IPX Routing Requirements

Centralized Routing Engine (CRE)

Key learning from recent IPX implementations

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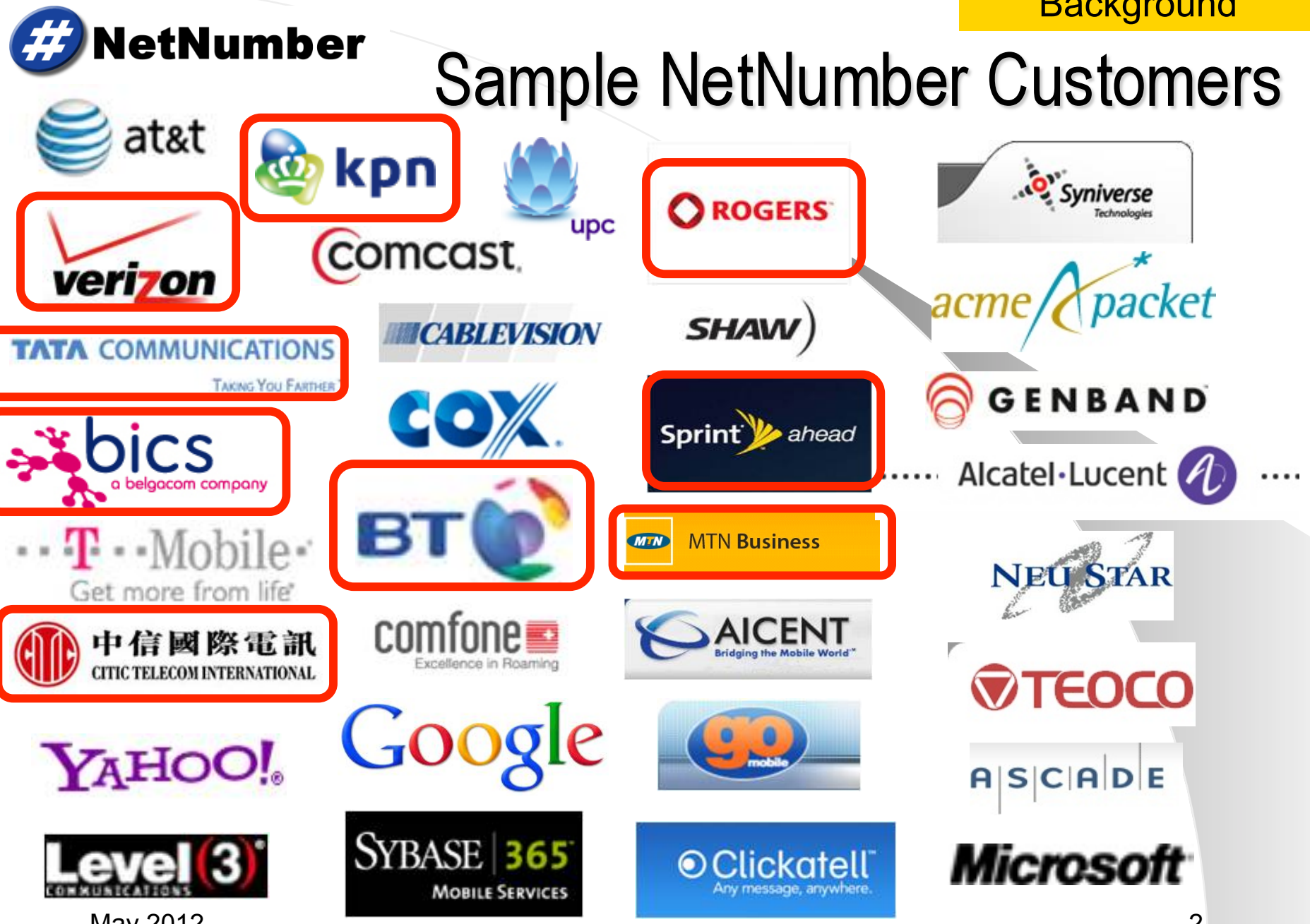
Sample NetNumber Customers



