Media Gateway Control Protocol and Related Musings
An Aside

• VoIP implementers think of the PSTN as “the old stuff we want to get rid of”
  – Major issue: terminology is not consistent
    » Asterisk calls any digit pattern an “extension” and the developers are quite proud of the fact that they have made extensions “more powerful”.
  – Other issues: Network management lessons are forgotten or ignored
    » Asterisk distributions like Trixbox have limited options to display the dial plan.
    » The Cisco UC 520 “Dashboard” does not show calls in progress.
The PSTN Gateway

• On the PSTN side
  – Looks like a PBX (trunk side)
  – Handles low-level signaling
    » Ground-start, Loop-Start
    » T1 CAS, ISDN PRI, etc.
  – Handles number transmission
    » DID, DNIS, ANI, Caller ID

• On the IP side
  – Must communication call info with the SIP Proxy or H.323 Gatekeeper
Option 1

• Gateway is a peer {proxy|gatekeeper}
• Popular in the SIP world
  – SIP “Trunk”
  – Gateway has its own dial plan and routing table (Cisco calls these “Dial Peers”)
  – Main SIP proxy uses its location registration logic to determine when to forward an INVITE to the gateway
  – For incoming calls the gateway sends an invite to the proxy
What originating number do I signal for Bob on the PSTN? Which trunk group do I use (e.g., local vs. LD)?

SIP INVITE 7405934891@gateway
Contact bob@proxy.net
What is the SIP address for the dialed number (is it the number or a name? Which proxy?)?

Gateway

SIP INVITE bob@proxy.net

614-555-0123

PSTN Trunks
Option 2

• Centralize configuration in the proxy or gatekeeper, and use a separate protocol to control the gateway.
  – Popular in H.323
    » H.248/Megaco
  – Popular in early Cisco implementations
    » MGCP
MGCP

• Components
  – Endpoints
    » Exist in a gateway
    » Physical trunks or lines
    » Logical points such as announcement or recording servers
  – SIP proxy usually handles the signaling
    » Known as MGC - Media Gateway Controller
  – Calls
    » Contain multiple connections (media flows)
MGCP Model

Diagrams from:
Simple Call between Gateways

Diagrams from:
Carrier Example

Diagrams from:
What about in-band signaling

• Analog trunks and T1-CAS
  – Signaling travels with the trunk to the gateway
  – MGC sends a Notification Request
    » Request contains the signal to look for, and what do do (normally: tell me when you see it).
    » Example
      • RQNT with parameter R: Hd(N)
      • Look for off-hook, and tell me
      • Useful to watch FXS ports (phones)