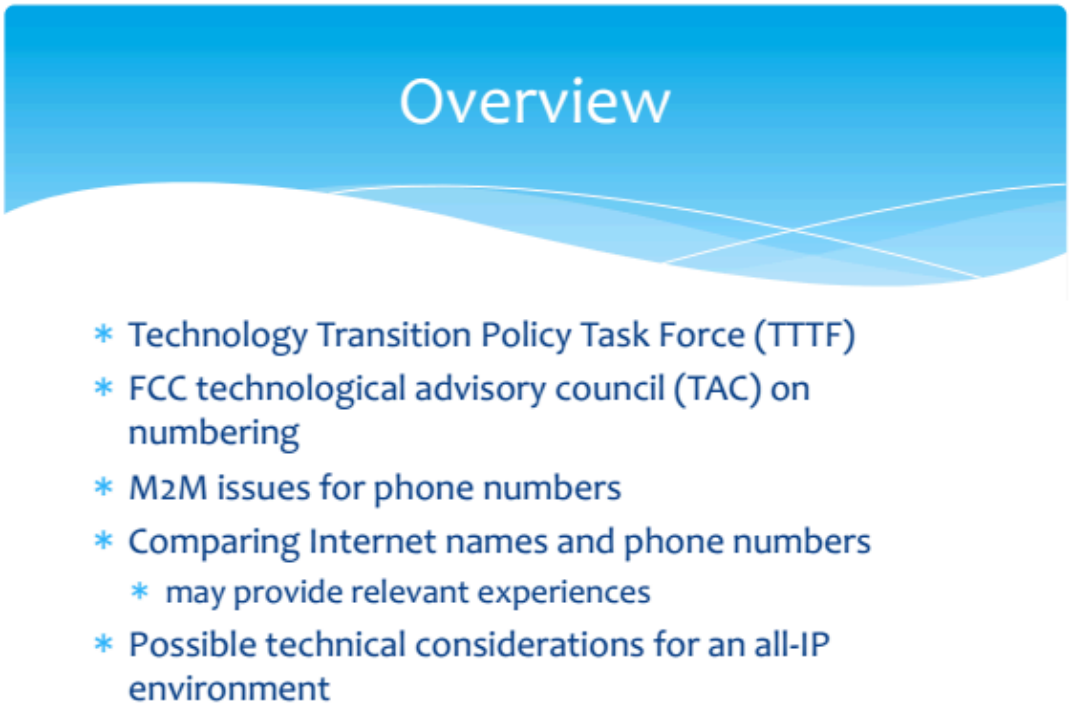
Technology Transition: Numbering

Henning Schulzrinne
FCC



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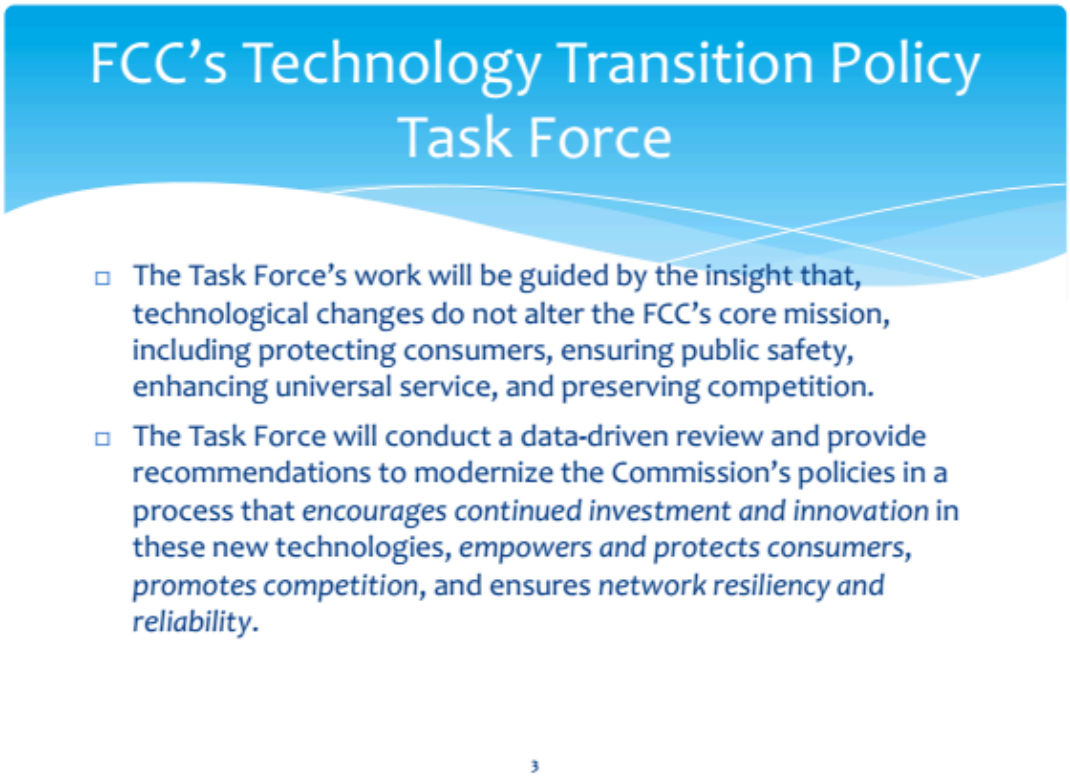
* Technology Transition Policy Task Force (TTTF) * FCC technological advisory council (TAC) on numbering * M2M issues for phone numbers * Comparing Internet names

