Reaching Functional Equivalency in Dialing Parity and Emergency Services (911/E911)

Solution presented by:

AT&T VRS

Hands On VRS

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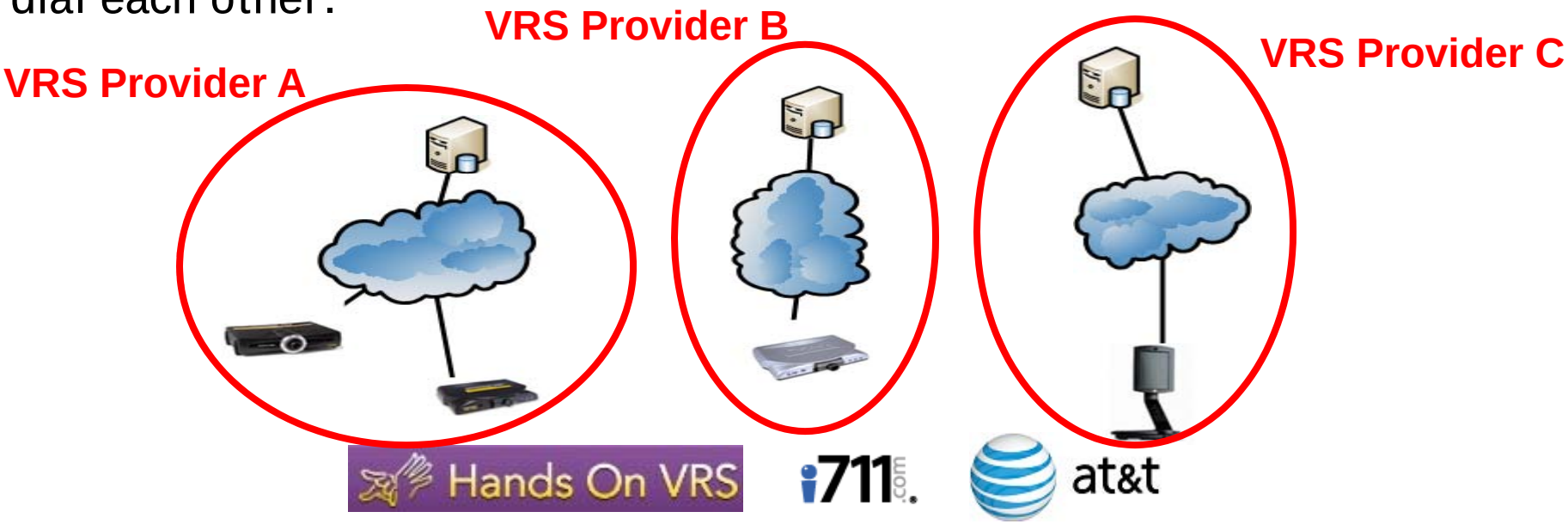
Need For Functional Equivalency

- Section 225 of Communications Act requires functional equivalent service.
- Relay is not functionally equivalent:
  - Lacks dialing parity & true interoperability between callers.
  - Emergency Services, 911 / E911 are not generally available.
- The solution requires two steps:
  1. Standardized numbering plan for the VRS users and Industry.
  2. Standard interface to the existing 911 / E911 service.

Today Multiple VRS Providers operate Multiple Separate Databases

- There are an estimated 100,000 video phones in use today by Deaf & Hard of Hearing consumers.
- Each provider maintains a separate and closed database of its users and devices, including their unique IP address on the Internet.
  - Some provider assign proxy (faux) numbers, some assign extensions, others provide Toll Free numbers or none at all – dialing methods vary depending upon provider and device.
- Because these databases are closed and do not communicate with each other ("peer") end users are restricted from being able to easily dial each other.

