

VoIP – From Concept to Reality



AT&T

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Services, CTO & CIO**

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Top Ten Technology Trends

- 1. IP Will Eat Everything!**
- 2. Broadband Will Be Common**
- 3. Wireless Internet Will Be Big – Driving Mobility**
- 4. Sensor Networks Will Be Everywhere**
- 5. Convergence of Communications & Computers Will Become a Reality**
- 6. Death of Locality**
- 7. Security Is Critical**
- 8. NexGen Distributed Computing Is Growing**
- 9. Home LANs Will Proliferate**
- 10. Data Mining → Information Mining**



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Making History



Telephone
Invented



First
Transatlantic
Phone Service



Transistor

The Big Bang
Echo

Cellular
Phone



VoIP
Services

Late
1800's

1910's

1920's

1930's

1940's

1950's

1960's

1970's

1980's

1990's

2000's



First
Transcontinental
Phone Call



Speech
Synthesis



Laser



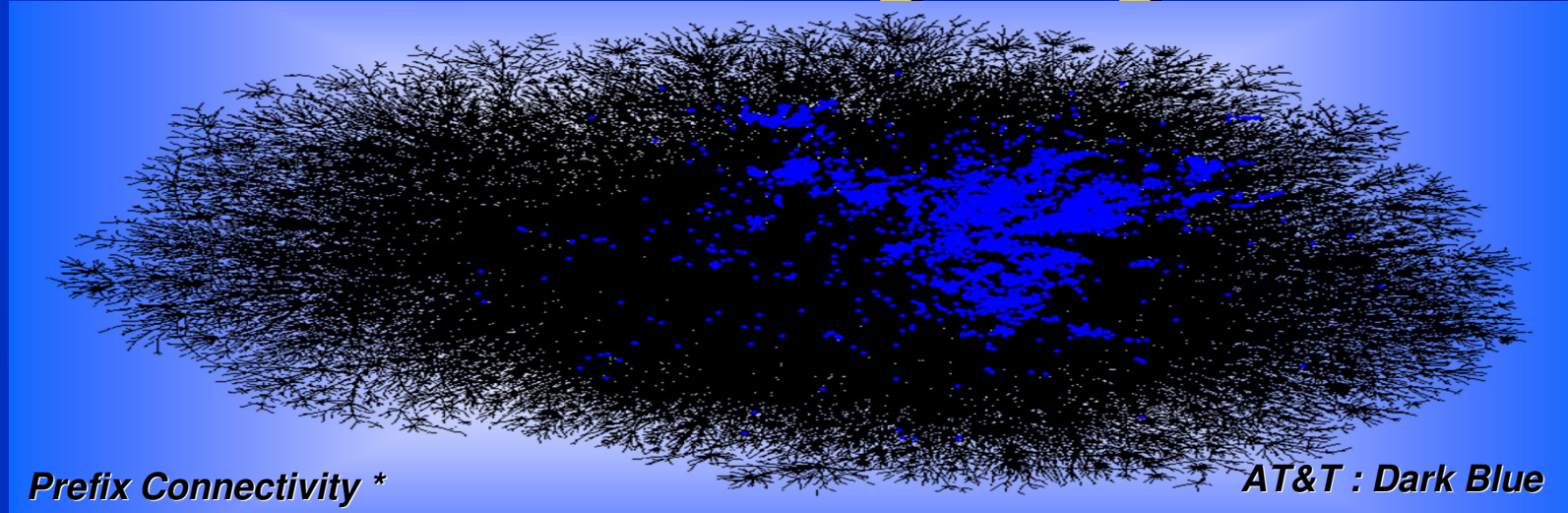
Fiber Optics
Communications

WiFi
Standards

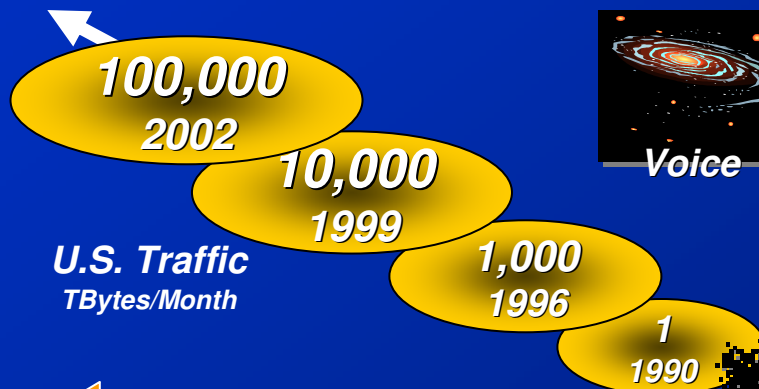


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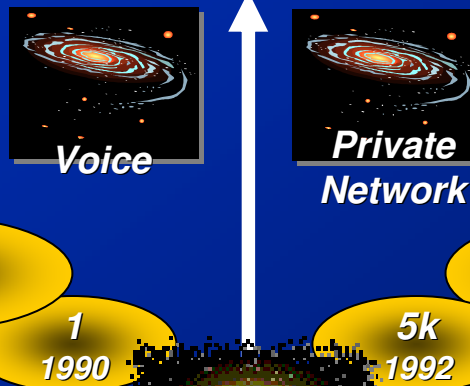
Internet Big Bang