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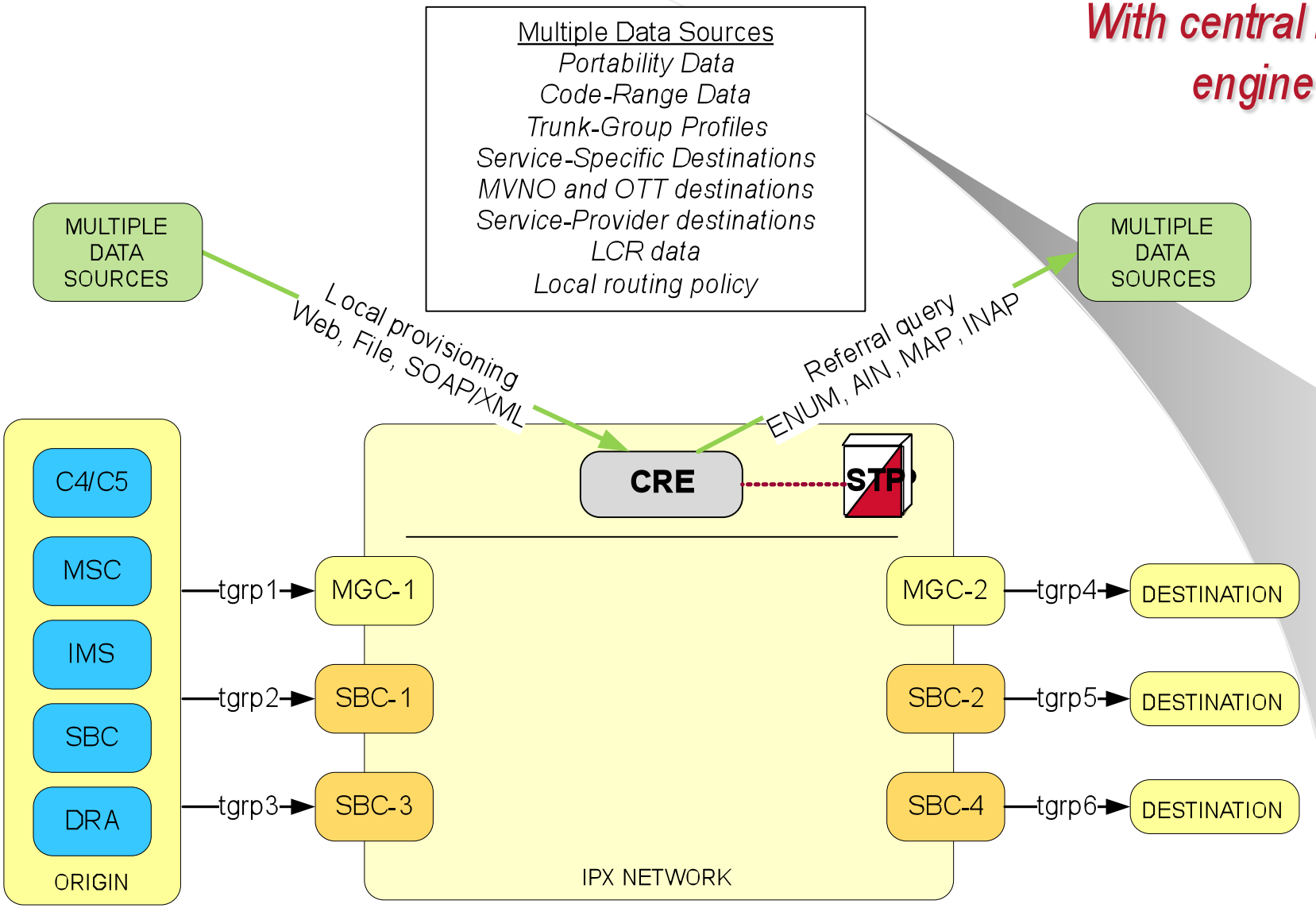
Recent IPX Implementations

- Common Features
  - MGC and SBC services at edge of network
    - MGC – TDM trunks
    - SBC – SIP trunks
  - Central Routing Engine (CRE)
    - *SIP-redirect from MGC or SBC on every call to access routing instructions.*
  - Multiple Sources of Routing Data
    - Global portability data from multiple countries and multiple data sources
    - Override data
      - OTT, and Enterprise override data
    - Carrier-of-Record data
      - (i.e. Comcast, Verizon-Wireless)
- IPX provider specific routing-logic
  - IPX routing goes well beyond original LCR model
    - Origin-based routing
    - Service-specific routing
    - Global portability-correction
    - Dynamic interworking (transcoding, SIP-to-SIPI, transrating)
    - Traditional LCR destinations

Baseline IPX Network Design

With central routing engine (CRE)