and phone numbers

* may provide relevant experiences * Possible technical considerations for an all--IP

environment



- The Task Force's work will be guided by the

insight that, technological changes do not alter the FCC's core mission, including protecting consumers, ensuring public safety, enhancing universal service, and preserving competition.

The Task Force will conduct a data--driven review and provide recommendations to modernize the Commission's policies in a process that encourages continued investment and innovation in these new technologies, empowers and protects consumers, promotes competition, and ensures network resiliency and reliability.

TAC: Database and Identifiers - 2012

Recommendation	Near Term	Longer Term
Sponsor industry workshops on the full range and scope of the impacts to routing databases as transition to IP occurs • LNP and ENUM integration • Toll Free Services	• Initially focus on specific routing database issues o ENUM model for sharing routing data for carrier interconnection o Toll Free, identify issues related to current dependence on LATA-based routing and called party based charging	• Set schedule for nationwide 10 digit dialing • Align LATAs and rate centers elimination with "Bill and Keep" implementation date • Implement non-geographic number portability which becomes possible with elimination of LD specific charges to consumers
• Sponsor Multi-Stakeholder industry forum to address the future of identifiers in support of industry trends beyond the e.164 numbering plan.	• Identify Key implementation areas to facilitate the transition to the new public communications o Consider identifiers outside e. 164 numbering plan o Determine M2M impact (if any) for identifiers o Create International Database Strategy Team	• Identify limitations requiring additional development to address and propose solutions o Security, anti-spoofing, Privacy (Identity) o Use of location data o Role of IPv6 and DNS in emerging identifiers

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• Toll Free Services

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to current dependence on LATA--based routing and called party based charging

• Set schedule for nationwide 10 digit dialing

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164 numbering plan o Determine M2M impact (if any)