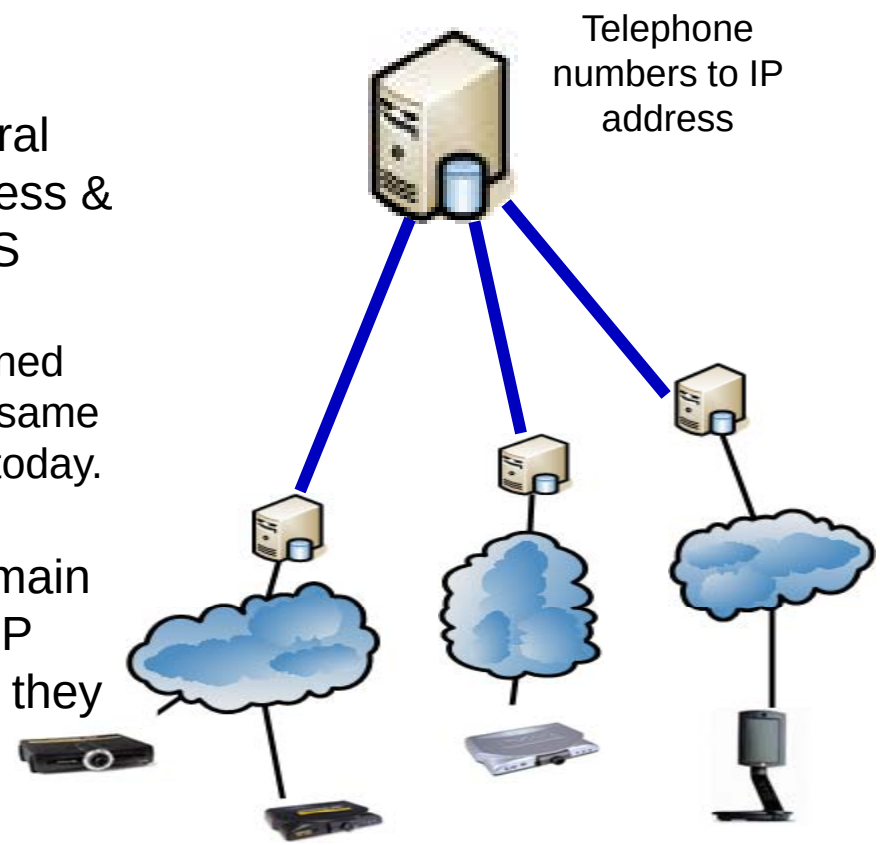


Simple Solution for Creating Dialing Parity

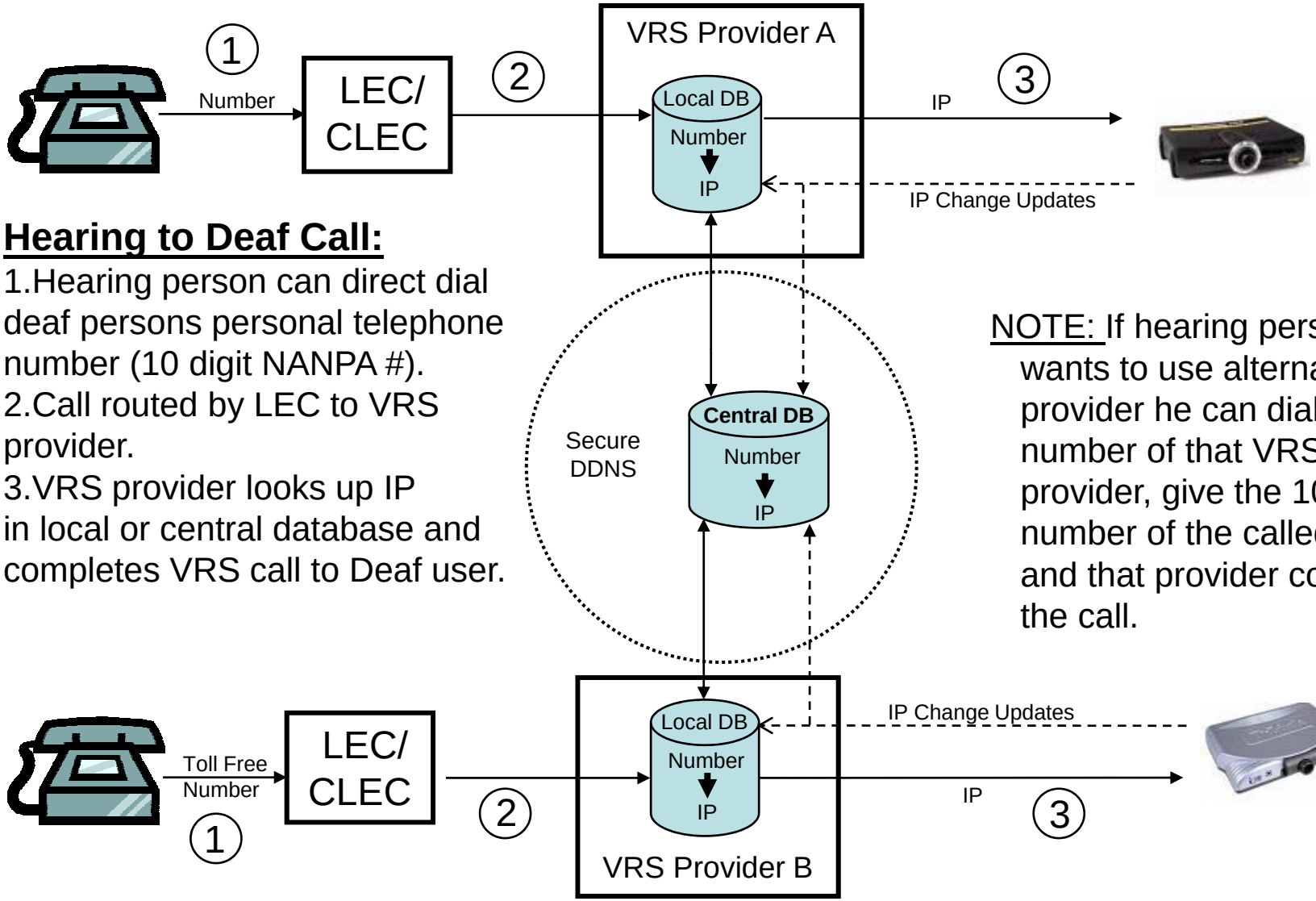
1. New secure 3rd Party database containing current IP address & telephone numbers of VRS users.