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Centralized Routing Model

Key benefits to IPX providers

- Simplified administration of routing data – *lower operating costs*
  - One location to update routing for all switches.
- Real-time routing updates – *faster introduction of new services*
- Origin specific routing – *customer specific solutions*
  - Every origin can receive its own unique routing services.
- Simplified deployment of new switching systems – *reduced capex*
  - No requirement to learn in-switch routing database.
- Unlimited routing detail – *more accurate routing*
  - 1.5 billion routing entries supported in TITAN.
- Global portability-correction – *lower termination rates*
  - Combination of local download and referral-query
- Customized routing logic – *IPX provider solution - not a vendor*
  - Service logic implemented in TITAN programmable service logic execution environment.

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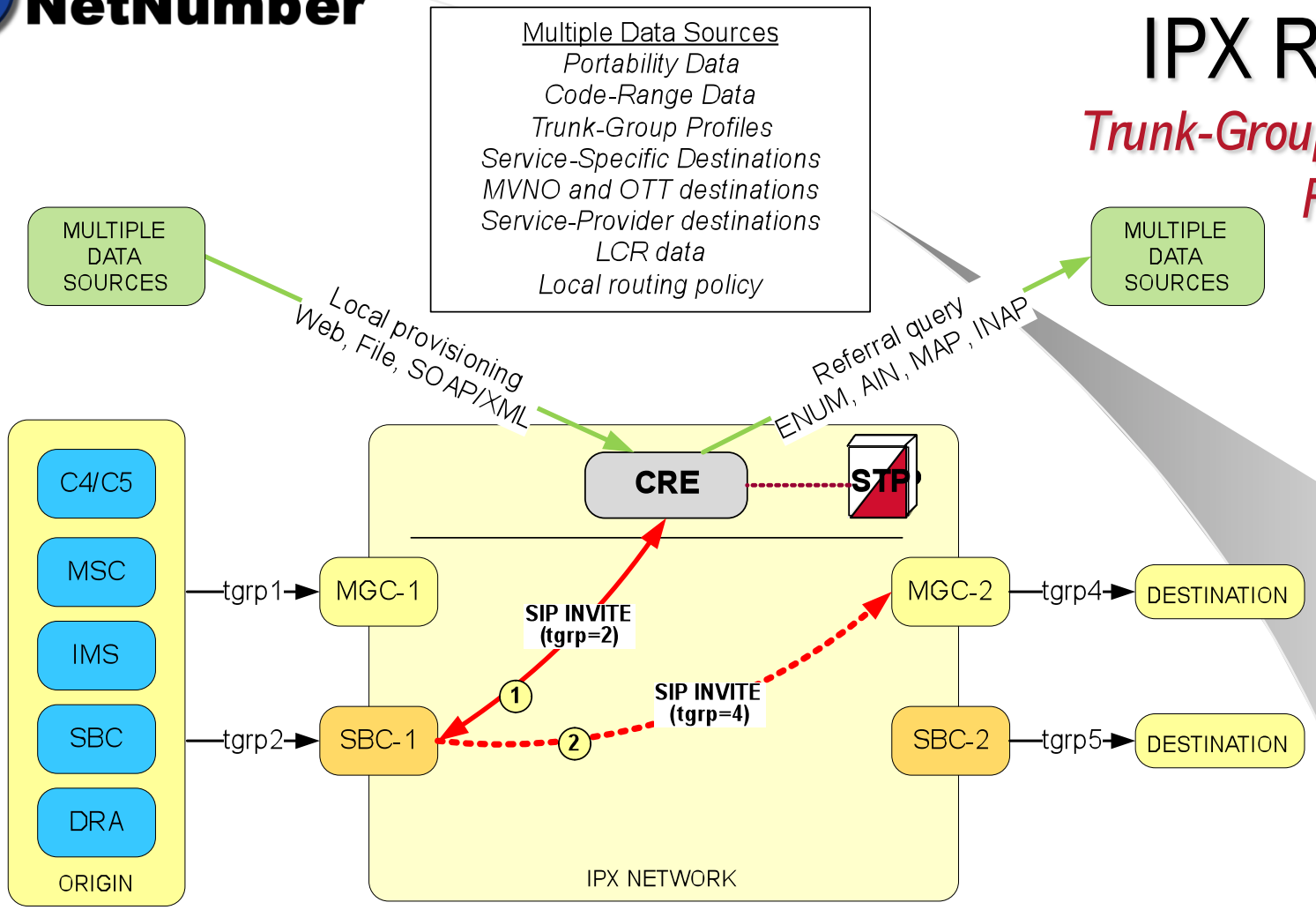
Architecture

IPX Routing

Trunk-Group Routing
RFC 4904



Originating switch sends originating trunk-group info to CRE with SIP-INVITE as per RFC 4904. CRE returns route-list with destination trunk-group info.

