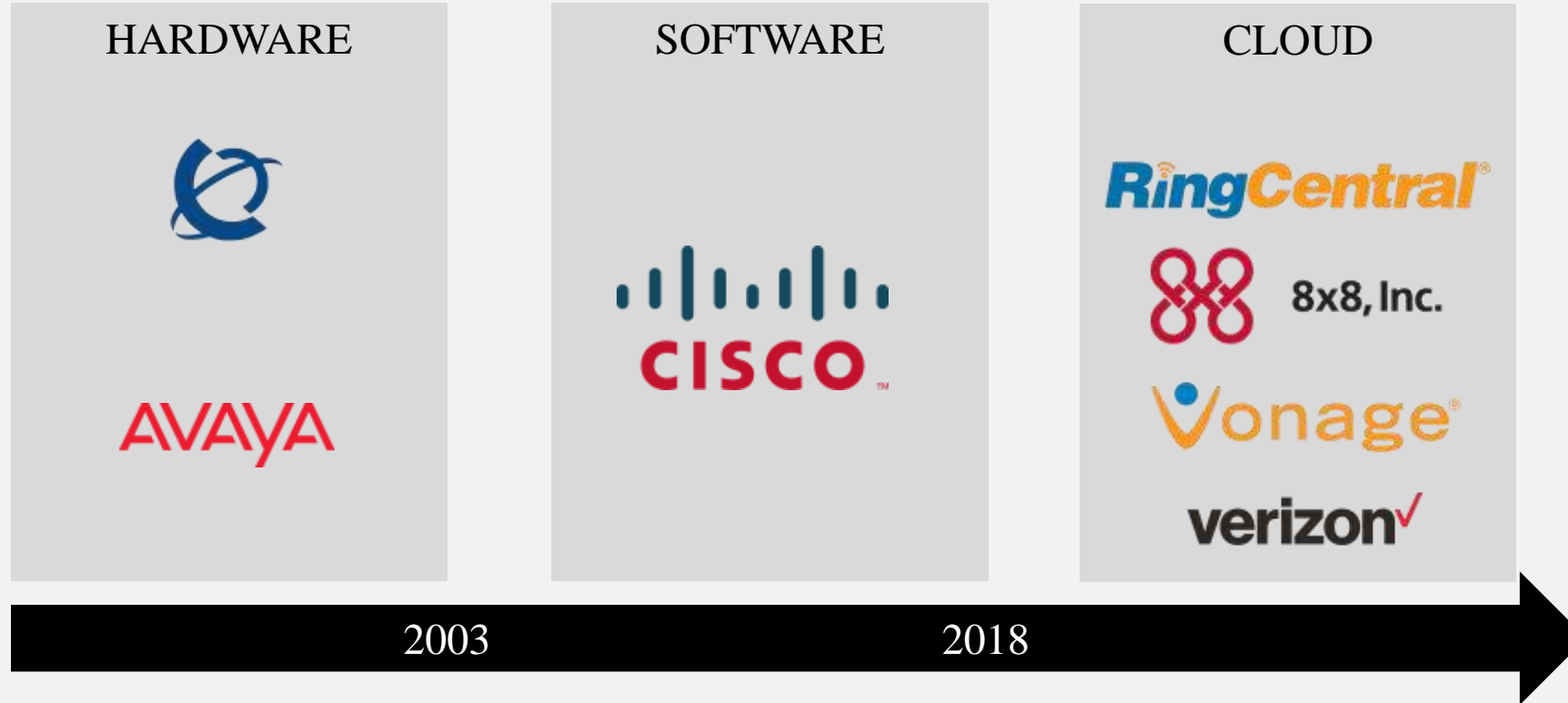


IMPLICATIONS OF ENTERPRISE CLOUD ON SIP NETWORKS

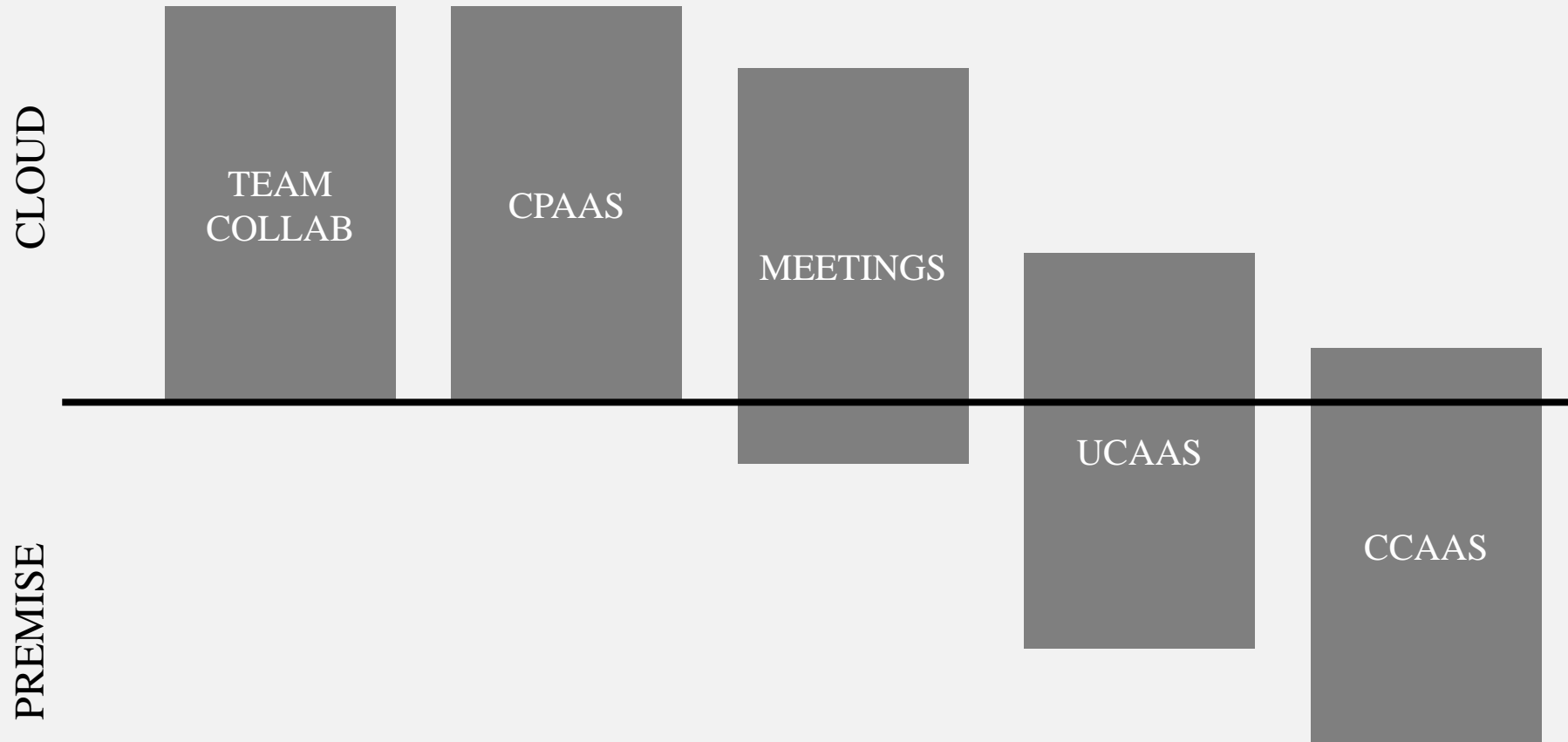
Jonathan Rosenberg

Or, “How the cloud changes everything”