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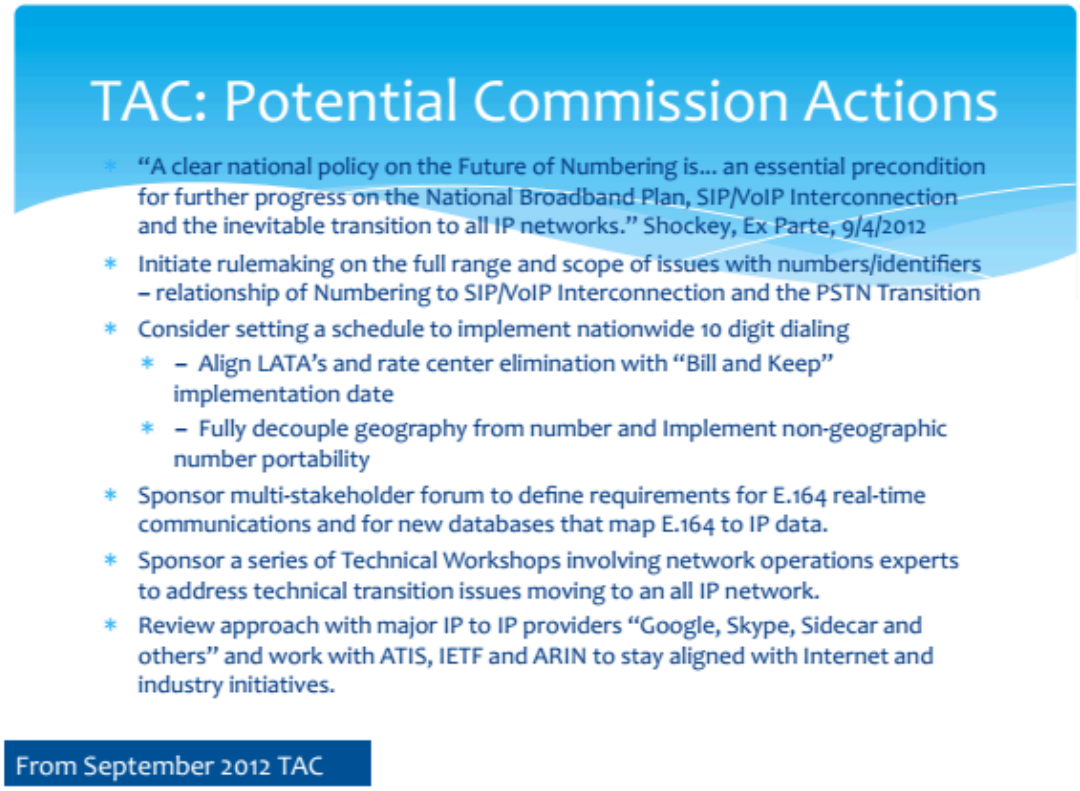
Strategy Team

• Identify limitations requiring additional development to address and propose solutions o Security, anti--spoofing, Privacy

(Identity) o Use of location data o Role of IPv6 and DNS in

emerging identifiers



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* "A clear national policy on the Future of Numbering is... an essential precondition for further progress on the National Broadband Plan, SIP/VoIP Interconnection and the inevitable transition to all IP networks." Shockey, Ex Parte, 9/4/2012 * Initiate rulemaking on the full range and scope of issues with numbers/identifiers – relationship of Numbering to

SIP/VoIP Interconnection and the PSTN Transition * Consider setting a schedule to implement nationwide 10 digit dialing

* – Align LATA's and rate center elimination with "Bill and Keep"

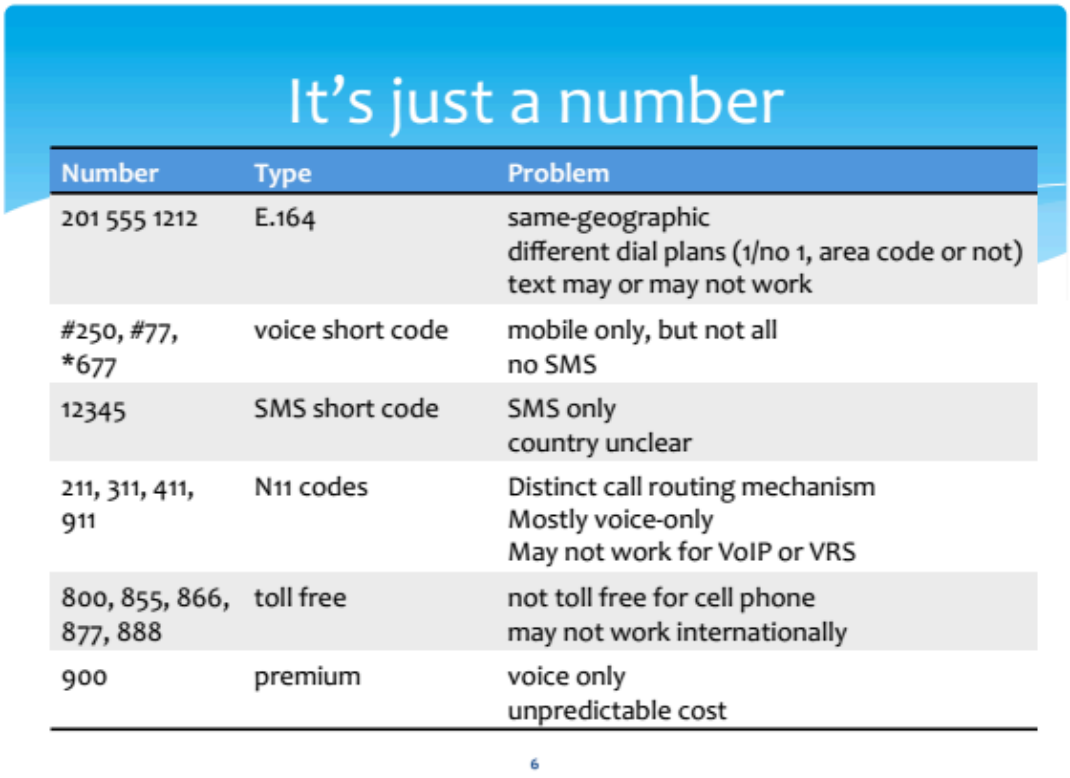
implementation date * – Fully decouple geography from number and Implement non--geographic