*sip:+12125551234;npdi;**tgrp=4**;trunk-context=ipx@**mgc2.ipx**;user=phone*

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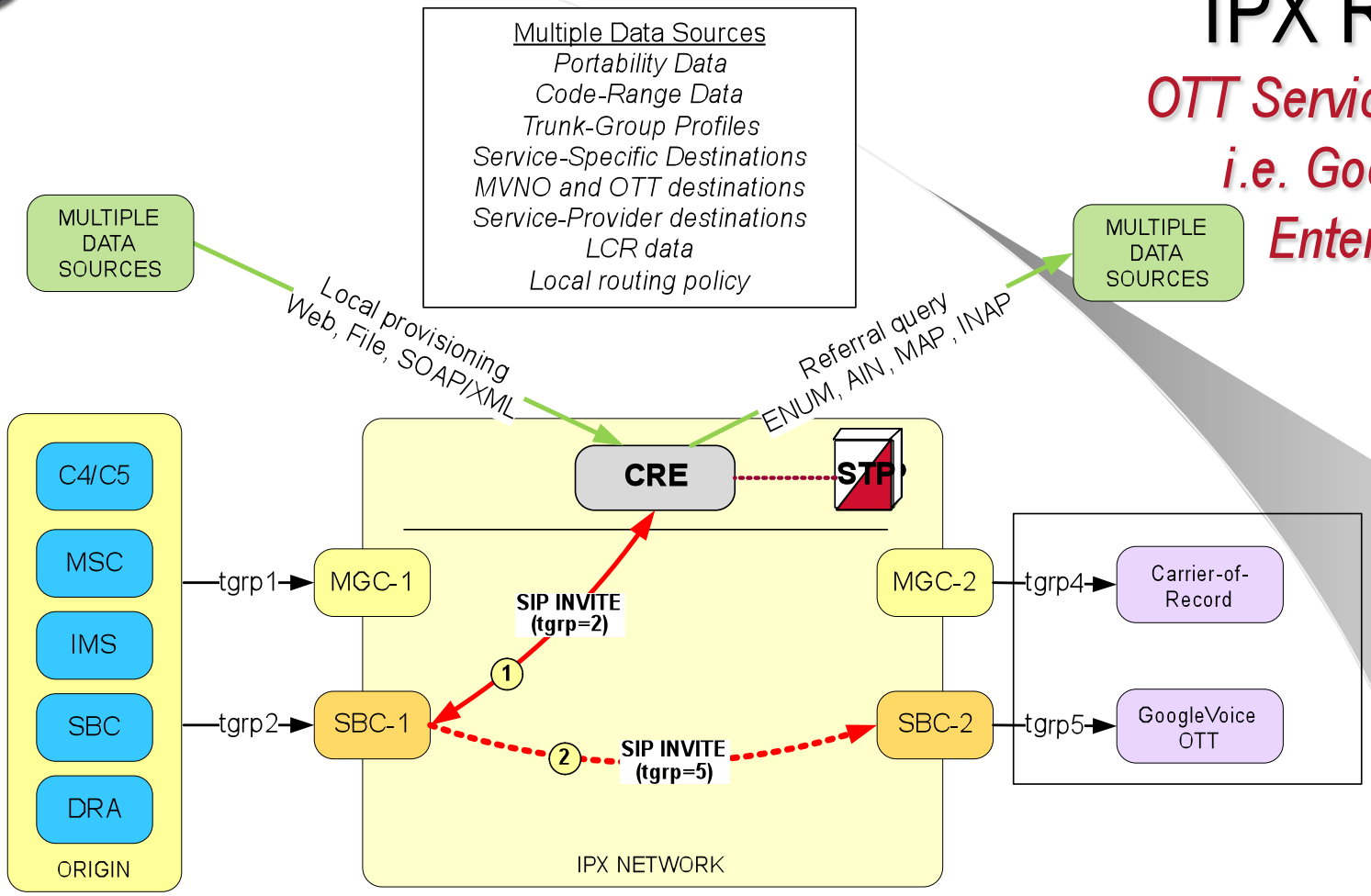
Architecture

IPX Routing

OTT Service Routing i.e. GoogleVoice, Enterprise, etc.