2. Each VRS provider must keep the Central Database current with end user IP address & telephone number using a secure DDNS interface.
   - NANPA Local Numbers are easily obtained through commercial agreements in the same manner that VoIP service providers do today.

3. The 100,000+ existing video phones remain the same, communicating their current IP address to the provider of the device as they do today.



Direct Dialing (Hearing to Deaf)



Hearing to Deaf Call:

1.Hearing person can direct dial deaf persons personal telephone number (10 digit NANPA #).
2.Call routed by LEC to VRS provider.
3.VRS provider looks up IP in local or central database and completes VRS call to Deaf user.

NOTE: If hearing person wants to use alternate VRS provider he can dial 800 number of that VRS provider, give the 10 digit number of the called party and that provider completes the call.

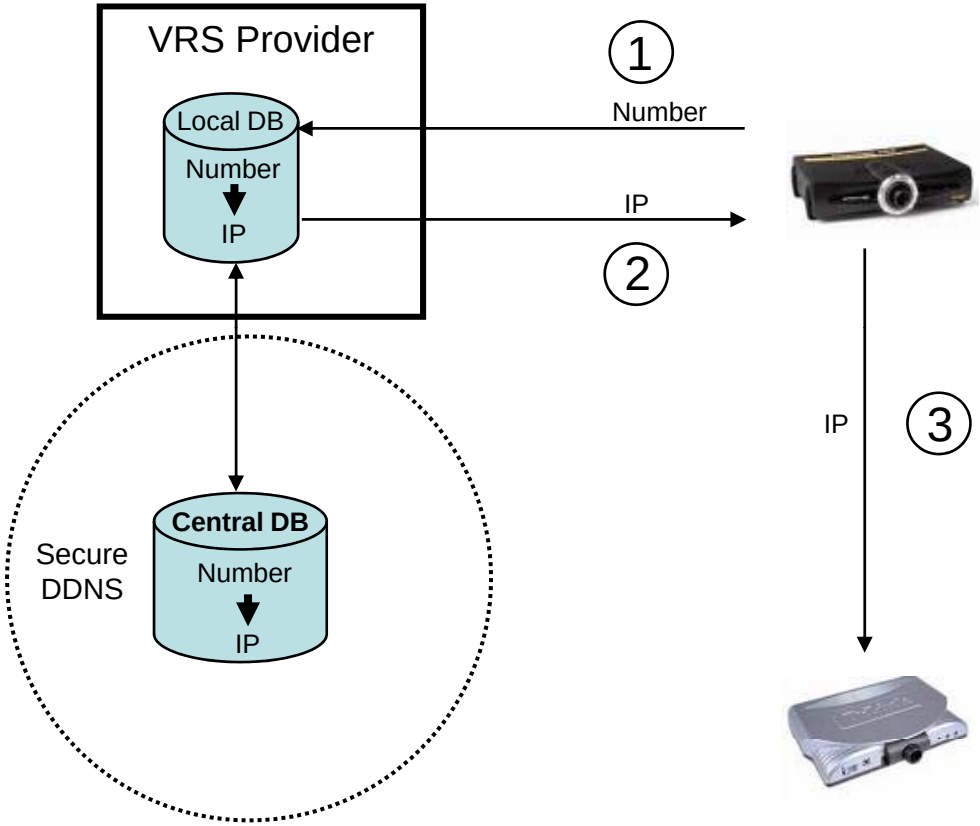
Direct Dialing (Deaf to Deaf)