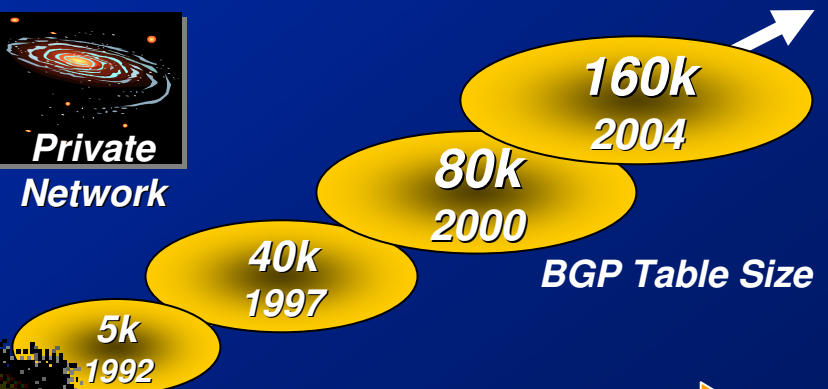
Volume Expansion



Galaxy Integration



End Point Expansion



Arpanet
1969

APPLICATION EXPANSION
Mail, Web, Multimedia, Gaming

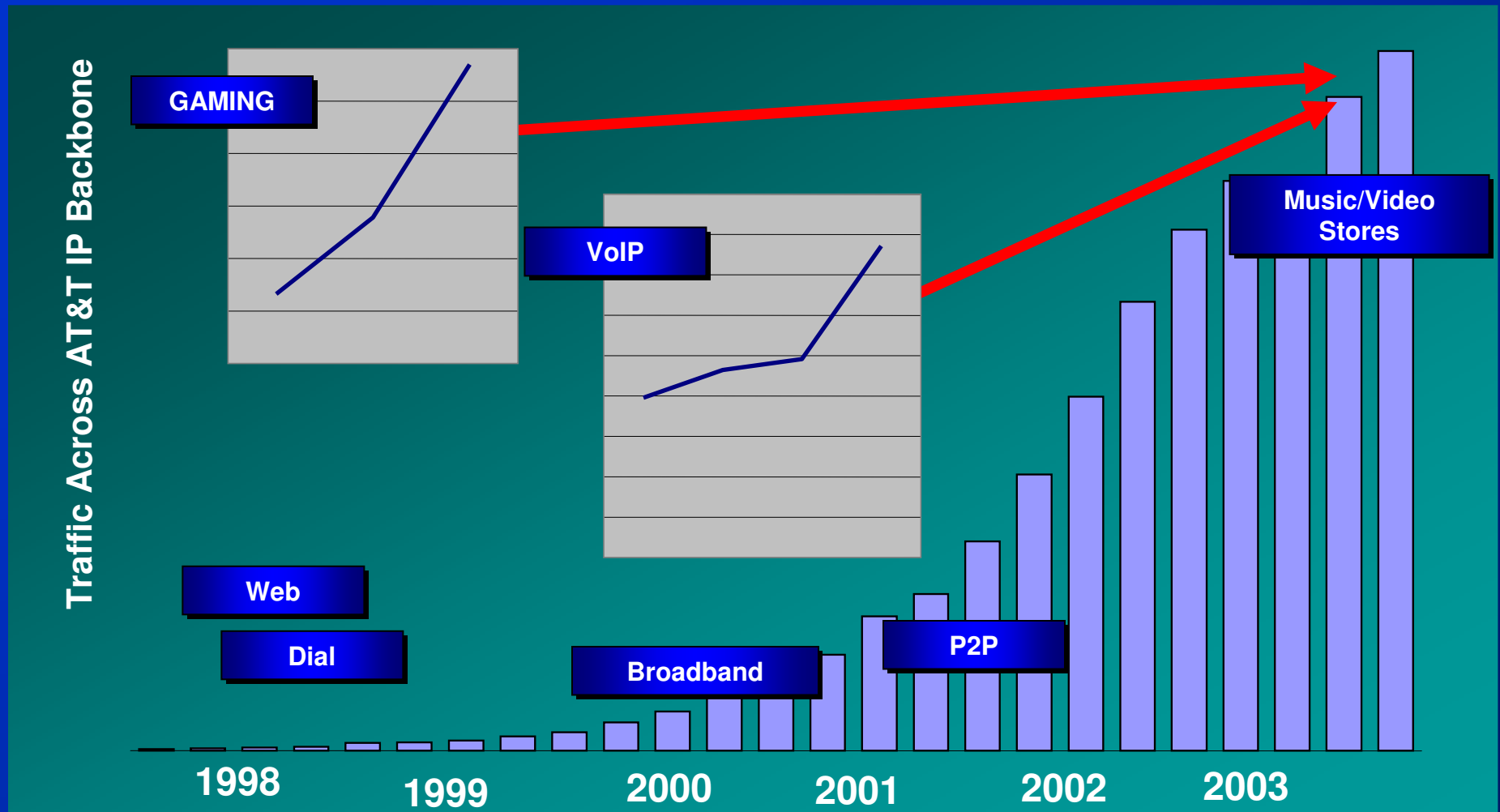
MATTER DISTRIBUTION
P2P, Grid Computing



Expansion, Expansion, Expansion

* AT&T Labs Research, Data Courtesy Lumetqa, Inc.

Internet Big Bang!

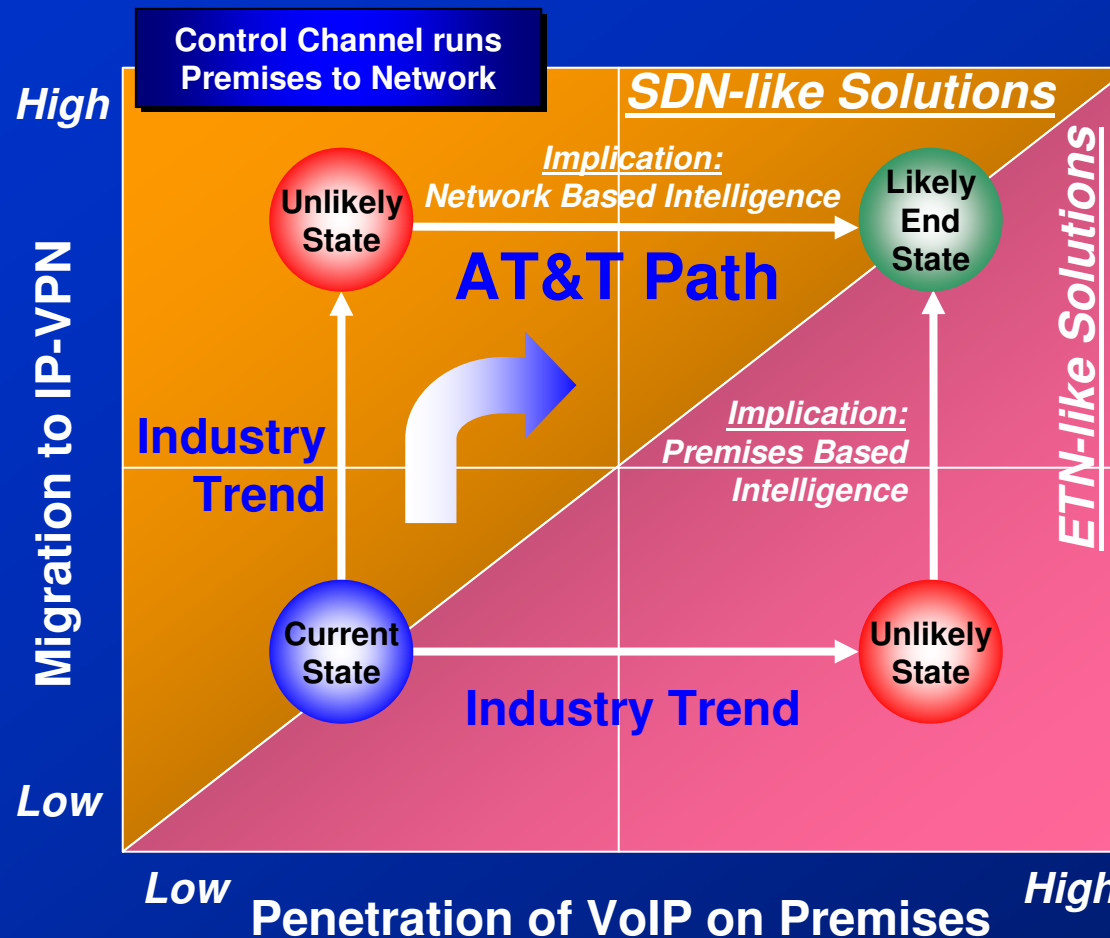


The Rise of IP Communications Services



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AT&T Business VoIP Opportunity