THREE ERAS OF ENTERPRISE TELECOM



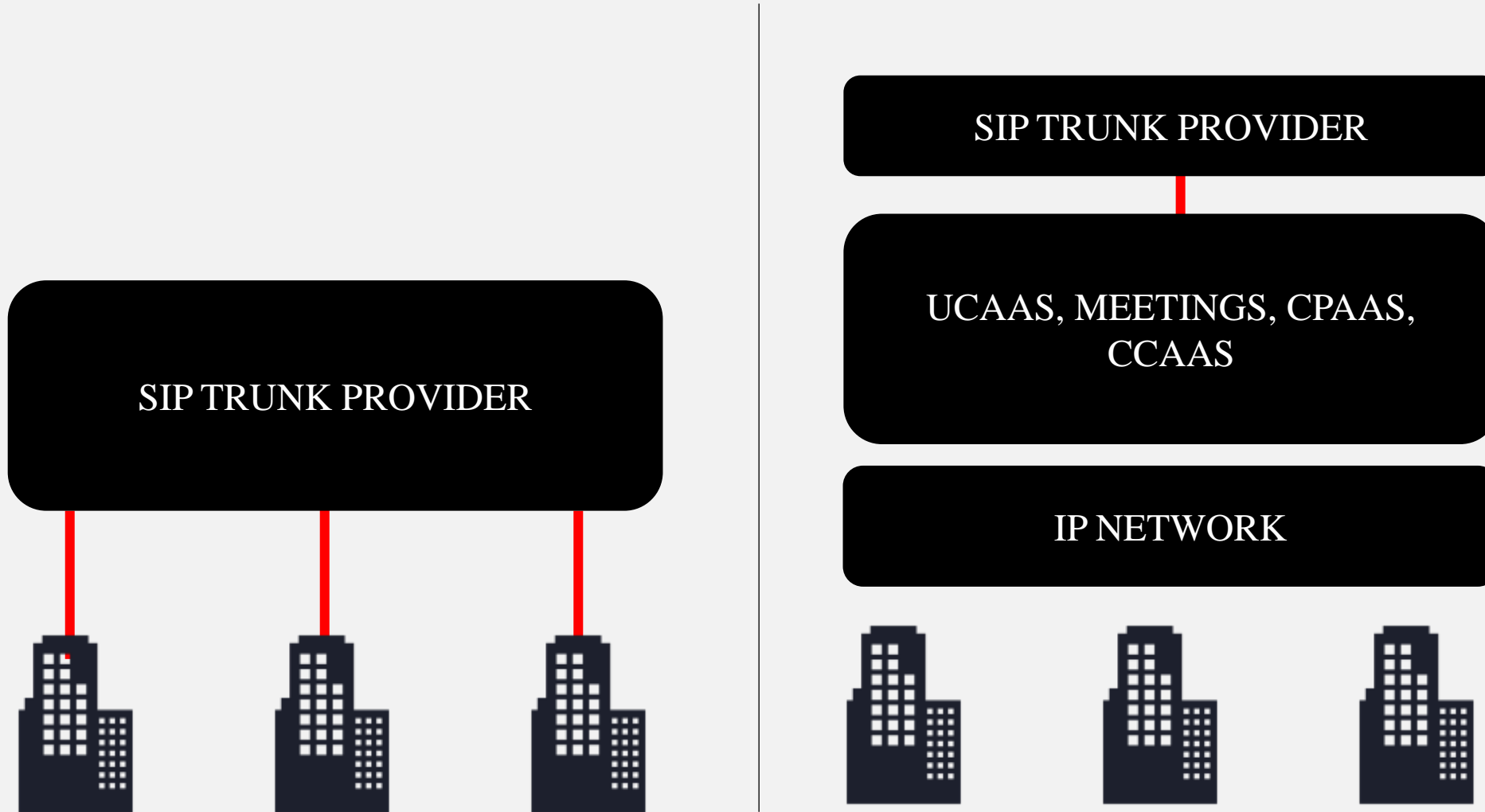
MANY SEGMENTS AT DIFFERENT STAGES



WHAT DOES THIS MEAN FOR SIP NETWORKS?

Less is More.

SIP TRUNKING MIGRATES TO THE CLOUD TOO



MASSIVE CARDINALITY REDUCTION



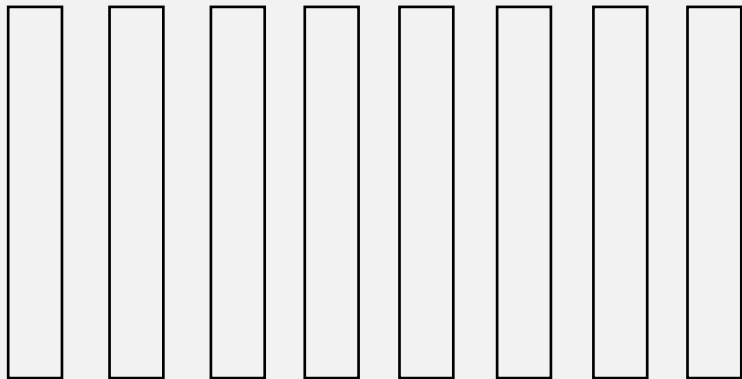
~100K enterprises = ~100K SIP Trunks



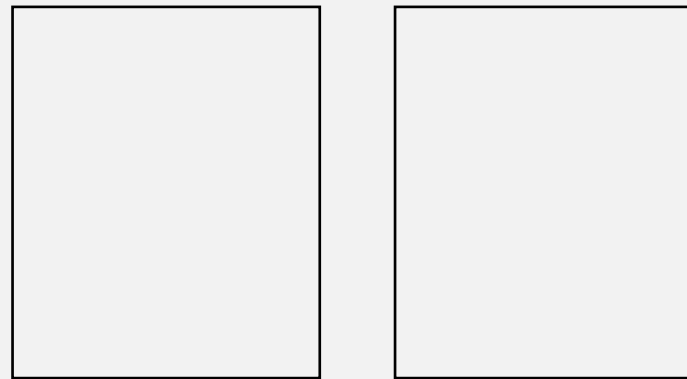
~10s of providers = ~10s of SIP trunks!