number portability * Sponsor multi--stakeholder forum to define requirements for E.164 real--time

communications and for new databases that map E.164 to IP data. * Sponsor a series of Technical Workshops involving network operations experts

to address technical transition issues moving to an all IP network. * Review approach with major IP to IP providers "Google, Skype, Sidecar and

others" and work with ATIS, IETF and ARIN to stay aligned with Internet and industry initiatives.



Number Type Problem 201 555 1212 E.164 same--geographic

different dial plans (1/no 1, area code or not) text may or may not work #250, #77, *677

6 voice short code mobile only, but not all

no SMS 12345

SMS short code SMS only

country unclear 211, 311, 411, 911

N11 codes Distinct call routing mechanism

Mostly voice--only May not work for VoIP or VRS 800, 855, 866, 877, 888

toll free not toll free for cell phone

may not work internationally 900 premium voice only

unpredictable cost

Numbers vs. DNS & IP addresses

	Phone #	DNS	IP address
Role	**identifier** + locator	identifier	**locator** (+ identifier)
Country-specific	mostly	optional	no
# of devices / name	1 (except Google Voice)	any	1 (interface)
# names /device	1 for mobile	any	any
controlled by	carrier, but portability unclear (800#) and geo. limited	any entity, with trademark restrictions	any entity (ISP, organization)
who can obtain?	geographically-constrained, currently carrier only	varies (e.g., .edu & .mil, vs. .de)	enterprise, carrier
porting	complex, often manual; wireless-to-wireline may not work	about one hour (DNS cache)	if entity has been assigned PIAs
delegation	companies (number range)	anybody	subnets
identity information	carrier (OCN), billing name only → LERG, LIDB	WHOIS data (unverified)	RPKI, whois

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Role identifier +

locator

identifier locator (+

identifier

)

Country--specific mostly optional no

# of devices / name 1 (except Google Voice) any 1
(interface) # names /device 1 for mobile any any

controlled by carrier, but portability

unclear (800#) and geo. limited

any entity, with trademark restrictions

any entity (ISP, organization)

who can obtain? geographically--constrained,

currently carrier only

varies (e.g., .edu & .mil, vs. .de)

enterprise, carrier

porting complex, often manual;

wireless--to--wireline may not work

about one hour (DNS cache)