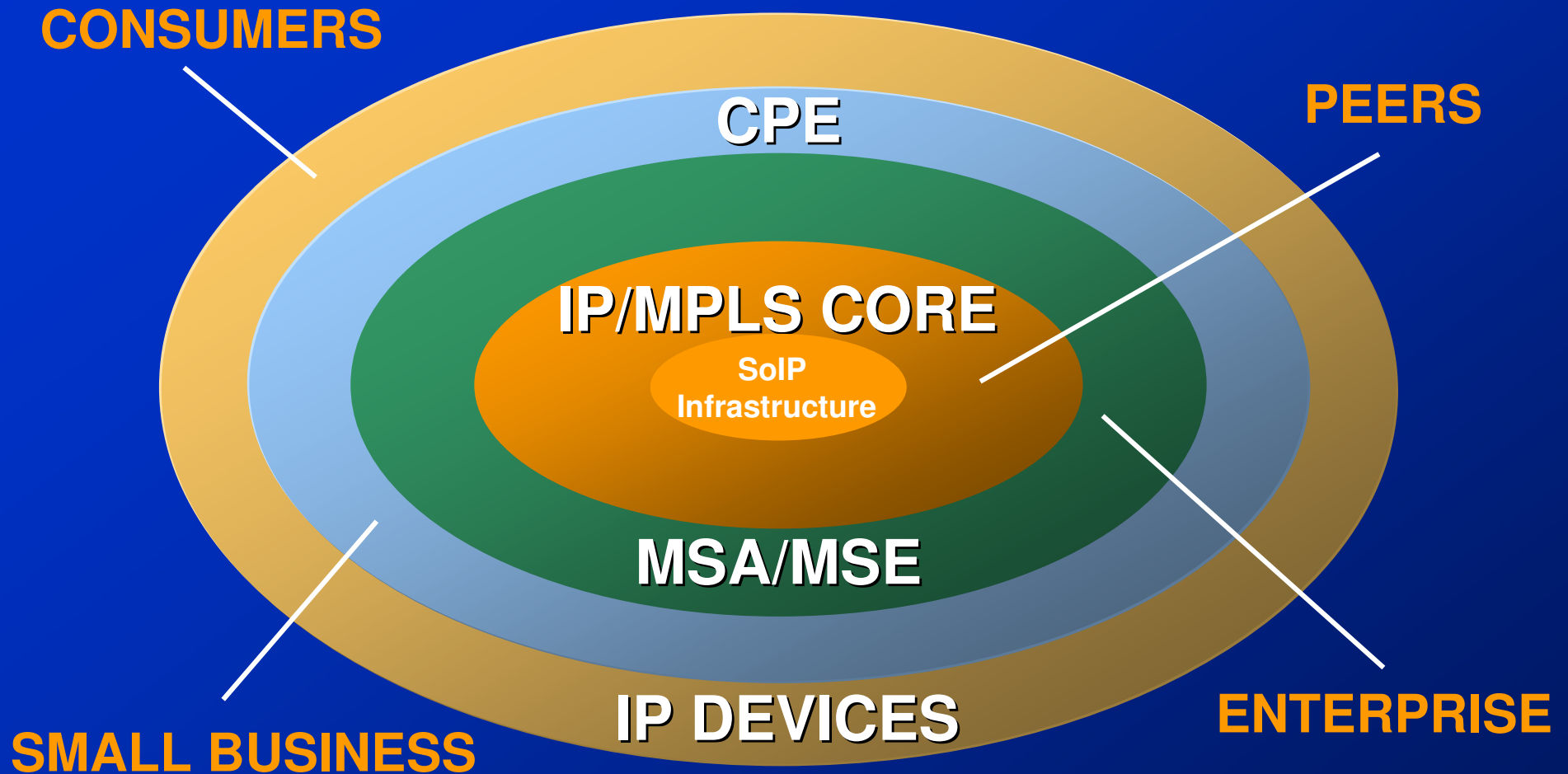


Follow a Path To Provide Internetworking Value Among SIP Endpoints & Applications



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IP Enablement



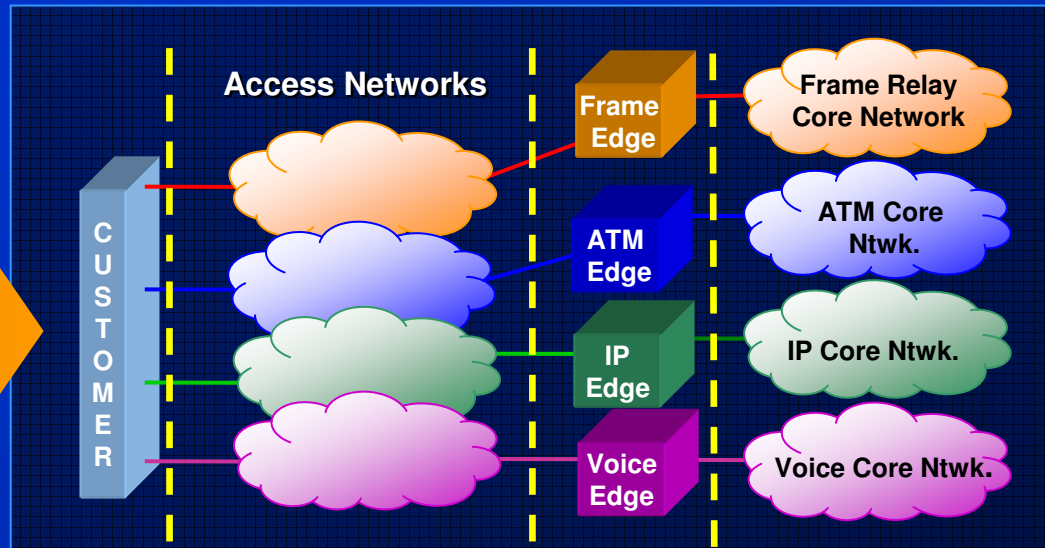
Packetizing to the Edge of the Network Enables Unprecedented Flexibility to Our Customers and Partners



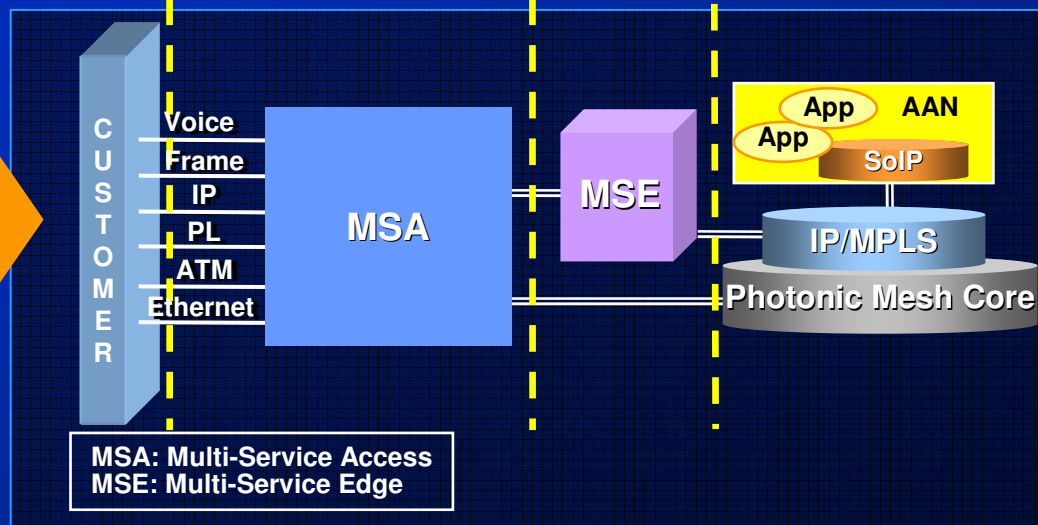
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Network Transformation