VOLUME CONSOLIDATION

SIP TRUNK PROVIDER

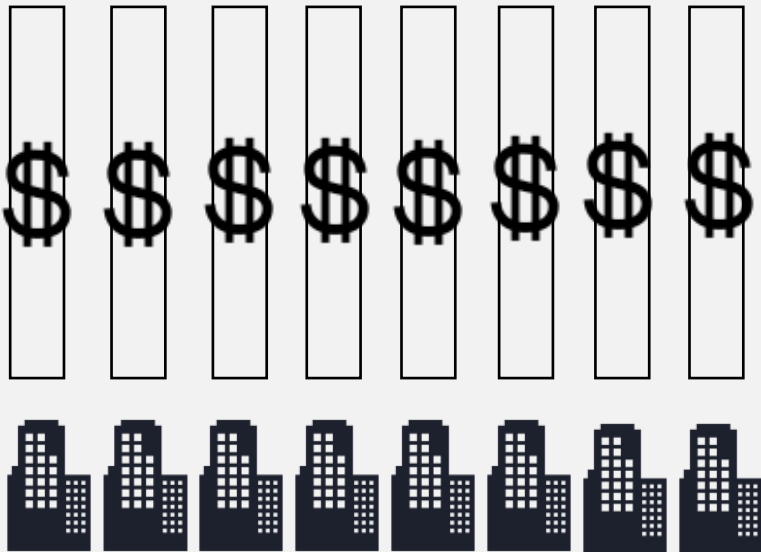


SIP TRUNK PROVIDER

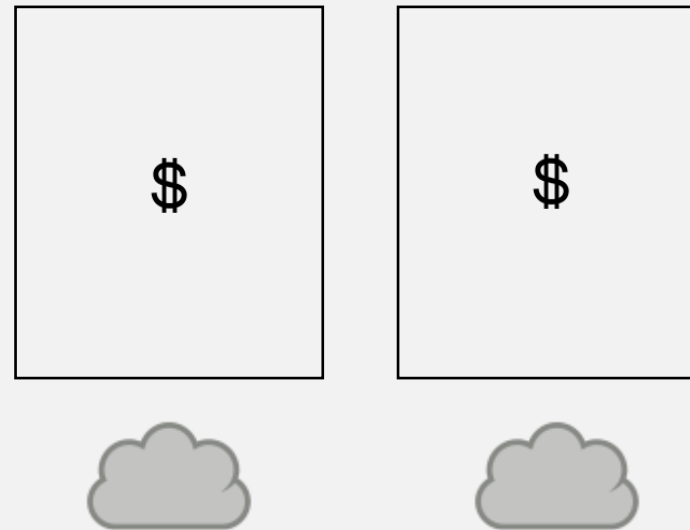


PRICE EROSION

SIP TRUNK PROVIDER



SIP TRUNK PROVIDER



SERVICE TRANSFORMATION

ADMIN PORTALS



API ACCESS

FLEXIBILITY



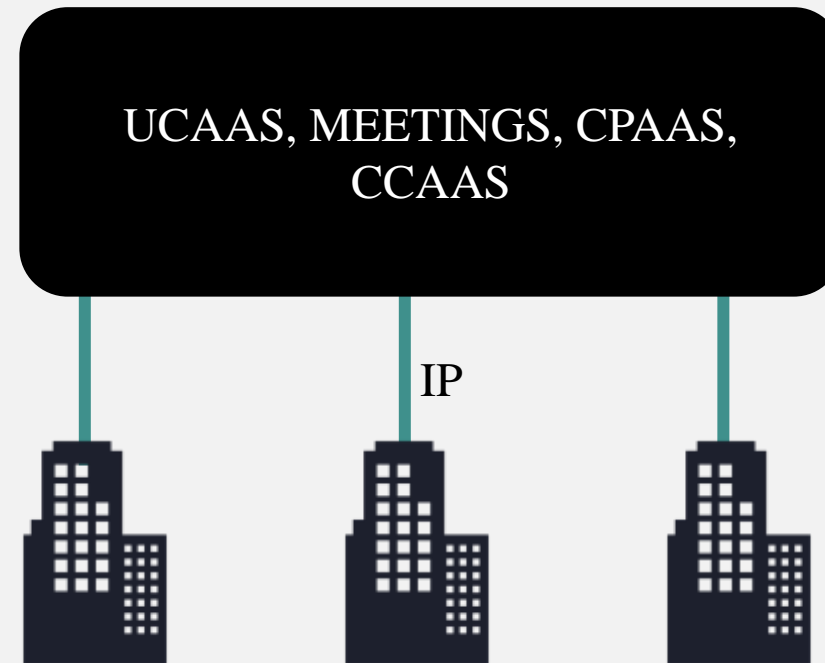
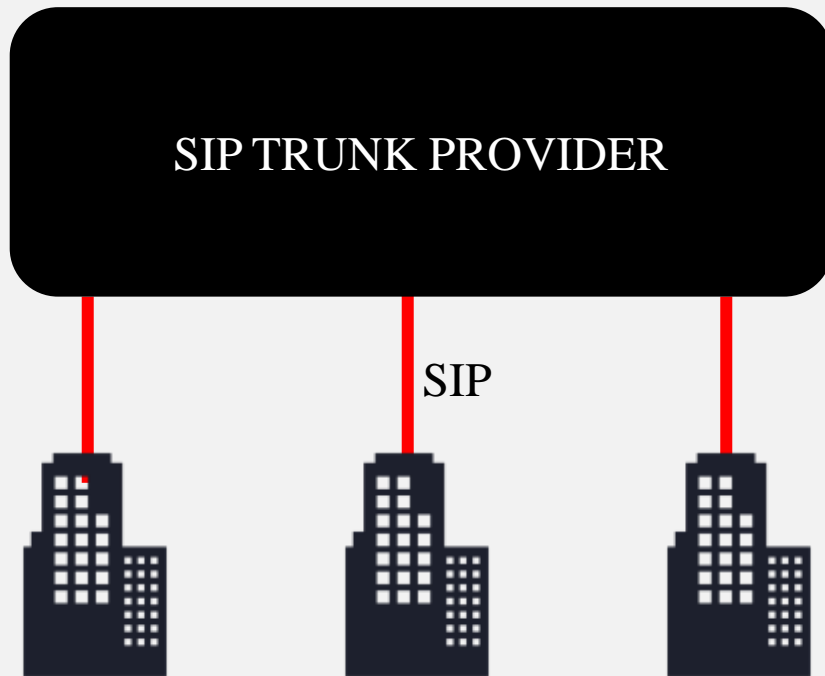
SIMPLICITY

VALUE ADD

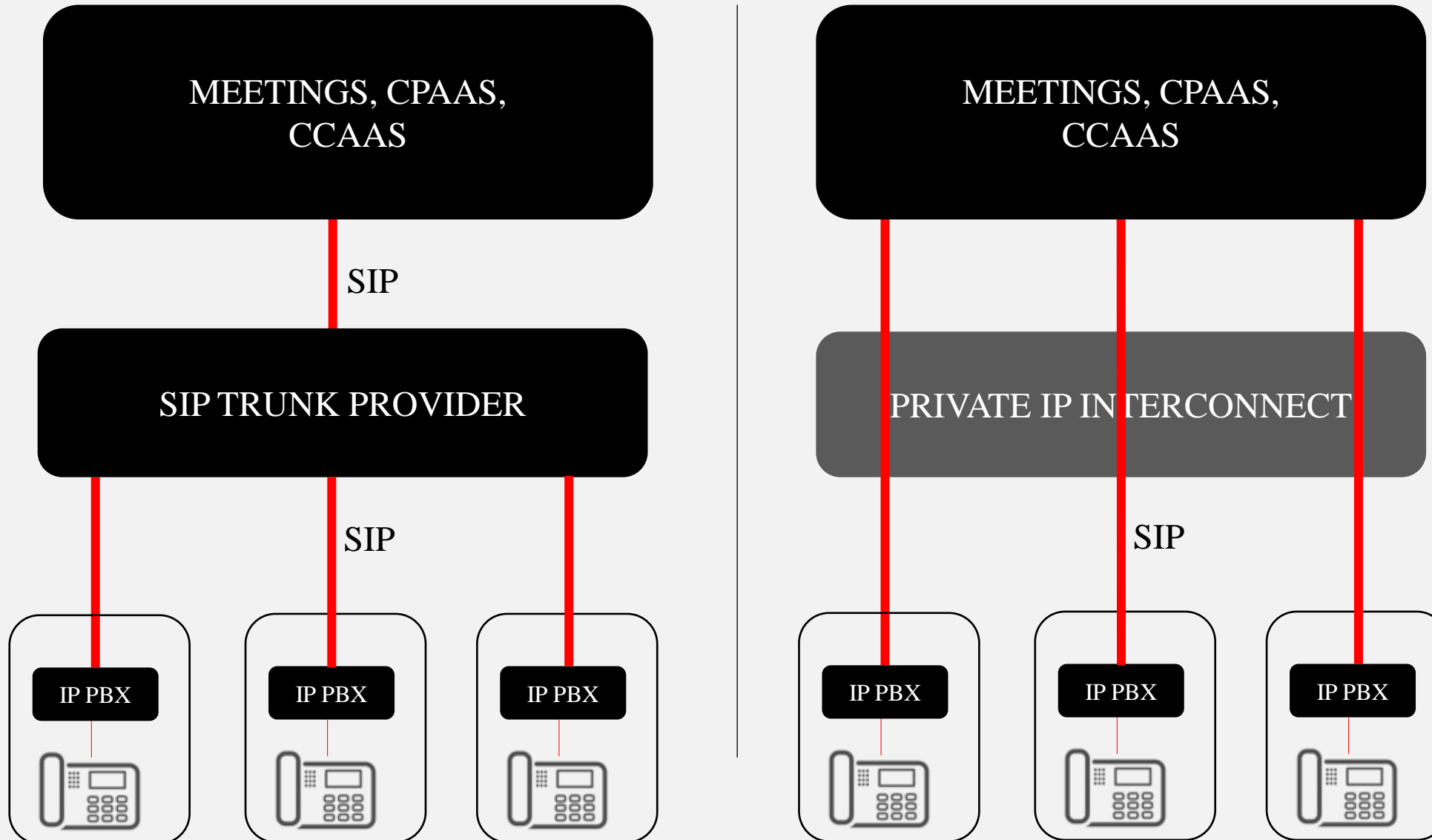


COST REDUCTION

SIP PEERING BECOMES IP PEERING



PRIVATE SIP TRUNKING FOR HYBRID DEPLOYMENTS



ITS HERE TODAY



Webex Edge services capabilities



Webex Edge Audio

Edge Audio decouples the public switched telephone network (PSTN) from Webex by intelligently routing audio calls over VoIP or using existing PSTN services. It allows any company with Unified Communications Manager to reduce PSTN costs, with no change in user behavior.

