Kamailio in the North American PSTN

Alex Balashov
Evariste Systems LLC
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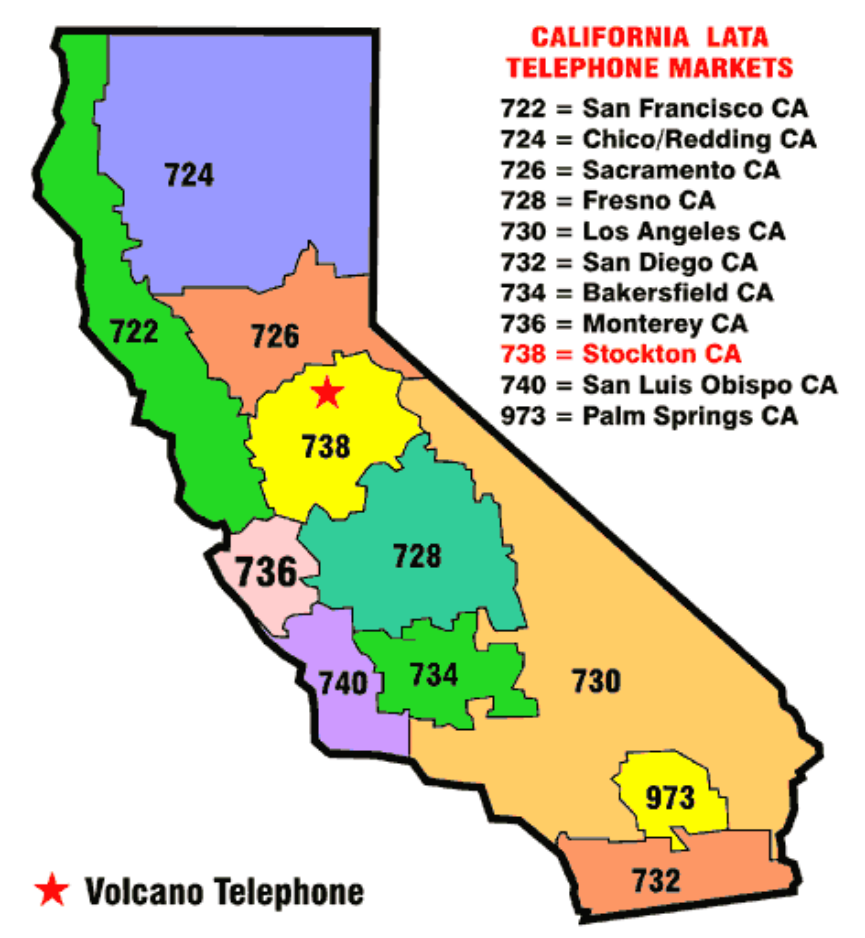
E-mail: abalashov@evaristesys.com
SIP URI: Does anyone even know how to call one of those?

@abalashov

+1 678-954-0671

US PSTN – Hierarchical Design

- Organised into administrative divisions known as LATAs
  - Local Access and Transport Areas