Current
Network
Architecture



Target
Network
Architecture



Target Network Architecture

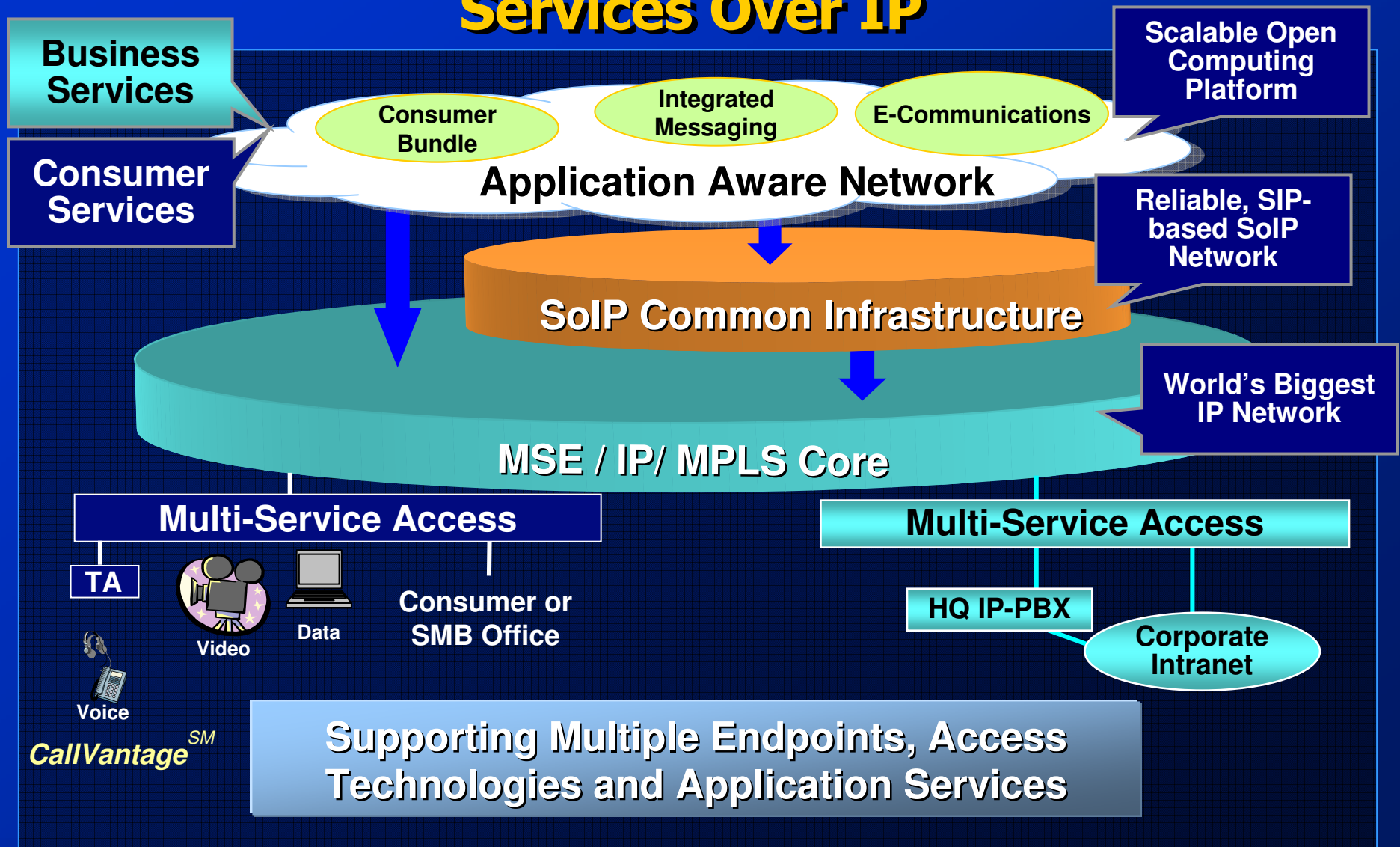
Partnering our innovation with best-in-class vendors, AT&T is transforming our network to provide:

- Lowest Cost
- Greatest Scale
- Flexibility in Service Offerings



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Network Transformation End-State: Services Over IP



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VoIP – Some Key Issues

Security

E911

Legal Intercept

Scalability & Reach

Operations & Network Mgt.



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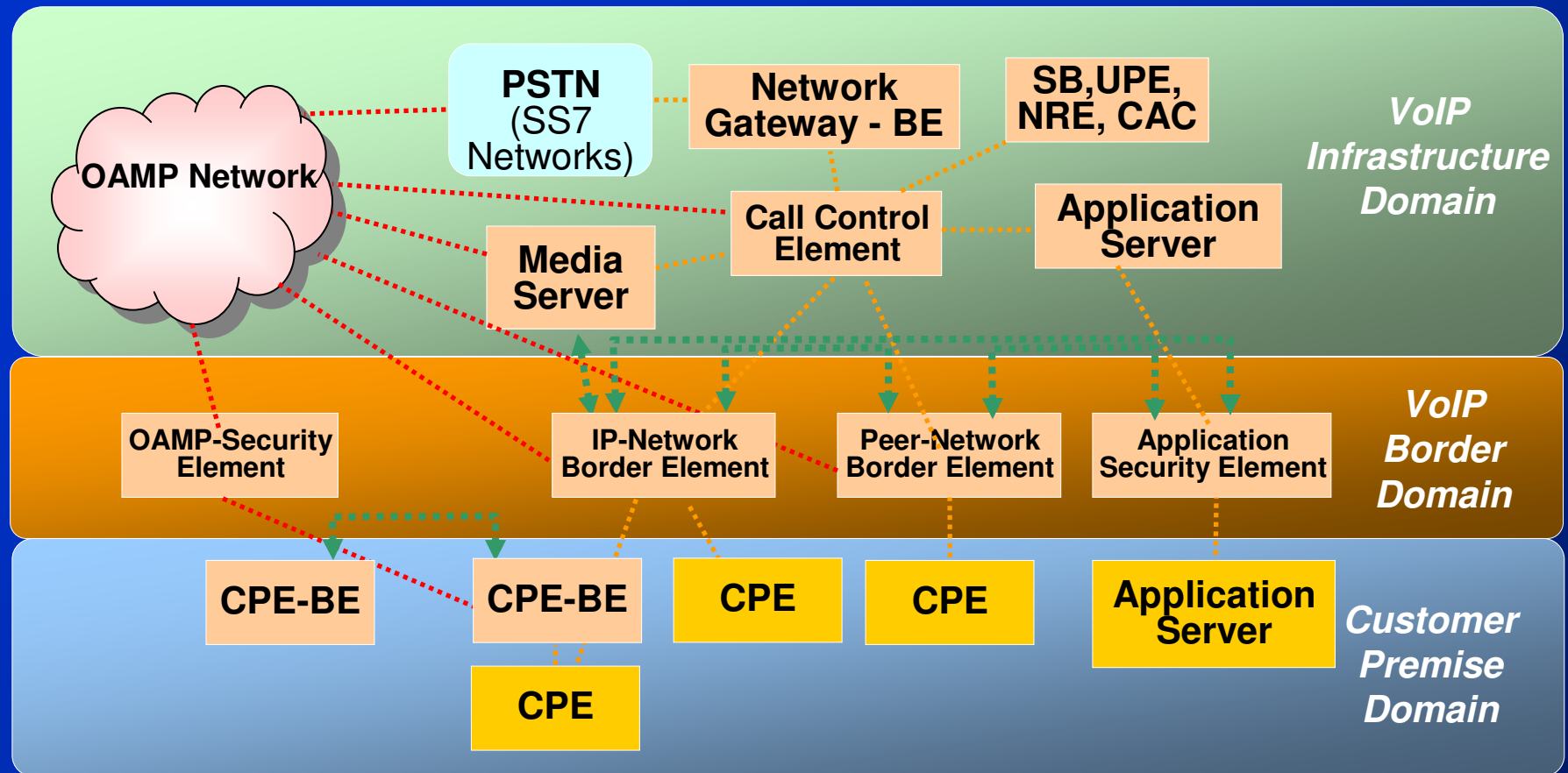
VoIP Security Objectives