Deaf to Deaf Call:

1. Deaf user dials 10 digit number of friend (not knowing or caring what device they use).

2. VP queries provider database, VRS provider db queries central db if needed to return current IP address of friend.

3. Direct call established to friend using current IP address.



Dialing Parity - Stakeholder Impacts

Deaf & Hearing End Users

1. No change to Customer Premise Equipment or software should be required.
2. Sign up for true NANPA telephone number with provider of choice.
3. Dial friends & family using 10 digit numbers without regard to type of equipment or provider used by the party you are calling, no longer worry about IP address changes.

VRS Service Providers

1. Continue to manage end user device IP addresses and provide call routing instructions based on 10 digit number inputs from end users.
2. Obtain NANPA numbers from PSTN carrier of choice and offer/assign them to end users.
3. Interconnect user database to Central Database to peer IP addresses & telephone number information via secure data connection.
   - Update Central DB every 60 seconds w/ current / changed end user routing information (IP & Phone #).
   - Query Central DB for call routing information as needed
4. Setup appropriate procedures and controls to protect Customer Proprietary Network Information (CPNI).
5. Do not discriminate between callers regardless of who provides the NANPA number.

Dialing Parity – Stakeholder Impacts

PSTN Carriers / System

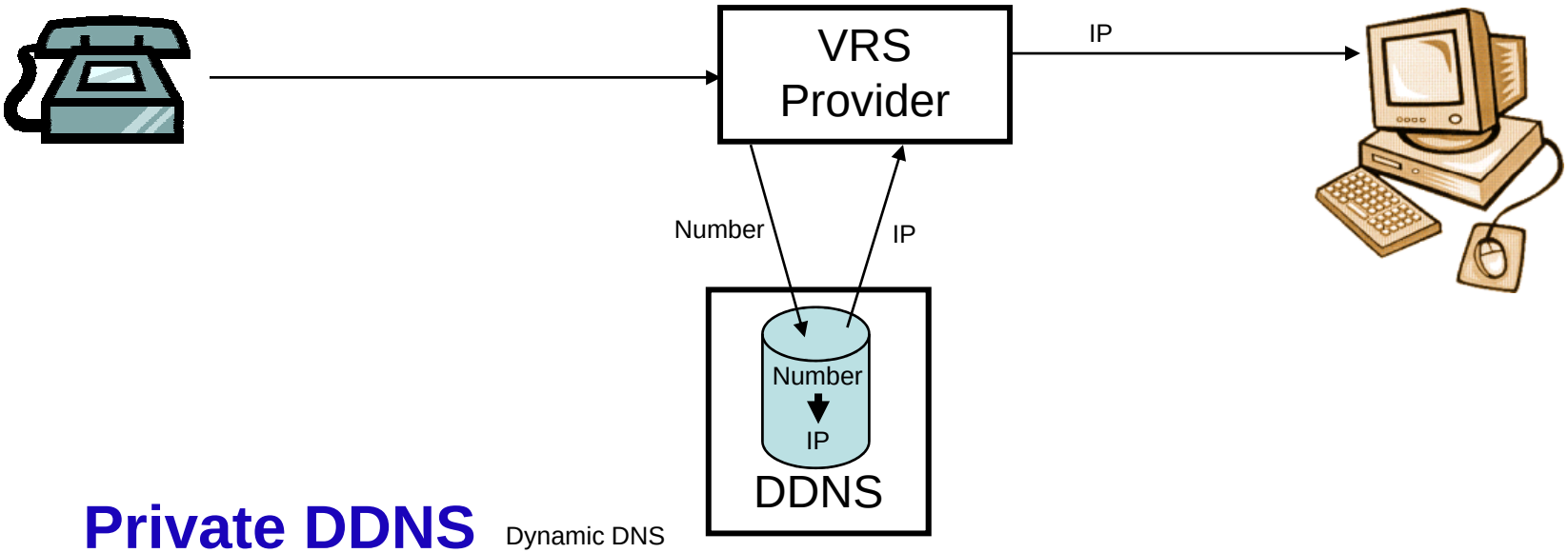
1. No Change to existing systems or processes required.
2. Standard (current) numbering rules and network management rules continue to apply.
3. All current telecommunication surcharges, fees and taxes continue to apply as usual to the current responsible parties.
4. Offer reasonable commercial solutions to provider NANPA numbers and access to the PSTN – similar to what VoIP service providers have used for the past several years.
5. Current Local Number Portability ("LNP") regulations and processes enable end users to easily switch preferred VRS providers and keep their local telephone number.