[Get started >](#)

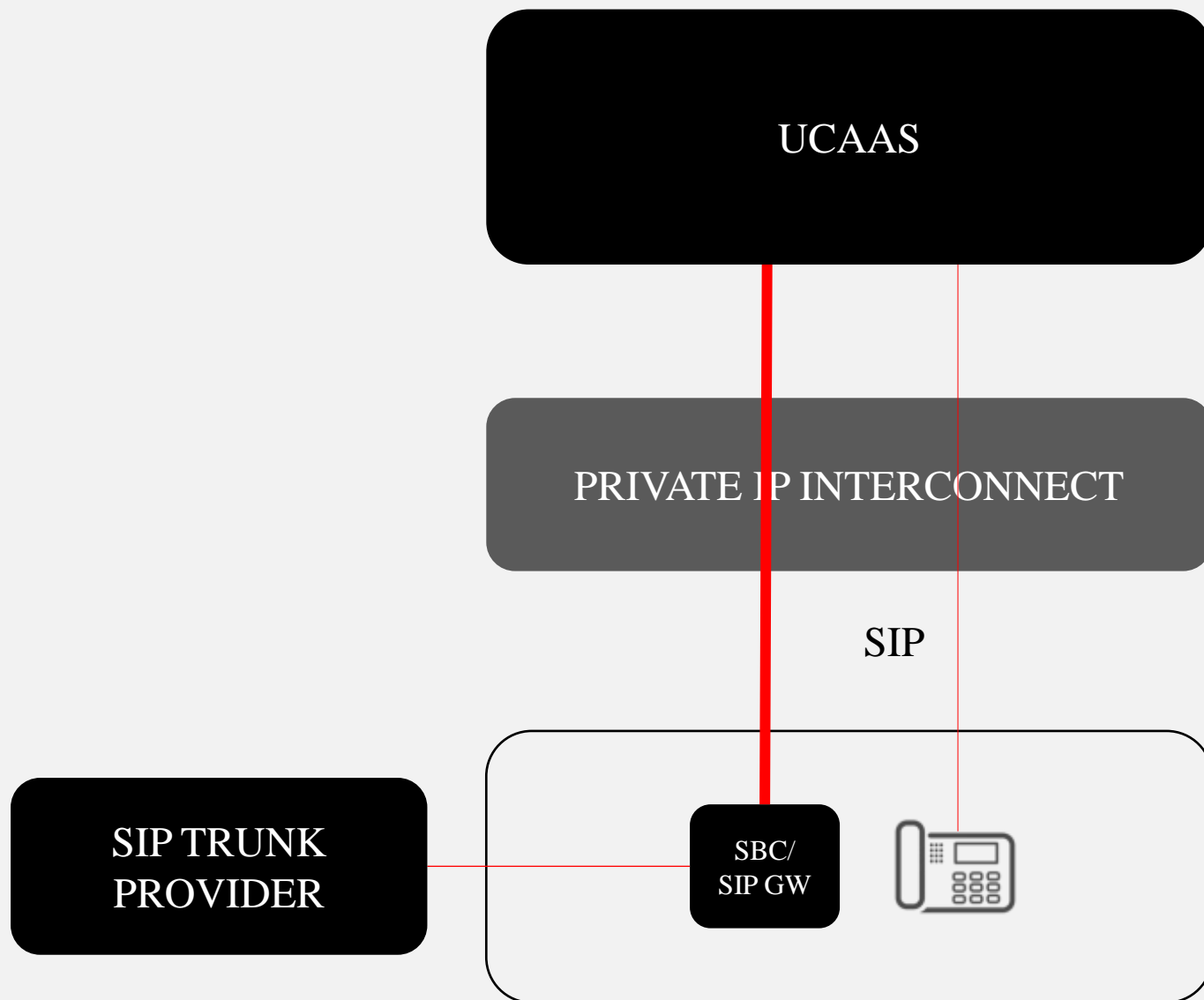
The Zoom logo is the word "zoom" in a bold, lowercase, blue sans-serif font.



All About SIP-Connected Audio

With SIP-connected audio, we establish a SIP trunk (a network connection specifically designed to make and deliver phone calls) over a direct and private connection between the customer's network and the Zoom cloud. Meeting participants that dial into a meeting or have the meeting call them, and are "on net" from the perspective of the customer's IP telephony network, will be connected over this trunk rather than over the Public Switched Telephone Network (PSTN aka phone lines). This connection is secure and reliable, and saves money compared to PSTN rates and fees.

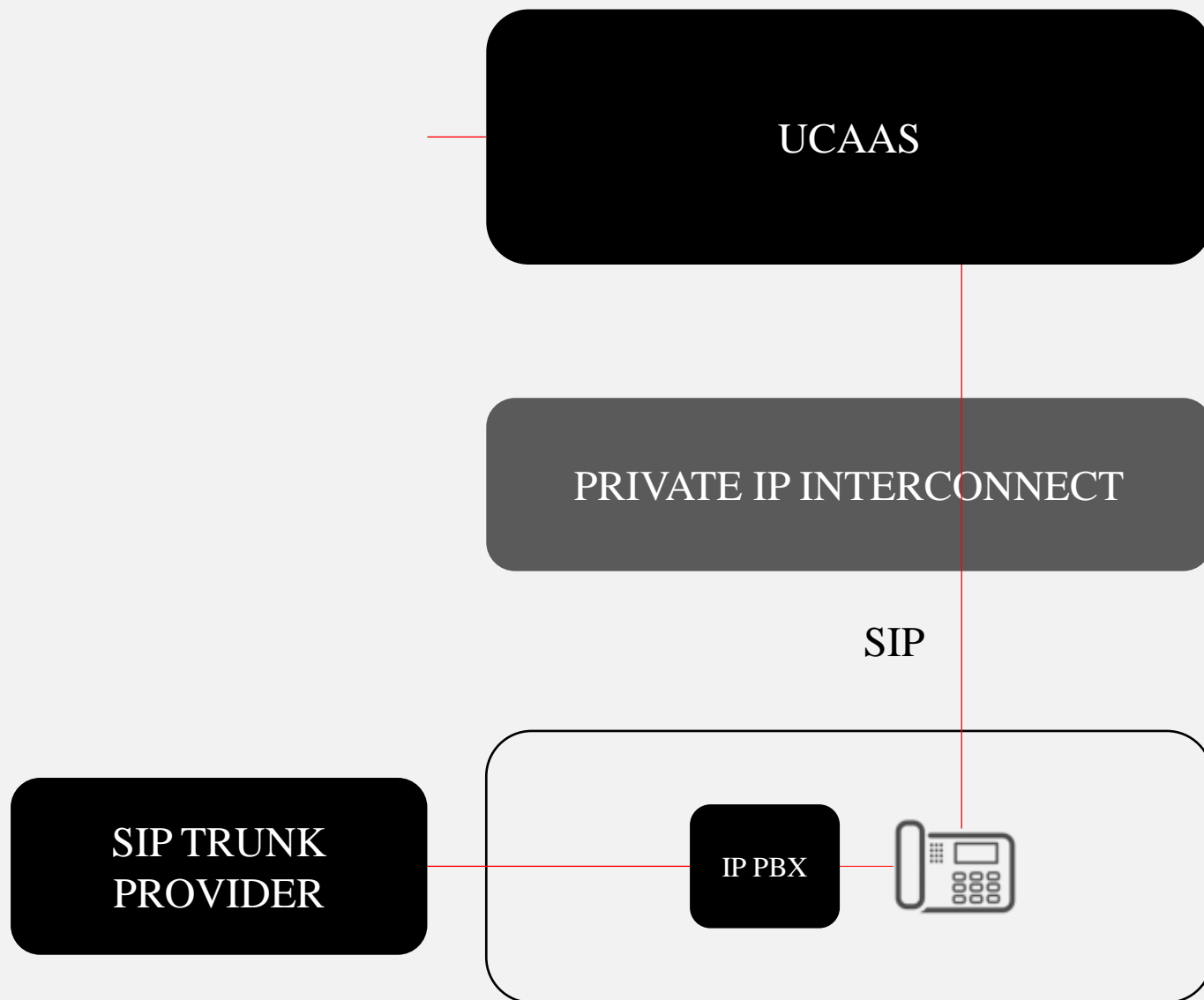
UCAAS WITH ON-PREM GW



WHY ON-PREM GW MODEL?

