

IP nets: from the origins to a possible NGN future

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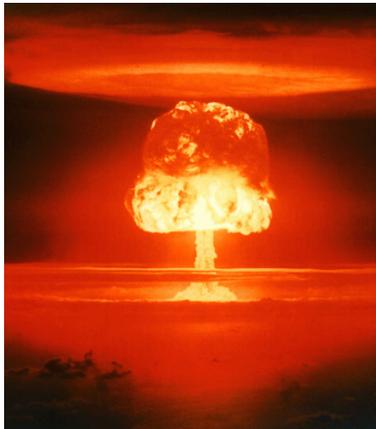
Agenda

- origins
- evolution
- non-evolution
- effectors
- futures

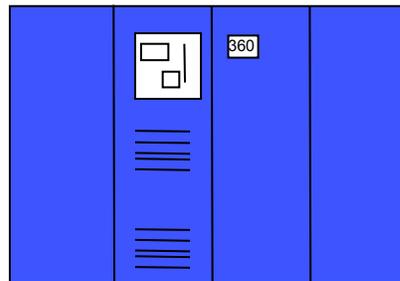
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origins

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or



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government \$



Cisco 1/ 05: 5

What existed?

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The Phone Network from **The P**hone **C**ompany

circuit-based

predictable interconnections between ends

assumed absolute requirement for QoS

assumption of being **carrier**-provided

the service was **voice**

the **“Intelligent Network” (IN)**



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if not **TPC**, lets create our own layer
(note: layer not network)

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Dest Addr	Src Addr	payload
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Dave's Goals

- 0/ multiplexed utilization of **existing** networks
- 1/ **survivability** in the face of failure
- 2/ support **multiple types** of communications service
- 3/ accommodate a **variety** of network types
- 4/ permit **distributed management** of resources
- 5/ **cost effective**
- 6/ **low effort** to attach a host
- 7/ **account** for use of resources

!security
!QoS
!efficiency

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e2e!

(which **might** mean “stupid network”
but does mean “no permission required”)



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What did *they* think the Internet was?

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- by definition
some *theys* still think this

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evolution

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Internet:

- government research net -> “for profit” ISP
- maybe to telco carrier
- but where is business model?
- transparent -> opaque
- NAT/firewall (not due to lack of addresses)
- limit innovation
- MPLS: TE to VPN marketing (but maybe useful)
- “IETF’ s ATM?”
- over wires -> carrying “wires” (pseudo wires)
- over voice net -> replacing voice net

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enterprise net:

SNA (DECnet, IPX, AppleTalk) -> IP

IP part: from toy -> utility

internal islands -> unified net

-> what's enterprise & what's Internet?

switching -> routing -> VLANs

disconnected -> connected

firewall enough -> firewall required but useless

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non-evolution

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IP
routing
network management
security
telephone business/regulation

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effectors

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non-regulation
lack of a business model
phone-based assumptions
regulation (CALEA, content control,
Sarbanes-Oxley, cyberconvention
Internet governance (ICANN, WSIS etc)

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futures

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ITU-T's NGN (phone system v2)
regulated monopoly
Internet (not just in name)

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NGN

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ITU-T effort

many other SDOs helping (ETSI, ATIS, FR forum ...)

basic idea

future is IP

future is SIP

but net requires e2e QoS (and billing)