Regulatory Groups

1. NANPA – No Change to current numbering rules.
2. NECA/TRS Fund – consider reasonable costs for solution in VRS reimbursement rates.
3. FCC – adopts an order to:
   - Require use of central routing database.
   - Require VRS companies to maintain accurate information in central database on near-real time basis.
   - Require VRS providers to maintain / provide NANPA numbers for their end users.
   - Apply CPNI & Anti-Slamming rules to VRS providers similar to voice carriers today.
   - Continue to enforce interoperability regulations.
   - Appoint central database administrator if providers are unable to agree upon one.

Alternative Proposals have significant challenges

- Proposal utilizing the NPAC
  - The NPAC is not a call processing database and will not contain IP addresses
  - Instead the NPAC will have URIs, e.g. 7948675309@vrssp1.com
  - The NPAC downloads the URIs to a 3rd party database, which VRS companies would have to interface with.
  - On calls to VRS users other than their own, the calling VRS SP must
    - Query the 3rd party database for the URI
    - Query DNS to resolve the URI to the IP address of the serving VRS SP
    - Send the SETUP message to the serving VRS SP for forwarding or redirection to the called VRS user
  - New development in the NPAC is required
  - VRS SPs must
    - Work through the company providing telephone numbers to provision the NPAC
    - contract with a database provider and meet their query interface
    - Plan to redirect or forward calls originated by other providers