- Incremental Migration
- Contracts
- Global connectivity
- Costs: middleman
- No Porting

UCAAS WITH BYOSIP



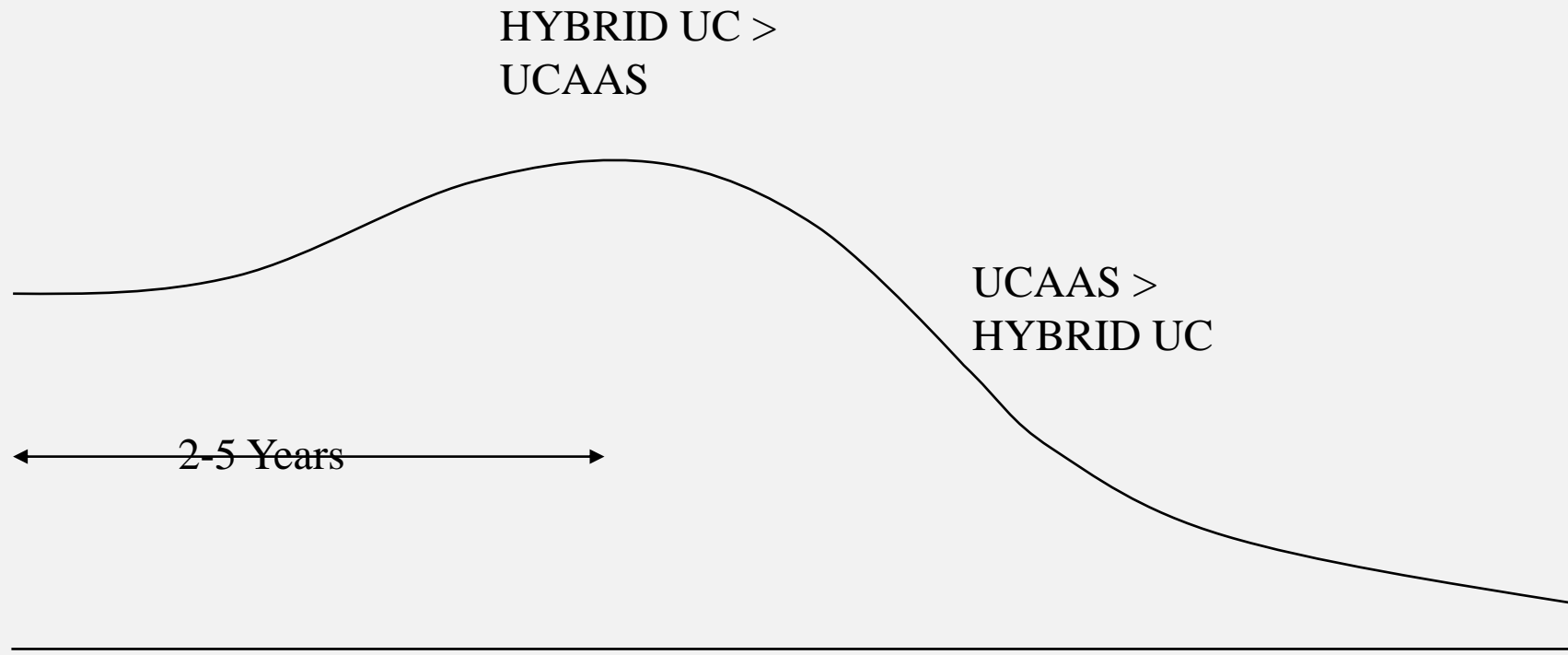
BYOSIP VS PURE UCAAS

	BYOSIP	PURE UCAAS
Contract Owned by	Enterprise	UCaaS Provider
Number of Trunks	One per enterprise	One per UCaaS Provider
Requires Porting	No	Yes

RIPPLE EFFECTS



ENTERPRISE SBC MARKET PEAKS THEN DIES



CLOUD PROVIDERS OFTEN BUILD SBC



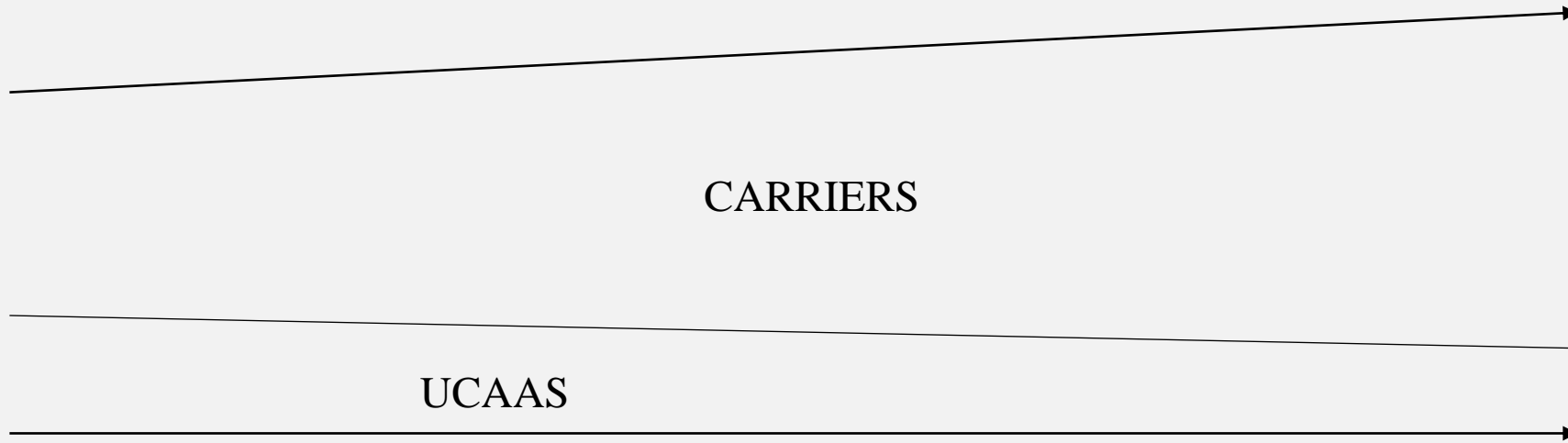
AUTOMATION

LMA INTEGRATION

HORIZONTAL SCALE

MINIMAL FEATURE NEED

SP SBC MARKET GROWS FOR CARRIERS, DECLINES FOR SAAS PROVIDERS



ROBOCALLING



CPAAS – AUTHENTICATED CALLER ID

The screenshot shows the Twilio documentation page for making an outbound call. The page is titled "Make an outbound call to a phone number" and includes sections for "SIP addresses", "Client identifiers", and "Specify the caller ID". The "Specify the caller ID" section explains that Twilio uses the "From" parameter to set a phone number or client identifier as the caller ID. It notes that phone numbers should be formatted with a '+' and country code (E.164 format). A code block shows a JavaScript snippet for creating a call with a "from" parameter. A callout box highlights that any phone number specified must be a Twilio phone number or a verified outgoing caller ID.

adding it to your [Verified Caller IDs](#) in the console.

SIP addresses must be formatted as `sip:name@example.com`. For example, to dial Pat's SIP address at Example Company, the `To` parameter should be `sip:pat@example.com`.

Client identifiers must begin with the `client:URI` scheme. For example, to call a client named `joey`, the `To` parameter should be `client:joey`.

Specify the caller ID

Twilio uses the `From` parameter (required) to set a phone number or client identifier as the caller ID for your outbound call.

If you used a phone number for your `To` value in your POST request, the `From` value you specify must also be a phone number. Just as with the `To` parameter, phone numbers should be formatted with a '+' and country code, e.g., +16175551212 ([E.164](#) format).

Any phone number you specify here must be a Twilio phone number (you can purchase a number through the [console](#)) or a [verified outgoing caller id](#) for your account.