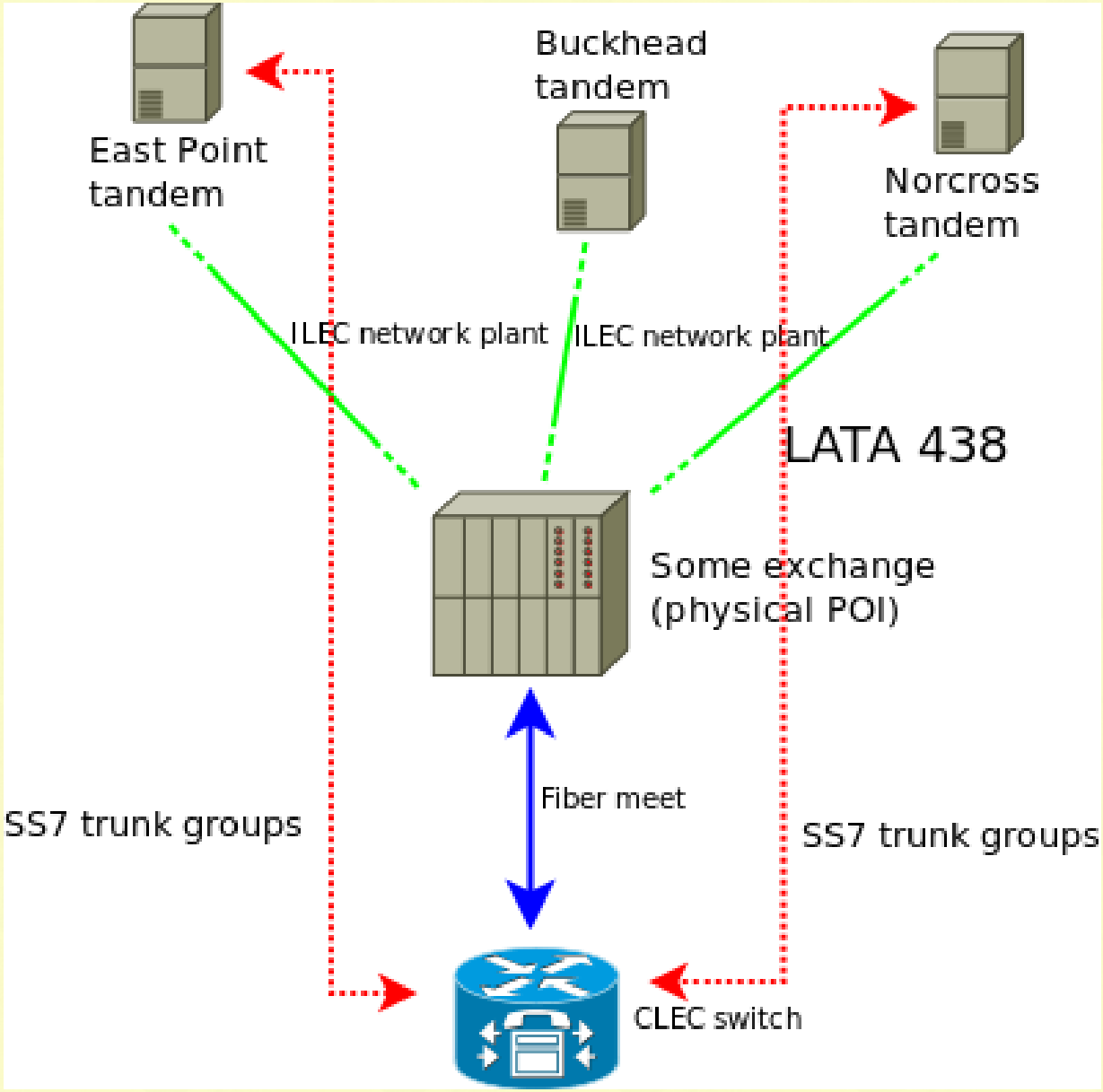
US PSTN – Hierarchical Design

- “Local exchange” services are intra-LATA.
- Traditional “long-distance” is inter-LATA.

US PSTN – Hierarchical Design

- LATAs came out of AT&T monopoly and divestiture
- Two types of Local Exchange Carriers:
  - Incument LEC (ILEC) – Regional Bell Operating Company (RBOC) or pre-divestiture non-AT&T entity
  - Competitive LEC (CLEC) – Interconnected competitive carrier, made possible by Telecommunications Act (1996).
- CLECs service the VoIP industry
  - Especially large ones: Level3, XO, etc.

US PSTN – Hierarchical Design



US PSTN – Hierarchical Design

- Interconnection is done in every LATA.
- Interconnection agreement terms depend on the ILEC whose territory the LATA belongs to.
- Physical interconnection is to a POI via a mid-span fiber meet.
- Logical interconnection is to tandems (“toll offices”):
  - LATAs have >= 1 tandem.
  - SS7 signaling.
  - “Default route” for inter-carrier reachability.
  - “Default route” for traditional IXC (“inter-exchange carrier” / “long-distance”) access.

US PSTN – Hierarchical Design

- Only LECs can directly interconnect with incumbents
- Interconnection is required to fulfill certain regulatory functions
  - e.g. 911 emergency calling
- Only LECs can directly receive number allocations
- If interconnected, ILEC interconnection is mandatory
- If connected to ILEC, connection to its tandems is mandatory
- In most ILEC territories, connection to **all** tandems is mandatory
- Most ITSPs buy origination/termination from CLECs
  - “Underlying carrier” (ULC)
  - Apart from regional, few have resources to deal with all this

US PSTN – Hierarchical Design

- Inter-carrier settlement
  - Intra-LATA: reciprocal compensation
  - Inter-LATA: access charges
    - Rural carriers can charge higher ones, allowing arbitrage scams such as free conference calling services
- Number portability
  - Centralised
  - Run by private company: Neustar
  - Clearinghouse that returns LRN (Local Routing Number) via real-time SS7 TCAP queries
  - More and more accessible via SIP redirect-based services

US PSTN – Number Portability

- Why is number portability (LNP) so important?
- Because termination cost varies with access charges of terminating operator, not number dialed.
- The most important thing when terminating a call is to find out who the underlying operator is.

US PSTN – Calling Name / Directory

- “CNAM”
- Also queried via SS7
- Also accessible via SIP redirect
  - HTTP APIs are much more common, though
  - e.g. Bandwidth.com's OpenCNAM

So what?

- Who cares?
- American (and Canadian) customers do.
- PSTN isn't going away any time soon.
  - ILEC tandem remains regulatorily mandated “default route” for many things
  - Americans love byzantine regulatory patchworks arising from obsession with federalism
  - Consequently, LECs are regulated at federal (FCC) and state (PUC – Public Utility Commission) levels
  - Too much lobbying in support of incumbent revenue models
  - Much depends on ILECs, who are under no mandate to do IP interconnects
  - Inter-carrier compensation will probably change a lot very soon, though (don't hold breath)

Role of Kamailio

- Most VoIP companies and ITSPs are interested in connecting to the PSTN
- VoIP is overwhelmingly PSTN-oriented
- Pure application space:
  - Yes, there is a need for pure-SIP custom gateways, load balancers, etc. that are not particularly PSTN-aware
- Most useful applications of Kamailio require PSTN awareness
- This will not change soon

Role of Kamailio

- Kamailio is seen as high throughout/high performance way to add intelligence to “dumb” network elements.
- Value comes from integration paths/APIs/database access/RPC interfaces/etc.
  - And performance.

Kamailio – Market Opportunities

- US routing and pricing is complex!
- Built-in modules like **lcr** and **carrierroute** do *not* provide sufficient business-layer intelligence to make this work
- Opportunities:
  - Expand that intelligence
  - LCR gateways
  - SIP information service interfaces (e.g. CNAM)

Kamailio – Market Opportunities

- Other things that interest North American customers:
  - SIP load balancers
  - Registrars
  - Security front-end / quasi-”SBC” type role
  - Other classical Kamailio stuff
- But the most value is in:
  - Injecting SIP-based intermediate intelligence into existing networks
  - Interface with more classical Class 4/5 softswitch platforms
  - Signaling gateway / transport translation
  - PSTN interworking services (e.g. LNP database access)