Pre NNP
A call is originated

Is the Dialed Number Local

Yes

Is the Dialed Number Local

No

Local Switch determines if Dialed NPA NXX is portable

Yes

Originating Switching Network Queries Database for LRN

No

Originating Switching Network Determines Calling Number’s presubscribed IXC

No

IXC Switch determines if Dialed NPA NXX is portable

Yes

Based upon query Response (CdPN/LRN,) Call is routed to Inter Switch trunk toward terminating network

No

Based upon query Response (CdPN/LRN,) Call is routed to Inter Switch trunk toward terminating network

Call is routed to the appropriate terminating end office or network for termination to subscriber’s Line

Slides 3-6

Slides 7-13

Slides 14-22

Slides 17-22

Slides 14-16

Slides 14-22
PSTN Class 5 – Non-portable NXX Intra Switch Local Call Routed to Subscriber
PSTN Class 5 to Class 5 – Non-Portable NXX Inter Switch Local Call Routed to Subscriber
PSTN Class 5 to Class 4 to Class 5 – Non-Portable NXX Inter Switch Local Call Routed Direct to Subscriber
Pre NNP

PSTN Class 5 to Class 4 to Class 5 – Non-Portable NXX Inter Switch Local Call Routed Direct to Subscriber
PSTN Class 5 – Portable NXX Non-Ported Number Intra Switch Local Call Routed to Subscriber
PSTN Class 5 to Class 5 – Portable NXX Non-Ported Number Intrer Switch Local Call Routed to Subscriber
Pre NNP

PSTN Class 5 to Class 4 to Class 5 – Portable NXX Non-Ported Number Inter Switch Local Call Routed to Subscriber

Class 5 Switch → LNP Database → Class 4 Switch → Class 5 Switch

LNP Query → CdPN → ISUP Trunk
PSTN Class 5 to Class 4 to Class 4 to Class 5 – Portable NXX Non-Ported Number Inter Switch Local Call Routed to Subscriber
PSTN Class 5 to Class 5 – Portable NXX Ported Number Inter Switch Local Call Routed to Subscriber

Pre NNP

Class 5 Switch → LNP Database → ISUP Trunk

LNP Query

LRN

ISUP Trunk

CdPN = LRN, GAP = DN, M-bit = 1

Class 5 Switch
Pre NNP

PSTN Class 5 to Class 4 to Class 5 – Portable NXX Ported Number Inter Switch Local Call Routed to Subscriber
Pre NNP

PSTN Class 5 to Class 4 to Class 4 to Class 5 – Portable NXX Ported Number Inter Switch Local Call Routed to Subscriber

Class 5 Switch

LNP Database

Class 4 Switch

Class 4 Switch

Class 5 Switch

LNP Query

LRN

ISUP Trunk

A

B

C

D

E

F

G

H
PSTN Class 5 to IXC to Class 5 – Portable NXX Non-Ported Number Inter Switch Long Distance Call Routed to Subscriber
PSTN Class 5 to Class 4 to IXC to Class 5 – Portable NXX Non-Ported Number Inter Switch Long Distance Call Routed to Subscriber
PSTN Class 5 to Class 4 to IXC to Class 4 to Class 5 – Portable NXX Non-Ported Number Inter Switch Long Distance Call Routed to Subscriber
PSTN Class 5 to IXC to Class 5 – Portable NXX Ported Number Inter Switch Long Distance Call Routed to Subscriber
PSTN Class 5 to Class 4 to IXC to Class 5 – Portable NXX Ported Number Inter Switch Long Distance Call Routed to Subscriber
Pre NNP

PSTN Class 5 to Class 4 to IXC to Class 4 to Class 5 – Portable NXX Ported Number Inter Switch Long Distance Call Routed to Subscriber
NLRN

Option 1
A call is originated

Switch determines if Dialed NPA NXX is portable

Switch Determines Calling Number’s presubscribed IXC

Based on LRN, Call is routed to Inter Switch trunk toward terminating network

IXC Queries Database for LRN

Is the Dialed Number Local

Call is rejected by Calling Number’s IXC

Is the Dialed Number Ported

Call is routed to the appropriate terminating end office or network for termination to subscriber’s Line

Call is rejected by Calling Number’s IXC

Call is routed to the appropriate terminating end office or network for termination to subscriber’s Line