If you use a client identifier as the value for `From`, your identifier must begin with the `client:URI` scheme. For example, to set a client named `charlie` as your caller ID, your `From` parameter should be `client:charlie`.

```
1 // download
2 // These IDs
3 // https://w
4 const account
5 const authTo
6 const client
7
8 client.calls
9 .create({
10   url: 'ht
11   to: 'ht
12   fr
13   t
14
```

```
1 {
2   "sid": "CAa346467ca321c71dbd5e12f627deb854",
3   "date_created": "Thu, 19 Aug 2018 00:12:15 +0000",
4   "date_updated": "Thu, 19 Aug 2018 00:12:15 +0000",
5   "parent_call_sid": null,
6   "account_sid": "ACXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX",
7   "to": "+14155551212",
8   "formatted_to": "(415) 555-1212",
9   "from": "+14158675310"
```

Any phone number you specify here must be a Twilio phone number (you can purchase a number through the [console](#)) or a [verified outgoing caller id](#) for your account.

CPAAS – AND RATE LIMITING

The screenshot shows the Twilio documentation page for "Initiate an outbound call with Twilio". The page title is "Initiate an outbound call with Twilio". The main content area contains the following text:

To place an *outbound call*, a phone call from a Twilio phone number to an outside number, you must make an HTTP POST request to your account's [Call resource](#):

```
POST /2010-04-01/Accounts/{AccountSid}/Calls
```

Calls initiated via the REST API are rate-limited to one per second. You can queue up as many calls as you like as fast as you want, but each call is popped off the queue at a rate of one per second.

Your POST request to the API must include the parameters **From** and **To** for Twilio to know where to direct the outbound call and what to use as the caller ID.

Specify the call's recipient

The **To** parameter (required) is the phone number, SIP address, or client identifier you're calling.

Phone numbers should be formatted with a '+' and country code (e.g., +14155551212).

The right side of the screenshot shows a code editor with a Node.js script for making a call:

```
1 // Download the Twilio REST API SDK
2 // These IDs are required to make a call
3 // https://www.twilio.com/docs/voice-api
4 const accountSid = 'ACXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX'
5 const authToken = 'your_auth_token'
6 const client = twilio(accountSid, authToken)
7
8 client.calls
9   .create({
10     url: 'http://example.com',
11     method: 'GET',
12     headers: {
13       'X-Twilio-Header': 'value'
14     }
15   })
```

Below the code editor, a JSON response is shown:

```
{
  "sid": "CAa346467ca321c71dbd5e12f627deb854",
  "date_created": "Thu, 19 Aug 2010 00:12:15 +0000",
  "date_updated": "Thu, 19 Aug 2010 00:12:15 +0000",
  "parent_call_sid": null,
  "account_sid": "ACXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX",
  "to": "+14155551212",
  "formatted_to": "(415) 555-1212",
  "from": "+14158675310"
}
```

Calls initiated via the REST API are rate-limited to one per second.

CLOUD PROGRAMMABILITY ENABLES EDGE ROBOCALL APPROACHES

provision phone numbers in over 200 countries

API registration

Third party API add-ons

Spot, reject or reroute spam callers programmatically. Nomorobo determines if an incoming caller has high frequency call patterns, and alerts you.

[Nomorobo SPAM Score](#)

[IceHook Phone Number Intelligence](#)

Advanced media handling

[Speech Recognition](#) ^{New}

[Natural Language Understanding](#) ^{Beta}

[Global Low Latency](#)

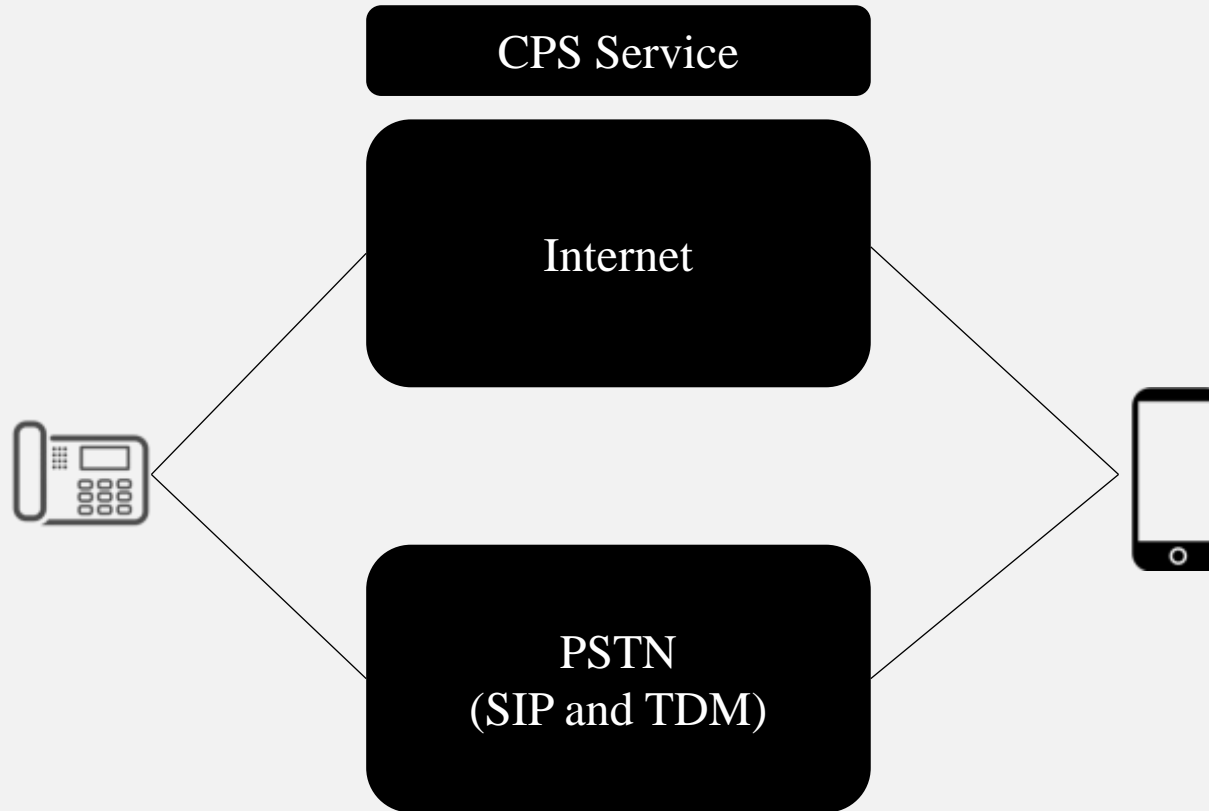
[Answering Machine Detection \(AMD\)](#)

[Call Recording and encryption](#)

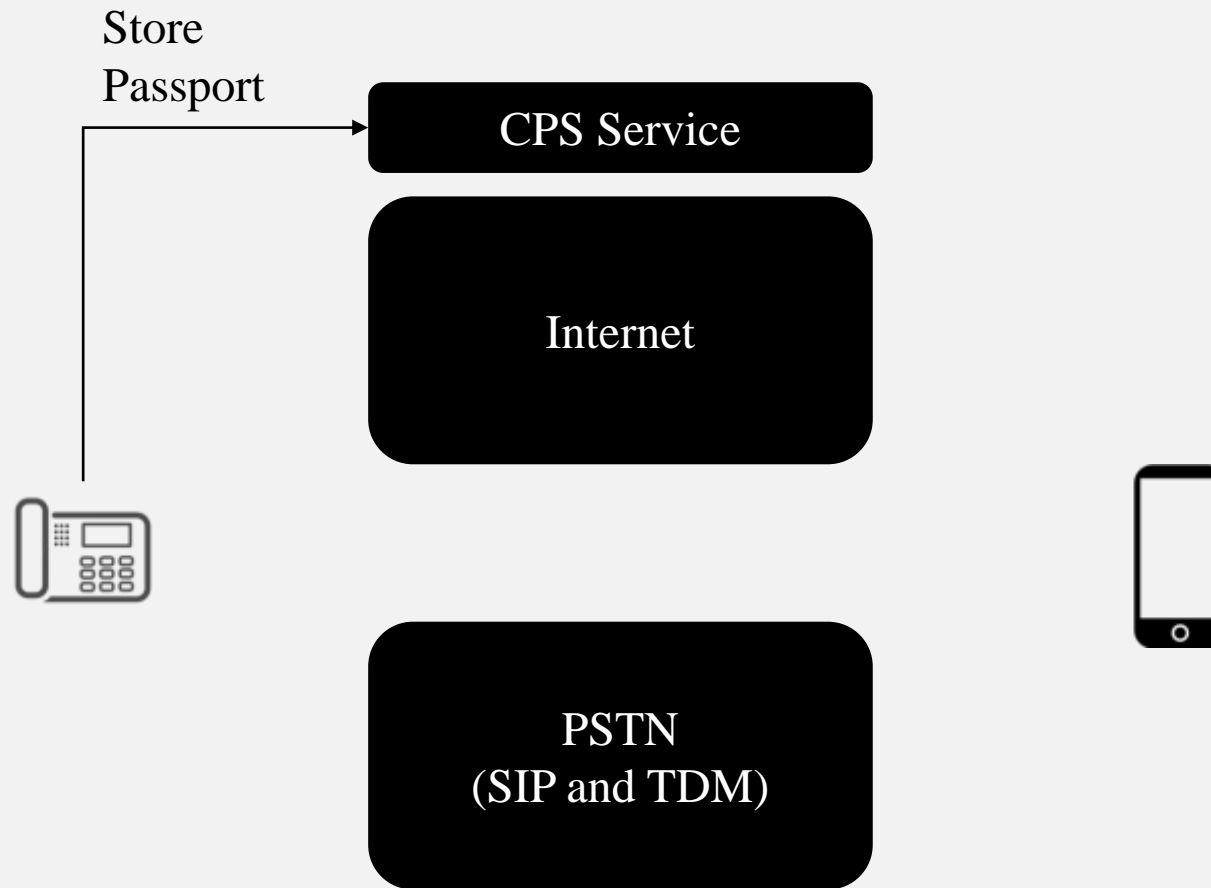
[Dual-channel Recording](#)

