =
 - H.225.0:** call control, RAS to gatekeeper: “may I?”, user location
 - H.235:** security for H.323 terminals
 - H.245:** capabilities exchange, indications, notifications
 - H.332:** large group conferences
 - H.450:** supplementary services
 - H.246:** interworking between H.323 and other H.xxx standards
 - Q.931:** call setup = ISDN, similar to Q.2931 (ATM)
 - Q.932:** supplementary services
- mostly ASN.1 (PER) based
- signaling TCP-based

H.323/2

H.323 Zones



H.323/3

H.323 Elements

H.323 Terminal : PC with H.323 software

MCU: multipoint control unit \Rightarrow mixes audio and video

MC: multipoint controller \Rightarrow performs signaling for centralized conferences

MP: multipoint process \Rightarrow actual device for mixing

gatekeeper: session control

gateway: interface between H.323 systems and other systems: PSTN, H.323 (PSTN mm), H.320 (ISDN), H.321 (ATM mm)

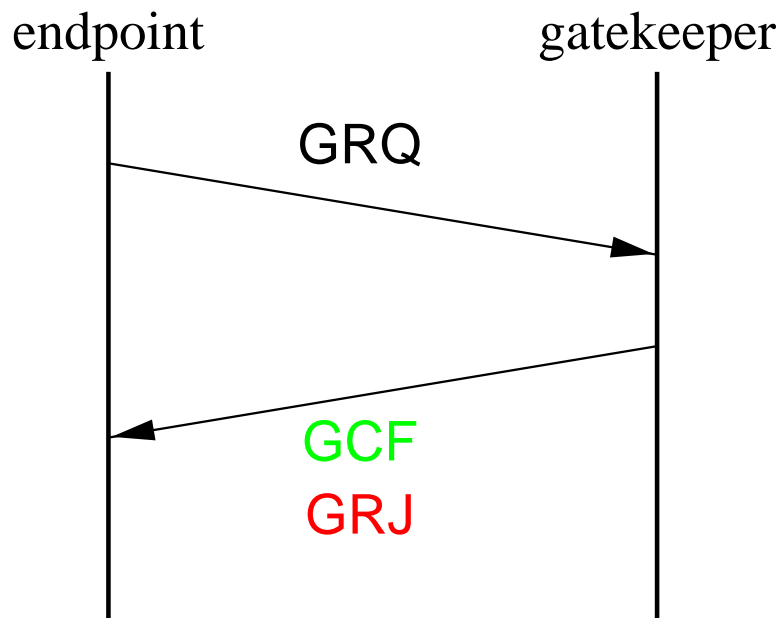
H.323/4

H.323 gatekeeper

- controls sessions
- performs user location and registration
- admission control
- reroutes signaling
- processes RAS (registration, admission, status) from H.323 terminals

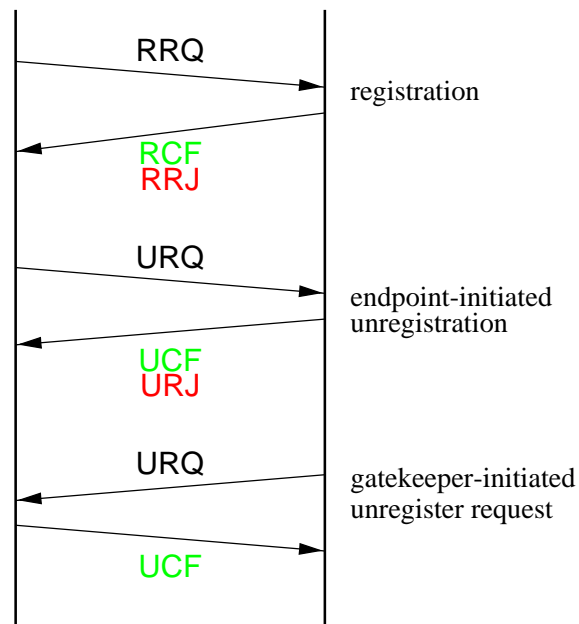
H.323/5

Gatekeeper Discovery



H.323/6

Registration with Gatekeeper



H.323/7

H.323 Phases

Initialization: register with GK

GK admission: obtain permission
GK resolves address

Call signaling: signaling connection to peer
call initiation and completion/rejection