Yes

Yes

Yes

Yes

No

No

No

No

Slides 25-31

Slides 32-35

Slides 31-44

Slides 39-44

Slides 38-41

Slides 20-44

Call is routed to the appropriate terminating end office or network for termination to subscriber’s Line

Slides 36-38

Slides 32-38

Slides 42-44
PSTN Class 5 – Non-portable NXX Intra Switch Local Call Routed to Subscriber
NNP NLRN
Option 1
Query by IXC

PSTN Class 5 to Class 5 – Non-Portable NXX Inter Switch Local Call Routed to Subscriber
PSTN Class 5 to Class 4 to Class 5 – Non-Portable NXX Inter Switch Local Call Routed Direct to Subscriber
PSTN Class 5 to Class 4 to Class 5 – Non-Portable NXX Inter Switch Local Call Routed Direct to Subscriber
NLP NLRN
Option 1
Query by IXC

PSTN Class 5 to Class 4 to IXC to Class 4 to Class 5 – Non-Portable NXX Inter Switch Long Distance Call Routed to Subscriber
NRP NLRN
Option 1
Query by IXC

PSTN Class 5 to Class 4 to IXC to Class 5 – Non-Portable NXX Inter Switch Long Distance Call Routed to Subscriber
NLP NLRN
Option 1
Query by IXC

PSTN Class 5 to Class 4 to IXC to Class 4 to Class 5 – Non-Portable NXX Inter Switch Long Distance Call Routed to Subscriber
NNP NLRN
Option 1
Query by IXC

PSTN Class 5 – Portable NXX Non-Ported Number Intra Switch Local Call Routed to Subscriber
NNP NLRN
Option 1
Query by IXC

PSTN Class 5 to Class 5 – Portable NXX Non-Ported Number Intrer Switch Local Call Routed to Subscriber
NNP NLRN
Option 1
Query by IXC

PSTN Class 5 to Class 4 to Class 5 – Portable NXX Non-Ported Number Inter Switch Local Call Routed to Subscriber
NLP NLRN Option 1
Query by IXC

PSTN Class 5 to Class 4 to Class 4 to Class 5 – Portable NXX Non-Ported Number Inter Switch Local Call Routed to Subscriber

Class 5 Switch - Class 4 Switch - IXC - LNP Database - Class 4 Switch - Class 5 Switch

LNP Query
CdPN
ISUP Trunk
NNP NLRN
Option 1
Query by IXC

PSTN Class 5 to IXC to Class 5 – Portable NXX Non-Ported Number Inter Switch Long Distance Call Routed to Subscriber
PSTN Class 5 to Class 4 to IXC to Class 5 – Portable NXX Non-Ported Number Inter Switch Long Distance Call Routed to Subscriber.
PSTN Class 5 to Class 4 to IXC to Class 4 to Class 5 – Portable NXX Non-Ported Number Inter Switch Long Distance Call Routed to Subscriber

NNP NLRN
Option 1
Query by IXC
PSTN Class 5 to Class 5 – Portable NXX Ported Number Inter Switch Local Call Routed to Subscriber
PSTN Class 5 to Class 4 to Class 5 – Portable NXX Ported Number Inter Switch Local Call Routed to Subscriber
NNP NLRN
Option 1
Query by IXC

PSTN Class 5 to Class 4 to Class 4 to Class 5 – Portable NXX Ported Number Inter Switch Local Call Routed to Subscriber
PSTN Class 5 to IXC to Class 5 – Portable NXX Ported Number Inter Switch Long Distance Call Routed to Subscriber
NNP NLRN
Option 1
Query by IXC

PSTN Class 5 to Class 4 to IXC to Class 5 – Portable NXX Ported Number Inter Switch Long Distance Call Routed to Subscriber

Class 5 Switch

Class 4 Switch

IXC

LNP Database

Class 5 Switch

ISUP Trunk

LNP Query

LRN
NNP NLRN
Option 1
Query by IXC

PSTN Class 5 to Class 4 to IXC to Class 4 to Class 5 – Portable NXX Ported Number Inter Switch Long Distance Call Routed to Subscriber
NLRN
Option 2
A call is originated

Switch determines if Dialed NPA NXX is portable

Yes

Switch Determines Calling Number’s presubscribed IXC

No

Based on CDPN, Call is routed to Inter Switch trunk toward terminating network

Call is routed to the appropriate terminating end office or network for termination to subscriber’s Line