CRE performs portability-correction and OTT override routing. Dialed digits are served by a PSTN Carrier but also served by an OTT provider (i.e. GoogleVoice). CRE returns route-list with destination trunk-group info based on local routing policy.

*sip:+12125551234;npdi;**tgrp=5**;trunk-context=ipx@**sbc2.ipx**;user=phone*

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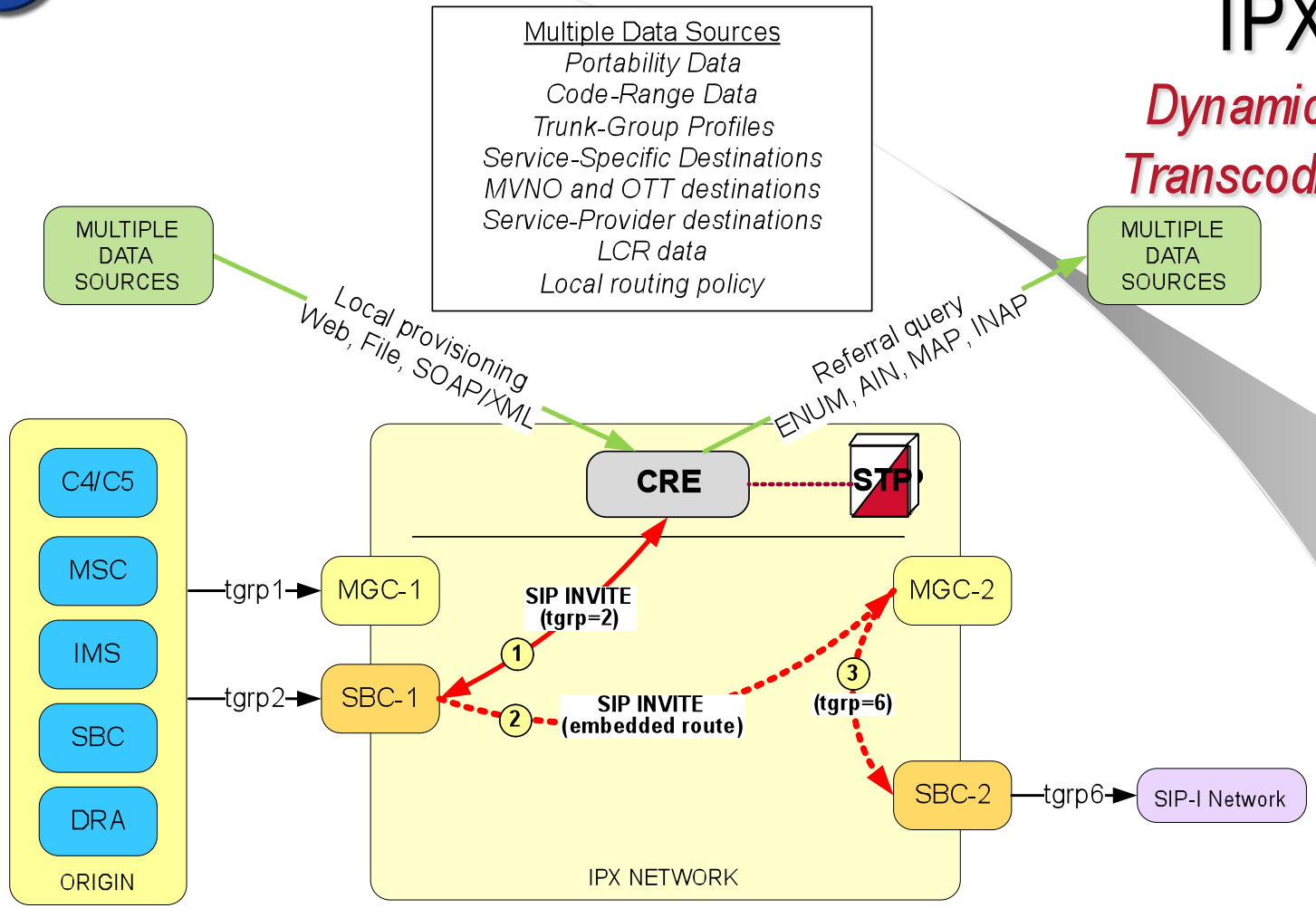
Architecture

IPX Routing

Dynamic Interworking
Transcoding, SIPI, etc.



