TRIP in Distributed Network Routing Architecture

Migrating to the IETF Standard Telecommunication Routing Information Distribution Protocol
PRC – Packet Routing Controller

- PRC (Packet Routing Controller)
- Roles of PRC:
  - Serves as a central controller for local routing, policy, screening and feature control,
  - Serves as an extension controller for call reachability beyond the local coverage,
  - Serves as a gateway controller for inter-carrier-network call handling.
PRC as a Local Central Controller

- PRC Domain: Local access domain serving a geographic location controlled by a PRC
A Carrier Network: Inter-connected Multiple PRC Domains

- Carrier Network: A number of PRC domains interconnected to each other to provide larger geographical coverage
Interworking between two Carrier Networks

- Internetwork between carrier networks
PRC – A Deeper View

• PRC’s Major Components:
  – Routing Engine with Redundancy Capability
  – Routing Information Database
  – External Routing Query Interface
  – External Configuration Interface
PRC DB Major Contents

- **Routing Information**
  - CDPN
  - CGPN
  - Digit Translation
  - 800
  - LNP
  - CNAM
  - Carrier ID
  - Country Codes

- **Call Treatment**
  - Announcement

- **Media Gateway Info.**
  - Chassis Info
  - TG/HG Info

- **Screening Rules**
  - COS/MCOS/ANI-COS
  - B/W List
  - Partition/SRS
  - Subscribe Dial Plan
    - PIN
    - Account code
    - Auth. Code
  - Calling Card (TCN)
  - Second Stage Dialing
  - Trunk class
Inter-PRC Routing Information Sharing

- **Within A Carrier Net**
  - CDPN etc. routing info need to be shared by all PRCs
  - Basic screening is done within local PRC domain
  - Calling card and second stage dialing info. need to be shared, but how?

- **Between Carrier Nets**
  - CDPN etc. routing info need to be shared by the interworking gateway PRCs
  - Interworking gateway treat off-net routes as “local” and share with other on-net PRCs
  - Basic screening is local
  - Calling card & second stage dialing?
Routing Information Exchange

- PRCs need to exchange routing information
- By either static or dynamic ways
  - Static: configuration or centralized database
  - Dynamic: TRIP – an IP BGP4 like protocol
TRIP Overview

• Telephony Routing over IP
• A policy driven inter-administrative domain protocol for:
  – advertising the reachability of telephony destinations
  – advertising attributes of the routes to those destinations
• Derived from BGP-4 with references from OSPF, IS-IS, SCSP etc.
• Runs over TCP.
TRIP Basic Operation

• Peer-to-peer session establishment and maintenance
  – transport connection establishment,
  – open and confirm connection parameters through message exchange,
  – negotiate LS capabilities and types of information to be advertised,
  – peer-to-peer keep-alive/notification mechanism
  – connection recovery on failure

• Database exchange and advertising TRIP routes

• Internal and External Synchronization
TRIP Messages

- **OPEN**
  - Capability Information

- **KEEPALIVE**

- **NOTIFICATION**
  - Error information

- **UPDATE**
  - Route attributes
    - Withdrawn Routes
    - Reachable Routes
    - Next Hop Server
    - Advertisement Path
    - Route Path
    - Atomic Aggregate
    - Local Preference
    - Multi Exit Disc
    - Communities
    - ITAD Topology
    - Converted Route
TRIP For Inter-PRC Routing Information Exchange

• TRIP fits Convergent inter-PRC routing information exchange requirement well
  – TRIP reachable routes and next hop server attribute for CDPN destination information,
  – Add new attributes as TRIP extension for PIN, AuthCode, Account Code etc. information exchange.

• IETF standard protocol, easy to migrate to global interoperability with 3rd party equipment

• Allow extension by adding more attributes
What Comes the Next?

- TGREP – Telephony Gateway Registration Protocol,
- an IETF proposal for exchange information between PRC and ICS,
- For register/upload trunk group level of configuration information from ICS to PRC
The Overall Solution

TRIP

TGREP

PRC Domain

PRC

PRC Domain

TGREP