Based on LRN, Call is routed to Inter Switch trunk toward terminating network

Call is routed to the appropriate terminating end office or network for termination to subscriber’s Line

I XC Queries Database for LRN

Slides 47-53

Slides 54-60

Slides 54-66

Slides 61-66

Is the Dialed Number Ported

No

Yes

Call is routed to the appropriate terminating end office or network for termination to subscriber’s Line

Call is routed to the appropriate terminating end office or network for termination to subscriber’s Line

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NNP NLRN
Option 2
Portable = LD2
PSTN Class 5 – Non-portable NXX Intra Switch Local Call Routed to Subscriber
NNP NLRN
Option 2
Portable = LD
Portable = LDPSTN Class 5 to Class 5 – Non-Portable NXX Inter Switch Local Call Routed to Subscriber
PSTN Class 5 to Class 4 to Class 5 – Non-Portable NXX Inter Switch Local Call Routed Direct to Subscriber
NNP NLRN
Option 2
Portable = LD

PSTN Class 5 to Class 4 to Class 5 – **Non-Portable NXX** Inter Switch Local Call Routed Direct to Subscriber
PSTN Class 5 to Class 4 to IXC to Class 4 to Class 5 – Non-Portable NXX Inter Switch Long Distance Call Routed to Subscriber

Class 5 Switch

IXC

Class 5 Switch

ISUP Trunk
PSTN Class 5 to Class 4 to IXC to Class 5 – Non-Portable NXX Inter Switch Long Distance Call Routed to Subscriber
NNP NLRN
Option 2
Portable = LD

PSTN Class 5 to Class 4 to IXC to Class 4 to Class 5 – Non-Portable NXX Inter Switch Long Distance Call Routed to Subscriber
NNP NLRN
Option 2
Portable = LD

PSTN Class 5 – Portable NXX Non-Ported Number Intra Switch Local Call Routed to Subscriber
PSTN Class 5 to Class 5 – Portable NXX Non-Ported Number Inter Switch Local Call Routed to Subscriber
PSTN Class 5 to Class 4 to Class 5 – Portable NXX Non-Ported Number Inter Switch Local Call Routed to Subscriber
PSTN Class 5 to Class 4 to Class 4 to Class 5 – Portable NXX Non-Ported Number Inter Switch Local Call Routed to Subscriber
PSTN Class 5 to IXC to Class 5 – Portable NXX Non-Ported Number Inter Switch Long Distance Call Routed to Subscriber

Class 5 Switch

IXC

LNP Database

Class 5 Switch

LNP Query

CdPN

ISUP Trunk

NNP NLRN
Option 2
Portable = LD
PSTN Class 5 to Class 4 to IXC to Class 5 – **Portable NXX Non-Ported Number** Inter Switch Long Distance Call Routed to Subscriber.
PSTN Class 5 to Class 4 to IXC to Class 4 to Class 5 – Portable NXX Non-Ported Number Inter Switch Long Distance Call Routed to Subscriber
PSTN Class 5 to Class 5 – Portable NXX Ported Number Inter Switch Local Call Routed to Subscriber
NNP NLRN
Option 2
Portable = LD

PSTN Class 5 to Class 4 to Class 5 – Portable NXX Ported Number Inter Switch Local Call Routed to Subscriber

Class 5 Switch

Class 4 Switch

IXC

LNP Database

Class 5 Switch

A

B

C

D

E

F

G

ISUP Trunk

LNP Query

LRN
NNP NLRN
Option 2
Portable = LD

PSTN Class 5 to Class 4 to Class 4 to Class 5 – Portable NXX Ported Number Inter Switch Local Call Routed to Subscriber
NNP NLRN
Option 2
Portable = LD

PSTN Class 5 to IXC to Class 5 – Portable NXX Ported Number Inter Switch Long Distance Call Routed to Subscriber
PSTN Class 5 to Class 4 to IXC to Class 5 – Portable NXX Ported Number Inter Switch Long Distance Call Routed to Subscriber
PSTN Class 5 to Class 4 to IXC to Class 4 to Class 5 – Portable NXX Ported Number Inter Switch Long Distance Call Routed to Subscriber