CPE compares profile of the originating-trunk and destination-trunk to select dynamic interworking services available via the MGC. CRE returns route-list with complex route that includes dynamic interworking.

*sip:+12125551234;npdi;**tgrp=6**;trunk-context=ipx@**sbc2.ipx**;user=phone?**route=<sipi.mgc2.ipx**;lr>*

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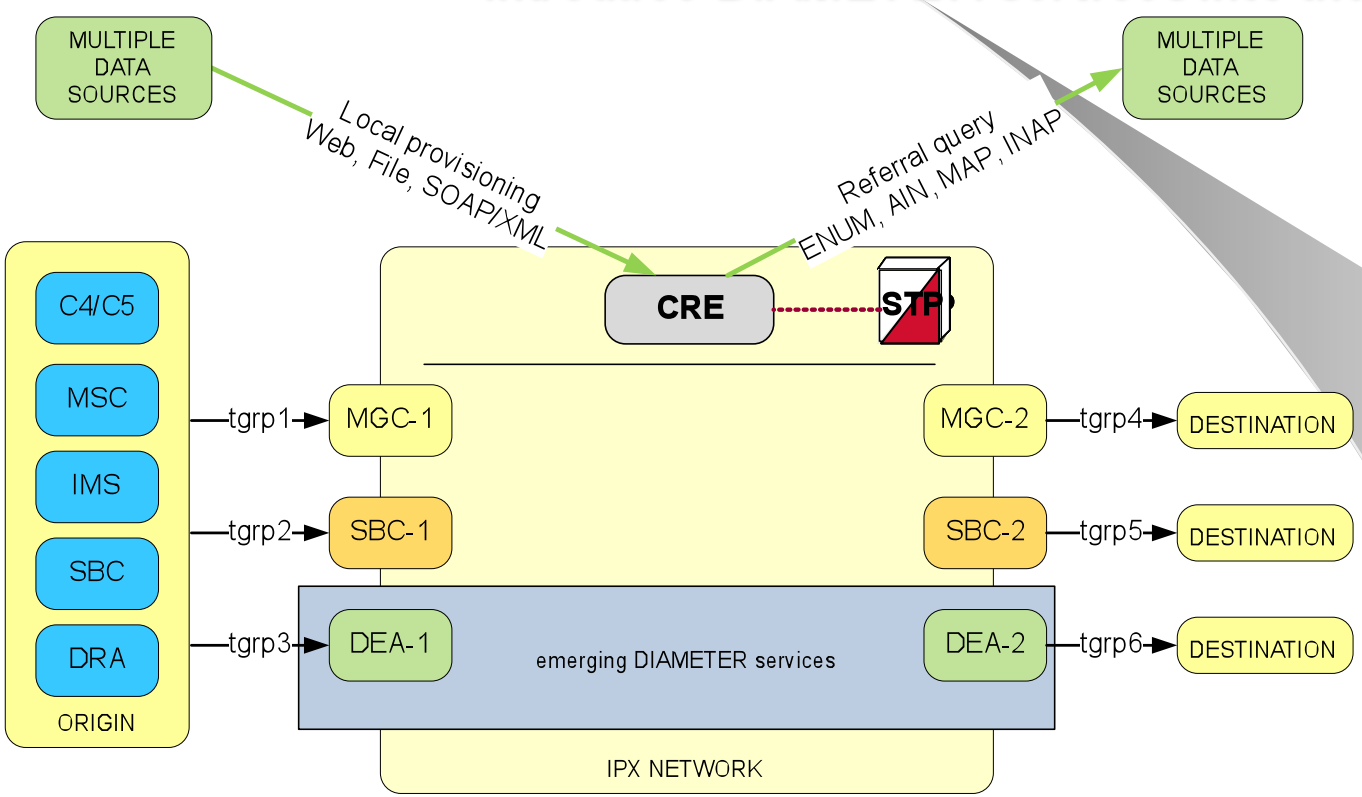
Word Of Warning For DIAMETER

Avoid mistake of building a separate routing solution when you introduce DIAMETER services into the IPX network



DIAMETER agents (edge-agents and routing-agents) are just one more "application" in the IPX network that needs access routing database services. Avoid the temptation to build another stand-alone "island" of routing logic when you introduce this next application to the network.

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Thank You