<https://www.twilio.com/marketplace/add-ons/nomorobo-spamscore>

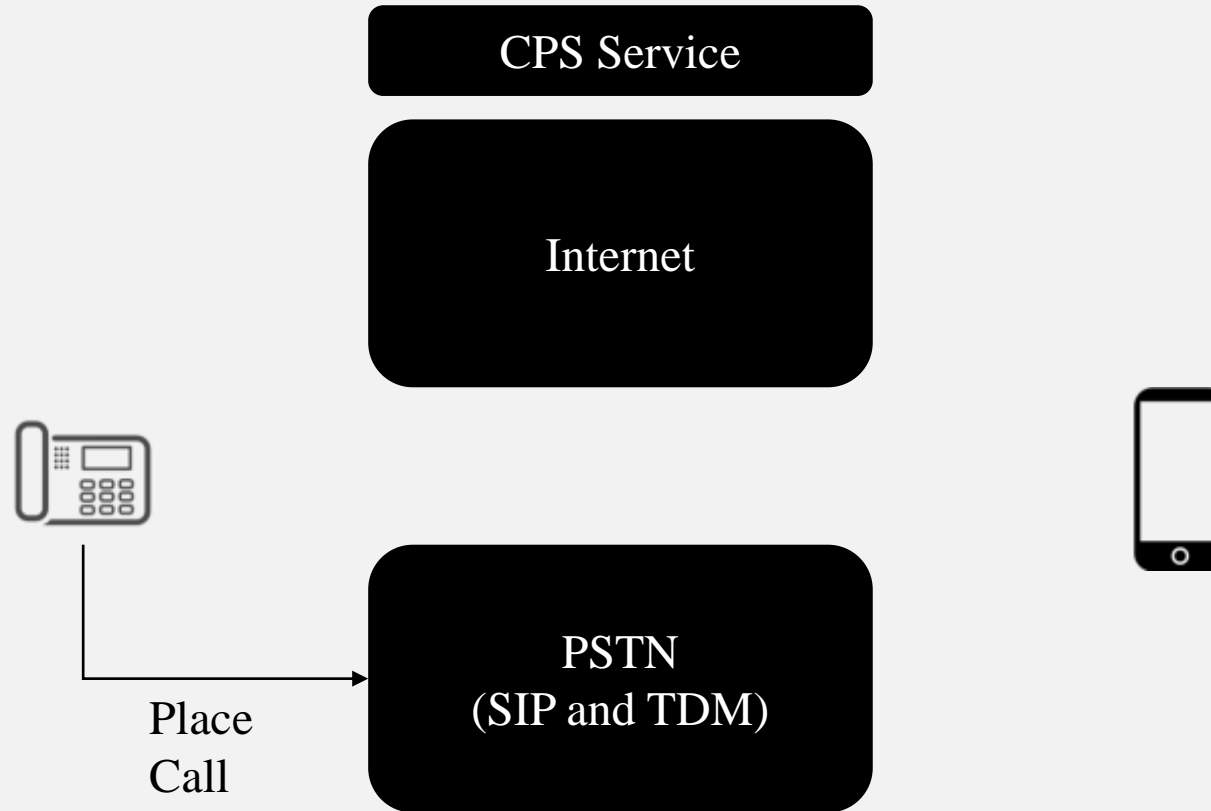
FUTURE – STIR-OOB



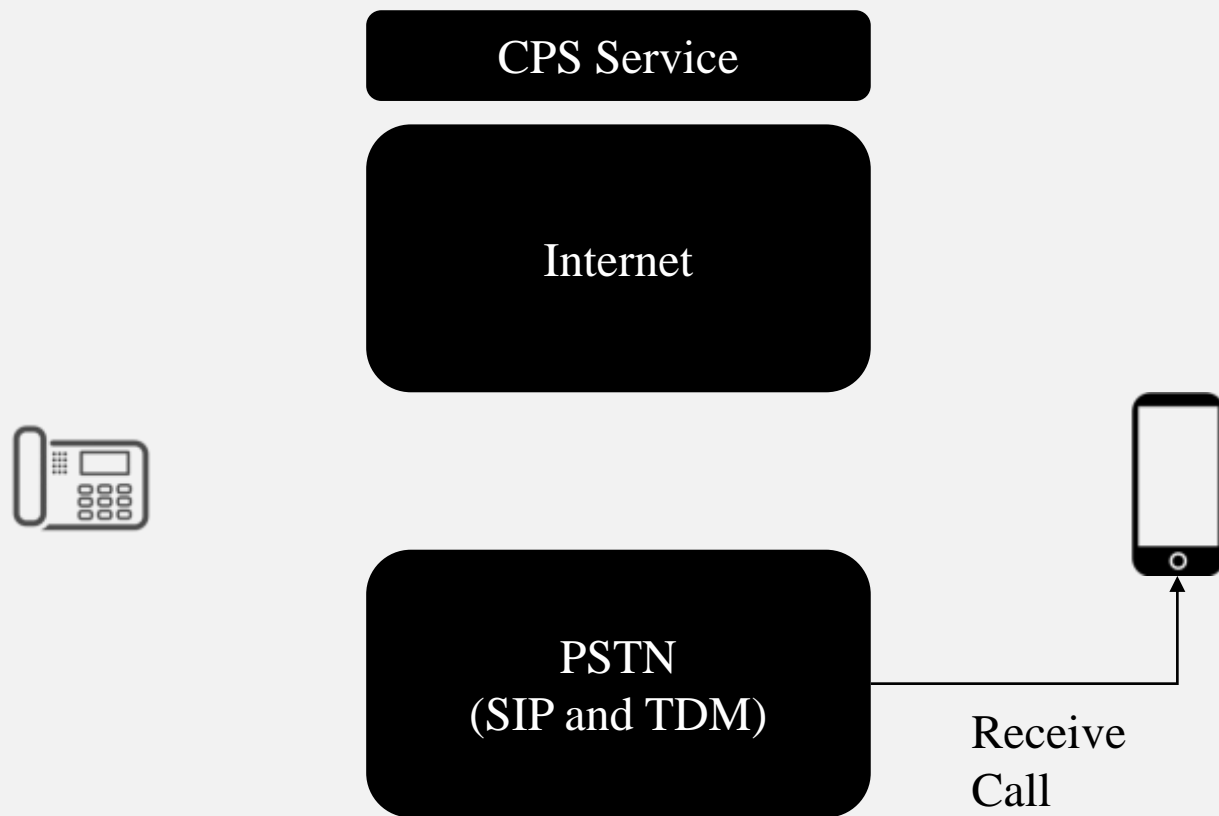
FUTURE – STIR-OOB



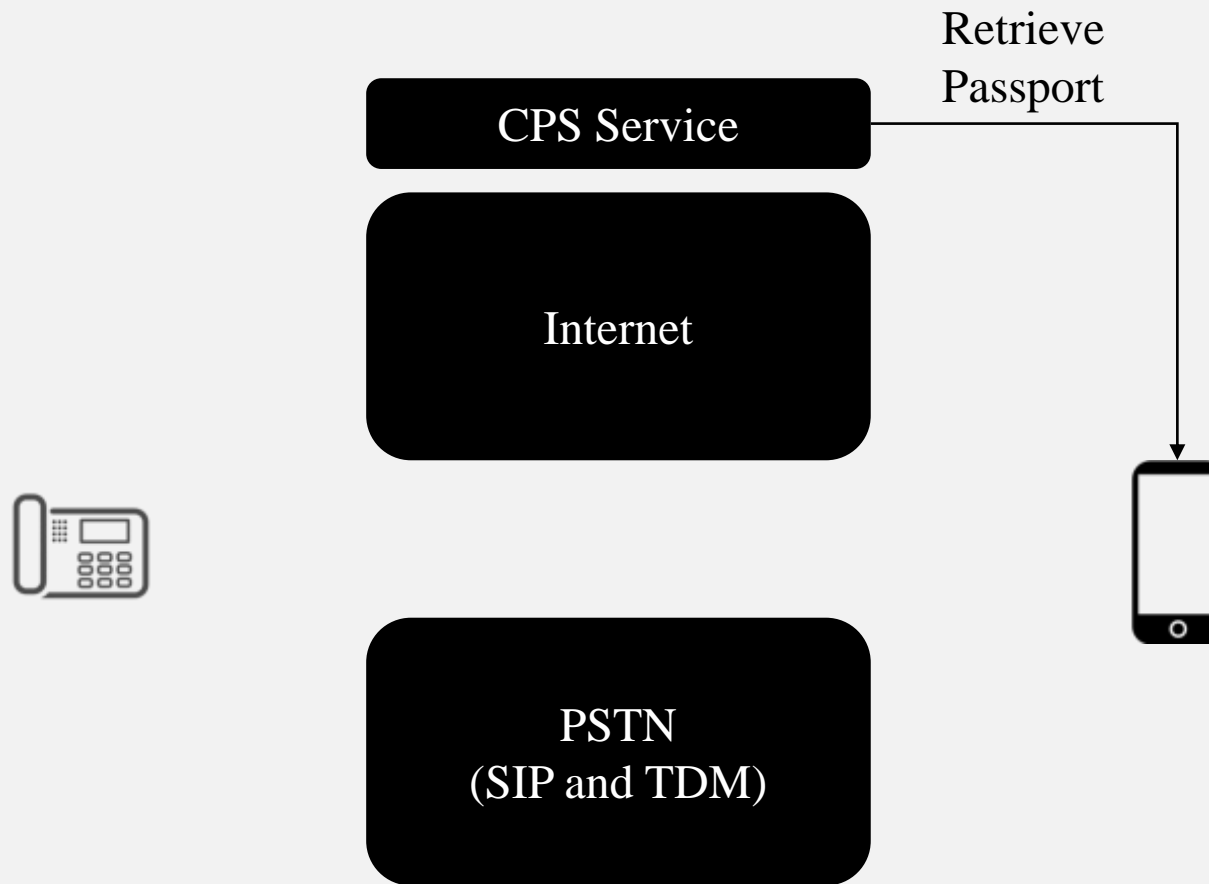
FUTURE – STIR-OOB



FUTURE – STIR-OOB



FUTURE – STIR-OOB



WHY STIR-OOB AND SAAS?

- Internet connected endpoints – IP phones, soft clients, mobile apps
- Richer UI – especially soft clients, mobile apps
- Multiple points of PSTN Interconnection
- Easy upgradeability and no dependency

WHATS NEXT IN CLOUD?

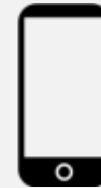


Machine Learning

UNTIL NOW: JUST MAKE THE CONNECTION