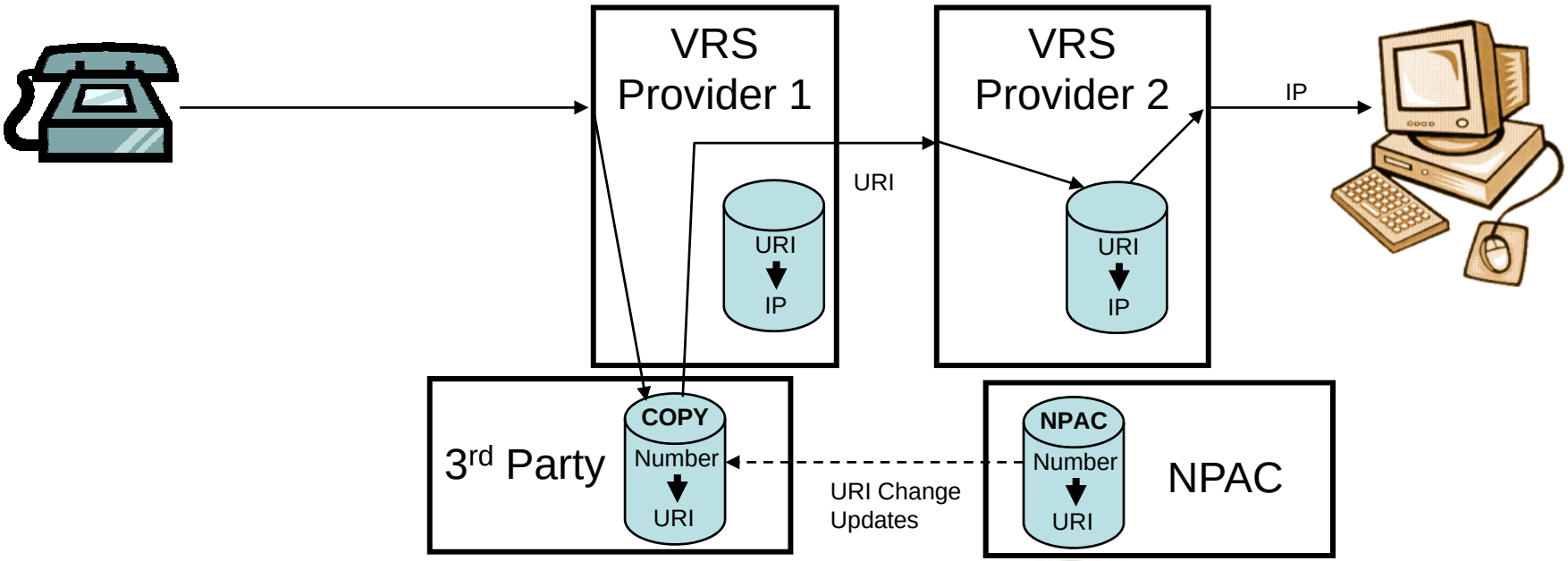


Private DDNS

Dynamic DNS

NPAC

Number Portability Administration Center



Alternative Proposals have significant challenges

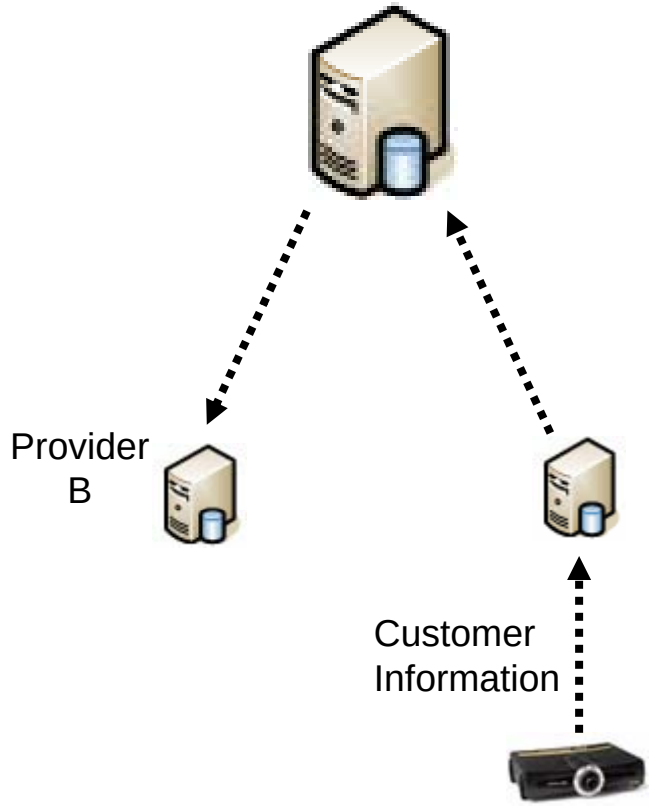
- Public Dynamic DNS
  - Implementing Dynamic DNS at the end user location would require end user to obtain and / or configure customer premise equipment to support this solution at a cost of approximately $50 to $100 dollars each.
  - A publicly accessible DDNS design presents a security hole whereby malicious users may “war dial” the database to obtain phone numbers and IP addresses of all deaf customers.

Customer Information

-The original provider of the video phone maintains direct control of the user information, even if the user switches providers. Provider B must rely on Provider A to keep the master database updated.