if entity has been assigned PIAs

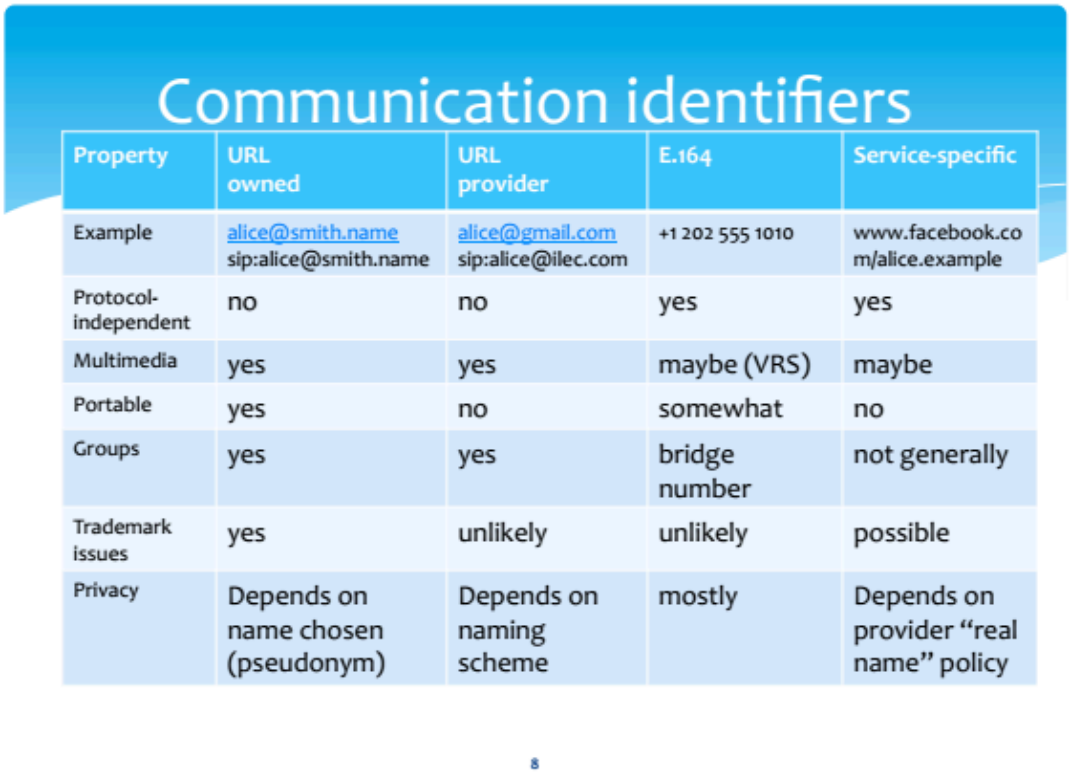
delegation companies (number range) anybody subnets

identity information

carrier (OCN), billing name only → LERG, LIDB

WHOIS data (unverified)