- Preserve **integrity**
 - Prevent theft of the VoIP service
 - Prevent fraudulent use of VoIP services
- Preserve the **availability**
 - Prevent Denial of Service of the VoIP service
- Preserve the **confidentiality**
 - Prevent eavesdropping on signaling and media paths

Customer Perception of VoIP Security Should
Match That of PSTN



VOIP Security Architecture Protection Domains



Open Architecture Enabling Best of Breed Plug 'n Play Components

■ AT&T Managed
■ Customer Managed

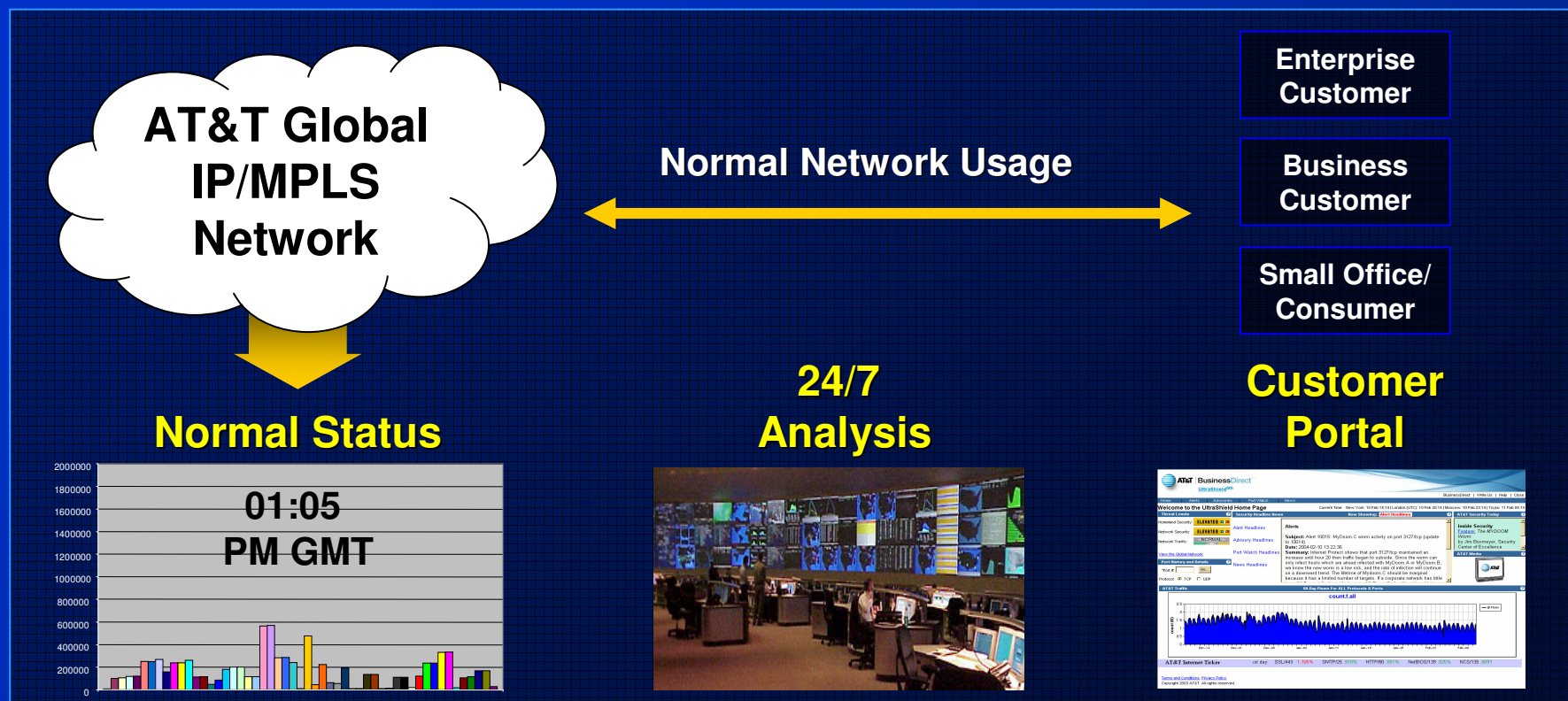
BE – Border Element
CAC – Call Admission Control
CPE – Customer Premise Equipment
NRE – Network Routing Engine
OAMP – Operations, Administration, Maintenance, Provisioning
SB – Service Broker
UPE – User Profile Engine



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AT&T Intelligence-Based Service: Internet Protect

Leveraging AT&T's Innovation to Meet Customer Needs



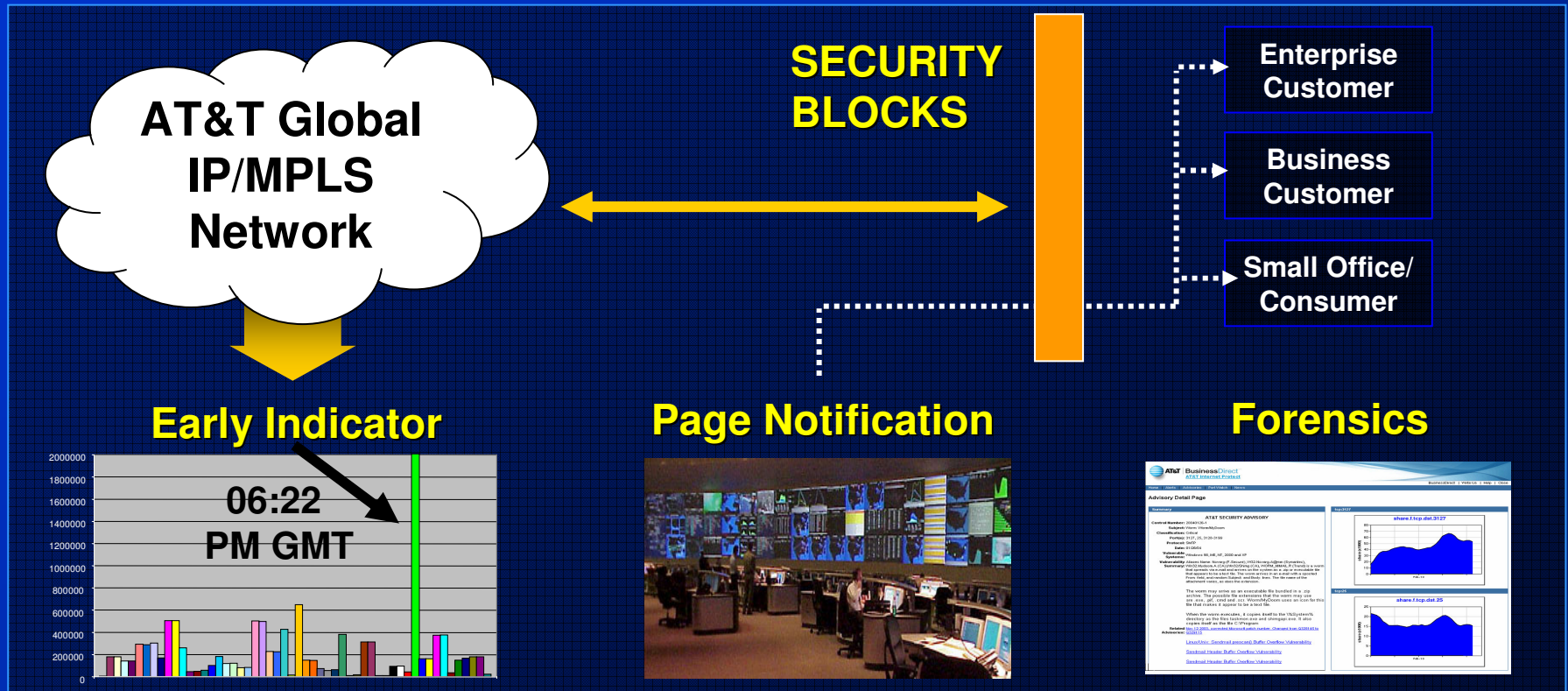
- AT&T Analysts Process Over 7 TB of Information Daily for Security Indicators
- Internet Protect Provides 24 by 7 Processing, Analysis, and Portal