100111000111



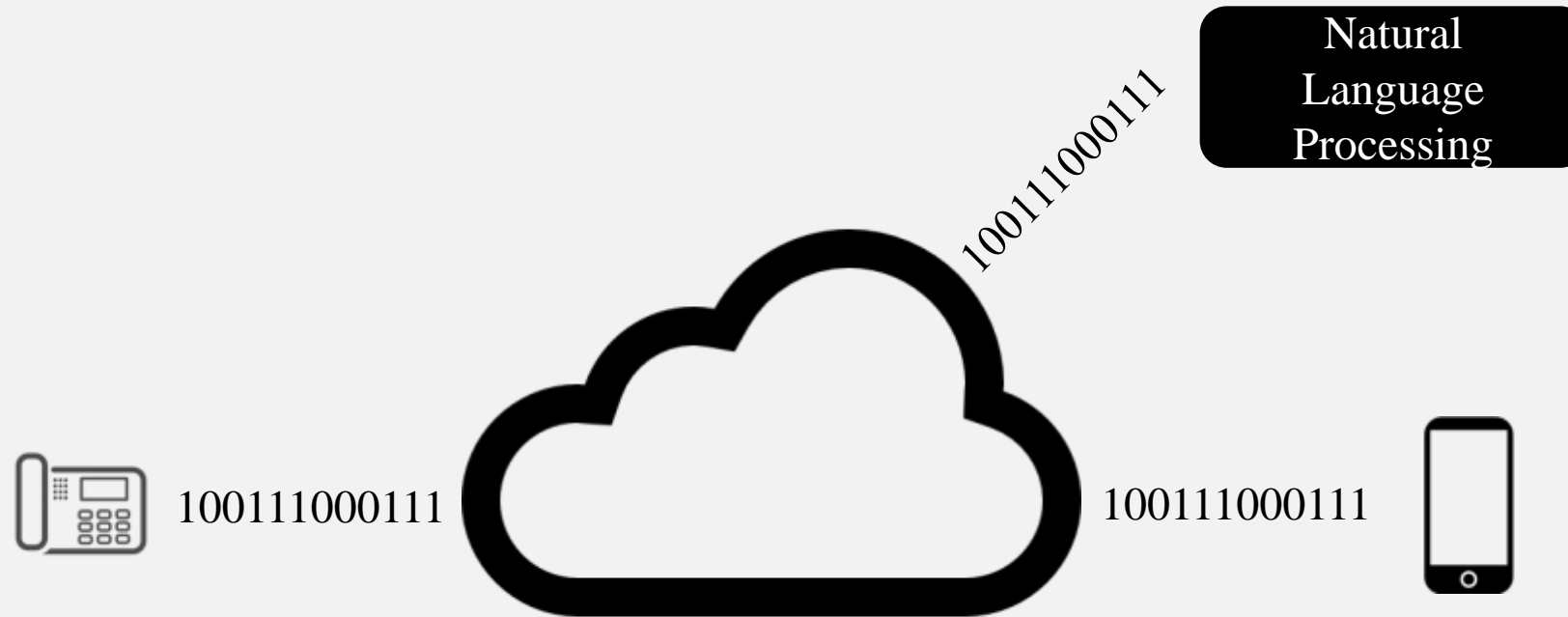
UNTIL NOW: JUST MAKE THE CONNECTION



100111000111



FUTURE: ANALYZE THE CONTENT



EXAMPLE 1: SURFACE INFORMATION ON NAMED ENTITIES

PERSON NAME



PROFILE DATA, NEWS

HISTORICAL
EVENT



WIKIPEDIA DETAILS

CASE NUMBER



CASE

EXAMPLE 2: MEETING ACTION ITEMS



TO: Alice

FROM: Bob

TODO: Update
sales forecast

CONCLUSION

MASSIVE CHANGES TO SIP TRUNKING

TRANSFORMATION OF SBC MARKET


NEW SOLUTIONS FOR ROBOCALLING

NLP FOR COMMUNICATIONS

THANK YOU

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 *jdrosen@jdrosen.net*

 *www.jdrosen.net*