Class 5 Switch

Class 4 Switch

IXC

LNP Database

Class 4 Switch

Class 5 Switch

A

B

C

D

E

F

G

ISUP Trunk

LNP Query

LRN
NLRN

Option 3
A call is originated

Switch determines if Dialed NPA NXX is portable

Is the Dialed Number Ported

Is the Dialed Number Local

Call is routed to the appropriate terminating end office or network for termination to subscriber’s Line

Originating Switching Network Queries Database for LRN

Is the LRN Within the LATA

Is the Dialed Number Local

Call is routed to the appropriate terminating end office or network for termination to subscriber’s Line

Based on LRN, Call is routed to Inter Switch trunk toward terminating network

No

Yes

No

Yes

No

Yes

No

Yes

Call is routed to the appropriate terminating end office or network for termination to subscriber’s Line

Originating Switching Network Determines Calling Number’s Presubscribed IXC

Based on LRN, Call is routed to Inter Switch trunk toward terminating network

No

Yes

Is the Dialed Number Local

Originating Switching Network Determines Calling Number’s Presubscribed IXC

Call is routed to the appropriate terminating end office or network for termination to subscriber’s Line

No

Yes

Call is routed to the appropriate terminating end office or network for termination to subscriber’s Line

Slides 66-72

Slides 73-88

Slides 80-88

Slides 80-88

Slides 80-85

Slide 86-88

Slide 80-82

Slide 80-85

Slide 83-85

Slide 80-85
NNP NLRN
Option 3
Query by Originating Switch
PSTN Class 5 – Non-portable NXX Intra Switch Local Call Routed to Subscriber
NNP NLRN
Option 3
Query by Originating Switch

PSTN Class 5 to Class 5 – Non-Portable NXX Inter Switch Local Call Routed to Subscriber
NNP NLRN
Option 3
Query by Originating Switch

PSTN Class 5 to Class 4 to Class 5 – **Non-Portable NXX** Inter Switch Local Call Routed Direct to Subscriber
NNP NLRN
Option 3
Query by Originating Switch

PSTN Class 5 to Class 4 to Class 5 – Non-Portable NXX Inter Switch Local Call Routed Direct to Subscriber

Class 5 Switch

Class 4 Switch

Class 4 Switch

Class 5 Switch

ISUP Trunk
PSTN Class 5 to Class 4 to IXC to Class 4 to Class 5 – Non-Portable NXX Inter Switch Long Distance Call Routed to Subscriber
NNP NLRN
Option 3
Query by Originating Switch
PSTN Class 5 to Class 4 to IXC to Class 5 – Non-Portable NXX Inter Switch Long Distance Call Routed to Subscriber
PSTN Class 5 to Class 4 to IXC to Class 4 to Class 5 – Non-Portable NXX Inter Switch Long Distance Call Routed to Subscriber
NNP NLRN
Option 3
Query by Originating Switch

PSTN Class 5 – Portable NXX Non-Ported Number Intra Switch NNP Local Call Routed to Subscriber
NNP NLRN
Option 3
Query by Originating Switch

PSTN Class 5 to Class 5 – Portable NXX Non-Ported Number Inter Switch NNP Local Call Routed to Subscriber
LNP
Class 5
Switch

Class 4
Switch

Class 5
Switch

LNP Database

PSTN Class 5 to Class 4 to Class 5 – Portable NXX Non-Ported Number Inter Switch Local Call Routed to Subscriber

ISUP Trunk

LNP Query

CdPN

NNP NLRN
Option 3
Query by Originating Switch
NNP NLRN Option 3
Query by Originating Switch

PSTN Class 5 to Class 4 to Class 4 to Class 5 – Portable NXX Non-Ported Number Inter Switch Local Call Routed to Subscriber
PSTN Class 5 to IXC to Class 5 – Portable NXX Non-Ported Number Inter Switch NNP Long Distance Call Routed to Subscriber

Class 5 Switch

LNP Database

IXC

Class 5 Switch

LNP Query

CdPN

ISUP Trunk
PSTN Class 5 to Class 4 to IXC to Class 5 – Portable NXX Non-Ported Number Inter Switch NNP Long Distance Call Routed to Subscriber
PSTN Class 5 to Class 4 to IXC to Class 4 to Class 5 – Portable NXX Non-Ported Number Inter Switch NNP Long Distance Call Routed to Subscriber
NNP NLRN
Option 3
Query by Originating Switch
PSTN Class 5 to Class 5 – Portable NXX Ported Number Inter Switch NNP Local Call Routed to Subscriber
NNP NLRN
Option 3
Query by Originating Switch