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AT&T Intelligence-Based Service: Internet Protect

Leveraging AT&T's Innovation to Meet Customer Needs



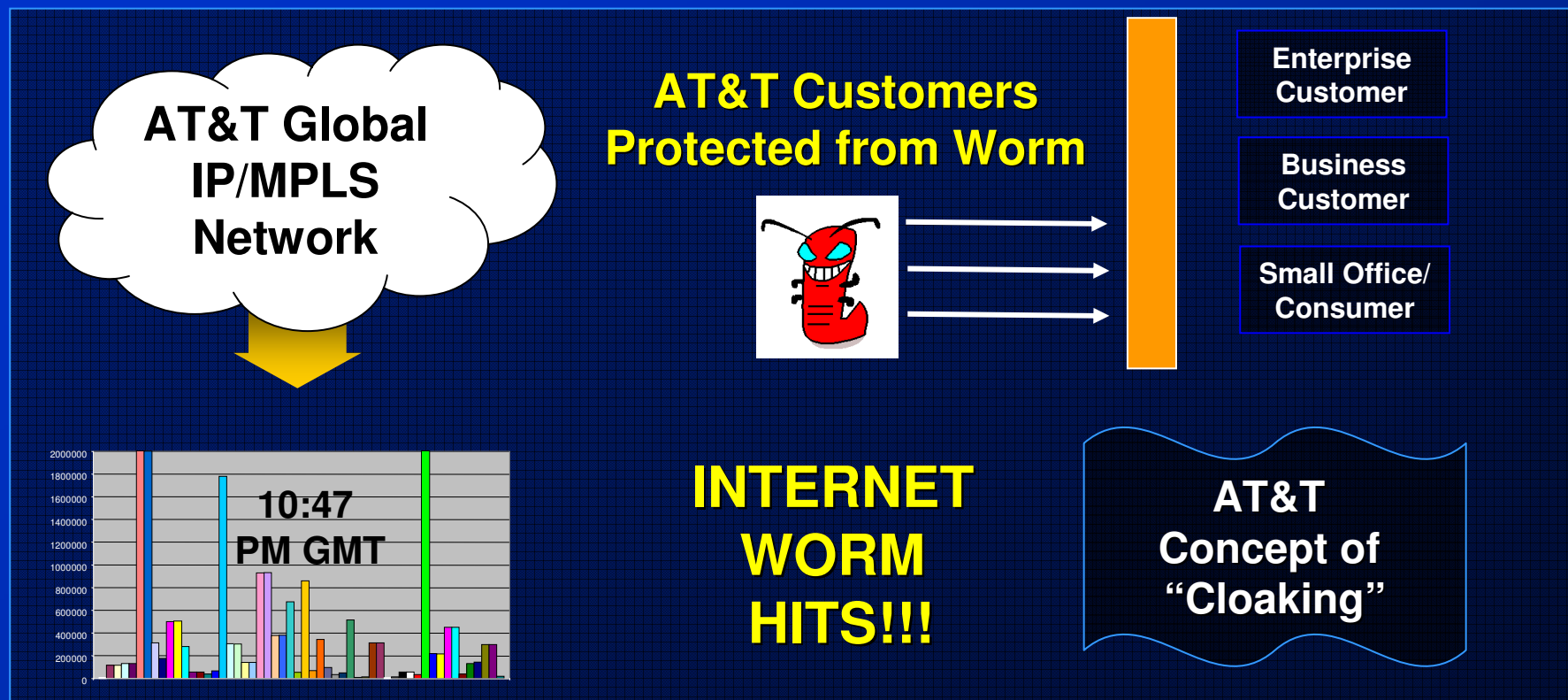
- Security Indicators Provide Real Time Alerting, Forensics, and Blocking
- 24 by 7 Monitoring Allows AT&T Clients to Respond Based on Best Data



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AT&T Intelligence-Based Service: Internet Protect