RPKI, whois



Example alice@smith.name

sip:alice@smith.name

+1 202 555 1010 www.facebook.co

m/alice.example

Protocol-- independent

alice@gmail.com sip:alice@ilec.com no no yes yes

Multimedia yes yes maybe (VRS) maybe Portable

yes no somewhat no Groups yes yes bridge number

not generally

Trademark issues

yes unlikely unlikely possible

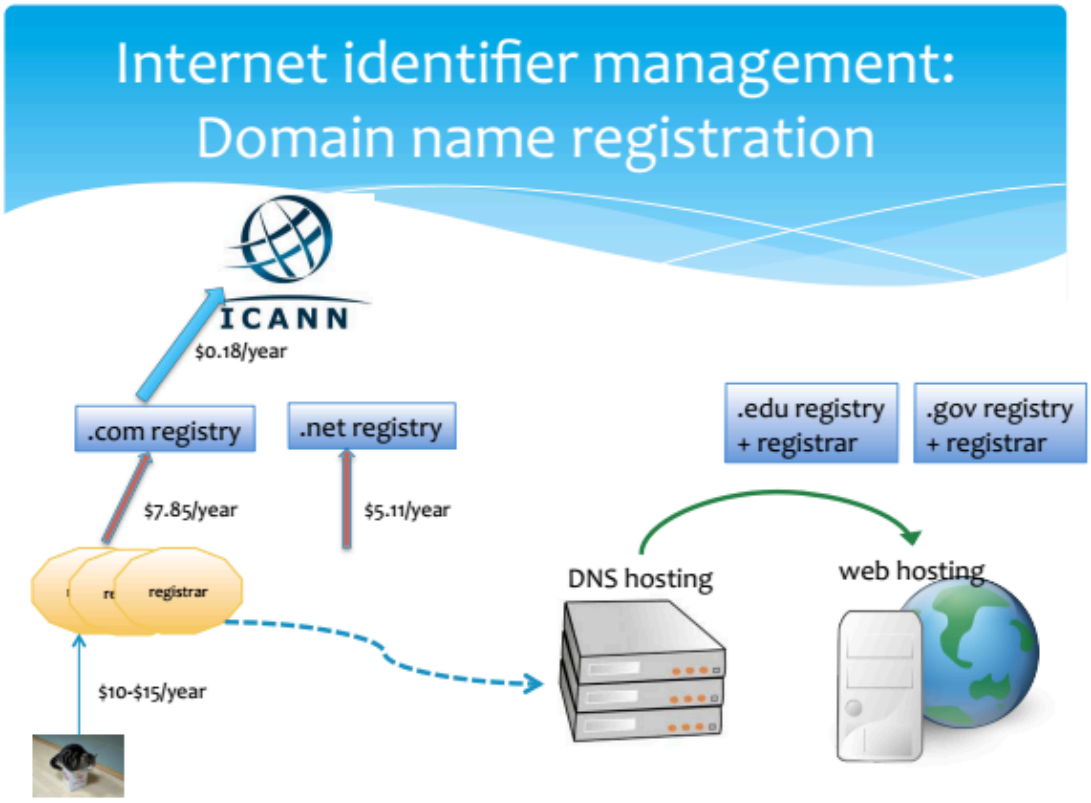
Privacy Depends on

name chosen (pseudonym)

Depends on

mostly Depends on naming

provider “real scheme name” policy



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gov registry .com registry .net registry

+ registrar

registrar

$7.85/year

registrar registrar

$10--$15/year

$0.18/year

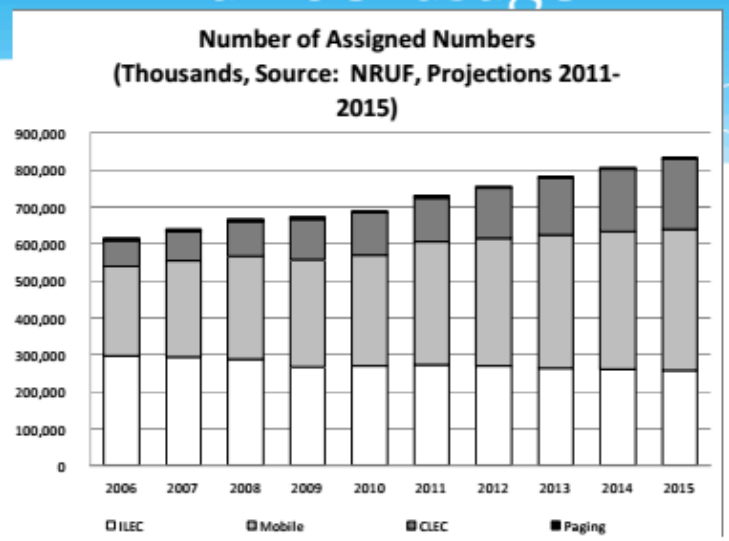
$5.11/year

DNS hosting

.edu registry + registrar

web hosting

Number usage



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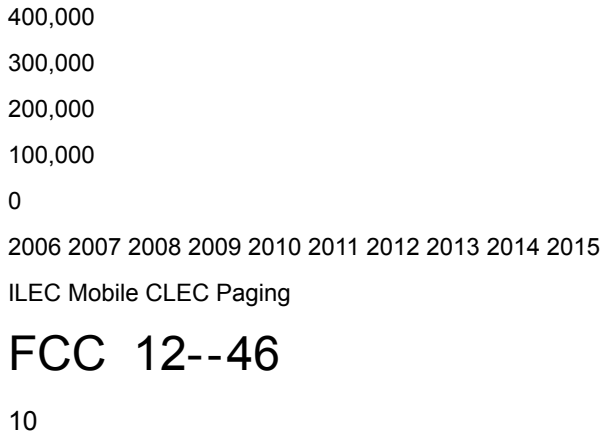
Number of Assigned Numbers (Thousands, Source: NRUF, Projections 2011- 2015) 900,000

800,000

700,000

600,000

500,000


400,000
300,000
200,000
100,000
0
2006 2007 2008 2009 2010 2011 2012 2013 2014 2015
ILEC Mobile CLEC Paging