Negotiation/configuration: negotiate roles during call
capability exchange
determine mode of operation

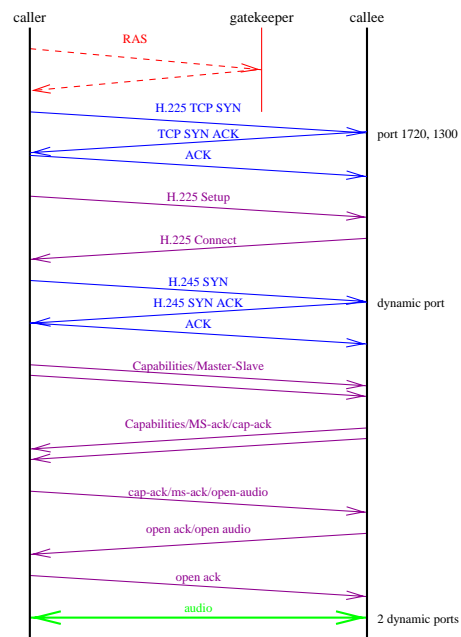
Media exchange: configure and open logical channels
transmit and receive data streams

Re-negotiation: change members, parameters, media, . . .

Shutdown: terminate the call/conference
deregister user on log-off

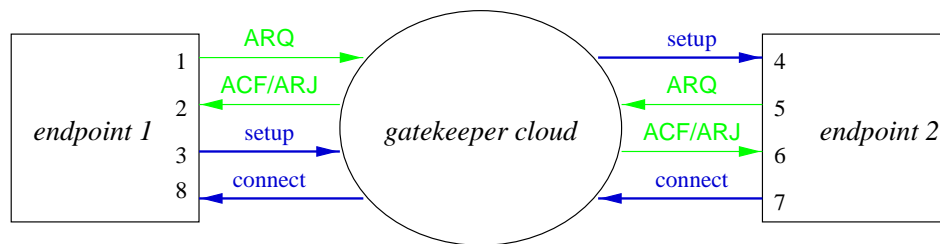
H.323/8

H.323v1 call setup (w/o fastStart)



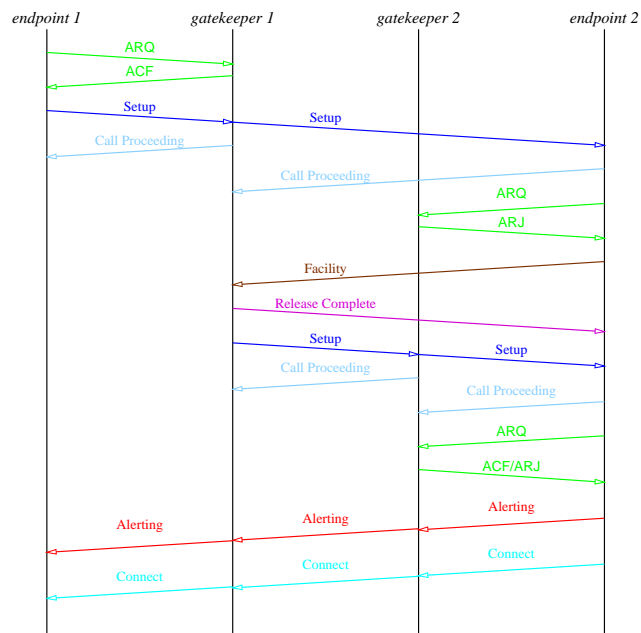
H.323/9

Gatekeeper-routed Signaling



H.323/10

Both Endpoints Registered – GK Routed



H.323/11

H.323 problems

- very complex (200+ pages)
- for “UNI” only
- no multicast signaling
- limited multicast conferences (⇒ MCUs)
- call = TCP connection ↔ mobility, reliability
- but: capability negotiation (H.245)
- no media servers
- agile ports ⇒ firewalls difficult

H.323/12

H.323 delay

- several TCP connections ⇒ very long latency (6.5-8 RTTs)
 - 1 TCP SYN loss ⇒ delay of 6 seconds
 - 2 TCP SYN losses ⇒ delay of 24 seconds
- ⇒ H.323v2 for fewer connections, UDP?

H.323/13