Leveraging AT&T's Innovation to Meet Customer Needs

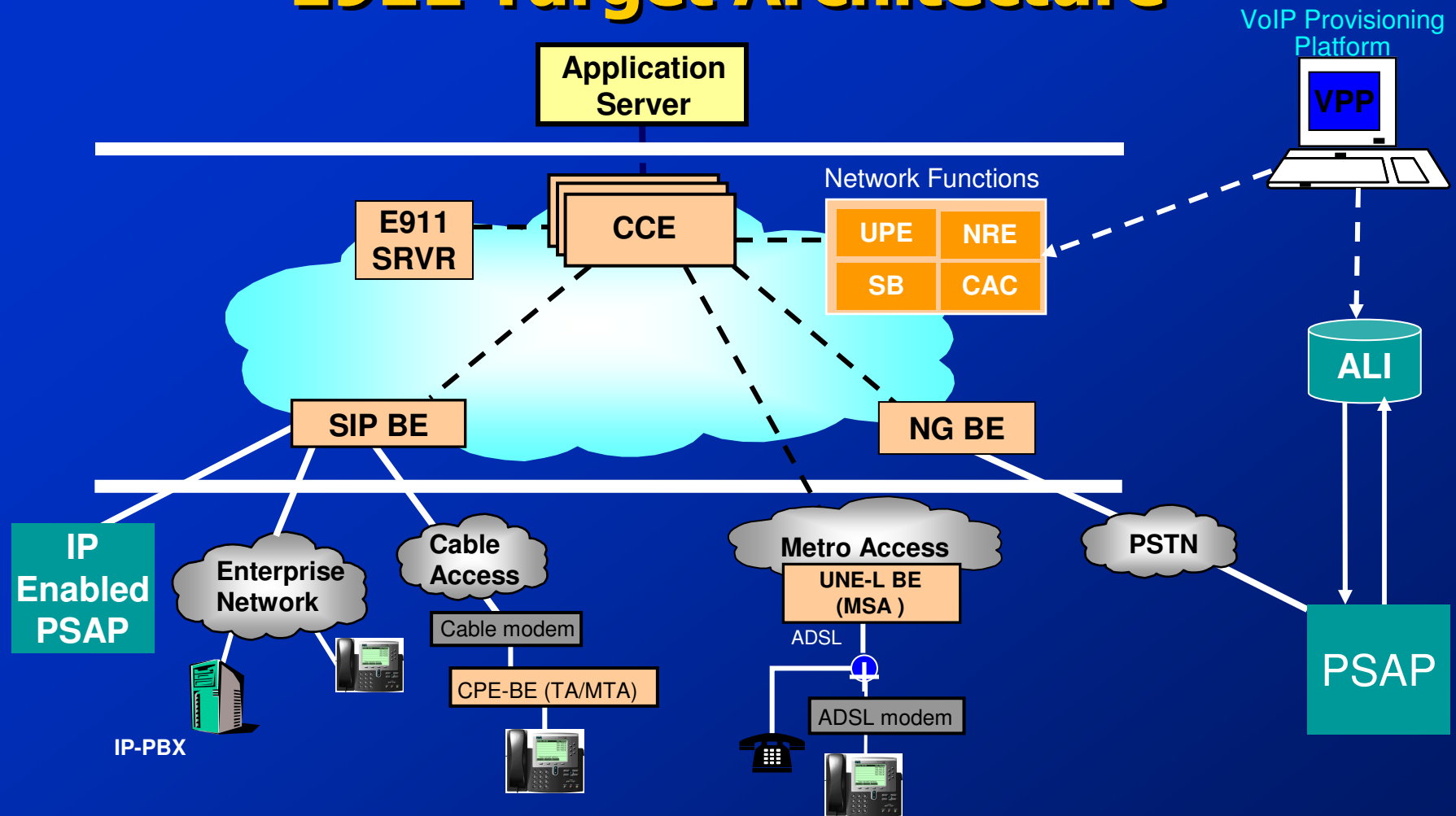


- Internet Protect will support a reliable VoIP service
- AT&T Internet Protect Reinvents "Network Intrusion Detection"



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E911 Target Architecture



AT&T's Flexible SoIP Architecture will Support Both Legacy PSAPs and Future IP-enabled PSAPs

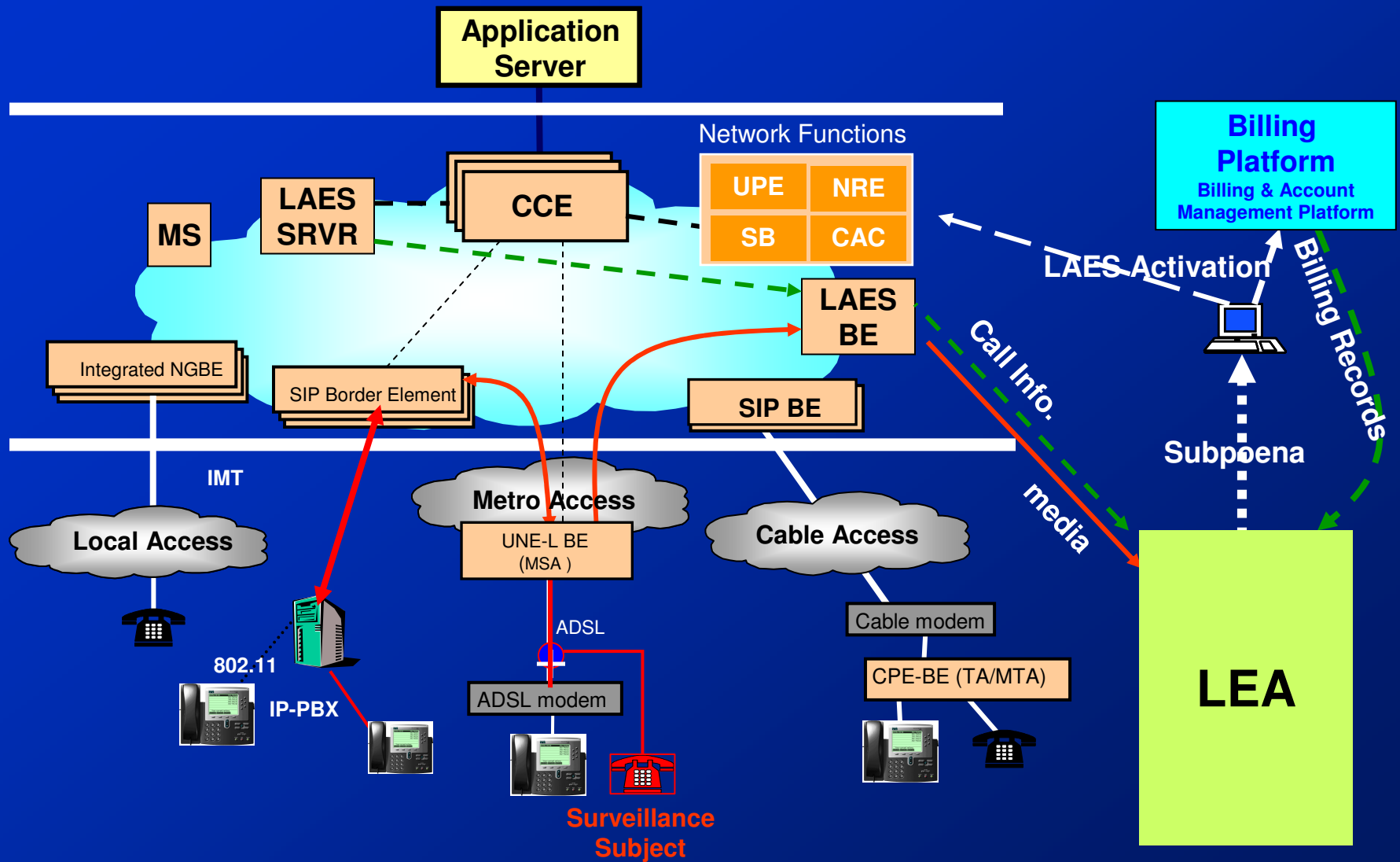


ALI – Automatic Location Indicator
BE – Border Element
NG – Network Gateway
PSAP – Public Safety Answering Point