-The FCC's ruling needs to assure the original equipment provider did not hinder or interfere with this flow of customer information.

-The ultimate solution is for provider B to give the customer a video phone so they can control the customer information.

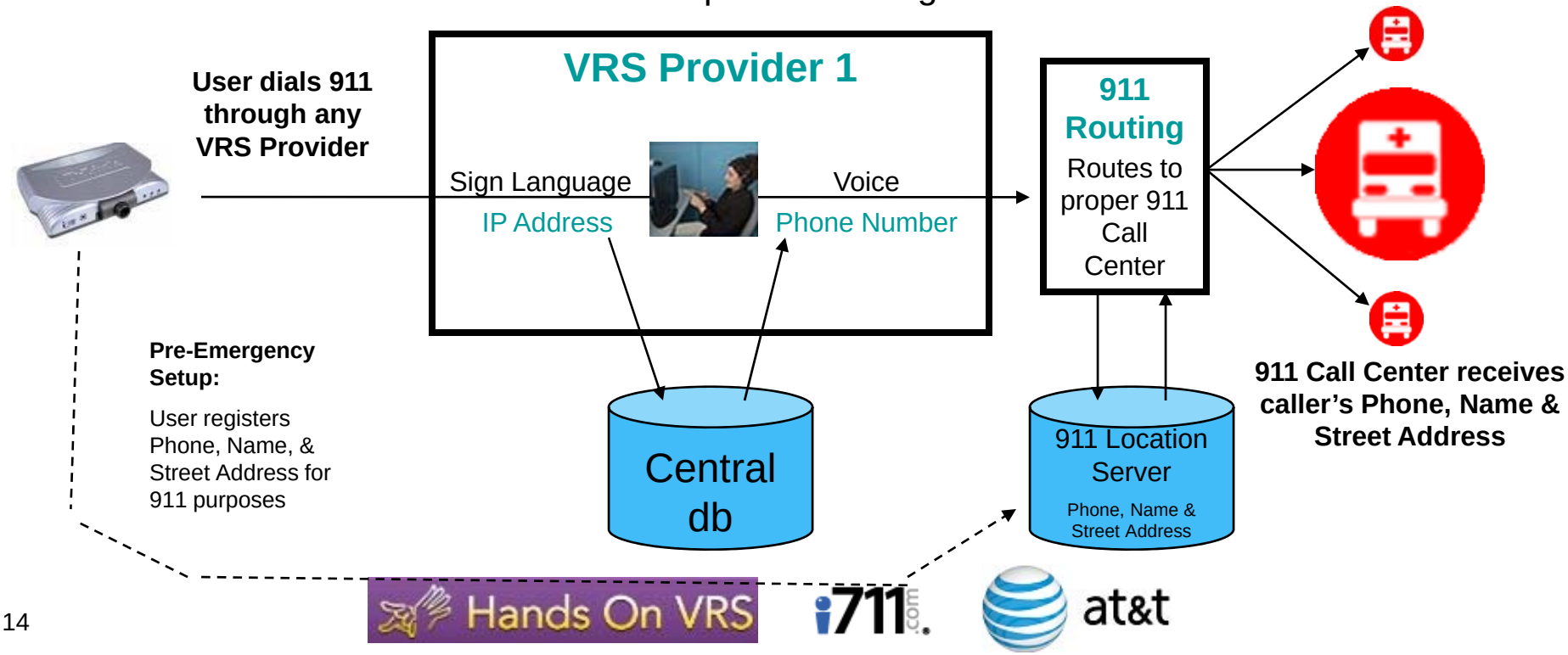


Enabling and Providing 911 & E-911 for VRS Users

- Once VRS users are able to obtain true NANPA registered local telephone numbers (from their VRS provider of choice) there is no reason why VRS providers can not implement similar 911/E-911 solutions as the VoIP providers and wireless carriers have done already.
- True NANPA numbers can be registered in existing Dynamic 911 ALI databases without concern for database numbering conflicts that exist today in VRS industry.
- All VRS providers must offer and end users will need to use valid NANPA phone numbers.
  - NOTE: This will require some providers to change the faux numbers, or "extensions" previously assigned to end users

Deaf 911 Call Flow – Leveraging Current Wireless & VoIP 911 Solutions

- When a VRS user obtains her phone number she registers her current street address with the 911 location server – through the VRS provider of her choice.
- VRS provider obtains user phone number from the Central DB (or its local database if available) and routes call to the 911 service provider for delivery to the appropriate PSAP and interprets, the emergency call for the user & 911 operator.
- If caller is not pre-registered, VI will need to obtain location information from caller, load address information in real time prior to routing the 911 call.