PSTN Class 5 to Class 4 to Class 5 – Portable NXX Ported Number Inter Switch Local Call Routed to Subscriber

Class 5 Switch

LNP Database

Class 4 Switch

Class 5 Switch

ISUP Trunk

LNP Query

LRN

A
B
C
D
E
F
G
H
I
NNP NLRN
Option 3
Query by Originating Switch
PSTN Class 5 to Class 4 to Class 4 to Class 5 – Portable NXX Ported Number Inter Switch Local Call Routed to Subscriber
NNP NLRN
Option 3
Query by Originating Switch

PSTN Class 5 to IXC to Class 5 – Portable NXX Ported Number Inter Switch NNP Long Distance Call Routed to Subscriber
NNP NLRN
Option 3
Query by Originating Switch
PSTN Class 5 to Class 4 to IXC to Class 5 – Portable NXX Ported Number Inter Switch NNP Long Distance Call Routed to Subscriber
NNP NLRN
Option 3
Query by Originating Switch

PSTN Class 5 to Class 4 to IXC to Class 4 to Class 5 – Portable NXX Ported Number Inter Switch NNP Long Distance Call Routed to Subscriber
Class 5 Switch

LNP Database

IXC

Class 5 Switch

PSTN Class 5 to IXC to Class 5 – Portable NXX Ported Number Inter Switch NNP Long Distance Call Routed to Subscriber
NNP NLRN
Option 3
Query by Originating Switch

PSTN Class 5 to Class 4 to IXC to Class 5 – Portable NXX Ported Number Inter Switch NNP Long Distance Call Routed to Subscriber
PSTN Class 5 to Class 4 to IXC to Class 4 to Class 5 – Portable NXX Ported Number Inter Switch NNP Long Distance Call Routed to Subscriber
SIP Call Flows
VoIP Non-NNP Ported Number

INVITE E.164: B

UAS (B2BUA)

LNP DB

RS

INVITE E.164: B

UAC

LSMS

NPAC

SIP URL: B@Route1, Route 2...

Green: Call
Orange: Lookup Data
Blue: Source Service Provider
Red: Destination Service Provider
Yellow: Third Party
VoIP NNP Ported Number

INVITE E.164: B

INVITE E.164: B

INVITE E.164: B

INVITE SIP URL: B@IP ADD 192.76.120.192

SIP URL: B@IP ADD 192.76.120.192

SBC

UAS (B2BUA)

LNP DB

RS

UAC

LSMS

NPAC

Green: Call
Orange: Lookup Data
Blue: Source Service Provider
Red: Destination Service Provider
Yellow: Third Party
VoIP Non-Ported Number

INVITE E.164: B
UAS (B2BUA) → SBC

E.164
LNP DB → SBC

NO RESULT
RS → SBC

E.164
INVITE E.164: B
UAC → SBC

SIP URL: B@Route1, Route 2...

INVITE E.164: B
SBC → SBC

Green: Call
Orange: Lookup Data
Blue: Source Service Provider
Red: Destination Service Provider
Yellow: Third Party
Wireless Call Flows
Wireless Non-NNP Ported Number

INVITE E.164: B

INVITE E.164: B

INVITE SIP URL: B@Route1, Route 2...

S-CSCF

P-CSCF

LNP DB

RS

UE (A)

LSMS

NPAC

I-CSCF

Green: Call
Orange: Lookup Data
Blue: Source Service Provider
Red: Destination Service Provider
Yellow: Third Party
Wireless NNP Ported Number

INVITE
E.164: B

INVITE
E.164: B

INVITE
SIP URL: B@IP ADD

INVITE
IP ADD

S-CSCF

P-CSCF

UE (A)

ENUM

DNS

LSMS

NPAC

I-CSCF

E.164
SIP URL
DOMAIN
B
IP ADD
Wireless Non-Ported Number

INVITE E.164: B

S-CSCF

I-CSCF

IP ADD

INVITE SIP URL: B@Route1, Route 2…

P-CSCF

LNP DB

RS

UE (A)

LSMS

NPAC

E.164

NO RESULT

E.164

ROUTES

Green: Call
Orange: Lookup Data
Blue: Source Service Provider
Red: Destination Service Provider
Yellow: Third Party