SB – Service Broker
CAC – Call Admission Control
UPE – User Profile Engine

NRE – Network Routing Engine
SIP – Session Initiation Protocol

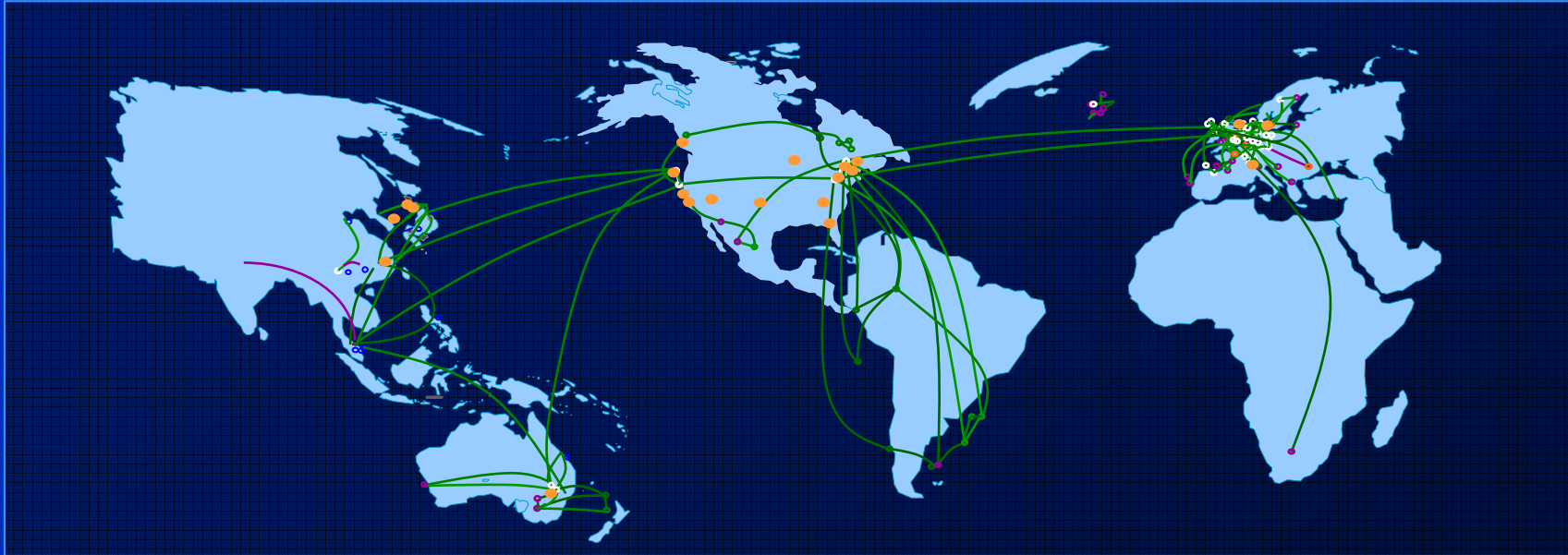
Legal Intercept/Surveillance Architecture



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CCE – Call Control Element
 LAES – Lawfully Authorized Electronic Surveillance
 LEA – Law Enforcement Agency
 MS – Media Server

VoIP – Scalability & Scope



More Places

Global Network

- 146 MPLS Nodes
- 4,800 Remote Access POPs in more than 150 countries
- 21 Internet Data Centers

Domestic Network

- 744 POPs
- 76K Route Miles

More Packets

AT&T carries around 1.2 petabytes of IP traffic per day over the AT&T network

AT&T's IP traffic is now over 40% greater than LD voice traffic

More Reliable

All of AT&T's networks perform between 4-5 nines of reliability



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AT&T and VoIP

OUR COMPANY OUR NETWORK

NETWORK
TRANSFORMATION

FLEXIBLE
ARCHITECTURE

LOWEST
COST STRUCTURE

GREATEST
SCALE

OUR VoIP COMMITMENT

FEATURE RICH

UNEQUALLED
SECURITY

COMPLIANCE WITH
LAWFUL
INTERCEPT & E911

MEETING
BUSINESS &
CONSUMER NEEDS

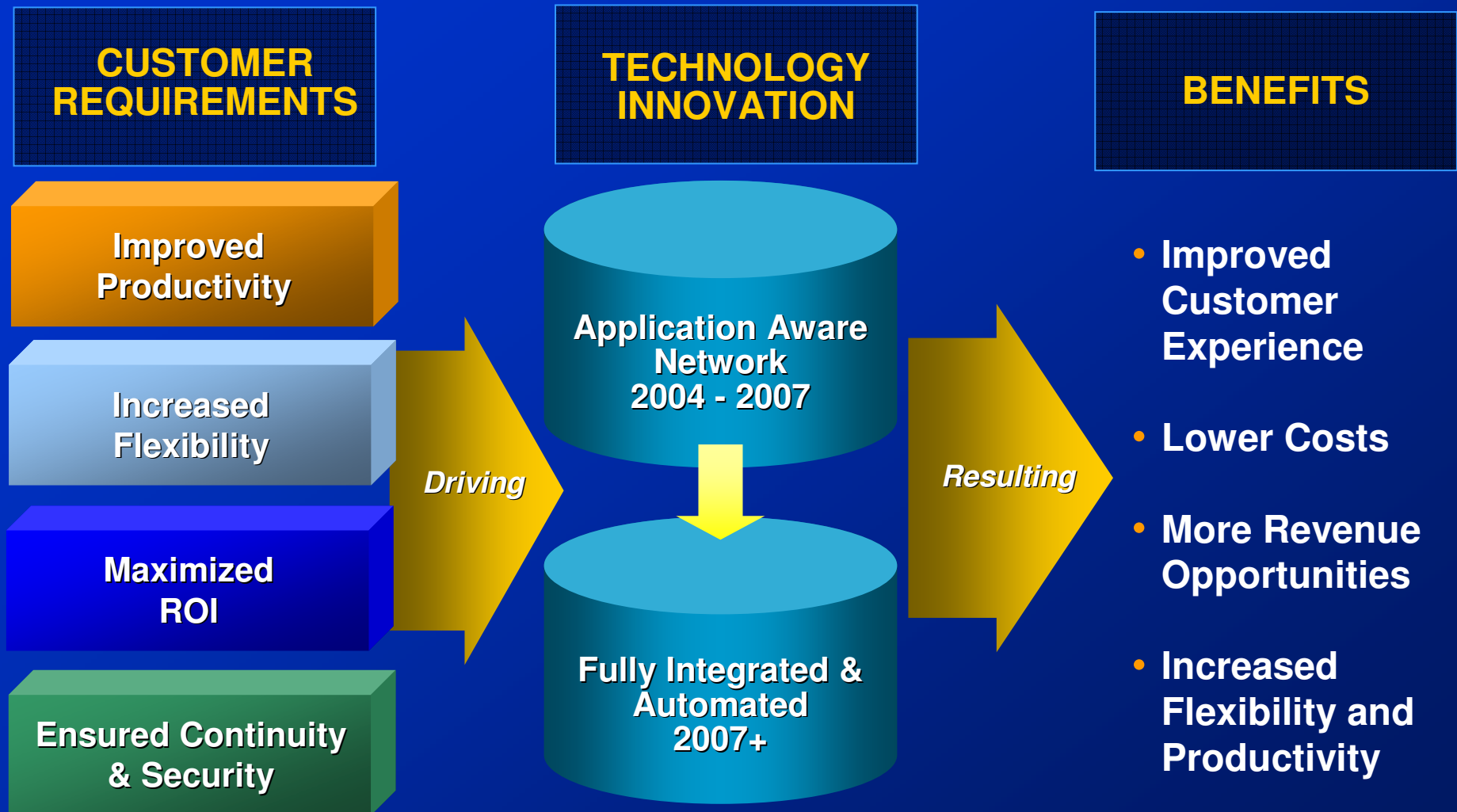


Operations & Network Management Will Be Key To Success



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Turning Vision into Reality



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