for carriers to be economically viable they have

to be "in the loop" on services & content over net

factors

to do guaranteed QoS you need access control

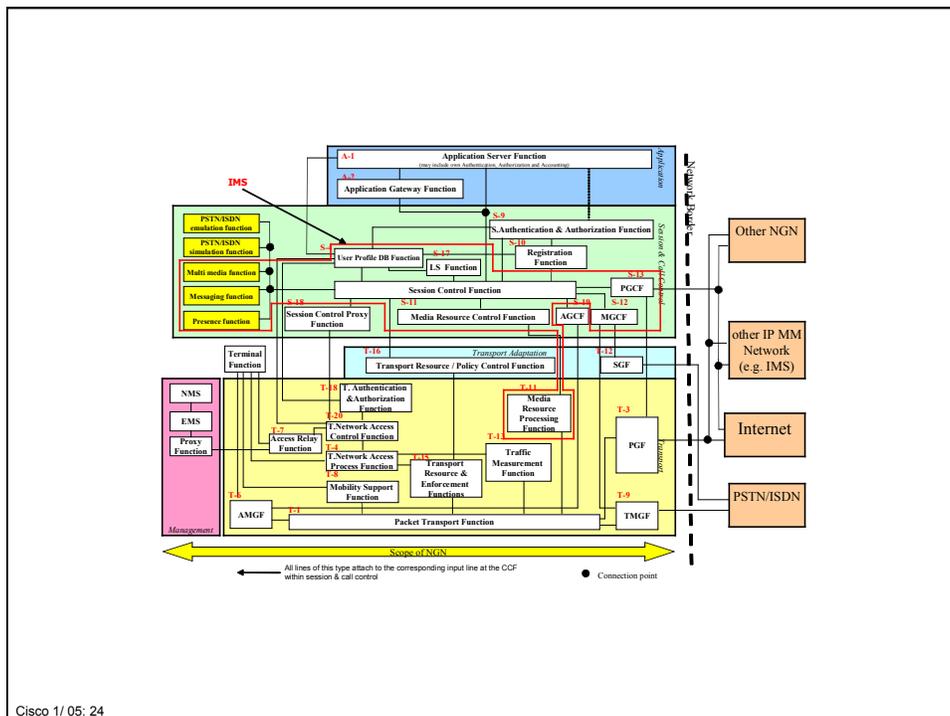
and per user authentication and authorization

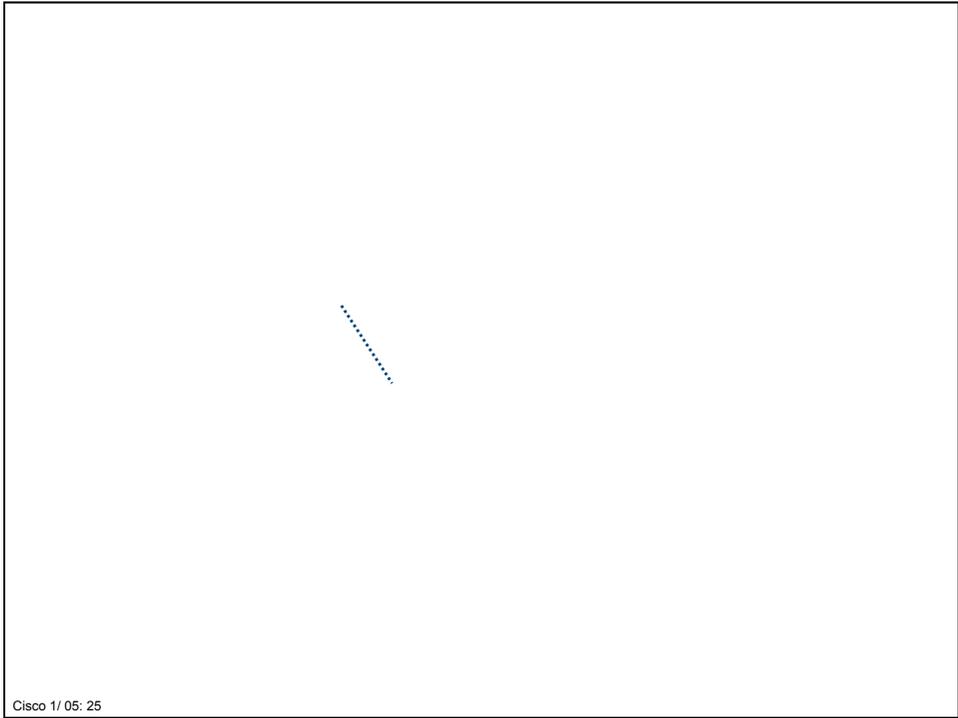
(not historic Internet features)

plans

e2e MPLS, inter-ISP settlements

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Architecture Feature

ISP does not profit from services running
over network

some telcos do not grok concept

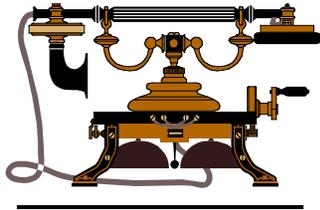
some carriers building “content aware” next
generation networks

“We do not know how to route money”

Dave Clark

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IP Telephony or Internet Telephony?



innovation or replication?

voice

IP

or

IP

“make sure it stays good”

“it is good enough”

some regulators want to “define” voice over IP
but no way to know what it *will* be