Deaf 911 - Stakeholder Impacts

Deaf & Hearing End Users

1. No Change to Customer Premise Equipment or software should be required.
2. Sign up for True NANPA local telephone number with provider of choice and register street address for 911 service.
3. End Users will be required to maintain current street address information with their provider, similar to VoIP end users.
4. Dial 911 through provider of choice upon emergency situations.
5. In the event they dial 911 through an alternate VRS provider they will need to provide address information to the VI at the time of the call prior to being connected to a PSAP.

VRS Service Providers

1. Subscribe to 911 solution similar to VoIP service providers.
2. Require customers to register their address for 911 when they receive their local phone number.
3. Train Video Interpreters on best practices of how to handle 911 calls, including when callers are not pre-registered.
4. Implement a priority routing mechanism for 911 calls – 911 calls should not wait in standard VRS queue.
5. Pass caller's local phone number to 911 service provider as caller's ANI information.

Deaf 911- Stakeholder Impacts

PSTN Carriers / Systems

1. Solution utilizes the current industry 911 solutions which VoIP and wireless service providers benefit from today.

Regulatory Groups

1. NECA/TRS Fund – consider reasonable costs for solution in VRS reimbursement rates.
2. FCC – adopt an order to:
   - Require use of central routing database.
   - Require VRS companies to maintain accurate information in central database on near-real time basis.
   - Require VRS providers to maintain / provide NANPA numbers for their end users.
   - Adopt CPNI and Anti-Slamming rules for VRS providers similar to those which apply to voice carriers today.
   - Provide VRS providers with similar liability protections that current regulated carriers enjoy when providing 911 services.
   - Adjust VRS Queuing rules to prioritize 911 calls.

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Proposed Implementation Plan

Once the FCC Order is effective, these solutions can be put in place very quickly.

	Estimated Implementation Time	Budgetary Cost per User per Month
VRS providers obtain and begin to offer local NANPA phone numbers	90 Days	$0.60
Develop and Implement Central Database	120 Days	$0.75
VRS providers contract and implement 911 solution	90 Days	$1.00
Total:	**120 Day Lead Time**	**$2.35**

VRS Provider Investment Costs - *estimated*

	Estimated Labor Costs	Estimated Hard Costs
Build and test database interface to Central Database	40 to 80 Person Hours ($8,000)	$15,000 Hardware & Software
Commercial agreement for Local NANPA numbers	40 to 60 Person Hours ($6,000)	$5,000
Commercial agreement for 911 solution	300 Person Hours ($30,000)	$5,000
Investment total:	$44,000	$25,000
Monthly Costs based on # of Subscribers (assuming $2.50 per subscriber)		
10,000 Subscribers	$25,000	
75,000 Subscribers	$187,000	

Result: True Interoperability!

We can now access Emergency Services (911) just like everyone else

I can Video call my friends without knowing their IP addresses!

I can have business cards that look like my colleagues

This proposed solution is a collaborative effort from the providers listed below. We believe this is the best solution for the relay industry and will bring functional equivalence to our relay customers.

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Questions?

Glossary of Terms

- **ALI Database** – Automatic Location Identifier database matching phone number (ANI) to physical street address for 911 services
- **ANI** – Automatic Number Identifier (phone number)
- **CLEC** – Competitive Local Exchange Carrier
- **CPNI** – Customer Proprietary Network Information
- **LEC** – Local Exchange Carrier
- **NANPA** – North America Numbering Plan Administration
- **PSAP** – Public Safety Answering Point, 911 emergency dispatch center
- **PSTN** – Public Switched Telephone Network
- **VI** – Visual Interpreter, interpret sign language to spoken language over Video Relay Service
- **VoIP** – Voice over IP
- **VRS** – Video Relay Service